Temporary Foreign Workers and Regional Labor Market Disparities in Canada[*]

Travailleurs Etrangers Temporaires et Disparites regionales des Marches du Travail au Canada

Dominique M. Gross
School of Public Policy, Simon Fraser University

and

Nicolas Schmitt
Department of Economics, Simon Fraser University

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Abstract

Temporary foreign worker programs are typically seen as short-term solutions to shortages of regional or occupational labor. During the past decade, Canadian regions experienced unequal economic growth and some suffered from significant excess labor demand. The Canadian temporary foreign worker program was thus expanded and conditions to access it made easier. During the same period, wide regional discrepancies in unemployment rates persisted. This paper shows that some of the persistence is due to the increased availability of temporary foreign workers. This suggests that policy makers did not price them correctly to avoid adverse effects on the Canadian labor market.

Keywords: Temporary foreign workers, regional unemployment, labor market test.
Mots cles: travailleurs etrangers temporaries, chomage regional, criteres du marche du travail.

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1. Introduction.

Recently, the number of temporary foreign workers has been soaring in Canada. Yet their potential impact on native workers has so far attracted very little attention on the part of researchers. In other countries in the past, the use of temporary foreign workers has been controversial. In this paper, we investigate whether the expansion of temporary foreign worker programs in Canada has contributed to maintain wider discrepancies in regional unemployment rates than without it. We do find that it did, suggesting that policy constraints for hiring temporary foreign workers are not strong enough to avoid adverse labor market effects.

Historically, temporary foreign worker (TFW) programs have been used by countries that did not have immigration settlement policies and had acute shortages of labor such as Germany, and Switzerland. Recently, however, the co-habitation of standard immigration settlement programs and full-fledged expanding TFW program has become common. Temporary foreign workers are seen as a transitory solution to maintain economic growth by filling excess labor demand in the presence of rather long delays for permanent immigration. They are considered an efficient tool to avoid a fast sectoral/local rise in wages and slowdown in economic growth. At the same time, wage signals are keys to reallocation of labor as wage adjustments trigger internal migration or labor force participation changes, which lead to convergence in unemployment across regions. Under some conditions, temporary foreign worker programs may prevent wage adjustments, and internal labor force shifts may no longer operate as spatially equalizing factors, leading to the persistence of labor market imbalances. As differences in regional unemployment rates may already exist because of moving costs or regional institutional variations, the addition of temporary foreign workers may further increase these differences.

Many OECD countries have tailored TFW programs to target highly skilled individuals in general (i.e., managers, university trained professionals) or skilled occupations (i.e., IT or health workers) but in the past decade, there has been a rise in programs for lower-skilled workers, and Canada is no exception (OECD 2006a, Part 1.C.1.). The Canadian program was designed to attract skilled workers and over time, a seasonal component (i.e. the farm worker program) and an occupation-specific component (the live-in-caregiver program) were introduced. In 2002, the program was extended to cover low-skill workers. While hiring conditions are specified to avoid adverse effects on the labor market, the present paper essentially concludes that these conditions are not sufficient.

There are several reasons why investigating whether the TFW program adversely affects the labor market is an important question. Canadian regions have long exhibited large differences in their labor market performances which have persisted until today despite the particularly strong economic growth since the mid-1990s. In addition, these differences vary greatly across skill levels. While high-skill workers face very similar unemployment rates across the country, low-skill workers face both large disparities in unemployment rates across provinces and much higher unemployment than their high-skill counterparts. Hence, there appears to be little regional convergence in unemployment except for the most skilled. During the same period, the Canadian TFW program underwent major changes, most of which have contributed to making it easier for employers to hire temporary foreign workers. An extension to low-skill workers and a relaxation of hiring conditions are the two most striking features recently introduced. By finding that the recent extension of the TFW program to low-skilled individuals has indeed had detrimental effects on the spatial adjustments of labor markets in Canada and has thus contributed to wider

discrepancies in provincial unemployment rates, we suggest that these recent changes may not have been warranted given the country-wide state of the labor market.

The paper is organized as follows. Section 2 provides a brief overview of the Canadian TFW program including evidence about its growth in recent years. Section 3 discusses regional unemployment disparities and surveys the main reasons for such disparities. Section 4 presents the model of regional adjustment, which serves as basis for the empirical investigation of Section 5. Section 6 provides conclusions.

2. Temporary Foreign Workers in Canada

The Canadian TFW program is made of several sub-programs and each has its own specificities and thus deserves a separate analysis. In this paper we consider only the skilled and unskilled temporary foreign workers who get authorization from the border authorities to enter Canada and for whom there is a labor market test. The programs covered are thus, the skilled and unskilled temporary foreign worker program, the live-in-caregiver program, and the seasonal agricultural worker program.[1] These programs while marginally different are typical in the sense that they share a number of characteristics with past and present programs: Foreign workers must pre-arrange a fixed-term employment contract; workers cannot change employers during the contract; workers are not entitled to automatic family reunion; upon expiry of the permit, workers must leave the country for a defined period of time. What distinguishes programs across time and countries are entry regulations. In Canada there is no quota, but employers must pay a small administration fee ($150) and the number of entries is determined by employers' demand subject to a labor market test.

[1] The post-graduation work permit program is not included because it concerns foreigners already in Canada; students and refugees also fall under the regulation of the temporary foreign worker programme but do not come to Canada for the same motives as TFW (CIC, 2008a).

The labor market test takes the form of a Labor Market Opinion (LMO) that employers must obtain from the Canadian government.[2] Some of the conditions for obtaining a LMO are a genuine job offer, wages and working conditions comparable to those offered to Canadians in the same occupation, proof of reasonable efforts to hire or train Canadians for the job, and evidence that the hiring of a foreign worker will not affect a labor dispute. In addition, the Canadian government considers other potential benefits such as whether the employment of the foreign worker will fill a labor shortage, directly create new job opportunities or help to retain jobs for Canadians, and/or transfer new skills and knowledge to Canadians. The goal of these conditions is to ensure there is no adverse effect on the Canadian labor market.

Initially, the Canadian TFW program was intended mostly for skilled workers, but in July 2002, it was extended to all categories of occupations (HRSDC 2009).[3] Additional conditions were imposed on hiring low-skill workers, such as payment of return airfare, proof of medical insurance coverage for the duration of the job contract, providing help in finding suitable accommodation, and registration under provincial workers' compensation regime. In 2007, as some regions and sectors were experiencing unprecedented growth (i.e., the natural resource and construction sectors in the West), the government introduced further reforms aimed mostly at easing the labor market test for low-skill workers. Under the so-called Expedited LMO in the Pilot Project for Occupations Requiring Lower Levels of Formal Training (NOC C and D), the contract period was extended from one to two years before the TFW must return home, with a compulsory review of the wage

[2] Specifically, the Department of Human Resources and Skills Development (HRSDC) issues a LMO before the Department of Citizenship and Immigration (CIC) authorizes entry of workers (HRSDC, 2009). Almost half of work permits are issued by CIC without HRSDC involvement (e.g. under international agreements, intra-company transferees; CIC, 2008a). Special conditions apply for jobs in academia, information technology, and film and entertainment (HRSDC, 2009).

[3] The Canadian national occupational classification (NOC) has the following categories: 0 (management), A (usually require university education), B (usually require college education or apprenticeship training); C (usually require secondary school and/or occupation-specific training) and D (on-the-job training is usually provided). Categories 0,A,B are considered skilled (HRSDC, 2006).

after twelve months. Also, applications could now be filed electronically and the required period of job advertising by the employer was shortened from about two to three weeks to one week (OECD 2008, Table II.A1.2). Also, provincial lists of *Occupations under Pressure* were established for which the process was accelerated further.

It is clear from this brief description that the Canadian TFW program has undergone broad changes to alleviate perceived labor shortages. This has been achieved by easing firms' access to foreign workers and decreasing their hiring cost; as a result, entries of temporary foreign workers have grown dramatically. As Figure 1 shows, annual entries of temporary foreign workers grew from about 101,000 at the beginning of the latest economic expansion in 1993 to 165,200 in 2007 (+63.6%). There is also a clear negative correlation between entries of TFW and unemployment rates during the period as unemployment declined from about 11.4% to 6%[4] between 1993 and 2007 as expected by the rules governing the TFW program. Moreover, since before the policy change in 2001, the proportion of unskilled TFW has increased from 27.3% to 44.1% in 2007 while the previous historical high occurred in 1990 with 39.1%.[5] When temporary seasonal agricultural workers are excluded the progression is from 10.8% to 26.6% with a historical high at 25.7% in 1990 (Figure 2).

This growth took place while Canada, a permanent settlement country, was accepting around 250,000 immigrants per year. One of the reasons advanced for having a temporary foreign

[4] It is worth noting that in the 1970s and 1980s when Switzerland had a similar programme, the overall unemployment rate in that country was less than 2 % (Gross, 2006). New Zealand experienced a sharp increase in temporary foreign workers after unemployment fell below 4 % in 2004 (OECD, 2007).

[5] The high share of low skill in 1990 is due to women for whom the share was 61.2% while it was 26.6% for men. By 1996, the shares for the two groups were quite similar (i.e., 26% for women and 24.5% for men) and there had been a drastic fall in entries of unskilled women. To our knowledge there is no study on the skill and gender composition of TFW in the 1980s and 1990s as the total number of TFW entries was not a concern at the time. Some of the decline in female TFW could be due to the introduction of the Live-in-Caregiver program in 1992 which imposed higher training and education requirements than the program previously in place (Kalaw and Gross, 2010). Another possibility is the change in policy for exotic dancers in several provinces after fast growth in the industry in the early 1990s and a surge in entries of foreign dancers. Unfortunately CIC does not provide data for TFW entries per occupations.

worker program is that processing permanent immigration takes too long and skills cannot be targeted for the present needs of the market. Broadly speaking unskilled permanent resident enter Canada mostly under the family class as the economic class targets skilled permanent immigrants with a point system (see DeVoretz, 2006, for details) and many may plan on entering the labor market upon arrival. Since both permanent and temporary immigrants feed the demand for labor, the correlation between the two groups matter to identify the responsibility of TFW in unemployment dispersion. Between 1991 and 2001 the correlation between the two annual flows was 0.315 and between 2002 and 2007, 0.347 showing little co-movement overall.[6] Hence, TFW might compensate for permanent immigrants.

The next task is to show that large divergences among provincial unemployment rates persisted during the expansion of the TFW program.

3. Regional Unemployment in Canada

3.1 Statistical Evidence

In an integrated economy, labor market disparities are more likely to arise under regional aggregate demand shocks than national shocks in part because of regional specialization in economic activity (Jimeno and Bentolila, 1998; Decressin and Fatas, 1995). Evidence that, in Canada, regional shocks have become relatively more prominent over time come from the results of the estimation of the impact of national employment growth on provincial employment growth (see Table A.I.1. in Appendix I for detailed results). The adjusted R^2 varies between 0.066 for BC and 0.920 for Ontario and are low for non-manufacturing and small provinces (BC, Saskatchewan,

[6] At the skill level, the correlations between 1997 and 2007 are 0.248 for A; -0.364 for B; .423 for C, and -0.495 for D. Unfortunately, the NOCS classification is available only since 1997. Also, permanent immigrants' skill levels are recorded based on "intention to work" which does not guarantee that the person will actually look for work. In 2007, 129,426 permanent immigrants indicated they intended to work out of 247,243 and 68,033 provided an intended occupation (CIC, 2009).

New Brunswick, PEI and Newfoundland); for a majority of provinces, the elasticity of provincial employment growth with respect to national employment growth is significantly different from one. This is consistent with the general view that in recent years, energy-rich provinces have led Canada's economic growth rather than manufacturing-intensive provinces and it also suggests increasing pressures for internal reallocation of labor; yet there is evidence of increased persistence in labor market disparities.

Persistence in provincial disparities has been observed in the Canadian literature for decades (see for example, Lazar, 1977), but Table 1 provides evidence of *increased* persistence in provincial unemployment divergence between the last two periods of expansion (defined as steady decline in overall unemployment). It shows that the simple correlation among provincial unemployment rates between the beginning and end of both periods (i.e., 1983 and 1989; 1993 and 2007) increased from 0.772 to 0.982.[7] Furthermore, during the latest expansion period, the correlation increased after the introduction of the TFW program in 2002 (i.e., between 1993 and 2001 the correlation is 0.940 and between 2001 and 2007, 0.951). One way to confirm this persistence is to look at the ranking of the provinces. During the 1980s' expansion, only Newfoundland kept its bottom ranking between the first and last year. During the latest expansion, however, four provinces (Ontario, Nova Scotia, PEI and Newfoundland) maintained the same ranking. Furthermore, between 1993 and 2007, two adjacent provinces in the ranking exchanged their spots (Quebec and New Brunswick); as a result only the first 4 spots were switched around. Between 1983 and 1989 no adjacent provinces exchanged spots and the first 9 ranks were switched around. Hence, the later period exhibits more persistence than the earlier one.

[7] Moreover the Theil index confirms that, among OECD countries, Canada experienced the largest increase in the dispersion of regional unemployment rates between 1993 and 2003 after Italy and Spain (OECD 2006b, Figure 2.7).

This inertia, moreover, appears to be driven by low-skill unemployment rates (see Table 2). While only two provinces kept the same ranking for university-educated people, five/four provinces did not change rank for the low-skill categories C/D; moreover, all provinces except Alberta moved by only one rank in the D occupation category. Also, not all provinces perform similarly across skill categories. For example, in 2006, Ontario ranked relatively worse for the highest skill category than for all others and, it was the opposite for New Brunswick; British Columbia ranks better for B and C skill categories than for the highest and the lowest, A and D respectively. While similar cross-skill distribution applied in 1993 for New Brunswick and British Columbia, Ontario at the time ranked among the best for high skill unemployment. Nevertheless, in all provinces, average unemployment rates in categories C and D are consistently much higher than those for skilled people (i.e., categories A and B).

Further evidence of the slow adjustment in provincial unemployment rates is given in Table 3, where unit root tests are conducted over the longest available sample with quarterly observations (1976.1–2010.4). The results of the ADF tests including a time trend show that most provinces' unemployment rates have a unit root and thus show high persistence; the exceptions are Saskatchewan, Manitoba and New Brunswick. The DF-GLS test is also run on annual data for the provincial unemployment rates in deviation from national rate. Two periods are considered: 1976 to 2002, which is the period analysed in Coe and Emery (2004) and 1976 to 2010 which is the longest available sample. Keeping in mind that unit-root tests are more accurate in larger sample, in column 3, the hypothesis of a unit-root can be rejected for British Columbia in addition to Saskatchewan, Manitoba and New Brunswick; for the shorter sample (column 2), only two provinces exhibit a unit-root. This tends to suggest that persistence has increased with time.

Interestingly, all the provinces exhibiting persistence have had higher than average unemployment rate (column 4) since 2002 except Alberta.

In summary, evidence point toward increased persistence in divergences for provincial unemployment rates during the past decades driven by lower-skill categories while there was an expansion of the use of low-skilled TFW.

3.2 Links to the Literature

The neo-classical model of labor market adjustment suggests that regional divergences are not sustainable. Imbalances trigger relative wage changes, which generate changes in labor force participation as well as encourage employers to adjust their input mix or to relocate. Persistent discrepancies then exist because of long-run differences in equilibrium unemployment rates or slow operation of the equilibrium mechanism. Specifically, if temporary worker programs are not constrained or priced adequately, employers and individuals might be discouraged from considering alternatives (Ruhs, 2002).

Theoretically, observed persistence in unemployment divergences can come from two sources: Differences in equilibrium unemployment and sluggish adjustment toward the equilibrium.[8] Countries' differences in equilibrium unemployment are commonly attributed to differences in labor market institutions, such as social programs and wage-setting mechanisms. In Canada, province-specific public policies have been shown to contribute to persistent dispersion in unemployment. Johnson and Kneebone (1991) for instance estimate that the natural rate of unemployment in 1980 was highest in Newfoundland at 14.8% and lowest in Alberta at 4%. They attribute these discrepancies to different structural factors such as unemployment insurance

[8] The literature on the causes of persistent regional unemployment is vast (see Elhorst, 2003, for a survey). Here, we review only the issues relevant to the Canadian case.

generosity and relative minimum wage rates as well as to different responses to these structural factors. In 1996, the Unemployment Insurance (UI) program was substantially reformed and renamed Employment Insurance (EI); it still encompasses strong regional-specific aspects that allow unemployed workers to qualify faster and collect benefits for a longer period in higher unemployment regions.[9] These features are likely to have perpetuated regional unemployment differences in recent times.

With shocks becoming more "regional" since the start of the growth period in 1993, it is expected that adjustments in the supply of labor occurred through internal migration and labor force participation adjustments. Table 4 provides inter-provincial flows for fourteen years before and after the peak of unemployment in 1993. Generally, internal migration flows *decreased* over time despite shocks being more region-specific. All provinces except Alberta experienced a decrease in in-migration, and all but Newfoundland and BC experienced a decrease in out-migration.

Past and recent literature on Canada, even though relatively scarce, confirms the weakening of the response of internal migration to regional labor market states. Grenier (2008) argues that the mobility of the working age population across Canada has decreased between the mid-1970s and the mid-1990s, a result also found by Cousineau and Vaillancourt (2001). Coulombe (2006) shows that inter-provincial migration do not respond to regional shocks but respond to more fundamental changes such as rural/urban structure or long-term differences in unemployment. The early literature from the 1980s shows that the lack of mobility between Canadian regions is mainly due to government policies and unemployment insurance in particular (for examples, Shaw, 1986; Polese, 1981), a point reaffirmed in Day and Winer (2001), who expand the study to income taxes

[9] For example, required number of hours of insurable employment in qualifying period range from 700 in regions with less than 6% unemployment to 420 in regions with more than 13% unemployment (Service Canada, 2008). See also Day and Winer (2001), Appendix D, for a description of some of the changes in UI parameters since 1966.

and provincial per capita spending. Cousineau and Vaillancourt (2001) point toward an aging population and a more equal distribution of income due in part to transfer programs. Finally, one of the consequences of low inter-provincial migration is wage inequality; hence, among factors affecting wage inequality, one should find those affecting migration. Dickie and Gerking (1998) find that in addition to transfer payment, relocation costs (age, low education, and language) are strongly related to wage differentials.[10] In an earlier study concerning Atlantic Canada, Drewes (1987) argues that persistently high unemployment in the region was due to inappropriately high wages imported from other Canadian regions.

In conclusion, there is ample evidence that large persistent disparities exist across provincial labor markets in Canada. Several studies confirm that such persistence reflects different equilibriums due to social programs' incentives. The presence of large regional shocks, however, is expected to trigger some migration flows, which, according to the evidence, did not occur. There is compelling evidence that divergence of provincial labor markets increased recently while internal mobility has decreased. This coincides with the temporary foreign worker program being expanded in regions under large positive demand shocks. Hence, it is natural to investigate whether the expansion of the TFW program contributed to slowing further inter-regional adjustments in Canada.

[10] The literature on provincial income convergence (see for example, Helliwell 1996; Coulombe and Tremblay 2007) is not reviewed here as it is not directly related to the focus of our paper.

4. Theory

To investigate the possible role of temporary foreign worker programs on the persistence in regional unemployment divergence, we adapt Blanchard and Katz (1992)'s model of the labor market. The model is composed of four equations: a short-run demand for labor, a wage-setting relation, a labor supply and a long-run regional labor demand.[11] Given that, in equilibrium, the demand for labor in a province is equal to employment in that province (and thus domestic labor force plus the stock of temporary workers minus the number of unemployed individuals), the four equations are:

$$w_{j,t} = -a(S_{j,t} + TF_{j,t} - u_{j,t}) + z_{j,t} \qquad (1)$$

$$w_{j,t} = -bu_{j,t} + X^{W}_{j,t} \qquad (2)$$

$$S_{j,t+1} - S_{j,t} = cw_{j,t} - gu_{j,t} + X^{S}_{j,t} \qquad (3)$$

$$z_{j,t+1} - z_{j,t} = -dw_{j,t} + X^{D}_{j,t} \qquad (4)$$

In these equations, the variables are measured relatively to their national values. Equation (1) represents the short-run demand for labor where wage at time t in province j depends negatively (i.e., $a>0$) on employment in that province, $(S_{j,t}+TF_{j,t}-u_{j,t})$, and on the position of the demand, $z_{j,t}$, for given employment level.[12] Equation (2) captures the relationship between unemployment and wage. It is assumed that higher unemployment is associated with lower wage ($b>0$). Also the more sensitive wage becomes with respect to change in unemployment (i.e., the higher b is), the more flexible the labor market of province j is. The variable $X^{W}_{j,t}$ includes all factors other than unemployment that may affect the regional wage (such as unemployment benefits). In (3), the increase in the relative labor supply, whether through relative natural growth of the population, permanent immigration, relative increase in participation or relative internal migration captured by

[11] Here we ignore stochastic shocks that may affect the demand and supply of labour.
[12] If S measures the logarithm of the labor force and u is the unemployment rate then the logarithm of employment is approximately given by S-u (see Blanchard and Katz, 1992).

$X^S_{j,t}$, also comes from a high relative wage or a low relative unemployment rate. It is fair to say that the natural growth of population, except through permanent immigration, is not likely to play a large role compared to internal migrations or change in participation rates as the labor supply is relative to the national average. Thus in $X^S_{j,t}$, the main variables are the ones affecting internal migration, whether it is the mild weather and the West-coast lifestyle of BC, the metropolitan lifestyle of Toronto, the French culture of Quebec, or changes in permanent immigration laws. The last equation (4) determines the position of the demand of labor and thus the attractiveness of a particular province as far as the firms are concerned. A lower wage makes it more attractive while $X^D_{j,t}$ contains the non-wage factors making a province attractive, such as relative technological progress that affect the goods produced in province *j* and thus the relative demand for labor, as well as amenities in province *j* other than wage, such as infrastructure, local taxes, regulatory and labor relations environment or even natural resources—in short, everything that affects the location decision of firms in province *j* relative to other provinces.

The long-term solution of the above model ($u_{j,t}=u_{j,t+1}$) for the unemployment rate is then

$$u_{j,t} = \frac{1}{ag + b(ac+d)}\left(aX^S_{j,t} + (d+ac)X^W_{j,t} - X^D_{j,t} + a(TF_{j,t+1} - TF_{j,t})\right) \qquad (5)$$

Since the change in the number of temporary workers is not exogenous, we add an equation determining this change. Following the conditions for the LMO process, we assume that such a change does not depend on wage but negatively on the level of unemployment and on other factors such as the additional cost of hiring TFW:

$$TF_{j,t+1} - TF_{j,t} = -hu_{j,t} + X^T_{j,t} \qquad (6)$$

where $h>0$ and $X^T_{j,t}$ represents the variables (other than unemployment) affecting the flow of temporary workers such as the hiring cost and TFW policy changes. Hence, the regions can have

different long-run unemployment rates because of different specific factors. A positive shift in the labor supply (through $X^{S}_{j,t}$), a decrease in the labor demand (through $X^{D}_{j,t}$), a positive shift in the regional determination of the wage (through $X^{W}_{j,t}$), or a positive shift in the supply of temporary workers contribute to increasing the unemployment rate of region *j*. Equations (5) and (6) are useful because they show that the flow of temporary workers has a direct impact on relative unemployment and could be estimated jointly.

Of course, the long-term reduced form for the unemployment rate (combining (5) and (6)) is

$$u_{j,t} = \frac{1}{a(g+h)+b(ac+d)}[aX^{S}_{j,t} + (ac+d)X^{W}_{j,t} - X^{D}_{j,t} + aX^{T}_{j,t}] \qquad (7)$$

Now the long-term unemployment rate depends only on exogenous variables, and thus on $X^{T}_{j,t}$ which includes the hiring cost of temporary workers (the lower this cost, the higher $X^{T}_{j,t}$).

5. Estimations and results

The estimation is for a semi-log linear form of the unemployment reduced form (7), such that:

$$u_{j,t} = c_j + \sum_S \alpha_S X^{S}_{j,t} + \sum_D \beta_D X^{D}_{j,t} + \sum_W \delta_W X^{W}_{j,t} + \sum_T \gamma_T X^{T}_{j,t} + \varepsilon_{j,t} \qquad (8)$$

where $u_{j,t}$ is the deviation of province *j* unemployment rate from the national rate and *Xs* are in deviations from national values unless otherwise indicated.

Supply shocks, $X^{S}_{j,t}$, are represented by provincial birth rate deviations ($Birthr_{j,t}$)[13] which influence women labor force participation. Parental leave legislation ($Lparleav_t$) is also use as an alternative measure. Provincial urbanization rate deviations ($Urban_{j,t}$) capture internal migration (Coulombe, 2006) as well as permanent international migration. In effect, social and ethnic networks have been shown to affect immigrants' location choice (McDonald, 2003; Gross and Schmitt, 2003). In Canada, immigrants concentrate in the three main urban centers (Montreal, Toronto and Vancouver)[14] and they tend to leave regions with few immigrants (Grenier, 2008). A decrease in the birth rate and, an increase in urbanization have an adverse effect on unemployment. A third supply shock variable is the share of non-economic immigrants in the annual inflow of permanent immigrants ($NonEconSh_t$). Recent changes in the permanent immigration legislation affected the skill composition of the international migrant labor force. In 1995, the Government of Canada wanting to refocus the policy on skilled immigrants introduced a target of 50% for permanent entries under the economic class. The subsequent decrease in the proportion of non-economic permanent immigrants may have increased the need for low-skill TFW and thus, affect unemployment dispersion adversely.

Demand shocks, $X^{D}_{j,t}$, are represented by provincial specific demand shocks ($Busc_{j,t}$) and the log of real oil price ($Loilp_t$). Because of Canada's diversified industrial structure, persistent differences can be caused by variations in the energy price. The effect is made province-specific using provincial dummies (D_j). It is expected that a rise in oil price increases unemployment rates in most provinces except Alberta, British Columbia and possibly Newfoundland. Wage shocks, $X^{W}_{j,t}$, are captured by Employment Insurance (EI) parameters. Three alternative EI

[13] All the variables are described in details in Apprendix II with basic descriptive statistics and simple correlations in Tables A.II.2. and A.II.3. respectively.

[14] According to the 2006-census, 62.9% of Canada's foreign born population lived in Toronto, Montréal and Vancouver (Chui et al., 2009).

measures are tested: the provincial length of qualifying and collection periods in deviation from national average ($EIqual_{j,t}$, $EIcoll_{j,t}$) and a distance weighted dispersion of collection periods ($EIben_{j,t}$) which allows to capture cross-province deviations. An increase in the qualifying period is expected to decrease dispersion in unemployment while an increase in collection period has the opposite effect. The weighted measure is also tested because a longer distance may decrease incentive to move despite de fact that the collection period may be lower at home. Other province-specific institutions likely to affect wage determination that are also taken into account are unionization rates ($Union_{j,t}$) and minimum wages ($Lminw_{j,t}$). Finally, the temporary foreign worker policy parameter, $X^{T}_{j,t}$, is measured by TFW–specific non-wage hiring costs not applicable to resident workers. The bulk of these costs are travel costs that employers are obligated to pay for unskilled TFW since 2002; they are measured with the time-varying log of the real price to fly one mile on international travel from the US ($Lftrav_t$). Unfortunately there is no similar measure from Canada. The cost of travel is relatively constant from 1991 to 2000 with an average value of 16.38 cents. Between 2000 and 2007 it fell substantially from 16.08 cents to 11.73 cents (-27.1%) making the hire of TFW easier. The measure is also interacted with a dummy to capture the start of the pilot project for low-skill TFW in 2002 (D_t is 1 from 2002 to 2007, and 0 otherwise). It is expected that an increases in the relative cost of hiring temporary foreign workers decreases regional unemployment as employers find it more advantageous to look beyond the local market. Other additional hiring costs for TFW that are province-specific, such as health premiums during the waiting period, are accounted for by the fixed effect.[15]

To summarize, the basic empirical specification is:

[15] The three-month waiting period is covered by employers' paying for private coverage only in British Columbia (www.health.gov.bc.ca), Ontario (www.health.gov.on.ca), Quebec (www.ramq.gouv.qc.ca), and New Brunswick (www.health.gnb.ca).

$$u_{j,t} = c_j + a_1 Busc_{j,t} + a_2 Birthr_{j,t} + a_3 Urban_{j,t} + a_4 NonEconSh_t + a_5 EIqual_{j,t}$$
$$+ a_6 Lftrav_t + a_7 (Lftrav_t * D_t) + \sum_{p=8}^{17} a_p (Loilp_t * D_j) + \varepsilon_{j,t} \qquad (9)$$

The model is estimated on a panel dataset for unemployment divergences from national for ten provinces over seventeen years (t=1991 to 2007) using cross-sectional fixed effects (FE). The time dimension is dictated by availability of the data for the various experiments. During that period, the four Atlantic Provinces (NL, NS, NB and PEI) and Quebec exhibit consistent positive differentials with Canadian unemployment rate and the maximum (9.867 percentage points) was reached in 2000 in Newfoundland. The three Western provinces (MB, SK and AB) exhibit systematic negative differentials with very similar averages; i.e., -2.33 percentage points for Alberta and Saskatchewan and -2.10 percentage points for Manitoba. Ontario's differential was negative until 2006 while British Columbia's differential turned positive between 1998 and 2004. The smallest differentials in absolute values are observed in Ontario and British Columbia as all but one are below 1.3 percentage point. The overall average provincial differential is positive at 1.259 percentage point. Next, the relevance of the statistical methodology is investigated, and then the robustness of results is tested with alternative variables and measures.

In Table 5, columns 1 and 2, the validity of province-specific fixed effects is confirmed by the strongly significant Hausman test. This suggests that province-specific amenities that are time invariant such as West-coast lifestyle or cultural differences do matter.[16] In column 2, the significant coefficients have the expected sign. Generally the results show that a rise in relative provincial aggregate demand decreases unemployment and increasing the EI qualifying period decreases unemployment dispersion. Also, since the introduction of the pilot project for low-skill TFW in 2002, higher costs of hiring foreign workers decreased divergences in unemployment

[16] It is important to note that variables with little time variations such as $Urban_{j,t}$ lose significance in the FE estimation.

rates. Before discussing the results further, we evaluate the validity of the results by correcting for some of the possible shortcomings of FE estimations.

5.1 Statistical Robustness

Cross-panel correlation may exist since the observations are for regions within a given country possibly subjected to common shocks. White cross-section standard errors (column 3) weaken some levels of significance like the one for urbanization rate for example but overall the results remain unchanged.

One of the conditions needed in order for the results to be consistent and in line with the equilibrium reduced-form is *strict* exogeneity of explanatory variables; that is, future Xs and the unobserved heterogeneity term are not correlated with the error term in any period (i.e., $E(\varepsilon_{j,t}|x_{j,1},x_{j,2}, \ldots x_{j,n},c_j)=0$, t=1, ….n; Wooldridge, 2002, 2007). The most likely candidate for endogeneity is the birth rate variable. Many studies have treated fertility as endogenous to women labor force participation and instruments used in macro studies are fertility-related policy variables (see for examples, Klerman, 1999; Bailey, 2006). It is also possible that unemployment influences future birth rates. Following Wooldridge (2007), we introduce $Birthr_{j,t+1}$ as additional explanatory variable to test for strict exogeneity (Table 5, column 4), and it is not significant indicating strict exogeneity is not violated. Another source of correlation with c_j is time-varying province-specific effects which are not taken into account (i.e., the fixed effect captures only mean effects). So, we introduce a time trend for each cross-section which is, however, likely to reduce efficiency. In column 5, the time trend is marginally significant and overall, the results remain quite stable. The coefficient of the share of permanent immigrants not coming through the economic class however, collapses in size and significance, possibly a result of co-linearity with the time trend (simple

correlation -0.736) as the policy was to decrease that share over time. In fact it decreased relatively steadily from 62.8% in 1991 to 37.9% in 2001 and then evolved between 40% and 45% until 2007. Considering the time dimension is relatively long (ten years), another concern is serial correlation within panels, especially since persistence in deviations has been identified. An AR(2) specification for the estimated error from the specification in column 3 shows that within panel serial correlation is unlikely.[17] Another issue to consider is non-stationarity which may lead to spurious correlation. Unit-root tests on the dependent variable do clearly reject the presence of a unit-root; however, those tests imply conditions that are not consistent with our model in addition to the time dimension being too short to produce reliable results.[18] Furthermore, the results obtained for the estimation in first difference in Table 5, column 7, are very similar to those of the basic model in terms of significance of the main variables and travel cost in particular.

Following all these results, we conclude that the bias in the FE estimation is not too large and efficiency is adequately corrected for in the basic model.

5.2 Results

The next step is to test for robustness to changes in variables and measurements. In Table 6, column 1 and 2, the collection period and the distance weighted collection period are used instead of the qualification period for the EI program. Both are significant with the expected sign. There is little difference between the three alternatives but the specification with the non-weighted collection period (Table 5, column 3) performs slightly better in terms of overall explanatory

[17] The results are: $e_{j,t}=-0.005+0.098\ e_{j,t-1}+0.069e_{j,t-2}$ with p-value=0.23 and 0.37 respectively for the coefficients on the lagged estimated errors.

[18] The value for the Levin, Lin and Chu test is -1.182 with p-value equal to 0.119, and that of the Im, Pesaran and Shin test is -0.638 with p-value equal to 0.26. However, the former imposes the constraint of identical unit-root across panels with the economic implication of identical convergence rate across provinces (Maddala, 1990, cited by Baltagi et al., 2007). The latter requires cross-sectional independence which is inconsistent with our economic model.

power. In columns 3, a non-linear impact of EI qualifying parameters is weak but significant, suggesting that an increase in the number of weeks necessary to qualify has larger impact where it is already harder to qualify. The design of employment insurance based on regional unemployment rate may appear to lead to endogeneity of the EI parameters. However, unemployment data is available with a lag and according to the EI Act, the policy is based on a moving average of past rates. Both features are likely to lower the probability of endogeneity which is reflected by the results of exogeneity tests which show that the hypothesis cannot be rejected for $EIqual_{j,t}$ but is strongly rejected for $EIcoll_{j,t}$.[19] In Table 5, column 6, we estimate the basic model by Two-Stage Least Squares and the results are quite stable especially for our variable of interest, the cost of travel, despite the loss of one period. This is in part attributable to the fact that $EIqual_{j,t}$ is constant over numbers of years in most provinces. So, considering that the evidence of endogeneity is not compelling, we continue experimenting with our basic specification, maintaining the largest possible sample.

Next we test for two more provincial institutions relevant to labor market flexibility, i.e., unionization (column 4) and minimum wage (column 5). Neither is significant. In column 6, the housing price is substituted for urbanization rate as the exogenous factor that affects internal migration. Like relative urbanization, it is not significant. Finally, in column 7, the number of weeks of parental leave is used as a substitute for birth rates to represent exogenous shocks on labor force participation. The number of weeks is set by federal legislation and only one change occurred during the period under consideration: an increase from 30 to 50 weeks in 2001. The timing matches almost that of the change in the TFW program and not surprisingly the coefficient

[19] The t-value for the one-period ahead variable is 2.1 for the qualifying variable and 0.9 for the collection period variable with p-values 0.037 and 0.393 respectively. Results are available upon request.

on the international travel cost shift decreases noticeably but parental leave has no significant impact.

Three alternative measures of the hiring cost of TFW are also tested; the results with the original measure are reproduced in column (7) for easier comparison. First, in 2007, the implicit cost of hiring a TFW was at least cut in half through the doubling of the contract length and the introduction of the expedited LMO with shorter advertising period. When this change is taken into account (column 8, $D(List)_t$) the overall results are hardly affected. Second, since employers are liable for travel costs only for low-skill workers, the cost is weighted by the provincial shares of TFW in categories C and D. In 2001, before the extension of the TFW program, the share of low-skill TFW entries was 27.2% for Canada as a whole, only slightly lower than the average over the previous twenty years (i.e., average 1980–2000, 28%). Between 2002 and 2007, the average share was 36.3% reaching a maximum of 43.5% in 2007. The weighting process ($LftravCD_t$) makes the travel cost variable province-specific as well as time varying. In column 9, the impact is larger but weaker in significance. Nevertheless, all these measures implicitly hold constant the hiring cost premium for out-of-province workers. Hence, the third measure is the cost of a ten thousand-mile international flight relative to the weighted cost of flying from any province within Canada ($Lftrav10_t$-$Ldtrav_{i,t}$). A 10,000 mile distance from foreign country is chosen as a proxy for average travel by foreign TFW. The majority of all TFW come from Europe and North and Central America (68% in 1998, 51% in 2007; CIC, 2008b); however, countries of origin vary across provinces. So, for example, in BC more than 1/3 of the TFW, between 2004 and 2006, came from Australia and Japan and, about 10% came from the UK (BCMAELND, 2010).[20] The cost ratio

[20] It must be noted that these percentages are for all TFW and the countries of origin of high-skill TFW is probably different from those of low-skill TFW. Since 10,000 miles is about the length of a return trip from Western Europe or Japan to Vancouver, we also ran the regression assuming a distance of 5,000 miles which may be more accurate for

falls steadily from the beginning of the sample until 2000 and after rising somewhat for two years, it falls again until 2007. So, generally speaking it is not only the absolute cost of hiring TFW which has fallen at the beginning of the 21st century but also the cost relative to Canadian workers. In columns 10, there is a negative impact before 2002 which has been aggravated since then. It is a bit surprising that the travel cost would be strongly significant before 2002 as it applied only to a small portion of TFW. This may be due to some multicollinearity as the relative foreign to domestic travel cost is correlated with the share of non-economic permanent immigrants (-0.796) the coefficient of which loses significance and magnitude. To summarize, the results from the alternative costs of hiring a TFW are generally consistent and the expansion of the program to low-skill workers has had an adverse impact on the Canadian labor market.

Finally, we also estimate by instrumental variable fixed effect (IVFE) a semi-reduced form model (i.e., equations (5) and (6) in Section 4) with TFW entries as explanatory variable to validate that the link between travel cost and unemployment dispersion is attributable to TFW. Two measures are considered: Total entries per province relative to national ($Ltfw_{j,t}$) and total non-seasonal entries per province relative to national ($Lnatfw_{j,t}$). The results in Table 7 show that for both variables, the effect is positive and significant at 10% and 5% respectively and thus, more TFW entries increase regional unemployment dispersion.

General regional aggregate demand variations have the expected impact on the long-term unemployment divergences. Energy shocks increase unemployment in central Canada and the Maritimes and decrease it Western Canada and Newfoundland. As found in other studies, the EI parameters are strong contributors to maintaining unemployment dispersion. Each additional week of qualification period on average decreases provincial unemployment deviation by slightly less

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Eastern Canada. As it can be seen in Table 6, columns 10 and 11 there is little difference in the results and thus we use 10,000 miles for further comments.

than 0.7 percentage points. Shocks on the labor supply through female participation and urbanization driving internal and international migration do not contribute significantly to maintaining divergences but changes in skill composition of permanent immigrants does. Raising the share of skilled immigrants probably worsened the shortage of low-skill workers and increased the impact of TFW.

Now that we have identified that the introduction of the pilot program for temporary foreign low-skill workers in 2002 contributed to maintain long-term divergences in regional unemployment rates, we can evaluate the degree of ineffectiveness of the policy by evaluating how an increase in the hiring cost of TFW affects regional unemployment disparities. Specifically, using the regression results with the cost of a 10,000 mile flight,[21] it can be found that if the program had not been modified in 2002, the unemployment divergences between 2002 and 2007 would have been on average 0.21 percentage point lower; that is the average unemployment divergence would be around 1.05% instead of 1.26%. The Canadian temporary foreign worker program is rather typical among OECD countries in terms of market test for low-skill workers. However, in most other countries the program is limited to specific sectors (mostly agriculture) and/or there is an annual quota (OECD, 2008, Tables II.A.1.1. and II.A.1.2.). The expansion to all low-skill occupations without limit in Canada has had an adverse effect on the Canadian labor market which suggests that such programs need to be carefully targeted.

Some countries have chosen a more market-oriented approach using complex mechanisms to price the hiring of unskilled TFW more accurately. Singapore, for example, imposes a monthly levy on employers hiring TFW which is industry-specific, skill-specific and rises with the

[21] Using the cost of a 10,000-mile flight instead of the cost per mile flown, the results for the variables of interest are: $-.0313*Lftrav10_t - .0292* Lftrav10_t*D_t$ with t-values 0.1 and 3.2 respectively.

employers' dependency level on temporary foreign workers.[22] The minimum fee for unskilled workers in manufacturing and services is S$240. In 2008, laborers earned S$975 monthly; hence the fee raised a worker's monthly wage by about 25% (Singapore Government, 2009a, 2009b). In comparison, the fee raised by the Canadian government $150 for a two-year contract represents about 0.5% of the average Canadian hourly minimum wage[23] and the combination of the fee and the flight cost, 5%.

So, considering the robustness of the results throughout the experiments, the effect of abandoning the careful targeting of temporary foreign worker program in Canada has not been negligible and one may wonder why a government would pursue such policy. It is clear that the long-term impact on the labor market perspectives of resident workers is not the only effect of such policy change. In 2002, regional shocks had probably the potential of creating bottlenecks in some industries like natural resources or construction and jobs might have been preserved through the hiring of TFW (i.e. one condition for obtaining an LMO). However, concerns about various risks attached to TFW programs with no opportunity to become permanent resident like in Canada (i.e., employment abuse, irregular stay at the end of the contract, etc.; see for example Ruhs, 2002) are well documented. Hence, a higher premium to hire TFW may incite employers to offer better financial conditions to workers residing in other Canadian provinces and save some well known long-term costs linked to the temporary status of foreign workers.

6. Conclusion

Temporary foreign worker programs contribute to smooth economic growth. They are designed to alleviate short-term specific labor shortages by allowing a rapid and flexible response.

[22] The levy is only one component of a very complex immigration policy rules (see for example, Yeoh, 2010).
[23] The computation is made for 50 weeks of 40 hours work over two years. Low-skill TFW are likely to work longer hours than that and the estimates represent upper bounds.

They are thus generally viewed as a policy which alleviates bottlenecks and thus avoids holding back short-term economic growth. In particular, because of skill complementarities that often exist among workers in a given sector, these programs often help domestic workers keep their jobs. However they are usually not expected to have long-term adverse effects. Yet, this paper shows that the 2002 change in the Canadian temporary foreign labor program has likely contributed to affect adversely regional unemployment dispersions since both the reduced- and the semi-reduced form estimations confirm there is a causality link between the two. Canada, despite fifteen years of steady growth, still exhibits large persistent differences in provincial unemployment, and these have been reinforced recently by regional demand shocks. Some province-specific institutions, such as the employment insurance scheme, have contributed significantly to these differences. However, this paper shows that the inter-provincial adjustment mechanism has also been slowed down by the expansion of the temporary foreign worker program to all low-skill occupations in 2002. While this expansion was accompanied by a labor market test, the pricing of low-skill TFW has been set too low to encourage employers to seek workers from high-unemployment provinces before seeking authorization to hire temporary foreign workers. In addition to maintaining unemployment at a higher level in some provinces, this may lead to future costs linked to the well known risks attached to TFW programs. However, this paper is the first attempt to evaluate the impact of relaxing the targeting of a temporary foreign worker program, and it is clear that further studies are needed especially to better evaluate the magnitude of the impact and the longer term dynamics for TFW.

References

ATA, Air Transport Association. 2008. Annual passenger yields: US Airlines. http://www.airlines.org/economics/finance/PaPricesYield.htm.

Bailey, M. J. 2006. More power to the pill: The impact of contraceptive freedom on women's lifecycle labor supply. *Quarterly Journal of Economics.* 121 (1): 289–320.

Baltagi, B. H., G. Bresson and A. Pirotte, 2007. "Panel Unit Root Tests and Spatial Dependence." *Journal of Applied Econometrics.* 22. 339-60.

BCMAELND, BC Ministry of Advanced Education and Labour Market Development, 2010. *Temporary Foreign Workers 2004 2008*. Fact Sheet. January.

Blanchard, O. J., and L. F. Katz. 1992. Regional evolutions. *Brookings Papers on Economic Activity* 1: 1–61.

Bollman, R. D. and H. A. Clemenson. 2008. Structure and change in Canada's rural demography: An update to 2006 with provincial detail. Agriculture and Rural Working Paper Series Research Paper. Catalogue No. 21-601-M – No. 90. Ottawa: Statistics Canada. December.

Chui, T., K. Tran and H. Maheux, 2009. "2006-Census: Immigration in Canada: A Portrait of the Foreign-born Population, 2006 Census: Findings." Social and Aboriginal Statistics Division. 2006 Analysis series. 97-557-XIE2006001. Statistics Canada. http://www.census2006.com/census-recensement/2006/as-sa/97-557/index-eng.cfm

Citizenship and Immigration Canada (CIC). 2009, 2008b. *Facts and Figures. Immigration Overview. Permanent and Temporary Residents.* Ottawa.

_____. 2008a. *Foreign Worker Manual.* June 11. Ottawa.

Coe, P.J. and, J.C.H. Emery, 2004. "The disintegrating Canadian labour market? The extent of the market then and now." *Canadian Journal of Economics*. 37, 4. 879-97.

Coulombe, S. 2006. Internal migration asymmetric shocks, and interprovincial economic adjustments in Canada. *International Regional Science Review* 29 (2): 199–223.

Coulombe, S., and J.-F. Tremblay. 2007. Skills, education, and Canadian provincial disparity. *Journal of Regional Science* 47 (5): 965–91.

Cousineau, J.-M., and F. Vaillancourt. 2001. Regional disparities, mobility and labour markets in Canada. In *Adapting Public Policy to a Labour Market in Transition,* ed. C. W. Riddell and F. St-Hilaire, 143–74. Montreal, QC: Institute for Research in Public Policy.

Day, K. M., and S. L. Winer. 2001. Interregional migration and public policy in Canada: An empirical analysis. Applied Research Branch. Strategic Policy. Working Paper W-01-3E. Ottawa: Human Resources Development Canada. July.

Decressin, J., and A. Fatás. 1995. Regional labor market dynamics in Europe. *European Economic Review* 39: 1627–55.

DeVoretz, D., 2006. "A History of Canadian Recruitment of Highly Skilled Immigrants: Circa 1980-2001." IZA Discussion Paper #2197. July.

Dickie, M., and S. Gerking. 1998. Interregional wage disparities, relocation costs, and labor mobility in Canada. *Journal of Regional Science* 38 (1): 61–87.

Drewes, T. 1987. Regional wage spillover in Canada. *Review of Economics and Statistics* 69 (2): 224–31.

Elhorst, Paul. 2003. The mystery of regional unemployment differentials: Theoretical and empirical explanations. *Journal of Economic Surveys* 17 (5): 709–40.

Grenier, G. 2008. The internal migration of the immigrant and native-born populations in Canada between 1976 and 1996. *The Journal of Socio-Economics* 37: 736–56.

Gross, D. M. 2006. Immigration policy and foreign population in Switzerland. Policy Research Working Papers. No 3437. The World Bank. Washington, DC. February.

Gross, D. M., and N. Schmitt. 2003. The role of cultural clustering in attracting new migrants." *Journal of Regional Science* 43 (2): 295–318.

Helliwel, J. F. 1996. Convergence and migration among provinces. Special Issue. *Canadian Journal of Economics* XXIX: S324–S330.

HRSDC, Human Resources and Social Development Canada. 2009. Temporary foreign worker program. http://www.hrsdc.gc.ca/eng/workplaceskills/foreign_workers/index.shtml.

_____, 2008. Database on Minimum wages. http://srv116.services.gc.ca/dimt-wid/sm-mw/menu.aspx?lang=eng

_____, 2006. National Occupational Classification Matrix 2006. Ottawa.

Jimeno, J. F., and S. Bentolila. 1998. Regional Unemployment Persistence. (Spain 1976-1994). *Labour Economics* 5: 25–52.

Johnson, J. A., and R. D. Kneebone. 1991. Deriving natural rates of unemployment for sub-national regions: The case of Canadian provinces. *Applied Economics* 23: 1305–14.

Kalaw, T. and, D.M. Gross, 2010. "Employment Standards Violations and Live-in-Caregivers' characteristics in British Columbia." Metropolis BC Working Paper, No 10-08. Centre of Excellence for Research on Immigration and Diversity, Simon Fraser University.

Klerman, J. A. 1999. U.S. Abortion Policy and Fertility. *The American Economic Review* 89 (2): 261–64.

Kuemmerly and Frei (K&F). (Undated). Canada map 1:5,300,000. Bern.

Lazar, F. 1977. Regional unemployment rate disparities in Canada: Some possible explanations. *Canadian Journal of Economics* X (1): 112–29.

MacKinnon, J. G. 1996. Numerical distribution functions for unit root and cointegration tests. *Journal of Applied Econometrics* 11: 601–18.

McDonald, J. T. 2003. The location choice of new immigrants to Canada: The role of ethnic networks. In *Canadian Immigration Policy for the 21st Century*, ed. C. N. Beach, A. G. Green, and J. D. Reitz, 163–96. Kingston, ON: John Deutsch Institute for Study of Economic Policy, Queen's University.

OECD, 2008, 2007, 2006a. *International Migration Outlook*. Sopemi. Paris.

———. 2006b. *Employment Outlook*. Paris.

———. 2004. *Economic Survey of Canada*. Paris.

Polese, M. 1981. Regional disparity, migration and economic adjustment: A reappraisal. *Canadian Public Policy* 7 (4): 519–25.

Ruhs, M. 2002. Temporary foreign worker programmes: Policies, adverse consequences and the need to make them work. Working Paper 56. Center for Comparative Immigration Studies. University of California, San Diego. June.

Service Canada. 2008. *Employment Insurance Act*. Ottawa.

Shaw, R.P. 1986. Fiscal versus traditional market variables in Canadian migration. *Journal of Political Economy* 94 (3): 648–66.

Singapore Government. 2009a. Work Permit (Foreign Workers). http://www.mom.gov.sg/publish/momportal/en/communities/work_pass/work_permit.html. Accessed in January.

Singapore Government. 2009b. "Report on wages 2008." *Singapore Yearbook of Manpower Statistics.* Available on line.

Statistics Canada. 2008. CANSIM Database. Ottawa.

UNCTAD. 2008. *Handbook of Statistics.* Electronic Database. Geneva.

Wooldridge, J. M. 2007. What's new in econometrics? Linear panel data models. With G. Imbens. Slides. NBER Summer Institute. Cambridge, MA.

———. 2002. *Econometrics Analysis of Cross Section and Panel Data.* Cambridge, MA: MIT Press.

Yeoh, B.S.A., 2010. "Singapore: Hungry for Foreign Workers at all Skill Levels." Country Profile. Migration Policy Institute. Washington, DC.

Appendix I: Regional vs. National shocks

Table A.I.1.: Common National and Provincial Employment Growth.

$$(lnN_{j,t} - lnN_{j,t-4}) = c_j + \beta_j (lnN_t - lnN_{t-4}) + \mu_{j,t}$$

Provinces	β_i	**Adj. R^2**
British Columbia	.338*	0.066
Alberta	.673*	0.581
Saskatchewan	.471*	0.167
Manitoba	.650*	0.549
Ontario	1.38*	0.920
Quebec	.992	0.768
New Brunswick	.830*	0.298
Nova Scotia	1.08	0.571
PEI	.633*	0.143
Newfoundland	1.17	0.299

$N_{j,t}$ is quarterly employment in province j, at time t and N_t is national employment in the same quarter. The sample is 1987.1 to 2007.4. Note that the weighted sum of the coefficients was not constrained to 1.
*significantly different from one at 5%, , one-sided test. Average adj.R^2=0.436.

Appendix II: Variable Definitions

$Birthr_{j,t}$ Provincial birth rates number of birth between July 1 and June 30 per hundred women aged fifteen to forty-nine years old in deviation from Canadian average (Statistics Canada, 2008, Tables 510013, 510001).

$Busc_{j,t}$ De-trended annual provincial GDP at constant 2002-prices, expenditure-based, provincial economic accounts minus de-trended annual Canadian GDP. Calculated as the estimated errors from the following regression between 1981 and 2007 for each province and Canada as a whole:

$$\ln GDP_{j,t} = c + \beta_1 Time + \beta_2 Time^2 + \varepsilon_{j,t}.$$

The results are presented in Table A.II.1. below. They show that the quadratic term is significant for some provinces and should be part of the specification (Statistics Canada, 2008, Table 3840002).

D_j Province specific dummy such that NL=Newfoundland; NS=Nova Scotia; PEI=Prince Edward Island; NB=New Brunswick; QC=Quebec; ON=Ontario; MN=Manitoba; SK=Saskatchewan; AB=Alberta; BC=British Columbia.

D_t Dummy with value 0 until 2002 and 1 afterwards capturing the introduction of the low-skill pilot project with employers' liable for travel costs.

$D(List)_t$ Dummy with value 0 until 2002, 1 from 2003 to 2006 and 0.5 for 2006 capturing both the introduction of the low-skill pilot project and the doubling of the length of contract in 2007.

$EIben_{j,t}$ Sum of the weighted minimum number of weeks necessary to qualify for the benefits from any capital city. Weights are the inverse of the distance between the provinces' capital cities ($Dist_{i,j}$, K&F). Calculated for each province j, and $i \neq j$, as:

$$EIBen_{j,t} = \sum_{i=1}^{9} \frac{1}{Dist_{i,j}} \left(EIcoll_{j,t} - EIcoll_{i,t} \right).$$

$EIcoll_{j,t}$ Maximum number of weeks of collection of benefits for an individual with minimum qualifying requirements in each province in deviation from national average. From 1991 to 1995, computed by Day and Winer (2001), Appendix D, Section 3 and Table S3. From 1996 to 2007, own calculation based on the same definitions and OECD (2004), Annex 3.2.

$EIqual_{j,t}$ Minimum number of weeks of insurable employment necessary to qualify for benefits in each province in deviation from national average. From 1991 to 1995, computed by Day and Winer (2001), Appendix D, Section 1 and Table S1. From 1996 to 2007, own calculation based on the same definitions and Service Canada (2008).

$Ldtrav_{i,t}$ Log of index of real price of domestic air travel. The index is the sum of the weighted cost of travelling from any capital city. The weights are the inverse of the provincial unemployment rate for occupation C ($Urate(C)_{i,t}$). Calculated for each province *j*, and $i \neq j$, as:

$$dtrav_{j,t} = \sum_{i=1}^{9} \frac{1}{Urate(C)_{i,t}} \left(Dist_{i,j} * costdm_t \right),$$

with $Dist_{i,j}$, the distance between provincial capitals and $costdm_t$, the price in dollars a passenger pays to fly one mile on domestic travel not including taxes (ATA, 2008) converted to Canadian dollars with monthly average of noon spot rate against the US$ and deflated by implicit price index from GDP for Canada, 2002=100 (Statistics Canada, 2008, Tables 3840036, 1760064)).

$Lftrav_t$ Log of real price of foreign air travel. Price in cents that a passenger pays to fly one mile of international travel not including taxes (ATA 2008) converted to Canadian dollars and deflated by implicit price index from GDP for Canada (Statistics Canada, 2008, Tables 1760064, 3840036). $Lftrav(5)10_t$ is the log of the cost of a (5,000) 10,000-mile flight.

$LftravCD_t$ Log of real price of foreign air travel weighted by province-specific shares of C and D workers.

$Lhousep_{j,t}$ Log of the ratio of real provincial house price to national average. Average of monthly new housing price index (Statistics Canada 2008, Table 2820054) deflated by annual implicit price index (2002=100), GDP, provincial accounts (Statistics Canada, 2008, Table 3840036). Observations from 1986 to 1995 are missing for PEI. The annual rates of change from Nova-Scotia are used for the missing values to recreate the housing index. Nova Scotia is chosen because the correlation between PEI and NS new housing price index between 1995 and 2007 is 0.976.

$Lminw_{j,t}$ Log of the ratio of provincial hourly minimum wages for adult workers to national average. (HRSDC, 2008).

$Lnatfw_{j,t}$ Log of the ratio of annual entries (initial and re-entries) of temporary foreign workers in province *j* without seasonal agricultural workers relative to total entries in Canada (Series provided by Citizenship and Immigration Canada).

$Loilp_t$ Real price of oil in Canadian dollars. Crude petroleum price in US$, average of Dubai, Brent and Texas, equally weighted (UNCTAD, 2008), converted to Canadian dollars with monthly average of noon spot rate against the US$ (Statistics Canada 2008, Table 1760064) and deflated by implicit price index from GDP for Canada, 2002=100 (Statistics Canada, 2008, Table 3840036).

$Ltfw_{j,t}$ Log of the ratio of annual entries (initial and re-entries) of temporary foreign workers in province *j* relative to entries in Canada (Numbers provided by Citizenship and Immigration Canada).

N_t, $N_{j,t}$ Total employment level for Canada and by province *j*. (Statistics Canada 2008, Table 2820054).

$NonEconSh_j$ Share of permanent immigrants not coming through the economic class (CIC, 2009).

Time Province-specific time trend.

$(u_{j,t}- u_t)$ Annual provincial unemployment rates for age fifteen years and over minus national unemployment rate (Statistics Canada 2008, Table 2820004).

$Union_{j,t}$ Provincial union rates in deviation from Canadian average (Statistics Canada 2008, Table 2820078, 2790025).

$Urban_{j,t}$ Provincial urbanisation rate in deviation from Canadian rate. Urbanisation rate is total urban population over total population. Urban population is computed as total farm and non-farm population in urban areas (i.e., more than 1000 population). Data is from census and inter-census years are extrapolated linearly (Bollman and Clemenson 2008, Appendix J).

Table A.II.1. : Estimation of GDP trend: 1981-2007.

	β_1	β_2	Adj R^2
Newfoundland	.014 (3.0)	.0004 (2.8)	.957
PEI	.027 (13.0)	-.00004 (0.6)	.990
Nova Scotia	.021 (5.7)	.000039 (0.3)	.960
New Brunswick	.026 (8.8)	.00010 (0.8)	.977
Quebec	.019 (6.4)	.00016 (1.5)	.976
Ontario	.028 (6.2)	.000075 (0.5)	.967
Manitoba	.018 (5.6)	.00012 (1.1)	.967
Saskatchewan	.028 (9.7)	.00016 (1.6)	.978
Alberta	.026 (10.2)	.00042 (4.8)	.993
British Columbia	.029 (11.0)	.000023 (0.3)	.988
Canada	.024 (8.2)	.0001 (1.4)	.984

Absolute t-values in parentheses.

Table A.II.2.: Descriptive Statistics

Variables	Mean	Max.	Min.	SD
$Birthr_{i,t}$	-0.02	0.91	-1.12	0.56
$Parleav_t$	38.24	50	30	9.87
$Busc_{i,t}$	0.002	0.075	-0.070	0.022
$EIben_{i,t}$	-1.96D-11	0.093	-0.053	0.031
$EIcoll_{i,t}$	0	13.3	-10.5	5.32
$EIqual_{i,t}$	0	2.49	-5.25	4.60
$Urban_{i,t}$	-11.92	5.45	-36.66	14.22
$Housp_{i,t}$	1.00	1.36	0.69	0.09
$Minw_{i,t}$	1.00	1.27	0.84	0.10
$Union_{i,t}$	0	18.97	-10.9	5.78
$Tfw_{i,t}$	0.099	0.512	0.001	0.143
$Natfw_{i,t}$	0.099	0.467	0.001	0.130
$Oilp_t$	36.76	64.96	20.99	14.07
$FTrav_t$	15.17	17.31	11.73	1.81
$FtravCD_t$	3.17	7.49	0.78	1.49
$Dtrav_t$	339.0	474.1	243.8	57.3
$Noneconsh_t$	46.84	62.8	37.9	7.76
$(u_{i,t}- u_t)$	1.259	9.867	-3.517	3.523

Table A.II.3.: Simple Correlations

	$Birthr_{i,t}$	$Busc_{i,t}$	$EIcoll_{i,t}$	$EIqual_{i,t}$	$EIben_{i,t}$	$Urban_{i,t}$	$Lhousp_{i,t}$	$Lminw_{i,t}$	$Union_{i,t}$	$Ltfw_{i,t}$	$Lnatfw_{i,t}$	$Loilp_t$	$Lftrav_t$	$NonEconSh_t$	Time	$LftravCD_t$
$Birthr_{i,t}$	1															
$Busc_{i,t}$	0.066	1														
$EIcoll_{i,t}$	-0.744	-0.106	1													
$EIqual_{i,t}$	0.761	0.103	-0.968	1												
$EIben_{i,t}$	-0.414	-0.023	0.846	-0.800	1											
$Urban_{i,t}$	0.349	-0.006	-0.618	0.664	-0.525	1										
$Lhousp_{i,t}$	0.363	0.162	-0.239	0.288	-0.209	0.245	1									
$Lminw_{i,t}$	0.106	-0.087	-0.447	0.400	-0.426	0.693	-0.105	1								
$Union_{i,t}$	-0.336	0.008	0.369	-0.306	0.275	-0.034	-0.006	0.062	1							
$Ltfw_{i,t}$	0.166	-0.026	-0.543	0.571	-0.584	0.943	0.185	0.724	-0.101	1						
$Lnatfw_{i,t}$	0.157	-0.023	-0.541	0.569	-0.579	0.946	0.180	0.721	-0.098	0.999	1					
$Loilp_t$	-0.032	-0.140	8.312e-18	8.879e-18	1.507e-17	-0.019	-0.237	0.009	2.292e-17	0.066	0.058	1	5			
$Lftrav_t$	0.030	0.018	1.9513e-17	-1.875e-17	-2.6531e-18	0.018	0.268	-0.011	-9.781e-31	-0.062	-0.054	-0.893	1			
$NonEconSh_t$	0.003	0.273	-5.859e-17	-1.959e-17	-2.252e-17	0.012	-0.009	0.007	-1.076e-16	-0.025	-0.021	-0.521	0.283	1		
Time	-0.023	-0.167	4.507e-17	8.597e-18	-6.569e-18	-0.020	-0.187	0.005	8.5842e-17	0.059	0.051	0.900	-0.821	-0.736	1	
$LftravCD_t$	0.423	0.127	-0.417	0.436	-0.234	0.543	0.109	0.488	-0.294	0.555	0.538	0.164	-0.251	0.101	0.129	1
$(Lftrav10_t - Ldtrav_{i,t})$	-0.225	-0.327	0.254	-0.275	0.151	-0.185	0.034	-0.060	0.073	-0.115	-0.117	-0.016	0.256	-0.635	0.194	-0.313

Table 1: Provincial Unemployment Distribution

	Unemployment			
	1983	**1989**	**1993**	**2007**
British Columbia (BC)	13.9	9.1	9.7	4.2
Alberta (AB)	11.0	7.2	9.6	3.5
Saskatchewan (SK)	7.7	7.4	8.3	4.2
Manitoba (MB)	9.5	7.5	9.3	4.4
Ontario (ON)	10.5	5.0	10.9	6.4
Quebec (QC)	14.2	9.6	13.3	7.2
New Brunswick (NB)	15.0	12.1	12.6	7.6
Nova Scotia (NS)	13.5	9.9	14.4	8.0
PEI	12.4	13.8	17.0	10.4
Newfoundland (NL)	18.2	15.6	20.2	13.6
Correlation	**0.772**		**0.982**	
Canada	**12.0**	**7.6**	**11.4**	**6.0**

	Ranking			
	1983	**1989**	**1993**	**2007**
BC	7	5	4	2
AB	4	2	3	1
SK	1	3	1	2
MB	2	4	2	4
ON	3	1	5	5
QC	8	6	7	6
NB	9	8	6	7
NS	6	7	8	8
PEI	5	9	9	9
NL	10	10	10	10
Same ranking	**1**		**4**	

Source: Statistics Canada (2008)

Table 2: Provincial Skill Unemployment Rates

	A		B		C		D	
	1993	**2007**	**1993**	**2007**	**1993**	**2007**	**1993**	**2007**
BC	5.6	3.0	8.4	3.3	9.3	4.9	15.9	11.1
AB	5.3	2.4	8.7	2.6	8.9	4.7	14.3	5.4
SK	4.3	2.1	7.1	3.2	8.0	5.4	9.6	5.7
MB	5.6	2.8	7.2	3.3	9.7	4.4	12.4	7.6
ON	5.3	4.3	9.0	5.0	12.0	7.8	13.3	9.4
QC	7.2	3.6	10.9	5.9	14.3	9.2	19.7	16.1
NB	4.9	2.8	10.2	5.9	12.5	8.4	20.8	19.6
NS	7.7	3.8	12.4	6.7	14.3	8.4	24.3	17.2
PEI	5.4	4.8	11.6	7.1	14.3	9.5	28.6	20.0
NL	6.6	4.3	16.5	11.7	18.2	14.6	31.3	26.7
Canada	**5.8**	**3.7**	**9.6**	**4.9**	**11.6**	**7.1**	**15.1**	**12.5**
Correlation	**0.459**		**0.964**		**0.957**		**0.945**	
	Rankings							
	A		**B**		**C**		**D**	
	1993	**2006**	**1993**	**2006**	**1993**	**2006**	**1993**	**2006**
SK	1.	1.	1.	2.	1.	4.	1.	2.
NB	2.	3.	6.	6.	6.	6.	7.	8.
AB	3.	2.	4.	1.	2.	2.	4.	1.
ON	3.	8.	5.	5.	5.	5.	3.	4.
PEI	5.	10.	8.	9.	7.	9.	9.	9.
BC	6.	5.	3.	3.	3.	3.	5.	5.
MB	6.	3.	2.	3.	4.	1.	2.	3.
NL	8.	8.	10.	10.	10.	10.	10.	10.
QC	9.	6.	7.	6.	7.	8.	6.	6.
NS	10.	7.	9.	8.	7.	6.	8.	7.
# with same ranking	**2**		**4**		**5**		**4**	

Source: Statistics Canada (2008)

Table 3: Unit-Root Tests (t-values) for unemployment

	1.	2.	3.	4.
	ADF with trend Provincial unemployment rate[a]	**DF-GLS Provincial-national unemployment rate difference[b]**	**DF-GLS Provincial-national unemployment rate difference[c]**	**Average unemp. rate (Canada: 7%)**
	1976.1-2010.4	**1976-2002**	**1976-2010**	**2003-2010**
BC	-1.864	-1.136	-2.362*	6.1
AB	-2.389	-1.865	-1.527	4.6
SK	-4.025*	-2.283*	-2.650**	4.8
MB	-3.688*	-3.536**	-2.806**	4.8
ON	-2.241	-1.538	-1.704	7.1
QC	-3.256	-2.170*	-0.888	8.1
NB	-4.476**	-1.600	-2.070*	9.1
NS	-3.136	-2.294*	-1.723	8.6
PEI	-1.889	-1.997*	-1.711	11.1
NL	-1.747	-1.083	-1.000	14.9

[a] The critical t-values for the ADF tests including a trend are -4.027 at 1% (**), -3.443 at 5% (*). [b] The critical t-values for the DF-GLS test without trend are -2.661 at 1%, -1.955 at 5%. [c] The critical t-values for the DF-GLS test without trend are -2.635 at 1%, -1.951 at 5% (MacKinnon, 1996).

Table 4: Inter-provincial Migration Flows

	Canada	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC
In-migration											
1980-93	4435706	118284	42614	254334	181448	350572	1172212	247532	245181	852174	891187
1993-07	4093971	116434	37932	224651	157924	310843	951631	196251	232760	1043558	757396
Out-migration											
1980-93	4435706	159910	42432	252892	192160	524757	1045732	313497	339005	882265	594420
1993-07	4098011	180801	37977	246468	178857	448102	954574	254973	289461	725984	701860
Total migration (In+Out)											
Total 1980-93	-	278194	85046	507226	373608	875329	2217944	561029	584186	1734439	1485607
Total 1993-07	-	315347	80663	503524	358902	815257	2044875	486344	561308	1874698	1574483
	Correlation between unemployment and net-migration										
1980-93	-	-0.720	-0.701	-0.882	-0.698	-0.409	-0.777	-0.898	-0.481	-0.894	-0.814
1993-07	-	-0.342	-0.506	-0.221	-0.597	0.177	0.063	0.489	-0.220	-0.691	-0.009

Source: Statistics Canada (2008).

Table 5: Provincial Unemployment Deviation: Alternative Methodologies.

	OLS	FE estimation	White robust cross section SE	Strict exogen. test Birth rate	With trend	2SLS[a]	First differences
	1.	2.	3.	4.	5.	6.	7.
$Busc_{i,t}$	-7.18 (3.5)***	-7.42 (4.9)***	-7.42 (4.2)***	-7.11 (4.0)***	-7.34 (4.2)***	-4.40 (2.5)**	-6.60 (2.2)**
$Loilp_t*D_j$							
NL	.682 (1.9)*	-1.54 (4.4)***	-1.54 (3.7)***	-1.22 (3.0)***	-1.62 (3.9)***	-2.40 (5.1)***	-.091 (0.1)
NS	-.652 (1.8)*	.801 (2.2)**	.801 (2.8)***	.584 (2.1)**	.738 (2.6)**	1.53 (3.3)***	-.125 (0.3)
PEI	-.514(1.3)	-1.10 (2.8)***	-1.10 (2.8)**	-1.42 (2.9)***	-1.18 (2.7)***	-.706 (1.6)	.418 (0.3)
NB	-.782 (2.1)**	.731 (2.1)**	.731 (2.8)***	.873 (3.1)***	.648 (2.8)*	1.20 (5.3)***	.139 (0.2)
QC	.197 (0.6)	.376 (1.0)	.376 (1.1)	.489 (1.6)	.293 (0.9)	1.10 (2.5)**	.629 (2.8)***
ON	.120 (0.3)	.927 (2.7)***	.927 (5.6)***	.823 (4.2)***	.850 (4.8)**	.786 (3.5)***	.972 (5.8)***
MB	-.441 (1.3)	.383 (1.0)	.383 (1.2)	.240 (0.7)	.341 (1.2)	-.157 (0.4)	.197 (0.5)
SK	-.665 (1.9)*	.090 (0.2)	.090 (0.3)	.207 (0.6)	.023 (0.1)	-.624 (1.5)	-.645 (1.9)*
AB	-.196 (0.6)	-1.29 (3.7)***	-1.29 (5.3)***	-1.30 (5.1)***	-1.37 (5.4)***	-1.49 (6.0)***	-.0593 (1.2)
BC	.058 (0.2)	-.250 (0.7)	-.250 (0.7)	-.022 (0.1)	-.343 (1.0)	.220 (0.6)	-.993 (2.3)**
$Birthr_{i,t}$	-.608 (2.1)**	.218 (0.7)	.218 (0.7)	.198 (0.4)	.233 (0.8)	.051 (0.2)	-.013 (0.0)
$Urban_{i,t}$	-.126 (4.2)***	.121 (1.8)*	.121 (1.5)	.115 (1.4)	.133 (1.7)*	-.032 (0.3)	.361 (1.1)
$NonEconSh_t$	-.010 (1.4)	-.011 (2.1)**	-.011 (-3.2)***	-.011 (3.0)***	-.0002(0.1)	-.012 (3.2)***	.003 (0.5)
$EIqual_{i,t}$	-.610 (9.6)***	-.679 (11)***	-.679 (8.0)***	-.660 (7.5)***	-.678 (8.0)***	-1.09 (5.5)***	-515 (6.5)***
$Lftrav_t$	.208 (0.2)	.013 (0.1)	.013 (0.1)	-.134 (0.3)	.532 (1.1)	.357 (0.8)	.705 (1.5)
$Lftrav_t*D_t$	-.086 (1.3)	-.078 (1.7)**	-.078 (3.2)***	-.088 (3.7)***	-.108 (3.8)***	-.087 (3.4)***	-.087 (4.8)***
$Birthr_{i,t+1}$	-	-	-	-.078 (0.2)	-	-	-
Time	-	-	-	-	.036 (1.7)*	-	-
Adj R^2	0.977	0.989	0.989	0.990	0.989	0.988	0.253
n	10	10	10	10	10	10	10
t	17	17	17	16	17	16	16
Log likel.	-126	-59.3	-59.3	-49.7	-58.5	-	-87.3
Hausman F-test for FE	-	F(9,143)=18.9 [.0000]	-	-	-	-	-

[a] The instrument for the EI qualifying period is $EIqual_{j,t-1}$. All estimations include fixed effect except column 1. Absolute t-values. in parentheses. *,**,*** significant at 10 %, 5%, and 1 % respectively.

Table 6: Provincial Unemployment Deviation: Alternative Expanatory Variable Measures.

	EI collect period	EI weighted qual. period	Non-linear qualifying	Union	Min. wage	House prices	Parental Leave
	1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**
$Busc_{i,t}$	-7.94 (6.2)***	-9.50 (7.4)***	-7.03 (4.4)***	-7.42 (4.2)***	-7.25 (3.9)***	-7.25 (3.4)***	-7.48 (4.1)***
$Loilp_t*D_j$							
NL	-.999 (3.4)***	-1.05 (3.9)***	-1.23 (2.6)***	-1.54 (4.0)***	-1.57 (3.5)***	-1.70 (3.9)***	-1.49 (3.4)***
NS	.225 (1.1)	-.148 (0.8)	.676 (2.3)**	.802 (2.9)***	.782 (2.9)***	.680 (2.3)**	0.765 (2.9)***
PEI	-.923 (3.1)***	-1.16 (4.0)***	-1.20 (3.0)***	-1.10 (2.9)***	-1.13 (2.9)***	-1.08 (2.9)**	-1.20 (3.4)***
NB	.602 (1.5)	.007 (0.1)	.711 (2.6)***	.732 (2.8)***	.769 (2.8)***	.680 (2.9)***	.730 (2.6)**
QC	.328 (1.2)	.101 (0.4)	.327 (1.0)	.375 (1.1)	.317 (1.0)	.392 (1.1)	.484 (1.7)*
ON	.987 (7.6)***	.801 (6.0)***	.923 (5.5)***	.927 (6.0)***	1.12 (4.7)***	.992 (6.8)***	.882 (5.1)***
MB	.146 (0.6)	.503 (1.7)*	.194 (0.6)	.383 (1.2)	.289 (0.8)	0.095 (0.5)	.364 (1.2)
SK	-.018 (0.1)	.372 (1.3)	-.216 (0.8)	.090 (0.2)	.119 (0.4)	.042 (0.1)	.092 (0.3)
AB	-1.26 (5.3)***	-.883 (3.4)***	-1.39 (6.4)***	-1.29 (4.7)***	-1.26 (5.5)***	-1.26 (5.3)***	-1.24 (5.2)***
BC	-.474 (1.1)	-.418 (1.0)	-.134 (0.4)	-.250 (0.7)	-.236 (0.7)	-.181 (0.6)	-.297 (0.8)
$Birthr_{i,t}$	-.082 (0.3)	-.251 (1.0)	.258 (0.9)	.219 (0.8)	.345 (1.1)	.278 (1.0)	-
$Urban_{i,t}$	.074 (1.0)	.085 (1.2)	.077 (1.1)	.121 (1.5)	.110 (1.3)	-	.117 (1.4)
$NonEconSh_t$	-.011 (2.8)***	-.010 (2.7)***	-.011 (3.8)***	-.011 (3.2)***	-.011 (3.3)***	-.011 (3.4)***	-.012 (3.0)***
$EIqual_{i,t}$	-	-	-.688 (9.1)***	-.679 (8.0)***	-.657 (8.6)***	-.675 (7.5)***	-.682 (8.0)***
$EIcoll_{i,t}$	.270 (7.6)***	-	-	-	-	-	-
$EIben_{j,t}$	-	31.8 (12)***	-	-	-	-	-
$EIqual_{i,t}^2$	-	-	-.025 (1.9)*	-	-	-	-
$Union_{i,t}$	-	-	-	.0002 (0.1)	-	-	-
$Lminw_{j,t}$	-	-	-	-	.191 (1.2)	-	-
$Lhousp_{i,t}$	-	-	-	-	-	-.519 (1.0)	-
$Lparleav_t$	-	-	-	-	-	-	-.094 (0.6)
$Lftrav_t$	.022 (0.1)	-.063 (0.1)	.028 (0.1)	.013 (0.1)	.038 (0.1)	.162 (0.4)	.018 (0.1)
$Lftrav_t*D_t$	-.077 (3.3)***	-.072 (3.1)***	-.088 (4.1)***	-.078 (3.2)***	-.079 (3.3)***	-.086 (39)***	-.064 (5.0)***
Adj R^2	0.987	0.988	0.989	0.989	0.989	0.989	0.989
n	10	10	10	10	10	10	10
t	17	17	17	17	17	17	17
Log likel.	-74.5	-65.9	-57.7	-59.3	-58.4	-60.8	-59.5

Absolute t-values. in parentheses. *,**,*** significant at 10%, , 5%, and 1 % respectively. White cross-section standard errors.

Table 6: Provincial Unemployment Deviation: Alternative Explanatory Variable Measures con't.

	FE estimation	Occupation list	Flight cost weighted C,D	Relative flight/domestic cost (10,000 mi)	Relative flight/domestic cost (5,000 mi)
	7.	8.	9.	10.	11.
$Busc_{j,t}$	-7.42 (4.2)***	-7.51 (4.2)	-7.63 (4.6)***	-7.05 (4.4)***	-7. 09 (4.4)***
$Loilp_t*D_i$					
NL	-1.54 (3.7)***	-1.55 (3.7)***	-1.77 (4.1)***	-1.72 (3.9)***	-1.740 (4.0)***
NS	.801 (2.8)***	.793 (2.8)***	.657 (2.5)**	.598 (2.4)**	.582 (2.3)**
PEI	-1.10 (2.8)**	-1.11 (2.8)***	-1.20 (3.0)***	-1.34 (3.1)***	-1.36 (3.1)***
NB	.731 (2.8)***	.718 (2.6)***	.583 (2.2)**	.520 (2.7)***	.502 (2.7)***
QC	.376 (1.1)	.360 (1.1)	.355 (1.2)	.207 (0.8)	.187 (0.7)
ON	.927 (5.6)***	.919 (5.2)***	.983 (5.2)***	.708 (4.1)***	.695 (4.0)***
MB	.383 (1.2)	.379 (1.2)	.276 (0.9)	.279 (1.1)	.273 (1.1)
SK	.090 (0.3)	.079 (0.2)	.051 (0.2)	-.063 (0.2)	-.071 (0.3)
AB	-1.29 (5.3)***	-1.31 (5.1)***	-1.29 (5.8)***	-1.38 (6.7)***	-1.383 (6.7)***
BC	-.250 (0.7)	-.265 (0.7)	-.277 (0.9)	-.435 (1.3)	-.439 (1.3)
$Birthr_{j,t}$	.218 (0.7)	.225 (0.8)	.138 (0.5)	.149 (0.5)	.155 (0.5)
$Urban_{i,t}$	.121 (1.5)	.123 (1.5)	.118 (1.6)	.138 (1.7)*	.138 (1.)*
$NonEconSh_t$	-.011 (-3.2)***	-.011 (3.0)***	-.013 (3.7)***	.0002 (0.1)	.0000 (0.1)
$EIqual_{j,t}$	-.679 (8.0)***	-.678 (8.0)***	-.684 (8.3)***	-.673 (8.2)***	-.673 (8.3)***
$Lftrav_t$	.013 (0.1)	.252 (0.5)	-		-
$Lftrav_t*D_t$	-.078 (3.2)***	-	-	-	-
$Lftrav_t*D(List)_t$	-	-.051 (1.8)*	-		-
$LftravCD_t$	-	-	.165 (1.2)		-
$LftravCD_t*D_t$	-	-	-.154 (1.9)*		-
$(Lftrav10_t-Ldtrav_{i,t})$	-	-	-	-.800 (3.4)***	-
$(Lftrav10_t-Ldtrav_{i,t})* D_t$	-	-	-	-.103 (2.3)**	-
$(Lftrav5_t-Ldtrav_{i,t})$					-.791 (3.3)***
$(Lftrav5_t-Ldtrav_{i,t})* D_t$					-.191 (2.3)**
Adj R^2	0.989	0.989	.989	.989	.989
N	10	10	10	10	10
T	17	170	17	17	17
Log likel.	-59.3	-60.1	-60.0	-56.3	-56.3

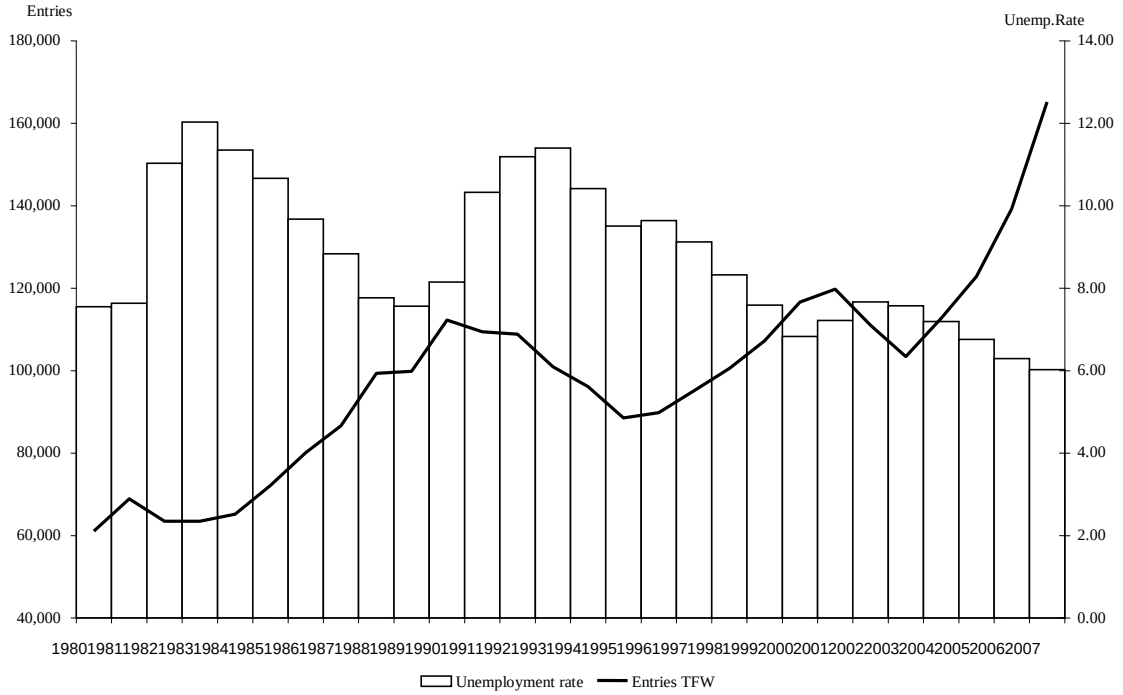
Absolute t-values in parentheses. *,**,*** significant at 10%, 5%, and 1% respectively. White cross-section standard errors.

Table 7: Semi-structural Form for Provincial Unemployment Deviation.

	Semi-reduced form IVFE (All TFW)	Semi-reduced form IVFE (Non-seasonal TFW)
	1.	**2.**
$Busc_{j,t}$	-14.1 (4.7)***	-12.1 (5.5)***
$Loilp_t*D_j$		
NL	-2.68 (3.9)***	-2.29 (4.5)***
NS	.870 (1.8)*	.720 (2.0)**
PEI	-1.82 (3.8)***	-1.71 (4.2)***
NB	1.19 (2.7)***	.892 (2.8)***
QC	.465 (1.0)	.615 (1.5)
ON	.838 (3.9)***	.930 (5.0)***
MB	-.477 (1.0)	-.191 (0.5)
SK	-.144 (0.3)	-.190 (0.5)
AB	2.52 (4.7)***	-2.17 (6.1)***
BC	-1.11 (2.6)**	-.933 (2.6)
$Birthr_{j,t}$	-1.16 (1.7)*	-.672 (1.5)
$Urban_{i,t}$	-.303 (1.8)*	-.135 (1.2)
$EIqual_{i,t}$	-.914 (4.6)***	-.817 (5.6)***
$Ltfw_{j,t}$	2.94 (2.6)**	-
$Lnatfw_{i,t}$	-	1.92 (2.8)***
Adj R^2	0.975	0.984
n	10	10
t	17	17

Absolute t-values. in parentheses. *,**,*** significant at 10%, 5 %, and 1 % respectively.
White cross-section standard errors not adjusted for d.f..
Instruments: $Lftrav_t$, $Lftrav_t*D_t$, $NonEconSh_t$ in addition to the model's exogenous variables.

Figure 1: Entries of Temporary Foreign Workers and unemployment in Canada (1980-2007).



Sources: Entry data provided by CIC; Statistics Canada (2008).

Figure 2: Annual entries of temporary foreign workers by skill category