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Explaining gender differences in migrant sorting: Evidence from Canada-US migration

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Abstract

This paper uses newly digitized border crossing records from the early 20th century to study the destination choice of female and male French Canadian migrants to the United States. Immigrant sorting across destinations was strikingly different between women and men. Absolute returns to skill dominate in explaining sorting among men, while job search costs and access to ethnic networks were more important for single women. Married women were typically tied to a spouse whose labour market opportunities determined the joint destination, and were much less responsive to destination characteristics as a result.

Keywords: Migration, sorting, gender, Canada, United States
JEL Codes: J61, N31, N32

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1. Introduction

How women select into migration and sort across destinations has profound implications for immigrant integration, the labor market outcomes of second-generation immigrants, and the effectiveness of immigration policies.[1] But despite accounting for about half of all international migration flows (Artuç et al., 2015; Ruyssen and Salomone, 2018), we know little about the factors that influence the migration decisions of women.[2] Previous literature modeling the migration decision focus mostly on the labor market position of migrants, with differences in earnings between source and destination economies playing the main role in determining who migrates and where migrants go (Borjas, 1987, 1991; Roy, 1951; Grogger and Hanson, 2011). Applying these models to study the destination choice of women migrants is challenging due to selective labor force participation and the presence of significant numbers of "tied movers" among the female migrant population (Adsera and Chiswick, 2007; Antecol, Cobb-Clark and Trejo, 2003; Mincer, 1978). This is particularly true if the analysis is extended to periods when institutions and social norms restricted the employment of women or in contexts with low female labor force participation after marriage (Goldin, 1986; Goldin and Olivetti, 2013; Goldin, 1988).

Previous research has also shown the importance of migration costs in shaping migration decisions (Chiquiar and Hanson, 2005; Grogger and Hanson, 2011; Fernandez-Huertas, 2011). Gender-specific factors, however, can differentially affect the magnitude and structure of migration costs, suggesting that the sorting of migrants across destinations may vary by sex. For example, female migrants may face greater labor-market competition due to gender discrimination, resulting in higher monetary and psychic costs in job search (Baudassé and Bazillier, 2014; Chort, 2014; Massey, 2016; Ruyssen and Salomone, 2018). Gender discrimination can also affect how women engage with public and private institutions such as banks and aid societies that can ease credit constraints for intending migrants (Abramitzky and Boustan, 2017; Ongena and Popov, 2016).[3] Similarly, the extent to which migrant networks (McKenzie and Rapoport, 2007, 2010; Munshi, 2003) and ethnic enclaves (Edin, Fredriksson and Åslund, 2003; Damm, 2009) assist men and women throughout the migration process may vary, with gender roles mediating social capital effects (Côté et al., 2015; Curran and Rivero-Fuentes, 2003; Hagan, 1998).

[1] Previous research shows that maternal skill (education) can influence the labor market outcomes of their children (Rosenzweig and Wolpin, 1994; Black, Devereux and Salvanes, 2005).

[2] Cobb-Clark (1993); Docquier, Lowell and Marfouk (2009); Docquier et al. (2012) are examples of the limited evidence on the selection and sorting of women migrants available to date.

[3] Evidence from mortgage markets suggests that single women in the United States experienced restricted access to credit prior to the 1974 Equal Credit Opportunity Act (Ladd, 1982).

In this paper, we examine how female and male Canadian migrants sorted across US destinations during the early 20th century. This setting provides an excellent environment to study the migration decisions of both women and men. Migrant flows from Canada were large, with about 1.1 million Canadians resident in the United States in 1920 as a result. Migration from Canada was also relatively gender balanced — 51 percent of Canadian migrants were female as compared to 33 percent of overseas immigrant flows between 1900 and 1924 (Truesdell, 1943, p. 49; Willcox, 1929, p. 396). Entry to the United States for Canadians was largely unrestricted, even after the introduction of national origin quotas for European migrants in 1921. Hence, the observed migrants' characteristics and destination choice reflect selection and sorting in response to market conditions rather than immigration policy effects.

Our analysis focuses on French Canadian migrants, who mostly settled in New England and made up the majority of flows through the Vermont border (Ramirez, 1986; Ramirez and Otis, 2001). Migration to New England was attractive to French Canadians for two main reasons. First, several destinations in New England offered a wide array of manufacturing jobs for men and women. These positions were relatively scarce in Quebec and did not require previous experience in industry, nor the ability to speak good English. Similar to many current contexts, employment opportunities for women were concentrated in particular industries such as textile manufacturing (Waldron, 2005), suggesting that the possibility of finding a job in the destination may have been key in determining female income gains from migration. Second, Quebec's proximity to New England meant that out-of-pocket migration costs were small to most potential destinations (Green, MacKinnon and Minns, 2005).[4] Furthermore, well-established communities of French Canadian migrants and their Franco American descendants in New England could have mitigated additional costs by providing information on housing and job possibilities, influencing how migrants sorted across counties.[5]

To examine migrant sorting, we use a sample of recently digitized Canada-Vermont border crossing records spanning from 1896 to 1924.[6] These records consist of immigration cards reporting individual data including physical stature (height) at time of crossing, which we use to measure sorting. Physical stature is a function of childhood conditions (nutrition less disease environment and work assignments) that are highly correlated with human capital and earnings potential (Borrescio-Higa, Bozzoli and

[4]Train fares from Montreal to Boston were about 6.50 in 1900, roughly equivalent to a few days of income for a laborer.
[5]"Petit Canadas" were established in New England in the late 19th century, and served to replicate aspects of French Canadian life at home through church and parochial schools for US-born children (MacKinnon and Parent, 2012; MacDonald, 1898).
[6]Border crossing records were used to track entry for future citizenship and naturalization requests but not for rejecting prospective migrants from Canada.

Droller, 2019; Komlos and Baten, 2004; Komlos and Meermann, 2007; Schultz, 2002; Schneider and Ogasawara, 2018). The major advantage in using height rather than wages or occupation rankings is that it allows us to characterize sorting patterns among women and men at a time when female participation in labor markets was limited, particularly among married women in Canada and the United States (Goldin, 1990, 2021). Figure 1 shows that sorting by height was strikingly different between men and women. Relatively few counties attracted female and male migrants of an equivalent height profile, and several destinations attracted only women or men. To account for differences in destination choices between women and men, we introduce a conceptual framework that extends the Grogger and Hanson (2011) model of migrant sorting. The main implication of our framework is that gender differences in the benefits and costs of migration can induce distinctive sorting patterns between female and male migrants. To assess this prediction, we use the 1910 and 1920 full-count US censuses to estimate county characteristics capturing the structure of benefits and costs that female and male migrants could expect upon arrival: returns to skill, job search costs, spousal search costs, and the presence of ethnic enclaves. We then estimate correlations between migrant height and destination characteristics controlling for a series of covariates that may have also been relevant for the destination choice.

Our econometric analysis shows that as in contemporary settings, income maximization largely explains sorting patterns among single male migrants—that is, taller men with above-average earnings potential moved to destinations where the absolute returns to skill were higher. We also observe this pattern among single female migrants, but the effect is dwarfed by that of cost factors. The coefficient on job search costs, which we proxy with the rate of female participation in the labor force at the destination, is large and statistically significant: a one standard deviation increase in the female participation rate is associated with a 0.32 inch increase in height. This finding shows that women with high earnings potential moved to destinations where job search costs were low, prioritizing employment opportunities over returns to skill.[7] This behaviour confirms that discriminatory social norms and institutionalized restrictions significantly constrained female participation in labor markets. We find an even larger relationship between migrant height and enclave size only for single women: a one standard deviation increase in the share of French Canadians in the destination is associated with a 0.39 inch decrease in the height profile. This finding is in line with literature arguing that migrants with unfavorable characteristics tend to sort themselves into ethnic enclaves (Borjas, 1992; LaLonde and Topel, 1997) and suggests that gender roles were likely to moderate the benefits of social capital. We explore potential

[7] One standard deviation increase in the absolute earnings difference between high and low-skilled workers is associated with a 0.06 inch increase in height for single women.

underlying mechanisms for this finding later in the paper. Results for married female migrants show a significant attenuation of the effect of destination characteristics, while estimates for married male migrants are similar to that of their single counterparts. These findings confirm the different degree of agency among female migrants by marital status in a setting prior to the female emancipation of the 1960s in the United States (Bailey, 2006). The attenuation of labor market and enclave effects for married women also reinforces the argument that networks differentially affect women migrants throughout their life cycle (Hagan, 1998).

This paper extends our understanding on the sorting of migrants across destinations through what is to our knowledge the first comparison of sorting patterns between female and male migrants. Our findings are directly relevant to recent research exploring the relationship between migration and gender discrimination (Ruyssen and Salomone, 2018). Our evidence shows that the economic and social barriers faced by women in the early 20th century led to a distinctive sorting pattern of women relative to men across destinations in New England and the Northeast, illustrating how network-based strategies identified in contemporary research are used to mitigate the costs associated to these constraints (Davis and Winters, 2001; Baudassé and Bazillier, 2014; Kanaiaupuni, 2000). Finally, a recent literature has argued that between 1850 and 1920 married women experienced significant economic benefits from the decline of coverture and the rise of women's rights to own property and control their own earnings (Geddes and Lueck, 2002; Geddes, Lueck and Tennyson, 2012). Our study shows that the migration decision was an area where married women continued to have little agency during the 1920s. The findings also emphasize the importance of barriers faced by economically active single women. While these barriers are widely acknowledged in the migration literature (Curran and Rivero-Fuentes, 2003), our results highlight their quantitative importance in shaping migration patterns.

2. Historical Background

About 30 million immigrants moved to the United States during the Age of Mass Migration (1850-1920). Although most research addressing this period has focused on trans-Atlantic flows, significant migrations also took place across US land borders (Abramitzky and Boustan, 2017; Hatton and Williamson, 1998). Canada was one of the leading immigrant source countries, with over one million Canadians present in the United States in 1920.[8] Both British (English-speaking) and French Canadians crossed the border in large numbers, with French Canadians accounting for approximately 30 percent of all Canadian

[8]Mexican immigration to the United States also increased gradually from the 1880s (Gratton and Merchant, 2015).

immigrants during the early twentieth century (Ramirez and Otis, 2001). High emigration rates in Quebec meant that about 20 percent of all French Canadians resided in the United States by 1920. While some European migrants transited through Canada en route to the United States, the vast majority of border crossings consisted of native-born Canadians of either French or British ancestry.[9] Over 80 percent of French Canadian migrants moved to states in New England and the Northeast, most of them holding low paid occupations such as laborers, production workers, and for women, domestic service (Ramirez and Otis, 2001, p. 72-86).

The conventional view among Canadian economic historians is that persistent emigration from Canada to the United States reflected differences in economic opportunities between the two countries. However, this argument is mostly based on labor market data for men. In the early 20th century, income per capita was significantly higher in the United States than in Canada, and in most occupations real wages for men were 5 to 20 percent higher in the United States (Green, MacKinnon and Minns, 2002; Bolt and van Zanden, 2020). Comparisons of men's earnings dispersion between the two countries suggest that skill premia were also larger in the United States. In Table 1 we report the earnings ratio of clerical to production workers as best available proxy for earnings dispersion by skill.[10] The figures show that skill premia in the United States were higher than in Ontario or Quebec in the first decades of the twentieth century, with gaps closing only after the First World War.

Although 51 percent of Canadian immigrants in the 1920 US Census were female—as compared to 33 percent of overseas immigrant flows between 1900 and 1924—the factors that influenced the emigration of Canadian women have not been systematically studied by previous literature (Truesdell, 1943, p. 49; Willcox, 1929, p. 396). Differences in skill premia between the United States and Canada appear to have been larger for women (see Table 1), suggesting that high-skilled female workers had the most to gain from moving to the United States. It is important to emphasize, however, that at the time women willing to work in Canada or the United States faced important employment constraints. While a significant minority of single women was employed before marriage in both countries, employment after marriage was rare. In 1920, less than ten percent of married women were employed in the United States (Goldin, 1990). Low employment rates among women were importantly influenced by discriminatory social norms and institutionalized restrictions such as marriage bars that directly affected women's economic

[9] At least until 1900, Canadian gross out-migration to the United States completely offset European gross immigration to Canada (McInnis, 1994).

[10] The US censuses did not include income information until 1940, and there are relatively few sources of alternative earnings or wage data disaggregated by occupation or gender.

opportunities (Hyland, Djankov and Goldberg, 2020; Goldin, 1988). Data on labor force participation show that opportunities for women were less constrained in the United States, with participation rates of adult women about 6 percentage points higher than in Canada (23.7 percent vs. 17.7 percent). In this sense, previous research on Canada-US migration has emphasized the role of female secondary earners in providing insurance to households in case of unemployment of male heads (Ramirez, 1986). Immigration data, however, show that the number of unaccompanied women was rising through the first half of the 20th century, as opportunities in Canada for independent women were even fewer than in other parts of North America (Ramirez and Otis, 2001; Waldron, 2005).

3. Migrant Data

To document how migrants from Canada sorted across US destinations, we use individual-level data from the US Immigration and Naturalization Service (INS) publication number M1462 (6 microfilm reels), containing 41,679 immigration cards.[11] The cards are arranged alphabetically by border posts located in Vermont, New England.[12] They record rich demographic (age, height, literacy, marital status, nationality, occupation, race, and sex) and geographic (locality of birth, last permanent residence, and intended destination) data as well as immigration information, including the intended time to remain, previous immigration experiences, and if any, the contact of a friend or relative in the United States. These data allow us to differentiate between permanent and temporary immigrants and to identify those individuals with access to immigrant networks. We draw a twenty percent sample of the cards in each reel by selecting every fifth card to digitize.[13] The complete digitized sample comprises 8,336 individual border crossings (20 percent of the total cards) spanning from 1880 to 1954, with the bulk being from 1920 and 1921 (see Figure A.1).

Note that our migrant sample consists of border crossings at official border posts and does not capture undocumented migration. However, to track and control immigration, from 1894 the INS in agreement with Canadian railroad companies recorded all passengers destined to the United States

[11] Publication M1462: "Alphabetical Index to Canadian Border Entries through Small Ports in Vermont, 1895-1924." The recording of immigrants entering the United States through Canada started in 1895 and was formalized under the Immigration Act of 1903, which instructed the inspection of aliens along the borders of Canada and Mexico (US Congress, 1903, p. 1221). The INS used immigration cards and manifests to record immigrant arrivals at the Canadian border. These documents are popularly known as the "St. Albans Lists" and were the main administrative tool to quantify the flow of immigrants from and via Canada (Ramirez and Otis, 2001, p. 190). The National Archives and Records Administration (NARA) catalogues these documents in publication numbers.

[12] The border posts by reel are Norton and Island Pond; Beecher Falls; Highgate Springs, Swanton, Alburg, and Richford; and St. Albans and Canaan. Other border posts occasionally appear, but they represent less than 1% of the sample.

[13] The starting point for the transcription was determined randomly.

(Smith, 2000).[14] Moreover, after 1906 immigration certificates—as proof of entry—became a requirement for all foreign-born residents applying for US naturalization, and individuals without a certificate were required to exit the United States and register at the border. Therefore, there was little reason for a Canadian immigrant to avoid border posts where immigrant registration took place. Another feature of the data is that some records consist of registry cards that provide immigration information retrospectively, which can be inaccurate if the registration occurred long after the arrival. However, previous research shows that yearly immigration fluctuations captured by the St. Albans Lists present a close correspondence with official US Bureau of Census data, suggesting that undocumented flows or errors in retrospective information were negligible (Ramirez and Otis, 2001, p. 192).

We restrict the sample to individuals reporting complete geographic data. We classify the reported localities of birth and last residence into Canadian census districts and sub-districts and the destination localities into US counties.[15] We then retain individuals reporting counties in New England, New York, New Jersey, and Pennsylvania as intended destinations. This fine-grained geographic classification allow us to do three main things. First, to discriminate between migrants, return migrants, and visitors. Second, to control for local-level factors that may have influenced stature. Third, to estimate the distance from the localities of origin to the nearest border post and to the intended destination for each individual. These distance estimates proxy for out-of-pocket transportation costs, which were fairly small relative to income and increased only modestly with distance within Canada.[16] We also limit the sample to migrants reporting their complete name (given name and family name) and race, which we use to classify migrants as British or French Canadians following the *Dictionary of Races or Peoples* (Folkmar, 1911).[17] For records where the race entry is incomplete, we use the family name to assign ethnicity. In the Appendix, we provide a full description of the methodology that we follow to identify French surnames in the migrant sample. Finally, we keep individuals who had passed their pubertal growth spurt before being observed: males aged 16-65 years and females aged 14-65 years. This refinement avoids capturing growing and shrinkage effects, which can distort selection and sorting estimates based on physical stature (Spitzer and Zimran, 2018). Following these restrictions, our final sample contains 4,638 immigrants (1,783 females and 2,855 males).

[14] At train stations in Canada, INS immigrant inspectors issued certificates of admission that were required for boarding US-bound trains. The certificates were collected by another inspector at the border ports, where immigrants were registered using manifest list or immigration cards.

[15] We follow St-Hilaire et al. (2007) to classify Canadian localities.

[16] Train fares from Montreal to Boston were only $6.50 and $8.50 from Halifax to Boston circa 1900. These fares were roughly equivalent to a few days of income for an unskilled laborer at the time (Green, MacKinnon and Minns, 2005).

[17] We identify as British Canadians those individuals indicating ethnic origins that were English, Irish, Scotch, or Welsh.

3.1 *Migrant Profile*

The border crossing records provide a range of demographic characteristics about migrants at the time of arrival in the United States. Panel A of Table 2 shows that migrants were about 30 years old when observed. The vast majority of migrants were literate, as one would expect given well-established primary schooling in Canada from the 19th century. The median amount of cash carried by French Canadian immigrants was 30 dollars for women and 50 dollars for men, which is equivalent to two to three times the typical weekly earnings of laborers in 1921.[18] Most French-Canadian men held semi-skilled occupations or were unskilled laborers, with relatively few moving from farms to the United States. The majority of women migrants did not report an occupation, but the share who did—about 26%—is considerably higher than female labor force participation rates in Canada or the United States prior to 1940 (Goldin, 1990). Both male and female migrants were fairly well balanced in terms of marital status. More than 90% reported having a contact in the United States and about 60% had previous migration experience, as one would expect in a population with relatively fluid access to migrant networks in the destination. About 52% of migrants with birth and residence places in Canada reported a town of residence differing from their birthplace, implying they had moved at least once within Canada before crossing the border.

The bottom of Panel A in Table 2 presents height estimates for male and female migrants. French Canadian migrant women were on average 63.5 inches tall while their male counterparts were just under 67 inches. Panel B offers some comparisons to cohort-specific mean heights for non-migrant men and women measured in 1953. These estimates are part of a national anthropometric study published in the Canadian Bulletin of Nutrition (CBN) and are based on a sample of 22 thousand Canadians examined by trained enumerators of the Department of National Health and Welfare (Pett and Ogilvie, 1957). This data is reported for two population cohorts: residents within Quebec and residents outside Quebec. This division may underestimate height differences between French and British Canadians due to the presence of English-speaking Canadians in Quebec and French-speaking Canadians outside Quebec. However, it is the only data source that allows us to make inferences about the self-selection of both migrant men and women. The comparison suggests that French Canadian migrants were positively selected on height: with the exception of the youngest male cohort, women and men were at least 0.9 inches taller than the comparison age group in the CBN. We find very similar selection patterns when

[18]The median annual labor wage in 1921 was $850 in Ontario and $800 in Quebec. See Table 2 in MacKinnon (1996) for weekly earnings across occupations. Only 2% of migrants reported carrying no money.

estimating adjusted heights by cohort or using micro data from military records as comparison group for males.[19] In Table A.1 we present the same descriptive statistics for a larger immigrant sample that includes observations without full geographic information. The migrant profile is very similar to that described above, suggesting that the data refinements we apply are unlikely to systematically bias our analysis.

Does physical stature is a useful measure of selection and sorting in our context?[20] Previous literature shows that well into the 20th century, female and male height continued to be positively associated with earnings potential in the United States (Case and Paxson, 2008). Moreover, using data from the US National Labor Survey of Youth, Schultz (2002) estimates that an additional centimeter in adult height was associated with a 0.45 and 0.31 percent increase in wages for men and women, respectively, in the early 1990s. Hence, it is very likely that height was also indicative of labor market success and human capital endowments for migrants entering the United States circa 1920. To provide additional evidence on the relevance of height as a measure of selection and sorting, we estimate the correlation between height and the amount of cash held at the time of crossing, which proxies for saving capacity and wealth. Figure A.2 shows that relatively tall individuals carried more cash across the border. This finding holds for both sexes, though the slope of the fit line is slightly steeper for men. This is consistent with previous literature showing that the marginal return to physical stature varies little by sex.[21]

3.2 Origins, Destination Choices, and Sorting

Figure 2 shows the origin of French Canadian emigrants by census sub-district in 1921. It reveals clear emigration patterns, with sub-districts close to the border—and especially south of the St Lawrence River—having higher emigration rates. Within Southern Quebec clusters are visible along the Vermont–Quebec border, north of Montreal on the eastern side of the Richelieu River, in Arthabaska and Wolfe, and in Beauce near the Chaudière River. These clusters are either close to the border, or near waterways and railroads that provided access to Vermont. Arthabaska and Beauce were areas of intermediate population density, with many small towns and villages that may have had surplus labor but were

[19] We estimate adjusted values regressing height on a full factorial structure for ethnicity, birth cohort, and sex. The model also includes an indicator variable for individuals who migrated after the enactment of the 1921 Emergency Quota Act, an interaction between this variable and sex, and district-of-birth fixed effects. The military data come from Cranfield and Inwood (2015). The height differences between male migrants and male conscripts are very similar to those that can be inferred using the CBN. These results are available upon request.

[20] There is a large body of literature that has used height to study migrant selection in diverse contexts and time periods (see, for example, Humphries and Leunig (2009); Juif and Quiroga (2019); Kosack and Ward (2014); Spitzer and Zimran (2018)).

[21] Previous empirical studies suggest that the height premium for men is slightly larger than for women: a 10cm increase in height is associated with a 15% and 10% increase in wages for men and women, respectively (Hübler, 2016).

also not well connected to Montreal, the economic centre of Quebec and Canada at the time. In Figure 3 we trace migrants from their Canadian origins to their destinations. The figure highlights the relative concentration of destinations in New England (Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island) with a few migrants heading further afield to New York, New Jersey, and Pennsylvania. Figure 3 also shows that many of the migrants in our sample settled in locations relatively close to the Canada-US border, where migration costs were lower and information on destination labor markets was likely available on the Canadian side.

In Figure 4 we present standardized adjusted heights by county for single migrants. It shows that migrants were strongly sorted on height across destination counties, and that the nature of sorting was quantitatively different for women and men. For example, females arriving in Massachusetts were relatively tall, while their male counterparts were relatively short. More striking is the variation in sorting across counties within states. In Southern New Hampshire, arriving female migrants were drawn from the upper ranks of the migrant height distribution, whereas their male counterparts were predominantly drawn from the opposite end of the distribution. The opposite is observed in Grafton County and Carroll County, located in the north of the state. Moreover, some destinations attracted only women, who were likely to be looking for paid work. These patterns highlight that models of migrant sorting should consider that women may face considerably different destination conditions than men, which could explain differences in sorting patterns between genders.

4. A Conceptual Framework for Migrant Sorting by Gender

We adapt the Grogger and Hanson (2011) model of international migration to illustrate how gender-specific factors can influence the destination choice of both single and married (tied) migrants. The model uses an income maximization framework to generate predictions on the scale of migration, the selection of migrants, and the sorting of migrants by skill across destinations. To explain sorting patterns, the model focuses on absolute earnings differences between skill groups in the destination while accounting for skill-related migration costs in the manner of Chiquiar and Hanson (2005) or McKenzie and Rapoport (2010).[22]

[22]This approach contrasts with earlier work focusing on relative returns to skill to explain the selection and sorting of migrants (Borjas, 1987).

4.1 Single Migrants

The model assumes that individuals with different skills consider wages w and migration costs c in their migration decision. Migration costs consist of a fixed component f and a skill-varying component g such that

$$c_{ish}^{j} = f_{sh} + g_{sh}^{j}, \tag{1}$$

where c_{ish}^{j} is the cost of migrating from source s to destination h for individual i belonging to skill group j. We consider two skill groups for simplicity: 1 (unskilled) and 2 (skilled). Assuming that the utility associated with migrating from s to h is a linear function of the difference between wages and migration costs, we can write a utility function for an individual as

$$U_{ish}^{j} = \alpha\,(w_{ih}^{j} - c_{ish}^{j}) + \varepsilon_{ish}^{j}, \tag{2}$$

where $\alpha > 0$ is the marginal utility of income and ε_{ish}^{j} is an idiosyncratic error term. The log odds of migrating to h versus staying in s for skill group j can be written as

$$ln\,\frac{E_{sh}^{j}}{E_{s}^{j}} = \alpha\,(w_{h}^{j} - w_{s}^{j}) - \alpha\,f_{sh} - \alpha\,g_{sh}^{j}, \tag{3}$$

where E_{sh}^{j} is the share of skill group j that migrates from s to h, and E_{s}^{j} is the share that remains in the source location. Taking differences between skilled and unskilled individuals from the above equation yields predictions about migrant selection:

$$ln\,\frac{E_{sh}^{2}}{E_{sh}^{1}} - ln\,\frac{E_{s}^{2}}{E_{s}^{1}} = \alpha\,[(w_{h}^{2} - w_{s}^{2} - g_{sh}^{2}) - (w_{h}^{1} - w_{s}^{1} - g_{sh}^{1})]. \tag{4}$$

The left hand side compares the skill mix of migrants to that of non-migrants. The right-hand side shows that selection (the sign of the left-hand side) depends on the magnitude of the wage difference between the source and destination faced by each skill group and the size of skill-varying migration costs. Rearranging the above equation yields

$$ln\,\frac{E_{sh}^{2}}{E_{sh}^{1}} = \alpha\,(w_{h}^{2} - w_{h}^{1}) - \alpha\,(g_{sh}^{2} - g_{sh}^{1}) + ln\,\frac{E_{s}^{2}}{E_{s}^{1}} - \alpha\,(w_{s}^{2} - w_{s}^{1}), \tag{5}$$

where the first two terms of the right-hand side capture the rewards to skill (net of migration costs) that explain the intensity of sorting. Hence, destinations offering higher net rewards to skill should

receive a higher-skilled mix of migrants from source s. To observe the model's implication on migrant sorting by sex, Equation 5 can be written as

$$ln\frac{E^2_{sh}}{E^1_{sh}} = \sum_k ln\frac{E^{2,k}_{sh}}{E^{1,k}_{sh}} = \sum_k \alpha\left(w^{2,k}_h - w^{1,k}_h\right) - \sum_k \alpha\left(g^{2,k}_{sh} - g^{1,k}_{sh}\right) + \sum_k \tau^k_s, \tag{6}$$

where $k = \{1 = \text{men}, 2 = \text{women}\}$ and $\tau^k_s = ln\left(E^{2,k}_s / E^{1,k}_s\right) - \alpha\left(w^{2,k}_s - w^{1,k}_s\right)$. Note that for simplicity we assume that men and women face the same marginal utility of income. Equation 6 states that under complete gender parity the skill mix of migrants should be gender balanced across destinations, as men and women face the same rewards to skill $\left(w^{2,1}_h - w^{1,1}_h\right) - \left(w^{2,2}_h - w^{1,2}_h\right) = 0$ and skill-related migration costs $\left(g^{2,1}_{sh} - g^{1,1}_{sh}\right) - \left(g^{2,2}_{sh} - g^{1,2}_{sh}\right) = 0$. Put differently, the existence of gender-specific factors affecting the benefits and/or costs associated with migration would generate distinctive sorting patterns by gender.

4.2 Married Migrants

To study the sorting of married (tied) migrants across destinations, we augment Equation 2 by introducing spousal returns to migration to the individual income maximization problem:

$$U^j_{ish} = \alpha\left(w^j_{ih} - c^j_{ish} + \theta^{j_{spouse}}_{ish}\right) + \varepsilon^j_{ish}, \tag{7}$$

where $\theta^{j_{spouse}}_{ish} = w^{j_{spouse}}_{ih} - c^{j_{spouse}}_{ish} + \varepsilon^{j_{spouse}}_{ish}$ is the spouse's net income faced by individual i. Equation 7 treats spouse net income as an endowment from the perspective of an individual migration decision. This approach is consistent with the migrant data we possess. Outside of a select sub-sample, we do not observe spousal pairs but individuals and their marital status. We also treat married migrants as joint migrants, and do not model sequential migrant decisions. To see how the spouse net income influences the scale of tied migration, we extend Equation 3 as

$$ln\frac{E^j_{sh}}{E^j_s} = \alpha\left(w^j_h - w^j_s - g^j_{sh} - f_{sh}\right) + \alpha\left(w^{j_{spouse}}_h - w^{j_{spouse}}_s - g^{j_{spouse}}_{sh} - f_{sh}\right). \tag{8}$$

Equation 8 shows that the log odds of migrating for skill group j depend positively on the spouse's skill-group-specific difference in wages between destination h and source s net of migration costs. Note that for simplicity we assume that both spouses face the same marginal utility of income, α, and fixed migration costs, f_{sh}. In this sense, fixed costs paid by spouses can deter tied migration if they are sufficiently large.

To see the implications on the skill-mix of migrants, we can take differences between skilled (2) and unskilled (1) individuals from the above equation to yield

$$ln\frac{E_{sh}^2}{E_{sh}^1} - ln\frac{E_s^2}{E_s^1} = \alpha\left[(w_h^2 - w_s^2 - g_{sh}^2) - (w_h^1 - w_s^1 - g_{sh}^1)\right] + \alpha[(w_h^{2\,spouse} - w_s^{2\,spouse} - g_{sh}^{2\,spouse}) - (w_h^{1\,spouse} - w_s^{1\,spouse} - g_{sh}^{1\,spouse})]. \tag{9}$$

Equation 9 indicates that the selection of migrant couples depends on two factors. The first is the degree of assortative matching in marriage captured by the correlation between j and j_{spouse}. A low correlation between j and j_{spouse} implies that on average spousal benefits and costs of migration are similar for skilled and unskilled potential migrants. In this case the skill mix of migrants is relatively unaffected by marriage partners. The second factor is skill-specific wage differences between the destination and source net of skill varying migration costs. If j and j_{spouse} are highly correlated, the returns to skill for men and women are positively correlated at the destination, and the wage difference between h and s is greater for skilled workers, then migrant couples should be positively selected. Rearranging Equation 9 yields

$$ln\frac{E_{sh}^2}{E_{sh}^1} = \alpha\left[(w_h^2 - w_h^1) - (g_{sh}^2 - g_{sh}^1)\right] + \alpha\left[(w_h^{2\,spouse} - w_h^{1\,spouse}) - (g_{sh}^{2\,spouse} - g_{sh}^{1\,spouse})\right] + \tau_s, \tag{10}$$

where $\tau_s = ln\left(E_s^2/E_s^1\right) - \alpha\left(w_s^2 - w_s^1\right) - \alpha\left(w_s^{2\,spouse} - w_s^{1\,spouse}\right)$. Equation 10 implies that destinations offering higher effective rewards to skill to both spouses should receive a higher-skilled mix of migrant couples.

Our framework considers that either partner may arrive in the destination as a tied mover who may be better suited to an alternative location. In practice, differences between men and women in their labor market positions, particularly after marriage, implies that married women are likely to have little agency in the migration decision. As a result a relatively large share of married women would migrate as tied movers in many contemporary and historical contexts (Mincer, 1978; Borjas and Bronars, 1991). In settings where married women had limited prospects post migration, location decisions would mostly reflect the returns experienced by male partners attached to the labor market. This would cause sorting patterns among married women to be less marked across destinations as their own net returns to migration were less relevant in location decisions than for men or for single women with a longer employment horizon. Historical evidence suggests that this may have been the case during the early

20th century, as less than a quarter of adult women in Canada and the United States were employed and less than 10 percent of married women held a job (Goldin, 1986, p. 560).

4.3 Destination Characteristics

To apply our conceptual framework, we use full-count data from the 1920 US Census to estimate county characteristics that potentially shaped sorting patterns. As the majority of the border crossing sample are from 1920 or 1921, and over 90 percent from 1917 to 1923, destinations characteristics in 1920 should serve as a good approximation of what migrants could expect upon arrival in different New England counties. We also estimate destination characteristics using the 1910 US Census for robustness checks, which we include in the Appendix.

Absolute Returns to Skill

We follow Grogger and Hanson (2011) and use the absolute returns to skill in the destination to capture the benefits of migration under income maximization. There are good reasons to expect that the pattern of absolute skill premiums varies significantly between women and men. Previous research has shown that local industry mix can play a major role in determining wages and working hours for women (King, 1978; Gustafsson and Jacobsson, 1985). Labor markets with a high proportion of feminized occupations have been found to have lower returns to skill due to occupational discrimination and measured job characteristics: feminized jobs feature lower levels of training and less labor market attachment (Groshen, 1991; Macpherson and Hirsch, 1995). Such a pattern would imply that destinations with high shares of female-intensive industries would tend to attract more unskilled women migrants. In the early-twentieth-century United States, textile manufacturing was arguably the industry where women were the most over-represented, with Fall River (Massachusetts) and Woonsocket (Rhode Island) being prominent examples of New England mill towns, whose industrial composition may have shaped sorting patterns (MacKinnon and Parent, 2012).

Following Grogger and Hanson (2011), we estimate absolute returns to skill as the difference between prospective earnings for the top and bottom 20 percent of the income distribution. Since earnings are not reported in the US Census in 1920 or 1910, we compute absolute returns to skill using full-count data from the 1940 census and Saavedra and Twinam (2020) LASSO procedure to assign individual earnings in 1920 by occupation code for each county in New England, New Jersey, New York, and

Pennsylvania.[23] We then use the distribution of occupations in each county in 1920 to estimate local occupational earning scores at the 80th and 20th percentiles. The difference between these is what we use as the absolute returns to skill in each destination. We apply this method for both employed men and employed women to generate gender-specific, local, absolute returns to skill. Note that we may be mismeasuring absolute return to skill by county if there were within-county differences in pay by occupation, or if the association between personal characteristics and earnings changed between 1920 and 1940. Figure 5 presents the spatial distribution of standardized absolute returns to skill. For women, the counties with the highest z-scores are in a belt running from Maine to Northern New York. We also observe above-average returns to skill in several counties in Pennsylvania. For men, we do not observe any clear spatial pattern.

Job Search Costs

To extend the analysis beyond simple income maximization based on prospective earnings, we consider three main factors that can shape the sorting of female and male migrants through their effect on migration costs. First, in locations where employment opportunities for women are limited, job search costs are higher, particularly for less-skilled women (Chort, 2014; Massey, 2016). Recent research has shown that low female employment rates in the destination reflect higher monetary and psychic costs that affect women's expected returns to migration (Aksoy and Poutvaara, 2021; Bertoli, Fernández-Huertas Moraga and Ortega, 2013; Sandell, 1977). A similar mechanism could apply to North American labor markets in the early twentieth century, with spatial variation in female labor force participation rates influenced by the application of barriers to employment such as marriage bars and social norms about the role of women in the workplace (Seltzer, 2011; Goldin, 2021).[24] We proxy job search costs with gender-specific labor force participation rates by county: the share of prime age men and women adults (16-65) who reported being employed.[25] Table 3 shows striking differences between female and male participation rates: while only 30% of women were employed, more than 90% of men had a job. Figure 6 displays standardized labor force participation rates by county. Female participation rates varied substantially, with counties in South Eastern New England having the highest participation rates.

[23] This approach uses variation in earnings by demographic characteristics in 1940 to generate individual varying predicted earnings in earlier censuses. The occupational coding is the IPUMS default 1950 Census Bureau occupational classification system.

[24] The existence of marriage bars and other labor-market gender norms also limited promotion possibilities for women, affecting their expected returns to human capital (Seltzer, 2013).

[25] Although labor force participation rates proxy for employment possibilities in the destination, unemployment and underemployment was higher among women than men, implying that gross participation rates may mismeasure job possibilities for women. Underreporting of employment among married women due to social norms may be another source of bias.

In contrast, male labor force participation rates were relatively homogeneous across the Northeastern states.

Ethnic Enclaves

The second factor is the presence of ethnic enclaves at the destination, which can affect migration costs through their capacity to offer network connections to potential migrants. Contemporary evidence shows that ethnic enclaves play a disproportionate role in facilitating the migration of less-skilled individuals, as ethnic connections reduce information and job search costs for newly arrived immigrants (Damm, 2009; Edin, Fredriksson and Åslund, 2003). In the context of early 20th century French Canadian migration to the United States, more skilled migrants with more education and better childhood conditions were more likely to speak English (and to speak English better).[26] Hence, the impact of French-Canadian enclaves in mitigating migration costs may have been large for less-skilled individuals. Due to differences in the ability to save between men and women, ethnic networks could have been particularly valuable for women (Curran and Rivero-Fuentes, 2003; Munshi, 2003).[27]

To examine the role of ethnic enclaves in shaping sorting patterns, we estimate the share of working-age (16-65) French Canadians by county: individuals reporting birthplace in French Canada and French as their native language (mother tongue).[28] Table 3 shows that on average French-Canadians represented about 4.5% of the working-age population in Northeastern counties. However, we observe substantial variation among leading destinations, with French-Canadian shares ranging from 5% (Essex County MA) to almost 20% (Androscoggin County ME). In Figure 7 we present the spatial distribution of standardized shares of French Canadians by county. Although several border counties had above-average shares, clusters with large numbers of French Candians were dispersed throughout New England; for example, there were counties with similarly high shares in Connecticut and Rhode Island.[29]

[26] In the 1921 Census of Canada, French Canadian men in professional and clerical occupations had literacy rates of 98% and 90% were able to speak English; among semi-skilled men these figures were 94% and 75%, and among the unskilled or in agricultural occupations these figures were 84% and 54%, respectively. The small number of women in professional and clerical occupations had literacy rates of 99% and 77% could speak English; among semi-skilled women these figures were 96% and 52%, among the low-skilled were 91% and 51%, and among the unemployed were 93% and 47%, respectively.

[27] Contemporary research suggests that social capital may have gendered impacts, with female networks strongly influencing the destination choice of women migrants (Davis and Winters, 2001).

[28] We find similar patterns if we consider second-generation immigrants: francophones with parents born in French Canada or any individual with parents born in French Canada.

[29] See MacKinnon and Parent (2012, p.32) for a similar portrayal of first and second generation French Canadians in New England.

Spousal Search Costs

Our third cost factor is the structure of marriage markets. The key hypothesis is that the size of the pool of suitable spouses in the destination matters: men and women who move to destinations with unfavourable gender ratios will experience an increase in the cost of finding a spouse due to the worsening of their bargaining position in the marriage market (Angrist, 2002; Bhaskar, 2019). If low-skilled individuals are less attractive in marriage markets due to lower earnings, lower social status, or less wealthy parents, they may experience a disproportionate increase in the cost of finding a spouse when partners are scarce. If marriage related costs are relevant to the sorting of single migrants, we would expect symmetrical effects for both genders, with unskilled single men (women) choosing locations where men (women) are scarce and their cost for finding a partner is low. Predictions on the sorting of single women migrants across destinations will depend on how marital utility varies across skill groups. If marital utility decreases with human capital, destinations with environments favoring the employment and careers of women should receive a higher-skilled mix of single, female migrants. We compute the female to male ratio of single individuals 16-40 years old by county to capture differences in the structure of local marriage markets.[30] Sex ratios were fairly balanced among leading destinations, except for Coos County NH that stands out as a major outlier (see Table 3). We also standardize our sex ratio estimates and present their spatial distribution in Figure 7. Counties with relatively high female to male ratios were mainly located in New Hampshire, Massachusetts, and Rhode Island.

In Figure A.3 we presents binned scatter plots showing the correlation between migrant height and each variable of interest. Panel A shows that physical stature of single women is positively correlated with returns to skill, but strongly negatively correlated with the share of French Canadians. In contrast, Panel B shows that physical stature of single men is positively correlated with both returns to skill and enclave size. The statistical relationships of migrant height with labor force participation rates and sex ratios are more modest for both sexes. Figure A.4 shows similar correlations for married migrants. Panel A shows that height is uncorrelated with destination characteristics for married women, except for enclave size that continues to have a negative correlation with height. Panel B shows that correlations between height and destination characteristics are broadly similar to what is observed for single men. This preliminary evidence shows potential gender-specific relationships between local conditions and

[30] We also compute sex ratios considering individuals 16 to 30 and 16 to 65 years of age as well as disregarding marital status. These alternatives have little impact on our core results.

sorting by height, particularly in relation to the presence of a sizeable French Canadian community at the destination.

5. Empirical Approach

We estimate the relationship between destination characteristics and migrant sorting by height using the following equation:

$$\begin{aligned} h_{iydc} = \; & \alpha + \eta_y + \theta_d + \lambda_1 \cdot rskill_c + \lambda_2 \cdot empl_c + \lambda_3 \cdot enclave_c + \lambda_4 \, sratio_c \\ & + \mathbf{X}'_{dc} \cdot \mathbf{\Gamma} + \mathbf{Y}'_{iydc} \cdot \mathbf{\Delta} + \mathbf{Z}'_c \cdot \mathbf{\Omega} + e_{iydc}, \end{aligned} \tag{11}$$

where h_{iydc} is the height of migrant i born in year y in Canadian census district d and resident after migration in US county c. The variables of interest $rskill_c$, $empl_c$, $enclave_c$, and $sratio_c$ are the difference in wages between the 80th and 20th percentile, labor force participation rate, French-Canadian enclave size, and female to male ratio in each county, respectively. We include year-of-birth, η_y, and district-of-birth, θ_d, fixed effects, to control for shocks affecting the height of specific age cohorts, or any time-invariant, district characteristic that may explain height differences across geographic areas. We also include a series of control variables to standardize on individual characteristics that may influence the destination choice and to account for additional factors that may shape sorting patterns.

A first set of control variables, $\mathbf{X}'_{dc}$, consists of the linear and quadratic source-to-destination distance, which capture out-of-pocket costs and their potential nonlinear effect on the destination choice (Hatton and Williamson, 1998). Note that, unlike for men, destinations that offered greater economic prospects for women were clustered in specific regions. This implies that the effect of distance is likely to vary between males and females, even though migrants of both sexes traveled similar distances (see Table 2). We also include an indicator for source-destination contiguity to control for border dynamics.

A second set of control variables, $\mathbf{Y}'_{iydc}$, consists of individual characteristics derived from the border crossings data that may correlate with the destination choice. These variables consist of indicators for whether the migrant has a personal contact in the United States, whether the migrant moved within Canada prior to entering the United States (last place of residence not equal to place of birth), whether the migrant had previous immigration experience in the United States, and whether the migrant entered the United States after the introduction of the national origin quotas in 1921.[31]

[31] While Canadians were not directly affected by the 1921 Emergency Quota Act, they had a substantial impact on immigration flows from Europe, and led to changes in the demand for Canadian labor in the United States (Abramitzky et al., 2019).

A third set of control variables, $\mathbf{Z}'_c$, consists of a range of additional county characteristics that may be correlated with the destination choice: average income, infant mortality, share of home-owning households, share of urban households, share of farm households, and population density.[32] How these destination characteristics may influence the sorting of migrants is unclear, as it is difficult to ascertain a priori how the preference for these features varies across skill levels and between genders.

To evaluate whether distinctive gender-specific patterns of sorting were present, we estimate our models separately for both female and male migrants. A model with gender interactions would be inappropriate due to life-cycle related biological differences in physical development between men and women. In regressions for married migrants, we also include in $\mathbf{Z}'_c$ the average wage and labor force participation rate of the opposite sex. This allows us to control for labor-market conditions faced by the partner. All regression models are estimated using ordinary least squares (OLS) and clustering standard errors by province of birth.

5.1 Results for Single Migrants

Our first results focus on single French-Canadian migrants. Figure 8 presents estimated coefficients for our variables of interest using four specifications. We include year-of-birth and district-of-birth fixed effects in all models. Panel A shows the results without any additional control variables. In Panels B, C, and D we sequentially add sets of variables controlling for transportation costs ($\mathbf{X}'_{dc}$), migrant characteristics ($\mathbf{Y}'_{iydc}$), and destination characteristics ($\mathbf{Z}'_c$). This allows us to observe how the estimated coefficients change as we adjust for diverse factors that may have shaped sorting patterns. The coefficients underlying these figures are presented in Table 4 to Table 7.

The point estimates of the baseline specification (Panel A) suggest that men and women sorted positively on absolute returns to skill, which aligns with predictions of our income maximization framework: counties with large absolute skill-related wage differences should attract taller individuals with above-average earnings potential. However, the coefficients are small in magnitude and statistically insignificant for women. The estimates also show that gender-specific labor force participation rates influenced male sorting only and sex imbalances had small effects but in the expected direction from the perspective of marriage markets, with shorter men migrating to destinations where candidate spouses were abundant and vice versa. The variable with the most notable gender-specific effect is the

[32] Except for average income, these data come from Bailey et al. (2018) and Haines and ICPSR (2010).

presence of French-Canadian enclaves, which exhibits a strong negative correlation with height for female migrants but a modest positive correlation for men.

The addition of successive sets of control variables in panels B, C, and D heightens the gender contrast in sorting among single migrants. The inclusion of distance has the most marked effect on the core variables in the analysis. The negative coefficient on sorting for men is similar to that observed in Grogger and Hanson (2011). The positive coefficient for women is more surprising, but may reflect the fact that the better labor market opportunities for women were disproportionately located in Southern New England. In all three further specifications the absolute returns to skill remain statistically insignificant for women, but the extent of female participation in the destination becomes a strong determinant of migrant sorting: a one standard deviation increase in the female labor force participation rate is associated with a 0.32 inch increase in the height profile of single migrant women. This result is consistent with the historical context of our study in which large spatial differences in the opportunities to work for women significantly determined the expected gains from migration across destinations. In contrast, the effect of labor force participation rates on male sorting is about 5 times smaller than that for females. Panel D shows no significant effect of marriage markets on female sorting, while those for men increase in magnitude and remain statistically significant. The most notable effect is the consistently large, gender-specific enclave effect across specifications: a one standard deviation increase in the share of French Canadians increases the height profile of women migrants by 0.23 to 0.39 inches.

As a robustness check, we estimate the previous models using data from the 1910 US Census.[33] Figure A.5 shows that our main findings hold. We also estimate the models including British Canadians in the migrant sample and allowing the effect of all the control variables to vary across ethnicities. Note that in these models we use the share of foreign born population as variable of interest. Table A.3 shows that job opportunities at the destination were the main determinant of migrant sorting among single Canadian women. The estimates for single Canadian men are also similar to those discussed above (see Table A.4).

[33]We compute the variables of interest and destination characteristics using 1910 census data, which we assign to individuals who migrated before or in 1915.

5.2 Results for Married Migrants

Figure 9 presents results for married men and women in four panels arrayed in the same fashion as in Figure 8. The baseline results (Panel A) show that the presence of enclaves was the only factor that influenced migrant sorting among married women. Panels B and C show that the estimated coefficients for married men are similar to those for their single counterparts. Once all controls are included (Panel D) no variable of interest has a significant impact on the sorting of married women. For men, absolute returns to skill continue to have a significant effect on sorting as the theory predicts. However, the coefficients on the labor force participation rate and sex ratio become positive and statistically significant. We present estimates using data from the 1910 US Census and including British Canadians in the analysis in Figure A.6, Table A.5, and Table A.6, respectively.

A significant effect of sex ratios on the sorting of married men is counter-intuitive, as we would not expect marriage markets to play a role in the destination choice of married individuals. This finding, however, is consistent with married women being largely tied migrants and their role as secondary earners. Recent work shows that in locations with relatively few men, women are more likely to work, have high-skilled jobs, and some earn higher wages (Conover, Khamis and Pearlman, 2021). Therefore, everything else equal, married men with above-average earnings potential would have the most to gain from moving to counties with high gender imbalances, as their female partners could easily become secondary earners and provide insurance to households in case of unemployment of male heads. Our estimates show that a one standard deviation increase in the female to male sex ratio in the destination increases the height profile of married migrants by 0.15 inches. Note that the validity of this interpretation depends on the presence of assortative matching in marriage—that is, relatively tall men married with relatively tall women. Although we cannot comprehensively test this interdependency given the lack of information on spouses for most of our migrants, we were able to obtain data about the spousal characteristics, including height, for about 200 married migrants. Figure A.7 shows a clear positive correlation in height between spouse pairs, suggesting that assortative matching on physical stature was a feature of French Canadian marriage.[34]

6. Discussion

The results largely confirm the importance of the income maximization view of migration for men and the large effect of tied migration on sorting among married women. The most striking finding, however,

[34] See Curtis (2020) for additional evidence on the existence of strong assortative matching in marriage in 19th century Quebec.

is the strong gendered role of enclaves in shaping the sorting of migrants. A large body of literature argues that low-skilled immigrants have a higher tendency to live in ethnic enclaves (see, for example, Borjas, 1992; Damm, 2009; Edin, Fredriksson and Åslund, 2003; LaLonde and Topel, 1997), but why do we find such strong effects for single women in particular? Our reading of the historiography of French Canadian migration and social histories of single women in the early-twentieth-century United States lead us to propose two explanations for this pattern.

For single women intending to work in the United States, ethnic enclaves may have dramatically reduced migration costs associated with finding accommodation. While many teenage girls working in New England lived with their parents, for older women housing search assistance was usually provided by contacts—other than nuclear family members—in the destination (Takai, 2001, p. 389). Furthermore, accommodation for unaccompanied women moving to United States was often arranged prior to migration, with families from Quebec providing affordable lodgings. This implies that for many poor, low-skilled, single women destination options may have been limited, in the first instance, to French-Canadian enclaves, as these locations offered the lowest housing costs. The historical literature also suggests that single women who lived by themselves and outside of boarding arrangements were exceptional (Waldron, 2005).[35] Examples include experienced manual workers and high-skilled individuals such as teachers, who would be drawn from the upper tail of the French Canadian skill distribution (Hareven and Tilly, 1981; Takai, 2001).

Enclaves may have also provided opportunities to borrow and save for young single women. In contemporary immigrant communities informal finance plays a large role in providing credit (Bond and Townsend, 1996). Ethnic communities can also provide formal credit instruments: the establishment of immigrant banks in 19th century America, and their role in facilitating savings is well known (Abramitzky and Boustan, 2017; Anbinder, 2012; Anbinder, Gráda and Wegge, 2019). For the French Canadian population in New England, a small number of savings institutions served the community in the 1880s and 1890s in locations such as Holyoke and Woonsocket (Podea, 1950, p. 378). The landscape for small-scale saving and borrowing fundamentally changed with the establishment of a number of credit unions (*caisse populaire*) in towns in Massachusetts, New Hampshire, and Rhode Island between 1908 and 1915.[36] The *caisses* were established to facilitate small-scale savings and loans within the community.

[35] Few single women were household heads in the United States prior to 1930. Among French Canadians in Lewiston and Lowell, less than ten percent were household heads (Takai, 2001).

[36] These credit unions were mostly founded by Alphonse Desjardins, who adapted the model used in the province of Quebec to local Francophone communities in the United States.

Membership was accessible, costing only a few dollars, and unlike other financial institutions at the time, women and in particular young single women were encouraged to use the *caisses* to borrow and save.[37] The institution would be well-known and understood by many migrants as it was widespread across Quebec, with almost 200 *caisses populaire* established by Desjardins between 1900 and 1920 (Poulin, 1990).[38] This implies that single female migrants could have had access to financial services (in French if necessary) in several major French Canadian communities across New England (Richard, 2015). footnoteThe *caisses* were mostly established in areas that had significant French Canadian enclaves: Manchester New Hampshire, Lowell, Lynn, Fitchburg, New Bedford, Worcester, Holyoke, and Fall River Massachusetts, and Central Fall Rhode Island (Poulin, 1990, p.231-241).

To examine the relationship between the presence of credit unions and sorting patterns, we estimate Equation 11 including an indicator variable for county destinations with a *caisses populaire*. Column 5 of Table 4 shows that destinations with a credit union attracted relatively tall single women. The coefficient on enclave size is almost identical to that in column 4. In contrast, we find a strong negative relationship between credit unions and the height profile of single men (column 5 of Table 5). Overall these findings suggest that despite being feasible, the access to credit unions among single women was mediated by skill and status. As a result, low-skilled single women had to rely on ethnic enclaves to provide direct assistance.

7. Conclusion

Our assessment of early 20th century Canadian immigration to the United States reveals that women and men migrating from Canada were positively selected on height, but sorted to different destinations in New England and the Northeast. A model of sorting based on income maximization does a good job of accounting for these patterns, and also highlights the need to consider gender-specific factors to fully understand migrant sorting. Tall single men sorted themselves into destinations with high expected absolute returns to skill. Costs also played a large role in determining sorting patterns among single migrants. We find that job opportunities and ethnic enclaves in the destination were particularly important for the sorting of single women migrants, which we view as strong signals of the importance of job search costs, and the role of ethnic networks in mediating the costs of finding accommodation and

[37] "... why should women, young girls, and especially children join? ... Young girls should also feel interested in the welfare of such a bank. Most of them will probably later on be wives and so called upon to take up the functions and duties now the lot of their mothers. Can they be taught at too early a date? Must they not be educated in thrift as well as in any other line and shown how necessary it is to insure the material well-being of those what will be dear to them ..." (Desjardins, 1914, p. 11).

[38] Approximately 20 percent of the Canadian *caisses* founded in this period were liquidated by the early 1920s.

in accessing financial services at the destination. These barriers were particularly prominent for single women due to the discrimination faced in labor, housing, and financial markets. While our evidence is drawn from a particular historical setting, the gender differences in access to opportunities observed in early 20th century North America continue to be present in contemporary labour markets, particularly in less developed economies.

Our analysis of married migrants shows that the sorting of married men across destination conditions largely resembled that of their single counterparts, while the sorting of married women was much less sensitive to destination benefits and costs. This finding suggests that married migrant women were typically tied to a spouse whose labor market opportunities determined the joint destination of the couple. The result also confirms a notable difference in agency between single women and married women in terms of migration decisions.

More broadly, these results provide important evidence and future direction for the study of migration and gender. That female and male prospective migrants respond differently to conditions at the destination indicates that the impact of social and policy environments on immigration cannot be understood from existing analyses based almost entirely on male migrants. While our analysis exploits measures of migration costs drawn from destination characteristics, future work could explore how the destination choices of women and men respond to policies that lead to changes in benefits and costs across destinations.

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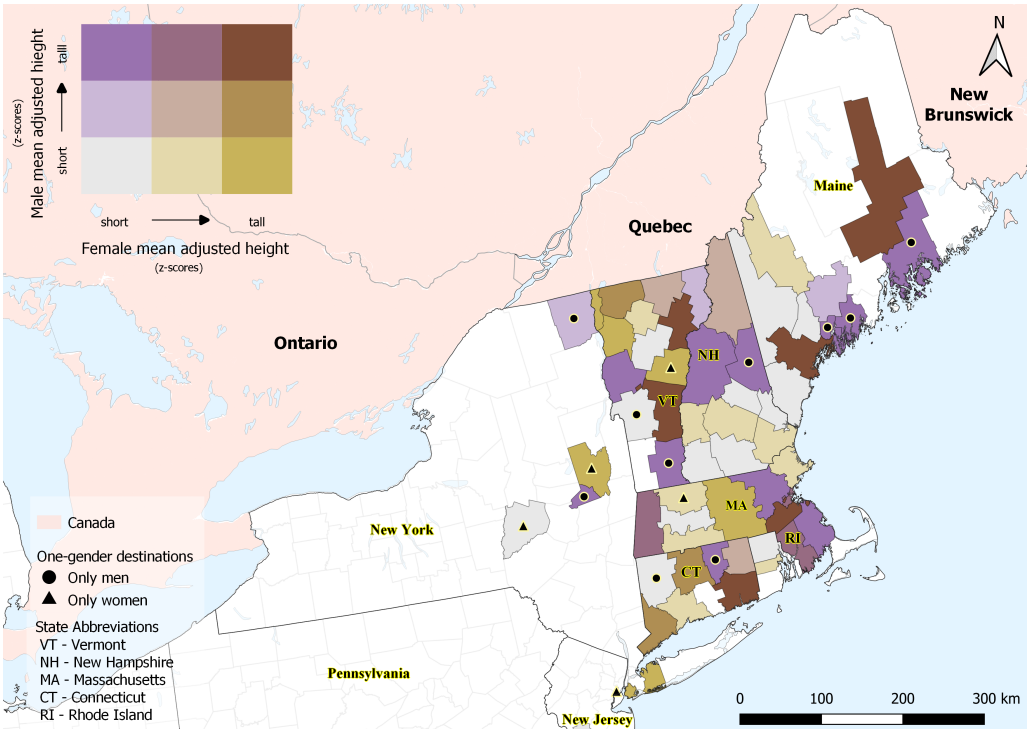
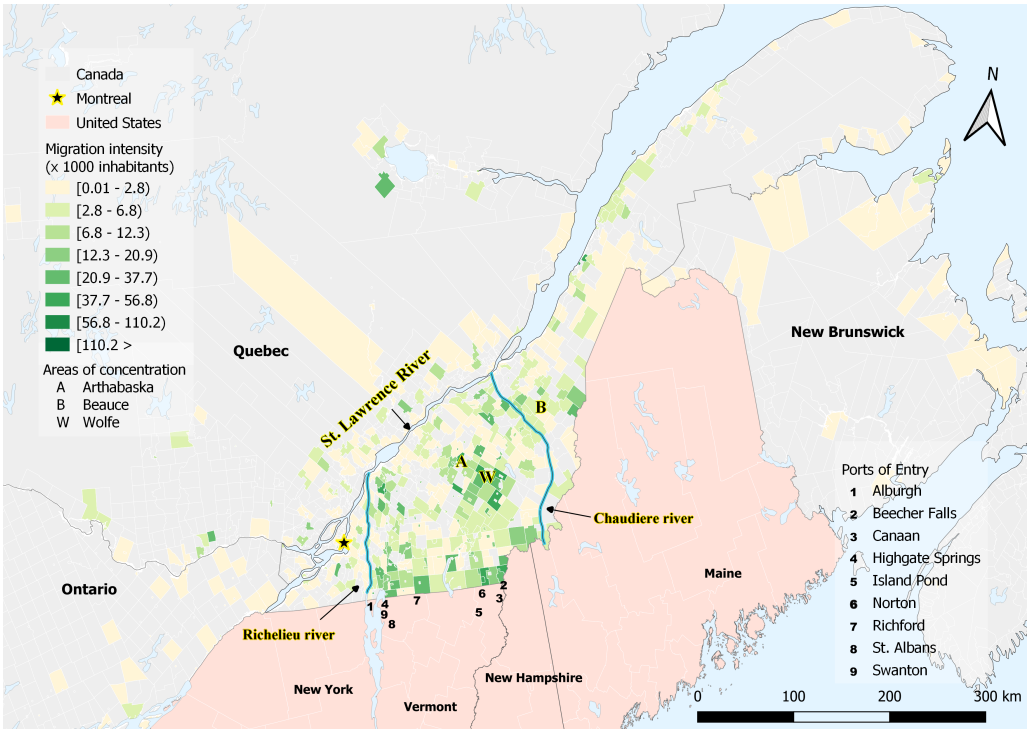
Figures and Tables

Figure 1: Sorting of Canadian Migrants by Height, 1906-1954



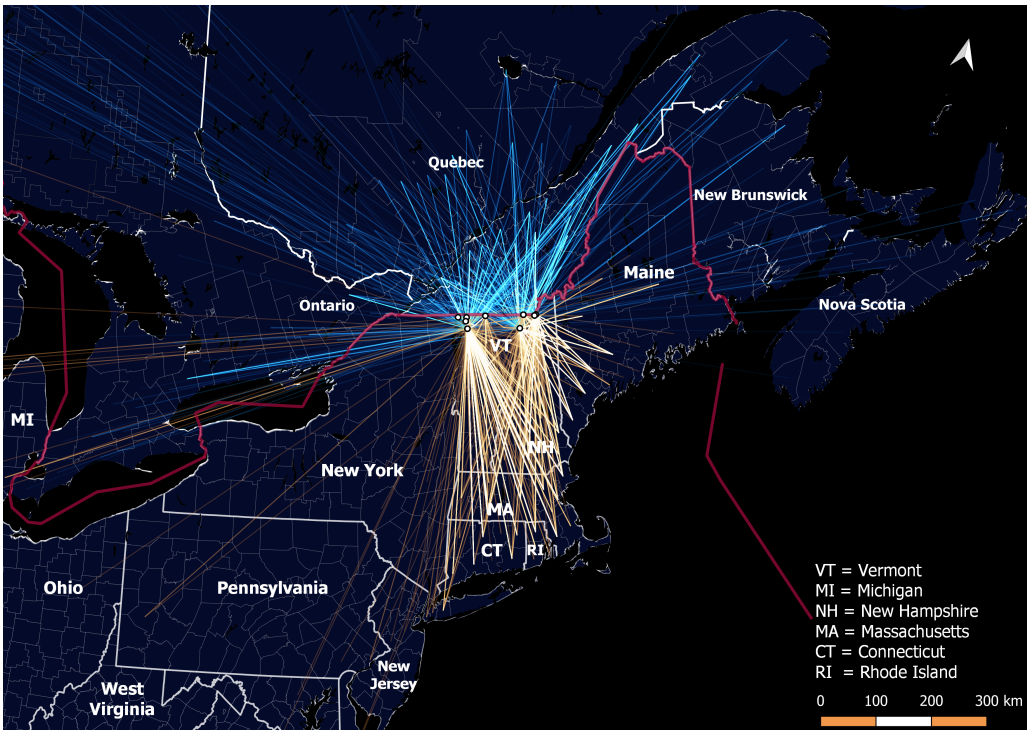
Source: St. Albans Lists. Publication number M1462.
Notes: The polygons display the height profile of female and male Canadian migrants. Sorting by height across destinations was strikingly different between men and women. Relatively few counties attracted female and male migrants of an equivalent height profile, and several destinations attracted only women (men).

Figure 2: Canadian Migration to the United States, 1906-1954



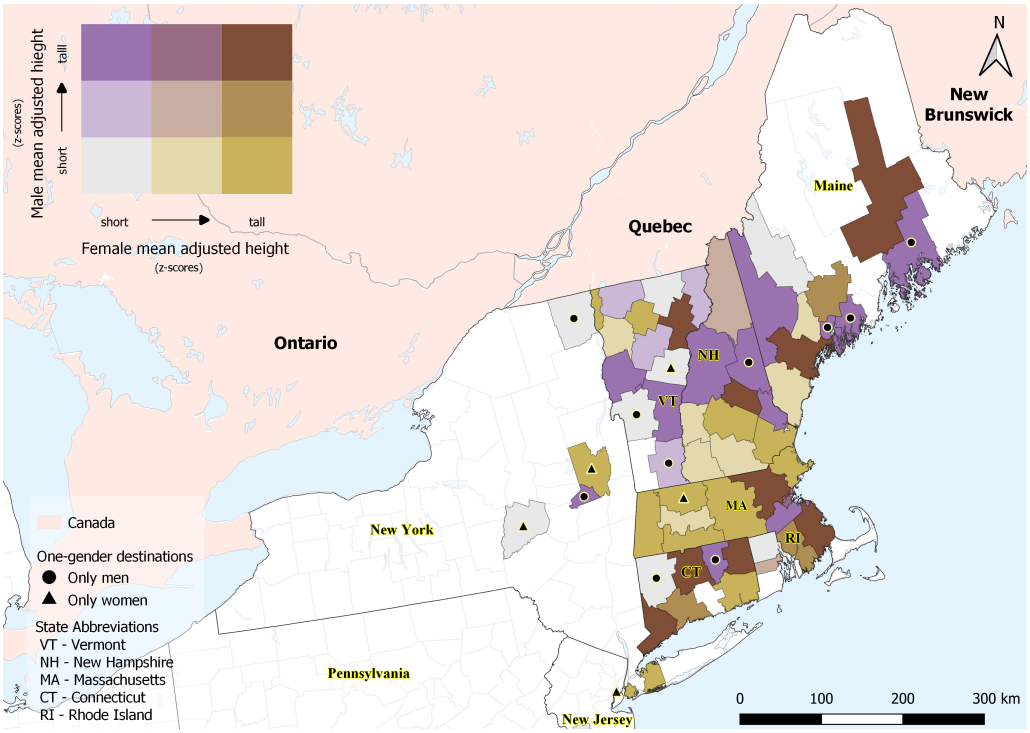
Source: St. Albans Lists. Publication number M1462.
Notes: The polygons display emigration rates per 1000 inhabitants at the sub-district level (classes determined using Jenks Natural Breaks method).

Figure 3: Source and Destination Choices of Canadian migrants, 1906-1954



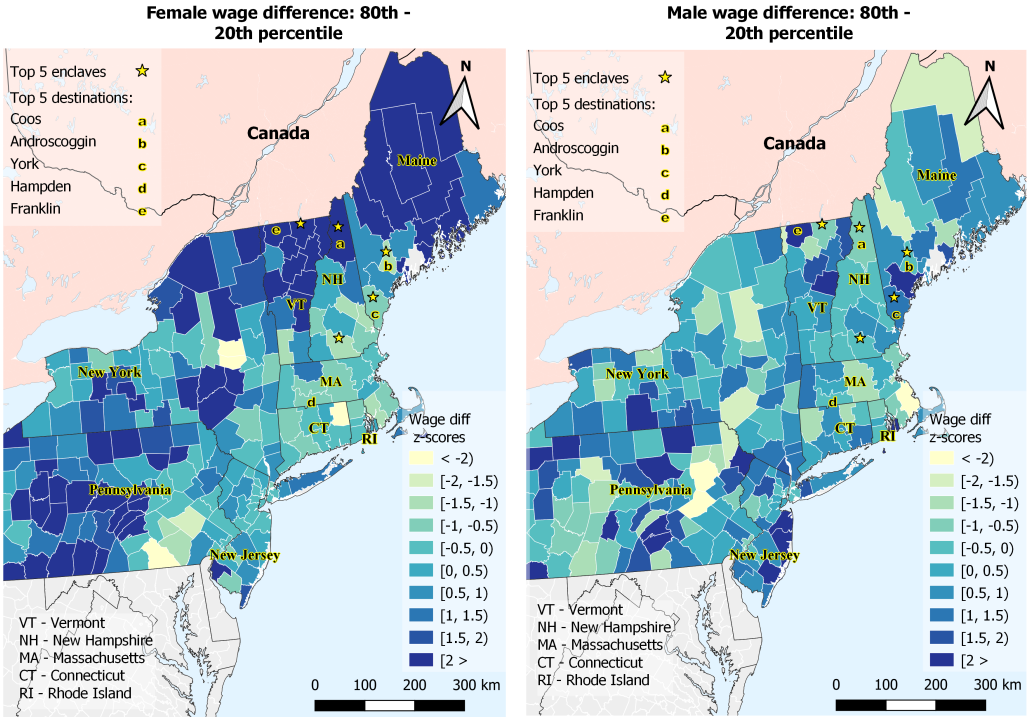
Source: St. Albans Lists. Publication number M1462.
Notes: Each line represents an individual. Overlapping lines capture the intensity of a source-destination pair by adding pixel values—that is, brighter lines represent more intense migration flows.

Figure 4: Sorting of Single Canadian Migrants by Height



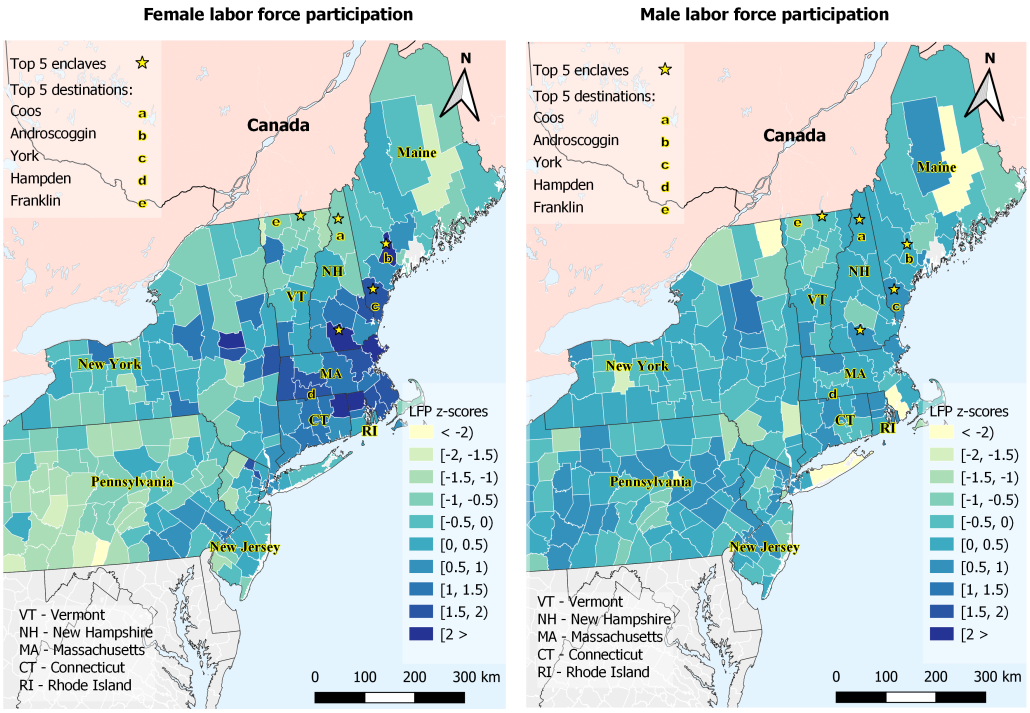
Source: St. Albans Lists. Publication number M1462.
Notes: The maps display z-scores of mean predicted height by county. Females arriving in Massachusetts were relatively tall, while their male counterparts were relatively short. More striking is the variation in sorting across counties within states. In Southern New Hampshire, arriving female migrants were drawn from the upper ranks of the migrant height distribution, whereas their male counterparts were predominantly drawn from the opposite end of the distribution. The opposite is observed in Grafton County and Carroll County, located in the north of the state.

Figure 5: Returns to Skill by Gender



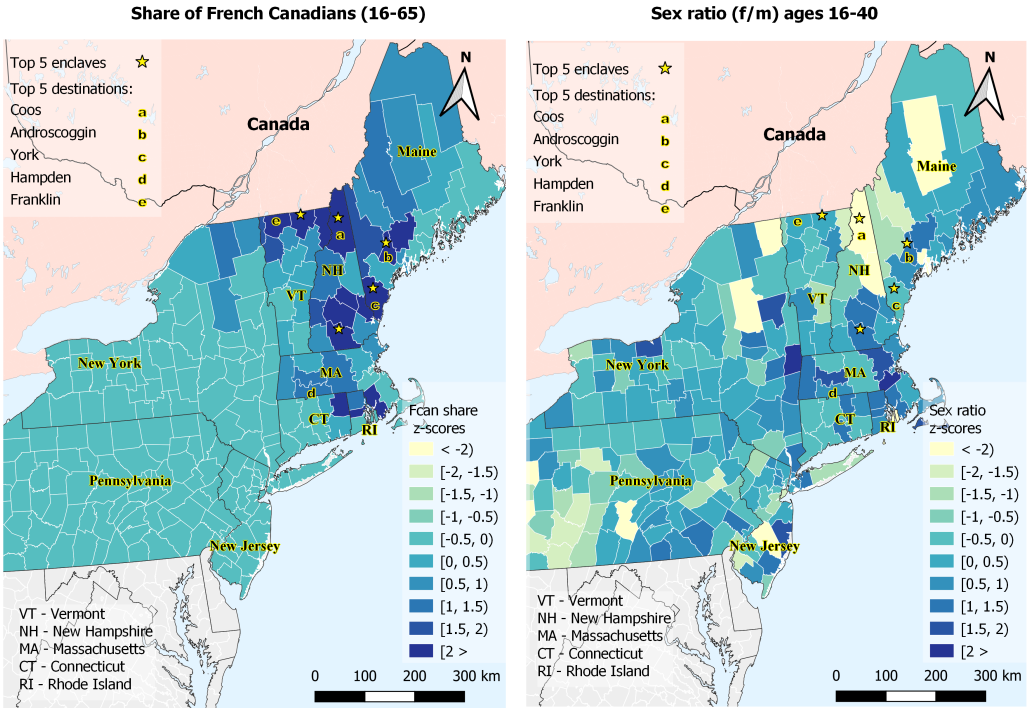
Source: Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

Figure 6: Labor Force Participation by Gender



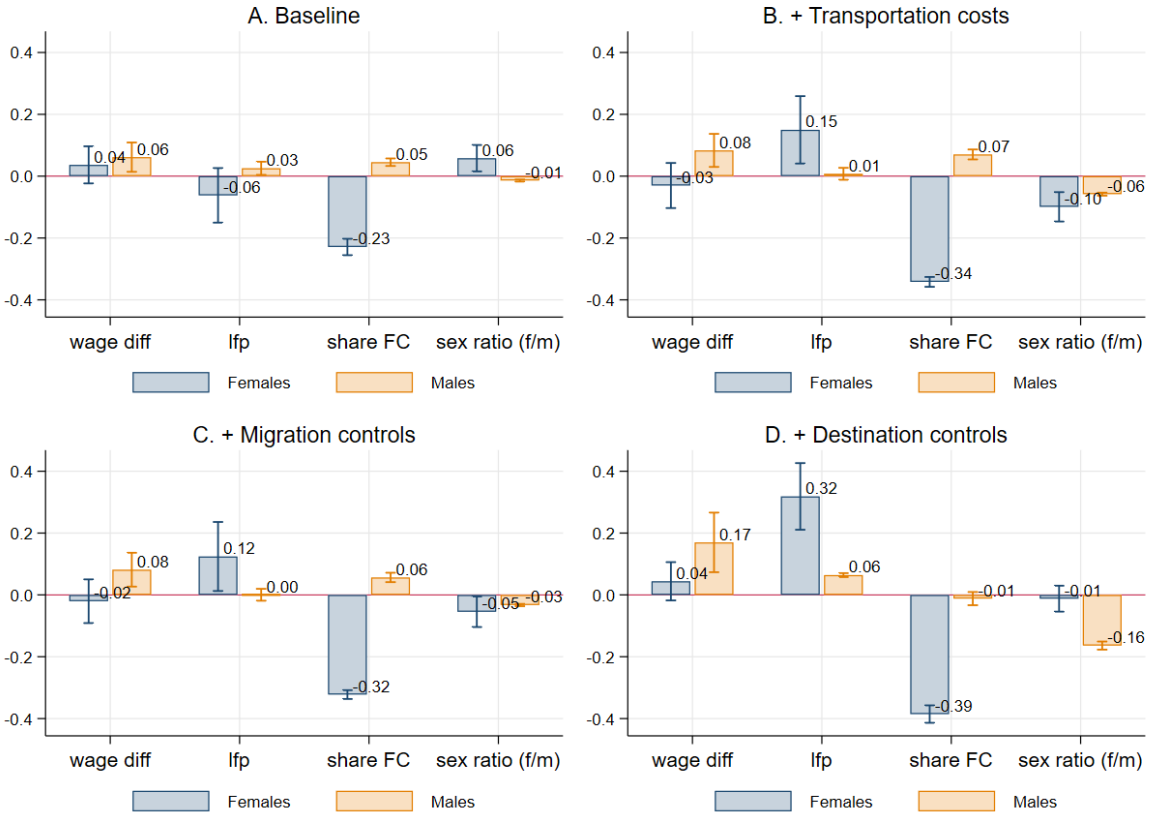
Source: Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

Figure 7: Share of French Canadians and Sex Ratios



Source: Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

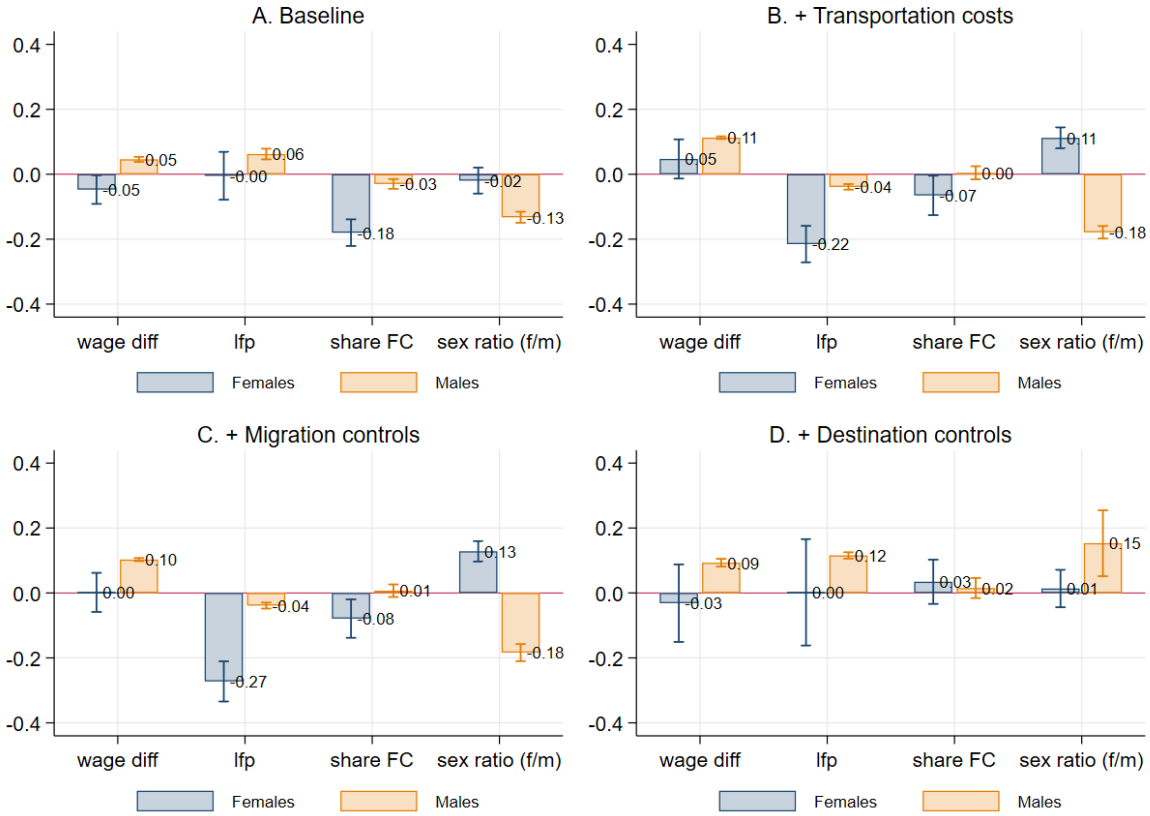
Figure 8: Sorting of Migrants by Height. Single French Canadians



Source: St. Albans Lists. Publication number M1462. Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.

Notes: Men sorted positively on absolute returns to skill, which aligns with predictions of our income maximization framework: counties with large absolute skill-related wage differences should attract taller individuals with above-average earnings potential. Female participation in the destination was a strong determinant of migrant sorting: a one standard deviation increase in the female labor force participation rate is associated with a 0.32 inch increase in the height profile of single migrant women. This result is consistent with the historical context of our study in which large spatial differences in the opportunities to work for women significantly determined the gains from migration. The estimates are for single, divorced, and widowed migrants.

Figure 9: Sorting of Migrants by Height. Married French Canadians



Source: St. Albans Lists. Publication number M1462. Steven Ruggles, Catherine A. Fitch, Ronald Goeken, J. David Hacker, Matt A. Nelson, Evan Roberts, Megan Schouweiler, and Matthew Sobek. IPUMS Ancestry Full Count Data: Version 3.0 [dataset]. Minneapolis, MN: IPUMS, 2021.
Notes: No variable of interest has a significant impact on the sorting of married women. For men, absolute returns to skill continue to have a significant effect on sorting as the theory predicts. A significant effect of sex ratios on the sorting of married men is consistent with married women being largely tied migrants and their role as secondary earners. Everything else equal, married men with above-average earnings potential would have the most to gain from moving to counties with high gender imbalances, as their female partners could easily become secondary earners and provide insurance to households in case of unemployment of male heads.

Table 1: Skill Premia in Canada and the United States in the Early 20th Century

	United States		Canada			
			Ontario		Quebec	
Year	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*
1909	1.7	2.0	–	–	–	–
1911	–	–	1.2	1.4	1.2	1.3
1914	1.7	2.1	–	–	–	–
1919	1.2	1.7	–	–	–	–
1921	–	–	–	1.2	1.0	–

Source: Clerical/production earnings ratios for the United States adapted from Goldin and Katz (1999). Clerical/operative earnings ratios for Canadian men adapted from Inwood, MacKinnon and Minns (2010). Clerical/operative earnings ratios for Canadian women are authors' estimates from the 1911 and 1921 Census.

Table 2: Summary Statistics, Immigrant Sample

	All Canadians		French Canadians		British Canadians	
	Men	*Women*	*Men*	*Women*	*Men*	*Women*
Panel A: Immigrants						
Age (years)	30.3	30.4	30.0	30.1	32.6	32.2
Literate (%)	95.2	96.2	94.7	95.8	98.7	98.4
Money (median, US dollars)	50	30	50	30	50	29.5
Occupation (%)						
professional	6.7	9.5	5.1	6.8	19.4	25.5
skilled	14.9	3.0	14.8	3.2	15.3	1.9
lower skilled	28.9	24.7	29.9	25.9	20.6	17.9
unskilled	29.3	2.2	30.4	2.4	20.3	1.1
farmers	13.5	0.2	13.6	0.2	13.1	0.4
none	6.7	60.4	6.2	61.5	11.3	53.2
Marital status (%)						
single	53.0	49.2	53.2	48.5	51.6	53.6
married	43.3	42.8	43.2	44.1	44.1	35.4
other	3.7	8.0	3.6	7.4	4.3	11.0
Networked (%)	92.6	95.2	92.3	95.8	95.3	91.6
US before (%)	62.9	61.6	62.0	61.4	70.3	62.7
Internal migration (%)	48.4	55.8	47.6	55.7	54.7	56.7
Distance (100s of km)	3.3	3.5	3.1	3.3	4.4	4.7
Height (in) by age cohort						
Average (full sample)	67.0	63.7	66.8	63.5	68.3	64.4
30-34	67.2	63.0	65.9	63.5	72.0	61.0
35-44	67.3	63.3	67.1	63.0	69.7	65.5
45-54	66.5	63.3	66.4	63.2	67.8	63.9
55-64	67.2	63.8	67.0	63.7	68.3	64.3
Observations	2,855	1,783	2,535	1,520	320	263
Sample share (%)	61.6	38.4	62.5	37.5	54.9	45.1
Panel B: Residents						
Canadian Bulletin of Nutrition						
Height (in) by age cohort						
30-34	68.0	62.8	65.7	61.6	68.4	63.2
35-44	67.5	62.4	65.3	61.8	67.9	62.7
45-54	66.9	61.8	65.5	61.2	67.2	62.1
55-64	66.0	61.3	64.6	60.5	66.4	61.6

Source: St. Albans Lists. Publication number M1462 and Canadian Bulletin of Nutrition (Pett and Ogilvie, 1957).
Notes: British and French migrants have a similar profile in terms of age, access to migrant networks, literacy, marital status, immigration experience, and money at hand. However, relevant measures of selection such as height and occupation class reveal important differences across ethnic groups. The statistics in Panel A are estimated for a sample of 4,638 observations, corresponding to the sample used for model (1) in the main regression. We replicate this table for a larger sample in Table A.1. Distance estimates are for a smaller subsample of observations (4,362) reporting complete geographic information (origin and destination).

Table 3: Summary Statistics, Top 10 Destination Choices

State	County	Return to skill Males	Return to skill Females	French Canadians / Residents (16-65)	LFP Males	LFP Females	Females / Males
Average County		0.714	0.790	0.044	0.922	0.283	0.981
		(0.151)	(0.368)	(0.048)	(0.047)	(0.073)	(0.076)
NH	Coos	0.583	1.170	0.181	0.934	0.197	0.791
ME	Androscoggin	0.640	0.334	0.192	0.930	0.404	1.067
ME	York	0.819	0.495	0.148	0.942	0.353	0.987
MA	Hampden	0.636	0.511	0.066	0.936	0.382	1.031
VT	Franklin	1.046	1.447	0.101	0.903	0.203	0.984
RI	Providence	0.555	0.501	0.070	0.946	0.391	1.060
NH	Hillsborough	0.627	0.322	0.181	0.941	0.442	1.065
MA	Essex	0.567	0.539	0.049	0.946	0.400	1.030
MA	Worcester	0.531	0.505	0.062	0.933	0.351	0.989
MA	Bristol	0.555	0.370	0.094	0.802	0.364	1.068

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 Full count census for destination characteristics. Notes: We define return to skill as the difference between the 80th and the 20th occupational income score percentile in the county. French Canadians are defined as those reporting their native language as French and Canada as their birthplace in the 1920 US census. Labor force participation is the share of the relevant group aged 16-65 years that is employed. Sex ratio is the female to male ratio of single individuals aged 16-65 years. Standard deviations in parenthesis.

Table 4: Sorting of migrants, French Canadian single women
Dep var: height in inches

	(1)	(2)	(3)	(4)	(5)
Wage diff (80th-20th women)	0.037	-0.030	-0.020	0.044	-0.019
	(0.030)	(0.034)	(0.033)	(0.029)	(0.031)
Employment (LFP women)	-0.062	0.150**	0.124*	0.318***	0.231**
	(0.044)	(0.051)	(0.052)	(0.051)	(0.052)
Share French Canadian	-0.229***	-0.342***	-0.322***	-0.386***	-0.383***
	(0.013)	(0.007)	(0.007)	(0.013)	(0.013)
Sex ratio (F/M)	0.058**	-0.099**	-0.055*	-0.012	0.000
	(0.021)	(0.022)	(0.023)	(0.020)	(0.020)
Distance		-0.191***	-0.194***	-0.141***	-0.164***
		(0.020)	(0.019)	(0.019)	(0.019)
Distance sq		0.007***	0.007***	0.005***	0.005***
		(0.001)	(0.001)	(0.001)	(0.001)
Contiguous (non-strict) = 1		0.431***	0.377***	0.378***	0.330***
		(0.016)	(0.019)	(0.041)	(0.041)
Migration within Canada = 1			-0.105	-0.079	-0.073
			(0.057)	(0.049)	(0.049)
Personal contact in the US = 1, yes			-0.089***	-0.117***	-0.121***
			(0.013)	(0.004)	(0.004)
Before in the US = 1, yes			-0.340***	-0.357***	-0.369***
			(0.021)	(0.023)	(0.023)
1921 Quota Act = 1			0.356***	0.364***	0.357***
			(0.017)	(0.017)	(0.017)
Infant mortality				0.100	0.106
				(0.102)	(0.102)
Home ownership				-0.300	-0.200
				(0.184)	(0.184)
Share of urban households				-0.427***	-0.410***
				(0.044)	(0.045)
Share of farm households				0.316***	0.345***
				(0.053)	(0.056)
Pop density				-0.814	-0.630
				(0.606)	(0.616)
Avg wage for females				0.114	0.154
				(0.128)	(0.130)
Credit union = 1					0.338***
					(0.013)
Observations	850	806	806	806	806
R-squared	0.175	0.191	0.197	0.204	0.205
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes	Yes
Destination controls	No	No	No	Yes	Yes

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census, Bailey et al. (2018), and Haines and ICPSR (2010) for destination characteristics.
Notes: More employment opportunities attracted taller women with above-average earnings potential. Enclaves received significantly shorter women, speaking to their role in facilitating migration among the unskilled. Wage diff is the difference between the 80th and the 20th occupational income score. LFP is the share of employed working-age population (16-65). French Canadians are identified as working-age individuals that reported French as native language and Canada as birthplace. Sex ratio is the female to male ratio of single individuals aged 16-40 years. Distance measures linear distance from place of residence to destination in 100s of km. Migration within Canada is identified by different birth and residence locations. 1921 Quota Act indicates whether the migration took place after June 3rd 1921. Infant mortality is defined as infant deaths over live births, home ownership is the share of home-owning households, and urban and farm households follow census definitions. Credit Union is an indicator variables for destinations with a *caisse populaire*. Robust standard errors clustered by province of birth in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table 5: Sorting of migrants, French Canadian single men
Dep var: height in inches

	(1)	(2)	(3)	(4)	(5)
Wage diff (80th-20th men)	0.061**	0.083**	0.082**	0.170**	0.141**
	(0.024)	(0.027)	(0.027)	(0.048)	(0.049)
Employment (LFP men)	0.025*	0.008	0.000	0.064***	0.038***
	(0.011)	(0.010)	(0.010)	(0.003)	(0.003)
Share French Canadian	0.045***	0.070***	0.056***	-0.012	0.007
	(0.006)	(0.008)	(0.008)	(0.011)	(0.010)
Sex ratio (F/M)	-0.014***	-0.058***	-0.033***	-0.164***	-0.144***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.005)
Distance		0.089***	0.064***	0.080***	0.082***
		(0.007)	(0.007)	(0.017)	(0.017)
Distance sq		-0.002***	-0.001***	-0.002**	-0.002**
		(0.000)	(0.000)	(0.000)	(0.000)
Contiguous (non-strict) = 1		-0.194***	-0.144***	-0.217***	-0.204***
		(0.016)	(0.013)	(0.017)	(0.017)
Migration within Canada = 1			-0.472***	-0.471***	-0.470***
			(0.019)	(0.017)	(0.017)
Personal contact in the US = 1, yes			-0.422***	-0.399***	-0.406***
			(0.005)	(0.005)	(0.005)
Before in the US = 1, yes			0.024	0.014	0.015
			(0.017)	(0.020)	(0.019)
1921 Quota Act = 1			0.014	0.012	0.005
			(0.019)	(0.019)	(0.018)
Infant mortality				0.294***	0.252***
				(0.018)	(0.018)
Home ownership				-0.060	-0.147
				(0.167)	(0.170)
Share of urban households				0.208***	0.166***
				(0.017)	(0.018)
Share of farm households				0.127	0.219
				(0.180)	(0.182)
Pop density				0.058	-0.031
				(0.233)	(0.234)
Avg wage for males				-0.076	0.026
				(0.045)	(0.042)
Credit union = 1					-0.232***
					(0.015)
Observations	1,440	1,340	1,340	1,340	1,340
R-squared	0.137	0.143	0.153	0.156	0.156
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes	Yes
Destination controls	No	No	No	Yes	Yes

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census, Bailey et al. (2018), and Haines and ICPSR (2010) for destination characteristics.

Notes: Higher absolute returns to skill attracted taller men with above-average earnings potential. Unlike for women the enclave effects are small, suggesting that gender roles may have influenced the access to social capital. Wage diff is the difference between the 80th and the 20th occupational income score. LFP is the share of employed working-age population (16-65). French Canadians are identified as working-age individuals that reported French as native language and Canada as birthplace. Sex ratio is the female to male ratio of single individuals aged 16-40 years. Distance measures linear distance from place of residence to destination in 100s of km. Migration within Canada is identified by different birth and residence locations. 1921 Quota Act indicates whether the migration took place after June 3rd 1921. Infant mortality is defined as infant deaths over live births, home ownership is the share of home-owning households, and urban and farm households follow census definitions. Credit Union is an indicator variables for destinations with a *caisse populaire*. Robust standard errors clustered by province of birth in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table 6: Sorting of migrants, French Canadian married women
Dep var: height in inches

	(1)	(2)	(3)	(4)	(5)
Wage diff (80th-20th women)	-0.047*	0.047	0.002	-0.031	-0.000
	(0.023)	(0.031)	(0.031)	(0.061)	(0.047)
Employment (LFP women)	-0.005	-0.215***	-0.272***	0.002	0.080
	(0.038)	(0.029)	(0.032)	(0.084)	(0.063)
Share French Canadian	-0.180***	-0.065*	-0.079**	0.034	0.044
	(0.021)	(0.031)	(0.030)	(0.035)	(0.031)
Sex ratio (F/M)	-0.020	0.112***	0.128***	0.014	-0.020
	(0.021)	(0.017)	(0.016)	(0.030)	(0.030)
Distance		0.303***	0.273***	0.269***	0.273***
		(0.021)	(0.020)	(0.035)	(0.034)
Distance sq		-0.009***	-0.008***	-0.007***	-0.008***
		(0.001)	(0.001)	(0.001)	(0.001)
Contiguous (non-strict) = 1		0.470***	0.454***	0.468***	0.483***
		(0.043)	(0.039)	(0.025)	(0.029)
Migration within Canada = 1			-0.316***	-0.302***	-0.300***
			(0.012)	(0.019)	(0.019)
Personal contact in the US = 1, yes			-0.325***	-0.255***	-0.267***
			(0.007)	(0.011)	(0.015)
Before in the US = 1, yes			-0.078**	-0.028	-0.028
			(0.027)	(0.025)	(0.025)
1921 Quota Act = 1			-0.082***	-0.080***	-0.084***
			(0.021)	(0.021)	(0.019)
Infant mortality				-0.396***	-0.402***
				(0.018)	(0.020)
Home ownership				-0.302**	-0.346**
				(0.104)	(0.127)
Share of urban households				0.059	0.050
				(0.042)	(0.047)
Share of farm households				0.734***	0.808***
				(0.030)	(0.051)
Pop density				-0.232**	-0.303**
				(0.064)	(0.093)
Avg wage for females				-0.585***	-0.563***
				(0.076)	(0.065)
Avg wage for males				0.906***	0.977***
				(0.078)	(0.102)
Employment (LFP men)				-0.174***	-0.218***
				(0.033)	(0.046)
Credit union = 1					-0.147
					(0.077)
Observations	670	632	632	632	632
R-squared	0.211	0.230	0.235	0.241	0.241
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes	Yes
Destination controls	No	No	No	Yes	Yes

Source: St. Albans Lists Publication No. M1462, US 1920 full count census, Bailey et al. (2018), and Haines and ICPSR (2010).

Notes: The results for married female migrants show a significant attenuation of the effects associated with the variables of interest, suggesting that women had little agency in the destination choice of tied migrants. Wage diff is the difference between the 80th and the 20th occupational income score. LFP is the share of employed working-age population (16-65). French Canadians are identified as working-age individuals that reported French as native language and Canada as birthplace. Sex ratio is the female to male ratio of single individuals aged 16-40 years. Distance measures linear distance from place of residence to destination in 100s of km. Migration within Canada is identified by different birth and residence locations. 1921 Quota Act indicates whether the migration took place after June 3rd 1921. Infant mortality is defined as infant deaths over live births, home ownership is the share of home-owning households, and urban and farm households follow census definitions. Credit Union is an indicator variables for destinations with a *caisse populaire*. Robust standard errors clustered by province of birth in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table 7: Sorting of migrants, French Canadian married men
Dep var: height in inches

	(1)	(2)	(3)	(4)	(5)
Wage diff (80th-20th men)	0.046***	0.113***	0.103***	0.093***	0.113***
	(0.004)	(0.002)	(0.002)	(0.006)	(0.007)
Employment (LFP men)	0.062***	-0.039***	-0.039***	0.116***	0.163***
	(0.008)	(0.004)	(0.005)	(0.005)	(0.012)
Share French Canadian	-0.030***	0.004	0.007	0.015	0.001
	(0.008)	(0.010)	(0.010)	(0.015)	(0.013)
Sex ratio (F/M)	-0.133***	-0.179***	-0.184***	0.153**	0.163**
	(0.009)	(0.010)	(0.013)	(0.050)	(0.053)
Distance		0.047***	0.046***	0.113***	0.122***
		(0.006)	(0.010)	(0.017)	(0.017)
Distance sq		-0.002***	-0.002***	-0.004***	-0.004***
		(0.000)	(0.000)	(0.001)	(0.001)
Contiguous (non-strict) = 1		-0.598***	-0.627***	-0.739***	-0.777***
		(0.020)	(0.015)	(0.019)	(0.024)
Migration within Canada = 1			0.138***	0.152***	0.157***
			(0.018)	(0.016)	(0.015)
Personal contact in the US = 1, yes			0.136***	0.177***	0.196***
			(0.030)	(0.020)	(0.018)
Before in the US = 1, yes			-0.280***	-0.302***	-0.298***
			(0.045)	(0.046)	(0.046)
1921 Quota Act = 1			-0.414***	-0.396***	-0.396***
			(0.025)	(0.027)	(0.025)
Infant mortality				-0.135***	-0.106***
				(0.028)	(0.023)
Home ownership				-0.053	0.008
				(0.032)	(0.041)
Share of urban households				-0.014	0.001
				(0.055)	(0.056)
Share of farm households				-0.622***	-0.720***
				(0.098)	(0.108)
Pop density				0.293***	0.351***
				(0.041)	(0.048)
Avg wage for males				-0.905***	-1.081***
				(0.090)	(0.098)
Avg wage for females				0.101	0.149
				(0.077)	(0.078)
Employment (LFP women)				-0.493***	-0.537***
				(0.045)	(0.051)
Credit union = 1					0.221***
					(0.037)
Observations	1,095	1,021	1,021	1,021	1,021
R-squared	0.176	0.187	0.194	0.199	0.200
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes	Yes
Destination controls	No	No	No	Yes	Yes

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census, Bailey et al. (2018), and Haines and ICPSR (2010) for destination characteristics.

Notes: The results show that married male migrants sorted similarly to their single counterparts. Wage diff is the difference between the 80th and the 20th occupational income score. LFP is the share of employed working-age population (16-65). French Canadians are identified as working-age individuals that reported French as native language and Canada as birthplace. Sex ratio is the female to male ratio of single individuals aged 16-40 years. Distance measures linear distance from place of residence to destination in 100s of km. Migration within Canada is identified by different birth and residence locations. 1921 Quota Act indicates whether the migration took place after June 3rd 1921. Infant mortality is defined as infant deaths over live births, home ownership is the share of home-owning households, and urban and farm households follow census definitions. Credit Union is an indicator variables for destinations with a *caisse populaire*. Robust standard errors clustered by province of birth in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Online Appendix

Table A.1: Summary Statistics, Full Immigrant Sample

	All Canadians		French Canadians		British Canadians	
	Men	*Women*	*Men*	*Women*	*Men*	*Women*
Panel A: Immigrants						
Age (years)	30.6	30.7	30.1	30.3	33.1	32.6
Literate (%)	94.7	96.2	94.1	95.8	98.1	98.1
Money (median, US dollars)	50	30	50	30	50	30
Occupation (%)						
professional	7.3	9.3	5.1	6.6	18.9	21.5
skilled	14.7	2.8	14.2	3.0	17.4	1.8
lower skilled	28.5	22.8	29.8	23.6	22.0	19.0
unskilled	28.3	2.2	30.2	2.4	18.1	1.1
farmers	12.7	0.2	12.9	0.2	11.9	0.5
none	8.5	62.7	7.8	64.1	11.7	56.1
Marital status (%)						
single	51.1	45.5	51.7	44.6	47.5	49.7
married	41.9	44.0	41.5	44.9	44.2	40.1
other	7.0	10.5	6.8	10.5	8.3	10.2
Networked (%)	88.6	87.0	88.7	87.1	88.1	86.5
US before (%)	63.6	59.8	62.1	59.0	69.0	63.2
Internal migration (%)	52.7	56.2	50.1	54.3	66.2	64.8
Distance (100s of km)	3.5	3.7	3.2	3.4	5.1	5.0
Height (in) by age cohort						
Average (full sample)	67.0	63.7	66.9	63.6	67.8	64.4
30-34	67.8	63.3	67.3	63.7	70.0	62.0
35-44	67.6	63.3	67.4	63.0	68.8	65.1
45-54	66.5	63.3	66.4	63.2	67.6	63.9
55-64	67.1	63.8	67.0	63.7	67.7	64.3
Observations	3,739	2,401	3,135	1,964	604	437
Sample share (%)	60.9	39.1	61.5	38.5	58.0	42.0
Panel B: Residents						
Canadian Bulletin of Nutrition						
Height (in) by age cohort						
30-34	68.0	62.8	65.7	61.6	68.4	63.2
35-44	67.5	62.4	65.3	61.8	67.9	62.7
45-54	66.9	61.8	65.5	61.2	67.2	62.1
55-64	66.0	61.3	64.6	60.5	66.4	61.6

Source: St. Albans Lists. Publication number M1462 and Canadian Bulletin of Nutrition (Pett and Ogilvie, 1957).
Notes: British and French migrants have a similar profile in terms of age, access to migrant networks, literacy, marital status, immigration experience, and money at hand. However, relevant measures of selection such as height and occupation class reveal important differences across ethnic groups. The statistics in Panel A are estimated for a sample of 6,140 observations, where we drop observations without complete information on height, age, and ethnicity. Individuals that had not passed their pubertal growth spurt and those identified as return migrants are also excluded. Distance estimates are for a smaller subsample of observations (4,931) reporting complete geographic information (origin and destination).

Table A.2: Summary Statistics, Top 10 Destination Choices for Men and Women

State	County	French Canadians / Residents (16-65)	Employed / Labor Force	Females / Males	Return to skill
Panel A: Women					
Average County		0.052	0.290	1.007	0.783
		(0.049)	(0.077)	(0.087)	(0.370)
ME	Androscoggin	0.192	0.404	1.091	0.334
ME	York	0.148	0.353	0.970	0.495
NH	Coos	0.181	0.197	0.814	1.170
MA	Hampden	0.066	0.382	1.046	0.511
VT	Franklin	0.101	0.203	1.019	1.447
NH	Hillsborough	0.181	0.442	1.086	0.322
RI	Providence	0.070	0.391	1.072	0.501
MA	Essex	0.049	0.400	1.037	0.539
ME	Cumberland	0.032	0.293	1.064	0.860
MA	Bristol	0.094	0.364	1.084	0.370
Panel B: Men					
Average County		0.045	0.922	1.000	0.713
		(0.048)	(0.048)	(0.082)	(0.154)
NH	Coos	0.181	0.934	0.814	0.583
ME	Androscoggin	0.192	0.930	1.091	0.640
ME	York	0.148	0.942	0.970	0.819
MA	Hampden	0.066	0.936	1.046	0.636
VT	Franklin	0.101	0.903	1.019	1.046
RI	Providence	0.070	0.946	1.072	0.555
NH	Hillsborough	0.181	0.941	1.086	0.627
VT	Essex	0.049	0.946	0.877	0.884
MA	Worcester	0.062	0.933	0.991	0.531
MA	Essex	0.120	0.935	1.037	0.567

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census for destination characteristics.
Notes: We define return to skill as the difference between the 80th and the 20th occupational income score percentile in the county. French Canadians are defined as those reporting their native language as French and Canada as their birthplace in the 1920 US census. Labor force participation is the share of the relevant group aged 16-65 years that is employed. Sex ratio is the female to male ratio of single individuals aged 16-65 years. Standard deviations in parenthesis.

Table A.3: Sorting of migrants, Single Women
Dep var: height in inches

	(1)	(2)	(3)	(4)
Wage diff (80th-20th women)	0.082	0.069	0.069	0.076
	(0.068)	(0.058)	(0.064)	(0.087)
Employment (LFP women)	0.134	0.300*	0.264**	0.499***
	(0.147)	(0.128)	(0.106)	(0.094)
Share Foreign Born	-0.209***	-0.216***	-0.212***	0.250
	(0.022)	(0.042)	(0.048)	(0.159)
Sex ratio (F/M)	-0.003	-0.111	-0.071	-0.028
	(0.064)	(0.066)	(0.057)	(0.053)
Observations	1,020	965	965	965
R-squared	0.251	0.266	0.273	0.284
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes
Destination controls	No	No	No	Yes

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census for destination characteristics. Notes: Wage diff is the difference between the 80th and the 20th occupational income score percentile, and LFP is the employed share of the working-aged population (16-65). The share of foreign born applies to the full population, and the sex ratio is the female to male ratio of single individuals aged 16-40 years. All variables are standardized. Robust standard errors in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table A.4: Sorting of migrants, Single Men
Dep var: height in inches

	(1)	(2)	(3)	(4)
Wage diff (80th-20th men)	0.056	0.075	0.079	0.144**
	(0.054)	(0.050)	(0.050)	(0.049)
Employment (LFP men)	0.040***	0.027***	0.018	0.066*
	(0.007)	(0.007)	(0.011)	(0.032)
Share Foreign Born	0.035	0.032	0.039	-0.122
	(0.044)	(0.058)	(0.064)	(0.127)
Sex ratio (F/M)	-0.011**	-0.051***	-0.027**	-0.206**
	(0.003)	(0.009)	(0.011)	(0.068)
Observations	1,619	1,515	1,515	1,515
R-squared	0.228	0.238	0.246	0.249
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes
Destination controls	No	No	No	Yes

Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 full count census for destination characteristics. Notes: Wage diff is the difference between the 80th and the 20th occupational income score percentile, and LFP is the employed share of the working-aged population (16-65). The share of foreign born applies to the full population, and the sex ratio is the female to male ratio of single individuals aged 16-40 years. All variables are standardized. Robust standard errors in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table A.5: Sorting of Migrants, Married Women
Dep var: height in inches

	(1)	(2)	(3)	(4)
Wage diff (80th-20th women)	-0.049*	0.142***	0.072*	0.111
	(0.022)	(0.033)	(0.031)	(0.067)
Employment (LFP women)	-0.060	-0.067	-0.121**	0.208*
	(0.045)	(0.043)	(0.033)	(0.093)
Share Foreign Born	-0.029**	-0.282***	-0.290***	-0.695***
	(0.011)	(0.024)	(0.020)	(0.010)
Sex ratio (F/M)	0.016	0.065**	0.059**	-0.285***
	(0.026)	(0.019)	(0.019)	(0.032)
Observations	763	724	724	724
R-squared	0.291	0.315	0.324	0.345
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes
Destination controls	No	No	No	Yes

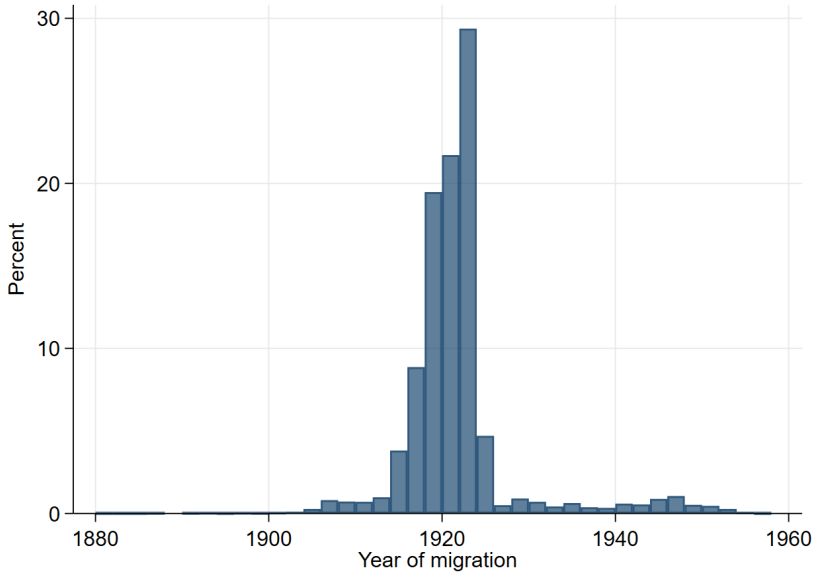
Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 Full count census for destination characteristics. Notes: Wage diff is the difference between the 80th and the 20th occupational income score percentile, and LFP is the employed share of the working-aged population (16-65). The share of foreign born applies to the full population, and the sex ratio is the female to male ratio of single individuals aged 16-40 years. All variables are standardized. Robust standard errors in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Table A.6: Sorting of Migrants, Married Men
Dep var: height in inches

	(1)	(2)	(3)	(4)
VARIABLES				
Wage diff (80th-20th men)	0.092***	0.164***	0.143***	0.073***
	(0.014)	(0.015)	(0.016)	(0.007)
Employment (LFP men)	0.053***	-0.042***	-0.045***	0.167***
	(0.006)	(0.009)	(0.009)	(0.011)
Share Foreign Born	0.074***	0.090***	0.051**	0.106**
	(0.014)	(0.019)	(0.017)	(0.043)
Sex ratio (F/M)	-0.137***	-0.172***	-0.181***	0.307***
	(0.012)	(0.013)	(0.017)	(0.080)
Observations	1,236	1,158	1,158	1,158
R-squared	0.265	0.280	0.287	0.298
Birth-year & Birth-district FE	Yes	Yes	Yes	Yes
Migration costs	No	Yes	Yes	Yes
Migration controls	No	No	Yes	Yes
Destination controls	No	No	No	Yes

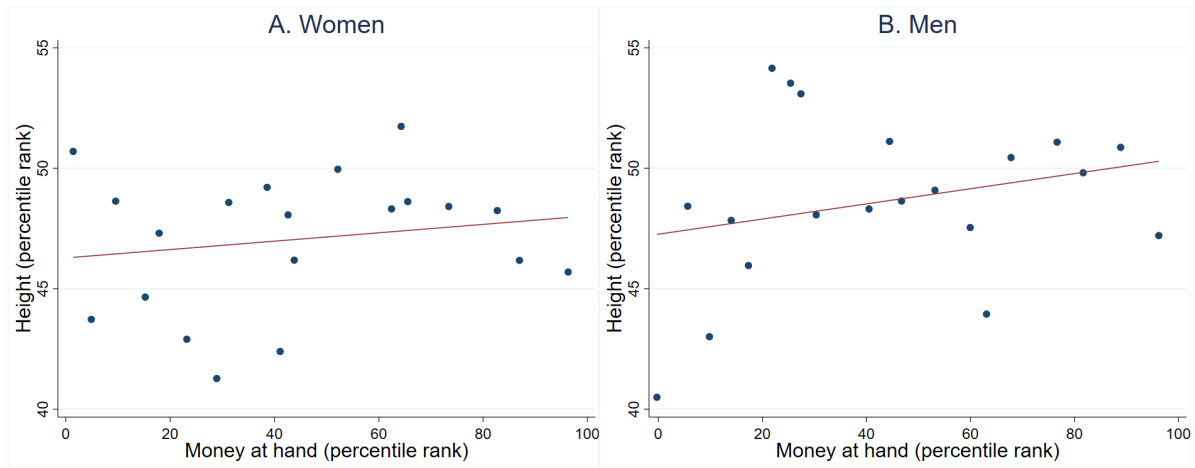
Source: St. Albans Lists Publication No. M1462 for migrants. US 1920 Full count census for destination characteristics. Notes: Wage diff is the difference between the 80th and the 20th occupational income score percentile, and LFP is the employed share of the working-aged population (16-65). The share of foreign born applies to the full population, and the sex ratio is the female to male ratio of single individuals aged 16-40 years. All variables are standardized. Robust standard errors in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level.

Figure A.1: Distribution of Border Crossings by Birth Cohort



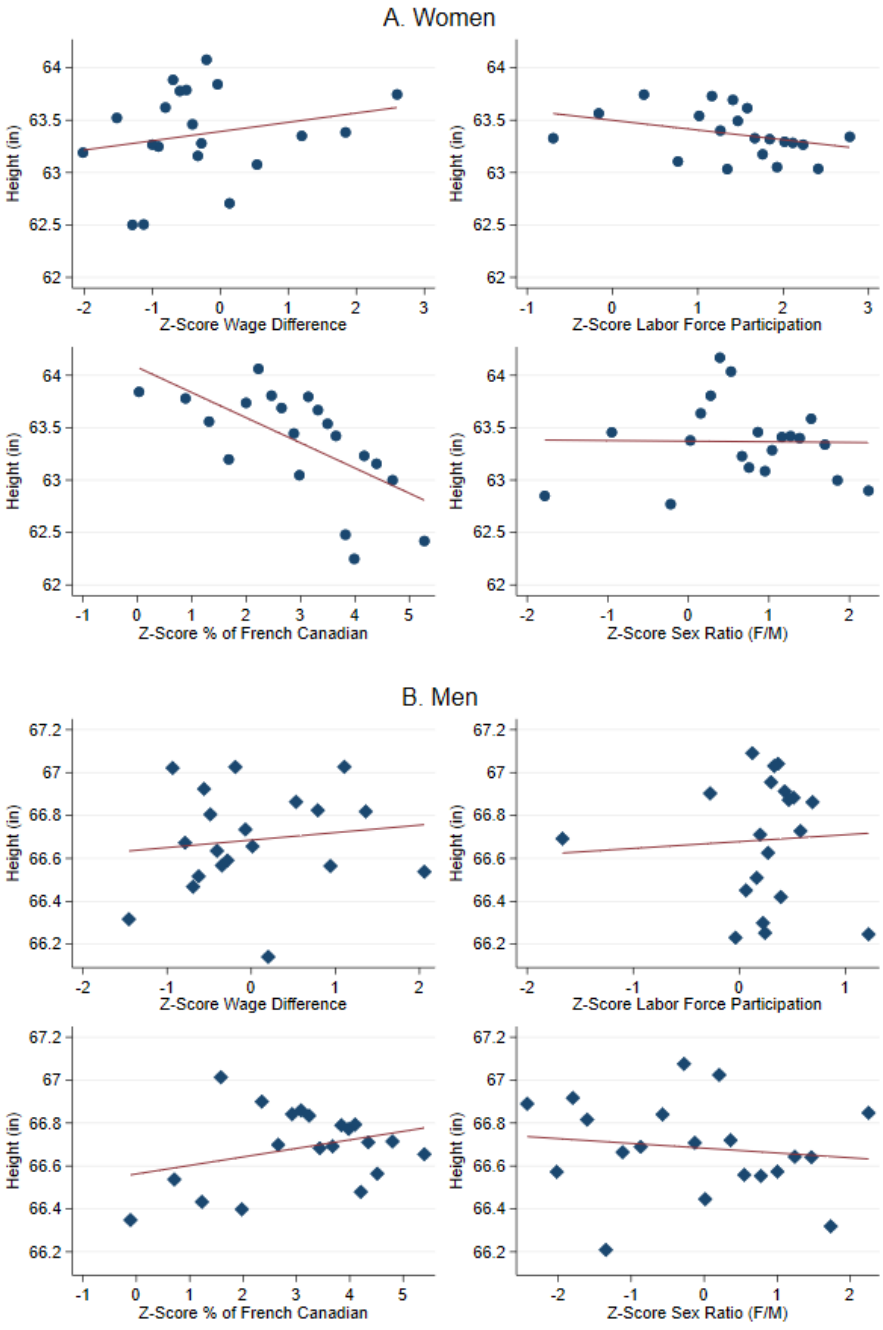
Source: St. Albans Lists. Publication number M1462.
Notes: Most border crossings in our sample concentrate around 1920.

Figure A.2: Height and Money at Hand. French-Canadian Migrants.



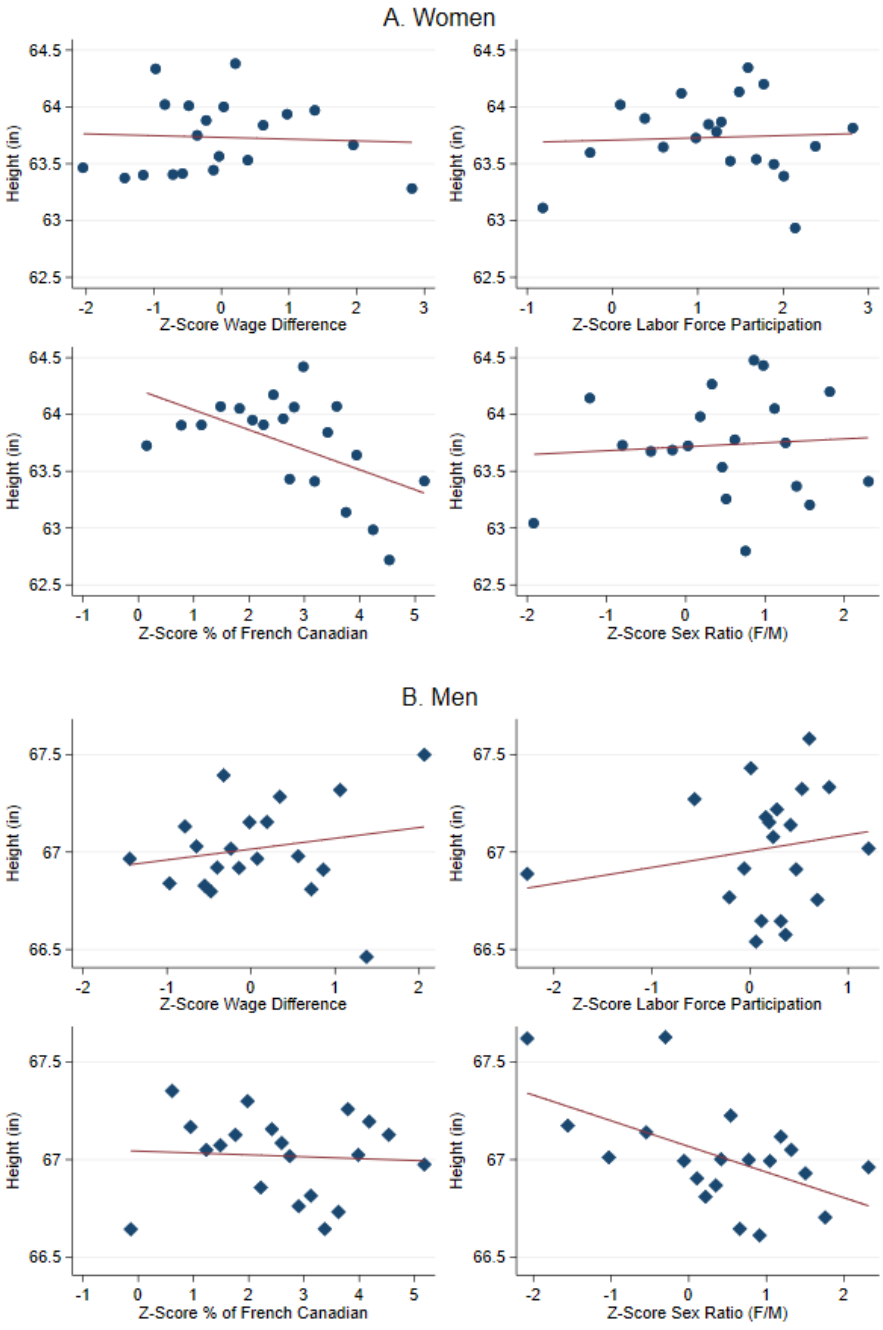
Source: St. Albans Lists. Publication number M1462.
Notes: Binned scatter plots of percentile ranks. The regressions include year-of-birth and district-of-birth fixed effects.

Figure A.3: Height and Destination Characteristics, Single French-Canadian Migrants



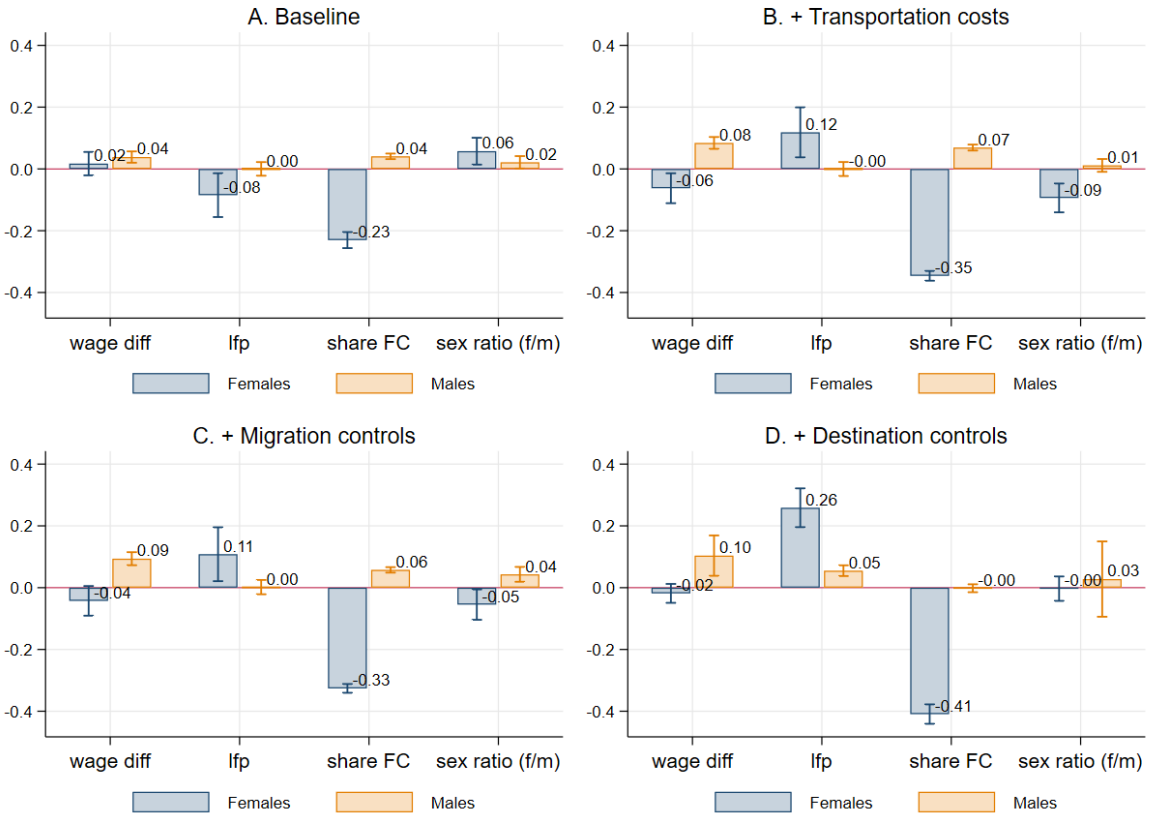
Source: St. Albans Lists. Publication number M1462.
Notes: We estimate binned scatter plots including year-of-birth and district-of-birth fixed effects.

Figure A.4: Height and Destination Characteristics, Married French-Canadian Migrants.



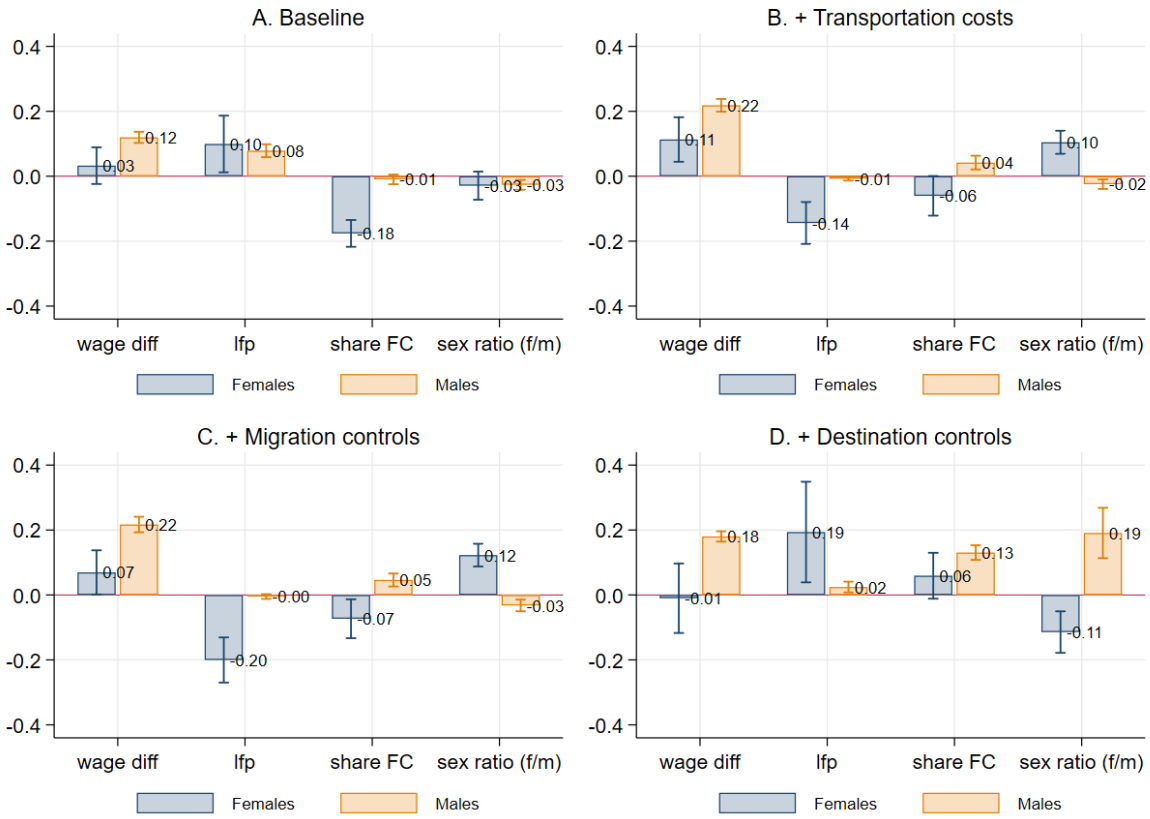
Source: St. Albans Lists. Publication number M1462.
Notes: We estimate binned scatter plots including year-of-birth and district-of-birth fixed effects.

Figure A.5: Sorting of Migrants by Height, Single French Canadians (1910 and 1920)



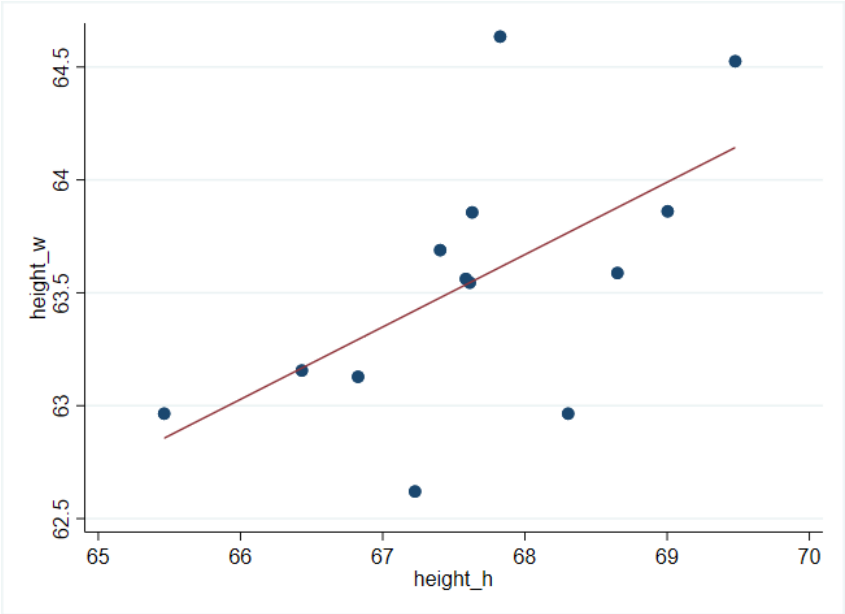
Source: St. Albans Lists. Publication number M1462.
Notes: The table shows regression results for single French-Canadian migrants using destination characteristics estimated from the 1910 and 1920 US Census.

Figure A.6: Sorting of Migrants by Height. Married French Canadians (1910 and 1920)



Source: St. Albans Lists. Publication number M1462.
Notes: The table shows regression results for married French-Canadian migrants using destination characteristics estimated from the 1910 and 1920 US Census.

Figure A.7: Assortative Matching in Marriage



Source: St. Albans Lists. Publication number M1462.
Notes: The figure illustrates the relationship between the height of spouses. We estimate the binned scatter plot including year-of-birth and district-of-birth fixed effects.