Are Recent Immigrants More Resilient to Job Loss? Evidence from Mass Layoffs in Canada [1]

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Abstract

This paper measures the effect of job loss on the subsequent labor market outcomes of immigrants as a function of the time spent in the host country at the time of displacement. The evidence comes from yearly employer-employee administrative data from Canadian taxes (2001-2019), linked to immigration records. I look at immigrants displaced during mass layoffs, which provide plausibly exogenous job separations. I estimate the impact of displacement in two distinct ways. First, through an event study approach. Second, through a regression-based approach that allows me to quantify how differences in the composition of pre-displacement characteristics contribute to the heterogeneous treatment effects and how the heterogeneity in earnings loss is linked to specific differences in post-displacement outcomes. I find that recent immigrants experience smaller and less persistent earnings losses from displacement, with a 21% decrease in earnings one year after displacement, compared to 26% for those who have been in the host country longer. Recent immigrants also display better post-displacement outcomes in other dimensions, such as lower time spent nonemployed and higher geographic mobility. I show that differences in pre-displacement characteristics account for 50% of the heterogeneous treatment effects on earnings: each additional year in Canada results in 0.8 percentage points larger earnings losses, but only 0.4 percentage points when controlling for pre-displacement characteristics. Age at displacement alone explains half of this difference. Differences in post-displacement outcomes account for an additional 40% of the heterogeneity in earnings losses, with time spent nonemployed being the most important mechanism.

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1 Introduction

When a worker loses their job during a mass layoff, they incur large and persistent earnings losses (Jacobson et al., 1993; Couch and Placzek, 2010; Bertheau et al., 2023). For immigrants, these losses may be particularly significant as they navigate labor markets where they may face additional barriers, including limited host-country language proficiency (Bleakley and Chin, 2004), smaller professional networks (Engdahl et al., 2024), and imperfect transferability of skills acquired abroad (Friedberg, 2000). These barriers are typically more binding for recent immigrants, yet there is limited evidence on whether newly arrived immigrants face worse post-displacement outcomes than their more established counterparts. Understanding this heterogeneity matters for designing effective policies to support displaced workers and for understanding the broader dynamics of the economic integration of immigrants.

In this paper, I investigate the heterogeneous effects of job loss on earnings and multiple labor market outcomes as a function of time spent in the host country. I find that recent immigrants experience smaller earnings losses following job displacement than those with longer residence. For example, recently arrived immigrants, those displaced within their first ten years in Canada, experience a 21% decrease in earnings one year after displacement, compared to a 26% decrease among those who have been in the country for a more extended period. Recently arrived immigrants also exhibit better post-displacement outcomes across other labor market dimensions. They are less likely to leave Canada in the short run, spend fewer months nonemployed, experience smaller declines in firm quality at their new jobs, as measured by firm-specific time-invariant components of pay, and are more geographically mobile within Canada following displacement.

I show that differences in pre-displacement characteristics partly drive the heterogeneity in treatment effects by years spent in Canada. For firm quality, geographical mobility, and industry switching, pre-displacement characteristics fully account for the differential effects, rendering the relationships between these outcomes and time in Canada economically or statistically not significant. For nonemployment duration and earnings, pre-displacement characteristics explain 17% and 50% of the heterogeneity, respectively, and the heterogeneity remains economically significant.

Among the pre-displacement characteristics, age at displacement, province of residence, and position on the job ladder are the most important variables explaining heterogeneity in earnings losses, losses of firm pay premium, and months spent nonemployed. These characteristics vary systematically with time in Canada in ways that increase vulnerability to displacement: immigrants who spent more years in Canada are older on average, which is associated with worse post-displacement outcomes (Deelen et al., 2018); they are more likely to reside in provinces where displaced workers fare worse; and they occupy higher rungs on the job ladder, leading to larger losses in

firm-specific pay premium and in earnings.

To understand the remaining heterogeneity in earnings losses after accounting for differences in pre-displacement characteristics, I examine the contribution of differences in post-displacement labor market outcomes. Among these factors, differences in nonemployment duration account for most of the remaining gap, explaining an additional 40% heterogeneity in earnings losses between recent and established immigrants.

These results matter for three reasons. First, they highlight that the challenges to the economic integration of immigrants evolve over time and are not necessarily the same beyond the initial years after arrival. Immigrants with ten years or more in Canada experience earnings losses that are 24% larger relative to those experienced by recent immigrants with less than ten years in Canada. This within-immigrant differential exceeds the native-immigrant earnings gap of around 18% estimated by Balgova and Illing (2024) in Germany. It suggests that policies supporting displaced workers should consider providing additional support for immigrants who have been in Canada for a longer period, which may be counterintuitive. Furthermore, these results highlight the need for additional research to investigate what explains the heightened vulnerability of established immigrants and whether the link between time in the host country and heightened vulnerability also applies to other negative economic shocks.

Second, they show that most of the heterogeneity in earnings losses doesn't originate from differences in the quality of their employer or other observable characteristics. We might expect established immigrants to experience larger earnings losses simply because they have "more to lose": they have climbed to higher-quality firms through on-the-job search or are at the peak of their age-earnings profile. Yet differences in pre-displacement characteristics, including firm position on the job ladder and age at displacement, explain only approximately 50% of the heterogeneity. Controlling for these observables, each additional year in Canada increases earnings losses by 0.4 percentage points, down from 0.8 percentage points without controls. This indicates that something about time in Canada itself, beyond the pre-displacement characteristics I consider, leads to higher earnings losses.

Third, my results provide additional evidence that post-displacement employment outcomes, as captured by employment status and the number of months not working in a year, are important mechanisms explaining the heterogeneous impacts of displacement on earnings across worker groups. I find that differences in nonemployment duration explain most of the differential earnings losses between recent and established immigrants. These results support other findings from studies of the heterogeneous impact of displacement and its link with time nonemployed. Schmieder et al. (2023) find that firm wage premium losses explain much of the cyclical variation in displacement effects and correlate strongly with nonemployment duration. Balgova and Illing (2024), who study native-immigrant differences rather than within-immigrant variation as in this paper, find that differences in post-displacement employment duration explain a large fraction of the migrant-native earnings gap. Similarly, Deelen et al. (2018)

show that employment outcomes also mediate age-based heterogeneity in earnings losses: older workers experience longer-lasting employment effects from displacement, with employment probabilities one year after displacement 28% below pre-displacement levels compared to 23% for prime-age workers.

Given that nonemployment duration explains most of the differential earnings losses, policies targeting employment outcomes could reduce heterogeneity across immigrant groups while helping the most at-risk immigrants. For instance, Hyman et al. (2024) investigate a wage insurance policy and find that it helps displaced workers avoid prolonged nonemployment spells, allowing them to find reemployment more quickly and avoid the negative consequences of duration-dependent wage offers. Such policies may be particularly valuable for established immigrants, who spend significantly more time nonemployed following displacement and consequently experience larger earnings losses.

I employ the following empirical strategy to identify these effects. Job loss is generally not a random event. Examining the outcomes of workers who involuntarily separate from their employers could introduce bias due to unobservable characteristics that cause both job loss and differences in earnings, earnings growth, propensity to stay in Canada, and other post-displacement outcomes. To avoid potential bias, I use an approach that compares the outcomes of workers who lose their jobs during mass layoffs with those of similar workers who do not. I build my sample similarly to Schmieder et al. (2023) for the definition of mass layoffs, displaced workers, and control workers. I use a Canadian employer-employee administrative dataset built from tax records spanning 2001 to 2019, which is linked to the universe of immigrants in Canada. I use these datasets to identify mass layoff events and the workers displaced by these events. I then match displaced immigrants to similar non-displaced immigrants using a one-to-one nearest neighbor method with demographic and labor market variables related to earnings, earnings growth, and other labor market outcomes.

My analysis proceeds in two steps. First, I estimate event studies of displacement effects on earnings, employment, firm quality, geographic mobility, industry switching, and outmigration. I estimate these effects separately for immigrants with fewer than ten years in Canada and those with ten or more years. These estimates capture the overall difference in displacement impacts between the two groups, reflecting both the direct effect of time in Canada and the indirect effects operating through differences in pre-displacement characteristics.

Second, I investigate the sources of heterogeneity in these treatment effects using a matched difference-in-difference design. I disentangle how differences in composition contribute to the heterogeneous treatment effects by years in Canada, and assess how differences in post-displacement outcomes explain the heterogeneity in earnings losses. To do so, I construct individual-level treatment effects using matched pairs of displaced and non-displaced workers. For each pair, I calculate the difference-in-differences in the outcomes of the displaced and non-displaced

workers in that pair. This provides an individual-level measure of the treatment effect for each outcome.

I then apply the Gelbach (2016) decomposition to understand what drives these heterogeneous treatment effects. For each outcome, I estimate two regressions. The baseline specification regresses the individual treatment effects on years spent in Canada, capturing the unconditional relationship between time in Canada and the outcome. The full specification additionally controls for a set of covariates, either pre-displacement characteristics or post-displacement outcomes, depending on the analysis. This full specification captures the conditional relationship of time in Canada on the outcome, while controlling for the added covariates. The Gelbach decomposition attributes the difference between the unconditional coefficient and conditional coefficient on years in Canada to each covariate using the omitted variable formula. A covariate contributes substantially when two conditions hold: immigrants with different years in Canada systematically differ in that characteristic, and the characteristic independently affects the outcome of interest.

I perform this decomposition analysis twice: first to assess how pre-displacement characteristics explain heterogeneity across labor market outcomes, and second to assess how post-displacement outcomes explain heterogeneity in earnings losses.

This paper contributes to the extensive displaced workers literature that began with the seminal study by Jacobson et al. (1993) using administrative data and relates to other studies in the literature that use propensity score matching (Couch and Placzek, 2010; Bertheau et al., 2023) and more recent approaches using nearest neighbor one-to-one propensity score matching with individual-level treatment effects to study heterogeneity and underlying mechanisms. Recent examples of this approach include Schmieder et al. (2023), which examines variation in earnings losses across the business cycle, Balgova and Illing (2024) by immigrant status, Illing et al. (2024) by gender, and Deelen et al. (2018) by age. In this paper, I consider a new dimension of heterogeneity: the impact of displacement on immigrants by time spent in Canada.

This paper also contributes to studies that have explored how different mechanisms can explain the size and persistence of earnings losses. The mechanisms I consider include the role of employers in determining post-displacement outcomes (Lachowska et al., 2020), the role of specific human capital and industry switching (Neal, 1995; Poletaev and Robinson, 2008), the role of internal migration as an adjustment mechanism (Huttunen et al., 2018), and the role of employment status (Lachowska et al., 2020; Schmieder et al., 2023; Balgova and Illing, 2024). This study also contributes to our understanding of displacement in Canada, following Birinci et al. (2023), who show how standard definitions of mass layoffs capture workers who separate for reasons other than layoffs and demonstrate that these workers have very different earnings trajectories post-displacement. Similar to previous studies, I find that these mechanisms are important for understanding the size and persistence of the impact of job

loss and explaining why it differs among immigrants with more or fewer years in Canada.

This paper contributes directly to the small set of papers that investigate the impact of job loss on immigrants. Bratsberg et al. (2018) and Hardoy and Schøne (2014) measure the average post-displacement earnings losses of immigrants and of natives. Closest to this paper, Balgova and Illing (2024) study how displacement affects immigrants compared to natives in Germany while taking into account variation in observable among the two groups. This study differs from theirs in several important dimensions. Most importantly, while they briefly explore how earnings losses differ by time spent in Germany, they do not investigate the mechanisms that drive these differential impacts by years in the country. The empirical approach used in this study allows me to isolate the impact of years spent in Canada, which is not the objective of their paper. Additionally, I examine outmigration following displacement, which they cannot analyze given their methodology of matching displaced immigrants to displaced natives to build their sample. My results complement theirs by showing that there is also economically large variation within immigrants in earnings losses and other outcomes following displacement.

The remainder of the paper proceeds as follows. I first present a conceptual framework that articulates my hypotheses about why displacement effects vary by time in Canada and summarize some of my results. I then present the data and empirical methodology, followed by the main results and their implications for our understanding of the heterogeneous treatment effect of displacement and implications for policymakers.

2 Conceptual Framework

To understand why job displacement effects might vary systematically with time spent in the host country, I draw on insights from structural models studied in the displaced worker literature, models of optimal residential location, and empirical studies of social networks and their impact on labor market outcomes. These frameworks generate predictions and suggest that recent immigrants should experience different post-displacement outcomes than established immigrants. These different post-displacement outcomes can arise because of three channels: (1) Position on the job ladder, (2) Accumulation of specific human capital, and (3) geographic mobility. These mechanisms suggest recent immigrants should have smaller earnings losses. I confirm this empirically and provide some evidence on which mechanism matters. I also discuss how differences in social networks are an alternative mechanism that predicts larger earnings losses for new immigrants.

Structural models that capture the size and persistence of earnings losses following displacement (Krolikowski, 2017; Jung and Kuhn, 2019; Jarosch, 2023) share a common feature: workers gradually climb a job ladder through on-the-job search, moving from lower-quality to higher-quality firms over time. Recent work in Canada by Dostie

et al. (2023) provides evidence that this is an important aspect of earnings convergence between immigrants and natives in their first ten years in Canada. There are two ways in which position on the job ladder can generate differential earnings losses and differential loss of firm pay premium: (1) Recent immigrants have smaller losses because they are more likely to work at lower-quality firms pre-displacement, and (2) recent immigrants have different transition dynamics pre- and post-displacement on the job ladder.

These two mechanisms could explain why recent immigrants experience different displacement effects on earnings and a measure of firm quality. One possibility is that recent immigrants typically occupy lower rungs on the job ladder because climbing requires overcoming search frictions through time spent searching on the job. Under this mechanism, established immigrants experience larger earnings losses when displaced because they transition from high-quality to lower-quality employers more frequently, as they occupy positions relatively higher on the job ladder more often. Conversely, recent immigrants face smaller drops since they were already working at lower-paying firms.

Alternatively, recent and established immigrants may have similar distributions on the job ladder but differ in their ability to maintain their relative position when reemployed. For instance, in the model by Jung and Kuhn (2019), workers do not draw from the same job offer distribution because firms direct vacancies to submarkets defined by worker characteristics, including age and accumulated worker-specific skills. Since immigrants with more or less time in Canada differ in these dimensions, it predicts that we should observe a different reemployment pattern and that it will differ depending on whether we control for these differences in characteristics or not. Along the same line of thought, Bowlus et al. (2016) estimates the parameters of a search model and allows them to depend on years spent in Canada. They find that the job offer arrival rate, among other parameters, evolves over time spent in Canada which would affect their position on the job ladder when moving from nonemployed to employed. More broadly, Castro et al. (2024) show that there are time-invariant types with different transitions between labor force status, and that the types have different distributions on the job ladder. Applied to immigrants, recent and established immigrants may differ in the composition of types, with recent immigrants overrepresented in types that have better transition dynamics when moving from nonemployment to employment.

My evidence supports both mechanisms. However, for the second mechanism, the results depend critically on whether the analysis controls for differences in observable characteristics at the time of displacement between newer and established immigrants. The distribution of recent immigrants across firm pay premiums differs from that of established immigrants. Established immigrants are 7.6% more likely to hold jobs in the top quintile (highest paying firms), with 50.8% in this quintile compared to 47.2% of new immigrants. Correspondingly, lower quintiles contain relatively more immigrants who have been in Canada for ten years or less.

For the second mechanism, I find that, conditional on firm ranking, new immigrants are less likely to move to

lower-quality firms after displacement once they are reemployed. However, the larger losses are from an estimate that does not control for differences in characteristics between the two groups that can correlate with their ability to maintain their position on the job ladder. After accounting for differences in observable characteristics at both the immigrant levels and firm levels, immigrants with more time in Canada experience similar losses in firm quality as recently arrived immigrants. Put differently, the unconditional pattern suggests established immigrants fare worse in maintaining their position on the job ladder, but when comparing newer and established immigrants with similar pre-displacement characteristics, their movements on the job ladder post-displacement are similar.

A second mechanism is that immigrants accumulate country-specific human capital over time in the host country at the firm-occupation-industry level, which has been shown to matter for the size of earnings losses because this human capital is not perfectly transferable across industries or jobs (Neal, 1995; Poletaev and Robinson, 2008; Krolikowski, 2017). In practice, the specificity of human capital is likely at the occupation and firm level, but I only observe industry in my setting. Therefore, this mechanism predicts that established immigrants, having accumulated more industry-specific human capital and higher tenure on average, will experience larger earnings losses.

For the role of industry switching, the contribution of this mechanism to heterogeneous displacement effects depends on the differential rates of industry switching between newer and established immigrants, as well as how switching relates to earnings losses. Industry switching is strongly associated with higher earnings losses (Figure A1 in the appendix), supporting the idea that industry-specific human capital is lost when workers switch industries. However, I find that new immigrants and established immigrants have a similar propensity to switch industry post-displacement. Moreover, in the analysis of how post-displacement outcomes explain heterogeneity in earnings losses, I find that, conditional on pre-displacement characteristics and other post-displacement outcomes, the impact of switching industries on earnings loss is not statistically significant. Overall, I have limited evidence that industry-specific human capital and industry switching are important mechanisms explaining the heterogeneity in displacement effects between newer and established immigrants.

A third mechanism is differences in geographic mobility, where lower moving costs for recent immigrants predict higher post-displacement mobility rates that partially offset displacement losses. Assuming lower moving costs for new immigrants is plausible, given estimates from discrete choice frameworks in the optimal location decision literature. Moving costs increase with age, which can be interpreted as capturing both the process of establishing oneself in a location, such as building social networks, and the accumulation of location-specific ties, including homeownership and family obligations (Kennan and Walker, 2011; Ransom, 2022).

For immigrants, especially those who have recently arrived, this implies that their moving costs are relatively

low and increase gradually with time in Canada. Furthermore, Borjas (2001) documents that new immigrants are more mobile and more likely to locate in areas with greater economic opportunities, especially a few years after arrival. A finding echoed by Cadena and Kovak (2016), who document that low-skilled immigrants were more mobile during the Great Recession and moved toward areas with greater opportunities.

I find that recently arrived displaced immigrants are 1.4 percentage points more likely to change provinces after displacement compared to displaced immigrants who have been in Canada for more than ten years. Yet, in the analysis of the contribution of different post-displacement mechanisms, when conditioned on their pre-displacement characteristics, switching provinces does not contribute to the heterogeneity of earnings losses. This follows from the analysis of the role of pre-displacement characteristics, where I find that, conditional on these characteristics, the rate of internal migration decrease with higher number of years in Canada, but the coefficient is not statistically significant. Interestingly, I show that the location of residence of immigrants can explain some of the heterogeneity in outcomes for earnings, firm quality, number of months spent nonemployed, and geographical mobility itself. My results suggest that new immigrants tend to reside in labor markets where displaced workers fare better, which aligns with Borjas (2001).

One alternative mechanism could generate heterogeneity following displacement: differences in social network size and quality. Differential network quality could generate heterogeneous displacement effects, but in the opposite direction from the previous mechanisms considered. Social networks provide advantages when searching for jobs through referrals and information about job opportunities (Schmutte, 2015; Saygin et al., 2021), and recent immigrants typically have smaller, lower-quality networks compared to established immigrants.

Research by (Engdahl et al., 2024) supports this, showing that recent immigrants have smaller networks due to limited exposure to coworkers and neighbors, and lower network quality. Established immigrants are able to accumulate connections to workers at higher-paying firms through longer labor market participation. This disadvantage suggests that recent immigrants may experience larger earnings losses due to fewer referrals and job opportunities at high-paying firms.

A comprehensive analysis of network mechanisms is beyond the scope of this paper. However, Engdahl et al. (2024) studies similar questions using displaced immigrants in Sweden and examines how the size and characteristics of the networks of immigrants evolve in the host country, affecting their labor market outcomes. They find that as immigrants spend more time in the host country, their probability of employment following displacement increases by six percentage points, which is related to better information flow from native coworkers. Initially, their networks consist mainly of co-nationals, but over time, they evolve to correspond more closely to those of natives, with positive implications for employment outcomes. In my setting, disadvantages from a smaller and lower-quality network early

on are plausible and may partially offset other mechanisms by increasing earnings losses from displacement for recent immigrants.

In summary, several mechanisms can explain why there should be a heterogeneous treatment effect of displacement by time in the host country for immigrants. The following sections present the data source, my empirical methodology, and the results that support, or not, these predictions.

3 Dataset and Sample Selection

3.1 Dataset

This project investigates the impact of mass layoffs on immigrant workers in Canada. For this analysis, I use the 2001-2019 Business Employee Analytical Microdata dataset (henceforth BEAM) and the Longitudinal Immigrants Database (henceforth IMDB). The BEAM is an employee-employer linked dataset consisting of three modules built from the universe of annual administrative data from workers' tax filings, business tax filings, and records of employment. The BEAM is linked to the IMDB, which contains information about all immigrants who became permanent residents between 1982 and 2019. The information from these modules has been linked together to create a dataset that allows me to identify mass layoff events, identify the immigrant workers affected by these events, and build a suitable control group. While my primary analysis focuses on immigrants, I also include Canadian-born workers using similar criteria to provide a benchmark for the magnitude of displacement effects in the event study section.

3.2 Sample Selection

In this section, I cover how I define the mass layoffs, how I define displaced workers, the sample restriction common to the displaced workers and control workers, and how I build the control group using one-to-one propensity score matching. The definition and sample selection rules are standard in the displaced workers literature, especially in studies using propensity score matching (Schmieder et al. (2023), Bertheau et al. (2023), Illing et al. (2024)). Additional information on the BEAM's module, the IMDB and variables used and any imputation is available in the appendix.

3.2.1 Definition of Mass Layoffs

I define mass layoffs at an employer as events where the count of employees decreased by at least 30% in the current year and the employer had at least 50 employees in the preceding year. This definition includes plant closures. To avoid characterizing mass layoffs as mergers and acquisitions or corporate restructuring, I exclude cases where 30% or more workers, at the firm with a drop in employment, move to the same next employer[1]. For my measure of employment at the firm level, I use the firm's average monthly employee count reported in their tax filings, averaged over the year.

3.2.2 Displaced Workers

A displaced worker is a worker with two years of tenure in the year before they separate and who separates from their main employer while the employer has a mass layoff event in the same year. I define the main employer as the firm providing the highest share of the worker's total labor earnings in a given year. Tenure is calculated as the number of years a worker has been continuously employed by their main employer in an uninterrupted job spell. When a worker was hired before 2001, I used the information from the record of employment, when available, to infer their tenure. The two years of tenure requirement is on the lower end compared to other studies using the same framework. Schmieder et al. (2023), Bertheau et al. (2023), and Balgova and Illing (2024) all use three years of tenure, while Illing et al. (2024) uses two years. In this setting, since I am interested in immigrants newly arrived in Canada, imposing higher tenure requirements would not only reduce the overall sample size, but also exclude those who have most recently immigrated. As such, I decided to use a lower threshold on tenure.

To avoid including workers who are on temporary layoffs in the treated group, I require that workers do not return to the main employer in the next three years after displacement. While the restriction is common in the displaced worker literature, it removes some workers who were permanently laid off but ended up returning to their main employers [2] I impose a minimum earnings threshold in the year before separation of 4 000$ to limit the sample to part-time and full-time workers. The 4 000$ threshold corresponds to roughly 10 hours per week annually at minimum wage. All earnings are pre-tax total annual labor earnings deflated to 2012. Additionally, I require that displaced immigrants have permanent resident status in the year of displacement to avoid selection bias

[1]The exclusion based on worker flow to their next firms is standard in administrative datasets to handle changes in firm ID due to mergers and acquisitions. Using the same dataset, Birinci et al. (2023) applied a 30% threshold. Similarly, Illing et al. (2024) used a 30% threshold with German administrative data. In a study spanning multiple European countries, Bertheau et al. (2023) employed a 20% threshold.

[2]Castro et al. (2024) documents that most recalls from non-employment in the same dataset, the BEAM, occur within the first year and are associated with temporary layoffs, parental leave, other leave-taking, and seasonal employment. As such, the restriction on returning to the main employer after three years fulfills its objective of capturing only permanent layoffs.

from individuals who gain permanent residency after displacement. This permanent resident status requirement also applies to potential control workers in their matched year. These criteria aim to identify workers in a stable job who have been involuntarily, exogenously, and permanently separated from their main employer.

3.2.3 Sample Restriction Common to Displaced and Potential Control Workers

I impose further sample restrictions on both displaced workers and the workers considered for the control group. For displaced workers, these restrictions apply to variables at the time of displacement. For potential control workers, the same restrictions apply to variables in the year they would be matched. For example, when selecting a match for a worker displaced in 2006, I only consider workers who were not displaced in 2006 and who meet the same criteria for the variables in 2006. Throughout the remainder of this paper, I refer only to the "displacement year" for simplicity, though for control workers, this corresponds to their matched year rather than an actual displacement event.

I limit my samples to workers between 25 and 50 years old at the time of displacement. This age range avoids issues of individuals being in school and early retirement decisions, which are not observable in the BEAM. Just like for the displaced workers, potential control workers must also have at least two years of tenure at their main employer and cannot work in the public sector. I do not impose further restrictions on post-displacement outcomes for both groups, such as continuous employment, to avoid limiting the analysis to workers who are highly attached to the workforce. For instance, following displacement, workers may work in any sector, have zero earnings, or experience a mass layoff. In the main analysis, I restrict the sample to workers displaced between 2004 and 2014 to ensure that in the first five years post-displacement, workers are expected to be observed each year, except if they have left Canada. For the analysis of outmigration, I restrict the sample to workers displaced between 2004 and 2009 and define them as having left Canada if they disappear from administrative records for five consecutive years.

3.2.4 Selecting the Control Workers

I use one-for-one nearest neighbor propensity score matching inside narrow partitions to create my control group. The matching strategy aims to compare displaced immigrants to similar non-displaced immigrants who were equally likely to experience displacement based on observable characteristics. This ensures that any post-displacement differences in the outcome variable can be attributed to the layoff rather than pre-existing differences between the treated and control group. For workers displaced in year t^*, the pool of potential control workers consists of all individuals who satisfy the sample selection criteria (aged 25-50, non-public sector employment, minimum two years

tenure, etc.) at time t^*.

The partitions I use for immigrants are year t^*, gender, region $\times$ education, years spent in Canada, age groups (25-30,...,45-50), and knowledge of official languages. For Canadian-born, I use year t^*, gender, and age groups. These variables are likely strongly associated with different earnings levels and earnings growth. Comparing individuals across these partitions would introduce a bias.

The region $\times$ education categorizes immigrants into different groups, similar to those of Dostie et al. (2023). These groups have significantly different earnings levels and earnings growth over their first ten years in Canada. This categorization is important because if I compare immigrants who lose their jobs to immigrants who don't, and one group has faster earnings growth due to their education level or country of origin, this would bias my estimate of job earnings losses following displacement. I define four groups by combining country origin status (advantaged or non-advantaged) with education level (has/hasn't a bachelor's degree or higher). Advantaged countries are the USA, Australia, New Zealand, and countries from northern EU and western EU. This yields four groups: advantaged with bachelor's degree or higher, advantaged with bachelor's degree or lower, non-advantaged with bachelor's degree or higher, and non-advantaged with bachelor's degree or lower.

I measure time in Canada using years since the first tax filing, rather than the official landing year, as this better captures Canadian labor market experience for those who may have worked or studied in Canada on a temporary permit before gaining permanent residency. The variable official language knowledge is immigrants' self-assessment of their knowledge of English and French. Immigrants report whether they know both, only one of them, or neither.

While other variables also matter, exact matching on them is not feasible because they are continuous or because they would create partitions that are too small, potentially resulting in no overlap in the support of the propensity score. Instead, inside each partition, I estimate the propensity score on the outcome of being displaced using a probit model that takes as input earnings measured in $t^* - 1$ and $t^* - 2$, age at $t^* - 1$, tenure at $t^* - 1$ and employer size at $t^* - 1$.

Then, for each displaced worker, I assign one control worker using one-to-one nearest neighbor matching. I perform this matching without replacement within the cell, and workers can be selected more than once across different years, as in Schmieder et al. (2023). To reduce potential bias from poor-quality matches, I remove any match where the difference in propensity score is higher than 0.1.

3.3 Firm Pay Premium

The displaced worker literature documents that moving down a job ladder, measured as transition to a firm with lower firm pay premiums, accounts for a significant portion of the impact of displacement on earnings losses (La-

chowska et al. (2020), Schmieder et al. (2023), Bertheau et al. (2023), Birinci et al. (2023), and others).

To quantify the contribution of this mechanism to displaced worker earnings losses and its potentially heterogeneous impact on immigrants according to their time spent in Canada, I estimate firm-specific pay premiums using an AKM model (Abowd et al., 1999) on the log of annual earnings. The firm fixed effects from this regression represent a time-invariant component of the pay policies of the firms that apply to all of their workers. One way to interpret them is that they capture firms' positions on the job ladder that workers climb throughout their careers. This approach will quantify the share of earnings losses due to workers moving to employers with lower pay premiums. Additionally, it will help me understand whether differences in post-displacement earnings losses across immigrants who spent more or less time in Canada can be explained by a differential impact of displacement on their position on the job ladder.

To estimate the firm pay premiums, I construct a sample distinct from the one used to analyze the impact of displacement. The estimating sample follows similar restrictions to those in Birinci et al. (2023). The sample consists of all workers aged 25-55 employed at firms with more than five employees and with annual earnings exceeding 4,000$ (approximately 400 hours at minimum wage). Workers in both the treated and control groups are dropped from this estimation sample. Because the dataset does not include information on hours worked or hourly wages, I exclude the first and last year of employment, as they are partial years and would lead to biased estimates of the firm pay premium. I keep only workers and firms inside the largest connected set, which consists of firms linked by workers who move between them. The worker fixed effects and the firm fixed effects are only identified for those within the largest connected set.

I estimate the firm fixed effects using an AKM (Abowd et al., 1999) based regression:

$$y_{ijt} = \alpha_i + \psi_{j(i,t)} + \theta_t + \beta X_{it} + u_{ijt} \tag{1}$$

where y_{ijt} is the log of earnings of worker i at firm j in period t, α_i are worker fixed effects, $\psi_{j(i,t)}$ are firm fixed effects, θ_t are year fixed effects and X_{it} are worker specific time-varying covariates; age and age-squared. I normalize age at 40 to identify the the coefficients on age and age square (Card et al., 2013).

A potential issue when estimating firm fixed effects is low mobility bias arising from low worker mobility between some firms. As highlighted in other articles in the displaced worker literature that estimate firm pay premiums, the low mobility bias is primarily a concern when decomposing the variance of firm fixed effects. Since I am using the estimated firm pay premium as an outcome in a regression, low mobility bias will increase measurement error and thus increase the standard errors associated with my coefficients of interest. However, it will not bias the treatment

effect estimates themselves (Lachowska et al. (2020), Bertheau et al. (2023)). Furthermore, using the same dataset, Birinci et al. (2023) document in their appendix that worker mobility in Canada is sufficiently high making this not a concern. Therefore, I proceed with estimation using the standard two-way fixed effects regression.

4 Methodology: Event Study and Matched Difference-in-Difference Design

4.1 Event Study Specification

I estimate the dynamic impact of displacement for immigrants by time in Canada using an event study specification. Let t_i^* be the year of displacement for individual i. The treatment effects of displacement on outcome y_{it} are measured with:

$$\begin{aligned} y_{it} = \alpha_i + \lambda_t &+ \sum_{k=-3, k\neq -1}^{k=5} \gamma_k \mathbb{1}(t = t_i^* + k) \\ &+ \sum_{k=-3, k\neq -1}^{k=5} \theta_k \mathbb{1}(t = t_i^* + k) \times \text{Displaced}_i \\ &+ X_{it}'\beta \\ &+ \epsilon_{it}. \end{aligned}$$

Where α_i are worker fixed effects, λ_t are time fixed effects, and X_{it} is age polynomial. Displaced_i is an indicator equal to one for workers who experienced displacement. The γ_k terms capture the mechanical earnings trajectory induced by the sample restriction requiring two years of tenure. This restriction selects workers on an upward earnings path leading up to displacement, followed by flatter positive earnings growth post-displacement for both groups in the absence of treatment effects. These γ_k terms separate this sample-induced trajectory from the true displacement effects captured by the θ_k coefficients (as described in Schmieder et al. (2023)). The coefficients of interest are θ_k and capture how the trajectory of the outcome variable differs between the treated workers and control workers k years relative to displacement. The θ_k are normalized with respect to θ_{-1} and the standard errors are clustered at the worker level. When the outcome is outmigration, I omit individual fixed effects since there is no within variation.

I estimate this specification separately for two subsamples: immigrants with fewer than ten years in Canada at

the time of displacement, and those with ten or more years at displacement. This allows the θ_k coefficients to vary across these two groups, capturing differential impacts of displacement by time in Canada. These regressions are estimated for different variables of interest. Namely: earnings, firm pay premiums, months nonemployed, indicator for employment, indicator for switching industry, indicator for switching province, and an indicator for outmigration.

4.2 Matched Difference-in-Difference Design

The event studies analysis provides an initial assessment of how displacement affects immigrants differently, based on their time in Canada and across different outcomes. To understand why earnings losses and other outcomes vary systematically with the number of years spent in Canada, I conduct two complementary analyses. For both analyses, I follow the same methodology. I construct individual-level treatment effects and estimate how years in Canada linearly affect the outcome in both a baseline specification and an augmented specification with additional covariates. I then apply the Gelbach (2016) decomposition to attribute the change in the years in Canada coefficient to each added covariate. First, I determine the extent to which heterogeneous displacement effects stem from differences in pre-displacement characteristics among workers. Second, conditional on those characteristics, I investigate how differences in post-displacement outcomes explain the heterogeneity in earnings losses by time in Canada.

4.2.1 Individual level Treatment

My sample consists of displaced workers matched to observably similar non-displaced controls. For each matched pair, I calculate a difference-in-differences to recover the individual-level treatment effect of displacement at the pair level on a specific outcome. I construct these treatment effects for the same outcomes I investigate in the event study analysis: earnings, firm pay premiums, number of months nonemployed, geographical mobility, and industry switching. Let t refer to the year of displacement. By construction, it is the same for the displaced workers and their matched control workers.

For each matched pair p, I construct an individual treatment effect of displacement for outcome y given by:

$$\Delta y_{DID,p} = \Delta y_{d,p} - \Delta y_{nd,p}.$$

This captures the difference-in-differences between displaced and non-displaced workers in outcome y where $\Delta y_{d,p}$ is the change in the outcome variable before and after displacement. Specifically, for the displaced worker in pair p, the change in outcome is:

$$\Delta y_{d,p} = \bar{y}_{d,p,post} - \bar{y}_{d,p,pre}$$

where $\bar{y}_{d,p,pre}$ represents the outcome y for the displaced worker at $t-1$ (one year before displacement), and $\bar{y}_{d,p,post}$ represents the mean during the post-displacement period from $t+1$ to $t+2$. Similarly, for the non-displaced worker:

$$\Delta y_{nd,p} = \bar{y}_{nd,p,post} - \bar{y}_{nd,p,pre}$$

where $\bar{y}_{nd,p,pre}$ represents the outcome y for the non-displaced worker at $t-1$ (one year before displacement), and $\bar{y}_{nd,p,post}$ represents the mean during the post-displacement period from $t+1$ to $t+2$.

4.2.2 Gelbach Decomposition

To analyze heterogeneous treatment effects, I regress individual-level outcomes on the number of years spent in Canada. The coefficient on years in Canada captures both the direct effect of time in the host country and indirect effects operating through characteristics that correlate with time in Canada and affect treatment outcomes.

If variable are added to this regression, any change in the coefficient provides information about how much of the heterogeneity is explained by differences in these characteristics. For instance, if established immigrants are systematically older at displacement and age independently affects earnings losses, then controlling for age will affect the coefficient on years in Canada compared to the regression that doesn't control for age, indicating that part of the effect of years in Canada actually operates through differences in age at displacement.

When there are multiple covariates, a natural approach is to sequentially add covariates and attribute changes in the coefficient to the latest variable added. However, if covariates are correlated with each other, this sequential approach produces results that depend on the order in which variables are added to the regression.

Gelbach (2016) provides a method to decompose the change in a coefficient when adding multiple covariates in a way that avoids the order-dependence problem of sequential addition. The Gelbach decomposition compares two regressions: a baseline specification and a full specification containing all covariates. It then applies the omitted variable bias formula to calculate how the change in the coefficient is attributable to each covariate added. The advantage is that the total change in the coefficient equals the sum of the individual contributions from each covariate, regardless of the order they might have been added sequentially.

Following Gelbach (2016), consider the full regression of the form:

$$\Delta y_{DID,p} = \beta_0 + \beta YSM_p + \gamma_1' X_{1p} + \gamma_2' X_{2p} + \varepsilon_p$$

where $\Delta y_{DID,p}$ represents the treatment effect for individuals in pair p, YSM_p denotes years since migration, X_{1p} captures the baseline control variables, and X_{2p} represents the additional covariates of interest.

To decompose how much of the change in the coefficient associated with years since migration is attributable to X_{2p}, I compare the coefficient on years since migration from two regressions: a baseline regression including only YSM_p and X_{1p} (yielding $\hat{\beta}^{base}$), and the full regression that additionally includes X_{2p} (yielding $\hat{\beta}^{full}$). The decomposition applies the omitted variable bias formula to express the difference between these coefficients as:

$$\hat{\beta}^{base} - \hat{\beta}^{full} = \hat{\alpha}' \hat{\gamma}_2$$

where $\hat{\gamma}_2$ is the vector of coefficients on X_{2p} from the full regression, and $\hat{\alpha}$ is the vector of coefficients obtained by regressing each variable in X_{2p} on the baseline regressors:

$$X_{2p,k} = \alpha_{0,k} + \alpha_k YSM_p + \Gamma_k' X_{1p} + W_{p,k}$$

for each covariate k in X_{2p}.

The individual contribution of each covariate k is calculated as $\hat{\alpha}_k \times \hat{\gamma}_{2,k}$. First, $\hat{\alpha}_k$ measures how much immigrants with different years since migration systematically differ in covariate $X_{2p,k}$ after controlling for baseline variables X_{1p}. Second, $\hat{\gamma}_{2,k}$ captures how much covariate $X_{2p,k}$ affects the outcome conditional on YSM_p, X_{1p}, and all other variables in X_{2p}. A covariate contributes more to explaining the change in the coefficient associated with years since migration when both components are large in magnitude.

For example, if immigrants with more years in Canada have systematically higher education levels compared to recent immigrants (large positive $\hat{\alpha}_{education}$), and education strongly reduces earnings losses (large positive $\hat{\gamma}_{2,education}$), then education will contribute to explaining why established immigrants have smaller earnings losses. Assuming the unconditional coefficient on years since migration is negative, adding education to the regression will make this coefficient more negative, such that the difference is positive between $\hat{\beta}^{base} - \hat{\beta}^{full}$. Hence, this indicates that part of the heterogeneity in earnings losses among established immigrants operates through their higher education levels. They appear to have lower earnings losses, but this is explained by their higher education levels.

The interpretation of the contribution is conditional on the set of variables in X_{1p} and X_{2p}. Changes to either set of covariates impact the contributions assigned to a covariate. Adding a new covariate to X_{2p} does not change $\hat{\alpha}_k$, since the correlation between $X_{2p,k}$ and YSM conditional on X_{1p} remains unchanged. However, it can change $\hat{\gamma}_{2,k}$ for all variables in X_{2p} because the full regression now conditions on additional variables when estimating the effect of $X_{2p,k}$ on the outcome in the full regression. In contrast, modifying X_{1p} affects both components: it changes $\hat{\alpha}_k$ since it changes the set of variables included when measuring the correlation between a variable $X_{2p,k}$ and YSM, and it can also change $\hat{\gamma}_{2,k}$ by changing the baseline controls in the full regression.

5 Descriptive Results

This section provides an overview of the sample constructed using the one-to-one matching procedure. I first compare the group of displaced workers, the group of matched control workers, and a group of randomly selected control workers, then examine how pre- and post-displacement characteristics vary with time spent in Canada. These descriptive statistics suggest that the matching procedure generated a comparable control group and provide initial evidence for heterogeneous treatment effects on labor market outcomes of interest by time in Canada.

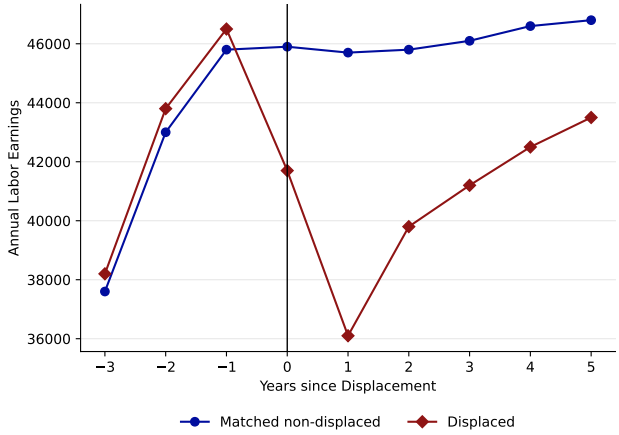
Table 1 shows that the matching procedure was successful. It presents summary statistics for displaced workers in column (1), the matched control workers in column (2), and lastly, in column (3), a group consisting of one randomly picked worker inside year-gender partition for each displaced worker. All variables are measured relative to the displacement year for displaced workers and the corresponding matched year for control workers. The analysis restricts the sample to workers with a displacement year or matched year between 2004 and 2014, which is the same sample used for the main analysis.

The table confirms that displaced workers and matched non-displaced workers have similar pre-displacement characteristics. In contrast, the differences between matched non-displaced workers and randomly selected workers are more pronounced, especially for their earnings at $t-1$. Matched non-displaced workers have lower earnings and slightly fewer years spent in Canada compared to randomly selected workers. These lower earnings likely stem from their higher probability of coming from non-advantaged countries, having education levels below a bachelor's degree, working in smaller firms, and having higher tenure. This highlights why using propensity score matching is important for building a comparable control group.

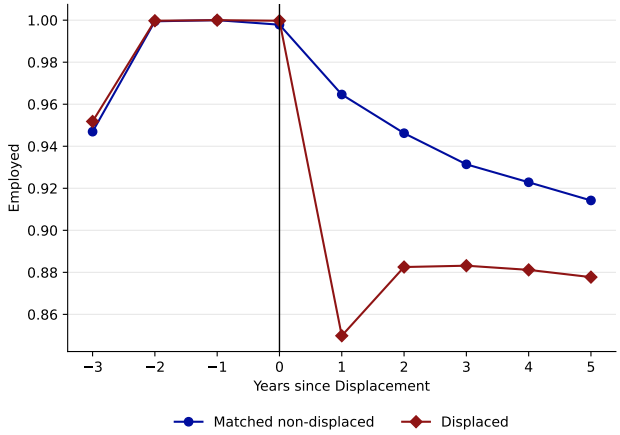
Characteristics	(1) Displaced workers	(2) Matched non-displaced workers	(3) Random non-displaced workers
Age at $t = 0$	41.57	41.56	41.86
	(5.61)	(5.61)	(5.68)
Gender (% Women)	0.43	0.43	0.46
	(0.49)	(0.49)	(0.50)
Tenure (Yrs.) at $t - 1$	3.93	3.93	4.23
	(2.10)	(2.07)	(2.21)
Yearly Earnings at $t - 1$	45 800	46 500	52 200
	(30 913)	(30 313)	(35 550)
Years since migration at $t = 0$	11.31	11.31	11.84
	(5.35)	(5.36)	(5.47)
Adv. BA+	0.01	0.01	0.04
	(0.11)	(0.11)	(0.19)
Adv. Not BA+	0.02	0.02	0.05
	(0.14)	(0.14)	(0.22)
Not Adv. BA+	0.42	0.42	0.43
	(0.49)	(0.49)	(0.49)
Not Adv. Not BA+	0.55	0.55	0.49
	(0.50)	(0.50)	(0.50)
Employer Size at $t - 1$	4 993	5 167	8 817
	(15 372)	(12 751)	(20 502)
Obs. (only for $t = 0$)	37 140	37 140	42 790

Note: For the matched non-displaced workers, their reference year is the displacement year of their matched displaced worker. The sample selection for all workers is: At $t = 0$, age 25-50, at least 2 years of tenure at $t - 1$ with an employer with more than 50 employees, and not in the public sector. Displaced workers (1) are workers who separate from their main employer during a mass layoff event and do not return in the following three years. Matched non-displaced workers in column (2) are selected using propensity score matching inside year-gender-region×education-YSM-age-knowledge of language partitions. Random non-displaced workers in column (3) are non-displaced workers selected randomly inside year-gender cells (one per displaced worker). Earnings in CAD 2012 prices. The sample used in this table includes all workers displaced during the period 2004-2014 and their matched control workers.

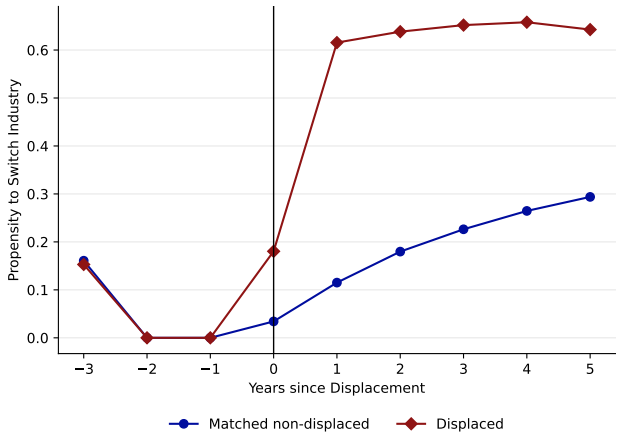
Table 1: Summary Statistics of the Displaced Workers and Control Workers



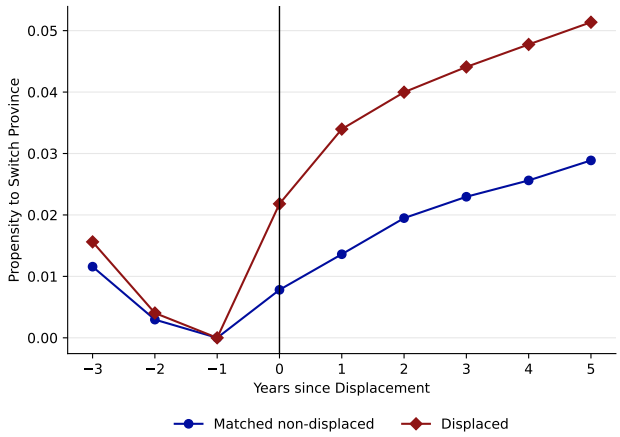
(a) Annual Labor Earnings ($)



(b) Employed



(c) Work in Different Industry from $t-1$



(d) Province Different from $t-1$

Figure 1: Raw Labor Market Outcomes Around Displacement

Note: The figure shows the labor market outcomes of displaced workers and matched control workers around the time of displacement. The relative year for each control worker is the year of displacement of the displaced worker they are matched with using the propensity score matching described in the text. The red line represents the mean of the variable for each year relative to displacement for the displaced workers, while the blue line represents the same for the matched control workers. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. This ensures that the only source of attrition from $t = 0$ to $t = 5$ in the sample is from outmigration. Earnings in 2012 prices.

Figure 1 provides graphical evidence that the treated and control groups follow similar pre-displacement trends and offer an initial view of the impact of displacement on the main outcomes of interest. The figure pools all workers displaced between 2004 and 2014 and their matched counterparts and shows their average labor market outcomes

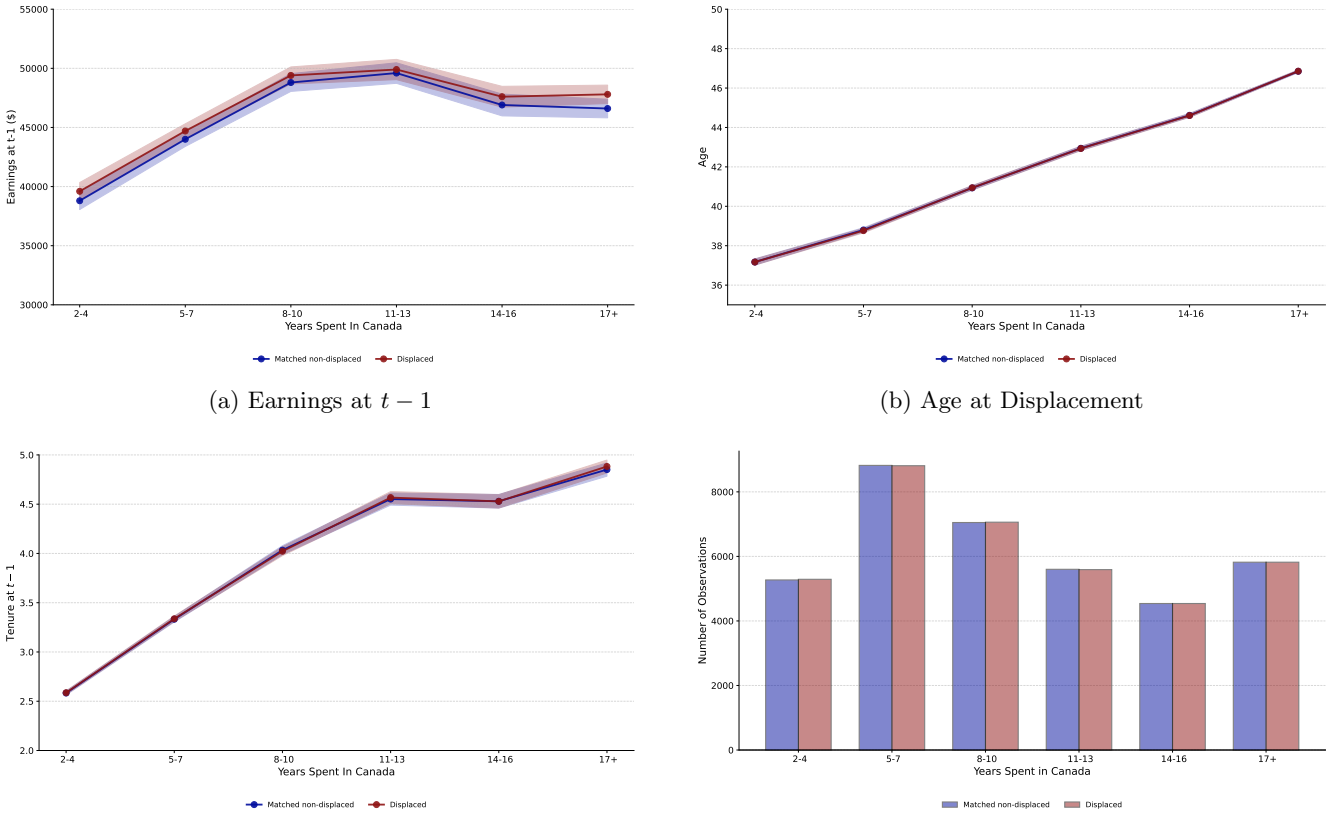
relative to the year of displacement (normalized to $t = 0$). The similar pre-trends across all labor market outcomes suggest the matching procedure successfully created a suitable control group.

Panel (a) shows the unconditional impact of displacement on earnings. In the first full year after displacement at $t+1$, displaced workers have lower earnings by around 9 600$, at 36 100$, compared to control workers who have average earnings of 45 700$. This represents a difference of around -21% and a gap in earnings persists for several years after displacement.

Panel (b) shows that displaced workers are more likely to be nonemployed for a whole year following displacement. Displaced workers have an employment rate of around 85% following displacement, while control workers have an employment rate slightly above 96%. Schmieder et al. (2023) have similar results, where control workers' employment, measured by the number of days worked in a year, decreases after their matched year while displaced workers spend much more time nonemployed and gradually recovered but lag behind even after five years. In the appendix, Figure A2 shows how the number of months nonemployed evolves around displacement. The results are similar [3].

Panel (c) shows that displaced workers are more likely to work in different industries after displacement, consistent with other empirical studies on displacement and industry switching (Neal, 1995; Poletaev and Robinson, 2008). Nearly 60% of displaced workers switch industries, while around 10% of workers in the control group do. Panel (d) shows that displaced workers are more than twice as likely to live in different provinces compared to $t-1$. Higher geographical mobility post-displacement is a common finding in studies examining the relationship between mobility and displacement (Huttunen et al., 2018; Messacar, 2022). Overall, the unconditional descriptive statistics on the impact of displacement on all immigrants are qualitatively similar to what is expected given the literature.

[3]The starting year, starting month, and last year and last month employed are only available if the workers separated from their employer between 2001 and 2019. For some workers, it may not be available even if the worker separates. In that case, I impute the starting and ending information using annual earnings in adjacent years, as was done by Castro et al. (2024).



(a) Earnings at $t-1$

(b) Age at Displacement

(c) Tenure at $t-1$

(d) Number of Observations

Figure 2: Descriptive Statistics of Selected Pre-displacement Variables by Years in Canada

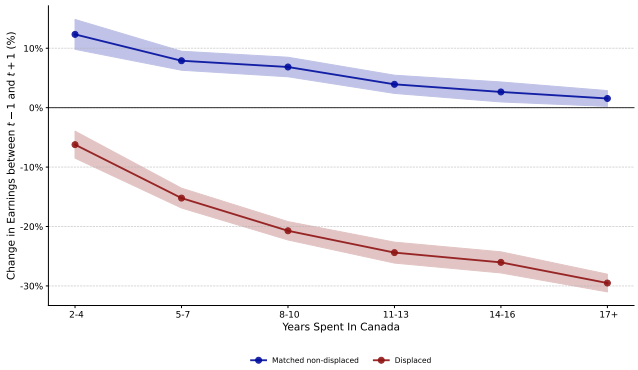
Note: The red line is the average of the variable in the panel for the displaced workers and the blue line for the control workers. The confidence interval is at the 95% level. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. Years spent in Canada is the number of years observed since the immigrants first reported taxes. Earnings in 2012 prices.

Figures 2 and 3 present descriptive statistics for selected variables from Table 1, broken down by time spent in Canada. They also provide an initial view of how displacement affects labor market outcomes differently based on time in Canada. I use three-year bins to smooth the descriptive statistics.

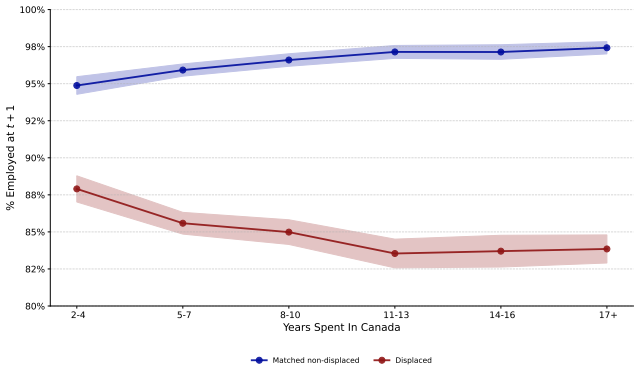
Panel (a) shows the average total labor earnings one year prior to displacement, deflated to 2012. Because of the sample restriction on tenure, this corresponds to a full year of employment at the main employer from which they are separated. Earnings increase with time spent in Canada, starting at 38 800$ for the first group and steadily increasing up to around 50 000$ at 8-10 years in Canada, then stagnating and decreasing slightly at 14-16 and 17+ years in Canada. The flattening of earnings growth after 8-10 years in Canada aligns with the age profile

shown in panel (b). Panel (b) shows that new immigrants are, on average, younger than established immigrants. New immigrants are in their prime earning years (late 30s to early 40s), while immigrants with longer tenure in Canada are in their mid-career, where earnings growth stagnates (mid to late 40s). This pattern is consistent with typical life-cycle earnings profiles. Tenure in panel (c) exhibits a similar pattern to age, both of which are positively correlated with time spent in Canada.

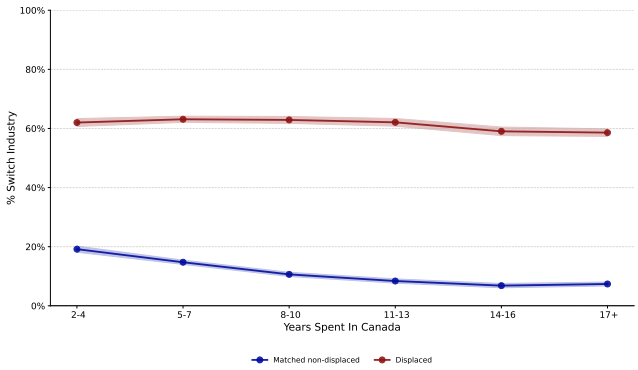
This suggests that some of the heterogeneous treatment effects by time spent in Canada may be explained by differences in composition among immigrants with varying time in Canada. For instance, Deelen et al. (2018) finds that older workers are more vulnerable to job loss compared to younger workers. Later in the paper, I use a decomposition method to address this formally. Lastly, Figure 2(d) shows the number of workers in each group, categorized by the number of years spent in Canada, binned in three-year intervals. Immigrants with more years in Canada comprise a smaller share of the sample, except for those who have arrived in Canada most recently. This partly captures how newer immigrants are more likely to be part of a mass layoff.



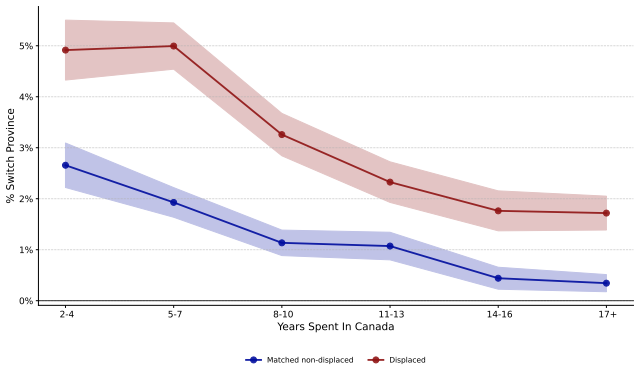
(a) Change in earnings between $t-1$ and $t+1$ (%)



(b) Employed at $t+1$



(c) Work in Different Industry from $t-1$ at $t+2$



(d) Province Different from $t-1$ at $t+2$

Figure 3: Descriptive Statistics of Selected Post-displacement Variables by Years in Canada

Note: The red line is the average of the variable in the panel for the displaced workers and the blue line for the control workers. The confidence interval is at the 95% level. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. Years spent in Canada is the number of years observed since the immigrants first reported taxes. Earnings in 2012 prices.

Figure 3 compares post-displacement outcomes for displaced workers and control workers. The results are broken down by years spent in Canada in three-year bins. Panel (a) shows the change in earnings between $t-1$ and $t+1$. For control workers, their earnings are growing, with increases above 10% for recently arrived immigrants, and steadily decline until it is around zero for those who have been in Canada for 17 years and more. For displaced workers, their earnings decrease, and the size of the decrease is greater for immigrants who have been in Canada longer. This pattern for control workers is consistent with the literature on earnings assimilation and the differences in average age across immigrants with varying time in Canada, as shown in Figure 2(b). This panel supports matching displaced immigrants within narrow years-in-Canada partitions, since the earnings growth of control

workers varies substantially by years spent in Canada. This suggests that control workers who best capture the counterfactual earnings growth of displaced workers are those with a similar number of years in Canada.

Panel (b) examines the employment rate one year after displacement. For control workers, employment rates increase from around 95% for recently arrived immigrants to 98% for those in Canada for longer. Displaced workers are gradually less likely to be employed following displacement as they spend more years in Canada. Immigrants in Canada who have been there for two to four years have an 88% employment rate, while immigrants with 11 or more years in Canada have an employment rate of around 83%.

Panel (c) compares the likelihood of working in a different industry at $t+2$ compared to $t-1$. The likelihood remains about the same for displaced workers in each three-year bin at around 60%. For control workers, they are initially more likely to switch industries at around 20%. This drops to 6% for immigrants who spent 16+ years in Canada. The declining propensity to switch industries after a longer time in Canada is consistent with the accumulation of industry-specific human capital.

Panel (d) shows that immigrants are more likely to migrate to another province when they are relatively new to Canada. The likelihood decreases in both groups as they spend more time in Canada. Displaced workers are nearly twice as likely to migrate compared to non-displaced workers. This holds for all groups of years spent in Canada and suggests that the hypothesis about immigrants having increasing moving costs over time spent in Canada is plausible.

These descriptive statistics support three key findings. First, the matching procedure successfully created a comparable control group. Second, they emphasize the need to separate the effects of pre-displacement characteristics from the direct impact of time in Canada on heterogeneous treatment effects. Third, they provide preliminary support for the theoretical predictions: recent immigrants appear to face different outcomes following displacement, particularly larger earnings losses associated with differences in post-displacement labor market behavior, including lower employment rates, higher rates of industry switching, and greater geographical mobility.

6 Main Results

6.1 Event Studies

The first part of the analysis estimates the dynamic treatment effect using the event study specification. I divide the immigrants into two groups: those with less than ten years in Canada and those with more than ten years. I keep workers displaced between 2004 and 2014 and their matched control workers. I recover the treatment effects on

earnings, earnings relative to $t-1$ (%), employment status, number of months nonemployed, propensity to switch industry, propensity to switch province, firm pay premium, and propensity to leave Canada. The treatment effects recovered in this section capture the overall difference in the impact of job loss without controlling for differences in characteristics. For policymakers interested in whether to target immigrants based on years spent in Canada, these are the main estimates of interest.

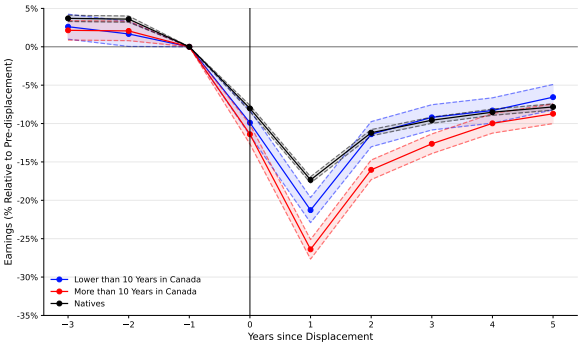
6.1.1 Earnings, Employment, Industry and Geographical Mobility

The main outcome of interest is the impact of displacement on total labor earnings. Figure 4(a) presents the impact of displacement on earnings as a percentage of total earnings one year before displacement. Figure 4(b) presents the impact in Canadian dollars. After displacement, workers experience significant earnings losses one year later, which persist for five years. This finding aligns with the displaced workers literature (Jacobson et al., 1993; Couch and Placzek, 2010; Bertheau et al., 2023), which also reports large and persistent earnings losses following displacement.

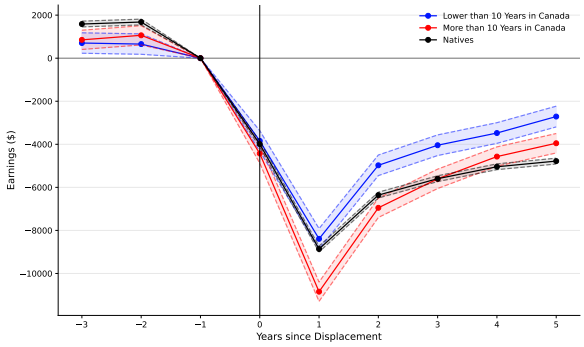
Immigrants with less than ten years in Canada lose around 21.3% of their pre-displacement earnings one year after displacement, equivalent to 8 400$. Immigrants with more than ten years in Canada face larger initial losses at 26.4% of pre-displacement earnings, or 11 850$. Five years after displacement, both groups show different earnings losses at 6.6% and 8.7%, respectively. While the sample does not allow direct comparison, natives experience immediate earnings losses of 17.3%, which are closer to those of immigrants with less than ten years in Canada. Established immigrants have earnings losses that are 24% larger. The difference is statistically significant and economically large. For comparison, Balgova and Illing (2024) finds a difference of around 18% between natives and immigrants, Illing et al. (2024) finds a difference of 40% between men and women, and Deelen et al. (2018) finds a difference of 31% in wage loss between younger and older workers.

While these results show economically large differences in earnings losses by time in Canada, they could be affected by selective outmigration. I examine this possibility and its implications for the main results in a later section, where I find limited evidence for the presence of a bias.

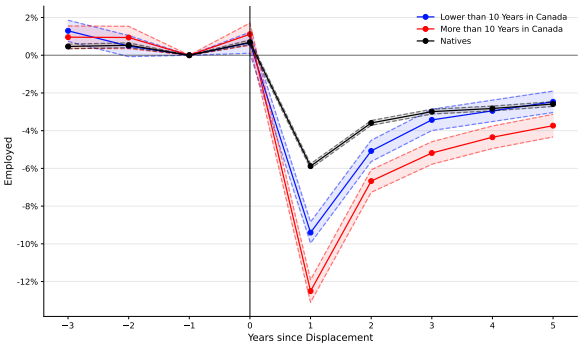
Figure 4 (c) shows the impact of displacement on an indicator of being employed in a year. Newer immigrants are 9.4 percentage points more likely to be nonemployed, while established immigrants are 11.9 percentage points more likely to be nonemployed for a difference of 3.1 percentage points. Figure 4 (d) uses an alternative measure of employment at the monthly level built using data on job spells at the monthly frequency. Both measures yield similar results. Newer immigrants spend 0.5 fewer months nonemployed one year after displacement compared to established immigrants. Differences in employment following displacement are an important explanation in other studies of heterogeneity in the impact of displacement (Schmieder et al., 2023; Balgova and Illing, 2024). For both



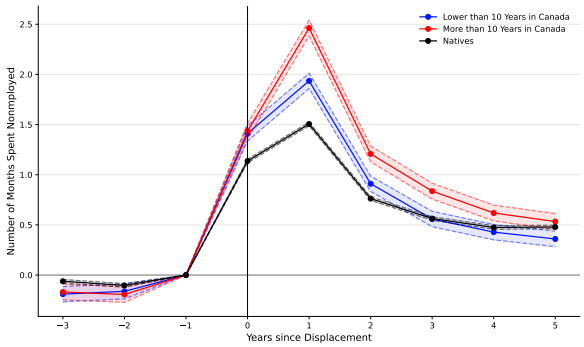
(a) Earnings (% Relative to Pre-displacement)



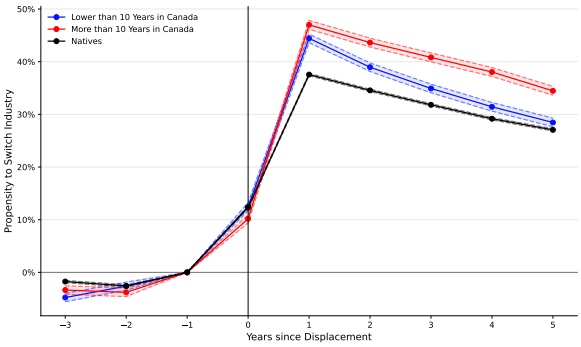
(b) Earnings ($)



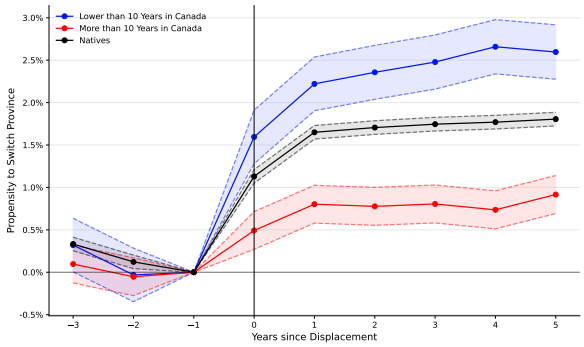
(c) Indicator for Employment



(d) Months nonemployed



(e) Industry Different from $t-1$



(f) Province Different from $t-1$

Figure 4: Labor Market Outcomes after Displacement by Years Spent in Canada

Note: The panels show all the event study coefficients, and their confidence intervals at the 95% level, for different labor market outcomes for immigrants by years spent in Canada and for natives. For instance, panel (a) shows how annual labor earnings relative to $t = -1$ (expressed as a percentage) evolve after displacement for each group. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include individual fixed effects, time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. Standard errors clustered at the worker level.

measures of employment, natives spend less time nonemployed in the first two years. Three years after displacement, they have similar outcomes as immigrants who have been in Canada for ten years or less.

Figure 4(e) presents the likelihood of switching industries and finds that newer immigrants are slightly less likely to switch. They switch at about 44% compared to 46%, with this difference being statistically significant but not economically important. Natives are less likely to switch, at around 38% one year after displacement. Figure 4 (f) compares the impact of job loss on geographical mobility across the two groups. Newer immigrants are approximately three times more likely to move provinces following displacement: 2.2% one year after displacement versus 0.8% for established immigrants. For this outcome, the rate of internal migration for natives following displacement falls between newer and established immigrants at around 1.6% one year after displacement.

6.1.2 Role of the Firms

Firms play a significant role in shaping the size and persistence of earnings losses from displacement (Lachowska et al., 2020; Bertheau et al., 2023; Birinci et al., 2023). Recent papers on the heterogeneous impact of job loss on earnings among groups of workers find that differences in movement on the job ladder are an important explanatory mechanism. These differences play an important role in explaining why workers have worse earnings losses following displacement in recessions (Schmieder et al., 2023), contribute to the gender wage gap following displacement (Illing et al., 2024), and in a setting closer to this paper, help explain why Balgova and Illing (2024) find that approximately 12% of the initial migrant-native gap in wages following job loss can be attributed to migrants being re-employed in firms with lower pay premiums.

I first document a similar pattern in the setting of this paper. Figure 5 shows that there is heterogeneity in firm pay premiums losses when comparing immigrants by time in Canada. Newer immigrants initially lose around 4.5% of their pre-displacement earnings due to moving down the job ladder toward lower-paying firms, while immigrants who have lived in Canada for ten years or more lose 7.2%. This represents a 60% larger loss for established immigrants compared to newer immigrants.

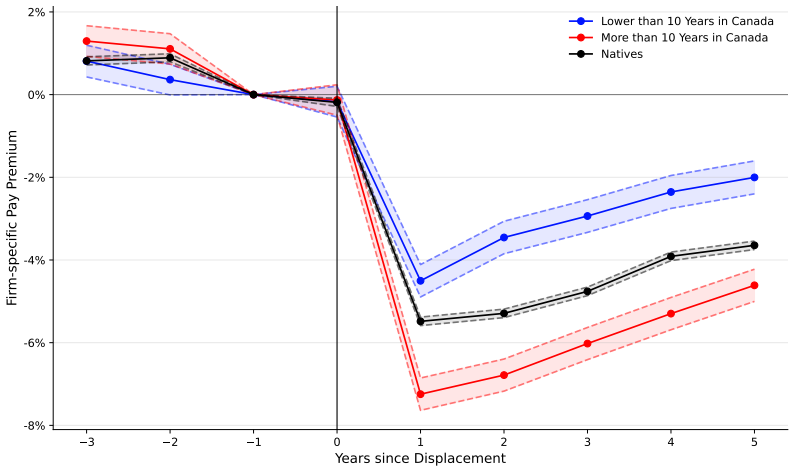


Figure 5: Firm Pay Premium Losses

Note: The figure show all the event study coefficients, and their confidence intervals at the 95% level, for the impact of job loss on firm pay premium for immigrants by years spent in Canada and for natives. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include individual fixed effects, time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. Standard errors clustered at the worker level.

Next, as was highlighted in the conceptual framework, two mechanisms could drive these differential firm pay premium losses.

The first mechanism is that established immigrants have more to lose because they occupy higher positions on the job ladder. When displaced, they fall back to the bottom of the ladder and must start over. Under this mechanism, both new and established immigrants find employment at similar firms following displacement. The difference in firm pay premium losses stems from their initial position on the job ladder; established immigrants fall from higher positions.

The second mechanism is that new and established immigrants differ in their ability to transition to high-quality firms following displacement. Under this mechanism, workers who separate from the same position on the job ladder experience different firm pay premium losses because they transition to firms at different positions on the ladder.

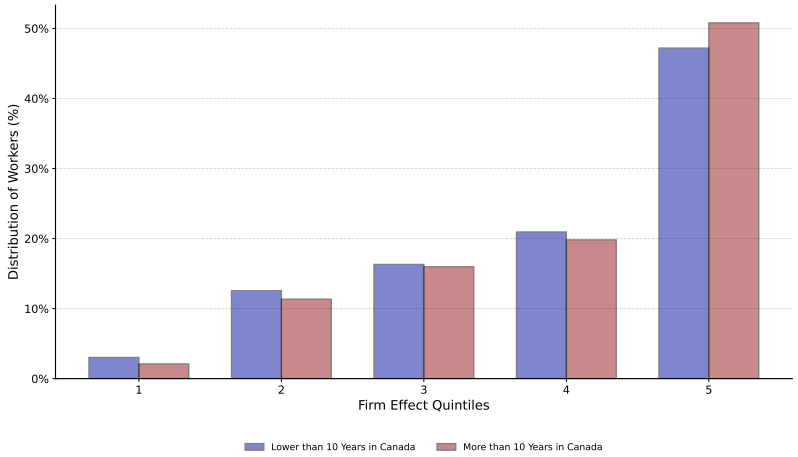


Figure 6: Distribution of Workers by Quintile of Firm Pay Premium by Years in Canada

Note: This figure shows the distribution of displaced workers across firm pay premium quintiles at their main employer in the year before displacement ($t = -1$), separately for workers with fewer than 10 years in Canada (blue) versus more than 10 years (red). The quintiles of the firm pay premium are constructed from the full universe of firms in the sample used to calculate the firm pay premium, not only from firms in the sample of displaced and control workers. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers.

To assess the relative importance of these two mechanisms, I first compare in Figure 6 whether the two groups differ in their pre-displacement distribution across firm quality quintiles. Then, I compare the transition matrix of immigrants with fewer than ten years in Canada and the transition matrix of immigrants with more than ten years in Canada.

Figure 6 plots the distribution of displaced workers across firm pay premium quintiles by time in Canada. Established immigrants are more concentrated at higher-paying firms. Specifically, 50.8% of established immigrants work in the top quintile (quintile 5) compared to 47.2% of newer immigrants, a 3.6 percentage point difference. At the bottom of the distribution, newer immigrants are overrepresented in the first quintile: 3% of newer immigrants versus 2% of established immigrants. In the remaining quintile, quintile 2 to quintile 4, immigrants with less than ten years in Canada are slightly more concentrated, but the differences are smaller. While differences in the distribution on the job ladder could explain some of the differential firm premium losses shown in Figure 5, the relatively modest gaps suggest that reemployment patterns play a significant role in explaining the heterogeneity in firm pay premium losses between the two groups.

Pre-disp.	Post-disp.				
	Q1	Q2	Q3	Q4	Q5
Q1	29.2%	18.8%	14.6%	18.8%	18.8%
Q2	11.4%	35.6%	24.8%	16.3%	11.9%
Q3	6.1%	19.5%	29.8%	26%	18.7%
Q4	4.4%	8%	19.5%	35.2%	32.8%
Q5	3.4%	6%	7.5%	19.5%	63.6%

(a) Lower than 10 Years in Canada

Pre-disp.	Post-disp.				
	Q1	Q2	Q3	Q4	Q5
Q1	39.1%	26.1%	13%	13%	8.7%
Q2	16.4%	32.8%	32.8%	11.7%	6.2%
Q3	6.6%	23%	40.4%	21.9%	8.2%
Q4	4.9%	9.4%	21.9%	41.5%	22.3%
Q5	4.1%	7%	8.8%	22%	57.8%

(b) More than 10 years in Canada

Note: This table shows transition probabilities from pre-displacement firm pay premium quintiles (rows) to post-displacement quintiles (columns) for displaced workers. Panel (a) includes workers with 10 years or less in Canada at the time of displacement, while panel (b) includes workers with more than 10 years in Canada. Pre-displacement quintiles are measured at the main employer in the year before displacement ($t = -1$), and post-displacement quintiles are measured at the main employer one year after displacement ($t = +1$). The sample is restricted to workers who were employed at both $t = -1$ and $t = +1$ at firms where the firm pay premium is available. The quintiles are constructed from the full universe of firms in the sample used to calculate the firm pay premium. The sample includes workers displaced during the period 2004-2014 only.

Table 2: Pre-displacement to Post-displacement Transition of Firm Quintile by Time in Canada

Table 2 shows transition probabilities for newer immigrants (panel a) and established immigrants (panel b). Newer immigrants have better reemployment outcomes across the entire distribution of firm quality. Workers in the fifth quintile (highest-paying firms) before displacement are more likely to find employment in the same quintile one year after displacement: 63.6% of newer immigrants stay in the fifth quintile compared to 57.8% of established immigrants, a 5.8 percentage point advantage. The pattern is even more striking for workers in the first quintile (lowest-paying firms): only 29.2% of newer immigrants remain in the same quintile versus 39.1% for established immigrants. Newer immigrants are 9.9 percentage points more likely to move up the job ladder. This pattern is consistent across all quintiles, with newer immigrants consistently showing higher probabilities of maintaining or improving their firm quality post-displacement.

The two pieces of evidence support that both mechanisms contribute to the larger firm pay premium losses experienced by established immigrants. The relatively small difference in the distribution on the job ladder by time in Canada, compared to the larger difference in transition to employment and initial position on the job ladder, suggests that the second mechanism plays a larger role in explaining the 60% gap in firm premium losses.

It is important to be cautious about how this translates to our understanding of how time spent in Canada shapes the labor market experiences of immigrants. The two groups considered in the event studies differ significantly in characteristics that can affect their ability to find employment in similar pre-displacement jobs. Since older workers generally experience more severe impacts from job loss (Deelen et al., 2018), and immigrants who have spent more years in Canada are older on average, the observed differences in job ladder mobility may reflect age-related factors

rather than purely immigration-related ones. In the section on the Gelbach decomposition, I provide an alternative estimate that takes into account differences in observables and demonstrates that these significantly affect the link between years in Canada and heterogeneity in loss of firm pay premium.

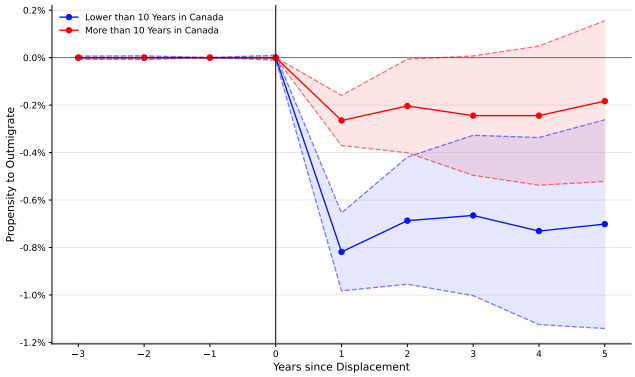
6.1.3 Outmigration

Immigrants choose whether to stay or leave Canada by weighing numerous tradeoffs, and displacement can affect their decision to stay. Dustmann and Görlach (2016) presents a discrete choice model highlighting key determinants of this choice: differential human capital accumulation rates, price levels between countries, asset accumulation, and potential wages in each country. Since displacement creates a large and persistent shock to earnings, employment, and wages, the model in Dustmann and Görlach (2016) predicts that it affects the decision of the displaced immigrant to leave or stay in the country.

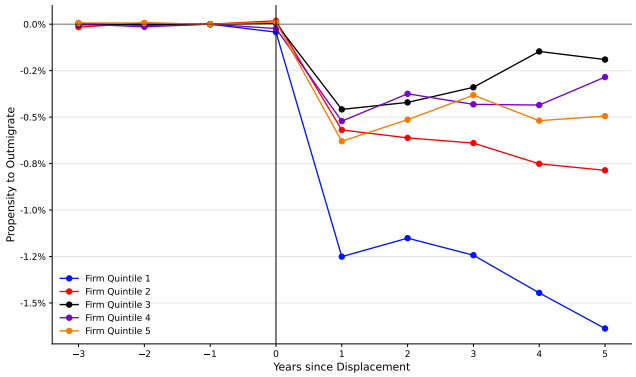
Job loss affects each immigrant differently within this framework, as the impact depends on the parameters of the model. Different parametrization of the model, such as locational preferences, skill transferability, purchasing power differentials, or skill accumulation rates, generate different decision rules for whether to stay or return. For instance, some immigrants might accumulate assets to a target level before leaving Canada. For them, displacement would delay their departure by slowing asset accumulation. Other immigrants with highly transferable skills might compare their potential earnings in each country and decide to leave after displacement if it significantly reduces their potential earnings in the destination country. The empirical impact of displacement thus depends on the characteristics of the immigrant and their origin and destination countries.

I estimate four event studies to measure how displacement affects outmigration. The specification is the same as previous event studies, but excludes individual fixed effects since there is no within variation. The sample consists of workers displaced between 2004 and 2009. This ensures that I can reliably identify immigrants who left, because anyone missing from administrative data for five consecutive years is likely to have left Canada. In Canada, even if you have low or no earnings, you are incentivized to file taxes because it is necessary to apply for different social benefit programs. I estimate how displacement affects outmigration across four dimensions: (1) years in Canada, (2) pre-displacement firm quality, (3) earnings levels relative to other displaced workers, and (4) age.

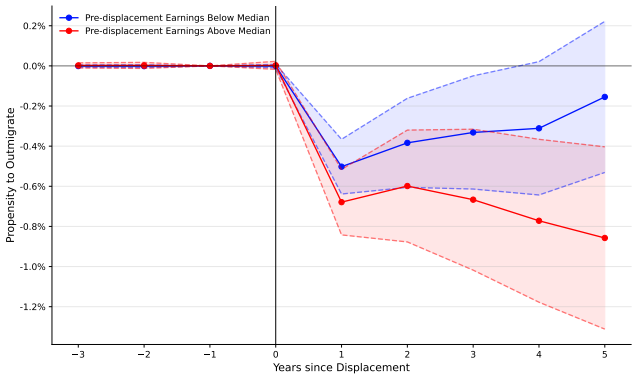
Figure 7 summarizes the results. Panel (a) shows that recent immigrants are 0.8 percentage points less likely to leave Canada following displacement, even after five years. This represents a substantial impact, given the baseline outmigration rate of 3.4 percentage points in the control group. Established immigrants also experience an initial reduction in outmigration of approximately 0.2 percentage points. However, after five years, the difference in outmigration rates becomes not statistically significant for this group. I cannot reject the hypothesis that the



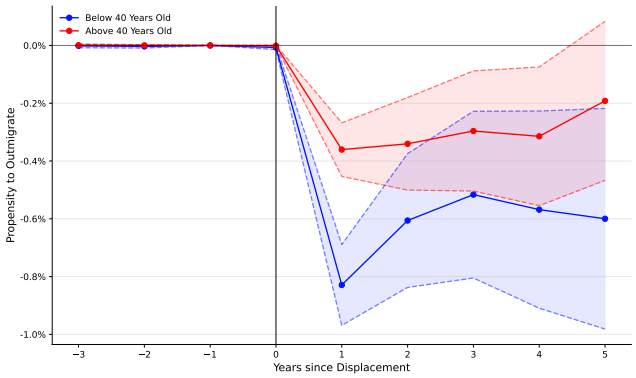
(a) by Years Spent in Canada



(b) by Pre-Displacement Firm Quality



(c) by Pre-Displacement Earnings



(d) by Age

Figure 7: Impact of Displacement on Outmigration

Note: The figure show all the event study coefficients, and their confidence intervals at the 95% level. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2009 and their matched control workers. Standard errors clustered at the worker level.

outmigration rate is the same between control and treated groups for immigrants with ten or more years in Canada. One interpretation of these results is that established immigrants are more attached to the host country, which is why they remained in Canada longer. Displacement may temporarily delay their departure, but it does not affect their decision as it would for newer immigrants.

Panels (b) and (c) show how the outmigration rate post-displacement varies conditional on pre-displacement firm quality and earnings. Initially, displacement reduces outmigration rates across all groups. This decrease is largest for workers in the lowest-paying firms and those with higher pre-displacement earnings. Workers with below-median pre-displacement earnings eventually return to outmigration rates similar to their control group five years after displacement. For them, displacement only delays departure. While confidence intervals are not shown in Panel (b) to preserve readability, a version with confidence intervals is available in Appendix Figure A3. The differences across quintiles of the firm pay premium are not statistically significant for quintiles 2 through 5, and are only marginally statistically significant for the first quintile.

In Panel (d), I show that age at displacement significantly affects outmigration rates. Younger workers (under 40) experience an initial decrease in outmigration of approximately 0.9 percentage points, an effect comparable in magnitude to the estimates by years in Canada. This reduction persists through year five. In contrast, older workers (above 40) show a smaller reduction in outmigration.

Displacement delays outmigration across all specifications one year after displacement. Other studies of immigrants and displacement do not report comparable estimates. Several articles (Bijwaard, 2009; Bijwaard and Wahba, 2014, 2019) examine the relationship between earnings at their arrival, transitions to unemployment, and outmigration, finding that lower earnings and transitions to unemployment increase outmigration. However, their identification strategy and setting in a European country differ considerably from mine. These results are likely Canadian-specific, as the outmigration decision depends on many factors that vary with the origin-destination country characteristics and the selection process for accepting immigrants. Overall, the impacts show clear patterns in the short run that are meaningfully large relative to the baseline outmigration rate in the control group.

6.2 Gelbach Decomposition

This section is broken down into two parts. First, I assess how differences in pre-displacement characteristics explain heterogeneity in treatment effects across the same labor market outcomes examined in the event studies. Then, I focus on earnings and assess how different post-displacement mechanisms explain the differential earnings losses, conditional on pre-displacement characteristics.

6.2.1 Pre-Displacement Characteristics

As shown in the descriptive statistics section, time in Canada correlates with other observable characteristics. Therefore, the heterogeneous treatment effects estimated in the previous section could be a result entirely from differences in composition between immigrants with fewer versus more years in Canada, rather than from the actual process of accumulating Canadian experience. The objective of this section is to answer: how much of the heterogeneity in treatment effects across groups can be explained by pre-displacement differences in observable characteristics?

To do so, I follow the method proposed by Gelbach (2016). I first compare a baseline regression to a full specification that includes pre-displacement characteristics of both the worker and its main employer. In the baseline regression, the outcome variable is the individual-level treatment effect measured using difference-in-differences with displaced and matched control workers. The only covariates are a constant and the number of years spent in Canada.

The additional covariates in the full specification capture factors expected to affect post-displacement labor market outcomes and to correlate with the number of years spent in Canada. For instance, workers displaced during the Great Recession experience larger earnings losses. If recently arrived immigrants face lower displacement risk during economic downturns, then some heterogeneous treatment effects by years since migration may reflect this pattern rather than an effect related to spending time in Canada.

Similarly, several studies document age effects on displacement outcomes. Jacobson et al. (1993) find that younger workers initially experience larger earnings losses but recover faster than older workers five years post-displacement. Deelen et al. (2018) show that older workers suffer higher earnings losses due to reduced employment and suggest this is related to having higher reservation wages, as they have more savings. While this example focuses on earnings as the outcomes of interest and age at displacement, other variables correlate with time spent in Canada and can affect the treatment effect of other labor market outcomes such as employment and geographical mobility.

I include all pre-displacement characteristics that: (1) plausibly affect post-displacement outcomes, (2) plausibly have variation across immigrants with different time in Canada. The decomposition has a useful property: including variables that fail to satisfy these criteria does not bias the results. If a variable neither affects the outcome nor correlates with time in Canada (conditional on other controls), its estimated contribution will be zero. Thus, the main specification adds many control variables even if some of them might not satisfy the two criteria for all of the outcomes.

The variables added to the full regression include demographic characteristics of the displaced immigrants and characteristics of their pre-displacement firms. All time varying variables are measured in the year before

displacement. Worker characteristics include age, tenure, year of job loss, province of residence, region $\times$ education, knowledge of official languages upon arrival in Canada, and gender. Firm characteristics include industry of the firm, log employment at the firm, share of immigrants at the firm, and decile of firm pay premium.

Table 3: Decomposition of Pre-displacement Characteristics

	Earnings	Firm Pay Premium	Months Nonemployed	Switch Province (x100)	Switch Industry
Baseline	-0.0082***	-0.0037***	0.0485***	-0.129***	0.00454***
	(0.0009)	(0.0003)	(0.0049)	(0.0208)	(0.000653)
Full	-0.0040***	0.0007*	0.0401***	-0.0281	0.00212**
	(0.0013)	(0.00038)	(0.0066)	(0.0286)	(0.000861)
Difference	-0.0042***	-0.0044***	0.0084*	-0.1009***	0.0024***
	(0.0009)	(0.0003)	(0.0047)	(0.0200)	(0.0006)
Demographics:					
Age	-0.0021***	-0.0010***	0.0029	-0.0410***	-0.0001
Tenure	0.0000	0.0004***	-0.0036*	0.0204**	0.0005*
Gender	-0.0003***	-0.0005***	0.0034***	-0.0056***	0.0004***
Official Language	-0.0002	-0.0001	0.0041***	-0.0019	-0.0002*
Region × Education	-0.0009***	-0.0014***	0.0036**	0.0074	-0.0007***
Province	-0.0011***	-0.0006***	0.0065***	-0.0795***	0.0000
Firm Characteristics:					
Decile AKM	-0.0007***	-0.0012***	0.0014***	-0.0046**	-0.0001
Share Immigrants	0.0006***	0.0003***	-0.0042***	-0.0002	0.0000
Log Employment Size	0.0002***	0.0000	-0.0027***	0.0008	0.0001**
Industry	-0.0001	-0.0004***	0.0001	0.0078	0.0018***
Other: Year of Displaced	0.0003***	0.0002***	-0.0030***	-0.0044*	0.0006***
Obs.	36 100	28 900	35 900	35 700	27 500

Note: This table presents results from a Gelbach decomposition analyzing the role of pre-displacement characteristics in explaining the heterogeneous impact of years in Canada on labor market outcomes following displacement. The baseline regression includes a constant and years in Canada. The full regression adds pre-displacement characteristics grouped into demographics (age, tenure, gender, official language proficiency, region × education, and province), firm characteristics (decile of AKM firm fixed effect, share of immigrants at the firm, log employment size, and industry), and year of displacement. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the pre-displacement characteristics. The bottom panels report the contribution of each group of variables to this difference. Standard errors are in parentheses. For the outcome of switching province, the coefficients and standard errors are multiplied by a hundred for readability. The sample includes workers displaced during the period 2004-2014 and their matched control workers. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

Table 3 presents results of the Gelbach decomposition which show how pre-displacement characteristics affect the coefficient on years in Canada. The first row contains the coefficient on years in Canada from the baseline regression, while the second row shows the same coefficient from the regression that includes the full set of pre-displacement characteristics. The third row displays the difference between the two coefficients. The remaining rows break down how each variable contributes to the difference in the coefficient. For the outcome of switching province, the coefficients and standard errors are multiplied by a hundred for readability.

A first look at Table 3 shows that controlling for pre-displacement characteristics affects the coefficients across all outcomes and reduces the magnitude of the relationship between years in Canada and the outcomes. Most remain statistically significant with the same sign. However, for the firm pay premium losses, the sign reverses after controlling for observable characteristics: immigrants who have been in Canada longer now show smaller losses on the job ladder. Similarly, for internal migration across provinces, the coefficient is no longer statistically significant in the full regression. Pre-displacement characteristics explain varying shares of the baseline relationship: 17% for nonemployment duration, approximately 50% for earnings and industry switching, and 78% for geographic mobility.

Among the demographic variables, a few stand out as particularly important across a few outcomes. Age at displacement explains a large portion of the heterogeneity in earnings losses and in the firm pay premium losses. The positive correlation between age at displacement and years spent in Canada suggests that age at displacement leads to increased earnings losses, firm pay premium losses, and lower geographical mobility post-displacement. This is consistent with older workers having worse outcomes following displacement (Deelen et al., 2018). Similarly, the estimates of moving cost indicates that it increases with age (Kennan and Walker, 2011; Ransom, 2022), which aligns with my results that established immigrants are less mobile partly because they are older.

Another important demographic variable is the province of residence of the displaced workers. Its contribution to earnings and firm pay premium is 26% and 14%, respectively, of the total difference between the coefficients. It also has high explanatory power for the number of months nonemployed and geographical mobility. For the labor market outcome, the sign of the contribution indicates that newer immigrants are located in stronger labor markets, as it shrinks the coefficient toward zero. If established immigrants were located in the same province, their earnings losses, for instance, would be smaller. This is consistent with the literature on immigrants' decisions about where to locate upon arriving in a new country, where they tend to settle or migrate to better-performing local labor markets (Borjas, 2001).

Among the variables related to the firm characteristics, two have a relatively large impact on explaining the heterogeneous treatment. First, the position on the job ladder, measured as the firm pay premium decile of the employer before displacement, explains 17% of the difference in the coefficient when the outcome is earnings and

27% when the outcome is the firm pay premium. The contribution of firm position to the decomposition quantifies the "more to lose" idea, where, loosely speaking, established immigrants face higher losses because they simply have more to lose. Interestingly, the sign on the contribution of position on the job ladder to the number of months nonemployed suggests that a higher position on the job ladder is linked with less time spent nonemployed.

Second, the share of immigrants at the pre-displacement firm also has a relatively large impact on a few key variables. The correlation between the share of immigrants and years spent in Canada is negative. This is not new in the literature, and it is associated with the idea that newcomers initially locate in areas with a higher proportion of immigrants (Damm, 2009) and are more likely to find work through networks of co-nationals (Engdahl et al., 2024). The sign on its contribution to the differences in the coefficients indicates that a higher share of immigrants at the firm has a negative impact on the treatment effects of earnings, firm pay premium, and months nonemployed. In other words, if new and established immigrants worked in firms with similar immigrant shares before displacement, established immigrants would experience larger losses while newer immigrants would experience smaller losses.

Lastly, the year of displacement contributes to the heterogeneous treatment effect for all variables, albeit to a lesser extent. This variable captures whether immigrants with different lengths of years in Canada are differentially affected by the economic conditions at the time of displacement. For instance, newer immigrants may be disproportionately displaced during recessions. Since job loss during a recession increases earnings losses (Schmieder et al., 2023), the sign of the contribution of the displacement year to labor market outcomes suggests that newer immigrants are more likely to be displaced during years when losses are larger.

The main results are robust across alternative specifications with different sets of control variables. For most outcomes, the qualitative results (sign and statistical significance) are similar. However, the results for the firm pay premium are more sensitive to the choice of the specification. While the specification in Table 3 shows a sign reversal from negative to positive, this coefficient becomes statistically insignificant in several alternative specifications.

Overall, this analysis shows that the heterogeneity in treatment effects by years in Canada stems partly from differences in observable characteristics that also correlate with the impact of job loss. The decomposition provides evidence for the "more to lose" mechanism: established immigrants' position on higher rungs of the job ladder explains 17% of their larger earnings losses and 27% of their larger firm pay premium losses. However, the near-zero relationship between time in Canada and firm pay premium losses after controlling for initial position on the job ladder and other observable characteristics suggests that differential ability to maintain position on the job ladder when reemployed is not a primary driver of heterogeneity in losses of firm pay premium. The province of residence also plays an important role, with newer immigrants locating in stronger labor markets that partially offset displacement losses. The only two outcomes where the heterogeneous treatment effect by time in Canada remains

both statistically and economically significant after controlling for pre-displacement characteristics are earnings losses and the number of months nonemployed.

6.2.2 Post-Displacement Mechanisms

Having established that years spent in Canada affect earnings losses, even after controlling for pre-displacement characteristics, I now investigate which post-displacement mechanisms drive this heterogeneity. Differences in treatment effects on earnings could arise because newer versus established immigrants have different post-displacement outcomes in other labor market dimensions that affect earnings, providing suggestive evidence of potential underlying mechanisms.

I apply the same decomposition approach to post-displacement characteristics. The baseline regression includes a constant, years in Canada, and all pre-displacement characteristics from the previous section. This setup isolates which post-displacement factors explain the conditional impact of years since migration on earnings, given the pre-displacement characteristics.

The full regression includes five post-displacement variables: difference-in-difference estimates of changes in firm pay premiums, months worked, industry switching, internal migration and an indicator for missing difference-in-difference estimates of changes in firm pay premiums and industry switching. I include this indicator since workers who are not employed have missing values for the firm pay premium and for the industry of their employer.

	Earnings
Baseline	-0.004***
	(0.0013)
Full	-0.0004
	(0.0011)
Difference	-0.0036***
	(0.0007)
Post-Displacement Outcomes	
Firm Pay Premium	0.0003**
Indicator for missing Outcomes	0.0138***
Number of Months nonemployed	-0.0040***
Switch Province	0.0000
Switch Industry	0.0001*
Obs.	35 500

Note: This table presents results from a Gelbach decomposition analyzing the role of post-displacement outcomes in explaining the heterogeneous impact of years in Canada on earnings losses following displacement. The baseline regression includes a constant, years in Canada, and all pre-displacement characteristics. The full regression adds five post-displacement variables: difference-in-differences estimates of changes in firm pay premiums, number of months nonemployed, industry switching, provincial migration, and an indicator for missing firm pay premium and industry outcomes. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the post-displacement variables. The bottom panel reports the contribution of each post-displacement variable to this difference. Standard errors are in parentheses. The sample includes workers displaced during the period 2004-2014 and their matched control workers. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

Table 4: Decomposition of Post-displacement Characteristics

Table 4 presents the results from both the baseline and full regressions. The sample differs slightly because some displaced workers have missing post-displacement variables. The baseline coefficient remains close to the previous analysis at 0.4 percentage points higher earnings loss per year in Canada. In the full specification, the coefficient drops to 0.04 percentage points and loses statistical significance.

The decrease in the coefficient toward zero suggests that differences in post-displacement outcomes across these mechanisms can account for the remaining heterogeneity. In other words, the heterogeneity in earnings losses can be associated with heterogeneity in other post-displacement outcomes. The details of the Gelbach decomposition in Table 4 show that longer nonemployment duration explains nearly all of the difference between the baseline and full specification, accounting for 0.40 of the total 0.36 difference in the coefficient. Nonemployment duration works in the opposite direction from the other mechanisms and more than offset their combined effect.

The other post-displacement outcomes play smaller roles: firm pay premium losses contribute 0.03 to the decrease of the coefficent, while provincial switching accounts for none. Both of them have virtually no contribution to the heterogeneity in earnings losses. Given the results in the previous analysis, this is not surprising since there were no heterogeneous treatment effects, conditional on pre-displacement characteristics, on these outcomes. Similarly,

industry switching shows virtually no contribution to explaining the heterogeneity. Considering the heterogeneous treatment effects for this outcome in the previous section, it implies that the impact of industry switching on earnings losses, conditional on pre-displacement characteristics and other outcomes, is close to zero.

Exploring which underlying factors cause these results is outside the scope of this paper. One potential explanation involves the relationship between accumulated wealth and reservation wages. Immigrants likely arrive in Canada with relatively low savings, regardless of their age or other characteristics at the time of arrival. Over time, however, those who spend more years in Canada accumulate greater assets. Following displacement, established immigrants can draw upon these accumulated savings to finance their job search, which raises their reservation wage and extends the time they spend nonemployed. This wealth effect would lead to longer unemployment duration and, through the duration-dependent wage penalties documented by Hyman et al. (2024), larger earnings losses.

Another explanation is that established immigrants are overly optimistic about their employment prospects, which raises their reservation wages and leads them to spend more time nonemployed following displacement. Mueller and Spinnewijn (2023) document that displaced workers who are most optimistic about their reemployment wages also report the highest perceived chances of finding a job, yet their actual job-finding prospects are lower. Established immigrants may exhibit similar patterns of over-optimism, which could explain the results of this section.

7 Robustness and Additional Results

7.1 Outmigration and Sample Selection Bias

7.1.1 Selection and Compositional Effects

Immigrants can return to their country of origin or migrate onward, potentially biasing our results in two ways. First, selection bias arises when immigrants leave Canada for reasons unrelated to displacement. Those who leave Canada might have different earnings trajectories following displacement than those who stay, even without actual displacement. For instance, individuals who would perform poorly if displaced might be more likely leave. When comparing immigrants with different lengths of time spent in Canada, there would be a positive bias because immigrants who have been in Canada longer represent a self-selected group that is, on average, less vulnerable to displacement effects.

Second, displacement may change who leaves Canada following displacement and create bias by modifying the composition of those who stay. This can happen whether or not displacement affects total outmigration rates. If

displacement alters the composition of leavers and selects immigrants with different earnings growth, it generates an additional source of bias. For example, displacement might cause immigrants with lower earnings growth to delay leaving Canada due to budget constraints. This compositional change would negatively bias our estimates by retaining workers with poor earnings growth who would otherwise have left the sample.

	Matched non-displaced		Displaced	
	Left before $t = 5$	Stayed at least until $t = 5$	Left before $t = 5$	Stayed at least until $t = 5$
Number of Workers	750	21 430	670	21 520
Share of Sample	3.4%	96.6%	3%	97%
Gender (% Women)	0.29	0.42	0.31	0.42
	(0.46)	(0.49)	(0.47)	(0.49)
Pre-displacement characteristics:				
Age at $t - 1$	39.65	41.76	39.78	41.75
	(5.88)	(5.42)	(5.79)	(5.43)
Yearly Earnings at $t - 1$ ($)	53 500	43 700	52 900	44 100
	(38 964)	(28 058)	(36 748)	(27 796)
Tenure at $t - 1$ (years)	3.36	3.64	3.42	3.65
	(1.49)	(1.62)	(1.47)	(1.59)
Employer size at $t - 1$	3 347.74	3 123.27	2 694.99	3 326.53
	(10 166.63)	(10 346.24)	(6 199.16)	(7 858.95)
Years since migration	9.26	11.44	9.58	11.42
	(4.76)	(5.26)	(4.91)	(5.26)
Region of Origin × Educ. Level :				
Advantaged BA+	0.03	0.01	0.01	0.01
	(0.17)	(0.08)	(0.15)	(0.08)
Advantaged not BA+	0.03	0.02	0.03	0.02
	(0.20)	(0.13)	(0.18)	(0.14)
Not advantaged BA+	0.55	0.37	0.55	0.37
	(0.50)	(0.48)	(0.50)	(0.48)
Not advantaged not BA+	0.37	0.61	0.39	0.60
	(0.48)	(0.49)	(0.49)	(0.49)
Post-displacement outcomes:				
Employed at $t + 1$	0.88	0.96	0.67	0.83
	(0.31)	(0.19)	(0.47)	(0.38)
Yearly Earnings at $t + 1$ ($)	42 700	43 500	28 200	32 400
	(44 336)	(31 225)	(37 710)	(32 178)
Earnings drop t-1 to t+1	-0.20	0.05	-0.48	-0.25
Changed province at $t + 1$	0.03	0.01	0.03	0.03
	(0.18)	(0.11)	(0.20)	(0.18)
Changed industry at $t + 1$	0.13	0.11	0.58	0.63
	(0.33)	(0.31)	(0.48)	(0.50)

Note: For the matched non-displaced workers, their reference year is the displacement year of their matched displaced worker. The sample selection for all workers is: At $t = 0$, age 25-50, at least 2 years of tenure at $t - 1$ with an employer with more than 50 employees, and not in the public sector. Displaced workers are workers who separate from their main employer during a mass layoff event and do not return in the following three years. Matched non-displaced workers in column (2) are selected using propensity score matching inside year-gender-region×education-YSM-age-knowledge of language partitions. Earnings in CAD 2012 prices. The sample used in this table includes all workers displaced during the period 2004-2009 and their matched control workers.

Table 5: Summary Statistics by Year Observed Post-Displacement

Table 5 presents information on the pre- and post-displacement characteristics of workers, conditional on the number of years they are observed post-displacement. This shows how immigrants who outmigrate in the first five years after displacement compare to those who stay longer. The first column for each group contains statistics for immigrants who leave within five years after displacement, and the second column contains statistics for those who stay at least five years. These statistics use workers displaced between 2004 and 2009.

Workers who leave within five years have higher pre-displacement earnings than those who remain in Canada at least five years. For instance, non-displaced workers who leave within five years earned 53 500$ at t-1, compared to 43 700$ for those staying at least five years. The difference in earnings is similar among displaced workers: 52 900$ for those who leave before five years compared to 44 100$ for those who stay at least five years.

For both displaced and control workers, immigrants who leave are approximately two years younger and more likely to come from advantaged countries and hold a bachelor's degree or higher. The share of "Not advantaged BA+" workers is 55% among those who leave before five years versus 37% among those who stay longer in both groups. Among displaced workers, those who leave soon after displacement have spent less time in Canada than those who remain longer (9.58 years since migration vs. 11.42 years). There is a similar difference in the control group (9.26 vs. 11.44 years). Overall, immigrants who leave Canada appear to be positively selected based on their pre-displacement earnings and education levels. This finding is consistent with other studies in Canada by Aydemir and Robinson (2008) and Dostie et al. (2023), which similarly suggest that immigrants leaving Canada are positively selected.

Post-displacement outcomes also show important differences. Workers who leave Canada earlier experience large earnings drops from $t-1$ to $t+1$ in both groups. Non-displaced workers who leave show a 20% earnings drop compared to a 5% earnings increase for those who stay. Among displaced workers, those who leave experience a 48% earnings drop compared to a 25% drop for those who stay at least five years after displacement. Similarly, displaced workers who leave Canada have employment levels 16 percentage points lower at $t+1$ than displaced workers who stay (67% vs. 83%). This pattern is less pronounced for non-displaced leavers, who show an eight percentage point difference compared to non-displaced workers who stay (88% vs. 96%). Additionally, those who leave Canada earlier after displacement show similar rates of industry switching but slightly higher rates of geographic mobility than those who stay longer.

The outmigration rates for displaced and matched workers are 3% and 3.4% by the fifth year after displacement, respectively. Assessing the extent to which outmigration biases our main estimates is challenging. Workers who already planned to leave Canada may put less effort into their job search and thus have worse post-displacement outcomes despite having high earnings potential. Therefore, determining whether those leaving have lower or higher

earnings growth compared to those who stay in the sample is difficult. Overall, the characteristics of those who outmigrate are quite similar between the displaced and control groups, making this less of a concern.

7.1.2 Balanced Panel Analysis

In the main analysis, workers who disappear and leave Canada are kept in the sample. As such, if their outcomes markedly differ from those of immigrants who stay in Canada for at least five years, it will create a bias. Under the assumption that those leaving have worse outcomes, and that new immigrants seem to be more sensitive to displacement in their decision to stay, there would be a bias where recently arrived immigrants' outcomes are positively biased. Immigrants who left would have had worse outcomes, and leaving immigrants with good outcomes are overrepresented.

In practice, it is not clear whether the best or worst performing immigrants are leaving, or if immigrants with lower earnings potential are delaying their departure. Immigrants leaving have worse post-displacement outcomes, but at the same time, they are positively selected based on their pre-displacement earnings. Their worst outcomes could be due to their desire to leave Canada and invest fewer resources and effort into finding a good job.

To assess the extent of bias from outmigration, I re-estimate the entire set of results, excluding outmigration rates, on a balanced sample where I retain immigrants who stayed for at least five years post-displacement. The results are presented in the appendix in Figure A4, Table A1 and Table A2. They replicate closely the main results on the unbalanced sample. While they are not exactly the same, they are, for all intents and purposes, identical.

7.2 Firm Closure Only

The main analysis includes all mass layoff events, which encompass both partial layoffs and complete firm closures. While mass layoffs generally provide plausibly exogenous separations, firm closures offer a cleaner identification strategy since all workers at the firm are displaced regardless of individual characteristics. This section examines whether the main results hold when restricting the sample to workers displaced during firm closures.

The firm closure sample is substantially smaller than the main analysis. For instance, the sample for the earnings outcome in the pre-displacement characteristics decomposition contains 8 200 observations compared to 36 100 in the main analysis. This smaller sample size leads to larger standard errors throughout the analysis.

Despite the smaller sample, the event study results remain qualitatively similar to the main findings. Figure A5 in the appendix presents event study coefficients for the firm closure sample, showing patterns consistent with those in Figure 4. Recent immigrants (fewer than 10 years in Canada) continue to experience smaller earnings losses than established immigrants (10 years or more in Canada). The initial earnings losses one year after displacement

are 19.4% for recent immigrants versus 23.3% for established immigrants, compared to 21.3% and 26.4% in the main analysis. While the magnitudes differ slightly, the relative pattern, with established immigrants experiencing approximately 20% larger losses, remains consistent. For the other labor market outcomes, the results are also similar, except for geographic mobility, where there is no difference between the two groups.

The decomposition results using the firm closure sample are presented in Tables A3 and A4. For most outcomes, the qualitative findings align with the main analysis despite larger standard errors. In the pre-displacement characteristics decomposition (Table A3), each additional year in Canada increases earnings losses by 0.61 percentage points. After controlling for pre-displacement characteristics, each additional year in Canada increases earnings losses by 0.18 percentage points, and loses statistical significance. However, the point estimate suggests a similar direction of effect. Age and position on the job ladder remain important variables.

For firm pay premium losses, the results are similar to the main analysis: the baseline negative coefficient becomes positive (though statistically insignificant) after controlling for pre-displacement characteristics. The pattern for months nonemployed also remains consistent, with pre-displacement characteristics explaining only a small portion of the heterogeneity.

The post-displacement mechanisms analysis (Table A4) shows similar patterns to the main results, though with lower statistical significance. The baseline coefficient on years in Canada is negative and not statistically significant. After controlling for post-displacement outcomes, the impact of years spent in Canada on earnings losses is close to zero and remains not statistically significant. The most important mechanism is still months nonemployed and explains all of the heterogeneity in earnings loss, consistent with the main findings.

Overall, the firm closure analysis supports the main conclusions despite the much lower sample size. The main finding, that recent immigrants experience smaller earnings losses and that nonemployment duration explains much of this differential, remains qualitatively valid.

8 Conclusion

In this paper, I used administrative employer-employee data from Canada to investigate how the costs of job loss differ between immigrants based on their time spent in the host country. This analysis differs from previous work on job loss and immigrants by focusing on within-immigrant heterogeneity in the impact of job loss. A key contribution of this paper is to show that displacement effects vary substantially by years in Canada, to quantify how much of this heterogeneity stems from differences in pre-displacement characteristics versus time in Canada itself, and to identify which post-displacement mechanisms drive the remaining differences in earnings losses.

I showed that immigrants who have been in Canada longer experience substantially larger earnings losses following displacement. Recent immigrants (fewer than 10 years in Canada) lose around 21% of their pre-displacement earnings one year after displacement, compared to 26% for established immigrants (10 or more years). Moreover, this heterogeneity persists even after accounting for differences in pre-displacement characteristics such as age, position on the job ladder, and province of residence. While these differences in pre-displacement characteristics explain approximately 50% of the gap in earnings losses, the remaining heterogeneity suggests that something about time in Canada itself, beyond observable characteristics, makes established immigrants more vulnerable to displacement.

The primary mechanism driving this remaining gap is nonemployment duration: established immigrants spend significantly more time nonemployed following displacement, accounting for 40% of their higher earnings losses. Higher nonemployment duration could stem from higher reservation wages among established immigrants and increase earnings losses both directly through reduced time working and indirectly through duration-dependent wage penalties Schmieder et al. (2016).

These findings have direct policy implications. Current policies supporting displaced workers typically do not distinguish between recent and established immigrants, yet my results suggest that established immigrants face systematically worse outcomes and may benefit from targeted support. Programs that help workers avoid prolonged nonemployment spells, such as the wage insurance policy studied by Hyman et al. (2024), could be particularly beneficial to established immigrants. More broadly, understanding that immigrant vulnerability to economic shocks can increase rather than decrease with time in the host country should inform how we design integration policies and support systems. Future research should investigate whether this pattern extends to other types of economic shocks beyond displacement, and whether similar dynamics occur in other immigrant-receiving countries.

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Appendix

Figures

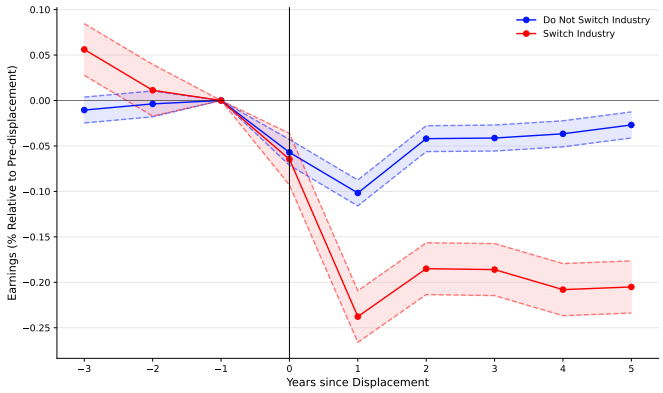


Figure A1: Earnings (% Relative to Pre-displacement) by Industry Switching

Note: The figure shows earnings losses (expressed as a percentage relative to pre-displacement earnings at $t = -1$) after displacement, separately for workers who switch industries and those who remain in the same industry. Workers are classified as industry switchers if they are employed in a different industry (2-digit NAICS codes) at $t = 2$ compared to $t = -1$. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include individual fixed effects, time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. Standard errors clustered at the worker level.

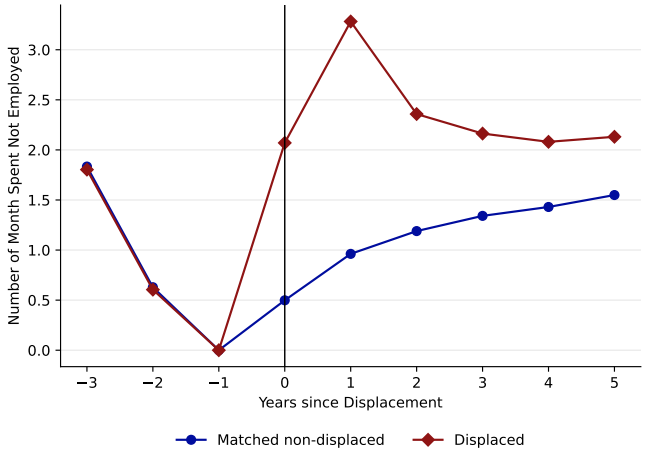


Figure A2: Number of Months Nonemployed

Note: The figure shows the labor market outcomes of displaced workers and matched control workers around the time of displacement. The relative year for each control worker is the year of displacement of the displaced worker they are matched with using the propensity score matching described in the text. The red line represents the mean of the variable for each year relative to displacement for the displaced workers, while the blue line represents the same for the matched control workers. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers. This ensures that the only source of attrition from $t = 0$ to $t = 5$ in the sample is from outmigration. Earnings in 2012 prices.

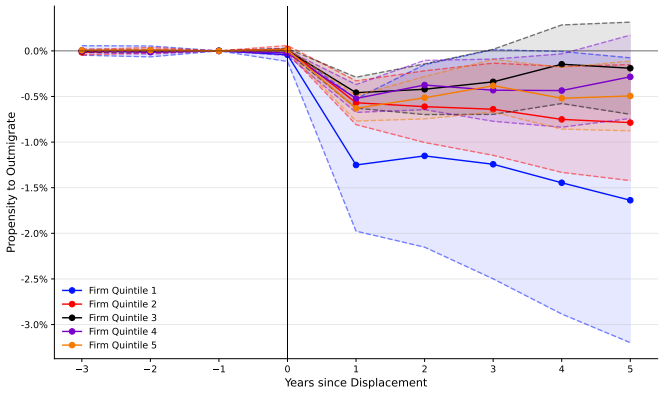
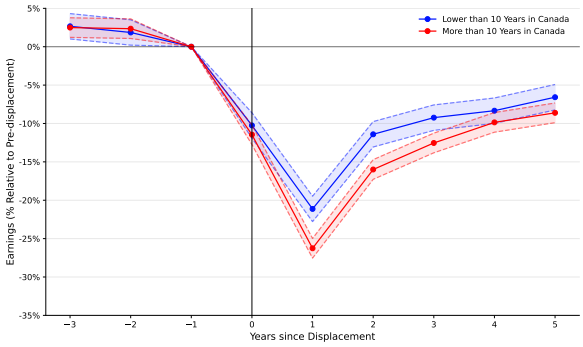
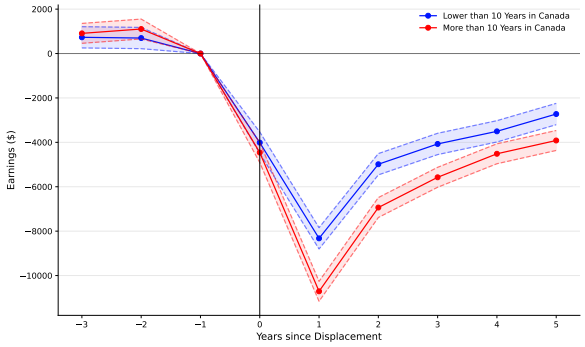


Figure A3: by Pre-Displacement Firm Quality with Confidence Interval

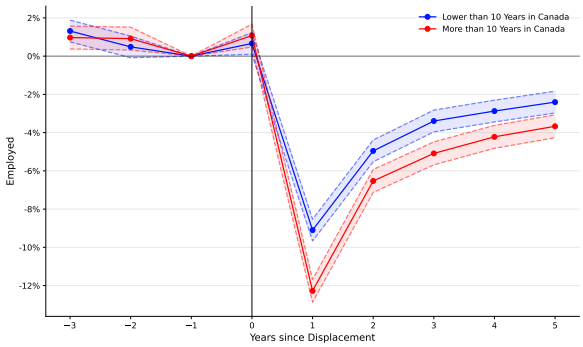
Note: The figure show all the event study coefficients, and their confidence intervals at the 95% level. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2009 and their matched control workers. Standard errors clustered at the worker level.



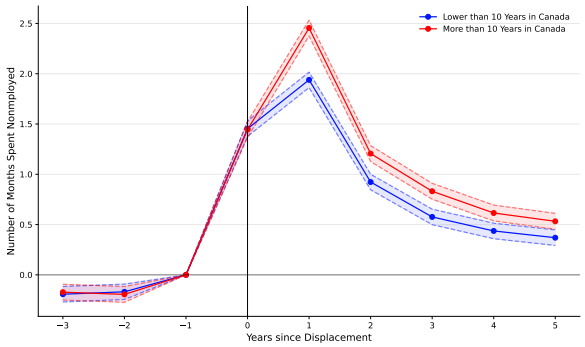
(a) Earnings (% Relative to Pre-displacement)



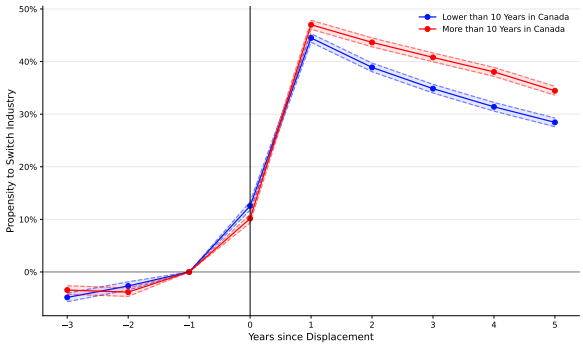
(b) Earnings ($)



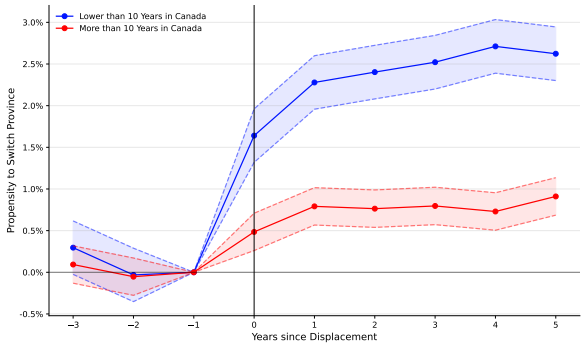
(c) Indicator for Employment



(d) Months nonemployed



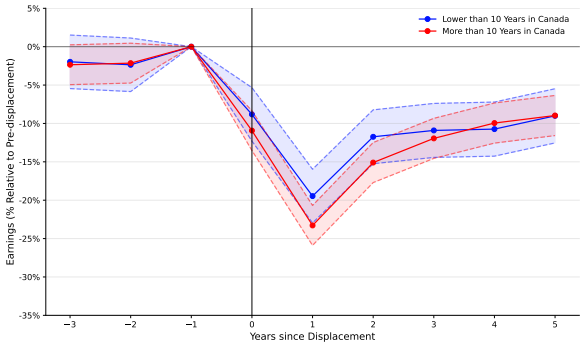
(e) Industry Different from $t-1$



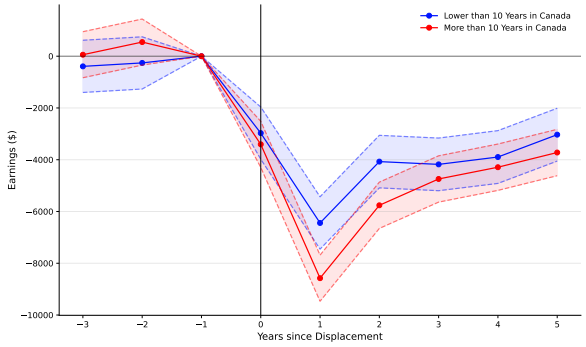
(f) Province Different from $t-1$

Figure A4: Balanced Sample: Labor Market Outcomes after Displacement by Years Spent in Canada

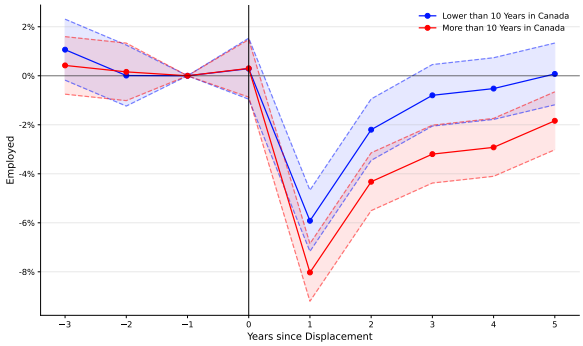
Note: The panels show all the event study coefficients, and their confidence intervals at the 95% level, for different labor market outcomes for immigrants by years spent in Canada and for natives. For instance, panel (a) shows how annual labor earnings relative to $t = -1$ (expressed as a percentage) evolve after displacement for each group. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include individual fixed effects, time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced during the period 2004-2014 and their matched control workers conditional on them staying five years after displacement. Standard errors clustered at the worker level.



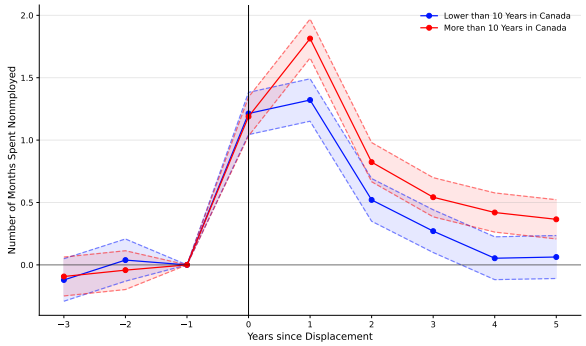
(a) Earnings (% Relative to Pre-displacement)



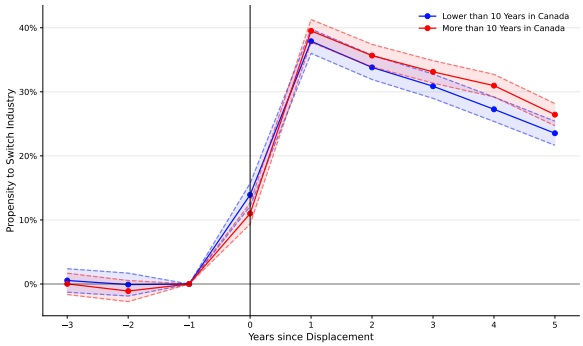
(b) Earnings ($)



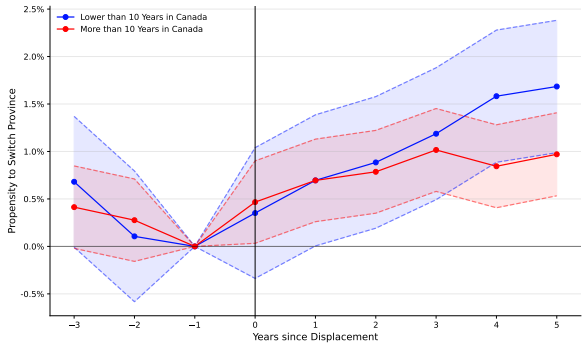
(c) Indicator for Employment



(d) Months nonemployed



(e) Industry Different from $t-1$



(f) Province Different from $t-1$

Figure A5: Closure Only Sample: Labor Market Outcomes after Displacement by Years Spent in Canada

Note: The panels show all the event study coefficients, and their confidence intervals at the 95% level, for different labor market outcomes for immigrants by years spent in Canada and for natives. For instance, panel (a) shows how annual labor earnings relative to $t = -1$ (expressed as a percentage) evolve after displacement for each group. The coefficients are from a regression of the event study specification as described in the main text on each group. The regressions include individual fixed effects, time fixed effects, years since displacement, age, and age squared. The sample used in this figure includes all workers displaced from firm closure during the period 2004-2014 and their matched control workers. Standard errors clustered at the worker level.

Table

Table A1: Balanced Sample: Decomposition of Pre-displacement Characteristics

	Earnings	Firm Pay Premium	Months Nonemployed	Switch Province (x100)	Switch Industry
Baseline	-0.00870***	-0.00368***	0.0529***	-0.133***	0.00445***
	(0.000925)	(0.000320)	(0.00493)	(0.0209)	(0.000659)
Full	-0.00410***	0.000700*	0.0423***	-0.0334	0.00218**
	(0.00127)	(0.000386)	(0.00664)	(0.0288)	(0.000870)
Difference	-0.0046***	-0.0044***	0.0105**	-0.1000***	0.0023***
	(0.0009)	(0.0003)	(0.0048)	(0.0202)	(0.0006)
Demographics:					
Age	-0.0022***	-0.0010***	0.0032	-0.0416***	-0.0002
Tenure	0.0000	0.0004***	-0.0036*	0.0212**	0.0005*
Gender	-0.0003***	-0.0005***	0.0035***	-0.0054***	0.0004***
Official Language	-0.0003**	-0.0001	0.0044***	-0.0017	-0.0002*
Region × Education	-0.0011***	-0.0014***	0.0050***	0.0078	-0.0007***
Province	-0.0011***	-0.0007***	0.0062***	-0.0802***	0.0000
Firm Characteristics:					
Decile AKM	-0.0007***	-0.0012***	0.0012**	-0.0048**	-0.0001
Share Immigrants	0.0006***	0.0003***	-0.0045***	-0.0005	0.0000
Log Employment Size	0.0002**	0.0000	-0.0028***	0.0009	0.0001**
Industry	-0.0001	-0.0004***	0.0005	0.0093*	0.0019***
Other: Year of Displaced	0.0003***	0.0002***	-0.0026***	-0.0050**	0.0006***
Obs.	35 200	28 300	35 000	34 800	26 900

Note: This table presents results from a Gelbach decomposition analyzing the role of pre-displacement characteristics in explaining the heterogeneous impact of years in Canada on labor market outcomes following displacement. The baseline regression includes a constant and years in Canada. The full regression adds pre-displacement characteristics grouped into demographics (age, tenure, gender, official language proficiency, region × education, and province), firm characteristics (decile of AKM firm fixed effect, share of immigrants at the firm, log employment size, and industry), and year of displacement. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the pre-displacement characteristics. The bottom panels report the contribution of each group of variables to this difference. Standard errors are in parentheses. The sample includes workers displaced during the period 2004-2014 and their matched control workers conditional on them staying five years after displacement. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

	Earnings
Baseline	-0.00399***
	(0.00128)
Full	-0.000162
	(0.00107)
Difference	-0.0038***
	(0.0007)
Post-Displacement Outcomes	
Firm Pay Premium	0.0003**
Indicator for missing Outcomes	0.0000
Number of Months nonemployed	-0.0042***
Switch Province	0.0000
Switch Industry	0.0001**
Obs.	34 600

Note: This table presents results from a Gelbach decomposition analyzing the role of post-displacement outcomes in explaining the heterogeneous impact of years in Canada on earnings losses following displacement. The baseline regression includes a constant, years in Canada, and all pre-displacement characteristics. The full regression adds five post-displacement variables: difference-in-differences estimates of changes in firm pay premiums, number of months nonemployed, industry switching, provincial migration, and an indicator for missing firm pay premium and industry outcomes. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the post-displacement variables. The bottom panel reports the contribution of each post-displacement variable to this difference. Standard errors are in parentheses. The sample includes workers displaced during the period 2004-2014 and their matched control workers conditional on them staying five years after displacement. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

Table A2: Balanced Sample: Decomposition of Post-displacement Characteristics

Table A3: Closure Sample: Decomposition of Pre-displacement Characteristics

	Earnings	Firm Pay Premium	Months Nonemployed	Switch Province (x100)	Switch Industry
Baseline	-0.00606***	-0.00343***	0.0452***	-0.0154	0.00409***
	(0.00163)	(0.000650)	(0.00943)	(0.0359)	(0.00143)
Full	-0.00182	0.00124	0.0256**	0.110**	0.00261
	(0.00218)	(0.000760)	(0.0123)	(0.0489)	(0.00180)
Difference	-0.0042***	-0.0047***	0.0196**	-0.13***	0.0015
	(0.0015)	(0.0006)	(0.0089)	(0.03)	(0.0013)
Demographics:					
Age	-0.0026**	-0.0002	0.0095	-0.04*	0.0007
Tenure	-0.0001	-0.0001	-0.0036	0.00	-0.0001
Gender	-0.0003**	-0.0003***	0.0031***	0.00	0.0005***
Official Language	-0.0004*	-0.0001	0.0034**	0.00	-0.0003
Region × Education	0.0002	-0.0012***	0.0010	-0.03**	0.0001
Province	-0.0006*	-0.0004***	0.0045**	-0.04***	-0.0006*
Firm Characteristics:					
Decile AKM	-0.0004	-0.0018***	0.0032*	0.01	0.0011***
Share Immigrants	0.0003*	0.0000	-0.0025*	0.00	0.0000
Log Employment Size	-0.0001	0.0000	0.0007	0.00	-0.0001
Industry	-0.0003	-0.0005**	-0.0004	-0.02**	-0.0004
Other: Year of Displaced	0.0001	-0.0002	0.0008	0.00	0.0005**
Obs.	8200	6100	8200	8100	5600

Note: This table presents results from a Gelbach decomposition analyzing the role of pre-displacement characteristics in explaining the heterogeneous impact of years in Canada on labor market outcomes following displacement. The baseline regression includes a constant and years in Canada. The full regression adds pre-displacement characteristics grouped into demographics (age, tenure, gender, official language proficiency, region × education, and province), firm characteristics (decile of AKM firm fixed effect, share of immigrants at the firm, log employment size, and industry), and year of displacement. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the pre-displacement characteristics. The bottom panels report the contribution of each group of variables to this difference. Standard errors are in parentheses. The sample includes workers displaced from firm closure during the period 2004-2014 and their matched control workers. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

	Earnings
Baseline	-0.00162
	(0.00218)
Full	0.000221
	(0.00185)
Difference	-0.0018
	(0.0012)
Post-Displacement Outcomes	
Firm Pay Premium	0.0004
Indicator for missing Outcomes	0.0000
Number of Months nonemployed	-0.0024**
Switch Province	0.0000
Switch Industry	0.0001
Obs.	8100

Note: This table presents results from a Gelbach decomposition analyzing the role of post-displacement outcomes in explaining the heterogeneous impact of years in Canada on earnings losses following displacement. The baseline regression includes a constant, years in Canada, and all pre-displacement characteristics. The full regression adds five post-displacement variables: difference-in-differences estimates of changes in firm pay premiums, number of months nonemployed, industry switching, provincial migration, and an indicator for missing firm pay premium and industry outcomes. The "Difference" row shows the difference in the years-in-Canada coefficient explained by the post-displacement variables. The bottom panel reports the contribution of each post-displacement variable to this difference. Standard errors are in parentheses. The sample includes workers displaced from firm closure during the period 2004-2014 and their matched control workers. Statistical significance: * indicates $p \leq 0.10$, ** indicates $p \leq 0.05$, *** indicates $p \leq 0.01$.

Table A4: Closure Sample: Decomposition of Post-displacement Characteristics

Data

This section provides more details on the dataset and any data imputation I carried out.

Description of Data Sources and Variables

The main sample uses data from the BEAM, which consists of three modules and is linked to the IMDB.

First, the T1PMF module contains annual personal income tax records from the Canada Revenue Agency covering all individuals who filed T1 returns before the CRA processing cut-off date. Most social programs offered by the government work through the tax system. As such, individuals have an incentive to file their taxes even if they are not working. The module provides comprehensive demographic variables including year of birth, sex, marital status, and province of residence. It includes information on different income streams. In this paper, I use the total pre-tax employment income, deflated to 2012 prices, as the measure of earnings. It is defined as the sum of employment income from T4 slips (wages, salaries, and commissions reported by employers) plus other taxable employment receipts (tips, gratuities, director's fees not on T4 slips). Notably, this excludes self-employment

income.

Second, the T2 module contains corporation income tax returns from all incorporated and unincorporated firms filing with the Canada Revenue Agency. The module provides firm-level financial variables including detailed balance sheet items, liabilities, income statement variables, expense categories, measures of productivity, and, most relevant to this paper, the PD7 employment measure[4]. It represents the total number of employees during the last pay period of each month as reported on payroll deduction remittance forms submitted to the CRA. One caveat of this dataset is that firm IDs do not form a panel. They can change under different scenarios such as name changes, changes in legal structure, and other cases where we would expect them to stay fixed. This creates potential breaks in firm histories during corporate amalgamations, mergers, and restructurings. As described in the main text, the main potential issue is mischaracterizing a mass layoff event or closure when, in reality, there was just a merger or change of structure. To avoid this, I impose a flow restriction based on where the employees find employment at their next firm.

Third, the T4ROE module links workers to employers through matched employee-employer administrative data, combining T4 tax slips (universal annual employment records) with Records of Employment (ROE) data. It allows for both person-level analysis (one record per individual per year aggregating multiple jobs) and job-level analysis (multiple records per individual-employer pair). For instance, I use this data to build the employment spells of workers at each of their employers using the month-year of hire and month-year of separation provided in the ROE. Employers issue ROEs when a worker separates from their firm or experiences an interruption of earnings[5]. The ROE is not always available. For instance, the worker might still work at the firm at the end of the sample (no ROE issued), or the firm ID might change. In the latter case, there will be no associated ROE for the worker's job spell under the previous firm ID. The ROE also provides the employer's industry classification (2-digit NAICS code) and province of employment. Province of employment doesn't necessarily correspond to the province of residence of the worker.

The IMDB contains detailed demographic information collected when immigrants apply to be permanent residents. The module includes country of origin, education level, knowledge of official languages (self-assessed proficiency in English and/or French), immigration category, landing year, and many more variables. For this paper,

[4]One advantage of PD7 is that it accurately captures the number of employees who work part time or full time for the normal operation of the firm. I could alternatively use the number of T4 slips issued in a year, but this would also capture workers who might have worked only one day in the extreme case, or just a few months. I calculated the correlation between the two employment measures (PD7 and T4) with different thresholds on earnings for the T4 and found significant differences. I decided to use PD7 in the end, following Birinci et al. (2023).

[5]Employers must issue a ROE whenever an employee separates from their firm or whenever the employee has an interruption of earnings. The latter can be either seven consecutive calendar days with no work/insurable earnings or a decrease by at least 60% of the worker's regular earnings.

the key variables are knowledge of the official languages at landing, country of origin and education level, which I use to categorize immigrants into four groups based on the classification in Dostie et al. (2023), and the year of first tax filing, which I use to measure years spent in Canada. One limitation is that the landing year records when immigrants became permanent residents, which may precede their first tax filing if they previously worked or studied in Canada on a temporary permit.

Imputation

I impute information on the following variables: age, sex, province of residence, and number of months nonemployed in a year. For the number of months nonemployed, this is required since not all job spells have a ROE issued at the end of them. For the other variables, it is required when the worker has T4 issued in a year but did not file taxes.

For the number of months nonemployed in a year, I follow a similar procedure as Castro et al. (2024). I compare the earnings in the first and last year to full year of employment. I recover the monthly earnings and impute the starting and ending month. If a full year of earnings at the same employer is not available, I use full year of employment in an adjacent year at another firm, or partial year of employment in job spells where there was a ROE issued. With the process above completed, I have information on each job spell about when they started and when they finished. I then calculate the number of months nonemployed using the job spell information.

For age and sex, this information is given in the T1PMF records. I only require one year with this information to impute any other missing years. For province of residence, I proceed in two steps. First, for all firms, I compare how often the province of residence of their workers differs from their province of employment. For firms where there is never a discrepancy, I impute missing province of residence using the province of employment. Second, if a province of residence is missing and the province of employment is the same as the province of residence in the preceding year and in the subsequent year, I impute the missing province of residence using the province of employment.