Disparities in Female Earnings in Canada: Evidence of Gaps by Origin Country

by

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Abstract

This study examines earnings of female immigrants from different world regions and the Canada-born population. Using annual data from the Longitudinal Immigration Database, the Education and Labour Market Longitudinal Platform, and the Census, we analyze earnings of immigrant cohorts and Canada-born individuals from 2004 to 2019. Specifically, the investigation aims to identify and quantify earnings disparities among female migrants in Canada, determine if there are significant differences in earnings based on place of birth, explore potential reasons for disparities, and assess regional differentiation in earnings. By employing the Blinder-Oaxaca wage decomposition framework to examine the extent of explained and unexplained contributions to earnings differences, we find evidence of migrant groups with consistently higher unexplained differences in earnings. Our study aims to identify disparities among different female groups and promote long-term economic integration in the labour market. In this regard, we find female migrants' place of birth may be associated with higher (lower) barriers to labour market integration.

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1 - INTRODUCTION

In 2021, Canada admitted 405,999 permanent residents (IRCC, 2022a). Further, there are over 450 first languages reported in the 2021 wave of the Canadian census (Statistics Canada, 2022a). The earliest immigrants to Canada faced many challenges integrating into a new climate, a challenge that many were unprepared for; return migration during the Age of Mass Migration (1850-1913) was one in three arrivals, higher than the rate of 20 percent after 10 years in Canada (Abramitzky, Boustan, Eriksson, 2017; Dustmann & Gorlach, 2016). However, disparities in economic integration and subsequent rates of return migration continue to impede the potential benefits of immigration for the Canadian economy (Picot, 2008). Investigation of the labour market challenges for immigrants to Canada can provide evidence that details the state of economic integration and determine areas for potential improvement.

The Canadian government continues to support increasing immigration levels (IRCC, 2022b). Consequently, the composition of Canada is evolving. According to Statistics Canada (2022) India recently took the top spot as the primary origin of migrants to Canada (18.6% of recent immigrants from 2016 to 2021), and it's estimated Southern Asia will lead (~18%) by 2036 (Statistics Canada, 2017a). Similarly, the Middle East and North Africa region (MENA) is anticipated to increase from 9.4% of the origin region share in 2011 to 14.8% in 2036.

This report aims to address the issue of disparities in labour market experiences of new Canadians, a country that saw 84% of its labour market growth

attributed to immigration in 2010 (Statistics Canada, 2022c). Working age immigrants typically earn lower wages compared to the Canada-born population, particularly during their period of integration, which is commonly referred to as the 'immigrant wage gap' (Crossman, 2021; Coloumbe, Grenier, Nadeau, 2014; Aydemir, & Skuterud, 2008). The changing composition of immigrants has implications for the immigrant wage gap. Issues such as language barriers, credential recognition, discrimination, cultural differences, and skill mismatches are by no means static, suggesting the need to quantify how these factors may impact economic integration.

Immigrants from different origin countries may experience integration differently (Adsera & Chiswick, 2007; Hum & Simpson, 2004). However, there has been relatively little investigation into wage gaps between different groups of immigrants in the literature, especially in the Canadian context. In fact, earnings disparities can occur not only between immigrants and Canadian-born individuals, but also between different immigrant groups (Fleischmann, Dronkers, 2010; Tubergen, Maas, Flap, 2004). In Canada, a study by Fang and Gunderson (2015) found that immigrants that are also visible minorities, tend to earn less than immigrants who are not visible minorities.

In addition, gender plays a significant role in labour market outcomes for migrants in Canada (Frank & Hou, 2015). Women who immigrate to Canada may encounter additional barriers to economic integration, such as limited access to education and training, caregiving responsibilities, and social isolation (Rezazadeh & Hoover, 2018; Bonikowska & Hou, 2017). Understanding these obstacles and

implementing policies to address them can help improve economic outcomes of immigrant women and narrow gender-based wage gaps. Promoting the economic integration of immigrant women can have far-reaching benefits for Canadian society, including increased labour force participation, lower poverty rates, and enhanced social cohesion (Wilkinson, Peter, & Chaturvedi 2006; Gunderson, 2006).

The investigation into earnings disparities among female immigrants in Canada is motivated by the possibility that different groups may experience different patterns of economic integration. To identify groups that are faring differently than others, we first confirm and characterize the existence of a Canada-born to immigrant earnings gap among females. Further, we investigate earnings between different groups of female immigrants characterized by place of birth. Additionally, this study explores whether earnings disparities are regionally differentiated across Canada (Atlantic Canada, Québec, Ontario, the Prairies, British Columbia). This examination provides insight into the mitigation of earnings disparities while promoting economic integration for all female immigrants to Canada, regardless of country of origin.

In this study, the hypothesis posits that females from the Middle East and North Africa (MENA) region tend to earn less than other female migrants. This could potentially be linked to Canada's female labour force participation rate of 76% compared to 82% for males in 2019 while in contrast, labour participation rate in the MENA region is 21% for females and 77% for males (World Bank, 2022). This difference in the labour force participation rates could contribute to the

disparities in labour market outcomes if source-country labour norms surrounding gender roles are carried over (Ghazal Read, 2004). By examining whether earnings and employment differences are due to self-selection stemming from gender role perceptions, insight on the extent of discrimination toward immigrants in the labour market could be realized. In Canada, 70.4% of Canadian-born women ages 20-54 reported full-time employment, compared to 58.5% and 64.9% of recent and long-term immigrants, respectively (Drolet, 2022).

Findings from this study suggest that the primary determinant of gaps in nominal annual earnings between females, based on country of birth, are related to cultural norms surrounding unpaid household work. Our work has important implications for equity, diversity, and inclusion in the Canadian labour market as it may clarify the extent of legitimate differences in earnings. Further, our findings shed light on the possibility of labour market discrimination between groups of immigrants.

We utilize the Canadian census data from 1996 to 2016, as well as the Longitudinal Immigration Database (IMDB) in combination with the Educational and Labour Market Longitudinal Platform (ELMLP) from 2004 to 2019 to conduct our analysis. The longitudinal data provides a unique opportunity to analyse immigrants' earnings over time and the dynamics of earnings convergence to Canada-born levels. Hum and Simpson (2004) for example, argue that earnings differentials between these groups may be overestimated by not taking into account the fact that immigrants may experience faster earnings growth over time than Canadian-born workers. Our salary gap decomposition results discovered

persistent unexplained differences across the years studied, implying the possibility of labour market discrimination. By reviewing our findings from the perspective of convergence and analysing across five Canadian regions we gain insight on the intricacies of labour market integration in Canada.

2 - LITERATURE REVIEW

Previous research has often cited human capital factors as the primary determinants of economic differences between immigrants and non-immigrants, factors such as language proficiency, foreign credentials recognition, and work experience can impact earnings disparities (Vezina, & Belanger, 2020; Coloumbe, Grenier, & Nadeau, 2014; Clarke, & Skuterud, 2013; Imai, Stacey, & Warman, 2011; Green & Worswick, 2009). There is also concern about the role of the immigration selection system in labour market outcomes and earnings disparities. For example, immigrants with pre-landing Canadian work experience may have higher earnings and narrower wage gaps (Hou, & Picot, 2016; Sweetman, & Warman, 2013). In Canada, earnings disparities are not limited to first-generation immigrants; in some cases, disparities may persist across generations, even in the absence of such disparities in the Canada-born population (Skuterud, 2010).

Crossman, Hou, and Picot, (2021) suggest that labour market earnings gaps may be closing. When comparing the weekly earnings of Canada-born individuals and new immigrants (1 to 5 years) in 2016 and 2019, findings suggest that females earned 27.6% and 23.8% less than their Canada-born counterparts, respectively. However, those gaps are an increase from the longer time horizon, only a 18.6% difference was found in 2000. The immigrant Canada-born gap does converge for recent (6 to 10 years) and long-term (10+ years) female immigrants, with long-term female immigrants reporting higher income than their Canada-born counterparts from 2001 through 2016. Although it remains unclear if the gap fully closes for long-term female immigrants, Labour Force Survey data shows a 6.5%

and 4.7% gap between long-term female immigrants and their Canada-born counterparts in 2015 and 2019, respectively.

Investigating human capital portability in the skill-under-utilization domain, Warman et al. (2015) find that immigrants tend to receive lower returns on pre-Canadian years of schooling relative to years of schooling completed in Canada. Having worked in Canada prior to immigrating to Canada also places a high premium on expected earnings. Research consistently finds that Canadian work experience is the most critical predictor of strong labour market earnings in the short- and long-term (Bonikowska, Hou, & Picot, 2016; Picot, Xu, Hou, & Bonikowska, 2020). Research has also shown that the wage gap between immigrants and Canadian-born individuals tends to decrease as immigrants spend more time in the host country, gaining more work experience and social capital (Borjas & Ramey 1994). Similarly, language proficiency tends to converge towards that of the Canadian-born population with an increase in years lived in the host country, potentially reducing the wage gap for long-term immigrants (Lumpe, 2019).

To assess whether earnings gaps can be attributed to discrimination in labour markets, researchers investigate the impact of salary determinants that may legitimately (education), or illegitimately (gender) explain differences (Donahue, 2021; Warman, Sweetman, & Goldmann, 2015). However, unobserved factors may also exist that influence income, such as social norms (Frank & Hou, 2015). For instance, youth may have a social norm of working part-time as they focus on education and rely on parents' financial support. Studies on the economics of

integration show that distinct groups self-select into different labour market outcomes based on social perceptions of employment (Carillo, Lombardo, & Venittelli, 2022).

Frank et al. (2013) conducted a study to understand the economic integration of immigrants in Canada by analyzing the wage disparities between Canadian-born adults and recent immigrant cohorts using Oaxaca-Blinder decomposition methods. The study found that a significant portion of the wage gap between the two groups was attributable to differences in education, work experience, and other observable factors. However, the study also found that a substantial portion of the gap remained unexplained, suggesting possible discrimination or other unobservable factors played a role. Similarly, Donahue (2021) conducted a study that examined wage gaps between immigrants and US-born individuals in the United States. She utilized a cross-sectional Blinder-Oaxaca decomposition method and found that only 68% of the wage gap can be explained by explanatory variables from the survey data. This suggests that unobservable factors, including labour market discrimination, play a role in the wage gap between immigrants and US-born adults.

Despite having vast literature on earning differentials between immigrant and Canada-born individuals, to the best of our knowledge, there is no such study investigating the differences between groups of immigrants. In the US, Ghazal Read (2004), studied Arab American women and found that traditional gender roles and family values were significant factors in their work experiences. Arab American women faced difficulties in balancing familial duties with work, and their

perceptions and experiences in the American labour market were also influenced by gender role and work ethic norms from their countries of origin. Solati, Chowdhury, and Rosado (2023) suggest that the female labour force participation rate is the lowest among MENA women in Canada. Their study argues that, due to cultural carry over, immigrant women from MENA countries have the lowest female labour force participation rate despite having above average levels of foreign or Canadian education compared to immigrants from other places of birth. In light of these findings, and in addition to findings from an initial review of our summary statistics, we suggest Oaxaca-Blinder analysis from the perspective of MENA as a group potentially experiencing the negative side of an unexplained earnings gap.

The MENA region is known for having a low female participation rate in the formal labour force compared to global standards (Omran, 1993; Table A.1). Krafft and Assaad's (2020) study on migration within the MENA region (Jordan, Egypt, Tunisia) reveals that, despite rising educational attainment in the countries analysed, female labour force participation remains very low. Women's work is often limited to activities deemed appropriate for women in a conservative social settings. Public sector employment is considered most acceptable, informal employment the least, and private formal employment exists somewhere in between. Therefore, the occupations perceived as least to most appropriate for MENA women in their home countries may also have the least to most employment disparities in Canada due to self-selection into socially acceptable professions.

Foroutan (2009) investigated earnings disparities following migration to Australia, specifically focusing on MENA women. The study proposed plausible explanations for employment disparities between Australia-born and MENA women based on discrimination and assimilation approaches. According to the discrimination approach, ethnic prejudice is a significant source of discrimination against ethnic minorities in the host country's labour market (Evans & Kelley, 1991; Sorensen, 1993). On the other hand, the assimilation approach suggests that the lower employment levels of female migrants from MENA may be partly due to the persistence of cultural characteristics associated with traditional gender roles in their region of origin.

Bongaarts et al. (2019) conducted a study on 58 developing countries to estimate the effect of children co-residing with women in the MENA region. The authors explored the relationship between employment and childbearing, considering the occupation of mothers. The study found that women from the MENA region have lower employment rates compared to mothers with the same number of children from other regions. Additionally, there was evidence of variation between employment and co-resident children across different occupational sectors. The study found that women from the MENA region had a higher likelihood of employment in professional/technical or managerial professions compared to women from other regions, although this refers to a distribution among employed females, not a gender ratio.

Unpaid housework and caregiving responsibilities may also contribute to the wage gap experienced by female immigrants in Canada. Aydemir (2010)

suggests that increased responsibility for unpaid housework and caregiving duties could partially explain the wage gap. Authors also find that immigrant women in Canada who have more children and who spend more time on child-rearing activities have lower earnings than those who spend less time (Bonikowska and Hou, 2017). There are also regional differences in caregiving activities, with female immigrants from South and East Asia more likely to provide care compared to those from other regions (Bonikowska and Hou, 2017).

In context of analyzing integration dynamics, a recent study in the immigration and culture literature by Rapoport, Sardoschau, & Silve (2021) indicates that immigrants are more likely to export the host country's culture back to their origin country, rather than delivering their own culture to the destination country. This finding contradicts the anti-immigration narrative that immigrants threaten the host country's culture. The authors find that cultural convergence between countries is mainly driven by assimilation, not by the dissemination of culture from immigrants to the host country. In the case of analyzing earnings convergence for female immigrants to Canada, this suggests that labour market norms and values may be observed converging closer to that of the host country. The study also suggests that the labour market participation of female migrants from regions with a low female labour force participation rate will not match that of their origin country counterparts and further drift apart as they spend more time in Canada.

The literature review examines the extensive research on the issue of labour market integration and outcomes for immigrants in Canada in comparison

to the Canada-born population. The review finds that human capital factors, such as language proficiency, foreign credentials recognition, and work experiences, can impact earnings disparities. Recent studies suggest that labour market earnings gaps may be closing for new and recent immigrants (less than 2 years, less than 5 years since arrival), but disparities may persist across generations. This study intends to address earnings gaps by looking at how different immigrant groups, particularly females from the MENA, region are faring compared to others using the Blinder-Oaxaca decomposition framework. This study aims to identify the extent of human-capital and unknown effects in the difference between earnings of immigrants and Canada-born individuals and investigate if discrimination or other unobservable factors play a role.

3 - METHODS

3.1 - DATA

The Longitudinal Immigration Database (IMDB) linked with T1 Family Files (T1FF) was used to obtain variables related to socio-economic characteristics of international migrants upon arrival. The IMDB is a critical source of information for determining labour market integration, as it provides insight into characteristics at the time of admission, such as age, education, and skill, that may have been attained in the origin country. Additionally, the IMDB contains information on identity that provides insight on disparities between groups such as gender, and country of birth. The IMDB, linked with T1FF records, provides information on integration outcomes measured by annual employment earnings. The longitudinal nature of this data also allows for the examination of the effect of accumulating years since arrival in Canada.

The Education and Labour Market Longitudinal Platform (ELMLP) provides additional data through the Postsecondary Student Information System (PSIS) and the Registered Apprenticeship Information System (RAIS), collectively referred to as PSIS-RAIS. This dataset contains educational and socio-economic information for both Canadian-born and immigrant population that have studied at a post-secondary institution in Canada. The PSIS-RAIS data is derived from administrative records and is linked with T1FF information. Each semester a student is enrolled full- or part-time in a recognized Canadian post-secondary education, the characteristics of their studies such as credential type, educational field, location, duration, etc. are recorded in the PSIS-RAIS. The PSIS-RAIS data

was selected for its comprehensive insights into educational attainment outcomes in Canada. Additionally, the annual PSIS-RAIS data can be linked with T1FF data and the IMDB to provide further insights into integration outcomes as migrants develop their human capital in Canada.

To create the final dataset used in analysis (Figure 1), T1FF tax records were utilized as the primary data source. The IMDB-T1FF and PSIS-RAIS-T1FF population datasets were merged, and consistent salary and educational attainment variables were derived. As a result, the finished dataset provides longitudinal educational attainment and socio-economic data for every individual who filed Canadian taxes between 2004 and 2019. However, some individuals were excluded from the analysis due to inconsistent data coverage or irrelevance to the research question as discussed shortly.

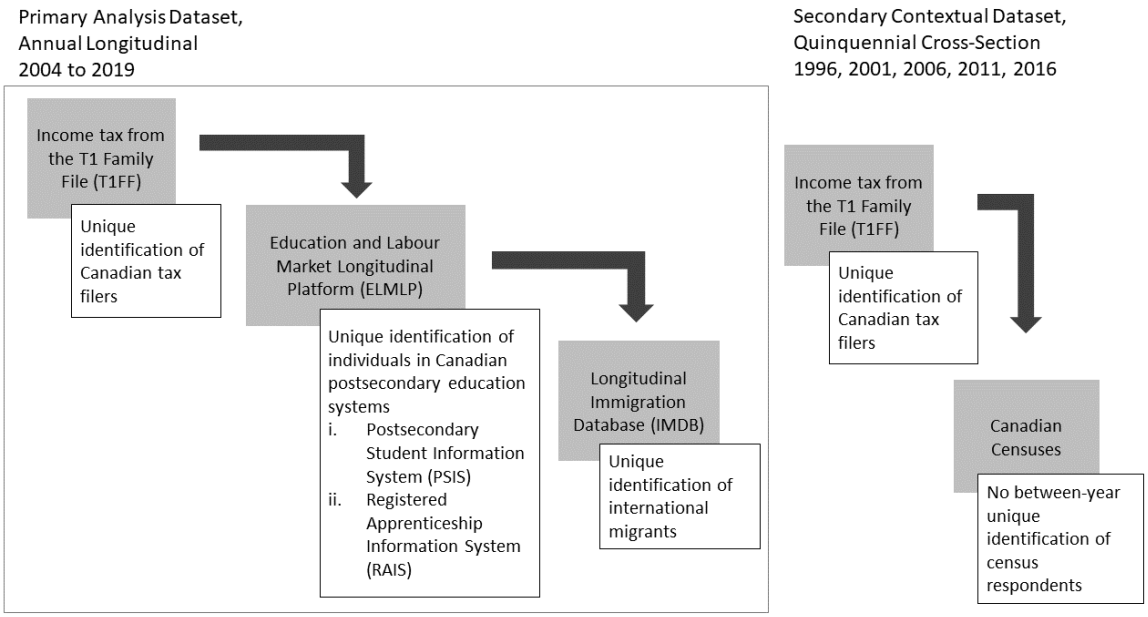


Figure 1: Schematic portraying the hierarchy of individuals' association with each source data set. When compiling the final dataset, annual records are merged according to the order of the arrows.

The data cleaning process begins by categorizing individuals into one of four educational attainment scenarios: those with foreign education only, no Canadian post-secondary education, Canadian post-secondary education only, or a combination of foreign and domestic post-secondary studies. International students studying in Canada who never applied for permanent resident status between 2004 and 2019 would have missing socio-economic and demographic data from the IMDB-T1FF data and are excluded from the study. Therefore, the analysis includes individuals who received a permanent residency from IRCC in any year between 2004 and 2019.

Some individuals may have initially received a non-permanent residency permit, such as a work visa, and subsequently became a landed immigrant by receiving permanent residency. Therefore, there are years in which these individuals were non-permanent residents and not yet immigrants, those years are included in the analysis. Every individual observed in the study did eventually become a landed immigrant, although some observations may refer to their time as a non-permanent resident. This nuance is important to keep in mind since some observations are of non-permanent residents. However, all individuals did become immigrants and had at least 1 year observed in the study as a landed immigrant.

When creating the educational attainment variable, many immigrants had IMDB and PSIS-RAIS records, indicating that their most recent studies were in Canada. However, some individuals had an IMDB record but no PSIS-RAIS record (such as migrants with no Canadian education), while others had a PSIS-RAIS record and no IMDB record (such as individuals born in Canada). To ensure a

consistent educational attainment variable, the PSIS-RAIS data was modified to account for immigrants with no Canadian education. These individuals must have attained their highest level of education before arriving in Canada, which would be identified in the IMDB but not the PSIS-RAIS. To reflect this, the credential was labeled as 'Foreign' (e.g. 'Foreign bachelor's degree') and added to the PSIS-RAIS educational attainment categories. The PSIS-RAIS educational attainment variable was coded according to Statistics Canada methodology, with the highest educational attainment achieved prioritizing Canadian education and accounting for foreign education in each year of observation. Table 1 describes all the variables used for our empirical analysis.

Individuals born in Canada who did not pursue post-secondary education or training are not observed in the PSIS-RAIS. McDonald, Daigle, and Miah (2019) proposed a method to identify these individuals by using linked T1FF data and categorizing Canada-born tax filers with no PSIS-RAIS records as having a high school education or less. However, this approach assumes that Canada-born tax filers missing from the PSIS-RAIS records did not complete post-secondary education or training anywhere in the world, which could potentially result in underestimating the education levels of Canada-born individuals who attained their highest credential outside Canada.

The analysis excludes years in which an individual is enrolled full- or part-time in any program of study to accurately capture full-year annual earnings for individuals who have completed their education. Additionally, the final dataset only includes years in which an individual filed a non-zero tax return to maintain a

complete income variable. As the focus of this research is on disparities among female workers based on world area of origin rather than gender discrimination, all individuals who identified as male in the IMDB and PSIS-RAIS records have been omitted from the analysis. Lastly, the analysis includes individuals aged 18 to 64 to capture self-dependence and regular activity in the work force, as it pertains to labour market outcomes.

Table 1 – Summary of Variables and Observations

Variable	Categories	Observations
CIPPG (Educational Field)	Unknown	20,064,480
	Arts	796,040
	Education	1,776,050
	Business and Public Administration	3,942,050
	STEM	1,720,130
	Health and Related	3,415,500
	Personal, Protective and Transportation	521,630
Place of Birth	Europe (EU)	1,266,070
	Sub-Saharan Africa (AF-MENA)	639,140
	South Asia (SA)	961,030
	East Asia (EA)	1,410,270
	Ocean and Other Asia (SEA-O)	960,140
	Latin America (LAT)	974,040
	United States and misc. (US)	148,210
	Middle East and North Africa (MENA)	821,190
	Canada (CAN)	32,219,820
Number and Age of Children	No Children	10,626,600
	1 Child Above 17yo	5,974,460
	At Least 2 Children Above 17yo	3,810,640
	1 Child Under 17yo	3,865,530
	At Least 2 Children At Least 1 Under 17yo	15,122,700
Highest Educational Attainment	Less than HS, HS, and Basic Education	18,773,880
	13 Years or less of Foreign Education	3,231,420
	Below Bachelor's Above HS	5,499,680
	Foreign Below Bachelor's Above HS	877,240
	Bachelor's Degree	6,602,150
	Foreign Bachelor's Degree	1,650,950
	Master's Degree and other graduate programs	2,026,800
	Foreign Master's Degree	463,540
	Health-related residency, Doctorate, Post-doc	215,380
	Foreign Doctorate	57,260
Marital Status	Married / Common Law	19,195,860
	Single / Widowed / Divorced / Separated	20,204,030
Family Income Tercile	Bottom	13,070,550
	Middle	13,156,480
	Top	13,172,860

Knowledge of an Official Language	Yes No	36,654,500 2,745,410
Years Since Permanent Residence	Not a Permanent Resident Less than 2 Years 3 to 5 Years 6 to 10 Years 11 to 20 Years 21 Years and Greater Born in Canada	396,060 903,580 969,110 1,544,260 2,254,290 1,112,790 32,219,820
Citizenship	Canada Citizen Not a Citizen Unknown	36,905,320 2,488,600 6,000
Skill Upon Arrival	Managerial Professional Skilled and Technical Intermediate and Clerical Elemental and Labourers Other / Not Stated	104,040 797,910 510,260 329,800 40,810 5,397,280

Note: Analysis variable derived the IMDB, ELMLP, T1FF data records. Observation counts include all female individuals aged 18-64 and summed over each tax year filed with the exception of years when an individual was enrolled in any education program.

For additional contextual analysis, micro-data records from the Canadian census released in 1996, 2001, 2006, 2011, and 2016 were used to examine the extent and nature of earnings disparities among different immigrant groups and between immigrants and the Canadian-born population. The Canadian census collects detailed information on a wide range of demographic and socioeconomic characteristics, including education, occupation, and income. The census data was used to quantify the extent of earnings disparities and identify the factors that contribute to earnings disparities such as differences in education, work experience, language proficiency, and discrimination in preliminary Oaxaca-Blinder analysis. The census limitation was a longitudinal perspective as our RDC data access remained unlinked between years, as such our analysis remained cross sectional albeit with aggregate comparison over the 20-year study period.

3.2 - ECONOMETRIC SPECIFICATION

From the existing literature, our model includes the following variables in our empirical analysis: a continuous age variable, and categorical variables for years since landing, highest educational attainment, educational field, skill upon arrival, knowledge of an official language, marital status, citizenship, number of children, Canadian region of employment, generalized world area of birth (South Asia, Middle East and North Africa, East Asia, United States, Sub-Saharan Africa, Southeast Asia and Oceania, Latin America, Canada, Europe), and family income tercile. We only included female individuals who were not enrolled in post-secondary studies during the tax year and were ages 18 to 64.

We developed a salary model based on Vezina & Belanger (2020), Skuterud (2010), and Zhang (2009). The salary model is designed to estimate earnings in the Canadian labour market by controlling for factors that determine the salaries of workers in Canada. Conclusions from our investigation of earnings determinants for both immigrant and Canada-born workers are described in the literature review. Following identification of the appropriate datasets and the rationale for their use in our salary model we employ the variables listed above. The model is then estimated using pooled OLS specifications initially to gain a broad understanding of trends in the data. Additionally, panel methods are prioritized in this study to estimate parameters with time-constant attributes.

To mitigate omitted variable bias from unobserved effects in the panel data, OLS models are best specified with panel effects. Individual fixed effects are applied as a suitable method to control for unobserved time-constant effects on salary such as a comprehensive identification of skill or motivation (Lochner, Park,

Shin, 2017; Kaushal et al., 2016,Hum & Simpson, 2004). This allows us to isolate the effect of observable variables, such as education and experience, on earnings, while controlling for unobserved heterogeneity across individuals.

The estimated model is then used as an input for Oaxaca-Blinder decompositions formulated by Oaxaca (1973) and Blinder (1973), and designed to capture the components of earning differentials between female workers. The Oaxaca-Blinder method can be used to compare earnings between immigrants from different origin countries by decomposing any gap into two parts: the part that can be attributed to differences in characteristics (such as education, work experience, occupation, and language proficiency) and the part that cannot be explained by these differences. To decompose differences in earnings between female immigrants from different world areas of birth, we apply the Oaxaca-Blinder decomposition approach in a panel setting, as extended by Kröger and Hartmann (2021).

The Oaxaca-Blinder technique is designed to decompose wage levels into an “explained” endowment component, which includes variables such as age, education, and years of experience, and an “unexplained” earnings function component, which includes slope coefficients. This method compares the differences in earnings between two groups by taking individuals with identical endowments from each group and comparing their earnings. The difference between a hypothetical individual with average endowments in one group and the person in the same group with the equivalent endowments is the explained portion of the earning gap. The remaining gap is the difference in earnings when comparing identical individuals apart from their association with a specific group.

This method is used under the assumption that there is an underlying difference in earnings between the two groups being compared.

Kröger and Hartmann (2021) generalize the Oaxaca-Blinder technique to longitudinal data (Jann, 2008). By modifying the existing decomposition approach of Wellington (1993) under an interventionist perspective, decompositions can address the impact on explained or unexplained gaps from time-constant factors. In the case of immigrant earning disparities, the approach may be applied to compare before and after salaries where a process or event occurred between two time points. In the case of salary convergence between immigrant groups and Canada-born individuals, the interventionist approach is applied such that we are comparing the before and after process of labour market integration, by controlling for years since arrival in the earnings model. Effectively the intervention is the passing of time. We quantify the extent between groups to which years since arrival prompts a reduction in earnings gap.

The analysis begins by estimating an earnings function for each group of interest using either a pooled OLS or individual fixed effects model. The Oaxaca-Blinder decomposition is then applied to the slope coefficients to compare equivalent individuals from each group and observe the earnings gap between them that cannot be explained by observable factors. In the cross-sectional Oaxaca-Blinder decomposition, the model inputs are pooled across time and individuals, and the results are interpreted as if we are only viewing one point in time. In contrast, the Oaxaca-Blinder decomposition using regression coefficients from a panel specification also considers differences in time-constant unobserved

variables between groups. This is because panel regression models incorporate individual-specific error terms that remain constant over time. As a result, part of the difference between groups is attributed to unobserved factors that do not change within the period of observation.

Interaction components from decompositions in the Oaxaca-Blinder panel data setting are different compared to cross-sectional decompositions. When decomposing panel data models, the interaction component captures the portion of the wage gap that is due to differences in time-varying characteristics of individuals in the two groups being compared. It signifies how the group membership variable (world area of birth) interacts with changes in observable characteristics over time, showcasing their combined contribution (Kröger and Hartmann, 2021).

When applying the Oaxaca-Blinder decompositions, the MENA region is always used as the first comparison group when specifying salary gap decompositions. The order of the comparison group is relevant when determining whether the interaction component contributes to the explained or unexplained effect. By using MENA as the first comparison group, the assumption is that comparison immigrants from origins outside MENA are paid according to their characteristics, and it is only the immigrants from MENA who may face discrimination. If the comparison groups were reversed, it would imply that migrants from MENA are paid based on their characteristics, while female migrants from other origins receive undue generous compensation (Jann, 2008). Based on these assumptions, the decompositions used in this analysis defines the

interaction component as an explained contribution to the income gap in addition to the endowment component (Rahimi & Nazari, 2021).

From Kröger and Hartmann (2021), it is possible to mathematically express the OLS regression as the following for cross sectional data,

$$\boldsymbol{Y_t^z = X_t^z \beta_t^z + \varepsilon_t^z}$$

Where the following assumptions are made from econometric theory,

$$\boldsymbol{E(\varepsilon^z) = 0}$$

$$\boldsymbol{COV(X, \varepsilon) = 0}$$

$$\boldsymbol{z \in [A, B]}$$

For the basic Oaxaca-Blinder decomposition, we take data pooled across points in time and individuals and treat the results as if we were only viewing 1 point in time. The decomposed "explained" and "unexplained" components can be expressed as the following under the assumption of group differences, and using $\boldsymbol{\Delta Y_t}$ to represent the earnings gap between groups,

$$\boldsymbol{\Delta Y_t = [E(X_t^A) - E(X_t^B)]\beta_t^B}$$

Since,

$$\boldsymbol{E(X_t^z \beta_t^z + \varepsilon_t^z) = E(X_t^z \beta_t^z)}$$

The components of the difference are then decomposed as:

$$\boldsymbol{\Delta Y_t = E_t + C_t + I_t}$$

Where,

$$\boldsymbol{E_t = [E(X_t^A) - E(X_t^B)]\beta_t^B}$$

$$\boldsymbol{C_t = E(X_t^B)(\beta_t^A - \beta_t^B)}$$

$$\boldsymbol{I_t = [E(X_t^A) - (X_t^B)(\beta_t^A - \beta_t^B)]}$$

And,

$\boldsymbol{E_t}$

The difference in earnings due to groups' endowments at time t.

$\boldsymbol{C_t}$

The difference in earnings due to differences in group specific earnings function slope coefficients.

$\boldsymbol{I_t}$

The difference in earnings attributed to the interaction of differences defined by *Et* and *Ct*.

For Oaxaca-Blinder decomposition using regression coefficients from a panel specification, we additionally take into consideration group differences in time-constant unobserved variables. This is due to panel regression models including time constant individual error terms. The panel regression model becomes,

$$\boldsymbol{Y_t^z = X_t^z \beta_t^z + \mu^z + \varepsilon_t^z}$$

Where $\boldsymbol{\mu^z}$ is the time constant individual error and $\boldsymbol{\varepsilon_t^z}$ is the time and group varying, idiosyncratic error term. The earnings decomposition necessarily becomes,

$$\Delta \boldsymbol{Y_t} = \boldsymbol{E_t} + \boldsymbol{C_t} + \boldsymbol{I_t} + \boldsymbol{U}$$

Where $\boldsymbol{U}$, in a fixed effects context, is the difference between groups' earnings gap due to unobservable fixed effects averaged across members of a group.

$$\boldsymbol{U} = [\boldsymbol{E}(\boldsymbol{U^A}) - \boldsymbol{E}(\boldsymbol{U^B})]$$

Therefore, the decomposition using a panel model attributes part of the differences between groups to unobserved factors that do not change within the period of observation.

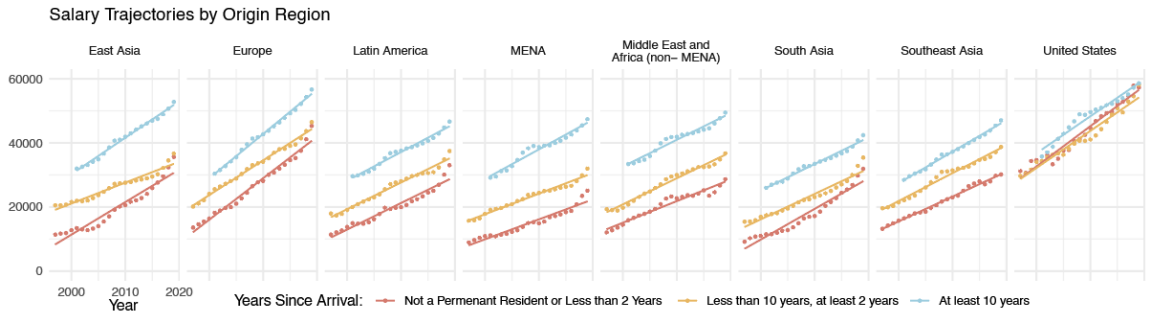
4 - RESULTS

4.1 – SUMMARY STATISTICS

There are clear differences in earnings when comparing Canada-born and immigrant females. Additionally, there is heterogeneity present when examining immigrant earnings across points of origin (See Figure 2 and Figure 3 below, and Figure A.1 to Figure A.7 in the Appendix). Figure 2 demonstrates that females from MENA are consistently the lowest earners compared to female immigrants from other regions, regardless of the cross-tabulation being analyzed. However, it is worth noting that there are some instances where the MENA group has higher salaries. For example, MENA women who are in the top third of household income distribution also have above average salaries relative to other female migrants in same category.

Additionally, as years since permanent residence increase, earning gaps between source-country groups appear to respond differently. Women from MENA begin to earn average wages across female immigrants, a change that occurs after staying in Canada beyond five years (Figure 2). In fact, their salaries were observed to be above average for individuals who had migrated to Canada 21 years ago or more. On the other hand, the summary statistics also suggest that women from MENA countries experience their largest income gap relative to other groups when they have been a permanent resident for less than 2 years. This finding in Figure 2 indicates that female migrants from MENA countries may experience a pronounced integration effect relative to other female migrants, as years since arrival have a greater impact on their earnings. The possibility is also

reflected in the greater spread between salaries for MENA women in Canada for the categories of ‘Not a Permanent Resident’ and ‘At least 20 years’.



	Not a Permanent Resident or Less than 2 Years		Less than 10, at least 2 years		At least 10 years	
	Salary	Observations	Salary	Observations	Salary	Observations
Sub-Saharan Africa	$20,682	132,320	$30,553	243,460	$39,418	263,380
East Asia	$19,665	302,550	$24,642	501,940	$39,964	605,770
Europe	$21,952	161,690	$29,930	379,790	$39,978	724,590
Latin America	$19,022	157,080	$28,471	309,220	$36,463	507,750
Middle East and North Africa	$13,873	140,070	$24,069	335,690	$36,511	345,410
South Asia	$22,439	189,520	$25,449	360,110	$37,270	411,390
South East Asia Oceania	$21,159	192,760	$31,081	344,050	$38,549	423,340
United States	$30,183	23,650	$32,945	39,110	$37,278	85,450

Figure 2: Average before-tax earnings for females ages 18 to 65, graphed for each origin world area birth and years since arrival. IMDB 2004-2019. Solid line is trend.

Preliminary findings displayed in Figure 3 also suggest there are considerable earnings gaps between immigrants from different source-country groups with education in the same field. For those who received post-secondary education or training in an “Education” filed, salaries were observed with less variation between groups compared to the average, indicating the possibility of lower disparities for MENA females in teaching fields. Additionally, when observing

the average salary of MENA females, the group fares better than usual in Education and Health fields. This suggests there may not be significant disparities for MENA females in these fields, further investigation could be valuable in confirming this finding.

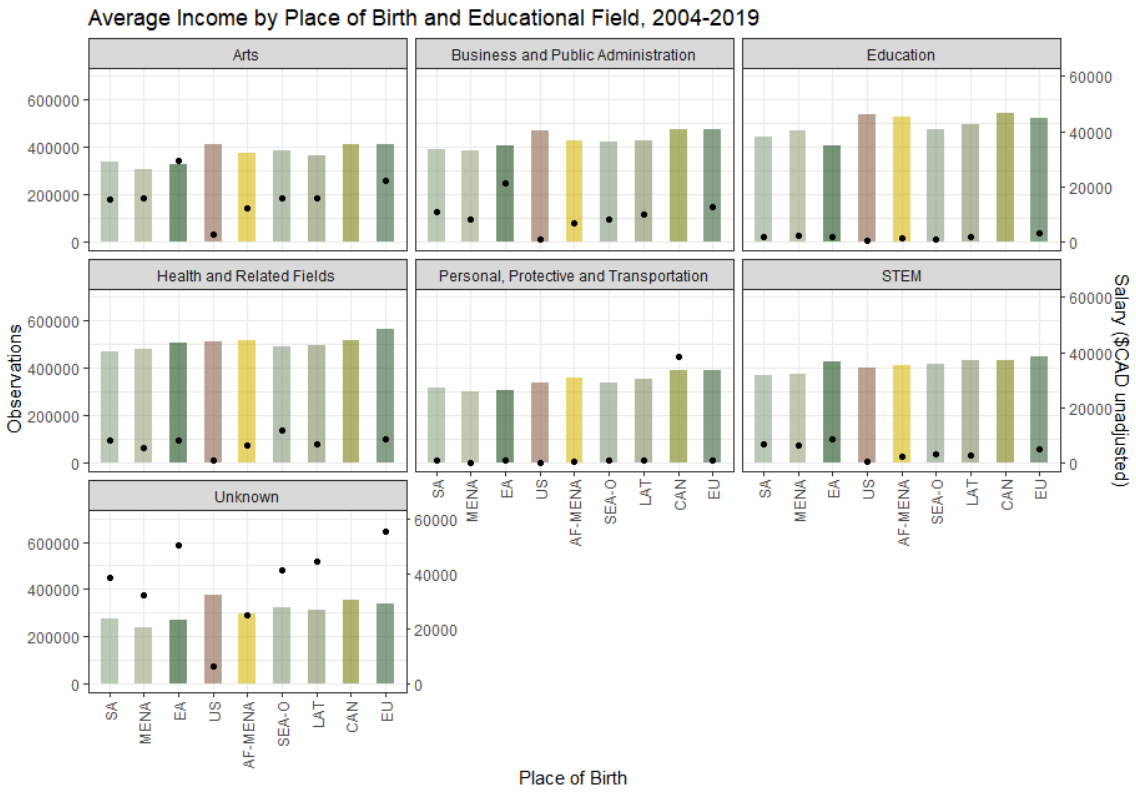
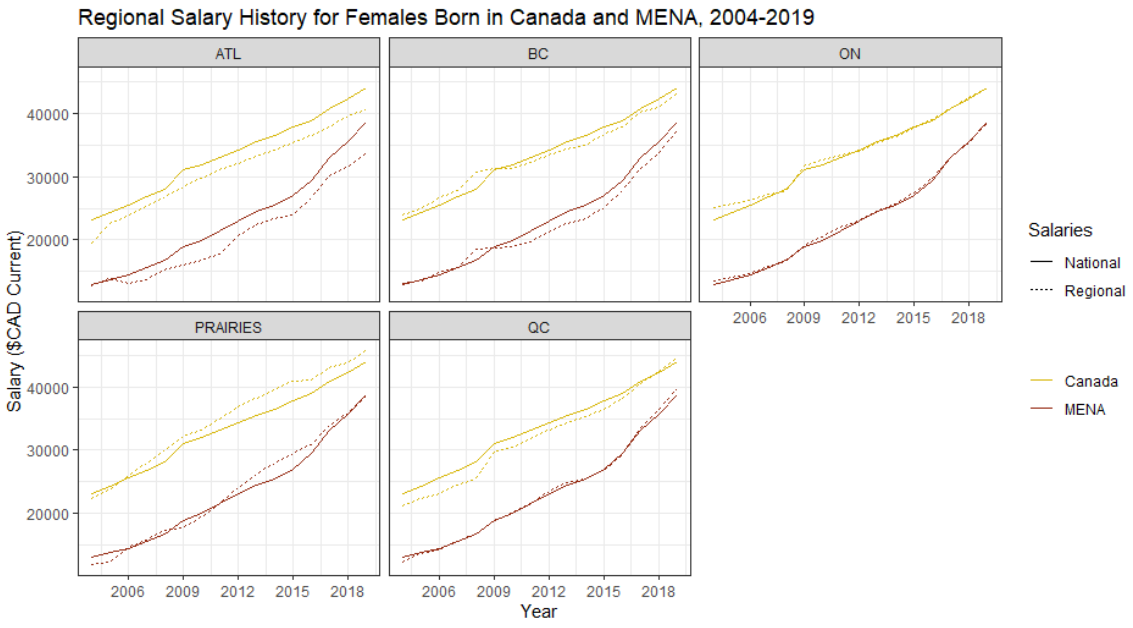


Figure 3: Average earnings observed across years 2004 to 2019, categorized by educational field of highest post-secondary credential and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

Figure 4 shows the average before-tax earnings for females ages 18 to 65, graphed for each region of Canada. Solid lines do not change in each region as they represent the national average salary reference point. The figure shows the average earnings for these groups in five Canadian regions as dotted lines, while solid lines represent the national average salary. Yellow and red lines indicate

Canada-born and MENA migrant females, respectively. The associated table depicts average before-tax earnings for each region and nationally across all years, 2004 to 2019. A persistent earnings gap between MENA females and the Canada-born population can be observed, which remains consistently lower across all years and regions in Canada. However, there is some indication that the earnings gap between Canada-born and MENA migrant females is decreasing over time. Additionally, it is evident that on average, MENA migrants follow the same regional patterns in earnings as the Canada-born population.



	ATL	BC	ON	PRAIRIES	QC	National
Canada	$31,047	$33,175	$33,776	$34,959	$32,122	$33,398
MENA	$20,719	$22,241	$23,349	$23,594	$23,271	$23,185

Figure 4: Before-tax earnings for females ages 18 to 65, graphed for each region of Canada. Solid lines do not change in each region as they represent the national average salary reference point. Table depicts average before-tax earnings for each region and nationally across all years. IMDB 1996-2019.

In the Atlantic provinces and British Columbia, earnings for MENA migrants and the Canada-born are both below the national average and Ontario and Quebec are approximately the same as the national average. Earnings in the

prairies are above average for both groups, although MENA migrant females do trend below the national average until 2010, whereas their Canada-born counterparts earn consistently above average in the time period analysed. An opposite trend is noticed in Quebec, where MENA females earn the national average, and the Canada-born population trends below the national average for the entire time period relative the national earnings of Canada-born females. The findings in the charts align with those from studies of provincial earnings disparities and GDP per capita.

Shifting to a preliminary analysis of the census data, there is some indication that we may find a stronger salary response among migrants during motherhood, which supports the observation of Bongaarts (2019). As shown in Figure 5, controlling for years since arrival brings the salary estimates for MENA females much closer to those of the Canada-born population. However, as young families form and children age, salary gaps widen, suggesting a possible difference in paid labour response to motherhood. These preliminary observations may support the idea of self-selection into less work during this time of life, resulting in lower salaries. Therefore, the number and age of children should be considered as key variables in explaining earnings gaps.

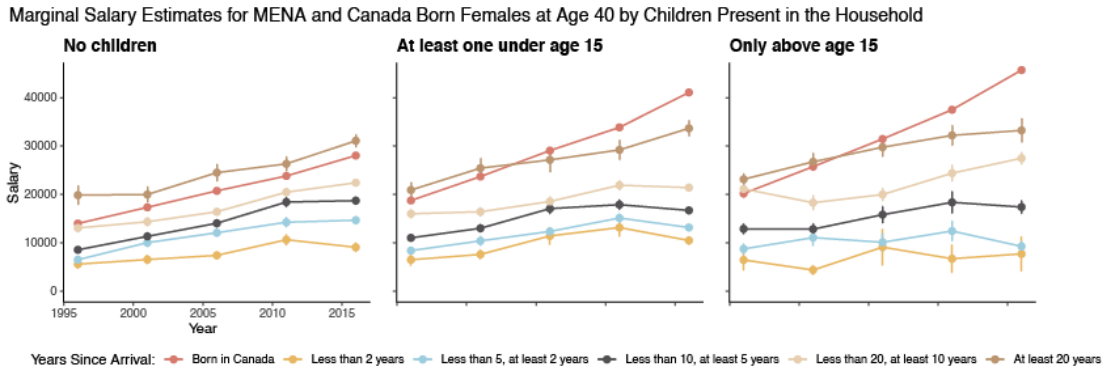


Figure 5: Salary estimates for MENA and Canada born females at the margin age 40. Trajectories for 6 “Years Since Arrival” categories differentiated by the number of present children in the household. Females Ages 18 to 65. Census 1996, 2001, 2006, 2016, NHS 2011. Years 1995 to 2015 are the same for each x-axis.

4.2 - ESTIMATES

Table 2 (expanded in Appendix Table A.3) contains the pooled OLS estimates for MENA females, all female immigrants, and Canada-born, respectively. In this table, beneath the coefficients and standard errors in brackets, we also include group-specific deviations from own group average income as a way to interpret the response to a 1-unit change in the independent variable. These group-specific deviations are reported in percentage terms, which allows for a relative understanding of income determinants. For example, in Table 2 model (1) presents a pooled OLS regression subset for MENA females at the national level. The effect of having ‘Less than 10, at least 5’ years since landing is a $4,518 increase from the average earnings of MENA females in the reference category ‘Non-permanent resident’. To put this in perspective and make it comparable to other groups analysed, 17.0% is included. Notably, the same effect of having ‘Less than 10, at least 5’ years since landing, is only a 10.6% increase from the average income of all other female immigrants, as found in model (2).

In general, we found that higher levels of education and longer periods since permanent residence were associated with higher salaries for all groups. However, there were some differences in the impact of other variables. For instance, being married was associated with a higher earnings increase for Canada-born than it was for MENA migrant females (Table A.2, & Table A.3). As age increases, the expected value of earnings increased for all groups, although diminishing returns on age decreased at a lower rate for MENA compared to the other groups.

In Table 2, we also provide national aggregate results for the baseline models and include 6 categorical variables of interest that best represent skill and ability, training, and motherhood with our available data. The finding that longer residence in Canada may result in increasingly smaller earning gaps supports a conclusion from the panel Oaxaca-Blinder decompositions discussed in Section 4.4. It appears that females from MENA may experience a greater rate of earnings convergence to other immigrant groups and Canada-born individuals as they reside in Canada longer, a finding supportive of Hum & Simpson (2004).

To investigate differences across Canada's regions, we generate another set of models specified with the same explanatory variables as (1) and (2) for each of 5 Canadian regions and tabulate the years since landing coefficients for years since permanent-residency (Table 3). The income response for values of years since landing for both MENA and non-MENA females is reported which includes the same percentage deviation in the coefficient from average salary for the reference group, 'Non-permanent resident'. The trend is consistent across all regions except for the Prairies, and it is most striking in Quebec. In Quebec, we observe MENA

females' income is associated with a 44.5% increase when years since permanent residence is 'At least 21 years' compared to the reference category, 'Non-permanent resident'. For the comparison group, non-MENA migrant females, the increase is only 33.1%.

Table 2 – Baseline OLS and Panel Models, MENA, All Migrants, Canada-Born

Dependent Variable: T4E (Before-Tax Income) Independent Variables – "*Reference*":	(1) Pooled OLS, MENA, National Estimates	(2) Pooled OLS, Any Origin including MENA omitting Canada, National Estimates	(3) Pooled OLS, Canada Born, National Estimates
Age	2898*** (70) 10.9%	3169*** (224) 9.9%	3478*** (525) 10.0%
Age ^{2}	-32.4*** (-55)	-35.6*** (-187)	-35.9*** (-389)
Years Since Landing – "*Non-permanent resident*"			
Less than 2 years	280* (2.0) 1.1%	153** (3.2) 0.5%	-
Less than 5, at least 2	2972*** (19) 11.2%	1640*** (32) 5.2%	-
Less than 10, at least 5	4518*** (26.8) 17.0%	3364*** (58) 10.6%	-
Less than 21, at least 10	8348*** (46) 31.4%	7116*** (107) 22.5%	-
At least 21 years	16057*** (62) 60.3%	13491*** (147) 42.6%	-
Number of Children – "*No Children*"			
1 Child Under 17yo	-4635*** (36) 17.4%	-4239*** (82) 13.4%	-3451*** (132) 9.9%
At Least 2 Children At Least 1 Under 17yo	-5785 (47) 21.7%	-6749 (136) 21.3%	-7645 (294) 22.0%
1 Child Above 17yo	-8231*** (43) 30.9%	-9787*** (153) 30.9%	-14076*** (433) 40.8%
At Least 2 Children Above 17yo	-14698*** (84) 55.2%	-16495*** (238) 52.0%	-19486 (466) 56.1%
Educational Field - "*Arts*"			
Education	4676*** (18) 17.6%	2571*** (20) 8.1%	2746*** (58) 7.9%
Business and Public Administration	3533*** (22) 13.3%	3725*** (60) 11.8%	4356*** (113) 12.5%
STEM	2763*** (15) 10.4%	2556*** (29) 8.1%	1668*** (33) 4.8%
Health and Related	8824*** (33) 33.2%	7313*** (91) 23.1%	7350*** (181) 21.2%
Personal, Protective, and Transportation	489 (1) 1.8%	-577*** (42) 1.8%	3064*** (1) 8.8%
Highest Education – "*Bachelor's Degree*"			
Less than HS, HS, and Basic Education	-698.6 (1) 2.6%	-2589*** (10) 8.2%	-1806*** (35) 5.2%
13 Years or less of Foreign Education	349* (2) 1.3%	-1109*** (16) 3.5%	-

Below Bachelor's Above HS	-700** (3) 2.6%	-751*** (9) 2.4%	-5076*** (173) 14.6%
Foreign Below Bachelor's Above HS	-900 (4) 3.4%	-2400*** (27) 7.6%	-
Foreign Bachelor's Degree	-331 (2) 1.2%	-1355*** (16) 4.3%	-
Master's Degree and other graduate programs	6730*** (20) 25.3%	6053*** (41) 19.1%	6435*** (123) 18.5%
Foreign Master's Degree	1339*** (5) 5.0%	-1077*** (7) 3.4%	-
Health-related residency, Doctorate, Post-doc	10135*** (14) 38.1%	9922*** (79) 31.3%	19305*** (0) 55.6%
Foreign Doctorate	2586*** (5) 9.7%	4876*** (9) 15.4%	-
Observations:	821,180	6,358,910	32,218,230
Adjusted R-squared:	0.375	0.302	0.248
Additional Independent Variables:	Yes	Yes	Yes

Note: *,**,*** represent 1%, 5%, 10% significance. Standard errors in parenthesis. Percentage term beneath coefficients and standard errors is the increase from reference category in quotations "". IMDB 2004-2019, PSIS-RAIS 2004-2019. Additional variables are "Skill Upon Arrival", "Citizenship", "Marital Status", Knowledge of Official Language", "World Area of Birth", "Region of Employment", "Family Income Tercile".

Table 3 – Years Since Permanent Residence Results within Regional Groupings

	Less than 2 years	Less than 5, at least 2	Less than 10, at least 5	Less than 21, at least 10	At least 21 years
Atlantic Canada					
MENA	-294 (0) -2.2%	1325 (1) 6.2%	2068 (2) 7.7%	3521** (3) 11.3%	11123*** (6) 26.5%
Non-MENA	574* (2) 2.6%	578 (2) 2.1%	1874*** (4) 6.0%	4824*** (8) 14.2%	8819*** (12) 20.5%
Quebec					
MENA	1665*** (9) 12.7%	5217*** (24) 24.4%	7083*** (29) 26.4%	10719*** (41) 34.5%	18662*** (47) 44.5%
Non-MENA	-45.9 (0) -0.2%	2947*** (24) 10.9%	5189*** (38) 16.7%	8612*** (52) 25.4%	14191*** (67) 33.1%
Ontario					
MENA	-145 (1) -1.1%	1734*** (7) 8.1%	2812*** (9) 10.5%	6859*** (23) 22.1%	14986*** (36) 35.7%
Non-MENA	829*** (13) 3.8%	1841*** (24) 6.8%	3121*** (36) 10.0%	7086*** (73) 20.9%	13673*** (101) 31.9%
Prairies					
MENA	-512 (1) -3.9%	1867** (3) 8.7%	4872*** (7) 18.2%	9115*** (12) 29.3%	14279*** (13) 34.0%
Non-MENA	583*** (6) 2.7%	2886*** (23) 10.7%	5669*** (38) 18.2%	9599*** (51) 28.3%	15595*** (61) 36.3%
British Columbia					
MENA	671 (2) 5.1%	2467*** (6) 11.6%	3782*** (8) 14.1%	7628*** (15) 24.6%	14539*** (22) 34.7%

Non-MENA	284 (2) 1.3%	1206*** (11) 4.5%	2816*** (23) 9.1%	6183*** (45) 18.2%	12237*** (67) 28.5%

Note: Specifications from models (1) and (2) from Table 1, with results generated for each Canadian region. Coefficients for the years since landing variable extracted. *,**,*** represent 1%, 5%, 10% statistical significance. Standard errors in parenthesis. Percentage term beneath coefficients and standard errors is the increase from reference category 'Non-permanent resident' that the coefficient represents, specific to the group and region subset. IMDB 2004-2019, PSIS-RAIS 2004-2019.

Comparing the same years since permanent residence figures for the Prairies, we observe 34.0% and 36.3% for MENA and non-MENA respectively. The findings indicate that integration dynamics may be regionally differentiated. From this pre-decomposition analysis we find that MENA females in Quebec may benefit relatively more than in other regions from residing longer in Canada. Additionally, there seems to be only a small group-specific effect from residing longer in Canada for MENA women in the Prairies. Therefore, if the wage gap for MENA females is decreasing in the Prairies, it is not solely due to more years since permanent residence. This finding is further elaborated in Figure 6 where as 'years since permanent residence' increase income levels converge across all migrant groups. A similar phenomenon can be ascertained from the quadratic age variable included in Table 2, models (1) through (3). All individuals experience diminishing returns to salary from greater age; however, MENA females experience these diminishing returns the least, coefficient of -32.4 compared to -36 for other groups. This result further indicates higher salary premiums with age for MENA females, in addition to years since permanent residency.

In our baseline OLS models displayed in Table 2, we additionally find evidence of weak effects from salary changes during motherhood. By observing the number of children variable with a reference category of 'no children', we can further understand the difference in the effect of motherhood on females' salaries

across groups. The only notable difference in salary decline during motherhood is for females with 1 child under 17 years old. We notice the effect on salary decline is greatest for MENA females with 1 child under 17 (-17.4%), and least for females born in Canada with 1 child under 17 (-9.9%). The unexpected result is the salary decline for females with at least 2 children with at least 1 of them under age 17 relative to females with no children.

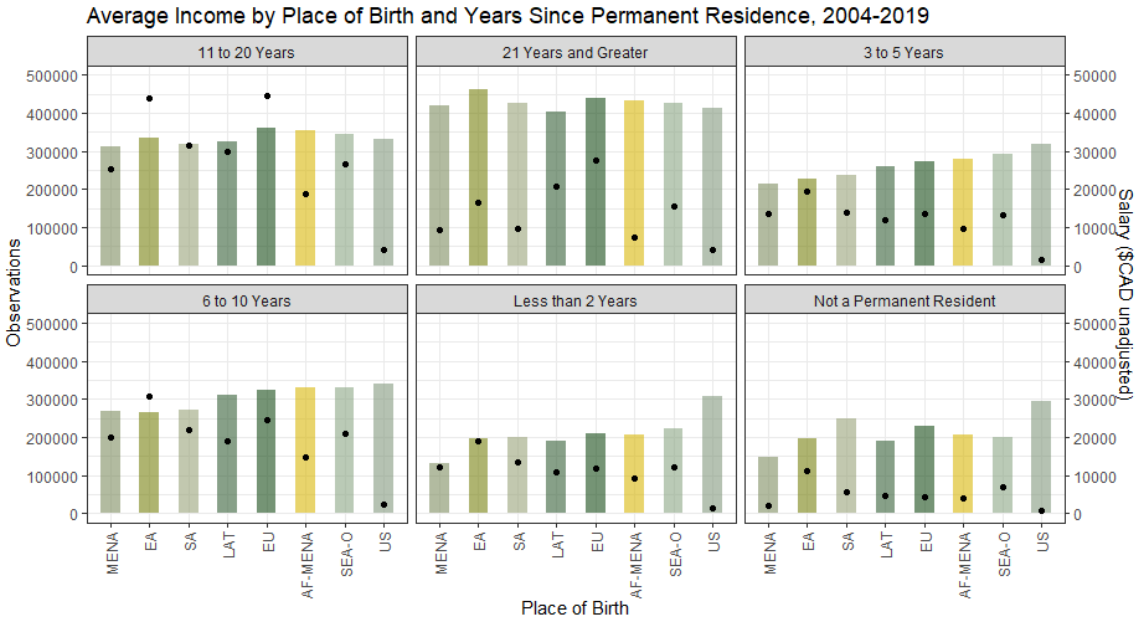


Figure 6: Average earnings observed across years 2004 to 2019, categorized by years since permanent residence and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

When observing the effect on salaries of having at least 2 children under the age of 17, for all immigrant females, the response in percentage difference from the relative group average salary is approximately -21.7%. Furthermore, there is negligible difference between MENA females and non-MENA migrant females. The finding may shed light on the so-called ‘female homemaker, male

breadwinner' social norm in the origin-country region. The regional perception is that males ought to support the family to the extent that females need not work, prioritizing family support in the household instead (Ghazal Read, 2004). The reservation wage may therefore be very high in this region of the world. However, our findings indicate this dynamic may only impact MENA women with 1 school-aged child in Canada. As these individuals age or reside in Canada even slightly longer, effects from this social norm are no longer clearly observed. For any other family composition, the social norm does not appear relevantly different than that of other immigrants except for Canadian-born females. For females born in Canada, there appears to be a greater association with large salary decline for women who have 1 child or at least 2 children above 17 years old, -40.8% and -56.1%, respectively (Table 2).

4.3 – CROSS-SECTIONAL OAXACA-BLINDER DECOMPOSITIONS

Using pooled OLS estimates described in Section 4.2, we perform Oaxaca-Blinder decompositions for MENA against other origin and Canada-born females ages 18-64. Based on Table 4 and summarised in Figure 7, females, on average, from MENA countries consistently reported less income than the comparison regions. When considering the unexplained component of the decomposition, a larger gap between the decomposition components may indicate a higher level of discrimination. For instance, while the average salary gap between females from MENA and from the United States is relatively consistent over time (parallel), the level of discrimination, or unexplained component of the decomposition, is widening between 1996 and 2016. In our Oaxaca-Blinder decompositions, we find

our results are in line with the existing literature by Frank et al. (2017) and Donahue (2021). Donahue (2021) finds that 68% of the earnings gap can be explained by observable characteristics. For our decomposition of the MENA income gap relative to Canadian-born females, the explained component accounts for 58.1% of the average difference.

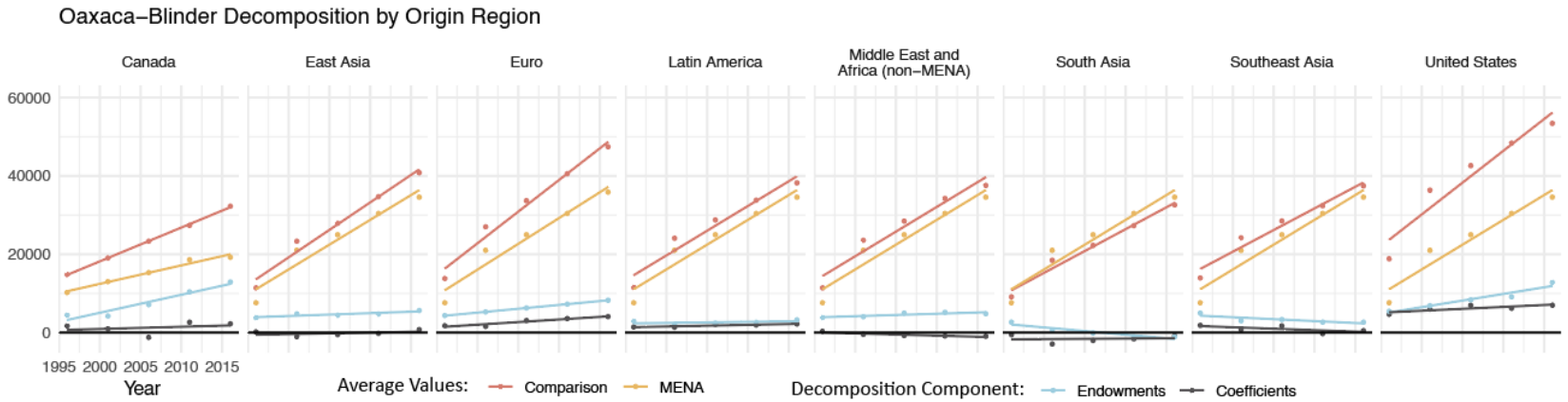


Figure 7: Oaxaca-Blinder decompositions for MENA against other origin and Canada born females age 18-65. Census 1996, 2001, 2006, 2016, NHS 2011.

Table 4: Oaxaca-Blinder decompositions for MENA against other origin and Canada born females age 18-65. MENA is specified as comparison group 1. Data is IMDB and ELMLP from 2004 to 2019.

	2004				2010				2019			
	Earnings	Difference	Explained	Unexplained	Earnings	Difference	Explained	Unexplained	Earnings	Difference	Explained	Unexplained
Middle East and North Africa	$12,958	-			$19,957	-			$38,777	-		
Canada	$23,105	-$10,147	-$23,582	$13,435	$31,958	-$12,001	-$16,594	$4,593	$44,061	-$5,284	$2,355	-$7,639
United States	$23,923	-$10,966	-$6,205	-$4,760	$30,946	-$10,989	-$5,812	-$5,176	$44,653	-$5,876	-$1,958	-$3,918
Latin America	$18,885	-$5,927	-$2,936	-$2,992	$25,833	-$5,876	-$2,780	-$3,096	$42,415	-$3,637	-$832	-$2,806
South East Asia Oceania	$19,380	-$6,422	-$1,927	-$4,495	$26,921	-$6,963	-$648	-$6,315	$42,992	-$4,214	$631	-$4,845
East Asia	$13,855	-$897	$246	-$1,144	$23,379	-$3,421	$26	-$3,447	$40,881	-$2,104	$1,705	-$3,809
South Asia	$15,131	-$2,173	$740	-$2,913	$21,902	-$1,945	$126	-$2,071	$40,269	-$1,492	$1,094	-$2,586
Sub-Saharan Africa	$17,361	-$4,404	-$225	-$4,178	$25,751	-$5,794	-$294	-$5,500	$43,227	-$4,449	$540	-$4,989
Europe	$19,535	-$6,577	-$3,012	-$3,565	$29,159	-$9,202	-$4,372	-$4,830	$47,224	-$8,447	-$2,822	-$5,624

Table 5 – Cross-Sectional Oaxaca-Blinder Decompositions By Region

Region	Total Difference	Explained Effect	Unexplained Effect
Atlantic Canada	6184*** (22)	4783*** (27)	1402*** (6)
Quebec	2432*** (51)	570*** (18)	1861*** (48)
Ontario	4765*** (96)	2881*** (46)	1884*** (46)
Prairies	4174*** (31)	2029*** (26)	2145*** (19)
British Columbia	5138*** (60)	3194*** (58)	1945*** (29)
Canada	4583*** (151)	2662*** (142)	1921*** (77)

Note: Comparing MENA (group 1) with all other migrant females' salaries, differentiated by Canadian region. IMDB 2004-2019, PSIS-RAIS 2004-2019.

For our analysis of differences in average level of inequality among immigrant groups using Oaxaca-Blinder decomposition methods, we adopted a panel approach as a comprehensive method of measuring change in inequality determinants over time. We examined the change in the explained and unexplained components of the earnings gap over time by performing cross-sectional Oaxaca-Blinder decomposition annually from 2004 to 2019. The results from the repeated cross-sectional decompositions are shown in Appendix Figures A.8 to A.12. The summary results of repeated cross-sectional Oaxaca-Blinder decompositions for the 5 Canadian regions are reported in Tables 4 and 5. In addition, the result for the national aggregate is displayed in Figure 8, providing a visualization for assessing trends in the explained and unexplained components of the wage gap at the national level over time.

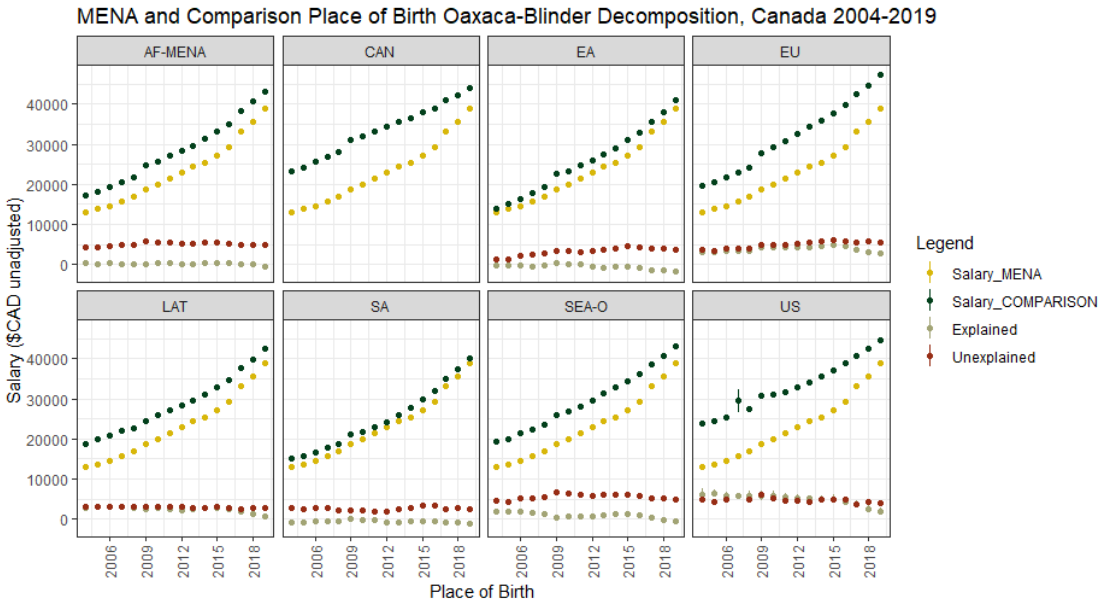


Figure 8: Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.3.

Figure 8 shows evidence that the scale of salary differences between MENA female immigrants and females from different regions in the world can be observed. The largest gap is observed when comparing immigrants from Europe and the United States, while the smallest is observed between East Asia and South Asia. The unexplained and explained components of the salary gap are represented by red and green points, respectively. The unexplained component of the salary gap is most economically significant when comparing with East Asia, Europe, United States, Southeast Asia, Oceania, and countries in Africa and the Middle East outside of the MENA area identified in Table A.1.

Among these world regions with significant unexplained gaps, comparisons between Southeast Asia and Oceania, and Africa and the Middle East outside of MENA, also reveal individuals with the lowest explained differences in the earnings gap. This result suggests that individuals from Southeast Asia and Oceania, and

Africa and the Middle East outside of MENA, likely have very similar levels of endowed income determinants, yet still appear to be earning more. On the other hand, the gap between females from MENA and females from Europe and the United States is equally due to explained and unexplained reasons. This result suggests females from Europe and the United States are, to some extent, justifiably endowed with favourable income determinants, but to the same extent, compensated more than females from MENA for unexplained reasons.

The charts displayed in Figure 8 also illustrate the presence of salary convergence and provide initial insight into the reasons for such convergence. For example, in the MENA Latin America decomposition over the last 3 years (2016-2019), there is evidence of a salary gap convergence indicated by an accelerated increase in the salaries of MENA females. From the repeated cross-sectional summary results, it appears that the decline in the explained component of the salary gap is responsible for convergence. This decline suggests that female immigrants from MENA and Latin America are converging in their levels of endowments, such as educational attainment. Furthermore, it appears that the natural path of income increase for females from Latin America remains unchanged while the path for MENA females pivots to a sharper increase. This change in relative endowments may be attributable to MENA females gaining additional endowments, such as language, experience, or education.

Table 6 – Repeated Cross-Sectional Oaxaca-Blinder Decomposition

Year	Average Salary – MENA	Average Salary – Other Migrants	Explained	Unexplained	Difference	Percent Explained
2004	12,958	18,296	1,903	3,435	5,338	35.6%
2005	13,786	19,131	1,981	3,364	5,345	37.1%
2006	14,448	20,199	1,941	3,810	5,751	33.8%
2007	15,635	21,820	1,835	3,761	6,186	29.7%
2008	16,802	22,550	1,799	3,949	5,748	31.3%
2009	18,843	25,368	1,942	4,584	6,525	29.8%
2010	19,957	26,270	1,965	4,348	6,313	31.1%
2011	21,476	27,507	1,856	4,174	6,031	30.8%
2012	23,090	28,832	1,572	4,170	5,742	27.4%
2013	24,483	30,356	1,591	4,283	5,873	27.1%
2014	25,484	31,870	1,808	4,577	6,386	28.3%
2015	27,041	33,742	1,874	4,826	6,701	28.0%
2016	29,405	35,688	1,682	4,601	6,283	26.8%
2017	33,142	38,312	1,112	4,058	5,170	21.5%
2018	35,646	40,516	603	4,267	4,869	12.4%
2019	38,777	43,094	235	4,082	4,317	5.4%

Note: Cross-sectional Oaxaca-Blinder decompositions for annual subsets. MENA females (Group 1) compared to other migrant females. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included, and the baseline model result found in Table A.4.

4.4 - PANEL OAXACA-BLINDER DECOMPOSITIONS

To conduct Oaxaca-Blinder decompositions in a panel setting, a base model is specified with fixed effects which include a binary variable for MENA origins interreacted with each explanatory variable and each year. To eliminate omitted reference category bias, normalization is applied to all categorical variables (Yun, 2005). The panel is estimated in 2-year intervals from 2004 to 2018 for all migrant groups.

An unbalanced panel is necessary to observe change over time in the time-constant error term. That is, if the panel is balanced, the expectations of the time-constant error terms cannot change over time and cannot contribute anything to the decomposition of change between groups (Kröger and Hartmann, 2021). Fixed

effects were applied in order to capture individual specific effects that are time constant. A possible source of unobserved time-invariant heterogeneity could be the prevailing social norms within a specific group.

Panel Oaxaca-Blinder decompositions were applied to compare immigrants from MENA countries with immigrants from other parts of the world in five regions of Canada. An additional national model was estimated comparing immigrants from MENA countries with the Canada-born population at the national aggregate. However it was not feasible to compare MENA and the Canada-born population in regional models due to heteroskedasticity in the distribution of income determinants when comparing females from MENA with Canada-born females. This is because a small population of MENA females in some regions may have skewed income determinants relative to a normally distributed Canada-born population. The bias is further amplified when comparing population sizes of different magnitudes. Therefore, immigrant to immigrant comparison remains relevant at the regional level, while the aforementioned caveats apply for immigrant to Canada-born comparison.

Table 7 presents the national salary decomposition of MENA immigrants and immigrants from other regions at the national level. Additionally, we provide longitudinal salary decompositions for five Canadian regions in Tables A.4 to Table A.9. The panel model employed is decomposed into four components: endowment, coefficient, interaction, and time-constant error term. The first section of the table depicts the mean group differences in absolute value of employment income estimated non-parametrically from the observed data. The subsequent two

sections display the decomposition results for levels and change between differences. The levels result includes the “unexplained” and “explained” components and provides an understanding of why there is a difference in earnings between two groups at a particular point in time. On the other hand, decomposition of changes decomposes splits the change in the outcome variable between two points in time into two parts: one part can be explained by changes in the characteristics of the two groups over time, and one part that cannot be explained by these changes (Kröger and Hartmann, 2021). This method is used to comprehend why the earnings differences between two groups have altered over time.

The endowment effect, ranging from -$1,673 to -$3,544, in the summary of level decomposition in Table 7, represents a substantial portion of the overall difference when compared to the coefficient and interaction effects. This indicates that the difference in known levels of income determinants between the two groups contributed significantly to the overall income gap over the years observed. The fixed effects (FE) component is relatively close in size to the other decomposition components, and a fixed effect component value of zero would indicate that the explanatory income determinants perfectly model time-constant error.

The fixed effects component is also decreasing over the years observed, and this relationship is due in part to a growing population of migrants. With each additional annual cross-section, individuals are added and retained in a longitudinal manner, and the attrition rate from return migration is lower than the increase in new individuals (Statistics Canada, 2017b). Therefore, as more

information on the explanatory income parameters is included in the regression, the variance in the error term of the estimated base model is reduced, and the model is better specified over time, as reflected by the diminishing time-constant error term.

As another measure of panel modelling advantage, the total decomposed difference is very close to the predicted difference in the repeated cross-sectional models for 2004 to 2018. For instance, comparing Table 6 and the row labelled total in the first section of Table 7, the same trajectory and magnitude of earnings gap at the national level between MENA and non-MENA migrants is observed. In the panel decomposition, the gap fluctuated by about $600 growing to a peak in 2010 at $5,463 and ultimately declining during the study period to a low of $4,805 in 2018. Adjusting for inflation, the same trajectory would result in a further pronounced decline in the salary gap suggesting the earnings gap has shrunk in recent years.

The second section of the summary of level decomposition tabulates the relative contribution of the four decomposition effects to the overall salary gap, in percentage terms. At the national level, when comparing income levels of immigrant women born in MENA countries to all other migrant females, the unexplained portion, measured as the coefficient and interaction, dominate as the primary source of the earnings gap. The unexplained components contribute to about 66% of the of the total gap, while the explained endowment component decreases the gap by 33%.

Table 7 – Panel Oaxaca-Blinder Decomposition Comparing Migrants from MENA with Migrants from Other World Areas of Origin, National Aggregate

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-1673	-1654	-1516	-1880	-2340	-2669	-3170	-3544
Coefficients	2944	2458	2429	3402	4291	5363	6420	6699
Interaction	424	572	637	451	429	654	838	1202
FE	3413	3675	3744	3489	2883	2057	1006	447
Total	5109	5050	5294	5463	5262	5406	5094	4805
Decomp %								
Endowments	-33	-33	-29	-34	-44	-49	-62	-74
Coefficients	58	49	46	62	82	99	126	139
Interaction	8	11	12	8	8	12	16	25
FE	67	73	71	64	55	38	20	9
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-1713	-1766	-1404	-886	0	933	1870	2321
Coefficients	3594	2024	1782	726	0	73	60	383
Interaction	-2565	-1262	-1208	-246	0	-38	-221	-726
FE	531	793	861	606	0	-825	-1877	-2435
Total	-153	-212	31	201	0	143	-169	-458
Decomp %								
Endowments	1120	833	-4470	-441		652	-1109	-507
Coefficients	-2350	-954	5672	362		51	-36	-84
Interaction	1677	595	-3844	-122		-26	131	159
FE	-347	-374	2742	302		-576	1114	532
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.3 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs at the National aggregate. By default, the 'xtoaxca' command does not report standard errors for the decomposed components: the decomposition is based on point estimates of the means and coefficients and does not take into account the uncertainty associated with those estimates.

The negative endowment effect in the summary of level decompositions indicates, at the national level, females from MENA countries benefit from higher compensation levels due to higher average levels of determinants such as educational attainment and industry of employment. The positive values of unexplained components, coefficients and interaction, indicate there are

unfavourable labour market biases toward MENA women, such as discrimination, or the effect of additional unobserved factors, that have contributed to lower average salaries for these women.

The source of unexplained salary gap in the comparison of immigrant females born in a different part of the world may be due to discrimination (Bloom et al., 1995; Oreopoulos, 2011). However, there remain unobserved factors that may contribute to unexplained differences, such as the propensity for mothers from different cultures to take on unpaid household work. This self-selection could bias discrimination estimates as the unexplained gap is merely unaccounted for by the independent variables. Number and age of children are included in the model as the best available proxies for propensity to take on unpaid household work.

5 - CONCLUSION

To ensure Canada is a welcoming host country, it is important to accurately identify the causes of labour market disparities. In Canada, women tend to earn less than men. Further, immigrants are predicted to earn less than Canadian-born adults. Therefore, we examine earnings differentials with a focus on females from MENA countries using a series of Blinder-Oaxaca techniques. This analysis attempts to identify the possible determinants of earnings disparities from a socio-demographic perspective. To decipher the confounding effects on labour market discrimination in a host country, and determine the interventions that governments can pursue, it is necessary to take these findings into account.

Using the Blinder-Oaxaca wage decomposition framework, the findings indicate the existence of an unexplained earnings gap between MENA female immigrants and those from different parts of the world. Females from MENA countries tend to earn the least compared to other groups of female migrants in Canada. The difference is most pronounced when examining recently arrived immigrants (less than 5 years). There are also some cases when the gap does not exist, and MENA females are found earning more than their counterparts, in teaching fields, in managerial occupations, and as part of families in the top income tercile, MENA females earn above national average across other migrant females. Lastly, there is no evidence persistent earnings disparities for MENA females who stay in Canada longer, comparing individuals who have been in Canada for at least 20 years, MENA females earn the average salary.

Limitations of the Oaxaca-Blinder in context of comparing disparities based on world area of origin earnings, include choice of control group which can affect the magnitude and direction of the estimated wage gap. In preliminary review, we discovered MENA females are often the lowest earning group among migrants, therefore we based our decomposition analysis on the assumption that this group is unduly earning less than any other group. The impact is a loss in nuance between other world areas of birth not including MENA. That is, since MENA is our choice of control group, the study does not provide in depth analysis of reasons why other groups may earn less than Canada-born individuals or comparison migrants. Additionally, the analysis relies on the availability of data on individual characteristics that may influence earnings, such as education and experience, and may not account for unobserved differences that contribute to earnings disparities. If indeed cultural characteristics play a role in earnings disparities among MENA female, a dataset must include individuals' cultural disposition to gain a better understanding of discrimination as the unexplained component of earning gaps.

Policy recommendations could include early learning and childcare plans that free up unpaid labour hours and allow mothers to take on formal employment. Discrimination in the labour market could also be addressed in the regions with greatest unexplained gaps, affirmative action and anti-discrimination laws are pragmatic solutions. World culture courses in Canadian high schools may also reduce the underlying cause of prejudice that contributes to labour market

discrimination. Lastly, implementing diversity and inclusion programs in the workplace can also reduce discrimination in the labour market.

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Figure Appendix

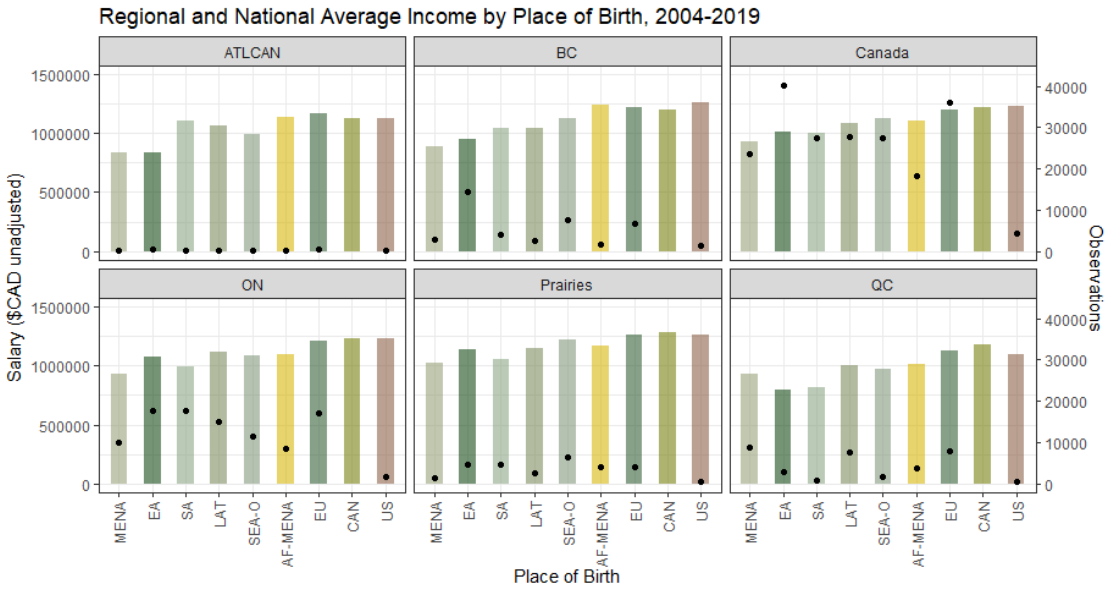

Figure A.1 Average earnings observed across years 2004 to 2019, categorized by region of Canada and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

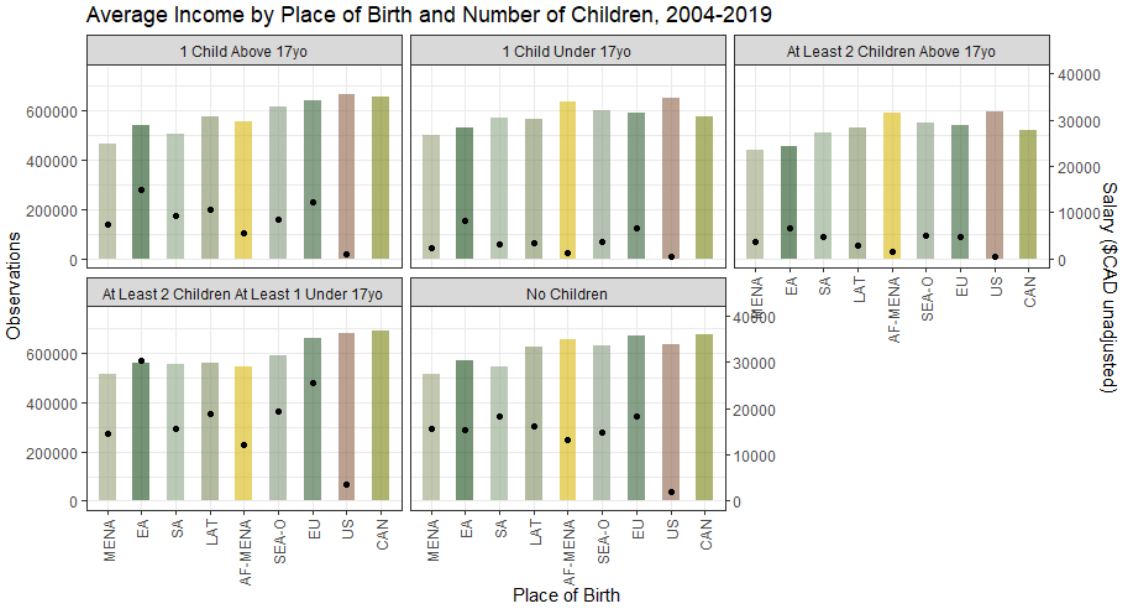

Figure A.2 Average earnings observed across years 2004 to 2019, categorized by Number of Children and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA,

Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

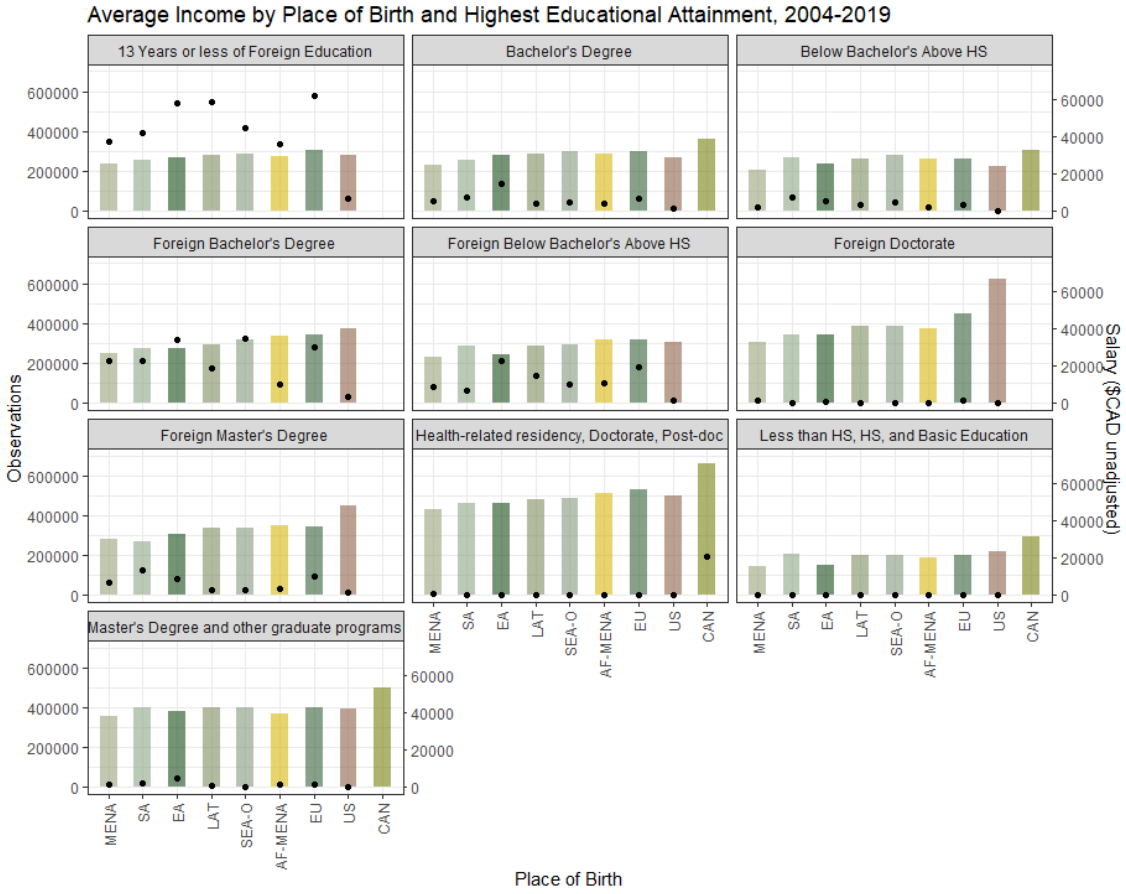

Figure A.3 Average earnings observed across years 2004 to 2019, categorized by Highest Educational Attainment and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

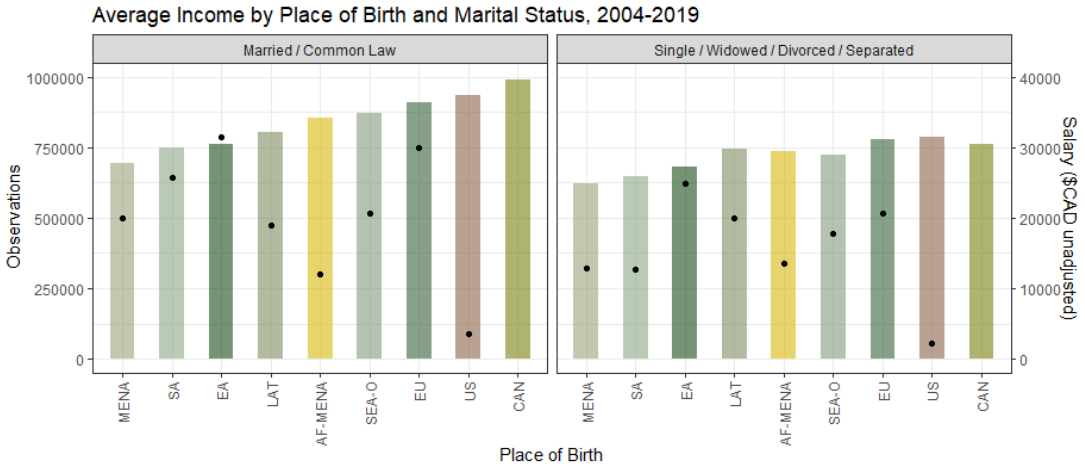

Figure A.4 Average earnings observed across years 2004 to 2019, categorized by Marital Status and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

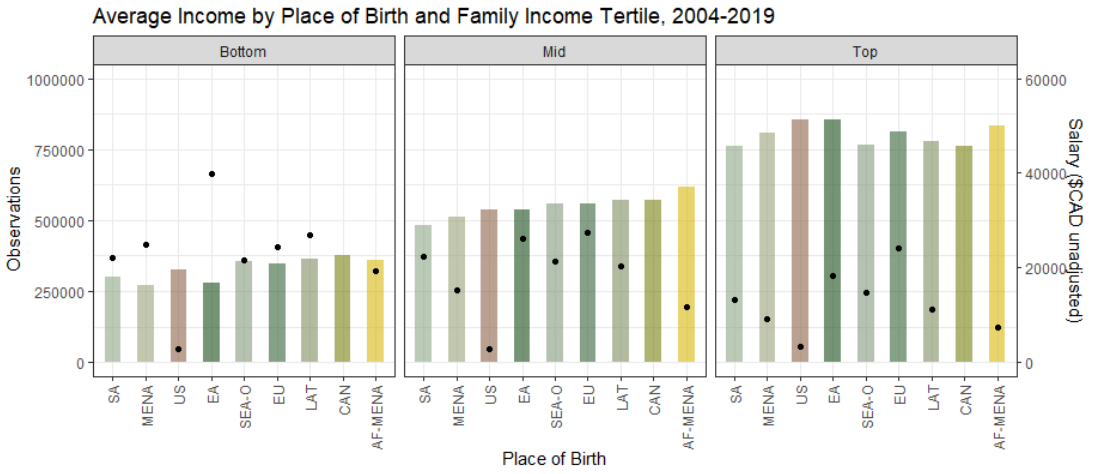

Figure A.5 Average earnings observed across years 2004 to 2019, categorized by Family Income Tertile and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

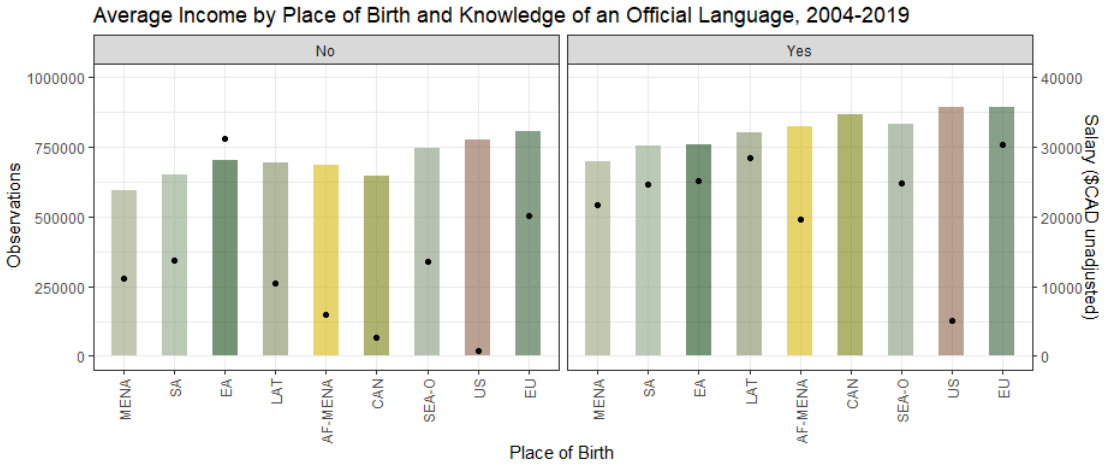

Figure A.6 Average earnings observed across years 2004 to 2019, categorized by Knowledge of an Official Language and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

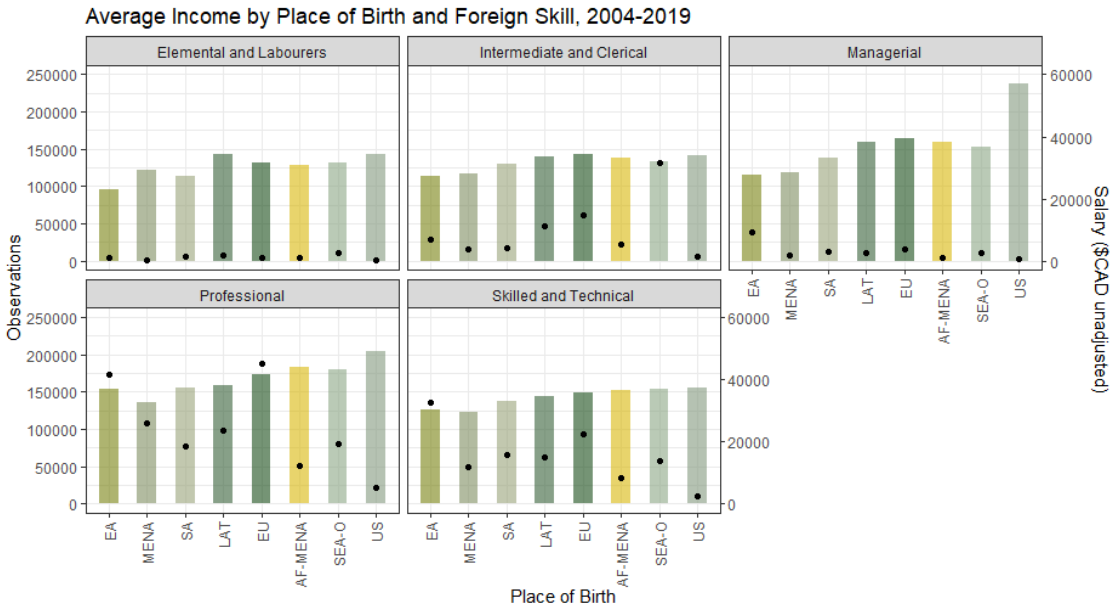

Figure A.7 Average earnings observed across years 2004 to 2019, categorized by Skill Upon Arrival and graphed by world area of birth. Right axis refers to the bars and is the average salary observed for each field. Left axis refers to the points and is total observations (years*individuals). IMDB 2004-2019, PSIS-RAIS 2004-2019. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

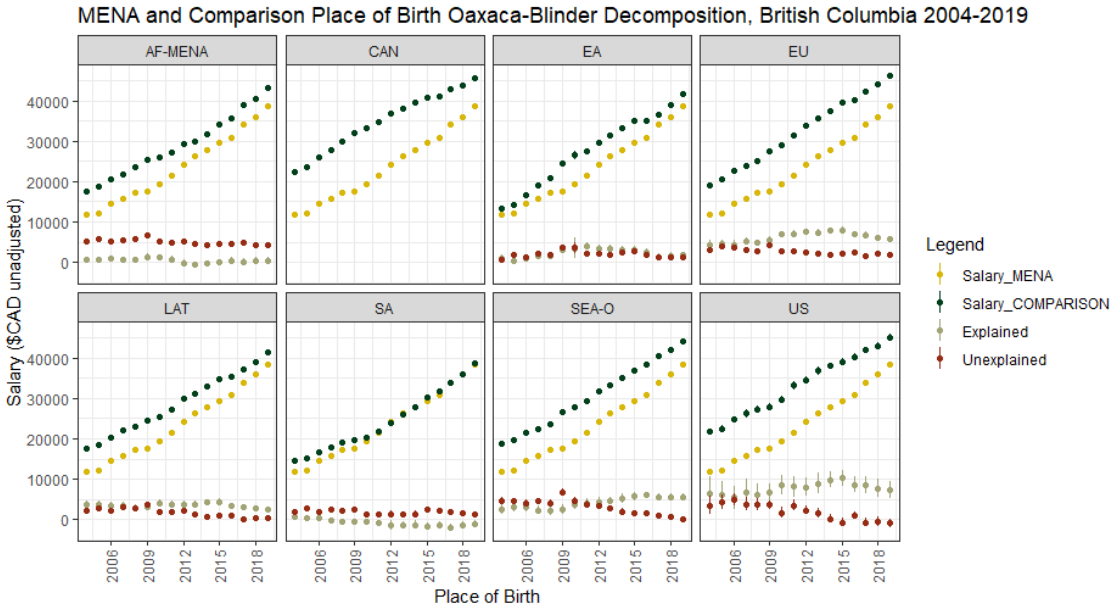

Figure A.8 Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.4. Results for British Columbia. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

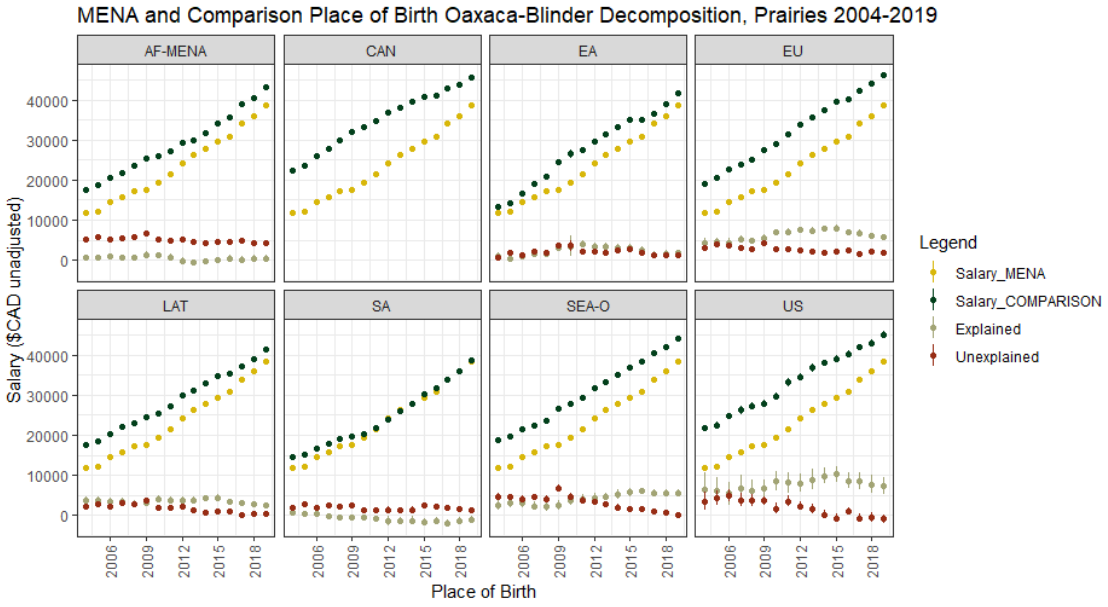

Figure A.9 Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.4. Results for the Prairies. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

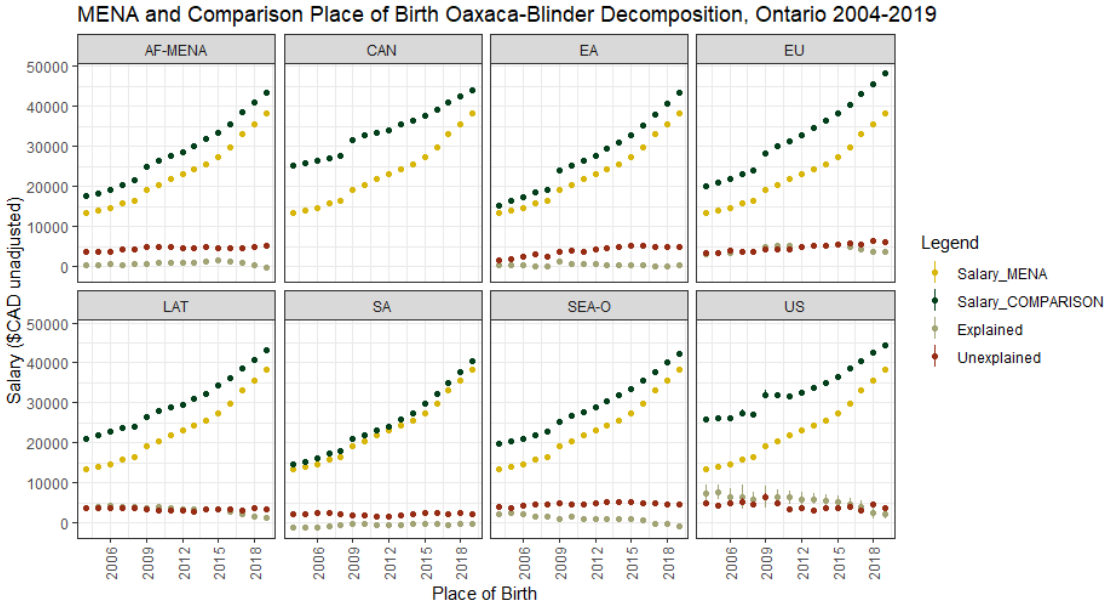

Figure A.10 Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.4. Results for Ontario. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

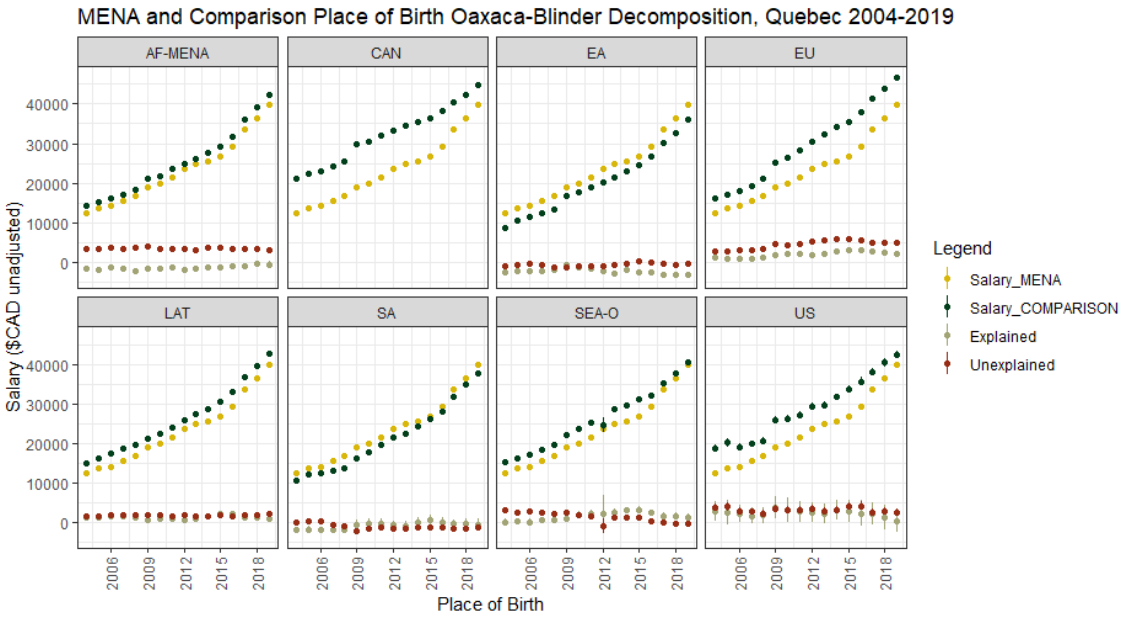

Figure A.11 Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.4. Results for Quebec. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

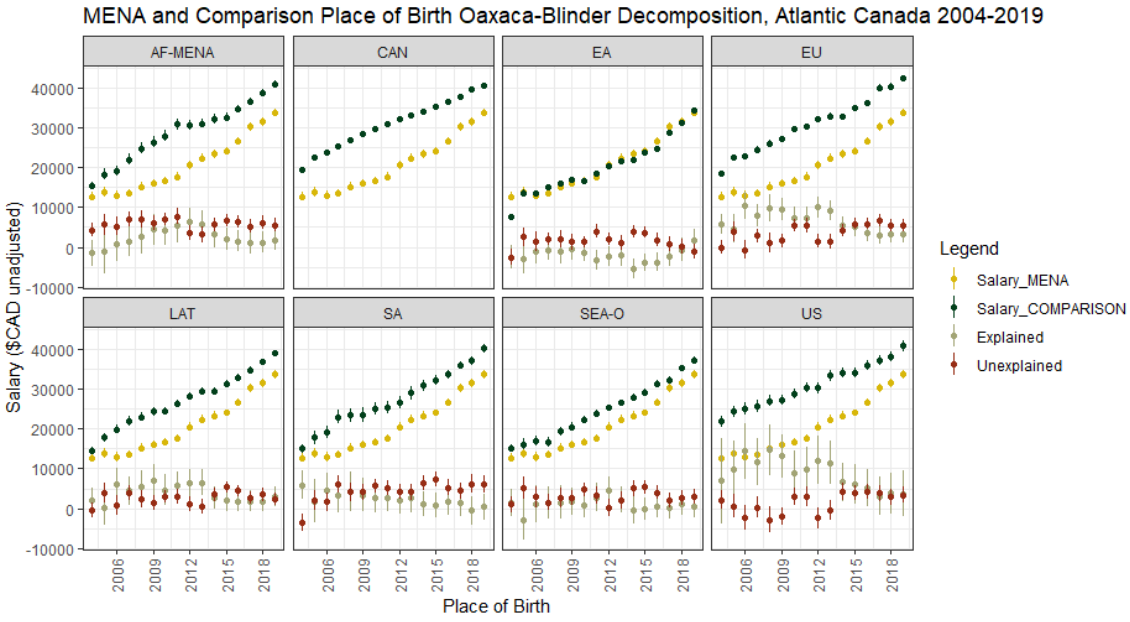

Figure A.12 Repeated annual Oaxaca-Blinder decompositions for MENA females against other origin migrant females and Canada born females ages 18-65. IMDB, PSIS-RAIS, T1FF. Annual before-tax income (T4E). List of control variables included and the baseline model result found in Table A.4. Results for Atlantic Canada. Origin country abbreviations: SA, South Asia; MENA, Middle East and North Africa; EA, East Asia; US, United States; AF-MENA, Sub-Saharan Africa; SEA-O, Southeast Asia and Oceania; LAT, Latin America; CAN, Canada; EU, Europe.

Table Appendix

Table A.1: MENA countries and female labour force participation rate

Algeria, 16	Iran, 14	Kuwait, 47	Mauritania, 27
Bahrain, 42	Iraq, 11	Lebanon, 21	Morocco, 22
Egypt, 15	Jordan, 13	Libya, 34	Oman, 29
Palestine, 17	Qatar, 57	Saudi Arabia, 31	Syria, 16
Tunisia, 25	Turkey, 32	UAE, 47	Yemen, 6
Canada, 61	MENA, 19	World, 46	

Note: International Labour Organization, ILOSTAT (2022) database. MENA Countries used in analysis. 2021 Labour force participation rate, female (% of female population ages 15+). Data as of June 2022.

Table A.2 – Baseline OLS and Panel Regression Results – Census Analysis

Dependent Variable: T4E (Before-Tax Income) Independent Variables – "*Reference*":	(1) Pooled OLS Non-MENA	(2) Pooled OLS MENA	(3) FE Non-MENA	(4) FE MENA
Age	2570*** (12)	2712*** (49)	3789*** (6)	4426*** (22)
Age ^{2}	-20.3*** (0.1)	-22.3*** (0.6)	-24.5*** (0.1)	-28.6*** (0.3)
Years Since Landing – "*Non-permanent resident*"				
Less than 2 years	4410*** (39)	4768*** (105)	4058*** (29)	4694*** (111)
Less than 5, at least 2	6855*** (39)	8306*** (122)	5406*** (29)	6366*** (111)
Less than 10, at least 5	9351*** (43)	11099*** (150)	5829*** (34)	5991*** (129)
Less than 20, at least 10	14420*** (51)	17472*** (186)	5774*** (42)	5161*** (154)
At least 20 years	21009*** (60)	26460*** (208)	4717*** (58)	4037*** (205)
Marital Status – "*Single*"				
Married, Common Law	-8921*** (49)	-10699*** (171)	.	.
Separated Divorce	-13321*** (113)	-13552*** (349)	.	.
Skill Level at Arrival – "*Skilled and Technical*"				
Managerial	9144*** (355)	5257*** (635)	.	.
Professionals	8198*** (98)	6759*** (254)	.	.
Intermediate and Clerical	-5443*** (77)	-1476*** (330)	.	.
Elemental and Labourers	-6181*** (126)	-4690*** (935)	.	.
New Workers	-1926*** (62)	3559*** (198)	.	.
Other non-workers	-5687*** (70)	5.28 (209)	.	.
Observations: Number of Groups: Avg. Obs. Per Group:	24,834,340 2,430,660 10.2	1,776,560 227,570 7.8	24,834,340 2,430,660 10.2	1,776,560 227,570 7.8
R-squared:	Within: 0.13 Between: 0.08 Overall: 0.10	Within: 0.18 Between: 0.10 Overall: 0.13	Within: 0.13 Between: 0 Overall: 0.02	Within: 0.19 Between: 0 Overall: 0.02
Additional Independent Variables:	Yes	Yes	No	No

Note: *,**,*** represent 1%, 5%, 10% significance. Standard errors in parenthesis. Models (1) and (2) are pooled OLS subset for Non-MENA and MENA, respectively. Includes migrant females, ages 18-64. Models (3) and (4) subset for same group, specified with fixed effects. Census 1996, 2001, 2006, 2016; NHS 2011. Additional dependent variables in (1): Citizenship, Family Status, Level of Education, Employment Province, World Area of Birth. Additional dependent variables in (2): Citizenship, Employment Province

Table A.3 – Baseline OLS and Panel Models

Dependent Variable: T4E (Before-Tax Income) Independent Variables – "*Reference*":	(1) Pooled OLS – MENA - National	(2) Pooled OLS - Any Origin less Canada - National	(3) Pooled OLS - Canada - National	(4) Fixed Effects - Any Origin - National
Age	2898*** (70)	3169*** (224)	3478*** (525)	4596*** (705)
Age ^{2}	-32.4*** (-55)	-35.6*** (-187)	-35.9*** (-389)	-36.4*** (-401)
Years Since Landing – "*Non-permanent resident*"				
Less than 2 years	280* (2.0)	153** (3.2)	-	2580.4*** (54)
Less than 5, at least 2	2972*** (19	1640*** (32)	-	4358*** (63)
Less than 10, at least 5	4518*** (26.8)	3364*** (58)	-	5202*** (71)
Less than 21, at least 10	8348*** (46)	7116*** (107)	-	5713*** (66)
At least 21 years	16057*** (62)	13491*** (147)	-	6488*** (58)
Number of Children – "*No Children*"				
1 Child Under 17yo	-4635*** (36)	-4239*** (82)	-3451*** (132)	-4737*** (224)
At Least 2 Children At Least 1 Under 17yo	-5785 (47)	-6749 (136)	-7645 (294)	-7467*** (320)
1 Child Above 17yo	-8231*** (43)	-9787*** (153)	-14076*** (433)	-8734 (294)
At Least 2 Children Above 17yo	-14698*** (84)	-16495*** (238)	-19486 (466)	-12374*** (389)
Educational Field - "*Arts*"				
Education	4676*** (18)	2571*** (20)	2746*** (58)	3195*** (67)
Business and Public Administration	3533*** (22)	3725*** (60)	4356*** (113)	1764*** (47)
STEM	2763*** (15)	2556*** (29)	1668*** (33)	1167*** (22)
Health and Related	8824*** (33)	7313*** (91)	7350*** (181)	5875*** (132)

Personal, Protective, and Transportation	489 (1)	-577*** (42)	3064*** (1)	-5242*** (2.3)
Highest Education – "*Bachelor's Degree*"				
Less than HS, HS, and Basic Education	-698.6 (1)	-2589*** (10)	-1806*** (35)	-3206*** (87)
13 Years or less of Foreign Education	349* (2)	-1109*** (16)	-	-3175*** (60)
Below Bachelor's Above HS	-700** (3)	-751*** (9)	-5076*** (173)	-4842*** (189)
Foreign Below Bachelor's Above HS	-900 (4)	-2400*** (27)	-	-7945 (112)
Foreign Bachelor's Degree	-331 (2)	-1355*** (16)	-	-6677 (105)
Master's Degree and other graduate programs	6730*** (20)	6053*** (41)	6435*** (123)	5891 (133)
Foreign Master's Degree	1339*** (5)	-1077*** (7)	-	-6751*** (60)
Health-related residency, Doctorate, Post-doc	10135*** (14)	9922*** (79)	19305*** (0)	18185*** (211)
Foreign Doctorate	2586*** (5)	4876*** (9)	-	-3278*** (7)
Skill Upon Arrival – "*Professional"*				
Managerial	-501 (-1)	-1024*** (-5)	-	-1261 (-0.4)
Skilled and Technical	-2185*** (-9)	-2927*** (-27)	-	1301 (0.8)
Intermediate and Clerical	-3524*** (-9)	-6407*** (-54)	-	-443 (-0.2)
Elemental and Labourers	-3449 (-1)	-6027*** (-23)	-	-5362 (-2)
Other / Not Stated	-3450 (-1)	-6789*** (-72)	-	398 (0.3)
Citizenship – "*Canadian Citizen"*				
Not a Citizen	-1470*** (14)	-1496*** (35)	-	-582*** (-15)
Marital Status – "*Married / Common-Law"*				
Widowed / Divorced / Separated / Single	5899*** (48)	7702*** (168)	8187*** (291)	6189*** (307)
Knowledge of an Official Language – "*Fluent"*				
Neither French nor English	-3074*** (-29)	-2987*** (-72)	-4627*** (-37)	-2849*** (-66)
World Area of Birth – "*Canada (1,2,3), U.S. (4)"*				
Europe	-	698* (3)	-	624 (0.2)
Africa and the Middle East (non-MENA)	-	2789*** (10)	-	-4238 (-1.5)

Southern Asia	-	704* (3)	-	-4501* (-2.2)
Eastern Asia	-	680* (2)	-	-2036 (-1.2)
Southeast Asia and Oceania	-	1293*** (5)	-	-5254 (-1.5)
South and Central America	-	546* (2)	-	-7591* (-2)
U.S or misc.	-	-	-	7009 (1)
MENA	-	-	-	-3355 (-0.8)
Canadian Region of Employment – "*Ontario"*				
Atlantic Canada	-651 (-1.3)	-1341*** (-7)	-3729*** (-109)	-2352*** (-30)
Quebec	319*** (3)	-1054*** (-19)	-845*** (-30)	-1614*** (-19)
Prairies	841*** (3)	799*** (13)	-241*** (-8)	2962*** (48)
British Columbia	-499** (-3)	-693*** (-12)	-2554 (-73)	602*** (9)
Family Income Tercile – "*Middle Third"*				
Bottom Third	-13780.4*** (-153)	-14127*** (-425)	-13864*** (-706)	-9344*** (-539)
Top Third	16667*** (83)	15271*** (237)	14409*** (497)	9243*** (470)
Constant	-29485*** (-37)	-28017*** (-74)	-33668*** (-288)	-75785*** (-250)
Observations:	821,180	6,358,910	32,218,230	19,339,764
Adjusted R-squared:	0.375	0.302	0.248	-
Additional Independent Variables:	No	No	No	No
Panel Model R-squared				
Within	-	-	-	0.268
Between	-	-	-	0.191
Overall	-	-	-	0.183

Note: *,**,*** represent 1%, 5%, 10% significance. Standard errors in parenthesis. Model (1) is estimated with a pooled OLS regression and subset for MENA migrants across all regions of Canada. Model (2) is estimated using a pooled OLS regression and includes any migrant including MENA, across all regions of Canada. Model (3) includes only Canada-born individuals and is estimated using a pooled OLS regression, across al regions of Canada. Model (4) is estimated using fixed effects panel methods, across all regions of Canada. All models include only females, ages 18-64. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019.

Table A.4 – Panel Oaxaca-Blinder Decomposition – British Columbia – MENA compared to Other non-Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-16673	-16477	-16564	-16800	-17672	-18010	-17721	-17745
Coefficients	15222	14601	13757	13376	12272	10225	8106	5587
Interaction	172	178	309	-427	-285	34	-481	63
FE	6688	7095	8586	10108	12093	14052	15735	16476
Total	5409	5397	6088	6257	6407	6301	5639	4381
Decomp %								
Endowments	-308	-305	-272	-268	-276	-286	-314	-405
Coefficients	281	271	226	214	192	162	144	128
Interaction	3	3	5	-7	-4	1	-9	1
FE	124	131	141	162	189	223	279	376
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-954	-335	82	397	0	-233	-478	-500
Coefficients	3926	2690	4042	1633	0	-1688	-3729	-4961
Interaction	1435	1633	-936	-196	0	-145	-203	-948
FE	-5405	-4998	-3507	-1985	0	1960	3642	4384
Total	-998	-1010	-319	-150	0	-106	-768	-2026
Decomp %								
Endowments	96	33	-26	-265		219	62	25
Coefficients	-393	-266	-1267	-1091		1589	486	245
Interaction	-144	-162	293	131		137	26	47
FE	542	495	1099	1325		-1845	-474	-216
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.4 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs and subset for British Columbia.

Table A.5 – Panel Oaxaca-Blinder Decomposition – Prairies – MENA compared to Other non-Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-27	1567	76	1528	322	203	-855	-803
Coefficients	-13831	-13215	-13319	-12815	-12374	-11208	-9774	-8835
Interaction	1827	674	2094	577	632	252	722	729
FE	17181	16869	16529	16276	15791	15173	14181	13721
Total	5149	5895	5379	5566	4371	4419	4273	4811
Decomp %								
Endowments	-1	27	1	27	7	5	-20	-17
Coefficients	-269	-224	-248	-230	-283	-254	-229	-184
Interaction	35	11	39	10	14	6	17	15
FE	334	286	307	292	361	343	332	285
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	2661	2282	1741	827	0	-445	-367	-256
Coefficients	584	2768	1245	341	0	1313	2785	5276
Interaction	-3857	-4605	-2715	-458	0	-202	-906	-2510
FE	1389	1078	737	485	0	-619	-1610	-2070
Total	778	1524	1008	1195	0	48	-98	440
Decomp %								
Endowments	342	150	173	69		-931	374	-58
Coefficients	75	182	123	29		2750	-2839	1200

Interaction	-496	-302	-269	-38		-423	924	-571
FE	179	71	73	41		-1296	1642	-471
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.4 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs and subset for the Prairies.

Table A.6 – Panel Oaxaca-Blinder Decomposition – Ontario – MENA compared to Other non-Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-2075	-1882	-1498	-1726	-1941	-2009	-1857	-2077
Coefficients	-3070	-4070	-4568	-4106	-3644	-2792	-1976	-1273
Interaction	2895	3018	2901	2778	2584	2655	2446	2633
FE	7889	8161	8601	8721	8581	7864	6958	6429
Total	5639	5226	5436	5667	5579	5718	5571	5712
Decomp %								
Endowments	-37	-36	-28	-30	-35	-35	-33	-36
Coefficients	-54	-78	-84	-72	-65	-49	-35	-22
Interaction	51	58	53	49	46	46	44	46
FE	140	156	158	154	154	138	125	113
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-424	-467	-523	-434	0	770	1579	1980
Coefficients	4174	2013	1934	647	0	150	339	974
Interaction	-2999	-1478	-1574	-266	0	-64	-304	-669
FE	-692	-420	20	140	0	-717	-1622	-2152
Total	60	-353	-143	88	0	139	-9	132
Decomp %								
Endowments	-710	132	366	-496		553	-18499	1495

Coefficients	6995	-570	-1351	739		108	-3974	735
Interaction	-5026	419	1100	-304		-46	3564	-506
FE	-1159	119	-14	160		-515	19009	-1625
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.4 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs and subset for Ontario.

Table A.7 – Panel Oaxaca-Blinder Decomposition – Quebec – MENA compared to Other non-Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-10	-340	-733	-913	-1055	-623	-569	-331
Coefficients	11765	11027	11706	10881	9906	9429	8515	7730
Interaction	-48	7	61	-142	0	-252	-173	-204
FE	-8530	-8256	-7694	-6993	-5819	-4982	-4226	-4027
Total	3177	2437	3340	2832	3031	3572	3547	3168
Decomp %								
Endowments	0	-14	-22	-32	-35	-17	-16	-10
Coefficients	370	452	350	384	327	264	240	244
Interaction	-2	0	2	-5	0	-7	-5	-6
FE	-269	-339	-230	-247	-192	-139	-119	-127
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	1042	1006	837	442	0	-240	-503	-571
Coefficients	8086	320	5643	742	0	-128	-797	-1270
Interaction	-6273	518	-4295	-208	0	71	222	185
FE	-2711	-2437	-1875	-1174	0	837	1593	1792
Total	145	-594	309	-199	0	541	516	137
Decomp %								
Endowments	717	-169	271	-222	0	-44	-97	-418

Coefficients	5564	-54	1828	-373	0	-24	-154	-930
Interaction	-4316	-87	-1391	105	0	13	43	136
FE	-1865	410	-607	590	0	155	309	1312
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.4 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs and subset for Quebec.

Table A.8 – Panel Oaxaca-Blinder Decomposition – Atlantic Canada – MENA compared to Other non-Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	27101	24690	24055	16546	10855	8464	6561	4250
Coefficients	416965	422141	422571	421136	414280	409765	406622	395333
Interaction	-20213	-16449	-15673	-8928	-4233	-1923	-1946	1407
FE	-425328	-425474	-423559	-420437	-415453	-410293	-404134	-401549
Total	-1476	4908	7394	8317	5449	6014	7104	-560
Decomp %								
Endowments	-1836	503	325	199	199	141	92	-759
Coefficients	-28252	8602	5715	5063	7603	6813	5724	-70606
Interaction	1370	-335	-212	-107	-78	-32	-27	-251
FE	28818	-8669	-5729	-5055	-7624	-6822	-5689	71716
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	-9331	-4532	2368	1920	0	-787	-2260	-2067
Coefficients	-32910	-12001	-2126	3663	0	-5781	-14284	-29085
Interaction	45192	26013	9809	2269	0	1973	6879	11239
FE	-9875	-10021	-8106	-4984	0	5160	11319	13904
Total	-6925	-541	1945	2868	0	565	1655	-6009

Decomp %								
Endowments	135	837	122	67		-139	-137	34
Coefficients	475	2217	-109	128		-1023	-863	484
Interaction	-653	-4806	504	79		349	416	-187
FE	143	1851	-417	-174		913	684	-231
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (2) from Table A.4 as inputs. Model (2) is modified by omitting individuals with MENA and Canada world area births. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs and subset for Atlantic Canada.

Table A.9 – Panel Oaxaca-Blinder Decomposition – Canada – MENA compared to Canada place of birth

Decomposition of Levels								
Summary of level decomposition								
Level non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	50113	11106	-4240	-1433	670	15	2247	4284
Coefficients	-46224	-8074	6946	1376	-1836	-1981	-6285	-10058
Interaction	3019	2651	1971	3086	2496	1733	1737	2035
FE	3710	4880	6461	7961	9344	10298	10748	10825
Total	10619	10562	11139	10991	10675	10064	8447	7086
Decomp %								
Endowments	472	105	-38	-13	6	0	27	60
Coefficients	-435	-76	62	13	-17	-20	-74	-142
Interaction	28	25	18	28	23	17	21	29
FE	35	46	58	72	88	102	127	153
Total	100	100	100	100	100	100	100	100
Decomposition of Change								
Summary of change decomposition								
Change non-parametric	2004	2006	2008	2010	2012	2014	2016	2018
Decomp								
Endowments	2677	2006	1576	766	0	-927	-1827	-2210
Coefficients	5332	4026	2810	1161	0	-597	-1632	-2250

Interaction	-2431	-1680	-1039	-228	0	-40	-173	-610
FE	-5634	-4464	-2883	-1383	0	953	1404	1481
Total	-56	-112	464	316	0	-610	-2228	-3589
Decomp %								
Endowments	-4782	-1784	340	243		152	82	62
Coefficients	-9524	-3579	606	368		98	73	63
Interaction	4342	1494	-224	-72		7	8	17
FE	10064	3970	-622	-438		-156	-63	-41
Total	100	100	100	100	0	100	100	100

Note: *xtoaxaca* decomposition results using Model (1) and a modified Model (3) from Table A.4 as inputs. Data is the PSIS-RAIS, IMDB, and T1FF for years 2004-2019. Models are estimated as decomposition inputs at the national level.

Table A.10 – Four Approaches for Oaxaca-Blinder Decompositions

	Cross-Sectional	Repeated Cross-Sections	Census Repeated Cross-sections	Longitudinal
Data	ELMLP (PSIS-RAIS), IMDB, T1FF	ELMLP (PSIS-RAIS), IMDB, T1FF	Canadian Census	ELMLP (PSIS-RAIS), IMDB, T1FF
Years Observed	2004 to 2019	Annual 2004 to 2019	1996, 2001, 2006, 2011, 2016	Bi-Annual 2004 to 2018
Region of Employment Subsets	• Canada • Atlantic Canada • Quebec • Ontario • Prairies • British Columbia	• Canada • Atlantic Canada • Quebec • Ontario • Prairies • British Columbia	Canada	• Canada • Atlantic Canada • Quebec • Ontario • Prairies • British Columbia

Groups Compared i.e. place of birth subsets	• MENA and any origin other than Canada	• MENA and CAN-born • MENA and AF-MENA • MENA and EA • MENA and EU • MENA and LAT • MENA and SA • MENA and SEA-O • MENA and US	• MENA and CAN-born • MENA and AF-MENA • MENA and EA • MENA and EU • MENA and LAT • MENA and SA • MENA and SEA-O • MENA and US	• MENA and any origin other than Canada • MENA and Canada-born
Found in Paper	• Table 5	• Table 4 • Figure 4 • Figure 8 • Table 6 • Figure A.8 to Figure A.11	• Figure 7	• Table 7 • Table A.4 to Table A.9
Input Models	Table 2 models (1) & (2) subset for regions above	Table 2 models (1), (2), (3) subset for each region and each place of birth above	Table A.2 models (1) & (2) subset for each place of birth above	Table A.3 model (4) subset for each region and the two generalized places of birth above

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