Three Essays on Inter-Provincial Labour Mobility of Canada

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ABSTRACT

Three essays on inter-provincial labour mobility of Canada

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This thesis consists of three essays on inter-provincial labour mobility in Canada. In the first essay, we explore the concepts of provincial gross, net and share of net mobility rates across education and age groups using the Survey of Labor and Income Dynamics (SLID, 1993-2011) of Canada. Our results show that provincial mobility of young and more educated are more than their counterparts. The share of net mobility rates reveals that young and less educated individuals mostly have one-way inter-provincial mobility. Moreover, inter-provincial migration using gravity model shows that the effects of border and population sizes of destination and original provinces have positive influences and distances have the negative influence on provincial migration. We also identify a positive correlation between provincial in- and out-migration in Canada. This shows that provinces that lose more people also seem to attract more people. Our analysis further illustrates that net provincial mobility has a stronger relationship with in-migration compared to out- migration.

The second essay examine the effect of local market conditions (LMC) on provincial mobility based on Canadian Survey of Labour and Income Dynamics (SLID) from 1993-2011. For measuring local market conditions at the provincial level, we consider two commonly used indices in the literature; one is based on employment growth (Bartik, 1991; Blanchard et al., 1992) and the other one is the unemployment rate. Our findings suggest that local market conditions of the original province rather than a destination province play a significant role in triggering inter-provincial migration. We find that less educated and young individuals are more likely to stay in response to increase in employment growth. However, in response to increase in the unemployment rate, less educated individuals are less likely, and young individuals are more

likely to move out of the province of origin. To have a deeper look about the impact of the local market condition on provincial mobility we estimate five different frequencies of mobility. This suggests that shorter frequency of mobility provides more accurate picture how local market conditions affect provincial migration compared to census data. We also find that the effect of employment growth and the unemployment rate of the original province on provincial mobility, build up gradually. However, the effect of unemployment rates of the destination province on provincial migration declines over time.

Finally, the third essay represents the characteristics and the mover-stayer wage gap of provincial movers. Each year a considerable number of people move across provinces of Canada. Some provinces are losing, and some provinces are gaining skilled workers. However, there are not many studies investigate "Who moves and Who Stays behind." By using Canadian longitudinal data set "Survey of Labor and Income Dynamics (SLID)" from 1993-2011, we find that individuals from both education and age groups prefer to stay in Alberta and British Columbia, and Quebec is far behind than Ontario in retaining above average workers. This study also examines pre-move and post-move wage difference of provincial movers and stayers in the same locality. Our results suggest that the mover-stayer wage gap varies across education and age groups and also depend on the employment status. In analyzing the wage pattern of mover-stayer wage gap, our study also reveals that wage differential between movers and stayers disappears after few years of the provincial move. In analyzing occupational mobility among provincial movers our findings demonstrate that provincial movers remain in the same occupation earn the most and provincial mobility pays, but occupational mobility does not.

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Essay 1

Gross and Net Provincial Mobility of Canada

1.1 Introduction

Because of lower fertility, migration has become a major determinant of employment growth across regions. This is also true for Canada. For example, recent data from Statistics Canada show that Quebec and Ontario has lost a considerable share of their workforce to the western provinces of Canada. Therefore, in order to understand the labour markets across Canada and provincial employment dynamics, it is essential to study the process through which the Canadian labour force reallocates across provinces in Canada.

There is a growing literature on labour mobility across Canada. My work in this essay differs from the existing studies in two important dimensions. First, previous studies on Canadian internal migration (Bernard et al., 2008; Chen and Fougere, 2009; Osberg, 1991; Vanderkamp and Grant, 1987; Robinson and Tomes, 1982) has mainly focused on the employment gain or loss across Canada. But, such approach has a major drawback which considers only estimations of overall gain and loss of labour force due to migration in-and-out of a province. Without identifying whether this negative or positive flows of labour force of a province due to less inflow or more outflow, it is difficult for the government to take an appropriate policy. Second, by using the longitudinal data set our findings provide more accurate estimation of provincial mobility rates compared to the census data and establish the empirical facts how migration flows is affected by population size, distance and presence of shared borders of provinces.

To understand the relocation process of individuals across provinces in Canada, it is essential to study gross, net and share of net mobility rates. Provincial gross mobility measures the sum of inflow and outflow of individuals of a province whereas provincial net mobility measures total inflow minus outflow of individuals of a province.

Share of net mobility rate is the ratio of the net and gross mobility rates which reveals whether mobility displayed one directional or both directional by any specific demographic profiles. Taking account of such numbers allow for quantitative assessment of labour mobility in Canada.

Provincial gross mobility rates can be affected by both in- and out-migration. A province can experience high numbers of both inflow and outflow that result in high gross mobility. However, due to movement in opposite directions, net mobility can be very low as the inflows and outflows cancel each other out. In another case, a provinces net-migration can be very low due to low both in-migration and out-migration. Lkhagvasuren (2014) concludes in his recent study that empirical analysis solely based on either gross or net mobility cannot clearly understand the dynamic nature of the labour market. Therefore, the combined consideration of provincial gross flows along with inter-provincial net mobility allows us to sharpen our understanding of the mechanism by which some provinces are gaining compared to others in terms of in-migrants.

In this essay, we have three main objectives. First, to have a deeper look into the provincial migration rates we consider three types of mobility rates; gross, net and share of net mobility rates. These mobility rates are also estimated across various age and education profiles to understand the dynamic structures of the provincial labour market. Second, to study provincial migration considering gravity model framework and estimate gravity-adjusted gross mobility rates. The third objective is to understand the relationships among in-migration, out-migration and net mobility rates in Canada. This highlight how in- and out-migration are correlated and also the strength of in- and out-migration in explaining net migration in Canada.

Different educational attainments generally have different job prospects which can demonstrate different patterns of labour mobility. Individual's age also plays an

important role in deciding someone's willingness to move as well as in adjusting capability after a provincial move. The analysis based on age and education has enormous importance in understanding provincial demographic composition and relevant policy issues. It is well established in the literature that migration propensities differ considerably by age and education level (Greenwood, 1997). Recent works by Lkhagvasuren (2014), Machin et al. (2012) and Malamud and Wozniak (2012) show that education has a large causal effect on mobility and young workers are more mobile compared to the old in the U.S. (Hansen and Lkhagvasuren, 2015).

In identifying major determinants of migration, there exists a large volume of literature based on the Gravity model. Greenwood (2005) mentions the basic framework of the gravity model that explores how gross migration is influenced by population sizes of origin and destination and also by the distance between them. Many of the studies focus on migration at the provincial level and sub-provincial level in Canada (Coulombe, 2006; Foot and Milne, 1984; Cheng et al., 2005; Flowerdew and Amrhein, 1989)[1]. Amirault et al. (2013) uses gravity model framework to explain aggregate gross migration flows between economic regions by using Canadian census data from 1991-2006[2]. Most of the studies in the migration literature used census data which has an inherently fixed migration interval (Greenwood, 2005). Thus census data only allows us to observe the partial history of such migrants. In this study, we use SLID which is a panel data set that is under-utilized in the study of labour mobility in

[1] Coulombe (2006) explored the determinants and consequences of Canadian interprovincial migration in the context of the structural and cyclical aspects of migration. He finds that migration responds more strongly to the structural asymmetries. Foot and Milne (1984) estimated Canadian inter-provincial migration using the gravity model. The data used was obtained from the 1961-79 Family Allowance data set. They concluded that the gravity model of migration was an insightful model in explaining migration patterns across Canadian provinces. Cheng et al. (2005) applied econometric techniques related to gravity models of international and inter-provincial trade. The techniques discussed in their paper also were very useful to us in our study of inter-provincial migration.

[2] The data used in this study are Statistic Canada's Censuses from 1991, 1996, 2001 and 2006 which are aggregated to the economic region level.

Canada. Using this data, we are able to calculate the year to year bilateral mobility across provinces in Canada. Such data set enables us to calculate bilateral provincial gross mobility with better precision and avoids the problems that are attached to census data.

One of the common findings in literature of labour mobility is that there is a positive correlation between in- and out-migration. Previous works by Coen-Pirani (2010)[3], Tervo et al. (2001) and Mueser (1989) estimated in- and out-migration rates among U.S. states and found a positive relationship between them. In this study, we also measure the three different types of correlation; in- and out-migration, net and in-migration and net and out-migration to contribute to the discussion in the context of Canada.

The remainder of the essay is organized in the following manner. In section 1.2, we describe the data and methodology. In section 1.3, we estimate different inter-provincial mobility rates across education and age groups. Section 1.4 explores the gravity model framework. Then in section 1.5, we reveal the relationships among in-migration, out-migration, and net mobility rates. Lastly, section 1.6 concludes the essay.

1.2 Data and Methodology

1.2.1 Data

The data used in the analysis are drawn from the Survey of Labour and Income Dynamics (SLID from 1993 to 2011). SLID is a household survey that provides long-range longitudinal follow-up on Canadian families and individuals' demographic background, income, education level, labour market activities and financial situation.

[3]Used U.S. census data from 1970-2000.

SLID interviews the same individuals for six consecutive years who are 16 years old or above and covers all persons living in Canada except: persons living in Yukon, the Northwest Territories, and Nunavut, persons living on Reserves, persons living in institutions, and military personnel living in barracks. SLID uses computer-assisted telephone interviewing (CATI) for collecting data, and interviews are conducted by telephone and the results are simultaneously entered in a computer that guides the interviewer through the questionnaire. In each panel, one individual is surveyed for six consecutive years and these individuals are randomly choose from the monthly Labour Force Survey (LFS). In our mobility estimation, we do not consider international migration as we only observe individuals who remain in the panels for six consecutive years[4]. This is a balanced panel data set. The SLID survey is a collection of seven panels, and a new panel is introduced in every three years. Except for the first panel from 1993-1995, all the remaining panels are overlapped for three years and panel-7, which is the last panel of the survey, contains just one year (2011). Each panel includes roughly 15,000 households, including about 30,000 adults. The figure in appendix 1.6 explains the span of one panel and how each panel is overlapping with another panel[5]. Moreover, based on panel 5, the response rate[6] of this data set is 72.8% and the permission rate[7] is 88.2%. In the appendix 1.A we also provide an overview of the SLID survey and highlight some data quality matters.

For our analysis, we formed two education groups - less educated and more educated and two age groups - young and old. For less educated group, we include

[4]Since, we only observe an individual who remain in the panel for all six consecutive years, it may underestimate the mobility rates estimation.

[5]Source: Data Quality in the 2002 Survey of Labour and Income Dynamics (SLID) written by Barbara Armstrong and Georgina House and published by Income Statistics Division and Social Survey Methods Division, Statistics Canada.

[6]Response rate is equal to the number of eligible respondent divided by total number of respondents. Non-respondent: If all persons in a household are non-respondent to both labour and income questions, then these persons (and households) are non-respondents.

[7]The respondent was asked for permission to access tax records. January refusal initiate may interview for income related questions.

individuals who only completed high school or dropped out from high school. For more educated group, we add all individuals with college and university degrees. Regarding age, we label all individuals from 16 to 30 as young and from 31 to 55 as old. We use the information on individuals' residence province every year to identify their current province. By observing any difference in the province of residence between years, we identify them as movers. After identifying the movers, we recognize their residence province before and after the move so that we can measure the magnitude of in-migration and out-migration of a specific province in a specific year. Our calculations also confirm that aggregate in-migration matched with aggregate out-migration to all provinces which validates our measurement accuracy in identifying provincial mobility (details are given in appendix 1.A as Technical Analysis).

1.2.2 Provincial Gross Mobility Rates

We have measured different types of provincial mobility rates in our study. We estimate gross mobility, net mobility, and share of net mobility across education and age groups at the provincial level. We also estimate economy-wide gross mobility rate. In fact, in the case of economy-wide mobility, the sum of in-migration from all provinces should be equal to the sum of out-migration, as the people who move out from a given province will definitely move into some other province. However, in case of economy-wide gross mobility, we have to consider either sum of in or the sum of out-migration for a specific period. We calculate the in-migration rate of a specific province in a particular year by dividing the total number of in-migration by the total population of that given province in a specific year. Similarly, we calculate the out-migration rate of a specific province in a particular year. For provincial gross mobility rate, we add both gross inflow rate and outflow rate to identify the overall gross mobility rate in a province over a specified period.

We compute provincial net mobility rates by calculating the differences between in-migration rates and out-migration rates across provinces (Davis and Haltiwanger, 1992; Lkhagvasuren, 2014). We also use differences between in- and out-migration rates when we measure correlations between net and in-migration and net and out-migration. Also, in our study, we measure the share of net mobility rate for a particular group by dividing net mobility rate with the gross mobility rate of the given group to understand the magnitude of net mobility relative to gross mobility. In appendix 1.A, we present all the formulas for all different mobility rates.

1.3 Gross and Net Mobility

Mobility has always been an essential aspect in understanding of labour dynamics in Canada. Regional diversity, in conjunction with diverse industries with different job opportunities that are always evolving encourage individuals to move and explore other places for better economic returns. In this section, we measure provincial gross, net and share of net mobility for all provinces in Canada.

1.3.1 Gross and Net Mobility Rates

Naturally, gross flows are larger relative to net flows (Lkhagvasuren, 2014; Coen-Pirani, 2010). If inflow and outflow are same for a region, then net mobility of that region is zero, but there is a positive gross mobility in that location. Overall economy-wide gross mobility rates are declining over the years from 1993-2011 and the average economy-wide gross mobility is 0.87% in Canada.[8]. However provincial gross and net mobility rates vary across provinces in Canada. Table 1.1 represents the provincial gross and net mobility rates.

[8]Economy-wide Gross Mobility Rate is given in the appendix 1.10

Table 1.1: Gross and Net Mobility Rates

Province	Gross Mobility Rate	Net Mobility Rate
NFL	2.45%	-0.43%
PEI	2.07%	-0.35%
NS	2.61%	-0.07%
NB	2.42%	-0.23%
QC	0.58%	-0.01%
ON	1.13%	0.08%
MN	1.85%	-0.27%
SK	2.30%	-0.38%
AL	3.92%	0.62%
BC	2.36%	0.16%
Average	2.17%	-0.09%

Notes: This table represents province wise Gross and Net Mobility rates calculated by using SLID data.

Based on the results from table 1.1, Alberta, British Columbia, and Ontario have the positive net mobility rates whereas all other provinces have negative net mobility rates. Furthermore, Alberta is experiencing the largest positive net mobility rate which indicates a strongly dominating in-migration flows into this province. However, provinces such as Newfoundland and Labrador, New Brunswick, Manitoba, Prince Edward Island and Saskatchewan show substantial negative net mobility rates meaning out-migration outweighs in-migration in these provinces. Moreover, Quebec, Ontario, and Nova Scotia display very low net mobility rates in absolute terms.

To understand labour mobility it is also important to focus on both in- and out-mobility along with net mobility. From the year 1993-2011, based on year to year mobility the average province experiences a combined inflow and outflow of individual of about 2.17% of its population. From SLID, we also calculate average in-migration, out-migration, net mobility rates from 1993 to 2011 are 1.00%, 1.17% and -0.09% respectively.

1.3.2 Mobility by Education

To explore the relationship between educational attainment and mobility, we form two education groups: less educated and more educated. By observing mobility rates across these education groups, we recognize the effect of education on individuals mobility decisions.

Table 1.2: Gross, Net and Share of Net Mobility: Education Groups

	Gross Mobility Rate		Net Mobility rate		Share of Net Mobility rate	
Education Group	Less Edu	More Edu	Less Edu	More Edu	Less Edu	More Edu
Mean	1.86%	2.70%	0.25%	0.31%	12.05%	10.56%

Source: Author's calculations from SLID 1993-2011

In table 1.2, we show the estimations of gross, net and share of net mobility rates in Canada. The average gross and net mobility rates both are higher for more educated individuals. However, the share of net mobility rate is higher for less educated individuals. This highlights the fact that more educated individuals exhibit greater magnitudes of in- and out-migration than less educated. This reflects that overall labour market conditions across provinces may produce more opportunities for more educated individuals which work as the driving force for greater both way traffics for this education group.

We also deconstruct different mobility rates across education groups based on different provinces that are provided in appendix 1.11. This signifies variability in mobility rates across educational groups in different provinces with diverse economic activities. We show that more educated are more mobile than less educated individuals across all provinces however the magnitudes vary. It is observed that New Brunswick has the largest difference while comparing gross mobility between less and more educated groups. Mostly provinces in the Eastern region (Atlantic part of

Canada) are losing individuals from both education groups. However, it is interesting to point out that less educated individuals are demonstrating higher magnitudes of one-way traffic than their more educated counterparts in all provinces except Quebec and British Columbia.

Moreover, we have identified contributions of both education groups in explaining population growth through migration of a province. In most of the provinces, the contributions of both less and more educated individuals in changing net mobility rates are roughly equal. In Nova Scotia, we find that less educated individuals made up 0.58% of every 1% change in net mobility rates. Interestingly, the result is strikingly different in Quebec where as high as 0.86% of every 1% change in net mobility rate is contributed by more educated individuals. A complete table is presented in the appendix 1.13.

1.3.3 Mobility by Age

To investigate the relationship between age groups and mobility, we form two age groups: young and old where young age group consists of individuals between age 16 and 30 and old age group contain individuals from 31 to 55.

Table 1.3: Gross, Net and Share of Net Mobility: Age Groups

	Gross Mobility rate		Net Mobility rate		Share of Net Mobility rate	
Age Group	16-30	31-55	16-30	31-55	16-30	31-55
Mean	4.94%	1.77%	0.66%	0.19%	11.63%	9.86%

Source: Author's calculations from SLID 1993-2011

From table 1.3, we observe that on average gross and net mobility rates are higher among the young compared to the old. Moreover, the share of net mobility is higher among the young which implies that mobility among the young is relatively more one directional.

In appendix 1.12, we have also provided all types of mobility rates across provinces based on different age groups. We find that young individuals are more mobile than older individuals across all provinces. Similar to our results from the education groups, we find that provinces in the Eastern region are losing individuals from both age groups. Newfoundland and Labrador have the highest negative net mobility rates whereas Alberta has the highest positive net mobility rate among the young. An interesting observation is that among all provinces only Quebec and Manitoba demonstrate higher magnitudes of one-way traffic among the old.

While observing contributions of different age groups in changing net mobility rates, our findings show that mostly the young contributed to the change in the population of a province. In Newfoundland and Labrador, the young contributed 0.79% of every 1% change in net mobility rate. However, only in Quebec and Manitoba the old demonstrate higher contributions to change. In Quebec, the old contributed 0.86% in every 1% change in net mobility rate. All the findings are provided in appendix 1.13.

In summary, we find in this section that the more educated and the young are more mobile than the less educated and the old respectively. Also, by calculating the share of net mobility rates we observe that the less educated and the young are demonstrating higher one directional movement relative to their respective counterparts.

1.4 Measuring Provincial Migration using Gravity Model Framework

In literature, migration is widely explained through the gravity model. Although the Gravity model was initially used in understanding the effects of population sizes of

origins and destinations and distances between them on volumes of trade (Pöyhönen, 1963)[9], later such model was adopted in economics in explaining volumes of migration between two regions. The basic gravity model illustrates that gross migration is positively related to the sizes of the origins and the destination populations, and negatively associated with the distances that separate them (Greenwood, 2005). Empirical studies by Courchene (1970), Finnie (2004), Robinson and Tomes (1982) and Helliwell (1997) found that interprovincial mobility is positively related to the home province's population size and negatively related to the distance between origin and destination provinces. Finnie et al. (2000) also identified that residents of smaller cities, towns and especially rural areas have been less likely to move than individuals in larger cities. In our modified gravity model, we add 'presence of common border' as an additional variable. The presence of border also plays a significant role in explaining migration flows between two regions. In our study, we use equation 1.1 for gravity model framework where the gross migration can be represented as:

$$GM_{AB} = F(lnPop_A, lnPop_B, lnDist_{AB}, Border_{AB}) \tag{1.1}$$

where F represents the distribution function to be specified below and GM_{AB} equals the total number of Canadians who moved from province A to province B between two consecutive years. We use the size of the population in the origin, Pop_A, the population in the destination, Pop_B, and the distance in kilometers between the capitals of two provinces A and B, $Dist_{AB}$. $Border_{AB}$ is a dummy variable that takes the value one if two provinces share a common border between them and zero otherwise.

In our analysis, we have calculated bilateral gross mobility for all Canadian

[9]One of the initial empirical papers in this literature is Pöyhönen (1963). Now there exists a large literature using gravity models to understand trade flows.

provinces and use the following gravity model (equation 1.2) to explore the relationships mentioned above.

$$lnGM_{origin\ \&\ destintion} = \alpha_1 + \alpha_2 lnPop_{origin} + \alpha_3 lnPop_{destination} + \alpha_4 lnDist_{origin\ \&\ destination} + \alpha_5 Border_{origin\ \&\ destination} + \epsilon \tag{1.2}$$

Our findings from regression equation 1.2, show that population of both origins and destinations are positively affecting the bilateral gross mobility of two provinces. This highlights that larger population attract a higher volume of migration flows. Bigger economies with large population always correspond to higher economic activities and therefore promote higher movements of people both in- and out-directions. Regression results are presented in table 1.4 below.

Table 1.4: Regression Results-Gravity Model

	Gross mobility
Population of Origin	0.642***
	(0.152)
Population of Destination	0.689***
	(0.151)
Distance	-0.373**
	(0.184)
Border	0.678*
	(0.363)

Notes: There are 90 observations. R^2=0.39. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level. This table presents how population, distance, and border affect bilateral gross mobility. For example, Quebec is the original province and if the population of Quebec increases by 10%, then gross mobility of Quebec will increase by 6.42% for a representative pair of provinces.

We illustrate the coefficient of gross mobility for the population at the origin with the following example: Suppose Quebec is the original province. The population of Quebec was 100,000, and gross mobility was 1,000 in 2015. Now suppose the population has grown by 10%. Therefore the new population of Quebec is 110,000

in 2016. Now if we want to know how this additional population will contribute to the gross mobility of Quebec in 2016, we can find that by using the gross mobility coefficient from the above table. The coefficient of the population at the origin is 0.642. This implies that if the population of Quebec increases by 10%, then gross mobility of Quebec will increase by 6.42% for a representative pair of provinces (that is, between Quebec and nine other provinces) over one year period. Thus gross mobility of Quebec will increase by 64 units due to 10% population growth in the province. Similarly, if we think of Ontario as a destination province, then using the coefficient of destination province from the table, we find that when the population in Ontario increase by 10% then gross mobility of Ontario will also increase by 6.89%.

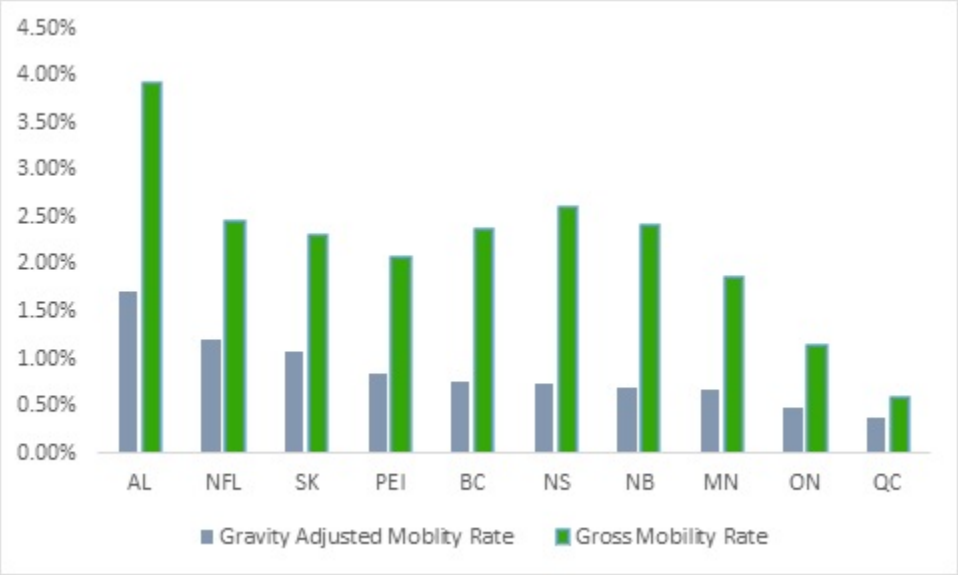
These results highlight bilateral gross mobility is affected by both population of origin and destination. However, regarding the effect on bilateral gross mobility there is no significant difference between the population of origin and destination populations. So, the relationship is weak to conclude that the big is getting bigger and small is getting smaller. Rather, provinces with smaller population sizes are still attracting people. Amirault et al. (2013) found similar results using Canadian census data where he defined gross mobility across Canadian economic regions.

Moreover, our results demonstrate that when two provinces are further away from each other, it has a negative effect on bilateral gross mobility between these provinces. For a representative pair of provinces, a 10% increase in distance (number of kilometers) between them decrease the gross mobility by 3.73% over a one-year period. Distances are associated with different natures of moving costs. On the outset, higher distance is directly related to higher transportation costs. Furthermore, higher distance could have an emotional cost; this is attached to the fact that migrants are moving away from family and friends and due to higher distance moving back is always costly and time-consuming. Therefore leaving the dear ones has an added

negative element to mobility when distances are greater. Results from the above table reveal that the presence of border between provinces raises bilateral gross mobility between them as expected. Neighboring provinces usually have many similarities such as resources, economic structure, weather, culture and thus these commonalities could also contribute to higher bilateral gross mobility. Using the coefficient of the border, we can say that the presence of border raises gross mobility by 67.8%. However, R^2 of our gravity model regression is 0.39 which highlights that the explanatory variables in this regression weakly explain the bilateral gross mobility rates.

By following the study by Coen-Pirani (2010), we also estimate gravity-adjusted gross mobility rates along with gross mobility rates at provincial levels. Gravity-adjusted gross mobility rates are estimated after controlling variables that are used to explain magnitudes of migration in the gravity model framework. The detail process of the measurement is included in appendix 1.A.

Figure 1.1: Gravity Adjusted Gross Mobility Rate Vs Gross Mobility Rate



Notes: In this graph the blue bar represents the gravity adjusted gross mobility rates after controlling for population size, distance and border across provinces and the green bar represents gross mobility rates without any adjustment. All the calculations are based SLID 1993-2011.

As we can observe from figure 1.1[10], all the provinces revealed lower gravity adjusted gross mobility rates compared to unadjusted rates. The relative difference between gravity-adjusted and unadjusted gross mobility rates also vary across provinces. Such difference is the highest in Nova Scotia and lowest in Quebec. Higher relative difference signify that population sizes of origin and destination, distances and presence of borders between them play important role in explaining bilateral gross mobility rates.

1.5 Relationship among In-Migration, Out-Migration, and Net Migration Rates

In this section, we explain the relationship among provincial in-migration, out-migration, and net-migration. First, we observe the relationship between in-migration and out-migration. Next, we also examine the relationship between provincial in and net-migration and provincial out and net-migration to identify whether in or out dominates provincial net-migration.

Table 1.5: Correlation Coefficients

	Inflow-Outflow	Inflow-Net Mobility Rate	Outflow-Net Mobility Rate
Correlation	0.368	0.6373	-0.482

Source: Author's calculations from SLID 1993-2011

Our findings from table 1.5 show that there exists a positive correlation between provincial in and out-migration. The correlation coefficient is 0.37. This positive correlation is also evidential from Coen-Pirani (2010) using the U.S. census data where he estimated the correlation coefficient between inflow and outflow as 0.63. When

[10]Gravity adjusted gross mobility rates are given in appendix 1.14 for each province

a province experiences favorable economic conditions, it is believed that more individuals would move into the province compared to individuals moving out of that province. However, in contradiction to such belief, the positive correlation between inflow and outflow rate is well established in the labour mobility literature. Many different explanations for such relationship were given by different authors in literature. Morrison (1971), DaVanzo (1983), Tervo et al. (2001), Bailey (1993), Long (1988) and Gleave and Cordey-Hayes (1977) concluded in their works that compositional effect[11] play a significant role in explaining the positive relationship between in and out migration. Another explanation called vacancy chain[12] was proposed to explain such positive correlation by Gleave and Cordey-Hayes (1977) and Tabuchi (1985). Mueser and White (1989) argued that positive correlation between in and out migration is due to the dynamic character of the migration process[13]. Among other possible reasons, Mueser and White (1989) and Bogue et al. (1957) explained such positive relationship through structure of location boundaries in their respective works. In addition, Sjaastad (1961); Krueger and Sjaastad (1962) suggested idiosyncratic matching[14] as one of the possible reason.

Figure 1.2 represents the relationship between provincial in and net-migration and provincial out and net-migration. The correlation coefficient between in and net-migration is 0.64 whereas the correlation coefficient between out and net-migration is -0.48.

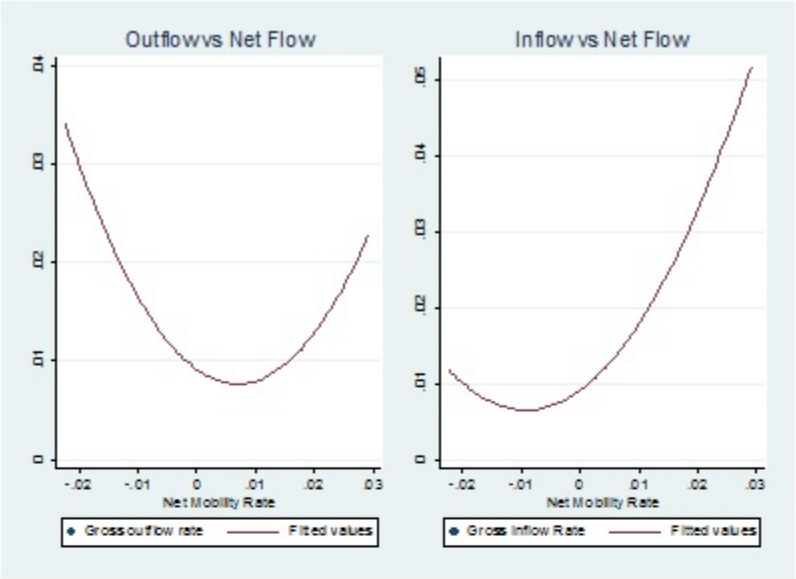
[11] According to the compositional effect, a province that attracts migrants becomes more migration prone, thus also increasing out-migration from the province.

[12] The idea of "vacancy chain" is such where the departure of residents leave vacated positions such as jobs and houses for new-comers, thus increasing in-migration. It is also possible that economic activities which make an area attractive may also increase turnover and thus out-migration. Where jobs are easily available, such phenomena not only attracts in-migrants but may also make workers leave jobs easily, thus adding out-migration.

[13] They termed this process as dynamic adjustment according to which population tends to redistribute itself in such a way so that it equalizes rates of in- and out-migration.

[14] Idiosyncratic matching refers to a workers match with the location where he/she lives.

Figure 1.2: Net Flow Vs. Inflow and Outflow



Notes: This figure represents the relationship between provincial in and net-migration and provincial out and net-migration. These two figures are also showing the quadratic fit of the data.

However, the magnitude of the correlation coefficient of in and net-migration is higher than the coefficient of out and net-migration. It follows that provinces that tend to lose workforce due to internal migration do so by experiencing lower than average inflow, rather than higher than average outflows. A similar exercise was carried out by Coen-Pirani (2010) based on U.S. census data where he found the positive correlation (0.85) between in and net-migration. However he found mixed (both positive and negative) and weak correlation between out and net-migration across different census periods[15].

[15]Pirani (2010) census 1970 (-0.04), 1980 (0.24), 1990 (-0.23) and 2000 (0.29) and pooled data 1970-2000 (0.03).

1.6 Conclusion

In this essay, we have measured different types of provincial mobility to have a clear understanding regarding the labour dynamics in Canada. We have used the Survey of Labour and Income Dynamics (SLID) of Canada for our analysis. Detailed questions of this panel dataset allowed us to capture various kinds of yearly provincial mobility rates. Observing provincial gross mobility together with net and share of net mobility allow us to sharpen our understanding of provincial labour mobility. As we calculate different mobility rates based on different education and age groups, results from this study can be critical for policymakers in taking a more targeted approach in managing labour mobility.

Findings from our analysis show that young and more educated move more across provinces in Canada. In addition, our results from the share of net mobility rates reveal that young and less educated individuals mostly have one-way inter-provincial mobility whereas old and more educated individuals show inter-provincial mobility at both directions. When a specific group demonstrates one way mobility, this signifies opportunities being generated or destroyed for that specific group in that specific province that result in such one way traffic of migration either in or out migration.

According to our results from the modified gravity models, the effects of border and population sizes of destination and original provinces has positive influence and distance has a negative influence on provincial migration. Such results signify the importance of shared borders as well as the physical closeness of provinces in understanding migration. At the same time, our results also show that it is not necessarily the case that provincial migration is attracting individuals away from smaller provinces towards bigger ones. Both big and small provinces are attracting migrants.

We also identify a positive correlation between provincial in - and outmigration

in Canada. This shows that provinces that lose more people also seem to attract more people. Our findings further clarify that net provincial mobility has a stronger relationship with in-migration compared to out-migration. Such relationship can be crucial for policymakers in designing policies that enhance labour market balance across provinces in Canada.

1.A Appendix

Table 1.6: Panel Distribution

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
P1	1	1	1	1	1	1													
P2				2	2	2	2	2	2										
P3							3	3	3	3	3	3							
P4										4	4	4	4	4	4				
P5													5	5	5	5	5	5	
P6																6	6	6	6
P7																			7

Notes: This table represents the panel distribution of Survey of Labour and Income Dynamics.

Data Quality of SLID

A preliminary interview takes place at the beginning of each panel to collect background information. Each of the six years has a split-interview format, with labour topics covered in January and income topics in May. In both cases, questions refer to the previous calendar year. The income interview occurs in May to take advantage of income tax time when respondents are more familiar with their records. In addition, many respondents permission to consult their income tax file, and avoid the income interview. Since 2004, however, the May interview was dropped in order to save on collection costs. If a respondent does not grant permission to link to the T1 tax file, the income questions were asked in January.

Table 1.7: Data Quality Indicators

Indicator	**Statistic**
Longitudinal sample size	
Panel 5	42,330
Panel 6	40,912
Response rate: Longitudinal - Person.	
Panel 5	72.80%
Panel 6	71.00%
Permission rate:	
Panel 5	88.20%
Panel 6	72.20%
Tax linkage rate (SIN found)	95.90%
Imputation rate - person	3.20%

Notes: **Response rate:** Number of eligible respondent / total number of respondents. Non-respondent: If all persons in a household are non-respondent to both labour and income questions, then these persons (and households) are non-respondents. **Respondent:** A household is considered to be a respondent household if at least one person in that household is a respondent. **Permission rate:** The respondent was asked for permission to access tax records. January refusal initiate may interview for income related questions. Source: Data Quality for the 2009 Survey of Labour and Income Dynamics (SLID), written by Jean-Franois Bastien, Published by Household Survey Methods Division, Statistics Canada.

Technical Issues

In order to measure different mobility rates with precision such as gross, net and share of net mobility rates it is extremely important to confirm that overall numbers of provincial in migration matches with provincial out-migration in Canada. Such findings are mandatory pre-requisites for our entire analysis. In this study, we calculate yearly provincial in and out migration for 1993-2011 as shown in the table below. The number of provincial in-migrants must be same as the number of out-migrants. Moreover, when we calculate in and out-migration for each province naturally we find that in and out-migration varies for each province. However, when we find the total number of in-migrants in all provinces we are reassured to see that it is exactly same

as the total number of out-migrants in all provinces. This gives us the required validation that our in and out-migration rates are measured with accuracy. Furthermore, when we restricted our sample based on education and age groups, we also find that the total number of provincial in-migrants match the total number of out-migrants in each education and age groups (see tables below). Due to impose restrictions, we find that the total number of mobile individuals shrink in these cases. Nevertheless, it can be shown with all the following tables that with our calculations we always find the total number of provincial in-migrants same as the total number of provincial out-migrants.

Table 1.8: Data Validation Across Education Groups

	Less Educated			**More Educated**		
Province	Styaers	in	out	Styaers	in	out
NFL	19,833	123	296	13,044	139	287
PEI	9,664	57	126	8,608	69	148
NS	24,005	235	278	19,670	299	330
NB	23,967	167	273	16,906	216	325
QC	73,079	165	168	54,611	201	220
ON	103,111	588	416	87,758	716	558
MN	27,472	146	258	19,074	178	289
SK	27,234	170	353	19,743	207	377
AL	31,095	817	383	27,708	828	446
BC	30,694	369	286	28,333	479	352
Total	**370,154**	**2,837**	**2,837**	**295,455**	**3,332**	**3,332**

Source: Author's calculations from SLID 1993-2011

Table 1.9: Data Validation Across Age Groups

	16-30			31-55		
Province	**Styaers**	**in**	**out**	**Styaers**	**in**	**out**
NFL	8,065	141	397	16,766	117	184
PEI	4,151	72	150	9,115	48	99
NS	9,925	283	358	21,552	215	241
NB	9,816	203	324	20,171	167	252
QC	30,388	196	195	63,450	171	177
ON	48,938	673	488	98,697	572	437
MN	11,804	181	266	22,866	132	250
SK	12,293	220	412	22,419	149	274
AL	16,481	969	463	30,969	632	342
BC	14,295	458	343	29,535	320	267
Total	**166,156**	**3,396**	**3,396**	**335,540**	**2,523**	**2,523**

Source: Author's calculations from SLID 1993-2011

Formulas

In order to calculate gross mobility, net mobility, share of net mobility, excess mobility and share of excess mobility we use the following formulas:

$$\text{In-Migration Rate } (INR_{rt}) = IN_{rt}/POP_{rt} \tag{1.3}$$

$$\text{Out-Migration Rate } (OUTR_{rt}) = OUT_{rt}/POP_{rt} \tag{1.4}$$

$$\text{Economy-Wide Gross Mobility Rate } = \text{Average of } INR_{rt} \tag{1.5}$$

$$\text{Provincial Gross Mobility Rate } (GMR_{rt}) = INR_{rt} + OUTR_{rt} \tag{1.6}$$

$$\text{Provincial Net Mobility Rate } (NMBR_{rt}) = (|INR_{rt} - OUTR_{rt}|)/2 \tag{1.7}$$

$$\text{Or, Provincial Net Mobility Rate } (NMBR_{rt}) = (INR_{rt} - OUTR_{rt})/2 \tag{1.8}$$

$$\text{Share of Net Mobility Rate } = NMBR_{rt}/GMR_{rt} \tag{1.9}$$

Table 1.10: Yearly Economy Wide Gross Mobility

Year	Mobility rate
1994	0.99%
1995	0.99%
1996	1.05%
1997	1.24%
1998	1.13%
1999	0.40%
2000	1.23%
2001	1.14%
2002	0.99%
2003	0.88%
2004	0.83%
2005	0.68%
2006	0.93%
2007	0.84%
2008	0.80%
2009	0.60%
2010	0.54%
2011	0.39%
Average	0.87%

Source: Author's calculations from SLID 1993-2011

Table 1.11: Gross, Net and Share of Net Mobility Rates by Education Across Provinces

	Gross Mobility		Net Mobility Rate		Share of Net Mobiltiy	
	Less Educated	More Educated	Less Educated	More Educated	Less Educated	More Educated
NFL	2.10%	3.23%	-0.43%	-0.56%	-20.64%	-17.37%
PEI	1.88%	2.50%	-0.35%	-0.46%	-18.85%	-18.20%
NS	2.12%	3.15%	-0.09%	-0.08%	-4.19%	-2.46%
NB	1.82%	3.16%	-0.22%	-0.32%	-12.05%	-10.07%
QC	0.45%	0.77%	-0.01%	-0.02%	-2.22%	-2.26%
ON	0.97%	1.44%	0.08%	0.09%	8.57%	6.20%
MN	1.46%	2.43%	-0.20%	-0.29%	-13.86%	-11.88%
SK	1.91%	2.93%	-0.33%	-0.43%	-17.50%	-14.55%
AL	3.76%	4.46%	0.68%	0.67%	18.08%	14.99%
BC	2.11%	2.88%	0.13%	0.22%	6.34%	7.64%

Source: Author's calculations from SLID 1993-2011

Table 1.12: Gross, Net and Share of Net Mobility Rates by Age Across Provinces

	Gross Mobility Rates		Net Mobility Rates		Share of Net Mobility Rate	
	16-30	31-55	16-30	31-55	16-30	31-55
NFL	6.56%	1.78%	-1.56%	-0.20%	-23.79%	-11.13%
PEI	5.26%	1.60%	-0.92%	-0.28%	-17.57%	-17.35%
NS	6.28%	2.09%	-0.37%	-0.06%	-5.85%	-2.85%
NB	5.26%	2.06%	-0.60%	-0.21%	-11.48%	-10.14%
QC	1.28%	0.55%	-0.01%	-0.01%	-0.78%	-1.82%
ON	2.34%	1.02%	0.19%	0.07%	7.97%	6.69%
MN	3.73%	1.66%	-0.35%	-0.26%	-9.51%	-15.45%
SK	5.05%	1.87%	-0.77%	-0.28%	-15.19%	-14.78%
AL	8.21%	3.08%	1.45%	0.46%	17.67%	14.89%
BC	5.43%	1.97%	0.39%	0.09%	7.18%	4.51%

Source: Author's calculations from SLID 1993-2011

Table 1.13: Contributions of Different Age and Education Groups in Overall Provincial Net Mobility

	Education		Age	
Province	Less Edu	More Edu	16-30	31-55
NFL	0.539	0.461	0.793	0.207
PEI	0.466	0.534	0.605	0.395
NS	0.581	0.419	0.743	0.257
NB	0.493	0.507	0.587	0.413
QC	0.136	0.864	0.143	0.857
ON	0.521	0.479	0.578	0.422
MN	0.502	0.498	0.419	0.581
SK	0.518	0.482	0.606	0.394
AL	0.532	0.468	0.636	0.364
BC	0.395	0.605	0.685	0.315

Source: Author's calculations from SLID 1993-2011

Methodology for Estimating Gravity-Adjusted Gross Mobility Rates

In our analysis, we have calculated the gravity adjusted gross mobility rates. For such calculation, we used the basic gravity model that is explained in equation 1.2.

Step 1: Run the regression based on equation 1.2. Here we consider bilateral

gross mobility without considering the log value. In this regression, we will have 90 observations. Because, for a specific year, an individual of a specific province can move to other nine provinces. So our total sample is 90. For example, in Quebec, there will be in-migrants from other nine provinces and out-migrants to other nine provinces.

Step 2: After running the above regression, we identify the residuals which explain bilateral gross mobility that cannot be explained using the explanatory variables from equation 1. Here, we have 90 residuals. These residuals represent bilateral gravity adjusted gross mobility.

Step 3: We then divide bilateral gravity adjusted gross mobility by the sum of population of the pair of the provinces. In order to identify gravity adjusted gross mobility rate for each province, we aggregate the 9 possible pairs of bilateral gravity adjusted gross mobility rates.

Table 1.14: Gravity Adjusted Gross Mobility Rates

NFL	1.21%
PEI	0.83%
NS	0.73%
NB	0.69%
QC	0.38%
ON	0.48%
MN	0.67%
SK	1.07%
AL	1.72%
BC	0.76%

Notes: Gravity-adjusted gross mobility rates are estimated after controlling variables (population, border, and distance) that are used to explain magnitudes of migration in the gravity model framework. Ideally, the gravity-adjusted gross mobility will be lower than the gross mobility rate without controlling the mentioned variables.

Essay 2

The Effects of Local Market Conditions on Provincial Labour Mobility in Canada: An Evidence from Survey of Labour and Income Dynamics

2.1 Introduction

Labour mobility is the key to understanding the dynamics of labour markets (Friedman, 1968). Economies with diverse resources, different structures of industries and labour forces trigger labour mobility across regions. Seminal work of Blanchard et al. (1992)[1] found that labour mobility is the dominant adjustment mechanism to the response of change in local market conditions; and a decrease in the unemployment rate may attract both employed and unemployed individuals towards the region of lower unemployment rate.

In Canada, local market conditions across provinces vary substantially. For example, from the year 1993 to 2011 the average unemployment rate of Newfoundland and Labrador is 12.6%, however the unemployment rate of Alberta is only 5.4%. The major causes of these differential of unemployment rates across provinces are influenced by both provincial and federal level effects.

In this essay, we address three questions related to how local market conditions affect inter-provincial labour mobility. First, whether provincial migration in Canada respond to local market conditions or not? If it does, whether the local market conditions of the original province or the destination province matters more? Second, how migration decisions differ across different education and age groups in response to the local market condition. Lastly, how the local market conditions affect provincial mobility over time by estimating different frequencies of mobility.

Moreover, compared to national indicators, Canadian provinces are diverse in local economic structure and industrial composition. In this study, for measuring the diversity of regional economic activities, we use two commonly used measures of local market conditions (LMC): provincial unemployment rates (Blanchard et al., 1992)

[1] Investigated based on U.S. state-level data and provided an extended time series analysis of the inter-relatedness of mobility and the local labour market conditions

and employment growth index proposed by Bartik (1991), which is also named as Bartik index. If there is an increase in employment growth of a province unemployed individuals may look for probable employment opportunities and employed individuals may look for better opportunities in terms of a job promotion or higher competitive wage. However, increase in the provincial unemployment rate may cause the unemployed workers to relocate to other provinces where the unemployment rates are not as bad as the province of origin. The increase in provincial unemployment rate not only shrinks the probability of the unemployed to get a job but also there is a possibility that employed may lose their existing job.

There are several studies focusing on inter-provincial mobility of Canada.[2]. However, to the best of my knowledge inter-provincial migration as a function of the local market condition is not studied well in the Canadian context. Moreover, the construction of Bartik instrument as a representation of local market condition brings a new dimension in the study of inter-provincial mobility of Canada. The empirical investigation of provincial migration in response to employment growth index (Bartik) is also for the first time in the study of the Canadian labour market.

Provincial mobility differs in response to the local market conditions of the origin and the destination province. Most of the previous studies consider either the local market condition of the origin or the destination province. Wozniak (2010) based on U.S. data investigated how local market conditions of birth state at the time of

[2]Coulombe (2006): Used yearly provincial annual net migration flows from 1977 to 2000 across different age groups from CANISM table provided by Statistics Canada. Analyzed how provincial net migrations are affected by economic variables, such as differential of provincial unemployment rates and labour productivity. He considered unemployment rate difference of the year and previous year of provincial net migration flows. Amirault et al. (2013):Based on Canadian Census data 1991, 1996, 2001, and 2006. Explained provincial bilateral gross mobility in Gravity model framework. Considered employment rate differences between the destination and the original province as one of the explanatory variables. Finnie (2004): Used Canadian Longitudinal Administrative Database from the period of 1982 to 1995. Considered unemployment rate of the destination province as an explanatory variable to estimate the probability of provincial move

entering the labour market affect labour mobility[3]. However, Davies et al. (2001)[4], Amirault et al. (2013) and Finnie (2004) used unemployment rate of the destination province to explain labour mobility. In our research, we use both the local market conditions of the origin and the destination province to reveal whether the probability of provincial migration depends on the local market condition of the origin or the destination province. In addition, we analyze whether LMC difference between the origin and the destination province bring any impact on provincial mobility.

Highly educated individuals in Canada are more provincially mobile than their less educated counterparts. For example, university graduates are roughly three times more mobile compared to high school dropouts. Moreover, the employment and unemployment rates differ across different education and age groups at provincial and national level. Given these large differences in provincial mobility and unemployment rates, it is reasonable to analyze how migration decisions of different education and age groups are affected by different local market conditions. Previous studies show that education and age play an important role in explaining regional mobility, where more opportunities are created for individuals who are young or attain higher levels of education (Malamud and Wozniak, 2012). Navratil and Doyle (1977) defines the decision to migrate as a two-dimensional process. In the first dimension, an individual takes the decision whether to relocate or not and this decision is particularly influenced by age and education. In the second dimension, the decision is associated with where to relocate to, and this decision is related to the characteristics of the area of the destination; such as higher relative wage, lower unemployment rate and so forth.

[3]Used U.S. Census data 1980, 1990, and 2000. Applied local market condition based on individuals the birth state, which is a province of origin and year is the labour market entry year of an individual

[4]Based on U.S. data from the Internal Revenue Service from 1986-87 to 1996-1997. Considered 47X47 matrix of state to state migration flows and non-movers. He found that migrants are significantly less likely to move to the destination with the relatively higher unemployment rate

Finnie (2004, 2000), Robinson and Tomes (1982),Chen and Fougere (2009) and Chen et al. (2008) find that younger individuals are more mobile across provinces in Canada. Chen et al. (2008) also added that workers under age 25 are four times more inter-industry mobile than workers over 45 years of age (average 34.5% vs. 7.1%) and five times more inter-provincially mobile (average 1.47% vs. 0.025%). Bound and Holzer (2000) stated that during 1980 either a labour demand shift or supply shift affects the employment and earning characteristics for less-educated and black males. If the demand shifts for these less educated people who are involved in an industry which is declining, it will create unemployment for the less educated people. On the other hand, Topel (1986) mentions that if there are differences in supply shift among the different educational groups, then less educated people will be affected more if the in-migration of highly educated people is more in growing industry and out-migrant of less educated people are less in the declining industry. In this study, to understand the impact of local market conditions on provincial mobility more appropriately, we consider four education and four age groups.

Greenwood (1975) mentioned that several studies (Gallaway et al., 1967; Lowry, 1966; Rogers, 1969) in the migration literature based on U.S. data, examined the influence of the unemployment rates on migration, have found the unanticipated sign. Greenwood (1975) mentioned the reason behind the unanticipated sign is employed unemployment rate of the end of the period to analyze migration, however, migration itself occurred over the period and influence end of period economic activities. In Canadian literature, Finnie (2004) and Amirault et al. (2013) used unemployment rate of the end of the period. In our study, we assign LMC at the beginning of frequency of mobility that means for the one-year frequency of mobility, we assign LMC of 1993, instead of 1994. In this case, we are assuming that LMC of 1993 is more important to influence the migration decision in 1994 rather than LMC of 1994.

Most of the previous studies on provincial mobility are based on census data. However, SLID data has presented panel data which is very rich in terms of contents with detailed information on labour and income information on individuals for six consecutive years. In this study, we estimate five different frequencies of mobility, which provide us the opportunity to see the impact of the local market condition on provincial mobility over time as well as enable us to compare the study based on census data. Blanchard et al. (1992) found that, over time, the effect of employment builds up, but the effect of unemployment rate steadily decline and disappears after approximately five to seven years [5]. Moreover, estimation of five different frequencies (one-year frequency to five-year frequency of mobility) also contributes to the advancement of empirical analysis of provincial mobility in Canada. Despite SLID's academic appeal, it is being observed in the literature that SLID data has not been utilized in many research works in the recent years.

This essay is organized in the following sections. Section 2.2, presents empirical facts of unemployment, employment and inter-provincial mobility across provinces. Section 2.3, describes the data and methodology. Section 2.4, reports the key stylized facts about provincial mobility patterns of different education and age groups. Section 2.5 and 2.6, interpret our empirical models and discuss the findings. Lastly, in section 2.7 we draw the conclusions of the essay.

2.2 Provincial Unemployment Rate, Employment Rate, and Mobility

In our research, we focus on two economic indicators that may trigger the provincial mobility among individuals. One is provincial unemployment rate, and another one

[5]He explained that, a state typically returns to normal after an adverse shock not because employment picks up, but because workers leave the state.

is employment growth, which is known as Bartik instrument (Bartik, 1991). From 1993 to 2011, Canadian provinces have experienced large and persistent differences in unemployment and the employment rates. To estimate the cross provincial differences of employment and unemployment rates we follow Lkhagvasuren (2007)[6].

From 1993 to 2011 the average cross-provincial coefficient of variation of the unemployment rate is 34.91%, and the employment rate is 7.49%[7]. To estimate the cross-provincial differences in unemployment and employment rates we use the data set from Statistics Canada. Table 2.1 and table 2.19 in the appendix provides relevant statistics about the demographics.

Table 2.1: Coefficient of Variation of Unemployment and Employment Rate, 1993-2011

	National		**Provincial**	**National**	**Provincial**	**National**
	Average UR	**Average ER**	**CV UR**	**CV UR**	**CV ER**	**CV ER**
Education Groups						
High School Drop	14.26%	43.96%	27.69%	11.50%	11.46%	3.73%
High School Graduate	7.97%	64.40%	42.85%	18.70%	7.54%	2.37%
College	6.43%	71.83%	37.60%	21.54%	4.87%	1.44%
University	4.74%	77.42%	19.14%	12.46%	2.34%	1.90%
Age Groups						
20-24	11.32%	79.92%	32.61%	16.82%	12.60%	2.78%
25-44	7.25%	66.88%	42.66%	21.21%	10.18%	5.62%
45-64	6.21%	68.74%	43.30%	18.97%	18.80%	3.11%

Notes: The first two columns is the national average of unemployment and employment rates. The third and fifth column represents the coefficient of variation of unemployment and employment rates across provinces compared to the national level. The fourth and sixth column represents the coefficient of variation of national unemployment and employment rates over the years from 1993 to 2011 across the age and education groups. Source: Author's Calculation from Statistics Canada (2015c) labour force survey estimates (LFS), by educational attainment, sex and age group.

[6]

$$CV_{provincial} = \sqrt{\sum_{p}(u_p/u_c - 1)^2} \tag{2.1}$$

Where p is for Province, from 1 to 10, u_c denote the national unemployment rate and u_p denote the provincial unemployment rate. The cross-provincial coefficient of variation explains the provincial variability of employment and unemployment rates in comparison to the national level of employment and unemployment rates.

[7] Statistics Canada (2015c)

To give an inference about the employment condition of different industries in Canada, we also estimate the cross-industry differences of the unemployment rates. As we mentioned, Bartik instrument is the employment growth from each industry estimated for each province. By using 21 industry categories[8], we estimate the cross-industry variation of unemployment rates with the national unemployment rates across different industries. The cross industrial coefficient of variation of the unemployment rate is very high (48.48%). Moreover, industrial growth and employment creation differ across provinces in Canada.

Clearly, demographics is one of the key variables where unemployment exhibits considerable variation. Unemployment and employment rates also vary across different education and age groups at provincial and national level. In our analysis, we focus mainly on the impact of local market conditions on provincial mobility for different education and age groups. Between 1993 and 2011, the national unemployment rate averages 14.26% for high school drop individuals, 7.97% for high school graduates, 6.43% for college graduates[9] and 4.74% for university graduates. For education-specific provincial unemployment rates, we perform similar exercises to those we performed on the provincial-level data, and we compared the cross-sectional variation of unemployment with the national unemployment rates across all education groups. We observed that the cross-provincial coefficient of variation of the unemployment rate is the highest in high school graduates compared to any other education groups while lowest in university graduates. Moreover the coefficient of variation of the national unemployment rate [10] shows a hump-shaped pattern from the lowest to

[8]The 21 industrial categories are given in the appendix 2.18 by using the data set from Statistics Canada Statistics Canada (2015c)

[9]post-secondary certificate or diploma which we defined as college to be consistent and the detail definition of each education group is given in the appendix

[10]
$$CV_{national} = \sqrt{\sum[(u_t - \bar{u})^2/n]}/\bar{u} \tag{2.2}$$

the highest degree of educational attainment[11]. We apply the same analysis based on employment rate across different education group. The cross-provincial coefficient of variation of employment rate is higher for high school dropouts (11.46%) and decrease with the increase in educational level. However, the coefficient of variation of the national employment rate is U-shaped, and university graduates have more variability than college graduates.

From table 2.1, across age groups, we find that the average national unemployment rate is the highest for young (20-24) and lowest for old(45-64) individuals. The cross-provincial coefficient of variation of the unemployment rate increases with age, while the coefficient of variation of the national unemployment rate shows a hump-shaped pattern over the life-cycle [12]. The employment rate variability across provinces (cross provincial CV) is highest for the age group 45-64 (18.80%) and lowest for the age group 25-44 (10.18%). However, the variability of national employment rate is U-shaped.

In Canada, provinces are heterogeneous in unemployment and employment rates. So, local market conditions (Bartik and Unemployment Rate) have an impact on inter-provincial mobility across age and education groups and worthy of further investigation empirically.

[11]The hump-shaped curve indicates that provincial variation of unemployment rates is increasing from high school graduates to post-secondary diploma and the variability is low for university graduates.

[12]The hump-shaped curve indicates that provincial variation of the unemployment rate has increased in the age group 25 to 44 and then decrease.The age group between 25-44 has the highest variability (21.21%) in national unemployment rate

2.3 Data Series and Methodology

2.3.1 Data

The data used in the analysis are drawn from the Survey of Labour and Income Dynamics (SLID) from 1993 to 2011. SLID is a household survey, which provides long-range longitudinal information about demographic background, income, education level, labour market activities and financial situation of Canadian individuals' and families. SLID interviews the same individual for six consecutive years and covers all persons living in Canada except: persons living in Yukon, the Northwest Territories, Nunavut, persons living on Reserves, persons living in institutions, and military personnel living in barracks. For collecting data, SLID uses computer-assisted telephone interviewing (CATI) and interviews are conducted by using telephone and the results are simultaneously entered in a computer that guides the interviewer through the questionnaire. Note that, in each panel, one individual is surveyed for six consecutive years and these individuals are randomly chosen from the monthly Labour Force Survey (LFS). The SLID survey is composed of seven panels, and a new panel is introduced in every three years. So except for the first panel from 1993-1995, all the remaining panels are overlapped for three years and panel- 7, which is the last panel of the survey contains just one year (2011). Each panel includes about 15,000 households, including about 30,000 adults[13]. Figure 2.9 in appendix explains span of one panel and how each panel is overlapping with another panel.

[13]Source: Data Quality in the 2002 Survey of Labour and Income Dynamics (SLID) written by Barbara Armstrong and Georgina House and published by Income Statistics Division and Social Survey Methods Division, Statistics Canada.

2.3.2 Defining Mobility and Frequency of Mobility from SLID

In our research, inter-provincial mobility is estimated by using the Survey of Labour and Income Dynamics (SLID), a longitudinal data set from 1993-2011. In this survey, the respondent mentions about the current province of residence in a reference year. This information of the current province of residence[14] brings into play to estimate the provincial status of an individual and replace the dummy[15] variable (move) by one, if the provincial status of a person has changed compared to the previous year. In this formation of SLID, we estimate five different frequencies of mobility of an individual. Based on the frequency of mobility, we determine the provincial move status of each individual compared to the province of the base year and the year of concern[16]. For example, for the five-year frequency of mobility of an individual, the dummy variable, move=1 if the province of residence differs between 1993 and 1998 in panel 1. The lower the frequency the smaller is the time gap and the higher the frequency the time gap is more as given in the table in appendix 2.8.

In this study, in a six-year panel, we can estimate five possible provincial mobility of an individual. For one-year frequency of mobility, we observe an individual five times independently. However, while observing the two-year frequency of mobility, we consider an individual four times independently to capture every possible combination of two-year frequency mobility as illustrated in table 2.8 in the appendix. Similarly, for identifying the three-year frequency, we classify an individual three times independently to address all possible provincial mobility and two times for four-year frequency of mobility. Lastly, for the five-year frequency of mobility, we address an

[14] pvreg25 indicates the current province of residence in SLID survey

[15] If current residence is changed compared to the previous year, the dummy variable takes the value one otherwise zero

[16] For 5-year frequency mobility, the base year is 1993 and the year of concern is 1998. The gap in between 1993 and 1998 is five years. For two-year frequency: gap is for 2 years, 1993-1995, 1994-1996, 1995-1997, 1996-1998

individual just once, which is after every five years.

One of the rationales behind estimating different frequencies of provincial mobility is to compare our results with previous studies which measured mobility using mainly census data that represent our estimation based on the five-year frequency of mobility. In case of census data, we observe an individual's provincial move status after five years, and if we want to estimate how provincial migration after five years is affected by the local market condition, we have to assign the local market condition five years before the individual moves. However, the mover can move anytime within these five-year period. In that case, the effect of the LMC can be weak for late movers compared to the early movers. This ambiguity can be resolved by finding shorter frequencies such as four-year frequency, three-year frequency, two-year frequency and ideally with one-year frequency. In one-year frequency, we can identify the exact timing of the move and assign local market conditions accordingly. Therefore the local market conditions effect becomes very precise in this scenario.

2.3.3 Assignment of LMC at the Beginning of Frequency of Mobility

In our analysis, we match local market condition based on the data provided of an individual's year and the province. We assign the LMC of the original and destination province of an individual. Suppose, an individual resided in Ontario in 1993 and moves to Quebec in 1995. For this individual, the assignment of LMC will be based on both origin (Ontario) and destination (Quebec). The year of LMC of the province will be assigned to each individual at the beginning of frequency of mobility. From table 2.8 in the appendix, for each frequency of mobility, the first column is the beginning year of the frequency of mobility. For example, in panel-1, the two-year frequency of mobility has two time dimensions: 1993 and 1995. The assignment of

LMC of 1993 is the LMC at the beginning of the year. The LMC at the beginning of year frequency gives us the estimation of how an individual takes into consideration the local market condition of the province two years before and successively decides to move after two years. In fact, provincial mobility is a long-term decision and people gradually take the decision to move. So, if the person moves in 1995 to a new province, the local market condition of 1993 (beginning of frequency of mobility) of the origin as well as destination province will be an important influential factor for the person's provincial mobility decision(Coulombe, 2006)[17]. If the LMC of origin is not favorable, then there is a higher probability that the person will pull out from the original province. Contrariwise, if the LMC of the destination is favorable, then there is a higher probability of the provincial move to the destination province. Wozniak (2010) applied local market condition based on individual's birth state, which is the province of origin and the year of the local market condition is the labour market entry year of an individual. However, in our research, we apply the labour market condition of the original province(the province an individual resides before the provincial move), the destination province and the difference between the destination and the original province rather than the province of birth. Moreover, the year of LMC depends on the frequency of mobility rather than the year of labour market entry.

2.3.4 The Sample Selection Rules

For analyzing the impact of local market conditions on provincial mobility, we consider ages between 20 and 55 (inclusive) from 1993 to 2011 (Finnie et al., 2001; Lkhagvasuren, 2014). However, in SLID, there are information available from the age of 16 and we apply the lower constraint of age to avoid pre-university or college

[17]Coulombe mentioned that it is natural to include the lagged differential unemployment rates in the regression and migration decisions at time t might be based partly on the economic situation at time $t-1$.

students, or other individuals whose decision to move is not self-directed or somehow depends on some adults and the ceiling from higher age level is due to avoid the individuals who are close to retirement(Finnie et al., 2001). For investigating the impact of LMC across different education and age groups, we divide education and age into four different groups[18]

2.3.5 Measuring labour Market Conditions

The Bartik instrument was developed by Bartik (1991). For isolating the local labour demand from local labour supply, the Bartik instrument is very popular and applied by Blanchard et al. (1992) and Wozniak (2010). In this study, we implement the Bartik Instrument as one of the representatives of the local market condition and investigate the effect of the local market condition on inter-provincial migration across provinces. The Bartik instrument is the representation of local market growth based on the employment growth of each industry compared to its national growth of employment from the labour demand point of view. Bartik (1991) carefully addressed the difference between local labour demand or employment growth and local labour supply. Successful province and growing economic policies increase the labour demand, reduce the unemployment rate and induced in-migration for that province. Therefore, we are expecting a negative relationship between employment growth and the unemployment rate for a specific province. Provincial employment growth is also caused by its labour supply. Suppose a province for some reason has more in-migrants since the province is more attractive, which creates the increase in labour supply and in consequence increases the unemployment rate and or lowers the

[18]high school drop, high school graduates, college graduates, and university graduates. The detailed explanations of education groups are given in the appendix 2.A. Four age groups: 20-24, 25-34, 35-44, and 45-55

wage rates (Blanchard et al., 1992)[19]. So, lower wages may increase the provincial employment growth. In this instance, we can say that higher provincial employment growth causes the higher unemployment rate due to more labour inflow into that province and there might be a positive correlation between employment growth and unemployment rates. The correlation estimates between Bartik and unemployment rates for each province is provided in table 2.10 in the appendix. We find that there remains a lower level positive correlation between Bartik and unemployment rates in New Brunswick and Quebec, and otherwise negative elsewhere.

From Bartik (1991) it is evident that the employment growth is influenced by labour demand. So, the estimation procedure which will reflect the provincial labour demand distinctively is very important for our analysis and the development of Bartik instrument measured by Wozniak (2010) is applied as one of the independent variable in our analysis.

$$Bartik_{pt} = \sum_{j=1}^{21} e_{pjt-1}(lnE_{jt} - lnE_{jt-1}) \tag{2.3}$$

Where j indexes industry, p province and t year. The first part of equation 2.3, e_{pjt-1}, measures the share of industry j's employment in province p in year $t-1$. It is applied as a weight to the log national employment growth term. The second part of the equation in parenthesis represents the national employment growth. The term lnE_{jt-1} measures the log of national employment of industry j in year t excluding the employment in industry j of the province p and E_{jt-1} is the same measure of the previous year. The sum of the employment growth from each industry (twenty-one industries), represents the proxy for labour market condition for the year t for province p. We have constructed Bartik index from 1993-2011 for each province by using the data from Statistics Canada[20]. So we have (18 X 10) 180 Bartik index

[19] They support the notion that trends in employment do not lead to trends in unemployment. However, a correlation may exist between employment trends and average unemployment rates.

[20] Statistics Canada (2015d)

that we match each individual based on year and province whether the person is a provincial mover or stayer.

The second important variable which will represent the labour market condition is the unemployment rate. In our empirical analysis, we also want to examine how provincial unemployment rates affect individual's probability to migrate to other provinces. The Bartik instrument captures the potential effect of employment growth from the perspective of labour demand. As we discussed early unemployment rate might be affected by both the demand and the supply side, and it has a wide horizon of capturing the economic state of affairs, which is more articulated and well-spoken variable that might influence the decision of mobility of an individual (Wozniak, 2010).

2.4 Stylized Facts

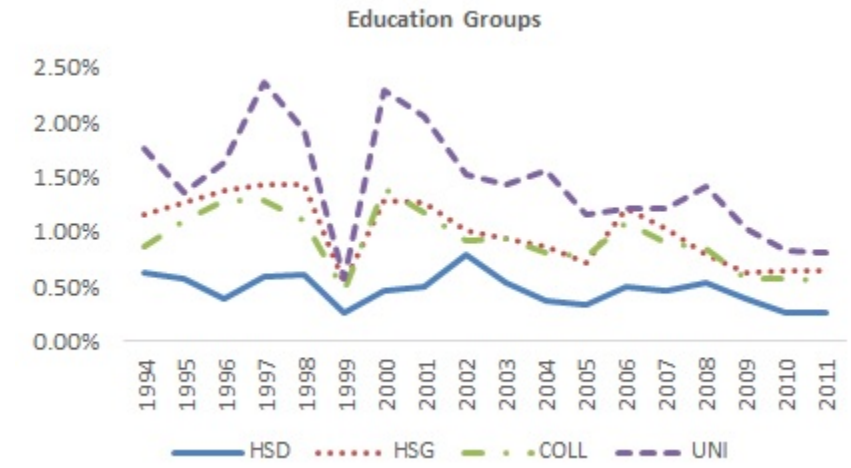
The longitudinal pattern of SLID data allows us to observe an individual for six consecutive years, which is very helpful to understand the pattern and the reasons behind the inter-provincial labour mobility. In our estimation from pooled panel data, from 1993 to 2011, the average annual migration rate is 0.87%[21], which is very close to the migration rate estimated based on census data, which is 0.90%[22]. However, gross mobility varies across different education and age groups. Table 2.19 in the appendix provides the estimation of gross mobility across different age and education groups by using SLID data.

Figure 2.1 represents the mobility rate across education and age groups estimated from pooled panel data from 1993-2011. Results indicate that compared to other educational levels, the university graduates (1.46%) are more mobile across provinces

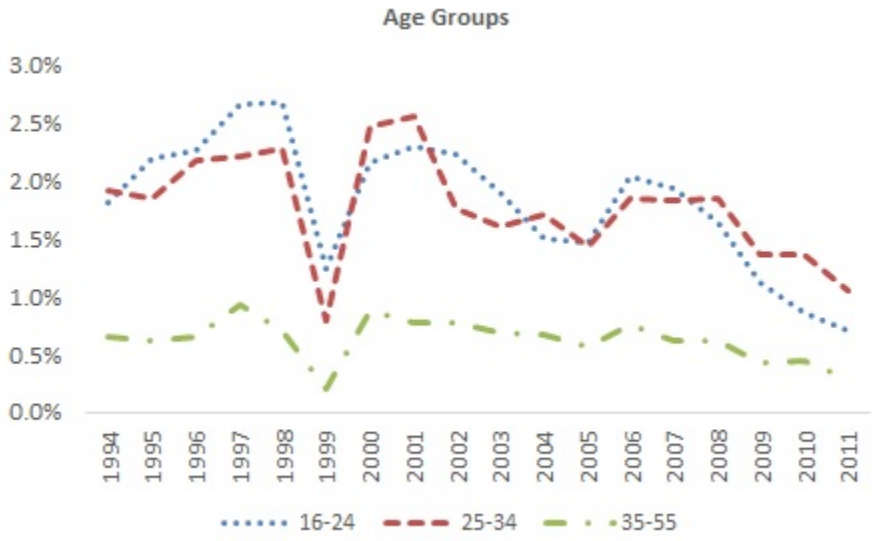
[21] This measure is also known as Economy-wide Gross Mobility Rate. This number is estimated using SLID data

[22] Statistics Canada (2015a,b)

Figure 2.1: Inter-provincial Mobility by Education and Age Groups



a



b

Notes: Figure (a) represents the mobility rate across education and figure (b) represents the mobility rate across age groups. The sharp drop of the inter-provincial mobility rate in 1999 may be caused by the small sample size problem Chen and Fougere (2009).

than any other education groups. However, high school drop out individuals has the lowest provincial mobility rate, (0.48%). Lack of opportunities and competitiveness in the job market may be one of the reasons behind the low mobility rate for less educated individuals. Over the years from 1994 to 2011, inter-provincial mobility rate is decreasing for all education groups.

Overall, the young individuals between the age of 20 to 24 years and 25 to 34 have the highest mobility rate compared to any other age groups. Typically, these groups have less family attachments, and they want to explore more opportunities and develop their skills at the initiation of their career. At the same time as the age increases, family attachments, moving costs, and other socioeconomic factors decrease the propensity to move from one province to another. Chen and Fougère (2011) treat inter-provincial mobility as a form of investment and old workers have relatively shorter time than younger to realize their returns because they are closer to retirement. They also added that compared to younger people, older individuals are more reluctant to move to other provinces due to the higher mobility cost and loss of more social capital. In our analysis, usually, we use four age groups. However, to show the yearly trend of mobility from 1994-2011 we use three age groups for this stylized facts only [23].

Probability transition matrix represents the probability that an individual will remain in the same province next year or moves to other provinces. Table 2.2 provides the probability transition matrix of inter-provincial mobility.

[23]This happens due to noncompliance of minimum cell requirement for a single year for the age group 45-55.

Table 2.2: Probability Transition Matrix of Provincial Mobility

	NFL	PEI	NS	NB	QC	ON	MN	SK	AL	BC
NFL	**98.91**	0.04	0.13	0.04	0.05	0.25	0.04	0.04	0.40	0.11
PIE	0.12	**99.05**	0.34	0.21	0.00	0.03	0.00	0.00	0.12	0.12
NS	0.07	0.04	**98.69**	0.17	0.03	0.40	0.08	0.03	0.40	0.09
NB	0.01	0.10	0.16	**99.02**	0.16	0.17	0.01	0.11	0.21	0.04
QC	0.00	0.00	0.02	0.03	**99.79**	0.11	0.00	0.00	0.04	0.01
ON	0.03	0.00	0.06	0.03	0.05	**99.63**	0.03	0.01	0.11	0.06
MN	0.04	0.00	0.05	0.04	0.04	0.31	**98.77**	0.32	0.20	0.25
SK	0.00	0.01	0.00	0.02	0.01	0.16	0.16	**98.79**	0.73	0.11
AL	0.10	0.02	0.18	0.03	0.06	0.21	0.02	0.20	**98.81**	0.36
BC	0.02	0.01	0.01	0.00	0.04	0.19	0.07	0.09	0.25	**99.32**

Note: Author's calculations from SLID, based on panel 5 (2003-2009) only. The diagonal elements show the probability that an individual will stay in the same province next year. The off-diagonal elements show the probability of cross-provincial mobility in the next year.

For example, each year, 98.91% of people in Newfoundland and Labrador (NFL) remained in the same province in the following year, and there is a 0.04% probability that people will move to Prince Edward Island (PEI). However, there is a 0.12% chance that people will move from PEI to NFL. Quebec is maintaining the highest probability to keep it's residents. One of the potential reasons is Francophone Quebecers were substantially less likely to leave their province than other Canadians (Bernard et al., 2008). However, Nova Scotia is the lowest in keeping its residents among other provinces in Canada. Ontario is the financial hub and one of the most progressive provinces in Canada. The probability of receiving in-migrants from other provinces in Canada is utmost for Ontario and Alberta is the second choice.

2.5 Empirical Framework

In this section, we introduce the model and discuss the precise nature of the dependent variable and the regressors. For estimating the probability of the inter-provincial move in response to the local market condition, we use probit model on pooled panel data from 1993 to 2011. The model's binary decision; zero: for stayer and one: for mover;

the individual who is not in the same province between this year and next year.

We define our first model as a simple model, where we use provincial mobility as a dependent variable and local market condition, educational groups, quartic polynomial of the individual's yearly age, personal characteristics, provincial dummy and year dummy as independent variables. In our analysis, we investigate the impact of LMC in three ways: LMC of the origin, LMC of the destination and LMC differences between the destination and the origin. The frequency of mobility is denoted as f in the model. For examining the impact of LMC on provincial mobility, we estimate the simple model based on equation 2.4, after considering the *full sample*.

$$move_{itp} = \beta_0 + \beta_1 LMC_{pj}^{t-f} + \beta_2 educ_i + \beta_3 age_i + \beta_4 X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{2.4}$$

where, $move_{itp}$ is the dependent variable equal to 1 if individual i move from the province p in year t. LMC is the measure of labour market condition of the province p. For measuring LMC at provincial level, we consider two commonly used indices in the literature; one is based on employment growth (Bartik) and the other one is the unemployment rate. In j denotes the province of origin or the province of destination or the difference between destination and origin. f denotes the frequency of mobility. So, $t - f$ define the timing of LMC. If we observe the person move status in the year 1994, then for one-year frequency ($f = 1$) of mobility we assign the LMC of the year 1993 $(t - f) = (1994 - 1) = 1993$. At the same time, for the five-year frequency of mobility if we observe the move status in the year 1998, then for five-year frequency ($f = 5$) mobility we assign the LMC of the year 1993 $(t - f) = (1998 - 5) = 1993$. age_i is the quartic polynomial of the individual's yearly age. X_i includes sex, marital status, Canadian background or credentials, living with children and immigration status. δ_p is the provincial dummy and δ_t is the year dummy.

The impact of the local market condition varies across different education groups. To understand how local market conditions affect the probability of provincial move for each education group we use the sub-sample of each educational level which is denoted as e, by using equation 2.5.

$$move_{itp} = \beta_0^e + \beta_1^e LMC_{pj}^{t-f} + \beta_2^e age_i + \beta_4^e X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{2.5}$$

The impact of LMC varies across different age groups as well. Using equation 2.6 for the sub-sample of each age group which is denoted as a, we estimate the impact of LMC on different age groups. In our analysis, we create four sub-sample of the age groups: 20-24, 25-34, 35-44, and 45-55.

$$move_{itp} = \beta_0^a + \beta_1^a LMC_{pj}^{t-f} + \beta_2^a educ_i + \beta_4^a X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{2.6}$$

In our model, we include provincial dummy to capture provincial specific effects. We use Ontario as the reference category. So, all other nine provinces are compared based on Ontario. This provincial dummy captures the other economic circumstances, such as population, geographical location, size, and all other non-economic characteristics pertaining to the specific province, which may affect the decision of an individual to move or not from a province (Finnie, 2004). We introduce age as a quartic polynomial of the persons yearly age age_i. Age is one of the important factors related to mobility decisions. Murphy and Welch (1990) find that quartic specifications make significant progress relative to the cubic and the quadratic specification by reducing the bias component. Finally, our models include year dummies from 1994 through 2011 (1993 is the omitted category) to control for time-specific effect.

2.6 Empirical Findings

The demonstration of empirical findings begins with the effect of local market conditions towards provincial mobility after considering *all samples*. This simple model represents how the impact of the local market condition of the original province is different from the destination province. These findings also correspond to the outcome of the local market condition effect of different frequency of mobility. Later, we explain how different education and age groups respond to the effect of local market conditions.

Table 2.3 displays the probability of provincial move of an individual based on the effect LMC of the original province by using the full sample and equation 2.4. The effect of Bartik on provincial mobility for *all* is significant for four different frequencies of mobility except for only five-year Frequency.

Table 2.3: The Effect of Employment Growth (Bartik) on Provincial Mobility: All

	1-Year	2-Year	3-Year	4-Year	5-Year
	Frequency	Frequency	Frequency	Frequency	Frequency
Employment Growth of Origin	-15.329***	-16.092***	-20.625***	-15.313***	-2.399
	(1.625)	(1.482)	(1.610)	(1.687)	(2.567)
Employment Growth of Destination	2.28	1.455	1.683	2.569	0.49
	(1.550)	(1.416)	(1.521)	(1.662)	(2.431)
Employment Growth Difference	54.989***	47.665***	54.201***	44.734**	6.678
	(6.863)	(5.380)	(5.143)	(5.730)	(7.622)

Notes: This table represents the probability of provincial move depending on the employment growth (Bartik) of origin, destination and difference between destination and origin. These are the coefficients of the Probit Model. The higher the coefficients, the higher the probability of inter-provincial move. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

As we mentioned before, Bartik index is a representation of employment growth. The impact of Bartik of the original province on provincial mobility is significant and provide us the desired results. The general assumption is that progressive economic

performance of the original province holds its residents and individuals are more likely to stay rather than move out of the original province. So, if there is an improvement in the employment growth in the province of origin, then individuals of that province are less likely to move out of the province of origin. While comparing the impact of Bartik of the original province on provincial mobility, we find that the effect of Bartik on provincial mobility is gradually increasing from one to five-year frequency. However, the impact of Bartik of the destination province on provincial mobility is not significant, but the signs of the effects are as expected i.e. if there is an increase in the employment growth in the destination province, individuals are more likely to move to the destination province. Table 2.3 also represents the impact of the differences of Bartik between the destination and the original provinces on provincial migration. There is a general assumption that positive differences of the employment growth between the destination and the original provinces evoke more people to move from origin to destination.

Table 2.4: The Effect of Unemployment Rate on Provincial Mobility: All

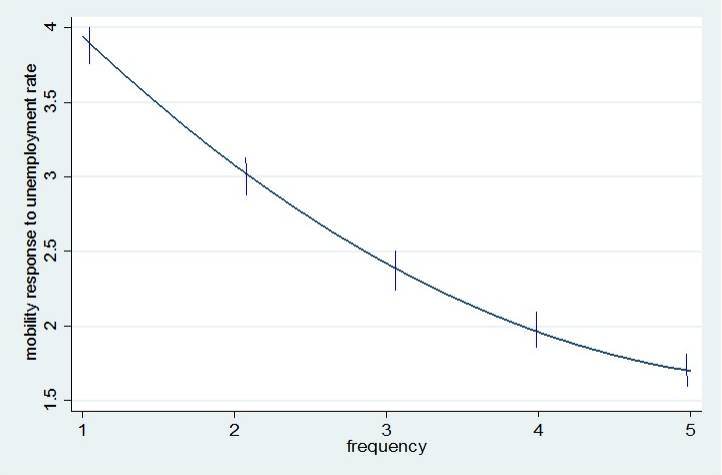
	1-Year	2-Year	3-Year	4-Year	5-Year
	Frequency	Frequency	Frequency	Frequency	Frequency
UR of Origin	0.110***	0.114***	0.122***	0.135***	0.155***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.009)
UR of Destination	-0.039***	-0.033***	-0.023***	-0.021**	-0.018
	(0.009)	(0.009)	(0.010)	(0.011)	(0.016)
UR Difference	-0.129***	-0.129***	-0.134***	-0.146***	-0.166***
	(0.009)	(0.007)	(0.007)	(0.008)	(0.010)

Notes: This table represents the probability of provincial move depending on the provincial unemployment rate of origin, destination, and the difference between destination and origin. These are the coefficients of the Probit Model. The higher the coefficients, the higher the probability of inter-provincial move. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.4 represents the effect of the unemployment rate on provincial migration.

If unemployment rate increases in the province of origin than individuals are more likely to move out of the province of origin. Provincial unemployment rate embodies one of the comprehensive economic measures and more readable to the workers of the province (Wozniak, 2010). In our estimation, we find the positive value of the coefficients of the unemployment rate, which signifies that an increase in the unemployment rate increases the probability to move out of the province of origin. The fear of higher unemployment rate may increase negative influence on the mobility for both unemployed and employed individuals. The unemployed may have a lower probability to be employed and employed may have the possibility to be unemployed in the near future. While comparing the impact of the unemployment rate of origin across the different frequency of mobility, we found that the effect unemployment rates are gradually increasing from one to five-year frequency. The impact of the unemployment rates of the destination provinces on provincial mobility is significant for all frequencies of mobility. If the unemployment rate increase in the destination province, then the individuals are less likely to move to the destination province and the results are statistically significant. While comparing the effect of unemployment rates of the destination province on provincial migration across different frequency of mobility, we find that the effect of the unemployment rate decreased from one-year frequency to five-year frequency. This explains the decaying effect of the unemployment rate on the provincial mobility of the province of destination. This decaying effect is also supported by Blanchard et al. (1992) and they mentioned that the effects of unemployment rate steadily decline and disappear after five to seven years.

Figure 2.2: Impact of Unemployment Rate on Provincial Mobility



Notes: This figure represents the effect of the unemployment rate on provincial mobility over the different frequency of provincial mobility. 1-year frequency represents provincial mobility after one-year, and five-year frequency represents provincial move after five years. We find that the effect of the unemployment rate on provincial mobility diminishing over-time.

Coulombe (2006) used unemployment rates differential between two provinces to explain net migration rates across provinces at the aggregate level and mentioned that unemployment rate differential would seem to be an important observable economic variable that drives inter-provincial migration. We find that positive difference of the unemployment rate between the destination and original province creates the negative impression to the province of destination and cause individuals to be reluctant to move to the destination province. From table 2.3 and table 2.4, our findings reveal that, if employment growth differential is positive between the destination and origin, then individuals are more likely to move to the destination province. At the same time if unemployment rates differential is positive between destination and origin, then individuals are less likely to move to the destination. In our estimation, we find significant results for all-frequency of mobility in both LMC specifications.

The detailed results of the effect of the local market condition of origin, destination and the difference between destination and origin are provided in appendix 2.11, 2.12

and 2.13 respectively. These tables in the appendix also represent the estimation of the probability of provincial move based on other control variables. The personal characteristics show the desired probability of inter-provincial mobility irrespective of the local market condition of origin or destination province. From table 2.11 in the appendix it is apparent that highly educated individuals, male, unmarried, living without children, and non-immigrants are more likely to move inter-provincially compared to their counterparts.

So, individuals are rational in response to the LMC of origin, destination and the difference between destination and origin as the sign of the coefficients are showing desired results. However, the individual's decision to move to another province is significant for LMC of Origin and the LMC difference between the destination and the origin. Moreover, there is a decaying effect of the unemployment rate of the destination on provincial mobility.

Inter-provincial mobility varies across different education and age groups. The magnitude of provincial mobility in response to local market condition also varies across different education and age groups. Table 2.5 displays the result of the effect of local market conditions of origin on the probability of provincial move for each education level by using equation 2.5. Based on our four education group analysis, we find that the coefficients of the LMC effect on each education group are highly significant and the signs are as expected. Each education groups are less likely to move from the origin in response to better local market conditions, which is represented by Bartik. This is also true for the unemployment rate, increase in the unemployment rate in the original province induces individuals to move out of the province of origin. These findings are also supported by Wozniak (2010).

Table 2.5: The Effect of LMC of Origin on Mobility for Each Education

	1-Year Frequency		2-Year Frequency		3-Year Frequency		4-Year Frequency		5-Year Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
School Drop out	-21.577***	0.062**	-13.840***	0.065***	-21.307***	0.077***	-12.963**	0.091***	2.600	0.100***
	(5.690)	(0.027)	(5.169)	(0.023)	(5.611)	(0.023)	(5.923)	(0.024)	(9.485)	(0.031)
High School Graduate	-14.999***	0.124***	-17.059***	0.140***	-25.273***	0.157***	-15.009***	0.171***	1.047***	0.197***
	(2.858)	(0.014)	(2.613)	(0.012)	(2.923)	(0.012)	(2.993)	(0.013)	(4.612)	(0.018)
College	-13.930***	0.110***	-15.296***	0.107***	-17.861***	0.108***	-12.926***	0.116***	0.525	0.140***
	(2.770)	(0.014)	(2.500)	(0.011)	(2.698)	(0.011)	(2.835)	(0.011)	(4.240)	(0.015)
University	-16.251***	0.115***	-18.104***	0.112***	-20.101***	0.118***	-20.878***	0.141***	-12.986**	0.158***
	(3.284)	(0.017)	(3.019)	(0.014)	(3.216)	(0.014)	(3.447)	(0.015)	(5.202)	(0.019)

Notes: This table represents the probability of provincial move across different education groups depending on the provincial employment growth (Bartik) and unemployment rate (UR) of original province. These are the coefficients of the Probit Model. The higher the coefficients, the higher the probability of inter-provincial move. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

In analyzing the impact of local market conditions on the provincial move, we find that the magnitude of the probability of provincial migration varies considerably by education levels. Based on the 1-year frequency of mobility, in response to Bartik, high school drop out individuals are more likely to stay in the province of origin compared to other education groups. However, college graduates are less likely to stay in the province of origin in comparison to other education groups. May be the job prospects in the original province already favorable for high school drop individuals, so they don't like to take the fierce challenge of competition by relocating themselves into other provinces with the least competitive advantage. Mostly, college educated has more opportunity to explore new avenues and improve their skills to become a competitive agent in the job market. Each education group is more likely to move out from the province of origin in response to the unemployment rate. However, across

education groups, high school graduates are more likely to move out from the province of origin when there is fear of losing current job or to be unemployed in future years. On the other hand, high school drop out individuals are less likely to move out from the province of origin even when there is an increase in unemployment rates. One of the possible reasons behind this result is that unemployment rate increases in the original province makes high school drop outs more insecure to get a job out of the province. In contrary, the higher level of education provides the more competitive advantage in the job market and makes them more more responsive to the unemployment rate of the original province. As a result, more educated i.e. university and college graduates are more likely to move out from the original province in comparison to other education groups. So, more educated are less likely to stay in response to increase in Bartik and more likely to move out in response to increase in provincial unemployment rate. However, less educated are more likely to stay in response to increase in Bartik and less likely to move out in response to increase in unemployment rate. By using U.S. census data Wozniak (2010) found that more educated are more likely to stay in response to increase in Bartik of origin and more educated are more likely to move out of the origin with the increase in unemployment rate. Our findings based on five-year frequency represent the similar results of the effect of Bartik and unemployment rate on provincial mobility across education groups. So, the findings based on the one-year frequency of mobility is different from the findings based on the five-year frequency of mobility, which is a reflection of the result obtained from census data.

The LMC effect for each education group based on the local market condition of the destination province and the difference between LMC of destination and origin is given in the appendix in table 2.14 and 2.15 respectively. The effect of LMC of the destination for each education group is as expected, but hardly significant for

both Bartik and unemployment rate specification. So, the LMC of the destination province has less or no impact on the mobility decision of an individual. However, the impact of the LMC difference between the destination and the origin on provincial mobility aligns with the same findings from the LMC effect of origin on provincial migration. If the destination provinces have more jobs than the original province, then individuals will move towards the destination. Simultaneously, if there is a positive difference in unemployment rates between the destination and the original province, then individuals are less likely to move towards destination provinces.

In analyzing the impact of local market conditions on the provincial move we find that the magnitude of the probability of provincial migration varies considerably by age levels as well. Table 2.6 represents the estimates of the probability of a provincial move for each age group based on the effect LMC of the original province by using equation 2.6.

Table 2.6: The Effect of LMC of Origin on Mobility for Each Age group

	1-Year Frequency		2-Year Frequency		3-Year Frequency		4-Year Frequency		5-Year Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
20-24	-18.522***	0.187***	-22.162***	0.213	-16.821***	0.24***	-22.489***	0.263***	-2.632	0.275***
	(3.720)	(0.017)	(3.565)	(0.016)	(4.960)	(0.018)	(4.426)	(0.022)	(6.833)	(0.029)
25-34	-20.034***	0.095***	-18.733***	0.096***	-13.116***	0.112***	-22.209***	0.127***	-3.542	0.166***
	(3.965)	(0.017)	(3.704)	(0.013)	(4.331)	(0.013)	(4.238)	(0.014)	(6.177)	(0.020)
35-44	-8.133*	0.069**	-12.648***	0.063***	-26.466***	0.059***	-2.872	0.063***	8.987	0.087***
	(4.488)	(0.027)	(4.064)	(0.022)	(3.955)	(0.021)	(4.474)	(0.022)	(6.890)	(0.028)
45-55	-16.738***	0.082***	-16.129***	0.112***	-30.752***	0.129***	-14.918***	0.135***	-7.171	0.112***
	(5.764)	(0.035)	(4.689)	(0.027)	(4.069)	(0.026)	(5.072)	(0.027)	(8.340)	(0.037)

Notes: This table represents the probability of provincial move across different age groups depending on the provincial employment growth (Bartik) and unemployment rate (UR) of original province. These are the coefficients of the Probit Model. The higher the coefficients, the higher the probability of inter-provincial move. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Based on four age group analysis, we find that the coefficients of the LMC effect of the original province are highly significant for each age group and the signs are expected. Each age group is more likely to stay in the province of origin in response to Bartik, a measure of employment growth. However, across age group, based on 1-year frequency, the age between 25 to 34 years old individuals are more likely to stay in the province of origin compared to any other age groups. However, the individuals between the age group of 35 to 44 are less likely to stay in the province of origin in comparison to other age groups. Finnie (2004) defined the age group between 35 to 44 as the prime age group. This group is more stable and in the process establishing careers. Even though there are opportunities in the original province, they might look for better opportunities in other provinces as well. In response to the unemployment rate, each age group is more likely to move out of the province of origin compared to other age groups. However, individuals between the age of 20 to 24 (young) are most likely to move out of the province of origin in response to increases in the unemployment rate in the original province. However, the prime aged (35-44) individuals are less likely to move out of the province of origin. Our results indicate that the effect of Bartik and unemployment of original province on provincial mobility is diminishing with the increase in age. Finnie (2004) mentioned that age generally has a negative effect on moving, because of increased costs of moving and decreased expected future benefits. The other reasons behind lower probability of provincial move by older individuals may include, social attachments, job experience, and human capital, which bring competitive advantage for these prime-aged and older individuals. However, young individuals are more responsive to the local market condition of the province, as they have less family attachment and more opportunities to explore. So, older individuals are less likely to stay in response to increase in Bartik and less likely to move out in response to increase in provincial unemployment rates.

However, young individuals are more likely to stay in response to increase in Bartik and more likely to move out in response to increase in unemployment rate.

The LMC effect for each age group based on the local market condition of the destination and difference between LMC of the destination and the origin are given in table 2.16 and table 2.17 in the appendix respectively. The LMC effect on mobility of the destination province for each age group is not significant, but we have desired signs of the coefficients. However, the effect of LMC difference between destination and origin is statistically significant and with desired signs.

In analyzing the impact of the local market condition on provincial mobility for different education and age group analysis we found that individuals are more inclined to stay in the province of origin rather than move to the destination province. However, if the local market condition measures are more favorable in the destination province compared to the origin, individuals are more likely to move to the destination province. In analyzing each education group, compared to less educated more educated are more likely to have the inter-provincial move with the increase in unemployment rates and less likely to stay with the increase in Bartik at the province of origin. In analyzing each age group, compared to the young, older individuals (specially prime-aged group) have less probability of inter-provincial move with the increase in unemployment rate and less probability to stay with the increase in Bartik at the province of origin.

2.7 Conclusion

In this study, we present the impact of the local market condition on provincial mobility for different education and age groups. In Canada, provincial mobility substantially varies across different education and age groups. University graduates and

the individuals between 25 and 34 years old are more inter-provincially mobile compared to their respective counterparts. Canadian provinces have experienced large and persistent differences in unemployment and employment rates across different education and age groups both at the provincial and national level. We observe that the variability of the unemployment rate is the highest for high school graduates compared to any other education groups, while lowest for university graduates. Moreover, the variability of the unemployment rate increases with age at the provincial level. We find that the impact of Bartik on provincial mobility is opposite to the unemployment rate. We notice that local market conditions of the original province rather than a destination province play a significant role in triggering inter-provincial migration. However, the positive difference of the local market condition between the destination and original province motivates individuals to move towards the destination province, and the results are significant for all education and age groups. So, the migration decision is less likely to depend alone on the local market condition of the destination province. The effect of local market condition on inter-provincial mobility also varies across education and age groups. More educated individuals are more competitive and responsive to the local market condition of the province. Based on the one-year frequency of mobility, our empirical findings reveal that more educated are less likely to stay in response to increase in Bartik and more likely to move out in response to increase in provincial unemployment rate. However, less educated are more likely to stay in response to increase in Bartik and less likely to move out in response to increase in unemployment rate. In contrary, the results are just opposite for five-year frequency mobility, which is a representation of estimation based on census data. In analyzing each age group, compared to the young, prime-aged group individuals are less likely to stay in response to increase in Bartik and less likely to move out in response to increase in provincial unemployment rates. However, young individuals are

more likely to stay in response to increase in Bartik and more likely to move out in response to increase in the unemployment rate. Our results indicate that the effect of Bartik and unemployment of original province on provincial mobility is diminishing with the increase in age. The decision of young individuals of inter-provincial move in response to the local market condition may also be influenced by low social attachments, lower moving costs and more opportunities to explore compared to the old. We also find that the effect of Bartik and the unemployment rate of the original province on provincial mobility build up over time. However, the effect of unemployment rates of destination province on provincial migration is weakening over time.

2.A Appendix

Table 2.7: Descriptive Statistics

Variable	Observation	Mean	Std. Dev
Age	454,339	38.49	10.14
20-24	109,519	19.75	2.56
25-34	106,100	29.70	2.91
35-44	141,196	39.64	2.85
45-55	150,800	49.79	3.14
Composite Hourly Wage Rate	302,722	18.47	10.66
Gender	454,339	1.52	0.50
Male	219,994		
Female	234,345		
Marital Status	453,616	38.49	10.14
Candian babckground	420,487	1.77	0.42
Living with Children	454,339	1.45	0.50
Immigration Status	430,436	1.90	0.03
Education	423,229	2.58	0.96
HSD	62,534		
HSG	133,142		
Coll	148,626		
Univ	78,927		
Annual Labour Force Status			
1	271,658		
2	5,974		
3	38,592		
4	31,633		
5	21,927		
6	4,574		
7	17,260		

Table 2.8: Frequency Of Mobility

	Panel Length	5 years frequency	4 years frequency	3 years frequency	2 years frequency	1 year frequency
			1993-1997	1993-1996	1993-1995	1993-1994
			1994-1998	1994-1997	1994-1996	1994-1995
Panel 1	1993-1998	1993-1998		1995-1998	1995-1997	1995-1996
					1996-1998	1996-1997
						1997-1998
			1996-2000	1996-1999	1996-1998	1996-1997
			1997-2001	1997-2000	1997-1999	1997-1998
Panel 2	1996-2001	1996-2001		1998-2001	1998-2000	1998-1999
					1999-2001	1999-2000
						2000-2001
			1999-2003	1999-2002	1999-2001	1999-2000
			2000-2004	2000-2003	2000-2002	2000-2001
Panel 3	1999-2004	1999-2004		2001-2004	2001-2003	2001-2002
					2002-2004	2002-2003
						2003-2004
			2002-2006	2002-2005	2002-2004	2002-2003
			2003-2007	2003-2006	2003-2005	2003-2004
Panel 4	2002-2007	2002-2007		2004-2007	2004-2006	2004-2005
					2005-2007	2005-2006
						2006-2007
			2005-2009	2005-2008	2005-2007	2005-2006
			2006-2010	2006-2009	2006-2008	2006-2007
Panel 5	2005-2010	2005-2010		2007-2010	2007-2009	2007-2008
					2008-2010	2008-2009
						2009-2010
					2008-2010	2008-2009
Panel 6	2008-2011			2008-2011	2009-2011	2009-2010
						2010-2011
Panel 7	2011					

Table 2.9: Panel Distribution

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
P1	1	1	1	1	1	1													
P2				2	2	2	2	2	2										
P3							3	3	3	3	3	3							
P4										4	4	4	4	4	4				
P5													5	5	5	5	5	5	
P6																6	6	6	6
P7																			7

Notes: This table represents the panel distribution of Survey of Labour and Income Dynamics.

Table 2.10: Correlation between Bartik and UR for Each Province (1993-2011)

Alberta	-0.499
British Columbia	-0.076
Manitoba	-0.158
New Brunswick	0.011
Newfoundland and Labrador	-0.271
Nova Scotia	-0.160
Ontario	-0.345
Prince Edward Island	-0.149
Quebec	0.105
Saskatchewan	-0.217

Education Group

High School Drop: Less than high school graduation

High School Graduate: Graduated high school

College: Non-university postsecondary certificate: This category includes persons who obtained a postsecondary certificate or diploma from a community college; a CEGEP (either general/pre-university or technical); an institute of technology; a school of nursing; a private business school; a private or public trade school; or a vocational school. Included in this category are persons who obtained a teaching or nursing certificate awarded by a provincial department of education, with the exception of teachers' or nurse's qualifications at the bachelor level or above obtained at university-affiliated faculty of education or nursing. Persons with an apprenticeship or trades certificate and no other college, CEGEP or other postsecondary and non-university certificate or diploma are excluded from this category. Persons with university certificates diplomas or degrees are also excluded from this category.

University degree or certificate: This category refers to persons who have obtained a university (level) certificate or diploma or degree from a degree-granting

institution.

Table 2.11: The Effect of LMC of Origin on Mobility for All

	1-Year Frequency		2-Year Frequency		3-Year Frequency		4-Year Frequency		5-Year Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
LMC Main effect (ALL)	-15.329***	0.110***	-16.092***	0.114***	-20.625***	0.122***	-15.313***	0.135***	-2.399	0.155***
	(1.625)	(0.008)	(1.482)	(0.007)	(1.610)	(0.007)	(1.687)	(0.007)	(2.567)	(0.009)
School Dropout	-0.070***	-0.075***	-0.077***	-0.081***	-0.094***	-0.098***	-0.108***	-0.114***	-0.108***	-0.110***
	(0.022)	0.022	0.020	0.020	0.021	0.021	0.024	0.025	0.033	0.033
College	0.060***	0.054***	0.074***	0.069***	0.073***	0.067***	0.070***	0.064***	0.061***	0.054***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.017)	(0.022)	(0.022)
University	0.282***	0.279***	0.297***	0.295***	0.304***	0.302***	0.300***	0.296***	0.306***	0.300***
	(0.016)	(0.016)	(0.015)	(0.015)	(0.016)	(0.016)	(0.018)	(0.018)	(0.024)	(0.024)
Age	0.769***	0.772***	0.838***	0.831***	1.028***	1.012***	1.134***	1.089***	1.164***	1.075***
	(0.141)	(0.142)	(0.129)	(0.129)	(0.136)	(0.137)	(0.158)	(0.160)	(0.213)	(0.217)
Female	-0.024**	-0.023**	-0.025**	-0.023**	-0.026**	-0.022**	-0.026**	-0.021*	-0.023	-0.017
	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.017)	(0.018)
Unmarried	0.043***	0.044***	0.023***	0.025***	0.007	0.009	0.003	0.006	-0.005	0
	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.015)	(0.016)
Non Canadian Background	0.086***	0.082***	0.092***	0.091***	0.096***	0.096***	0.101***	0.102***	0.098***	0.096***
	(0.016)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)	(0.017)	(0.023)	(0.023)
Living Without Children	0.132***	0.130***	0.143***	0.138***	0.144***	0.139***	0.142***	0.136***	0.136***	0.126***
	(0.015)	(0.015)	(0.013)	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.022)	(0.022)
non-immigrant	0.158***	0.141***	0.166***	0.147***	0.168***	0.145***	0.185***	0.157***	0.201***	0.169***
	(0.023)	(0.023)	(0.021)	(0.021)	(0.021)	(0.022)	(0.025)	(0.025)	(0.034)	(0.034)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.12: The Effect of LMC of Destination on Mobility for All

	1-Year Frequency		2-Year Frequency		3-Year Frequency		4-Year Frequency		5-Year Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
LMC Main effect (ALL)	2.28	-0.039***	1.455	-0.033***	1.683	-0.023***	2.569	-0.021**	0.49	-0.018
	(1.550)	(0.009)	(1.416)	(0.009)	(1.521)	(0.010)	(1.662)	(0.011)	(2.431)	(0.016)
School Dropout	-0.070***	-0.069***	-0.077***	-0.077***	-0.094***	-0.094***	-0.108***	-0.108***	-0.108***	-0.108***
	(0.022)	(0.022)	(0.020)	(0.020)	(0.021)	(0.021)	(0.024)	(0.024)	(0.033)	(0.033)
College	0.061***	0.061***	0.075***	0.075***	0.073***	0.073***	0.071***	0.071***	0.061***	0.061***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.016)	(0.022)	(0.022)
University	0.283***	0.283***	0.299***	0.299***	0.307***	0.306***	0.302***	0.302***	0.306***	0.306***
	(0.016)	(0.016)	(0.015)	(0.015)	(0.016)	(0.016)	(0.018)	(0.018)	(0.024)	(0.024)
Age	0.769***	0.771***	0.837***	0.838***	1.030***	1.031***	1.136***	1.135***	1.165***	1.164***
	(0.141)	(0.141)	(0.128)	(0.128)	(0.136)	(0.136)	(0.158)	(0.158)	(0.213)	(0.213)
Female	-0.024***	-0.024***	-0.025***	-0.025***	-0.026***	-0.026***	-0.027***	-0.027***	-0.023	-0.023
	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.017)	(0.017)
Unmarried	0.043***	0.043***	0.023***	0.023***	0.007	0.007	0.003	0.003	-0.005	-0.005
	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.012)	(0.012)	(0.015)	(0.015)
Non Canadian Background	0.085***	0.086***	0.092***	0.092***	0.096***	0.096***	0.100***	0.100***	0.098***	0.098***
	(0.016)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)	(0.017)	(0.023)	(0.023)
Living Without Children	0.132***	0.132***	0.143***	0.143***	0.144***	0.144***	0.142***	0.142***	0.136***	0.136***
	(0.015)	(0.015)	(0.013)	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.022)	(0.022)
non-immigrant	0.158***	0.158***	0.166***	0.166***	0.168***	0.168***	0.185***	0.184***	0.201***	0.201***
	(0.023)	(0.023)	(0.021)	(0.021)	(0.021)	(0.021)	(0.025)	(0.025)	(0.034)	(0.034)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.13: The Effect of LMC of Difference Between Destination and Origin on Mobility for All

	1-Year		2-Year		3-Year		4-Year		5-Year	
	Frequency		Frequency		Frequency		Frequency		Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
LMC Main effect (ALL)	54.989***	-0.129***	47.665***	-0.129***	54.201***	-0.134***	44.734**	-0.146***	6.678	-0.166***
	(6.863)	(0.009)	(5.380)	(0.007)	(5.143)	(0.007)	(5.730)	(0.008)	(7.622)	(0.010)
School Dropout	-0.073***	-0.073***	-0.076***	-0.079***	-0.092***	-0.096***	-0.108***	-0.112***	-0.108***	-0.109***
	(0.022)	(0.022)	(0.020)	(0.020)	(0.021)	(0.021)	(0.025)	(0.025)	(0.033)	(0.033)
College	0.059***	0.054***	0.073***	0.068***	0.073***	0.066***	0.070***	0.063***	0.061***	0.052***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.017)	(0.022)	(0.022)
University	0.282***	0.279***	0.297***	0.296***	0.305***	0.301***	0.299***	0.294***	0.306***	0.298***
	(0.016)	(0.016)	(0.015)	(0.015)	(0.016)	(0.016)	(0.018)	(0.018)	(0.024)	(0.025)
Age	0.790***	0.778***	0.850***	0.834***	1.042***	1.017***	1.138***	1.084***	1.166***	1.060***
	(0.142)	(0.143)	(0.129)	(0.130)	(0.137)	(0.137)	(0.158)	(0.160)	(0.213)	(0.217)
Female	-0.023**	-0.023**	-0.024**	-0.024**	-0.025**	-0.022**	-0.026*	-0.021	-0.023	-0.017
	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.013)	(0.013)	(0.017)	(0.018)
Unmarried	0.042***	0.044***	0.023***	0.026***	0.006	0.01	0.002	0.007	-0.005	0.001
	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.015)	(0.016)
Non Canadian Background	0.079***	0.084***	0.086***	0.092***	0.087***	0.096***	0.093***	0.101***	0.097***	0.096***
	(0.016)	(0.016)	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)	(0.017)	(0.023)	(0.023)
Living Without Children	0.131***	0.130***	0.143***	0.137***	0.144***	0.138***	0.143***	0.135***	0.136***	0.125***
	(0.015)	(0.015)	(0.013)	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.022)	(0.022)
non-immigrant	0.154***	0.137***	0.162***	0.143***	0.162***	0.141***	0.181***	0.153***	0.201***	0.164***
	(0.023)	(0.023)	(0.021)	(0.021)	(0.022)	(0.022)	(0.025)	(0.025)	(0.034)	(0.034)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.14: The Effect of LMC of Destination on Mobility for Each Education Group

	1-Year		2-Year		3-Year		4-Year		5-Year	
	Frequency		Frequency		Frequency		Frequency		Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
School Drop out	5.179	-0.059	-2.681	-0.060	-9.050	-0.015	-6.480	0.005	-12.187	0.014
	(7.112)	(0.041)	(6.143)	(0.039)	(6.601)	(0.042)	(7.300)	(0.050)	(11.376)	(0.068)
High School Graduate	3.065	-0.054**	0.418	-0.026	3.933	0.002	-0.169	0.017	0.461	0.004
	(3.563)	(0.023)	(3.351)	(0.023)	(3.745)	(0.024)	(4.047)	(0.028)	(5.958)	(0.040)
College	4.268	-0.031	4.777	-0.034	0.858	-0.022	7.301	-0.027	6.349	-0.005
	(3.922)	(0.023)	(3.445)	(0.021)	(3.728)	(0.023)	(4.095)	(0.028)	(5.701)	(0.038)
University	2.735	0.020	2.700	0.010	4.632	-0.019	3.355	-0.015	0.037	-0.003
	(4.516)	(0.027)	(4.182)	(0.026)	(4.403)	(0.028)	(4.815)	(0.035)	(7.165)	(0.048)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.15: The Effect of LMC Difference between Destination and Origin on Mobility for Each Education Group

	1-Year		2-Year		3-Year		4-Year		5-Year	
	Frequency		Frequency		Frequency		Frequency		Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
School Drop out	93.557***	-0.085**	56.409***	-0.099***	49.175**	-0.104***	21.855	-0.130***	-34.343	-0.148***
	(31.895)	(0.040)	(26.087)	(0.035)	(24.448)	(0.032)	(27.106)	(0.034)	(36.608)	(0.044)
High School Graduate	48.399***	-0.174***	49.684***	-0.183***	66.064***	-0.204***	28.363**	-0.210***	-12.368	-0.253***
	(16.357)	(0.022)	(13.247)	(0.019)	(13.153)	(0.019)	(14.858)	(0.021)	(19.122)	(0.029)
College	67.011***	-0.119***	57.022***	-0.122***	54.377***	-0.130***	53.043***	-0.131***	14.156	-0.143***
	(17.041)	(0.021)	(12.688)	(0.016)	(11.955)	(0.015)	(13.399)	(0.016)	(17.399)	(0.022)
University	56.052***	-0.109***	54.612***	-0.110***	59.809***	-0.124***	60.670***	-0.151***	25.573	-0.171***
	(18.269)	(0.030)	(14.459)	(0.024)	(13.363)	(0.024)	(14.676)	(0.026)	(19.929)	(0.035)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.16: The Effect of LMC of Destination on Mobility for Each Age Group

	1-Year		2-Year		3-Year		4-Year		5-Year	
	Frequency		Frequency		Frequency		Frequency		Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
20-24	5.970*	-0.045*	4.603	-0.055**	3.002	-0.052**	0.025	-0.025	0.217	-0.02
	(3.585)	(0.023)	(3.447)	(0.022)	(3.987)	(0.025)	(4.450)	(0.031)	(6.565)	(0.044)
25-34	3.33	-0.013	-1.34	-0.013	1.04	0.001	1.017	0.023	-4.427	0.001
	(3.753)	(0.021)	(3.423)	(0.021)	(3.701)	(0.023)	(4.056)	(0.028)	(6.009)	(0.039)
35-44	4.217	-0.02	4.173	0.024	1.512	0.043*	4.12	0.033	8.576	0.049
	(4.383)	(0.025)	(3.891)	(0.024)	(4.062)	(0.026)	(4.522)	(0.030)	(6.504)	(0.042)
45-55	4.117	-0.041	4.033	-0.055**	-0.866	-0.059**	2.956	-0.074**	0.597	-0.049
	(5.152)	(0.032)	(4.588)	(0.028)	(4.758)	(0.029)	(5.007)	(0.035)	(7.329)	(0.049)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.17: The Effect of LMC Difference Between Destination and Origin for Each Age Group

	1-Year		2-Year		3-Year		4-Year		5-Year	
	Frequency		Frequency		Frequency		Frequency		Frequency	
	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR	Bartik	UR
20-24	68.578***	-0.206***	71.065***	-0.236***	78.056***	-0.269***	51.1***	-0.29***	6.241	-0.299***
	(14.465)	(0.019)	(12.639)	(0.019)	(12.420)	(0.021)	(14.055)	(0.026)	(19.827)	(0.034)
25-34	67.826***	-0.106***	41.045***	-0.104***	55.45***	-0.117***	49.714***	-0.131***	-1.411	-0.174***
	(15.293)	(0.019)	(11.290)	(0.014)	(10.481)	(0.014)	(12.081)	(0.015)	(15.627)	(0.021)
35-44	44.767**	-0.085***	53.266***	-0.066***	43.448***	-0.058***	19.818	-0.063***	-1.655	-0.087***
	(22.435)	(0.032)	(17.221)	(0.025)	(16.618)	(0.023)	(17.351)	(0.024)	(22.203)	(0.030)
45-55	80.555***	-0.107**	65.187***	-0.143***	45.569***	-0.159***	54.318**	-0.162***	19.86	-0.131***
	(28.343)	(0.042)	(21.138)	(0.033)	(20.117)	(0.031)	(21.865)	(0.032)	(28.182)	(0.041)

Notes: standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 2.18: Industrial Categories

1	Agriculture	12	Finance and insurance
2	Forestry and logging with support activities	13	Real estate and leasing
3	Fishing, hunting and trapping	14	Professional, scientific and technical services
4	Mining, quarrying, and oil and gas extraction	15	Business, building and other support services
5	Utilities	16	Educational services
6	Construction	17	Health care and social assistance
7	Durables	18	Information, culture and recreation
8	Non-durables	19	Accommodation and food services
9	Wholesale trade	20	Other services
10	Retail trade	21	Public administration
11	Transportation and warehousing		

Notes: Bartik Index is estimated based on twenty one Industry categories.

Table 2.19: Migration Rate by Education and Age Groups

Education group	Migration rate	**Age Groups**	Migration rate
HSD	0.48%	16-24	1.87%
HSG	1.02%	25-34	1.86%
College	0.93%	35-44	0.82%
University	1.46%	45-55	0.50%

Source: Author's calculations from SLID 1993-2011

Essay 3

Who Moves and Who Stays Behind: An Evidence from Survey of Labour and Income Dynamics of Canada

3.1 Introduction

Human migration has long been recognized as an important means of redistributing labour to promote regional growth (Krieg, 1997). Each year a large fraction of the labour force moves across different provinces in Canada. This study is for both academic interest and related to very important policy issues, which should be addressed at the provincial level.

Numerous studies focus on provincial mobility in Canada. However, most of the studies are based on the estimation of provincial net migration rate to determine overall gain and loss of a province[1] without identifying the characteristics of provincial movers; who moves and who stays behind. For example, when workers are moving from Quebec to Ontario, are they above average workers or does Quebec lose below average workers to Ontario.

If the skill composition of the provincial movers and stayers are different then the internal migration can affect not only the employment size but also affect the overall skill level across provinces. By using panel data this essay is focusing on two issues related to inter-provincial mobility of Canada. First, the identification of the characteristics of provincial movers based on observable socioeconomic characteristics and the second one is the mover-stayer wage gap of provincial movers across the same age and education groups. The process of identification starts with a basic and first question: who moves and who stays behind? To answer this question we start with the estimation of the number of provincial movers and stayers based on demography, employment and job characteristics, industry and occupation categories. Later on,

[1] Bernard et al. (2008) used Longitudinal Administrative Data (1992-2004) and considered the age range of 20 to 54, Chen and Fougere (2009) used Survey of Labour and Income Dynamics (SLID) 1994-2005, age of 15 years and above Canadian, Osberg et al. (1994) used Labour Market Activity Survey (LMAS) 1986-87 waves.

we estimate pre-move wage[2] difference between movers and stayers for each province to explain whether provinces are losing above average or below average workers. My second question is related to whether there is substantial pre-move and post-move[3] wage difference between provincial movers and non-movers (stayers) in the same locality. At the same time, we also investigate the wage pattern of movers compared to stayers overtime. Lastly, we examine how the provincial mobility is associated with occupational mobility?

Most of the previous studies explain how mover-stayer wage gap influence the probability of provincial mobility[4]. Moreover, often times many of the studies relate wage to mobility at regional level and mainly focus on regional level wage gap. For example, by using LAD data set the study by Bernard et al. (2008)[5] measure pre-move and post-move earnings difference of provincial movers of each province. This study emphasized on regional level wage differences of provincial movers rather than taking into account for individual level wage differences. Mostly individuals moving from low wage rate province to high wage rate province is always gaining. Therefore, it is difficult to comprehend whether provincial migrants are earning more or less than their local counterparts. However, in our study we focus on individual level mobility

[2]Pre-move wage difference between movers and stayers refers to the wage gap between those who is going to move out from a province and who are going to stay in the same province in the next period. For example, a person is moving out from Quebec. While he was in Quebec, how his wage rate is different from the stayers in Quebec? More formally, $W_{QC}^{mover} \geq W_{QC}^{stayer}$ or $W_{QC}^{mover} \leq W_{QC}^{stayer}$? If $W_{QC}^{mover} \geq W_{QC}^{stayer}$ then Quebec is losing above average workers to other provinces and if $W_{QC}^{mover} \leq W_{QC}^{stayer}$ then Quebec is retaining above average workers

[3]Post-move wage difference between movers and stayers refers to the wage gap between in-migrants in the province in the next period and stayers in the same province in the next period. For example, a person is moving out from Quebec to Ontario. How his wage rate in Ontario, is different from the stayers in Ontario? More formally, $W_{ON}^{mover} \geq W_{ON}^{stayer}$ or $W_{ON}^{mover} \leq W_{ON}^{stayer}$?

[4]Finnie et al. (2001) used Longitudinal Administrative Data Base (LAD) from 1982-1995 and age from 20 to 54. The main results are based on a difference model which estimates the short-run effects of mobility on earnings (over the three-year sequences which comprise the sample structure), Finnie (1999) used Longitudinal Administrative Data Base (LAD) from 1982-1995 and age between 20 and 54(inclusive), Chen et al. (2008) used Survey of Labour and Income Dynamics (SLID) from 1994-2005, age of 15 years and above Canadians, Chen and Fougere (2009), Osberg et al. (1994)

[5]Used Longitudinal Data Set (LAD) from 1992 to 2004, age 20-54.

and estimate the mover-stayer wage gap based on both pre-move and post-move analysis across education and age groups. Moreover, pre-move and post-move wage analysis is worth investigating whether the situation of migrants actually improves in their new provinces. In addition, the one-year frequency of mobility allows us to analyze mover-stayer wage gap immediately (within a year), and five-year frequency of mobility allow us to explain mover-stayer wage gap distantly (after five years). The five-year frequency of mobility also allows us to compare our findings with the findings based on census data.

Migration has also been viewed as a means of increasing a person's earning capacity, i.e. as an investment in human capital (Sjaastad, 1962). O'Neill (1981) mentions that if migration is a normal (consumption) good, an increase in destination income increases both the potential investment gain from migration and the expected level of permanent income. To understand the evolution of earnings of provincial migrants compared to non-movers, we estimate the pattern of mover-stayer wage gap three years before and three years after provincial migration. By using U.S. census data (Borjas et al., 1992)[6] estimate how post-move hourly earnings of inter-state migrants are affected by the number of years and interpreted this analysis as the wage assimilation process of migrants in the new region's labour market. In our study, we also represent the pattern of mover-stayer wage gap across education and age groups. To our knowledge, no previous research has estimated the wage pattern of inter-provincial movers in a six-year window (three years before and three years after the inter-provincial move) in the Canadian context.

The workers who move across provinces may also change their occupational categories or remain in the same occupation. Usually, inter-occupational mobility flows is much larger than inter-regional migration (Greenwood, 1975; Osberg et al., 1994;

[6]Uses data from the National Longitudinal Survey of Youth (NLSY) from 1979-1986, between ages of 14 and 22.

Chen and Fougere, 2009). Osberg et al. (1994) and Chen and Fougere (2009) estimate whether wage differential is the key driving and determining factor of inter-occupational and inter-provincial mobility, and they found opposite results[7]. Studies by Cox (1971), Krumm (1983), Bartel (1979) and Gallaway (1967) illustrate the importance of occupational change and geographical change in earnings. Gallaway (1967) suggests that geographic mobility pays rather than occupational mobility. To understand the wage impact of provincial movers versus stayers in a more appropriate manner, we estimate the post-move wage difference between movers and stayers for both provincial and occupational movers. After considering workers who are in the same occupation and the province as a base, we compared the wage of inter-provincial movers and stayers along with who changes their major occupations or not.

Different education and age groups play an important role in explaining provincial migration and mover-stayer wage gap. Burbidge and Finnie (2000)[8] mentions that post-secondary graduates are at the cutting edge of the knowledge-based economy and within-Canada brain drain is one of the dynamic aspect, which deserves attention of policy makers. When individuals are obtaining education in one province but serving in another, brings no contribution to the province that provided education. Moreover, one of the most common patterns in the labour market is that young workers are more mobile and more adaptive to the change in the economy in comparison to older workers (Chen and Fougere, 2009). Age composition of different provinces is one of the most critical components for analyzing labour mobility of Canada. If one province has too many old people or the participants in the labour force is very low, the economic activity can be burdensome to that province. As a remedy, these kinds of provinces need to adopt policies to encourage the existing firms to open up more opportunities,

[7] Osberg et al. (1994) found that the differential in expected wages is a significant determinant of inter-regional migration. However, Chen and Fougere (2009) found differential in expected wages is a significant determinant of the inter-occupational move rather inter-provincial migration

[8] Used National Graduates Survey (NGS)

so young people may migrate-in, and the economy will return to the progressive path again. On the other hand, if a province has more young individuals and fewer employment opportunities, then this province will generate more unemployment. It may also create more out-migration of young individuals from that province that may affect the balance of age composition in that particular province.

In our study, we use the Survey of Labour and Income Dynamics (SLID), a Canadian panel data from 1993-2011. Each panel of SLID survey provides detailed information on labour and income information of individuals for six consecutive years. Despite the academic appeal of SLID, it is being observed in the literature that SLID data has not been utilized in many research works in the recent years.

This essay is organized in the following sections. In section 3.2, we describe the data, explain the methodology and present our empirical models. In section 3.3, we discuss the characteristics of provincial migrants and pre-move wage difference between movers and stayers of each province. Section 3.4, we present our empirical findings. Lastly, we draw the conclusions of our essay.

3.2 Data Series and Methodology

3.2.1 Data

In our analysis, we use the Survey of Labour and Income Dynamics (SLID), a longitudinal data set from 1993-2011. SLID is a household survey, which provides long-range longitudinal information about demographic background, income, education level, labour market activities and financial situation of Canadian individuals' and families. SLID interviews the same people for six consecutive years. The SLID survey is composed of seven panels, and a new panel is introduced in every three years. So except for the first panel from 1993-1995, all the remaining panels are overlapped for

three years, and panel-7, which is the last panel of the survey contains just one year (2011). Each panel includes about 15,000 households, including about 30,000 adults[9].

3.2.2 Defining Mobility and Frequency of Mobility from SLID

In our research, the inter-provincial mobility is estimated by using the respondent response about the current province of residence in a reference year. This information of the current province of residence[10] brings into play to estimate the provincial status of an individual and replace the dummy[11] variable (move) by one, if the provincial status of a person has changed compared to the previous year. In this formation of SLID, we consider both one-year and five-year frequency of mobility in our analysis. The one-year frequency of mobility captures whether an individual change his province of residence this year to next year; we observe an individual five times independently. At the same time, the five-year frequency of mobility addresses an individual in every five-year i.e. whether an individual is residing in a new province after five years or not. In this five-year frequency of mobility, an individual can change his province anytime within this five-year interval. Based on the frequency of mobility, we calculate the move status of each individual compared to the province of the base year and the year of concern[12]. For example, for the five-year frequency of mobility of an individual, the dummy variable, move=1, if the province of residence differs between 1993 and 1998 for panel 1. The lower the frequency there is a small time gap and the higher the frequency the time gap is more as provided in table 3.8 in the appendix.

[9]Source: Data Quality in the 2002 Survey of Labour and Income Dynamics (SLID) written by Barbara Armstrong and Georgina House and published by Income Statistics Division and Social Survey Methods Division, Statistics Canada.

[10]pvreg25 indicates the current province of residence in SLID survey

[11]If current residence is changed compared to the previous year, the dummy variable takes the value one otherwise zero

[12]For five-year frequency mobility, the base year is 1993 and the year of concern is 1998. The gap between 1993 and 1998 is five years

One of the rationales behind estimating and comparing between different frequencies of mobility is to compare our results with previous studies, where the estimation of mobility is mainly based on census data. In our study, the analysis based on the five-year frequency of mobility can be compared with the study based on census data. Compared to five-year frequency, the one-year frequency of mobility provides more accurate information because the mover can move anytime within these five years. In one-year frequency, we can identify the exact timing of the provincial move with less ambiguity regarding the several possible moves within five years of interval.

For estimating occupational mobility, we consider ten categories of the occupational list given in appendix 3.6. We consider an individual as occupationally mobile if that individual changes occupation by the end of the reference year compared to the base year.

3.2.3 The Sample Selection Rules

In this research, to estimate the wage difference between movers and stayers, we consider male, paid workers and those aged between 30 and 55 (inclusive). We also consider *all-year-employed* and *partly-employed* separately and together (*all-sample*) in our analysis. The lower constraint of age is to avoid pre-university or college students or other individuals whose decision to move is not self-directed or somehow depends on some adults. On the other hand, the ceiling from higher age level is to avoid the individuals who are close to retirement.

3.2.4 The Model

The wage difference between movers and stayers is analyzed based on two scenarios: pre-move mover-stayer wage comparison and post-move mover-stayer wage comparison. In the pre-move wage analysis, we compare the hourly wage rate of a provincial

mover vs provincial stayer before the move, i.e. we are comparing the hourly wage rate of provincial movers and stayers of the province of origin. For post-move analysis, we compare the hourly wage rate of in-migrants and stayers of the receiving localities (destination province).

$$wage_{itp} = \beta_0 + \beta_1 move_{itp} + \beta_2 educ_i + \beta_3 age_i + \beta_4 X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{3.1}$$

Where w_{itp} is the log composite hourly wage rate[13] of person i in province p in the year t. $move_{itp}$ is a dummy for whether the person migrated to province p. The coefficient β_1 measures the earnings difference between movers vs stayers in the same locality. age_i is the quartic polynomial of the individual's yearly age. δ_p and δ_t denote, respectively the provincial and year dummy. X_i includes sex, marital status, Canadian background or credentials, living with children and immigration status.

To compare the wage between movers and stayers for each education group and age group we consider the following two regression equations. Equation 3.2 for each education group, which is denoted as e and equation 3.3 for each age group, which is denoted as a.

$$wage_{itp} = \beta_0^e + \beta_1^e move_{itp} + \beta_2^e age_i + \beta_3^e X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{3.2}$$

The coefficient β_1 of equation 3.2 and 3.3 measure the earnings difference between movers vs stayers for each education and age groups respectively.

$$wage_{itp} = \beta_0^a + \beta_1^a move_{itp} + \beta_2^a educ_i + \beta_3^a X_i + \delta_p + \delta_t + \epsilon_{itp} \tag{3.3}$$

[13] In our analysis, we use composite hourly wage rate as a proxy of the wage. Composite hourly wage rate allows us to capture the weighted average rate wage rate of a person if the workers are involved in more than one job.

In this study, we also analyze the pattern of mover-stayer wage gap three years before and three years after the provincial move. SLID provides us information about the hourly wage of an individual for six consecutive years. To observe the wage pattern we consider individuals with the provincial move only in the 4th year of any panel. Therefore, we have the opportunity to capture the wage three years before the provincial move and three years after the provincial move (including the 4th year of the panel) of an individual. For estimating mover-stayer wage gap three years before and three years after the provincial move we use equation 3.1 for *all* and 3.2 and 3.3 for each education and age group respectively. For each equation, we assign the dependent variable (wage) based on three years lag $(t-3)$ to three years forward $(t+3)$.

3.3 Characteristics of Provincial Movers

We estimate the net migration rate[14] based on demographic, industrial, occupational and employment characteristics of each province to identify who is moving out of provinces. In our analysis, we divide the Canadian regions into three parts: Eastern or Atlantic region (Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick), Central region (Quebec and Ontario), and Western region (Manitoba, Saskatchewan, Alberta, and British Columbia).

Demographic characteristics are analyzed based on age groups, educational groups, gender, Canadian background, and immigration status. Table 3.7 in the appendix represents the net migration rate based on demographic characteristics of each province of Canada. Individuals from all age groups are moving out from the Atlantic part of Canada except the older individuals from Nova Scotia.[15] Newfoundland and Labrador

[14] net migration rate is the difference between in-migration and out-migration, divided by total population

[15] Taber (2012) published in the Globe and Mail mentioned that according to Statistics Canada

is all time loser and fails to retain residents[16]. However, the net migration rate for the prime age group (35-44) is negative and the highest in Manitoba. Overall, individuals from all ages prefer to stay in Ontario, Alberta and British Columbia. Among these three provinces, Alberta is in leading position in retaining residents. Across different education groups, the high school dropouts are mostly moving out from Saskatchewan, and high school graduates are moving out from Newfoundland and Labrador. However, college and university graduates are mostly moving out from Newfoundland and Labrador and Prince Edward Island respectively. Interestingly, in Quebec, net migration rate for high school dropouts is only -.01%, which is the lowest compared to the other provinces in Canada. The possible reasons may be the language barrier, lack of competitive skills and available jobs suited to the Quebec residents. Canadian background is not helping individuals to stay in a province without growth. However, individuals without a Canadian background are more likely to stay in Quebec, Ontario, Alberta and British Columbia. Immigrants mostly prefer to stay in Ontario, Alberta and British Columbia.

The industrial characteristics are analyzed based on industrial classifications,[17] occupational categories and number of employees in all locations. Table 3.7 in the appendix shows the net migration rate for each province of Canada. We find that professionals from different industries are leaving the Atlantic region of Canada and mostly prefer Ontario, Alberta and British Columbia as their destination. Even professionals are moving out from the regulated industries e.g. health industry from the provinces except for Quebec, Ontario, Alberta and British Columbia. However,

Census 2006, Nova Scotia province has the highest proportion of residents older than 65 (16%). By 2036, projections show somewhere between one in four and one in three residents will be of retirement age.

[16] Higgins (2008) mentioned that although out-migration has long been a reality in rural Newfoundland and Labrador, it intensified during the 1990s after the collapse of the cod fishery deprived most small villages of their economic base. To protect cod stocks the federal government imposed a moratorium on the commercial Northern cod fishery in 1992, ending a 500-year-old industry.

[17] For analyzing net migration rate; we divide Canadian industries into five broad categories.

net migration rate in the trading industry is highest for Manitoba compared to other provinces in Canada. In management, business, natural and applied science category net migration rate is positive for Nova Scotia, Quebec, Ontario, Alberta and British Columbia. The number of employees in all locations of a company indicates the size of the firm. It is interesting to see that the firm size of less than 20 employees has the lowest average net migration rate (-.15%). However, net migration rate is more negative for bigger firms. So, workers of smaller and mid-sized firms are less likely to move out of the provinces.

Employment characteristics are studied based on labour force status, a full-time job and whether the job is public or private. Table 3.7 in the appendix estimate net migration rates based on employment characteristics for each province of Canada. Based on labour force status, the net migration rate for unemployed individuals is negative and highest in Prince Edward Island. However, for employed individuals, net migration rate is positive and highest in Alberta. The net migration rate also positive for Ontario, New Brunswick and Nova Scotia among the employed individuals. Importantly, net migration rate is also higher in Alberta for individuals who are not in the labour force.

Ibbitson (2015) published in the Globe and Mail mentioned that Canada now consists of three groups based on equalization payments. There are the "have" provinces: British Columbia, Alberta, Saskatchewan, and Newfoundland and Labrador [18] and these four contribute to the equalization pot. After the "haves" come the big "have-nots": Ontario and Quebec and Quebec is receiving the most transfer payments from the Government of Canada. Bringing up the rear are the small "have-nots": the Maritimes and Manitoba. These also illustrate why individuals are mostly moving out from the Eastern part and moving to the Western and Central part of Canada.

[18] NFL is included even though it also suffers from high unemployment and out-migration, because of the revenues it now receives from offshore oil and other natural resources

Greenwood (1975) mentions that the potential migration will presumably select that locality at which the real value of the expected net benefit that accrues to him from migration is greatest. Overall, the inter-provincial in-migrants are higher than out-migrants in Ontario, Alberta and British Columbia. It is also important to note that the average real median earnings are high in Alberta and Ontario. British Columbia is slightly below the average of overall average real median earnings of Canada. However, provinces in the Eastern region have the lowest average real median earnings, and real earnings of Newfoundland and Labrador is the lowest. Real median earnings are presented in appendix 3.4 also help us to clarify the possible reasons why individuals are moving towards the Central and Western regions of Canada.

3.3.1 Where Out-migrants are Moving to?

Individuals are moving out from their original provinces and heading towards different regions of Canada. In our analysis, we divide the Canadian regions into three parts: Eastern or Atlantic region, Central region, and Western region. The general idea is that individuals will move towards that province where economic conditions and other social benefits are favorable. Provincial mobility is high across provinces who are sharing their borders (Amirault et al., 2013). Table 3.1 presents different regions where the out-migrants are moving to.

Table 3.1: Where Provincial Out-Migrants are Moving to?

Province	Atlantic Canada	Central Canada	Western Canada
NFL	26.50%	32.36%	41.14%
PEI	49.54%	21.28%	29.18%
NS	32.82%	33.85%	33.33%
NB	34.22%	38.37%	27.41%
QC	4.95%	77.94%	17.11%
ON	21.94%	27.74%	50.32%
MN	7.11%	24.76%	68.13%
SK	2.43%	1.58%	95.99%
AL	13.49%	7.91%	78.60%
BC	8.78%	5.93%	85.29%
Average	20.18%	27.17%	52.65%

Notes: In Canada, there are ten provinces, and for our analysis, we divide Canadian provinces into three regions: Atlantic (Eastern), Central and Western Canada. This table represents the out-migrants from each province are moving to which regions of Canada. For example, among the out-migrants from Quebec, 5% are moving to the Atlantic region, 77.94% are moving to the Central Canada (except Quebec, so it should be the Ontario in the central part) and 17.11% are moving to the Western part of Canada.

The Western region is the most favorable destination for the out-migrants of other provinces of Canada. On an average 52.65% of the out-migrants are migrating towards the Western region and only 20.18% are moving towards the Eastern region of Canada. Western regions are receiving in-migrants mostly from Ontario and Newfoundland and Labrador of the Central part and the Eastern part of Canada respectively. However, the residents in Quebec are least likely choose the Western region as their destination province. In fact only 17.11% of the out-migrants of Quebec are moving to the Western region. However, out-migrants of Quebec prefer to move to Ontario as their destination province (77.94%). The shared border concept is very strong in the Western and the Central regions. On an average, there are about 82% of the out-migrants of the Western region are retained within the Western parts. This picture reveals the disparity of economic and social atmospheres across provinces of Canada. It is very interesting to see that the out-migrants from the Eastern parts are more or less equally distributed within the Central and the Western parts of Canada.

So, in the Central part, the out-migrants of Quebec are mostly moving to Ontario, and the out-migrants from Ontario are heading towards the Western part of Canada. However, in the Western region, the out-migrants prefer other provinces in the Western region rather than move to the Central and Eastern region. However, Ontario is receiving the most out-migrants from the Western region.

3.3.2 Pre-move Wage Difference between Movers and Stayers Across Provinces

Interprovincial mobility was associated with significant and sometimes substantial increases in earnings (Finnie, 1999; Finnie et al., 2001; Finnie, 2004). Bernard et al. (2008) by using Canadian data found that most often the movers had better earnings growth than the stayers and younger individuals migrating from the low earning province have more positive impact on their earnings growth. However, these results are not giving any clear idea whether these young provincial migrants are receiving higher wage compared to the local labour force in the province of origin and at the same time are they receiving higher or lower wage than their local counterparts in the destination province. As the minimum wage rate and cost of living[19] are not same across provinces, a mere wage increase by provincial migration does not represent the well-being of migrants and the integration process into their new labour market. This section is basically focused on who moves and who stays behind based wage difference between provincial movers and stayers before the out-migrants leave their province. The idea is to identify whether provinces are losing above average or below average workers to other provinces in terms of wage rate. We analyze the mover-stayer wage gap across different education and age groups for each province for both one-year and five-year frequency of mobility. Table 3.2 represents the wage difference between

[19]The Minimum Wage rate and CPI index for each province provided in the appendix 3.9. We represent CPI index as a representation of Cost of Living.

provincial movers and non-movers across education and age groups.

Table 3.2: Wage Difference between Movers and Stayers Across Major Provinces

Province	All	Less Educated	More Educated	Young	Old
NFL	-0.015	0.532***	-0.067	0.275**	-0.545***
	(0.114)	(0.096)	(0.154)	(0.143)	(0.187)
PEI	0.042	0.31***	0.046	0.102	0.259**
	(0.087)	(0.096)	(0.102)	(0.104)	(0.118)
NS	0.187***	0.403***	0.127**	0.213***	0.356***
	(0.056)	(0.091)	(0.067)	(0.062)	(0.096)
NB	0.168***	0.286***	0.137**	0.183***	0.249
	(0.051)	(0.078)	(0.071)	(0.052)	(0.163)
QC	0.166***	0.368***	0.159**	0.303***	0.149
	(0.055)	(0.098)	(0.07)	(0.056)	(0.136)
ON	0.024	0.174**	0.013	0.088*	0.088
	(0.046)	(0.079)	(0.06)	(0.053)	(0.103)
MN	0.066	-0.026	0.159**	0.119*	0.206*
	(0.054)	(0.083)	(0.067)	(0.063)	(0.114)
SK	0.072	0.07	0.077	0.166***	-0.027
	(0.051)	(0.083)	(0.065)	(0.053)	(0.117)
AL	-0.024**	-0.091***	0.061	-0.018	0.168
	(0.011)	(0.026)	(0.06)	(0.057)	(0.121)
BC	-0.002	-0.026	0.045	0.075	-0.036
	(0.06)	(0.088)	(0.083)	(0.074)	(0.114)

Notes: This table represent the pre-move wage difference between provincial movers and non-movers of the province from where out-migrants are moving out. The positive and significant coefficients indicate that the provinces are losing above average workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Quebec is one of the most prominent and influential provinces in Canada. Our results show that out-migrants of Quebec are receiving 16.6% more wage in comparison to the local labour force in Quebec. So Quebec is losing above average workers to the other provinces. Among the less educated and more educated, out-migrants of Quebec are receiving 37% and 16% more wage respectively than their local counterparts. Mostly, from all age and education groups, Quebec is losing skilled workers. Reports by Clemens and Labrie (2016) in the National Post, News (2014)[20] and Vendeville

[20]CBC News also surveys the reasons behind the out-migration from Quebec and most people across all groups named taxes, jobs, political uncertainty and the economy as the most significant reasons they had contemplated a departure

(2014) in the Montreal Gazette, raise the issues regarding Quebec's loss of residents, but they did not mention the characteristics of those people. Vendeville (2014) also reports that most Quebecers are moving away mainly for better job opportunities.

On the contrary, out-migrants of Alberta are receiving 2.4% lower wage in comparison to the local workforce in Alberta. Even among the less educated, out-migrants are receiving 9% lower wage compared to their local counterparts. Among the more educated, young and old workers there is no significant wage difference between movers and stayers in Alberta. These results suggest that Alberta is losing below average workers to other provinces and retaining skilled or above average workers.

Our results also show that there is no significant wage difference between out-migrants and local labour force in Ontario. However, across education groups, among the less educated, out-migrants are receiving 17% higher wage than the local labour force in Ontario. This number suggests that Ontario is losing better less educated workers. However, more educated labour force prefers to stay in Ontario as the mover-stayer wage gap for more educated is very low and insignificant. At the same time, across age groups, young out-migrants of Ontario are receiving 8.8% more than their local counterparts. So, Ontario is losing above average young workers to other provinces. However, mostly, Ontario is doing better in retaining more educated and experienced workforce in comparison to Quebec.

Now if we look at the provinces in the Eastern part of Canada, out-migrants from these provinces are receiving more wage than the workers in the same localities. Mostly from all educational and age groups, these provinces are losing their labour force to the other provinces of Canada and wage gap between movers and stayers are significant. Ibbitson (2015) in the Globe and Mail reports on how Maritime or Eastern regions became Canada's shrinking zone[21].

[21]Mentioned that after decades of declining fortunes, the Maritime or Eastern provinces now find themselves trapped in what one observer describes as a perfect storm of economic and demographic

So, the Western part of Canada is doing better in retaining more educated and young workers in comparison to the Eastern part. In the central part of Canada, Quebec is far behind than Ontario in retaining both the education and age groups. Based on Canadian data set Bernard et al. (2008) find that migrants generally enjoy greater earnings increases than non-migrants, especially those leaving any Atlantic province, Quebec or Saskatchewan [22].

Alternatively, we can say that among the big provinces in Canada; Alberta, British Columbia, and Ontario have the positive selection of workers, i.e., the mover-stayer wage gap is negative or no significant differences. So these provinces are retaining their skilled or above average workers. However, the mover-stayer wage gap is positive for most the provinces in Canada. Among the prominent provinces in Canada, Quebec has the characteristics of the most negative selection and losing their above average workers compared to any other provinces, i.e., positive mover-stayer wage gap. Education and age play an important role in triggering regional or provincial mobility. It is assumed that highly educated individuals have more options to explore better opportunities across provinces in Canada. Mostly mover-stayer wage gap is highest in Quebec for young individuals among the provinces of Canada. Besides, Quebec also looses the good part of workers from both less and more educated

decline. Because of their fading economies working-age population of New Brunswick will have declined by 30,000, again largely due to the exodus of younger workers, even as 50,000 more people pass the age of 65. A provincial commission in Nova Scotia forecasts that, within 20 years, that province's working-age population will have declined by 100,000, or about 20 per cent and there are fewer workers to pay taxes and more old people in need of government services

[22]Based on Longitudinal Administrative Data, 1992 to 2004. For men, migrants on average experienced an earnings growth of 15% from the year prior to migration in the year following migration, compared with 8% for non-migrants. However, the differences were much greater in the Atlantic provinces, Quebec and Saskatchewan. The biggest difference was found in Newfoundland and Labrador, where migrants recorded earnings growth of 76%, compared with 6% for non-migrants. No evidence of a positive effect on earnings was seen for migrants from Ontario or Alberta. The average earnings increase for women of the year prior to migration of the year after migration was 12%, versus 8% for non-migrants. As was the case for men, women leaving any Atlantic province, Quebec or Saskatchewan experienced much greater earnings growth than women who stayed, whereas no positive difference was found in Ontario, Alberta or British Columbia

workers, and these results are statistically significant.

We do a similar exercise, for *all sample* (both *all-year-employed* and *partly employed*) and find similar results of provincial selection of skilled workers. The detailed results are given in appendix 3.10. Overall, the Western part of Canada is doing better in retaining more educated and young workers in comparison to the Eastern part. In the central part of Canada, Quebec is far behind than Ontario in respect to both the education and age groups.

3.4 Empirical Analysis

In this analysis, we estimate the wage differences between provincial movers and stayers in both pre-move and post-move scenario. For analyzing the wage difference between provincial movers and stayers we mainly consider *all-year-employed* workers and compare the wage difference between movers and stayers across two education and two age groups. Moreover, we do a similar exercise considering *all sample* (both *all-year-employed* and *partly-employed*) and *partly-employed* workers as well, for deepening our understanding whether employment status plays any role in explaining the wage difference between provincial movers and stayers. In addition, one-year frequency and five-year frequency of mobility enable us to compare the findings based on the census data. Again, panel data allows us to analyze pre-move wage difference between movers and stayers which is not possible in cross-sectional or census data. Also, we can observe the wage pattern of provincial movers compared to stayers in the same locality. In this section, we address several important questions related to mover-stayer wage gap and investigate how wage pattern has changed in the pre-move and the post-move scenario.

3.4.1 Wage Difference Based on Age and Education Groups

Table 3.3 summarizes the result of the wage difference between movers and stayers for both one-year and five-year frequency of mobility considering *all-year employed* workers who employed consecutively six years in a panel. The results from this table are obtained by using equation 3.1, 3.2 and 3.3.

Table 3.3: Wage Difference Between Movers and Stayers: All-Year-Employed

	1 year Frequency		5 year Frequency	
	Pre Move	Post Move	Pre Move	Post Move
All	0.07***	0.095***	0.113**	0.055*
	(0.019)	(0.016)	(0.021)	(0.033)
Less Educated	0.153***	0.177***	0.211**	0.15**
	(0.032)	(0.029)	(0.033)	(0.06)
More Educated	0.083***	0.122***	0.116**	0.103**
	(0.024)	(0.021)	(0.027)	(0.042)
Young	0.086***	0.097***	0.096***	0.04
	(0.02)	(0.018)	(0.024)	(0.036)
Old	0.03	0.084**	0.157***	0.116
	(0.041)	(0.039)	(0.039)	(0.082)

Notes: This table summarizes the result of the wage difference between movers and stayers for both one-year and five-year frequency of mobility. In our analysis we consider *all-year-employed*, paid and male workers only. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

From table 3.3, in pre-move scenario, our results show that in case of provincial move after one year (1-year Frequency of mobility) the out-migrants are earning 7% more than the local labour force of the province they are leaving and in post-move scenario in-migrants in the destination province are receiving 9.5% more than their local counterparts. However, based on the five-year frequency the positive mover-stayer post-move wage difference is lower than the pre-move wage difference. Our results suggest that these skilled group of workers is receiving more wage compared to the local labour force in shorter frequency and over time the wage gap is decreasing

between in-migrants and the incumbents' workers of the receiving localities. Our findings also reveal that in the post-move scenario, among the less educated, in-migrants are earning more than the stayers of the receiving provinces in both one and five-year mobility specification compared to the more educated workers. Across age groups, post-move wage differences are showing positive and significant results for young workers in case of one-year frequency only. However, five-year frequency post-move wage differences are not significant for either age groups.

We also perform a similar exercise after considering *all sample* (both *all-year-employed* and *partly-employed*), which is given in the appendix 3.11. These results also represent the fact that although there is a pre-move wage difference between movers and stayers, but wage differential disappears within a year and the in-migrant's wage is integrated into the new workplace after one-year of provincial migration i.e. there is little or no difference of wage between movers and stayers. The five-year frequency of mobility also reflects the same notion of the disappearance of the wage gap between movers and stayers in the destination province. Wage differential of movers and stayers also varies across education and age groups. In one-year frequency, pre-move and post-move mover-stayer wage gap is positive for both less educated and more educated workers. In five-year frequency, although there are pre-move wage differences, but the post-move wage differences are not significant across education and age groups. Our results suggest that, although there is an initial wage gap between in-migrants and local counterparts across education groups, but wage differential disappears within five years of the provincial move. In the later part of the analysis, we represent the wage pattern provincial migrants to understand the mover-stayer wage gap in more appropriate manner.

Based on our analysis of mover-stayer wage gap in one-year and five-year frequency of mobility we have several findings. First, in pre-move scenario provincial movers

are earning more than their local counterparts in both one and five-year frequency analysis. Second, in-migrants are integrated into their new "local" labour markets over time Borjas et al. (1992). Third, less educated are earning more than their local counterparts in the destination province, compared to the more educated workers. Fourth, among the young workers, migrants are earning more than their counterparts in both origin and the destination province compared to the old. Finnie et al. (2001) also found similar results for young migrants and mentioned that young male migrants moving from "have-not" provinces enjoy substantial increases in post-move earnings than older ones.

In our study, estimation of five-year frequency serves two purposes: first, it compares the empirical findings based on census data; and second, it explains the wage integration process with local labour force in the destination province. Similar study based on U.S. Census data carried out by Lkhagvasuren (2014)[23], can be compared with our findings related to the analysis of mover-stayer wage gap. He found that post-move wage difference between movers and stayers are negative -2.3% for *all*, among high-school-educated workers, in-migrants are receiving 9.2% less and college educated in-migrants are earning 4.4% more than their local counterparts.[24] Based on Canadian panel data set, we find that mover-stayer wage gap is positive for each education group. Moreover, among the more educated workers in-migrants are earning 12.2% more than their local counterparts. The post-move positive wage difference between movers and stayers indicate that, in Canada, provincial movers require higher wage, due to the higher moving cost of the inter-provincial move for both more and less educated workers, as our sample is restricted to only *all-year-employed* workers.

[23] Post-Move analysis based on US census (1980-2000), sample: 28-64, Male employees, who worked between 20 to 80 hours per week and at least 17 weeks a year, excluding self-employed and unpaid family workers.

[24] Lkhagvasuren (2014) defined college educated who has Bachelor's Degree. In our analysis, more educated individuals are college and university graduates.

Lkhagvasuren (2014) revealed that moving cost and the wage differences between movers and stayers are intimately related, and the higher moving cost is associated with higher mover-stayer wage gap.

Our findings also reveal that less educated provincial movers are earning more than their local counterparts compared to the more educated provincial movers. To understand the mover-stayer wage gap more clearly, we extend our analysis based on four education groups. From Table 3.13 in the appendix, we report that in the post-move analysis, the mover-stayer wage gap is the highest for high school and university graduates in the case of both one-year and five-year frequency of mobility. However, the post-move wage gaps are not significant for high-school-drop and college graduate workers in both one-year and five-year analysis.

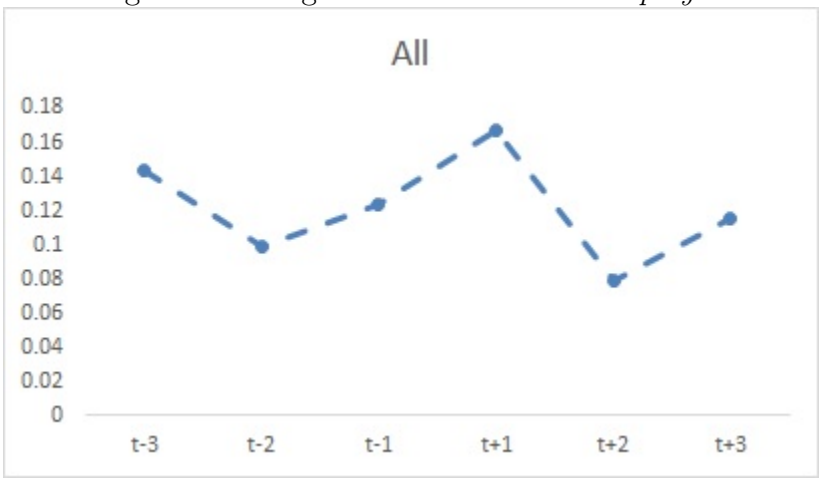
Our results suggest that there is a positive mover-stayer wage gap in both pre-move and post-move scenario. One of the possible reasons is that, our sample is restricted to only *all-year-employed* and paid workers. If this is the case, then the movers will only migrate to another province when they have received higher wage offers from employers of other provinces. These results also indicate that these workers are skilled and get higher wages in the province of origin and when they move to the province of destination, these workers are maintaining the same bargaining and competitive edge over the stayers of the destination province. This scenario is different if we consider workers who are *partly-employed* and the results are presented in table 3.12 in the appendix. We find that, when the workers are having unemployment history or partly employed in a year, then provincial movers are receiving lower wages or no wage gap in both pre-move and post-move scenario compared to the stayers of the province from where migrants are moving out in both one-year and five-year frequency of mobility. However, In the post-move analysis, among the more educated, partly-employed workers are showing the positive wage gap in one-year frequency only. If

this is the case, then the provincial movers may accept lower or equal wage to be hired by the employers in the province of destination.

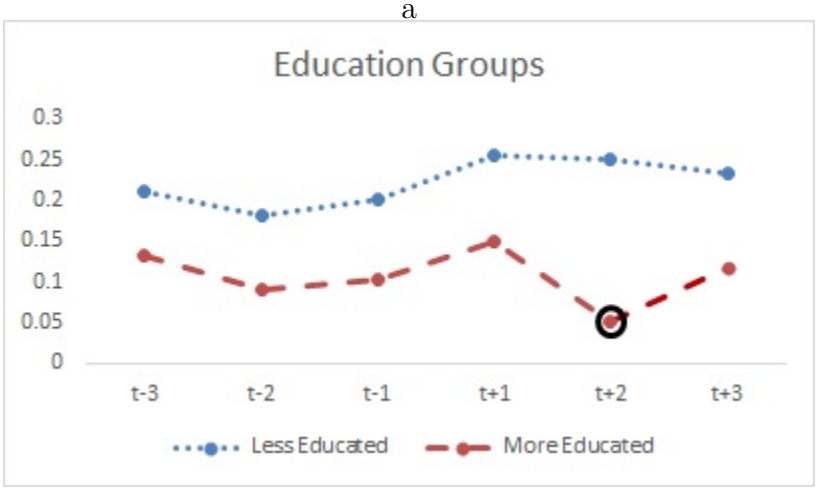
3.4.2 Wage Pattern

In the previous section, we compared the wage gap between provincial movers and stayers based on one-year and five-year frequency of provincial mobility. We find that mover-stayer wage gap of *all-year-employed* workers, is positive after one year and five years of the provincial move. In this section, after considering a different sub-sample, we represent the pattern of the mover-stayer wage gap to identify the period of the integration process of in-migrants in their destination labour market. In mover-stayer wage gap analysis, we estimate the move status of an individual after considering the change in the province between this year and the next year (one-year frequency: observe an individual five times independently) and this year to after five years (five-year frequency of mobility: observe an individual one time). In analyzing the wage pattern, we are considering an individual who moves in the 4th year of the six-year panel. Therefore, we can capture the wage three years before and three years after the provincial move, which is a different sub-sample than previous sections of the mover-stayer wage gap. In this way, we can capture individual's wage pattern three years before and three years after the provincial move. Figure 3.1 represents the wage pattern of provincial movers vs stayers for *all*, and for each education and age groups.

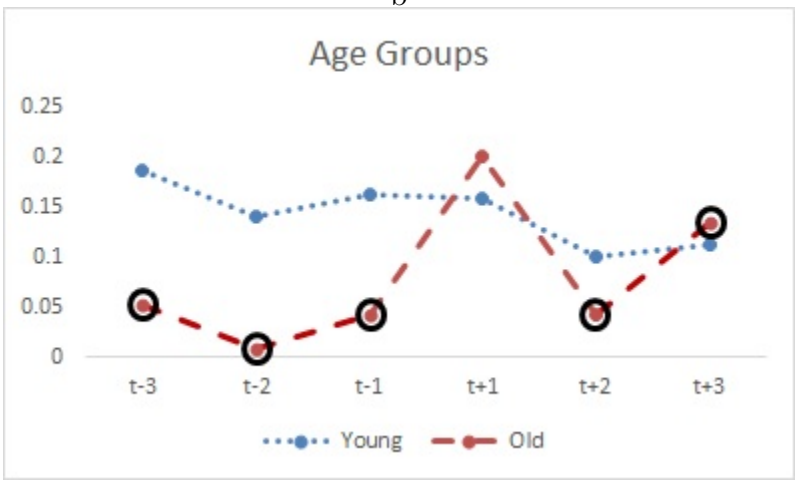
Figure 3.1: Wage Pattern: *All-Year-Employed*



a



b



c

Notes: These graphs are based on the wage pattern of an individual three years before and three years after the provincial move. We consider only *all-year-employed* individuals, who move only in the 4th year of a six-year panel. The cross marks point indicates that the mover-stayer wage gap coefficient is not significant for that particular time.

In figure 3.1 part *a* for *all*, we find that, in both pre-move and post-move scenario, these skilled groups of workers are experiencing positive mover-stayer wage gap. However, wage patterns are having both up and down trend in both pre-move and post-move scenario. Part *b* and *c* describes the wage pattern across education and age groups respectively. Our results show that positive mover-stayer wage gap for less educated is weakening more slowly compared to the more educated. Across age groups for older individuals, there is no significant wage difference between movers and stayers in pre-move wage pattern. However, young worker's post-move wage gaps are declining over the years. If we compare the findings of wage pattern analysis with the findings of mover-stayer wage gap based on one-year and five-year frequency (table 3.3), we find some similarities about mover-stayer wage gap across education and age groups. Moreover, wage pattern represents the trend of wage evolution of these skilled workers in the pre-move and post-move scenario.

Similarly, we observe the wage pattern of provincial movers vs stayers for *all sample* (*both all-year-employed partly-employed*) provided in 3.2 in the appendix. In part *a* for *all*, the positive mover-stayer wage gap is declining before the provincial move and then quickly integrated with the wage of the local labour force in the destination province; as the post-move wage differences between movers and stayers are not significant at all. Among the less educated, there remains a positive mover-stayer wage gap before the provincial move. However, after two years in the destination province, among the less educated there is no wage difference between in-migrants of the receiving localities and the local counterparts. Therefore, less educated worker's wage is integrated within two years of provincial move in the destination province. Moreover, more educated workers are not showing any statistically significant wage difference with their local counterparts after moving to a new location. Across age groups, there is no significant wage difference between young provincial movers to their receiving

province's counterparts. Moreover, there is no pre-move and post-move wage differences between old provincial movers with their counterparts both in the origin and the destination province. Even though wage pattern analyses are based on different sub-sample compared to the mover-stayer wage gap in section 3.4.1, nevertheless, the wage pattern analyses resemble the similar findings of wage integration process found in section 3.4.1 based on *all sample*. For example, post-move mover-stayer wage gap is not significant for *all* based on one-year frequency analysis. In the wage pattern analysis, we find the similar non-significant mover-stayer wage gap after the first year of the provincial move. Moreover, the mover-stayer wage gap is positive and significant after one year of the provincial move, but there is no significant wage difference after five years of the provincial move. The wage pattern analysis for less educated exposed that less educated are mostly integrated with their local counterparts within two years of the provincial move. The wage pattern of partly-employed is also presented in figure 3.2 in the appendix. We find that among the *partly-employed* workers provincial movers are receiving a lower wage (negative coefficients of mover-stayer wage gap) or same wage in comparison to the local labour force both in origin and the destination province i.e. the results are not significant at all.

Based on our discussion, we find that wage integration varies across education and age groups and also depend on the employment status. Among *all-year-employed* workers provincial movers of both the less educated and the more educated workers are receiving more wage than their local counterparts. However, the integration of wage with local labour force is weakening more slowly for less educated compared to the more educated workers. Similarly, across age groups, the mover-stayer wage gap is declining slowly for young compared to older workers. Moreover, based on *all sample* (both *all-year-employed* and *partly-employed*), there is no significant wage

difference between movers and stayers after one year of provincial move in the destination province. After all, *all-year-employed* provincial migrants are slowly integrated into receiving province and continue to receive more wage compared to the local counterparts of the receiving province.

3.4.3 Inter-Provincial Mobility and Occupational Change

Labour mobility may involve a change in residence with or without a change in job status (Krieg, 1997). Many studies related to provincial mobility failed to address how occupational mobility is associated with provincial mobility and mover-stayer wage gap with and without occupational change. By using U.S. data Krumm (1983), finds that occupational change reduces earnings growth. In this section, we estimate provincial mobility along with whether workers change their occupation or not across education and age groups.

Table 3.4: Occupational Mobility across Education and Age Groups

Occupational	***Provincial***	
	For All	
	Stayers	*Movers*
Stayers	89.19%	72.45%
Movers	10.81%	27.55%
	Education Group	
	Less Educated	*More Educated*
	Stayers Movers	Stayers Movers
Stayers	88.70% 68.10%	89.75% 72.84%
Movers	11.30% 31.90%	10.25% 27.16%
	Age Group	
	Young	*Old*
	Stayers Movers	Stayers Movers
Stayers	90.23% 77.25%	92.66% 78.68%
Movers	9.77% 22.75%	7.34% 21.32%

Notes: This table represents the percentage of provincial migrants and non-migrants, who changed their major occupation or stay in the same occupation across education and age groups. Based on *all-year employed*, male and paid workers.

Table 3.4 presents the percentage of provincial movers and stayer that change their occupation or not across education and age groups. Among the provincial movers, 27.55% change their occupation, whereas the provincial stayers change their occupation only by 10.81%. However, the change in occupation varies across different age and education groups. We find that less educated (31.90%) and young (22.75%) provincial movers are more occupationally mobile than more educated (27.16%) and older aged (21.32%) workers. Interestingly, these scenarios are just opposite for those who are provincial movers with the same occupational categories. At the same time, among the provincial stayers more educated and older are less likely to change their occupational categories compared to younger and less educated provincial stayers.

Table 3.5: Wage Impact of Occupational Mobility

Occupational	**Provincial**	
	Stayers	Movers
Stayers	Base	0.103***
		(0.026)
Movers	-0.066***	0.087***
	(0.006)	(0.05)

Notes: This table represents mover-stayer wage comparison based on Cell-1: No change in occupation and province. Cell-2: Provincial movers remain in the same occupation. Cell-3: Provincial Stayers who change their major occupation. Cell-4: Provincial movers who change their occupation. Based on *all-year employed*, male and paid workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

To understand the wage impact of provincial mobility separately from occupational mobility we consider *all-year-employed* and paid male workers who are between the age of 30 and 55 years. Table 3.5 represents post-move wage difference between movers and stayers for both provincial and occupational movers. For comparison purpose workers who changed neither province nor occupation is considered as base in our analysis. We find that male worker who changed their province but remains in the same occupation (cell-2) earn the most compared to the benchmark (cell-1). However, among the provincial stayers, occupational movers earn 6.6% less than the workers who neither change their province nor occupation. So, provincial movers require the higher wage to compensate the moving costs of the inter-provincial move. Suppose, an individual lost job and change his current occupation. This individual's wage is dropped by 6.6% compared to the stayers. However, the impact of the wage drop from this occupational change can be reduced by provincial move without a change in major occupation. In other words, occupational and provincial mobility can be very strong substitute component. The future work should focus more narrowly on the

nature of occupation that triggers wage differences across occupational movers. Interestingly, workers in the same occupation, whether inter-provincially mobile or not, have considerably higher earnings than workers who changed occupation[25]. These findings are also supported by Gallaway (1967) and Greenwood (1975). Gallaway (1967) interprets his findings as reflecting the impact of involuntary mobility, where involuntary mobility is defined as a situation in which remaining at one's most recent job is not one of the alternatives available to workers when making a mobility decision.

3.5 Conclusion

Every year a large number of individuals are moving across provinces of Canada. This study addresses the characteristics of provincial movers and estimates the wage gap between provincial movers and stayers in the same locality. Provinces are always trying to retain skilled or above average workers. However, some provinces are gaining skilled or above average workers, and some are losing. Our findings reveal that above average workers from all education and age groups are leaving most of the provinces in the Eastern part of Canada. In the Central part of Canada, Quebec is far behind than Ontario in retaining above average workers from both the education and age groups. Skilled or above average workers of both education and age groups are preferred to stay in Alberta, British Columbia, and Ontario. Therefore, the Western part of Canada is doing better in retaining more educated and young workers compared to the Eastern part. We also estimate the wage difference between provincial movers and stayers in both pre-move and post-move scenario. We find that among the less educated, provincial movers are earning more than their local counterparts. At the

[25]Occupational stayers are earning more than the occupational movers. The top two cells are showing more earnings than bottom two cells

same time, among the young workers, provincial movers are earning more than their local counterparts. Interestingly, the mover-stayer wage gap is higher for the less educated compared to the more educated workers. We also find that wage evolution of provincial movers varies across education and age groups and also depend on the employment status. Among the *all-year-employed* workers both the less educated and the more educated workers are receiving more wage than their local counterparts. However, the integration of wage with the local labour force weakens more slowly for less educated compared to the more educated workers. Similarly, across age groups, the mover-stayer wage gap declines slowly for young compared to older workers. Moreover, based on *all sample* (both *all-year-employed* wage differences are not significant between provincial movers and stayers after one year of provincial move in the destination province, i.e., wage of provincial movers are integrated with the local labour force. However, among the *partly-employed* workers provincial movers receive a lower or same wage in comparison to the local labour force both in origin and destination province. Finally, provincial movers change their major occupation more than the provincial stayers. Moreover, young and more educated provincial movers are more occupationally mobile than their counterparts. Our result suggests that provincial migration may be a better substitute rather than change in major occupation. Because provincial mobility pays but occupational mobility does not.

3.A Appendix

Education Group

High School Drop: Less than high school graduation

High School Graduate: Graduated high school

College: Non-university postsecondary certificate: This category includes persons who obtained a postsecondary certificate or diploma from a community college; a CEGEP (either general/pre-university or technical); an institute of technology; a school of nursing; a private business school; a private or public trade school; or a vocational school. Included in this category are persons who obtained a teaching or nursing certificate awarded by a provincial department of education, with the exception of teachers' or nurse's qualifications at the bachelor level or above obtained at university-affiliated faculty of education or nursing. Persons with an apprenticeship or trades certificate and no other college, CEGEP or other postsecondary and non-university certificate or diploma are excluded from this category. Persons with university certificates diplomas or degrees are also excluded from this category.

University: University degree or certificate: This category refers to persons who have obtained a university (level) certificate or diploma or degree from a degree-granting institution.

Table 3.6: Occupational Categories

01 : Management Occupations	06 : Occupations in Art, Culture, Recreation and Sport
02 : Business, Finance and Administrative Occupations	07 : Sales and Service Occupations
03 : Natural and Applied Sciences and Related Occupations	08 : Trades, Transport and Equipment Operators and Related Occupations
04 : Health Occupations	09 : Occupations Unique to Primary Industry
05 : Occupations in Social Science, Education, Government Service and Religion	10 : Occupations Unique to Processing, Manufacturing and Utilities

Notes: This table represents the occupational category at the end of reference year or at the end of the employment spell if job ended before the end of the reference year.

Table 3.7: Net Migration Rate Across Provinces

Charecteristics	Atlantic				Central		Western			
Demographic	NFL	PEI	NS	NB	QC	ON	MN	SK	AL	BC
Age Group										
16-24	-3.43%	-1.94%	-0.90%	-1.24%	0.05%	0.35%	-0.67%	-1.40%	3.57%	0.66%
25-34	-1.71%	-1.35%	-0.47%	-1.02%	-0.11%	0.44%	-0.80%	-1.44%	1.84%	0.63%
35-44	-0.56%	-0.55%	-0.04%	-0.49%	0.03%	0.13%	-0.70%	-0.68%	1.20%	0.15%
45-64	-0.28%	-0.45%	0.09%	-0.18%	-0.01%	0.01%	-0.34%	-0.36%	0.51%	0.33%
Educational Group										
HGD	-0.35%	-0.45%	-0.13%	-0.17%	0.01%	0.09%	-0.17%	-0.53%	0.97%	0.17%
HSG	-1.60%	-1.01%	-0.24%	-0.70%	-0.02%	0.23%	-0.64%	-0.80%	1.70%	0.33%
College	-1.02%	-0.66%	-0.14%	-0.49%	-0.02%	0.12%	-0.52%	-0.67%	1.33%	0.32%
University	-1.47%	-1.46%	-0.20%	-0.96%	-0.06%	0.28%	-0.69%	-1.21%	1.47%	0.69%
Canadian Background										
yes	-0.69%	-0.40%	-0.11%	-0.44%	-0.06%	0.15%	-0.42%	-1.13%	1.89%	0.14%
no	-0.98%	-0.88%	-0.16%	-0.51%	0.03%	0.17%	-0.52%	-0.68%	1.22%	0.38%
Immigration status										
yes	-0.80%	-2.98%	-0.42%	-0.51%	-0.06%	0.03%	-0.94%	-1.12%	0.47%	0.42%
no	-0.93%	-0.73%	-0.13%	-0.49%	-0.12%	0.20%	-0.45%	-0.72%	1.48%	0.34%
Gender										
Male	-0.86%	-0.73%	-0.23%	-0.48%	-0.01%	0.14%	-0.55%	-0.71%	1.36%	0.28%
Female	-0.88%	-0.69%	-0.08%	-0.45%	-0.03%	0.18%	-0.52%	-0.81%	1.19%	0.35%
Industrial										
Industry Classification										
Agriculture, Forestry, Utilities, Construction, Manufacturing	-1.50%	-0.74%	-0.27%	-0.41%	-0.08%	0.29%	-0.45%	-0.77%	1.75%	0.06%
Trade	-2.00%	-1.36%	-0.59%	-0.69%	-0.05%	0.41%	-1.38%	-0.80%	2.65%	0.32%
Transportation, Finance, Professional, Business	-2.47%	-1.60%	-0.17%	-0.82%	0.00%	0.33%	-0.72%	-1.25%	1.78%	0.60%
Educational, Health, Information	-0.75%	-0.85%	-0.03%	-0.58%	0.08%	0.33%	-0.35%	-0.91%	0.91%	0.39%
Accommodation, Other, Public	-1.46%	-0.66%	-0.51%	-1.28%	-0.03%	0.48%	-0.73%	-0.87%	2.07%	0.66%
Occupational Categories										
Mangement, Business, Natural and Appleied Sciences	-1.94%	-1.06%	0.28%	-0.93%	-0.14%	0.31%	-0.74%	-0.90%	1.15%	0.63%
Health, Social Science, Art, Culture	-1.01%	-0.88%	-0.39%	-0.87%	0.08%	0.31%	-0.49%	-0.94%	1.37%	0.39%
Sales and Service	-1.70%	-1.03%	-0.53%	-0.76%	0.07%	0.22%	-0.84%	-1.20%	2.39%	0.53%
Transport, Primary, Processing	-1.38%	-0.85%	-0.49%	-0.40%	-0.02%	0.15%	-0.51%	-0.64%	2.20%	-0.03%
Number of Employee in all Location										
Less than 20	-0.92%	-0.48%	-0.13%	-0.59%	0.05%	0.12%	-0.33%	-0.68%	1.18%	0.32%
20 to 99	-2.71%	-0.46%	0.23%	-0.71%	-0.06%	0.81%	-0.70%	-0.99%	1.97%	0.44%
100 to 499	-0.71%	-0.61%	-1.01%	-0.41%	0.02%	0.12%	-0.61%	-0.59%	1.76%	0.20%
500 and Over	-1.89%	-1.81%	-0.31%	-0.97%	-0.10%	0.42%	-0.88%	-1.22%	2.08%	0.48%
Employment History										
Labour Force Status										
Employed all year	-0.22%	-0.41%	0.27%	0.40%	-0.04%	0.16%	-0.38%	-0.52%	0.84%	-0.26%
Unemployed all year	-0.62%	-2.39%	0.53%	1.52%	-0.26%	0.59%	-2.41%	-1.96%	6.60%	-1.39%
Not in the labour force all year	0.27%	-1.14%	0.06%	0.58%	0.09%	0.17%	-0.73%	-1.34%	2.18%	-0.55%
Job Was Full Time										
Full Time	-0.19%	-0.92%	-0.24%	-0.79%	-0.05%	0.40%	-0.79%	-0.83%	1.94%	0.44%
Part Time	0.58%	-0.98%	-0.41%	-0.44%	0.11%	0.57%	-0.44%	-1.08%	1.21%	0.06%
Public or Private										
Public	-0.40%	-0.62%	-0.51%	-0.58%	-0.11%	0.48%	-0.58%	-0.57%	1.18%	0.48%
Private	0.05%	-1.05%	-0.22%	-0.78%	0.01%	0.19%	-0.78%	-1.01%	1.90%	0.40%

Notes: This table represents the net migration rates based on Demographic, Industrial and Employment Characteristics Across Provinces of Canada. Source: Author's calculations from SLID 1994-2011.

Table 3.8: Frequency of Mobility

	Panel Length	5-year frequency	1-year frequency
			1993-1994
			1994-1995
Panel 1	1993-1998	1993-1998	1995-1996
			1996-1997
			1997-1998
			1996-1997
			1997-1998
Panel 2	1996-2001	1996-2001	1998-1999
			1999-2000
			2000-2001
			1999-2000
			2000-2001
Panel 3	1999-2004	1999-2004	2001-2002
			2002-2003
			2003-2004
			2002-2003
			2003-2004
Panel 4	2002-2007	2002-2007	2004-2005
			2005-2006
			2006-2007
			2005-2006
			2006-2007
Panel 5	2005-2010	2005-2010	2007-2008
			2008-2009
			2009-2010
			2008-2009
Panel 6	2008-2011		2009-2010
			2010-2011

Notes: In our data set we have seven panels. But the last panel, which is panel-7 is for only 2011. 5-year frequency consider an individual once in a panel. However, one-year panel consider an individual five-times independently.

Table 3.9: Minimum Wage Rate and CPI index for each Province

Province	**Wage Rate**	**CPI**
Newfoundland and Labrador	10.5	1.82%
Prince Edward Island	11	1.85%
Nova Scotia	10.7	1.93%
New Brunswick	10.65	1.75%
Quebec	10.75	1.60%
Ontario	11.4	1.87%
Manitoba	11	1.95%
Saskatchewan	10.72	2.11%
Alberta	12.2	2.24%
British Columbia	10.85	1.53%

Notes: CPI: Statistics Canada. Table 326-0021 - Consumer Price Index, annual, Minimum Wage Rate: http://www.retailcouncil.org/quickfacts/minimum-wage, as of October 1st 2016

Table 3.10: Wage Difference between Movers and Stayers Across Major Provinces: *All Sample*

NFL	-0.134*	0.111	-0.179*	0.082	-0.415***
	(0.075)	(0.158)	(0.095)	(0.101)	(0.117)
PEI	0.025	0.156	0.06	0.063	0.279**
	(0.073)	(0.105)	(0.088)	(0.087)	(0.117)
NS	0.159***	0.315***	0.13**	0.206***	0.246**
	(0.001)	(0.09)	(0.058)	(0.055)	(0.115)
NB	0.171***	0.249***	0.168***	0.212***	0.233*
	(0.048)	(0.086)	(0.062)	(0.052)	(0.138)
QC	0.131***	0.277***	0.168***	0.258***	0.2*
	(0.052)	(0.095)	(0.065)	(0.062)	(0.116)
ON	0.0003	0.094	0.008	0.081*	0.013
	(0.045)	(0.094)	(0.054)	(0.049)	(0.114)
MN	0.092*	0.035	0.178***	0.133**	0.245**
	(0.05)	(0.078)	(0.063)	(0.058)	(0.109)
SK	0.049	0.095	0.046	0.138***	-0.022
	(0.048)	(0.077)	(0.061)	(0.05)	(0.106)
AL	-0.068*	-0.124**	0.015	-0.058	0.021
	(0.042)	(0.063)	(0.057)	(0.048)	(0.12)
BC	-0.064	-0.052	-0.04	0.064	-0.145
	(0.054)	(0.078)	(0.073)	(0.065)	(0.092)

Notes: This table represent the pre-move wage difference between provincial movers and non-movers of the province from where out-migrants are moving out considering *all sample* (both *all-year-employed* and *partly-employed*). The positive and significant coefficients indicate that the provinces are losing above average workers. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 3.11: Wage Difference Between Movers and Stayers: *All Sample*

	1 year Frequency		5 year Frequency	
	Pre Move	Post Move	Pre Move	Post Move
All	0.038**	0.015	0.082***	0.006
	(0.017)	(0.014)	(0.019)	(0.028)
Less Educated	0.108***	0.073***	0.146***	0.068
	(0.03)	(0.026)	(0.032)	(.05)
More Educated	0.056***	0.047***	0.098***	0.056
	(0.021)	(0.017)	(0.026)	(0.037)
Young	0.063***	0.034	0.067***	-0.006
	(0.018)	(0.016)	(0.022)	(0.032)
Old	-0.024	0.025	0.125***	0.049
	(0.037)	(0.03)	(0.039)	(0.064)

Notes: This table represents the mover-stayer wage gap after considering *all sample* (both *all-year-employed* and *partly-employed* male paid workers only. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 3.12: Wage Difference Between Movers and Stayers: *Partly Employed Only*

	1 year Frequency		5 year Frequency	
	Pre Move	Post Move	Pre Move	Post Move
All	-0.007	0.004	-0.018	0.013
	(0.035)	(0.023)	(0.045)	(0.053)
Less Educated	-0.007	-0.032	-0.029	0.024
	(0.062)	(0.044)	(0.07)	(0.082)
More Educated	0.035	0.067**	0.032	0.058
	(0.044)	(0.028)	(0.065)	(0.07)
Young	0.044	-0.013	-0.016	-0.008
	(0.038)	(0.028)	(0.049)	(0.064)
Old	-0.128*	0.05	-0.017	0.063
	(0.071)	(0.044)	(0.109)	(0.085)

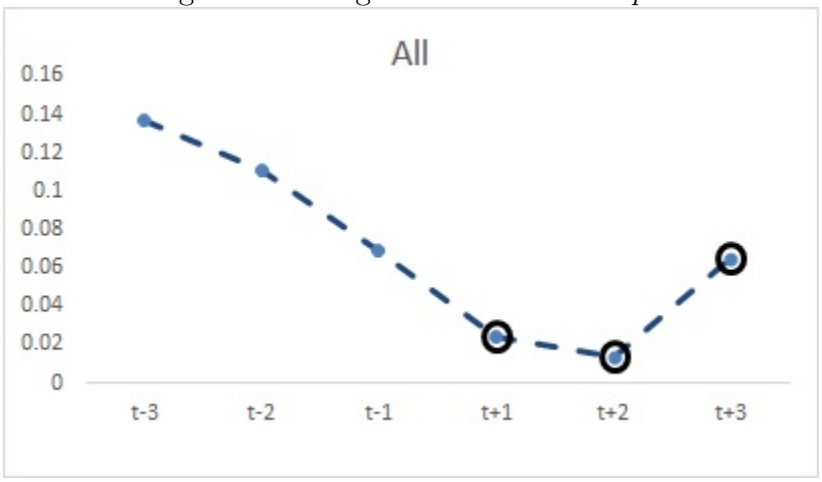
Notes: This table represents the mover-stayer wage gap after considering only *partly-employed* male paid workers only. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

Table 3.13: Wage Difference Between Movers and Stayers: Four Education Groups

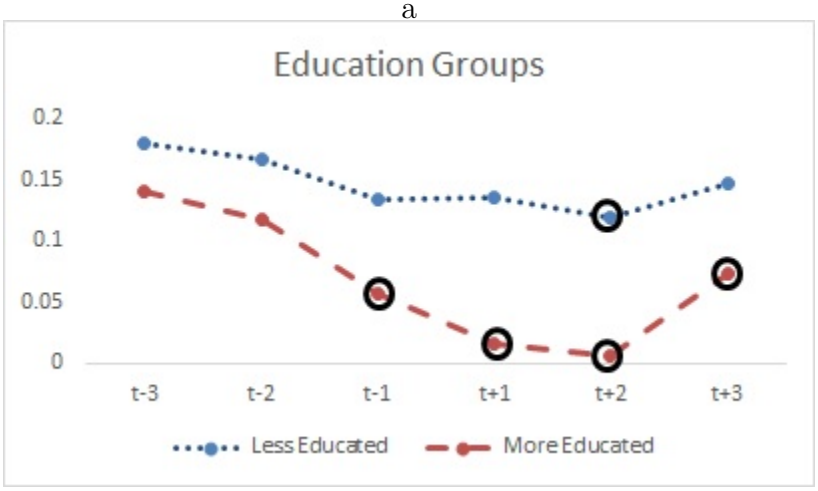
	1 year Frequency		5 year Frequency	
	Pre Move	Post Move	Pre Move	Post Move
HSD	0.097*	0.07	0.106	0.054
	(0.062)	(0.067)	(0.075)	(0.172)
HSG	0.143***	0.175***	0.19***	0.131**
	(0.036)	(0.03)	(0.035)	(0.062)
College	0.036	0.03	0.087**	-0.026
	(0.036)	(0.034)	(0.04)	(0.066)
University	0.045*	0.099***	0.08**	0.074**
	(0.028)	(0.024)	(0.035)	(0.036)

Notes: This table represents pre-move and post-move analysis across four education groups for *all-year-employed* individuals, based on both one-year and five-year frequency analysis. Standard errors are in parenthesis. * indicates significance at the 10 percent level, ** indicates significance at the 5 percent level, *** at the 1 percent level.

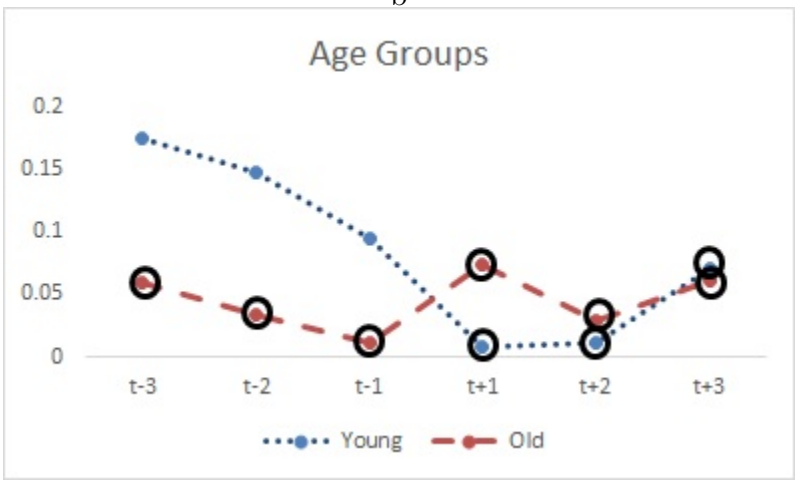
Figure 3.2: Wage Pattern: *All Sample*



a



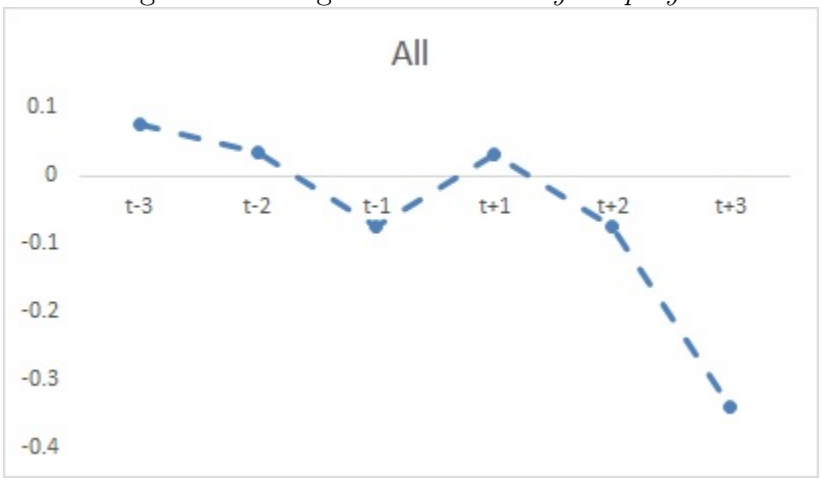
b



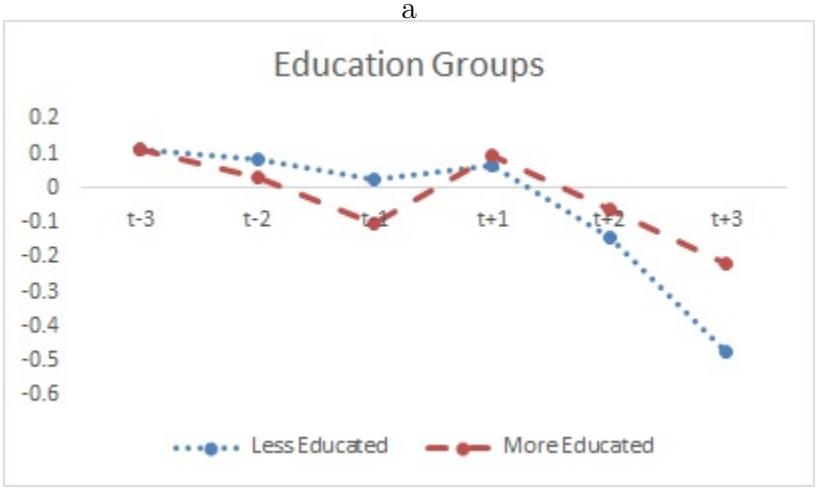
c

Notes: These graphs are based on wage pattern of an individual three years before and three years after provincial move. We consider *all sample* (both *all-year-employed* and *partly-employed* individuals), who moves only once in a six years of a panel. The cross marks point indicate that, the mover-stayer wage gap coefficient is not significant for that particular time.

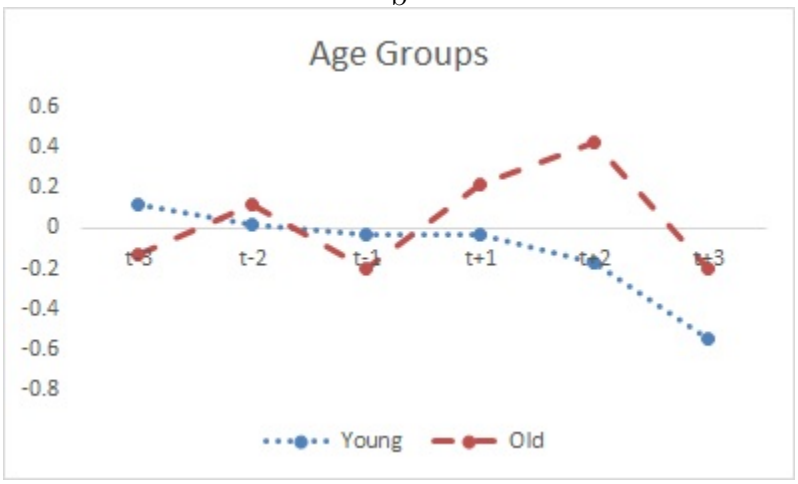
Figure 3.3: Wage Pattern: *Partly Employed*



a



b



c

Notes: These graphs are based on wage pattern of *partly-employed* individuals only for three years before and three years after provincial move. In these three graphs, the coefficients are not statistically significant.

Figure 3.4: Average Median Earnings Across Provinces in Canada from 2000 to 2014

Source: CPI Index Statistics Canada (2016a) , Median Income Statistics Canada (2016b)

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