Migrant Self-Selection and Random Shocks: Evidence from the Panic of 1907

David Escamilla-Guerrero*
University of St Andrews

Moramay Lopez-Alonso†
Rice University

August 12, 2022

Abstract

We study the impact of the 1907 Panic, the most severe economic crisis before the Great Depression, on the selection of Mexican immigration. We find that migrants were positively selected on height before the crisis. This pattern changed to negative selection during the crisis but returned to positive selection afterward. Adjustments in selection were partially mediated by the *enganche*, a historical labor-recruiting system that reduced migration costs but only for taller laborers with above-average earnings potential. We document that labor recruiting contributed to maintaining the relatively constant height profile of the migration flow in the short run.

Keywords: labor recruiting, migrant self-selection, Panic of 1907, Mexico
JEL Classification Numbers: F22, J61, N36, O15

Note: This paper is a revised version of chapter 4 of Escamilla-Guerrero's doctoral dissertation. A previous version of this paper was circulated under the title "Migrant self-selection in the presence of random shocks. Evidence from the Panic of 1907."
Acknowledgments: Escamilla-Guerrero is especially grateful to his PhD supervisors Eric Schneider and Joan Rosés for their guidance and comments. We thank Eric Hilt (the editor) and three anonymous referees for their detailed comments that greatly improved this article. We also thank Fernando Pérez, León Fernández, Miguel Niño-Zarazúa, Noam Yuchtman, Chris Minns, Leah Boustan, Tim Hatton, Lorenzo Neri, and David Jaeger for their insightful comments. We benefited from presenting at the Economic History Society, Economic History Association, Cliometric Society, and IZA Migration annual meetings. This research was developed with the financial support of the Radwan Travel and Discovery Fund (2016) - LSE; the Pre-Dissertation Exploratory Grant (2017) - Economic History Association; and the Research Fund for Graduate Students (2017) - Economic History Society.

*School of Economics and Finance, University of St Andrews, St Andrews, Scotland, UK. Corresponding author. e-mail: david.escamilla-guerrero@st-andrews.ac.uk
†Department of History, Rice University, Houston, TX, USA. e-mail: moramay@rice.edu

INTRODUCTION

In the early twentieth century, Mexican immigration to the United States transformed from a small flow into a mass movement that continues to today (Durand et al., 2001; Feliciano, 2001; Gratton & Gutmann, 2000).[1] The migrants who left Mexico during this period were different from earlier cohorts. They turned away from traditional zones of settlement and increasingly began to work in activities other than agriculture (Cardoso, 1980; Gratton & Merchant, 2015; Innis-Jiménez, 2013). Previous literature has shown that stagnant living standards in Mexico as well as more and better employment opportunities across the American Southwest were the main incentives to migrate. Growing migrant networks and the recruiting of intending migrants by American employers reduced migration costs, making migration to the United States even more profitable (Brass, 1990; Durand, 2016; Henderson, 2011). Unlike previous periods, however, a number of shocks including armed conflicts, severe economic downturns, and sharp changes in immigration policy may have also influenced who crossed the border during the early twentieth century (Escamilla-Guerrero et al., 2021). This paper examines how the Mexico-US migration flow changed in response to the Panic of 1907—the most severe financial crisis before the Great Depression. In particular, we leverage this major demand shock to identify changes in migrant selection and study the role of labor recruiting in shaping the composition of the flow.

The 1907 Panic unfolded quickly and unexpectedly in the second half of the year. During these months two thousand companies and more than one hundred banks failed (Markham, 2002, p. 31). Many financial institutions across the United States also limited or suspended their cash payments, pushing companies in all economic sectors to curtail operations (Andrew, 1908). In the aftermath of the crisis real GNP and industrial production declined 6.7 and 30 percent, respectively (Hansen, 2014; Odell & Weidenmier, 2004). How migrant selection adjusts to large-scale shocks such as the Panic of 1907 depends on whether the incentives and means to migrate are significantly affected. The few studies addressing the impact of economic crises on Mexican immigration provide mixed results, with selection on education changing after the Great Recession (Villarreal, 2014) but being not affected by the Peso Crisis of 1995 (Monras, 2020). Unlike contemporary settings, the early twentieth century provides a unique opportunity to assess the impact of random shocks on migrant selection, as the United States maintained an open border for Mexican immigration (Durand, 2016; Fogel, 1978; Samora, 1982). The absence of entry restrictions not only allows for immigration to adjust to shocks in the short run, but also minimizes the under-enumeration

[1] Mexico-to-US migration is considered one of the largest population transfers of the twentieth century. About 9 percent (10.2 million) of Mexico's population had migrated to the United States by 2003, comprising 28.3 percent of the foreign-born population in the United States (Borjas, 2007, p. 1).

of undocumented migrants, a factor that can bias selection estimates (Fernandez-Huertas, 2011; Ibarraran & Lubotsky, 2007).

We use anthropometric evidence on height (physical stature) to assess migrant selection in the absence of wage data and occupation rankings. Height has been used extensively to study selection into migration in diverse historical contexts (Humphries & Leunig, 2009; Juif & Quiroga, 2019; Kosack & Ward, 2014; Spitzer & Zimran, 2018; Stolz & Baten, 2012), as it is positively correlated with human capital and earnings potential (Borrescio-Higa et al., 2019; Komlos & Baten, 2004; Komlos & Meermann, 2007; Schultz, 2002).[2] A major advantage of using height as measure of selection is that for adults height cannot be manipulated in anticipation of or in response to migration. We obtain data on height for Mexican migrants from individual records of border crossings from 1906 to 1908. These documents capture migrant arrivals at nine entrance ports located along the Mexico-US border.[3] To determine the selection of Mexican immigration, we estimate differences in height between migrants and three samples of residents. The height data for Mexican residents come from military recruitment records of ordinary soldiers and elite forces, and from passport application records. These comparison samples capture the lower, intermediate, and upper ranks of Mexico's height distribution, respectively. In this sense, the estimated height differentials allow us to infer from which part of the height distribution the migrants were drawn. In our baseline specification, we control for the individual's birth cohort (year of birth) and birth region, as these factors may influence height over time and across space.

We find that migrants were 2.3 cm taller than the ordinary soldiers, 0.6 cm taller than the military elite forces, and 2.7 cm shorter than the passport holders. This implies that Mexican immigration was characterized by an intermediate or positive selection, as relatively tall, physically productive individuals with higher earnings potential moved to the United States. Our estimates hold when controlling for occupational skill class, suggesting that Mexico sent its "best" unskilled, skilled, and professional workers. In addition, the degree of selection varied across source regions, with migrants from the central plateau—who faced the lowest wages in Mexico and had to travel about 580 km to the border—being more positively selected than their peers from the North—who migrated from locations less than 200 km away from the border. This finding is consistent with predictions of the Chiquiar & Hanson (2005) model, where the poor and unskilled are disproportionately priced out from migration due to high bureaucratic, information, and transportation costs that are likely to decrease with human capital. Our results showing that Mexican migrants were mostly drawn from the intermediate/upper ranks of the height (earnings)

[2] See Spitzer & Zimran (2018, p. 228) for a review on cliometric literature using height to estimate migrant selection.
[3] See Escamilla-Guerrero (2020) for a full description and analysis of these records.

distribution are also consistent with documented selection patterns for the period (Kosack & Ward, 2014) and contemporary settings (Mishra, 2007; Orrenius & Zavodny, 2005).

To examine the impact of the Panic of 1907 on migrant selection, we classify migrants into three groups (time periods) depending on when they crossed the border: before, during, or after the crisis. Our empirical approach estimates selection patterns in each period conditional on the aforementioned control variables, each interacted with a full set of time-period dummies. This allows the effect of each factor to vary arbitrarily across periods. We find that migrants were positively selected on height (0.7 cm taller) relative to the military elite before the Panic of 1907. This pattern changed dramatically during the Panic, with migrants being negatively selected (0.9 cm shorter). We also observe selection patterns returning to pre-Panic levels once the US financial system was restored, suggesting that the crisis did not have a permanent effect on migrant selection. Our estimates are robust to several sensitivity checks, which include controlling for seasonal migration and allowing the effect of each control variable to vary flexibly across birth cohorts.

To explain how selection patterns adjusted to the crisis, we focus on factors affecting the costs of migration. In the early twentieth century, stagnant wages and binding liquidity constraints resulted in high migration costs for the majority of the Mexican population (Cardoso, 1980; Rosenzweig, 1965). This condition favored the operation of a labor recruiting system: the *enganche* (Brass, 1990; Durand, 2016). The *enganche* reduced migration costs by offering wages in advance and transportation to the destination in exchange of future labor service. We provide evidence suggesting that the *enganche* shaped the composition of Mexican immigration, as American recruiters systematically chose the tallest workers—that is, the *enganche* system was characterized by a positive selection in recruiting. On average, *enganche* migrants were 0.7 cm taller than migrants who crossed the border using other means. In the pre-Panic period, the *enganche* effect accounted for about 41 percent of the difference in height between migrants and the military elite. When the Panic of 1907 hit the financial system, American companies faced liquidity constraints and were not able to finance the *enganche*; therefore, the share of recruited migrant workers dropped from 36 to 1 percent. This variation in the share of recruited migrants allows us to infer that had the scale and degree of assortative recruiting continued during the crisis, the height difference between migrants and the military elite would have been about -0.2 cm only.

We also find significant changes in the height profile of recruited and non-recruited migrants in the aftermath of the crisis. The evidence suggests that recruiting patterns changed, with post-Panic, recruited migrants being on average 2.1 cm shorter than their pre-Panic peers. This effect, however, was counterbalanced by the change in the degree of positive selection of non-recruited migrants, who were about 1 cm taller than their pre-Panic counterparts. The combination of these opposing effects led to a positive selection similar, in terms of degree, to that observed in the pre-Panic period. This finding provides suggestive evidence that the *enganche* was a mechanism that maintained the height profile (skill mix) of Mexican immigration relatively constant in the short run. As part of the analysis, we show that the shift in recruiting patterns was not driven by the recruiting of seasonal migrants nor by regional droughts in Mexico that could have induced changes in the composition of recruited and non-recruited immigration.

One caveat to our results is that labor recruiting only partially explains the adjustments in migrant selection. This implies that unobserved factors influenced the above-mentioned shifts in selection. For example, previous literature shows that earnings inequality can change dramatically during and after large-scale shocks such as wars, public health emergencies, social conflicts, or financial crises (see Acemoglu et al., 2004; Adams-Prassl et al., 2020; Alvaredo et al., 2018; Piketty & Saez, 2003). If during the Panic of 1907 the US wage dispersion was substantially compressed, the relatively short and poor individuals from Mexico would have had the most to gain from migrating. This would explain the shift toward a negative selection during the crisis. However, this hypothesis is difficult to test without detailed wage data from both the United States and Mexico.

This paper adds to our knowledge about the selection of Mexico-to-US immigration in the early twentieth century. In particular, our study complements the work of Kosack & Ward (2014), who estimate the selection of Mexican migrants in 1920—that is, at the end of the Mexican Revolution. Our results pertain to selection patterns before this conflict during which about 350,000 people fled Mexico (McCaa, 2003). While both papers find positive selection on height relative to a similar sample of ordinary soldiers, we find that migrants were on average 2.1 cm taller. This height gap is half of that documented in Kosack & Ward (2014), suggesting that the Mexican Revolution may have increased the degree of positive selection. Note that our immigration data cover more entrance ports (9 versus 4) and thus may capture a higher variation in the composition of migrant flows.

Our main contribution is to provide an example of how selection patterns of Mexican immigration adjusted to random shocks in the later part of the Age of Mass Migration (1850-1920). We find that Mexican immigration was very responsive to changes in the business conditions, with selection on height adjusting in a matter of months. Adjustments during and after the shock were partially mediated by the recruiting of migrant workers. In this sense, we also contribute to our understanding about the role of labor recruiting in shaping the composition of migrant flows. In the past and present, labor recruiting has influenced the decision to migrate, especially in contexts where social networks are not yet established (Abella, 2004; Eelens & Speckmann, 1990). Similar to the Mexican case, during the Age of Mass Migration, Brazilian landowners recruited intending Italian migrants, who were offered subsidized passages to Brazilian coffee plantations (Sánchez-Alonso, 2019; Stolz et al., 2013). Hence, formal and informal recruiting systems can help us to understand who migrates in the early stages of international migration and reconcile empirical evidence that appears to be at odds with predictions from classic migrant selection models.[4]

HISTORICAL BACKGROUND

The United States became the world's leading manufacturing nation at the turn of the twentieth century (Maddison, 1987; Nelson & Wright, 1992; Wright, 1990). The rapid growth of the American economy increased employment opportunities, pulling millions of migrants from all over the world looking for better living conditions.[5] Mexicans were no exception. From 1900, Mexican immigration increased sharply and expanded its geographic range of settlement in the United States (Cardoso, 1980; Feliciano, 2001; Gratton & Merchant, 2015).[6] Diverse factors shaped Mexican mass migration during this period, but labor recruiting practices and the lack of restrictive immigration policies were key. American companies and contractors recruited intending migrants in Mexican towns offering wages in advance and transportation in exchange of future labor service (Brass, 1990; Durand, 2016). Once at the border, migrant workers were admitted without restrictions since they were considered temporary aliens who moved back and forth supplying labor (Fogel, 1978; Gamio, 1930; Samora, 1982). Mexican migrants were employed mainly in farms, mines, and railways across the American Southwest.

The American economic ascendancy also multiplied investment opportunities. National and state banks increased their bond and stock assets from 50 million in 1892 to 487 million in 1907 (Johnson, 1908, p. 457). Moreover, the optimism engendered by the growing economy fueled the tendency of the public to take on more risk and invest in speculative industries. The Dow Jones index doubled from 1904 to 1906, and by the end of 1905, the call money rate was 25 percent and foreseen to increase further the following year (Markham, 2002, p. 29). The appetite for investment was funneled by a financial

[4] See Abramitzky & Boustan (2017) for a review on empirical evidence that appears to be inconsistent with predictions from the classic Borjas-Roy model.

[5] After 1900, European intercontinental emigration rose to over a million per year, with the United States absorbing most of these migrants (Hatton & Williamson, 1998, p. 7-9).

[6] The Mexican-born population enumerated in the US census increased five-fold from 1900 to 1920.

system that was expanding rapidly. About 16 thousand financial institutions supplied capital for the creation of new firms in every sector of the US economy (Bruner & Carr, 2007, p. 116).[7] However, these institutions were mostly financial intermediaries (small unit banks, fiduciary trust companies, and clearing houses) that operated without effective financial regulation. While the access to capital was relatively unconstrained, the absence of a central bank and the growing speculative environment made the US financial system fragile.

The Panic of 1907

In April 1906, an earthquake devastated the city of San Francisco causing damages equal to 10.5 billion in current US dollars (Ager et al., 2020). Since most of the city's insurance policies were underwritten by British companies, extraordinarily large amounts of gold flowed from London to the United States. In response, the Bank of England undertook defensive measures to sharply reduce the outflows of gold and attract gold imports (Odell & Weidenmier, 2004, p. 1003). This policy added pressure to the fragile American financial markets, setting the stage for one of the most severe financial crises in American history: the Panic of 1907 (Frydman et al., 2015; Moen & Tallman, 1992; Andrew, 1908).

In March 1907, a scramble for liquidity produced a sell-off of securities. The repatriation of finance bills reduced substantially the US gold stock, pushing the economy into a recession (Odell & Weidenmier, 2004, p. 1021). Stock prices fell and the financial system gradually faced greater pressure.[8] Finally, the Knickerbrocker Trust Company—the third largest trust company in New York—suspended suddenly in October. This event triggered a full-blown panic. The suspension of payments by banks spread nationally, constraining transactions in all sectors and pushing companies to curtail operations. Full convertibility of deposits was not restored until January 1908 (Frydman et al., 2015, p. 912; Johnson, 1908, p. 454).

It is unclear which industries were hit the hardest by the crisis, but based on the plunge in share price, companies in the auto, metals (copper and iron), mining, and railway industries may have experienced the greatest losses (see Figure 1 in Bruner & Carr (2007)). The agricultural sector was similarly affected, with the number of farms that went bankrupt increasing 26 percent in 1907 (US Bureau of the Census, 1949, p. 111). In this sense, the crisis impacted the main sources of employment for Mexican migrants, but its effect on the labor market may have been larger in the industrial sector.

[7] To dimension the size of the US financial system at the time, in 2007 existed 7,500 financial institutions.

[8] This phenomenon was recorded by the American press throughout 1907. For instance: "New York. Aug. 12 – The wildest break in the stock market since the present wave of selling occurred today. It carried stocks down from 1 to 17.5 points. In some cases to new low records. About one-half of the entire number of issues dealt on the exchange rate were sold at new low prices for the year." (The Washington Post, 1907).

We leverage two features of the Panic of 1907 to study how selection patterns of Mexican migrants adjusted during and after the crisis. First, previous literature shows that the 1906 San Francisco earthquake triggered the chain of events that culminated in the Panic of 1907 (Bruner & Carr, 2007; Odell & Weidenmier, 2004). Hence, the random nature of the crisis minimizes the likelihood of anticipation effects that can distort the response of migrant selection to changes in the business conditions.[9] Second, although the Panic of 1907 became a world-wide affair (Johnson, 1908; Noyes, 1909), no bank collapsed or went bankrupt, nor losses for bill holders or depositors occurred in Mexico (Gómez, 2011, p. 2095). It is documented that the structure of the Mexican financial system prevented contagion and guaranteed the national solvency abroad (The Wall Street Journal, 1910). Moreover, unlike the United States, the Mexican economy and manufactures production expanded in 1907, and there is no evidence that bankrupt companies or unemployment increased.[10] The crisis, however, depressed trade with the United States and may have induced a transient recession in 1908, which was quickly overcome in 1909 (see Figure A.2 in the Appendix). This allows us to consider fixed the business conditions in Mexico during the period and discard the presence of simultaneous adjustments from the demand and supply side induced by the crisis.

In addition, in the early twentieth century, Mexican migrants did not face legal barriers to entering the United States.[11] Immigration restrictions can hinder migrant selection adjustments, as they are implemented to control the scale and composition of immigration (Abramitzky & Boustan, 2017, p. 1324). Therefore, the US open border policy enabled Mexican immigration to respond to shocks in the short run. The lack of immigration restrictions also minimizes illegal border crossings and thus the under-enumeration of undocumented migrants: a factor that can bias selection estimates in contemporary settings (Fernandez-Huertas, 2011; Ibarraran & Lubotsky, 2007). Next, we present a conceptual framework to understand shifts in migrant selection patterns.

CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

To explain differences in the skill mix of migrants, models of self-selection focus primarily on two factors: earnings inequality and migration costs. The classic Borjas-Roy model predicts that migrants from countries with relatively high earnings inequality will be negatively self-selected: drawn from the lower half of the skill distribution (Borjas, 1987, 1991; Roy, 1951). This is because countries with

[9] Although earthquakes had occurred in the region, the timing and magnitude of destruction of the San Francisco earthquake were unanticipated (Ager et al., 2020).

[10] Unfortunately, there are no adequate data to assess the impact of the crisis on employment levels in Mexico.

[11] The Immigration Act of 1917 required all migrants to pass a literacy test and pay an eight dollar head tax (Kosack & Ward, 2014, p. 1015). However, Mexicans were exempted from these restrictions until 1921 (Cardoso, 1980, p. 98).

high earnings dispersion are unattractive to workers with less-than-average productive skills, who would have the most to gain from moving to countries with relatively low earnings inequality. This prediction, however, assumes that migration costs are constant across individuals and thus do not influence the direction of selection. Chiquiar & Hanson (2005) extend the Borjas-Roy model by considering that in practice migration costs vary by skill level. They argue that bureaucratic, transportation, job-search, and information costs involved in migration are fixed, representing fewer hours of work for the high skilled, who can finance migration with no or lower borrowing costs. The main implication of Chiquiar and Hanson's framework is that migrants from countries with relatively high earnings inequality are unlikely to be negatively self-selected but drawn from the intermediate ranks of the skill distribution. This is because migration costs preclude the poor and low skilled from migrating, while high returns to skill (high earnings inequality) at home dissuade the high skilled from migrating (see Figure A.3).[12]

Historical evidence confirms that developments in earnings inequality across countries can explain shifts in migrant self-selection patterns. For example, over the last two centuries, migrants arriving to the United States had become more positively self-selected, which is partially explained by the widening of the US income distribution and the divergence in absolute income between the United States and the developing world (Abramitzky & Boustan, 2017). Previous empirical research also shows that factors lowering migration costs for future migrants such as migrant networks (McKenzie & Rapoport, 2007, 2010; Munshi, 2003) and household wealth accumulation (Abramitzky et al., 2013; Connor, 2019) can influence migrant selection. Similarly, immigration policies that directly or indirectly affect migration costs can adjust the direction and degree of selection into (return) migration (see, for example, Antecol et al., 2003; Bianchi, 2013; Clemens et al., 2018; Greenwood & Ward, 2015; Massey & Pren, 2012; Mayda et al., 2018; Spitzer & Zimran, 2018; Timmer & Williamson, 1998; Ward, 2017).

In addition, unexpected events such as economic crises, natural disasters, or wars can shape self-selection patterns by affecting migration incentives. Negative shocks to receiving economies like the Panic of 1907 can reduce employment opportunities and thus increase labor-market competition among immigrants. This may affect the skill mix of migrants, as competition increases migration costs through the increase in monetary and psychological costs associated with job search (Massey, 2016). Following Chiquiar & Hanson (2005), an increase in migration costs would disproportionately preclude the poor and low skilled from migrating, leading to an increase in the average skill level of migrants. Negative shocks, however, can differentially impact economic sectors and occupations. For example, shocks affecting

[12] Chiquiar & Hanson (2005) assume that migration costs are large and credit constraints are sufficiently binding as in much of the developing world.

manufacturing jobs more than agricultural ones would tend to reduce the average skill level of migrants, possibly inducing a greater degree of negative self-selection.[13]

Negative shocks in sending countries can also impact migration incentives. However, they may not necessarily induce changes in self-selection patterns despite increasing migration costs, as factors including antipoverty programs and migrant networks can relax financial constraints for the poor and low-skilled, who otherwise would be priced out of migration (Angelucci, 2015). In fact, the few studies addressing the impact of shocks on migrant selection—which predominantly examine negative shocks in sending countries—provide mixed findings. On the one hand, Villarreal (2014) shows that the Great Recession (2007/9) modified significantly the selection of Mexican migrants in terms of education. Collins & Zimran (2019) also document a decline in human capital of Irish migrants during Ireland's Great Famine (1845/9). On the other hand, Monras (2020) argues that observable characteristics of Mexican migrants did not change significantly before and after the Mexican Peso Crisis of 1995, and Spitzer et al. (2020) find no evidence that the Messina-Reggio Calabria Earthquake (1908)—arguably the most devastating natural disaster in modern European history—impacted Italian emigration or its composition. A common feature of research studying disruptive events affecting immigration is the use of annual or census data, which may not always capture shifts in migrant selection. To overcome this limitation, we exploit high frequency micro data (daily border crossings) that allow us to precisely pinpoint changes in migrant selection within a year. We now turn to describe these data and our measure of selection.

DATA

Measure of Selection

We use physical stature (height) to estimate the selection of Mexican migrants. Average height reflects genetic factors as well as nutritional and health conditions during early childhood and youth. Since wealthier people have better access to food, hygienic conditions, and medical resources, they tend to be taller than the poorer population (see Borrescio-Higa et al., 2019; Deaton, 2007; Komlos & Baten, 2004; Komlos & Meermann, 2007; Komlos & A'Hearn, 2019; Steckel, 1995). Taller individuals also develop better cognitive abilities, reach higher levels of education, and thus tend to earn more as adults (Case & Paxson, 2008; Ogórek, 2019; Schultz, 2002). Hence, physical stature is indicative of wealth and life chances.

[13] McKenzie & Rapoport (2010) show that these predictions depend on the density of the skill distribution across skill levels.

Average height is a relevant measure of migrant selection when large sectors of the economy rely on physical productivity of labor and earnings data are scattered or unreliable. In fact, in contexts prior to widespread mechanization, physical stature is indicative of returns to strength and earnings potential (Juif & Quiroga, 2019, p. 116). López-Alonso (2007) documents that this was the case of Mexico in the early twentieth century, making physical stature the best measure to estimate selection patterns of Mexican migrants. Moreover, height is a useful measure of selection because for adult migrants it cannot be manipulated in anticipation of or in response to emigration (Spitzer & Zimran, 2018, p. 229).

Migrant Sample: Border Crossing Records

The registration of aliens arriving at the Mexico-US land border began in 1906. American authorities used different types of documents to collect information about these individuals. These documents are known as Mexican Border Crossing Records (MBCRs) and to our knowledge are the only individual-level data available to study Mexican immigration before 1910. The sample that we use comes from the publication N° A3365, which contains two-sheet manifests reporting rich information on immigrants that crossed the border at nine entrance ports (see Figure A.1 in the Appendix).[14] The manifests report individual characteristics (age, sex, marital status, occupation, literacy, citizenship, and race), anthropometric data (height, complexion, and color of eyes and hair), and geographic information (birthplace, final destination, and last residence). The anthropometric data was recorded by a sworn physician and surgeon, who examined each migrant at the entrance port. In addition, the manifests provide information about the migrant's current and previous immigration spells.

One caveat is that age, birthplace, and occupation were self-reported and therefore subject to biases. A second caveat is that the sample records only documented immigration (crossings at official entrance ports) and may present problems of selection and under-enumeration. However, unlike nowadays, Mexican migrants did not have incentives to avoid official entrance ports for the desert. Most official entrance ports were also railway terminals and the principal crossing points for migrants from regions other than border municipalities. In addition, Escamilla-Guerrero (2020) provides evidence suggesting that the sample is representative of Mexican immigration during the 1900s and may capture an important share of the total border crossings. The sample covers the period from July 1906 to December 1908 and consists of 9,083

[14]The title of the publication is: Lists of Aliens Arriving at Brownsville, Del Rio, Eagle Pass, El Paso, Laredo, Presidio, Rio Grande City, and Roma, Texas, May 1903-June 1909, and at Aros Ranch, Douglas, Lochiel, Naco, and Nogales, Arizona, July 1906-December 1910. The publication N° A3365 does not report data for years prior 1906 or entrance ports in California.

Mexican immigrants.[15] Note that we exclude data from 1909 onward to only capture migrant workers and not refugees from the Mexican Revolution (1910–1920).

Comparison Samples: Military Records and Passport Applications

We use military recruitment files and passport records to compare migrants with individuals that chose to remain in Mexico. These data are the result of extensive archival work completed by López-Alonso (2015), who uses height to study secular trends of living standards in Mexico from 1850 to 1950.[16] We believe that these comparison samples capture different parts of the height (earnings) distribution of the Mexican population, allowing us to identify from which part of the distribution the migrants were drawn.

The military recruitment files consist of two samples that capture two different parts of the height distribution in Mexico. On the one hand, the federales were ordinary soldiers of the Mexican army (cavalry, infantry, and artillery), who served and retired, died in the line of duty, or deserted the military. At the time, there were minimum age, health, literacy, and stature requirements to enlist in the army. While these requirements might have introduced systematic biases to the sample, López-Alonso (2015, p. 112) shows that none of them were enforced during the period. The sample size is 7,088 males born between 1840 and 1950, who proxy for the average laborer/peasant in Mexico—that is, the lower ranks of the height (earnings) distribution. The source of these data are the archives of the Ministry of National Defense (*Secretaría de la Defensa Nacional*–SEDENA).

On the other hand, the rural police, known as the rurales, was a militia created in 1860 as an armed group loyal to the president. The members of this militia received a higher salary than the federales and needed to bring their own horses and weapons in the militia's beginnings. The rurales often received additional monetary rewards and political favors to maintain the stability in the country. We consider the rurales sample separately from the federales because the rurales were clearly not representative of the ordinary soldier. Since the rurales received a higher salary and extra monetary and non-monetary rewards for their service, they were above the ordinary soldiers in the socioeconomic ladder. Hence, the rurales could be considered as the military elite of that time, representing the intermediate ranks of the height (earnings) distribution in Mexico (López-Alonso, 2015, p. 156). The sample size is 6,820 individuals born between 1840 and 1900, and the source of these data is the National Archives, Public Administration Section (*Archivo General de la Nación*–AGN).

[15] Escamilla-Guerrero (2020) provides a full description of the publication N° A3365 and sampling plan followed to transcribe the micro data.

[16] López-Alonso (2015, p. 107) provides a detailed description of the archival work involved.

Finally, the passport records consist of all the passport applications made from 1910 to 1942 reporting the applicant's height. We believe that this sample represents the upper ranks of the height (earnings) distribution because passport holders were individuals with the economic means to travel abroad for business, leisure or education purposes (López-Alonso & Condey, 2003). Yet, two important characteristics of these data should be noticed. First, height was self-reported by the applicant. Second, the records capture all the issued passports but not all the travel permits issued by regional offices to applicants that could not travel to Mexico City. The sample size is 6,746 male individuals born between 1860 and 1922. The source of these data are the archives of the Ministry of Foreign Affairs (*Secretaría de Relaciones Exteriores*–SRE).

Descriptive Statistics

To obtain the best migrant selection estimates, we implement a series of data refinements. We keep only males reporting full geographic information (region and state of birth).[17] This allows us to capture differences in selection across Mexican regions. In addition, we keep migrants that had reached their terminal height at the moment of registration: individuals between 22 and 65 years old. This avoids capturing growing and shrinkage effects (Spitzer & Zimran, 2018, p. 231). To minimize capturing effects of the Mexican Revolution present in the comparison samples, we keep military and passport holders that had passed their pubertal growth spurt before the Mexican Revolution regardless of their year of registration: individuals 18 years old or older before 1911. We apply this partial refinement because keeping only those individuals registered before the conflict reduces significantly the size of the samples. Therefore, our estimates may capture some effects of the conflict; for example, time-varying sample selection.

In Figure 1 we plot kernel density estimates of height for each sample. Visual inspection suggests that all samples follow an approximate normal distribution and do not suffer from truncation. Table 1 presents the main characteristics of the final samples. On average, migrants were 168 cm tall, 3.6 cm taller than the ordinary soldiers, 1.4 cm taller than the military elite, and 2.1 cm shorter than the passport holders.[18] Recall that a lower average height indicates that a group faced worse conditions of health care, nutrition, disease environment, and work assignments some 10 to 50 years before being observed (Schneider & Ogasawara, 2018, p. 64).[19] Hence, differences in height between samples confirm that

[17] We constrain our analysis to males, as the military data do not report the birth place for females.

[18] In Figure A.4 we show the average height of the migrants and non-migrants across each year-of-birth cohort in the data.

[19] Schneider & Ogasawara (2018) argue that disease environment, proxied by infant mortality rates, have economically meaningful effects on child height at ages 6-11.

the ordinary soldiers belonged to the lowest social strata, whereas the migrants and the military elite belonged to Mexico's intermediate social strata. These height differentials, however, may be a product of the geography of emigration in Mexico. The distribution of the migrant sample reveals that indeed migrants came mostly from the North and Bajio (see Figure A.1).[20] In Table A.1 we present mean heights for each sample by region. The height gap between migrants and ordinary soldiers almost doubles in the Center and South relative to the North. This preliminary evidence suggests that the degree of selection on height varied substantially across regions. Interestingly, based on the amount of cash held at the crossing, migrants from the Center were considerably richer than the rest. They reported to have 20 dollars, two times the amount held by migrants from the North. Bajio migrants had only one dollar in hand when crossing the border, suggesting that they were the poorest as argued by previous literature (Durand, 2016; Verduzco, 1995).

Table 1 also shows that migrants were mostly unskilled workers and were less likely to be literate than the military or passport holders. This suggests that Mexican migrants may have moved to the United States to work in activities where brawn relative to brain had a greater value—that is, jobs with high returns to physical productivity. Clark (1908, p. 477 & 486) documents that outside agriculture Mexican migrant workers were usually employed in activities related to railway track maintenance, or as drillers, wood choppers, coke pullers, and surface men in the mines: occupations requiring physical strength. In terms of marital status, about 59 percent of the migrants reported to be married. Historical literature, however, agrees that male migrants did not move with their families but alone (Durand, 2016; González, 2010), and therefore a significant share of the flow may have consisted of seasonal (temporary) migrants (Gratton & Merchant, 2015; Kosack & Ward, 2014). In fact, Cardoso (1980) and Clark (1908) document that border crossings were more intense during the planting (February–April) and harvest (August–October) season of cotton, grapes, lettuce, sugar beet, and other vegetables and fruits, as seasonal agricultural migrants were mostly employed in these crops. To examine the relevance of seasonal migration, we classify individuals into seasonal and non-seasonal migrants depending on their crossing date. The micro data support the argument that seasonal migration was significant, with one in two migrants crossing the border during the planting or harvest season.

Regarding the comparison samples, the distribution across occupational skill classes reflects that the ordinary soldiers (federales) and military elite (rurales) capture different parts of Mexico's skill distribution, with the former being more likely to be unskilled. The micro data also support the argument

[20]The region classification was taken from López-Alonso (2015, p. 127).

that passport holders belonged to the upper social class, as all were literate and most of them self-reported as professional workers. In addition, the passports sample concentrates in the Center, implying that most passport holders may have lived in Mexico City or nearby states, where the Mexican upper social strata resided at the time. Next, we estimate the selection of Mexican immigration and assess the impact of the Panic of 1907 on selection patterns.

EMPIRICAL STRATEGY

To estimate the selectivity of Mexican immigration, we pool the migrant sample with each of the comparison samples separately and estimate the following equation:

$$y_i = \alpha + \beta \cdot mig_i + \mathbf{X}_i' \cdot \mathbf{B} + \varepsilon_i, \tag{1}$$

where y_i is the height of individual i. The variable mig_i is an indicator equal to 1 for individuals belonging to the migrant sample. The coefficient of interest, β, captures the average difference in height between migrants and each comparison sample (federales, rurales, or passport holders), conditional on a vector of individual characteristics, $\mathbf{X}_i'$, that control for birth-cohort (year of birth), region of birth (North, Bajio, Center, or South), and occupational skill class (unskilled, skilled, or professional). The birth cohort dummies control for year-specific shocks affecting population height. Examples of these events are droughts or wars affecting the living standards of all individuals born during the time period of the event. The dummies for region of birth control for environmental factors that vary across regions and influence height, such as food availability or endemic diseases. The dummies for skill class factor out composition effects resulting from skill-based selection mechanisms that may be present in our comparison samples; for example, military recruitment patterns favoring the enlistment of unskilled over skilled individuals to minimize desertion. Standard errors in all regressions are clustered at the birth-cohort level.

The estimated coefficient β, however, reflects average selection estimates for the period October 1906–December 1908. As mentioned previously, from August 1907 to January 1908 the US economy was severely affected by the Panic of 1907.[21] To estimate changes in selection into migration as a consequence of the crisis, we estimate the following model:

$$y_{it} = \alpha + \gamma \cdot mig_i + \mathbf{X}_i' \cdot \mathbf{\Gamma} + \sum_k \lambda_k \cdot mig_i \cdot I_t^k + \sum_k \mathbf{X}_i' \cdot \mathbf{I}_t^k \cdot \mathbf{\Lambda}_k + \varepsilon_{it}, \tag{2}$$

[21] There is no consensus about the ending month of the crisis. Yet, previous literature agrees that normalcy in the financial market was restored in January 1908 (Frydman et al., 2015, p. 937).

where t indexes time and $k \in \{Panic, post\text{-}Panic\}$. The time-period dummies, I_t^k, indicate whether an immigrant crossed the border during or after the crisis, respectively. Note that the comparison samples cannot be classified into these time periods, and thus the time-period indicators vary across migrants only. We also include a full set of interactions of control variables with time-period dummies. This allows the effect of each control variable to vary flexibly in any time period. The estimated coefficients λ_k capture the average difference in height for individuals that crossed the border during Panic (August 1907–January 1908) or after the Panic (February 1908–December 1908) relative to those who migrated before the Panic (October 1906–July 1907). The estimated coefficient γ reflects the average height gap between pre-Panic migrants and each comparison sample. Holding everything else equal, the estimated selection pattern during the Panic of 1907, $k = Panic$, is $\gamma + \lambda_k$. One caveat to our empirical approach is that the dummies for region of birth and skill class exert a constant effect on height across cohorts. As we observe migrants and non-migrants born over a long period (from 1840 to 1893), it is conceivable that the effects of these control variables vary across cohorts. To address this concern, we also estimate Equation 1 and Equation 2 including birth-region-by-cohort and skill-class-by-cohort fixed effects.

Self-Selection of Mexican Migrants

Table 2 presents our migrant selection estimates. Birth cohort (year of birth) is control variable in all models. Differences between the estimates in columns 1 and 2 confirm that environmental factors at the region level explain about 34–66 percent of the height gap between migrants and stayers. On average migrants were relatively tall: 2.1 cm taller than the federales and 0.5 cm taller than the rurales. Relative to the passport holders, however, migrants were 3.1 cm shorter. Given that taller individuals tend to earn more, the results allow us to infer that earnings of migrants were higher than those of ordinary soldiers and very similar to the earnings of the military elite. Therefore, it is unlikely that the first Mexican migrants were negatively self-selected, but drawn primarily from the intermediate or upper ranks of the earnings distribution in Mexico—that is, Mexican immigration in the early twentieth century was characterized by an intermediate or positive selection. Moreover, as physical stature is correlated with unobserved productive skills, our results suggest that migrants may have had even higher human capital accumulation (Bodenhorn et al., 2017, p. 201). This finding is consistent with the results of Kosack & Ward (2014), who show that Mexican migrants were positively selected on height in 1920. Our results are also in line with literature arguing that contemporary Mexican migrants are drawn from the upper ranks of the educational or skills distribution (Chiquiar & Hanson, 2005; Orrenius & Zavodny, 2005).

One caveat to this finding is that our military and passport samples may be selected. For example, the federales were not conscripts but volunteers, and it is expected that in a growing economy, like Mexico at the time, the opportunity cost of enlisting increases for productive and tall individuals (Bodenhorn et al., 2017, p. 173). Hence, the federales sample may capture the shortest individuals within the lower ranks of the height distribution. This would lead to imprecise migrant selection estimates resulting from comparisons with extreme values of the distribution. However, if our comparison samples had major selection problems, we would expect to obtain conflicting migrant selection estimates across specifications: a negative selection relative to the lower social strata (ordinary soldiers) and a positive selection relative to the upper social strata (passport holders). Table 2 shows that our estimates are consistent across panels, suggesting that sample selection bias in our comparison groups should be minimum, if any. Previous literature, however, documents that non-pecuniary factors such as patriotism or recruitment patterns can influence the social class composition of volunteers enlisting in the military (Komlos & A'Hearn, 2019, p. 1145). Considering that occupations are correlated with social class, we estimate migrant selection conditional on occupational skill class to account for selection mechanisms that may be present in our comparison samples. Results in column 3 (Panels A and B) show no differences in migrant selection when controlling for skill class, suggesting that the skill composition of both military samples are not driving our results. However, controlling for skill class reduces in 32 percent the difference in height between migrants and passport holders (Panel C). This finding shows that comparing like with like—individuals born in the same year and region, and with similar cognitive abilities (skills)—is advisable when the comparison groups may suffer from ambiguous sample selection bias. Column 4 presents the results of our flexible approach, which allows the effects of the aforementioned control variables to vary arbitrarily across birth cohorts. The height differences relative to the military samples are very similar to our previous results in terms of magnitude and significance, confirming the intermediate/positive selection of Mexican migrants. However, the height gap between migrants and passport holders increases in 27 percent. This adjustment suggests that the effects of factors influencing height such as place of birth are unlikely to remain constant over long periods of time.

Did the degree of selection vary across regions? To answer this question, we estimate separately Equation 2 for each region. We only present results for the North and Bajio, as 98 percent of the migrants in our sample came from these regions. Columns 5–6 of Table 2 show that the degree of positive selection relative to the ordinary soldiers was larger in the Bajio (see Panel A). This is explained by the combination of two factors. First, wages in the Bajio were considerably lower than elsewhere in Mexico (Rosenzweig, 1965, p. 450; Campos-Vázquez & Vélez-Grajales, 2012, p. 613). Second, Bajio migrants faced higher transportation costs. The average distance by train from Bajio municipalities to the border was 580 km, three times as much as from source municipalities in the North.[22] Hence, the poor and short population of the Bajio—for whom upfront monetary costs were higher and credit constraints likely binding—were disproportionately priced out from migration. We do not find statistically significant differences in height between migrants and elite soldiers. The point estimates, however, suggest that migrants were slightly taller than the military elite, with height gaps being very similar in both regions (see Panel B). Our results also show that the average height gap between migrants and passport holders was larger in the Bajio (see Panel C). The regional differences in the degree of migrant selection relative to the ordinary soldiers and passport holders reveal that Bajio migrants came from a narrower range of stature values (earnings levels) than their Northern counterparts. The variation in the degree of migrant selection, however, does not change our main finding: migrants were mostly drawn from the intermediate/upper ranks of the height (earnings) distribution.

The Effect of the Panic of 1907

In Table 3 we show the effect of the 1907 Panic on migrant selection. Individuals that migrated during the crisis were 1.3-1.8 cm shorter than their pre-Panic counterparts. The estimated coefficients for the post-Panic period are small and not statistically significant, meaning that pre-Panic and post-Panic migrants had a similar stature. Column 1 reveals that before the Panic, migrants were positively selected on height relative to the average ordinary soldier (2.4 cm taller). This pattern changed during the Panic, when migrants became considerably less positively selected (0.5 cm taller), but returned to pre-crisis levels afterward. Column 2 shows that this finding holds when we allow the effects of the control variables to vary arbitrarily across cohorts. We observe the same "U" pattern relative to the rurales and passports samples. These results suggest that in the beginnings of the twentieth century, when migrants could cross the border without restrictions, the composition of Mexican immigration adjusted very quickly to short-run changes in the US business conditions.

In Figure 2 we plot the adjusted mean height of migrants by month for the period under analysis (October 1906–December 1908).[23] Shifts in our measure of selection follow closely the development of the crisis. In March 1907, the first strong drop in stock prices occurred. In the following months, the speculation and uncertainty continued and by May 1907 the US economy had fallen into a short but severe recession (Odell & Weidenmier, 2004, p. 1003). Similarly, we observe a decline in the adjusted

[22] Distance estimates are for 1900 and were kindly shared by Woodruff & Zenteno (2007).

[23] We estimate the adjusted values regressing individual height on a full set of fixed effects that control for municipality of birth, year of birth, month of crossing, and entrance port.

height from March, with a substantial fall happening after May 1907. In August 1907, the Secretary of the Treasury announced the deposit of 28 million dollars to banks across the United States for relieving the expected stringency in money supply and bring back confidence to the financial system (Markham, 2002, p. 31). This measure only delayed the financial crash of October, but along with substitutes for legal currency and the creation of "legal holidays" prevented even more bankruptcies during the Panic period (Andrew, 1908, p. 516). Following the narrative of these events, the adjusted height increases slightly after August and falls later on. Finally, the adjusted height increases significantly after January 1908, when the payments to depositors of commercial banks were fully restored, but moderates over the year, returning to pre-Panic levels by July 1908.

We also indicate in Figure 2 the planting (February–April) and harvest (August–October) season of the crops in which Mexican migrants were usually employed. It is conceivable that the influx of seasonal agricultural migrants could have influenced the observed shifts in height if they were drawn from specific ranks of the height (earnings) distribution. Figure 2 shows, for example, that migrants were shorter during the harvest months during which the financial crash also developed. To investigate this hypothesis, we estimate differences in height between seasonal and non-seasonal migrants conditional on our baseline set of control variables. Table 4 shows that the average difference in height between these two migrant groups was small and not statistically significant (see column 1). When decomposing this estimate by season, we find that planting- and harvest-season migrants had different height profiles, with the former being taller (1.3 cm) and the latter being shorter (0.5 cm) than their non-seasonal counterparts (see column 2). We obtain similar results when performing the analysis at the region level (see columns 3-6).[24] Hence, seasonal migration could have magnified the fall in mean height observed during the crisis.

To address this concern, we also estimate Equation 2 controlling for seasonal migration. Table 3 shows that our previous results do not suffer major changes, suggesting that the shift toward a negative selection during the Panic period was unlikely to be driven by seasonal migration. Note that the estimated coefficients for the post-Panic period remain statistically insignificant across specifications, suggesting that the crisis did not have a permanent effect on the selection of Mexican immigration. This could also be interpreted as the crisis delaying migration rather than changing the composition of the flow. However, other factors could have contributed to the degree of selection returning to levels similar to that

[24] This is consistent with historical literature documenting that Mexican migrants performed tasks demanding physical strength—breaking up dirt clods and removing stones—during the planting season (Cardoso, 1980, p. 24), while they were employed for picking cotton and other crops during the harvest season, i.e., tasks that required nimble fingers rather than physical strength (Clark, 1908, p. 482).

observed before the crisis. Next, we address the role of labor recruiting in shaping migrant selection and its interaction with the Panic of 1907.

LABOR RECRUITING

We next focus on factors that could have adjusted migrant self-selection by affecting the structure of migration costs during the Panic. In particular, we study the *enganche*, an institutionalized labor recruiting system used to allocate Mexican migrant workers in the United States during the early twentieth century. Labor recruiting systems are characterized by reducing transportation and job-search costs for intending migrants (Abella, 2004; Eelens & Speckmann, 1990); therefore, they can shape the scale and skill composition of immigration, especially in contexts where migration costs are high and migrant networks providing assistance and information are not yet established.

To see how labor recruiting can shape migrant selection, consider the model of Chiquiar & Hanson (2005), where migration costs are large and decrease with skills.[25] In this framework the effect of labor recruiting on migrant selection depends on the scale and nature of recruiting. Note that the skill composition of immigration may not change if recruiting is practiced at low scale. However, if labor recruiting accounts for a significant share of immigration the effect toward a positive or negative selection depends on how intending migrants are recruited. On the one hand, intending migrants can be randomly recruited. The effect of random recruiting is to decrease migration costs at all skill levels. As a result, migration incentives increase at both ends of the skill distribution, in other words, more unskilled and skilled people are willing to migrate (see Panel A of Figure A.5). On the other hand, intending migrants can be sorted and recruited based on skills. The effect of assortative recruiting is to decrease migration costs only at some skill levels. In this case, migration incentives increase for individuals with the skill profile preferred by the employer (see Panel B of Figure A.5).

Employers can also adjust the pattern and scale of recruiting to deal with changes in business conditions. For example, recruiting can be scaled down in response to shocks such as the Panic of 1907, which are likely to negatively affect the demand for migrant workers. During health crises or wartime, however, the need for migrant workers with specific qualifications can increase (Clemens et al., 2018; Fernández-Reino et al., 2020; San, 2022). In this case, both the pattern and scale of recruiting can be adjusted to satisfy the labor demand in particular sectors. Labor recruiting systems can thus serve as adjustment channel of migrant selection during periods of economic depression or expansion.

[25] Note that Chiquiar & Hanson (2005) use the concept of skills in a broad sense, comprising any productive attribute capturing earnings potential, such as education or height.

The Enganche

During the nineteenth century, Mexico was characterized by regional labor supply mismatches. The *enganche*, a system for recruiting and transporting workers to remote locations or with labor shortages, was institutionalized to regulate labor markets (Durand, 2016, p. 50-1). Recruiters "hooked" workers by offering wages in advance in exchange of future labor service, creating a relationship of indebtedness that kept workers at the destination until the debt was cleared (Brass, 1990, p. 74). At the turn of the twentieth century, US companies and labor contractors adopted the *enganche* to satisfy the increasing demand for workers in the American Southwest and other regions. The internationalization of this labor recruiting system was possible due to the expansion of the Mexican railways network and its connection to the US rail lines from 1884. Contractors used railways for traveling south into Mexico and transporting recruited migrant workers north to the United States (Woodruff & Zenteno, 2007, p. 512). The recruitment of workers, however, was not confined to places with railway access. Clark (1908, p. 475) documents that intending migrants also arrived at border towns where they met representatives of US companies and labor contractors. The recruited workers then crossed the border and received transportation to the destination and a subsistence allowance, both discounted from their future wage (Clark, 1908; Durand, 2016; Gamio, 1930). We will later show that intending migrants were not recruited randomly but from the upper half of Mexico's height distribution. Therefore, the *enganche* can be understand as a persistent labor institution that reduced transportation and job-search costs for intending migrants with above-average earnings potential.

Identification of Enganche Migrants

Our data do not directly identify migrants that used the *enganche* to cross the border. Hence, we design a methodology to identify *enganche* migrants based on the characteristics of this labor recruiting system. The *enganche* profitability depended on two main factors: the number of workers recruited and the associated transportation costs. Previous literature suggests that recruiters commonly transported between 30 and 400 workers depending on the nature of the jobs and season of the year (Clark, 1908, p. 470 & 476; Durand, 2016, p. 56 & 63). We validate this information with twenty *enganche* advertisements published in Mexican and American newspapers from 1902 to 1909. The number of vacancies advertised range from 50 to 600, suggesting that the minimum number of workers that made the *enganche* profitable ranged between 30 to 50.

To identify *enganche* migrants, we first collapse the migrant sample by source (Mexican municipality), destination (American county), crossing date (month and year), and entrance port. Note that each source-destination-port-date combination represents a group/flow of migrants who reported the same source-destination pair and were registered at the same entrance port during the same month. We then standardize the size of each flow using the mean and standard deviation of the migration corridor (source-destination-port combination) to which they belong. Finally, we consider *enganche* migrants those individuals belonging to a flow of at least 30 migrants and whose size falls at least one standard deviation above the mean size of the flows belonging to the same migration corridor. This methodology allows us to identify unusual, large groups of migrants who were likely moving together, which proxies for *enganche* migrants. We present a formal expression of this methodology in the Appendix. Figure 3 displays the municipalities that our methodology identifies as the source of *enganche* migrants. All the localities have direct access to railways, which was necessary for transporting the recruited migrant workers. The spatial distribution of the *enganche* also supports the argument that this labor recruiting system was practiced at border towns and in the central plateau of Mexico, where salaries were relatively low and labor-market pressures were high. One caveat to our methodology is that it may confound *enganche* migrants with seasonal immigration. To attenuate this concern, we explicitly control for seasonal immigration to disentangle the effect of the *enganche* on selection patterns.

The Enganche Effect

Our methodology for identifying flows of recruited migrant workers reveals that the Panic of 1907 significantly affected the scale of labor recruiting. Table A.2 shows that before the Panic about one in three migrants used the *enganche* to cross the US border. This share falls to only 1 percent during the Panic, suggesting that the crisis severely affected labor recruiting. After the Panic, the recruiting of migrant workers resumed, with 13 percent of migrants using the *enganche* system (see Panel A). Although labor recruiting did not return to pre-Panic levels in either region, the share of *enganche* migrants had a greater recovery in the North—both in absolute and relative terms—than in the Bajio (see Panels B and C).

To identify additional changes in labor recruiting, we plot in Figure 4 the density of *enganche* and *non-enganche* immigration by month and source region. Before the crisis *enganche* immigration follows seasonal patterns, with flows from both regions increasing during the planting season (February–April). We also observe large flows of *enganche* migrants in other periods, which may indicate that the *enganche* was used to satisfy labor demand in sectors other than agriculture. The density of *enganche* immigration from both regions falls just before the Panic, and it does not increase until after the crisis. Interestingly, we observe very few *enganche* flows from the North during the 1908 planting season, suggesting that the *enganche* operated primarily in the Bajio during the months following the Panic. Note that the density of *non-enganche* immigration from the North remains relatively constant across months. *Non-enganche* immigration from the Bajio, in contrast, increases just before the 1907 harvest season and remains constant from the onset of the crisis. Overall, the recruiting of migrant workers was dramatically curtailed during Panic of 1907, and its scale and geographic composition changed after the crisis. If migrant workers were recruited from specific ranks of the height distribution, these changes could explain the observed shifts in the selection of Mexican immigration.

To disentangle the effect of the *enganche* system on migrant selection, we start by examining whether it was characterized by a random or selective recruiting. We expand Equation 1 as follows:

$$y_i = \alpha + \beta \cdot mig_i + \delta \cdot eng_i + \mathbf{X}_i' \cdot \mathbf{B} + \varepsilon_i, \tag{3}$$

where eng_i is a dummy variable that takes the value of 1 if the migrant crossed the border using the *enganche* system and zero otherwise. The estimated coefficient δ captures the difference in height between *enganche* and *non-enganche* migrants. Column 1 of Table 5 shows that American recruiters chose the tallest laborers among those willing to migrate. On average, *enganche* migrants were 0.7 cm taller than migrants that crossed the US border without using labor recruiting. The estimated coefficient β captures the difference in height between *non-enganche* migrants and each comparison sample. The β coefficient reported in column 1 is not statistically significant. However, the point estimate suggests that *non-enganche* migrants may have been about 0.4 cm taller than the military elite (intermediate selection). This implies that *enganche* migrants were clearly positively self-selected, as they may have been 0.7-1.1 cm taller than the military elite ($\beta + \delta$). Hence, the evidence suggests that on average American companies and labor contractors may have practiced positive assortative recruiting. Did the degree of assortative recruiting vary? In Figure 5 we plot monthly adjusted heights of *enganche* and *non-enganche* migrants. It is not clear that positive assortative recruiting was consistently practiced across months. However, recruited migrants were always at least as tall as their non-recruited counterparts, and in some planting and harvest months recruited migrant workers were notably taller. This initial evidence suggests that the *enganche* pushed toward a positive selection through large-scale, positive assortative recruiting.

The Enganche and the Panic of 1907

To examine the effect of the *enganche* on selection patterns across periods, we expand Equation 2 as follows:

$$y_{it} = \alpha + \gamma \cdot mig_i + \pi \cdot eng_i + \mathbf{X}_i' \cdot \mathbf{\Gamma} + \sum_k \lambda_k \cdot mig_i \cdot I_t^k + \sum_k \phi_k \cdot eng_i \cdot I_t^k + \sum_k \mathbf{X}_i' \cdot \mathbf{I}_t^k \cdot \mathbf{\Lambda}_k + \varepsilon_{it}, \qquad (4)$$

where I_t^k are the same time-period dummies defined before. The estimated coefficients γ and λ_k capture height differences between *non-enganche* migrants and each comparison sample, while the estimated coefficients π and ϕ_k capture height differences between *enganche* migrants and their *non-enganche* peers. Holding everything else equal, when $k = Panic$, $(\pi + \phi_k) + (\gamma + \lambda_k)$ will reflect the selection of *enganche* migrants during the Panic period.

Column 2 of Table 5 reports again our baseline migrant selection estimates across periods. Column 3 presents estimates of Equation 4, which allows us to infer how the scale and sorting of labor recruiting shaped the selection of Mexican immigration. We use estimates relative to the military elite to illustrate our argument. Estimates relative to the other comparison samples are reported in Table A.3. During the pre-Panic period, the average Mexican migrant was 0.67 cm taller than the military elite (column 2), whereas *non-enganche* migrants were 0.39 cm taller (column 3). Although the latter estimate is not statistically different from zero, the point estimate suggests that the *enganche* may have accounted for at least 41 percent of the average height gap between migrants and the military elite. This effect results from a share of *enganche* migrants of about 36 percent (scale of recruiting) and a 0.7 cm height gap between *enganche* and *non-enganche* migrants (degree of sorting).

During the Panic, Mexican immigration became negatively selected, with the average migrant being about 0.9 cm shorter than the military elite (column 2). The point estimates in column 3 suggest a similar, negative height gap (-1 cm) between *non-enganche* migrants and the military elite, which is explained by the virtual absence of labor recruiting: only 1.2 percent of migrants used the *enganche* system during the crisis. Although the ϕ_{Panic} coefficient is not statistically different from zero, the point estimate is large and positive, suggesting that the degree of sorting in recruiting could have increased. Figure 5 shows that indeed the few *enganche* migrants that crossed the border during the Panic were taller than most of their pre-Panic peers. Back-of-the-envelope calculations suggest that had the scale and degree of selective recruiting continued during the Panic, the height difference between migrants and the military elite would have been about -0.2 cm. Equivalently, a 50 percentage point increase in the recruiting scale during the crisis would have offset the negative-selection effect of *non-enganche* immigration. How did the Panic of 1907 change the scale of recruiting? Recall that during the crisis banks and financial institutions limited or suspended cash payments. This likely affected the liquidity of American companies and labor contractors for financing the *enganche* system, which operation required paying train tickets, subsistence allowances, and wages in advance for tens or hundreds of recruited migrant workers. The demand for migrant workers could have also decreased, as thousands of firms and over one hundred banks went bankrupt as the crisis unfolded (Markham, 2002, p. 32). In addition, major railway companies were severely impacted by the Panic and had to curtail their operations, affecting the transportation of workers in the United States (Johnson, 1908, p. 456). These factors likely constrained the recruiting of migrant workers with above-average physical productivity, and consequently its effect toward a positive selection faded.

In the aftermath of the crisis, we observe different adjustments in the selection of *non-enganche* and *enganche* migrants. On the one hand, *non-enganche* migrants became more positively selected, as they were 0.6-1 cm taller than their pre-Panic peers. On the other hand, the $\phi_{post\text{-}Panic}$ coefficient is not statistically different from zero. The point estimate, however, is negative and large, which indicates that recruiting patterns may have changed in the post-Panic. Figure 5 shows that the degree of positive sorting in recruiting varied during 1908, with the height of *enganche* migrants increasing substantially during the planting season and decreasing later in the year during the harvest months. We also observe seasonal shifts in the height of *non-recruited* migrants throughout 1908, although less pronounced.

Robustness Checks

The above evidence suggests that the recruiting of seasonal migrant workers could explain the observed shifts in migrant selection. We test this hypothesis by including in the control variables a full set of interactions between *enagnche* and season dummies. Like all the control variables, we allow their effect to vary flexibly across periods. Column 4 of Table 5 reports estimates that reflect selection patterns for *non-seasonal* migrants. There are three main results to note. First, the negative selection of non-recruited migrants increases by 45 percent during the Panic. This indicates that seasonal immigration during the 1907 Panic did not influence the shift toward negative selection. In fact, the average adjusted height of non-recruited seasonal migrants did not change during the Panic (coefficient not reported). Second, the post-Panic positive selection of non-recruited migrants increases by 62 percent, which suggests that the crisis changed the height profile of non-seasonal migrants. Third, the *enganche* effect in the pre-Panic increases by 56 percent, implying that the degree of positive sorting in recruiting was larger among non-seasonal migrants. Note, however, that the crisis may have changed this pattern, as in the post-Panic non-seasonal recruited migrants became 2.1 cm shorter than their pre-Panic peers.

One important caveat to our findings is that events such as crop failures, droughts, or political unrest could have occurred in Mexico during our period of analysis. This kind of random shocks can affect the incentives to migrate and consequently shape migrant selection. To our knowledge there were no major social conflicts in Mexico that could have induced migration flows before December 1908. However, Contreras (2005, p. 123), Clark (1908, p. 473), and Mayet et al. (1980, p. 757) document that some states experienced droughts in 1908, causing important crop losses in some areas (Cardoso, 1980, p. 12). We identify the specific locations affected by droughts using the Mexican Drought Atlas (Stahle et al., 2016) and link them with the migrants' reported locations of origin. This allows us to identify migrants whose decision to move could have been influenced by the presence of droughts. We describe this methodology in more detail in the Appendix. We then estimate Equation 4 including a full set of interactions between an indicator for migrants affected by droughts and time-period dummies. Column 5 shows that our results remain very similar in terms of magnitude and significance, suggesting that the presence of droughts in Mexico did not explain the observed shifts in selection. Finally, column 6 shows that our results hold when including birth-region-by-cohort and skill-class-by-cohort fixed effects.

CONCLUSION

Shifts in migrant selection induced by random shocks can have important implications. Changing selection can affect earnings of natives and existing immigrants in the destination, which in turn can modify internal migration patterns at the local level (Abramitzky et al., 2019). Short-run changes in the composition of arriving cohorts can also affect the assimilation process of the immigrant population (Massey, 2016). In the sending communities, short-run changes in the composition of migrants can affect inequality across households through direct and indirect effects of remittances (Ibarraran & Lubotsky, 2007; McKenzie & Rapoport, 2007).

We leverage the Panic of 1907—a severe financial crisis that unexpectedly affected the demand for Mexican migrant workers in the United States—to study how the selection of early-twentieth-century Mexican immigration adjusted to short run changes in the business conditions. We find that migrants were drawn from the intermediate/upper ranks of Mexico's height distribution. In other words, Mexico sent to the United States relatively tall laborers with above-average earnings potential. This selection pattern changed significantly in response to the crisis, with the adjustment toward negative selection occurring very quickly (in matter of months). We also show that the observed short-run adjustments were partially mediated by a historical labor-recruiting system that was importantly involved in the immigration process and intertwined with the American business cycle. We provide evidence suggesting that the effect of labor recruiting on migrant selection may depend on the interaction of two factors: the scale and type of recruiting (assortative or random). The results suggest that in early twentieth century, a period with no restrictions for Mexican immigration, assortative labor recruiting contributed to maintain relatively constant the height profile (skill-mix) of the migration flow in the short run.

References

Abella, M. I. (2004). The role of recruiters in labor migration. In *International migration. Prospects and policies in a global market* (pp. 201–211). Oxford University Press.

Abramitzky, R., Ager, P., Boustan, L. P., Cohen, E., & Hansen, C. W. (2019). The Effects of Immigration on the Economy: Lessons from the 1920s Border Closure. *National Bureau of Economic Research Working Paper 26536*.

Abramitzky, R. & Boustan, L. (2017). Immigration in American Economic History. *Journal of Economic Literature*, *55*(4), 1311–45.

Abramitzky, R., Boustan, L. P., & Eriksson, K. (2013). Have the poor always been less likely to migrate? Evidence from inheritance practices during the age of mass migration. *Journal of Development Economics*, *102*, 2–14.

Acemoglu, D., Autor, D. H., & Lyle, D. (2004). Women, war, and wages: The effect of female labor supply on the wage structure at midcentury. *Journal of Political Economy*, *112*(3), 497–551.

Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). Inequality in the impact of the coronavirus shock: Evidence from real time surveys. *Journal of Public Economics*, *189*, 104245.

Ager, P., Eriksson, K., Hansen, C. W., & Lønstrup, L. (2020). How the 1906 San Francisco earthquake shaped economic activity in the American West. *Explorations in Economic History*, 1013–1042.

Alvaredo, F., Cruces, G., & Gasparini, L. (2018). A short episodic history of income distribution in Argentina. *Latin American Economic Review*, *27*(1), 7.

Andrew, A. P. (1908). Substitutes for Cash in the Panic of 1907. *The Quarterly Journal of Economics*, *22*(4), 497–516.

Angelucci, M. (2015). Migration and Financial Constraints: Evidence from Mexico. *Review of Economics and Statistics*, *97*(1), 224–228.

Antecol, H., Cobb-Clark, D. A., & Trejo, S. J. (2003). Immigration policy and the skills of immigrants to Australia, Canada, and the United States. *Journal of Human Resources*, *38*(1), 192–218.

Barjau Martínez, L. (1976). Estadísticas Económicas del Siglo XIX. *Cuadernos de Trabajo del Departamento de Investigaciones Históricas – INAH*, (14), 19–21.

Bianchi, M. (2013). Immigration Policy and Self-Selecting Migrants. *Journal of Public Economic Theory*, *15*(1), 1–23.

Bodenhorn, H., Guinnane, T. W., & Mroz, T. A. (2017). Sample-selection biases and the industrialization puzzle. *The Journal of Economic History*, *77*(1), 171–207.

Borjas, G. (2007). Introduction. In *Mexican immigration to the United States* (pp. 1–12).

Borjas, G. J. (1987). Self-Selection and the Earnings of Immigrants. *American Economic Review*, *77(4)*, 531–553.

Borjas, G. J. (1991). Immigration and Self-selection. In *Immigration, Trade, and the Labor Market* (pp. 29–76). University of Chicago Press.

Borrescio-Higa, F., Bozzoli, C. G., & Droller, F. (2019). Early life environment and adult height: The case of Chile. *Economics & Human Biology*, *33*, 134–143.

Brass, T. (1990). The Latin American enganche system: Some revisionist reinterpretations revisited. *Slavery and Abolition*, *11*(1), 74–103.

Bruner, R. F. & Carr, S. D. (2007). Lessons from the financial crisis of 1907. *Journal of Applied Corporate Finance*, *19*(4), 115–124.

Campos-Vázquez, R. M. & Vélez-Grajales, R. (2012). Did Population well-being improve during Porfirian Mexico? A regional analysis using a quasi-human development index. *Journal of Human Development and Capabilities*, *13*(4), 597–620.

Cardoso, L. A. (1980). *Mexican emigration to the United States, 1897-1931*. Tucson: University of Arizona Press.

Case, A. & Paxson, C. (2008). Stature and status: Height, ability, and labor market outcomes. *Journal of Political Economy*, *116*(3), 499–532.

Chiquiar, D. & Hanson, G. H. (2005). International migration, self-selection, and the distribution of wages: Evidence from mexico and the united states. *Journal of Political Economy*, *113*(2), 239–281.

Clark, V. (1908). Mexican Labor in the US. *Bulletin of the United States Bureau of Labor*, *XVII*(78), 466–522.

Clemens, M. A., Lewis, E. G., & Postel, H. M. (2018). Immigration restrictions as active labor market policy: Evidence from the mexican bracero exclusion. *American Economic Review*, *108*(6), 1468–87.

Collins, W. J. & Zimran, A. (2019). The economic assimilation of Irish Famine migrants to the United States. *Explorations in Economic History*, *74*, 101302.

Connor, D. S. (2019). The cream of the crop? Geography, networks, and Irish migrant selection in the age of mass migration. *The Journal of Economic History*, *79*(1), 139–175.

Contreras, C. (2005). The droughts in mexico during the XIX century. *Investigaciones Geográficas*, (58), 118–133.

Deaton, A. (2007). Height, health, and development. *Proceedings of the National Academy of Sciences*, *104*(33), 13232–13237.

Durand, J. (2016). *Historia Mínima de la Migración México-Estados Unidos*. Mexico City: El Colégio de México.

Durand, J., Massey, D., & Zenteno, R. (2001). Mexican Immigration to the United States: Continuities and Changes. *Latin American Research Review*, 107–127.

Eelens, F. & Speckmann, J. D. (1990). Recruitment of labor migrants for the Middle East: the Sri Lankan case. *International migration review*, *24*(2), 297–322.

El Colegio de México (1960). *Estadísticas Económicas de Porfiriato: Comercio Exterior de México, 1877-1911*.

Escamilla-Guerrero, D. (2020). Revisiting Mexican migration in the Age of Mass Migration: New evidence from individual border crossings. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 1–19.

Escamilla-Guerrero, D., Kosack, E., & Ward, Z. (2021). Life after crossing the border: Assimilation during the first Mexican mass migration. *Explorations in Economic History*, *82*, 101403.

Feliciano, Z. M. (2001). The skill and economic performance of Mexican immigrants from 1910 to 1990. *Explorations in Economic History*, *38*(3), 386–409.

Fernandez-Huertas, J. (2011). New Evidence on Emigrant Selection. *The Review of Economics and Statistics*, *93*(1), 72–96.

Fernández-Reino, M., Sumption, M., & Vargas-Silva, C. (2020). From low-skilled to key workers: the implications of emergencies for immigration policy. *Oxford Review of Economic Policy*, *36*(Supplement 1), S382–S396.

Fogel, W. (1978). *Mexican illegal alien workers in the United States*. Los Angeles: Institute of Industrial Relations (UCLA).

Frydman, C., Hilt, E., & Zhou, L. Y. (2015). Economic effects of runs on early "shadow banks": Trust companies and the impact of the panic of 1907. *Journal of Political Economy*, *123*(4), 902–940.

Gamio, M. (1930). *Mexican immigration to the United States*. Chicago: University of Chicago Press.

Gómez-Galvarriato, A. (2009). The Political Economy of Protectionism. In *The Decline of Latin American Economies: Growth, Institutions, and Crises*. University of Chicago Press.

Gómez, M. (2011). Había una vez un sistema de bancos privados emisores de billetes. México, 1897-1910. *Historia Mexicana*, 2069–2109.

González, M. (2010). Los braceros en el Porfiriato. *Estudios Agrarios*, (44), 9–26.

Gratton, B. & Gutmann, M. P. (2000). Hispanics in the United States, 1850–1990: Estimates of population size and national origin. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, *33*(3), 137–153.

Gratton, B. & Merchant, E. (2015). An Immigrant's Tale: The Mexican American Southwest 1850 to 1950. *Social Sciences History*, (39), 521–50.

Greenwood, M. J. & Ward, Z. (2015). Immigration quotas, World War I, and emigrant flows from the United States in the early 20th century. *Explorations in Economic History*, *55*, 76–96.

Hansen, B. A. (2014). A failure of regulation? Reinterpreting the panic of 1907. *Business History Review*, *88*(3), 545–569.

Hatton, T. J. & Williamson, J. G. (1998). *The Age of Mass Migration: Causes and Economic Impact*. New York: Oxford University Press.

Henderson, T. J. (2011). *Beyond borders: A history of Mexican migration to the United States*. John Wiley & Sons.

Humphries, J. & Leunig, T. (2009). Was Dick Whittington taller than those he left behind? Anthropometric measures, migration and the quality of life in early nineteenth century London? *Explorations in Economic History*, *46*(1), 120–131.

Ibarraran, P. & Lubotsky, D. (2007). Mexican immigration and self-selection: New evidence from the 2000 Mexican census. In *Mexican immigration to the United States* (pp. 159–192).

Innis-Jiménez, M. (2013). *Steel Barrio: The Great Mexican Migration to South Chicago, 1915-1940*. NYU Press.

Johnson, J. F. (1908). The crisis and panic of 1907. *Political Science Quarterly*, *23*(3), 454–467.

Juif, D. & Quiroga, G. (2019). Do you have to be tall and educated to be a migrant? Evidence from Spanish recruitment records, 1890–1950. *Economics & Human Biology*, *34*, 115–124.

Komlos, J. & A'Hearn, B. (2019). Clarifications of a Puzzle: The Decline in Nutritional Status at the Onset of Modern Economic Growth in the United States. *The Journal of Economic History*, *79*(4), 1129–1153.

Komlos, J. & Baten, J. (2004). Looking Backward and Looking Forward: Anthropometric Research and the Development of Social Science History. *Social Science History*, *28*(2), 191–210.

Komlos, J. & Meermann, L. (2007). The introduction of anthropometrics into development and economics. *Historical Social Research/Historische Sozialforschung*, 260–270.

Kosack, E. & Ward, Z. (2014). Who Crossed the Border? Self-Selection of Mexican Migrants in the Early Twentieth Century. *The Journal of Economic History*, *74*(4), 1015–1044.

Lindert, P. H. & Williamson, J. G. (2016). *Unequal gains: American growth and inequality since 1700*. Princeton University Press.

López-Alonso, M. (2007). Growth with inequality: Living standards in Mexico, 1850–1950. *Journal of Latin American Studies*, *39*(1), 81–105.

López-Alonso, M. (2015). *Estar a la altura. Una historia de los niveles de vida en Mexico, 1850-1950*. Mexico City: Fondo de Cultura Económica.

López-Alonso, M. & Condey, R. P. (2003). The ups and downs of Mexican economic growth: the biological standard of living and inequality, 1870–1950. *Economics and Human Biology*, *1*(2), 169–186.

Maddison, A. (1987). Growth and slowdown in advanced capitalist economies: techniques of quantitative assessment. *Journal of Economic Literature*, *25*(2), 649–698.

Markham, J. W. (2002). The Panic of 1907. In *A financial history of the United States. Volume II: From JP Morgan to the Institutional Investor (1900-1970)* (pp. 29–41). Sharpe.

Massey, C. G. (2016). Immigration quotas and immigrant selection. *Explorations in Economic History*, *60*, 21–40.

Massey, D. S. & Pren, K. A. (2012). Unintended consequences of US immigration policy: Explaining the post-1965 surge from Latin America. *Population and Development Review*, *38*(1), 1–29.

Mayda, A. M., Ortega, F., Peri, G., Shih, K., & Sparber, C. (2018). The effect of the H-1B quota on the employment and selection of foreign-born labor. *European Economic Review*, *108*, 105–128.

Mayet, E. F., y Cervera, J. S., & Arias, D. P. G. (1980). Las sequías en México: historia, características y efectos. *Comercio Exterior*, *30*(7), 756.

McCaa, R. (2003). Missing millions: The demographic costs of the Mexican Revolution. *Mexican Studies*, *19*(2), 367–400.

McKenzie, D. & Rapoport, H. (2007). Network effects and the dynamics of migration and inequality: theory and evidence from Mexico. *Journal of Development Economics*, *84*(1), 1–24.

McKenzie, D. & Rapoport, H. (2010). Self-selection patterns in Mexico-US migration: the role of migration networks. *The Review of Economics and Statistics*, *92*(4), 811–821.

Mishra, P. (2007). Emigration and wages in source countries: Evidence from Mexico. *Journal of Development Economics*, *82*(1), 180–199.

Moatsos, M., Baten, J., Foldvari, P., van Leeuwen, B., & van Zanden, J. L. (2014). Income inequality since 1820. In *How was life? Global well-being since 1820* (pp. 291–316). OECD.

Moen, J. & Tallman, E. W. (1992). The bank panic of 1907: the role of trust companies. *The Journal of Economic History*, *52*(3), 611–630.

Monras, J. (2020). Immigration and wage dynamics: Evidence from the Mexican peso crisis. *Journal of Political Economy*, *128*(8), 3017–3089.

Munshi, K. (2003). Networks in the modern economy: Mexican migrants in the US labor market. *The Quarterly Journal of Economics*, *118*(2), 549–599.

Nelson, R. R. & Wright, G. (1992). The rise and fall of American technological leadership: the postwar era in historical perspective. *Journal of Economic Literature*, *30*(4), 1931–1964.

Noyes, A. D. (1909). A year after the panic of 1907. *The Quarterly Journal of Economics*, *23*(2), 185–212.

Odell, K. A. & Weidenmier, M. D. (2004). Real shock, monetary aftershock: The 1906 San Francisco earthquake and the panic of 1907. *The Journal of Economic History*, *64*(4), 1002–1027.

Ogórek, B. (2019). Talented but lazy. The height-school premium among Cracow's schoolboys in the interwar period. *Economics & Human Biology*, *34*, 252–256.

Orrenius, P. M. & Zavodny, M. (2005). Self-selection among undocumented immigrants from Mexico. *Journal of Development Economics*, *78*(1), 215–240.

Piketty, T. & Saez, E. (2003). Income inequality in the United States, 1913–1998. *The Quarterly Journal of Economics*, *118*(1), 1–41.

Robles, G. (1960). El desarrollo industrial. In *México, 50 años de revolución* (pp. 197). Fondo de Cultura Económica.

Rosenzweig, F. (1965). El Desarrollo Económico de México de 1877 a 1911. *El Trimestre Económico*, *32*(127(3)), 405–454.

Roy, A. D. (1951). Some thoughts on the distribution of earnings. *Oxford Economic Papers*, *3*(2), 135–146.

Samora, J. (1982). *Los mojados: The wetback story*. Notre Dame: University of Notre Dame Press.

San, S. (2022). Labor Supply and Directed Technical Change: Evidence from the Termination of the Bracero Program in 1964. *American Economic Journal: Applied Economics. Forthcoming.*

Sánchez-Alonso, B. (2019). The Age of Mass Migration in Latin America. *The Economic History Review*, *72*(1), 3–31.

Schneider, E. B. & Ogasawara, K. (2018). Disease and child growth in industrialising Japan: critical windows and the growth pattern, 1917-39. *Explorations in Economic History*, *69*, 64–80.

Schultz, T. P. (2002). Wage gains associated with height as a form of health human capital. *American Economic Review*, *92*(2), 349–353.

Spitzer, Y., Tortorici, G., & Zimran, A. (2020). International Migration Responses to Natural Disasters: Evidence from Modern Europe's Deadliest Earthquake. *National Bureau of Economic Research Working Paper 27506*.

Spitzer, Y. & Zimran, A. (2018). Migrant self-selection: Anthropometric evidence from the mass migration of Italians to the United States, 1907–1925. *Journal of Development Economics*, *134*, 226–247.

Stahle, D. W., Cook, E. R., Burnette, D. J., Villanueva, J., Cerano, J., Burns, J. N., Griffin, D., Cook, B. I., Acuna, R., Torbenson, M. C., et al. (2016). The Mexican Drought Atlas: Tree-ring reconstructions of the soil moisture balance during the late pre-Hispanic, colonial, and modern eras. *Quaternary Science Reviews*, *149*, 34–60.

Steckel, R. H. (1995). Stature and the Standard of Living. *Journal of Economic Literature*, *33*(4), 1903.

Stolz, Y. & Baten, J. (2012). Brain drain in the age of mass migration: Does relative inequality explain migrant selectivity? *Explorations in Economic History*, *49*(2), 205–220.

Stolz, Y., Baten, J., & Botelho, T. (2013). Growth effects of nineteenth-century mass migrations:"Fome Zero" for Brazil? *European Review of Economic History*, *17*(1), 95–121.

The Wall Street Journal (1910). Financial Wisdom in Mexico. *Jan 13*, 1.

The Washington Post (1907). Stocks Thrown Over. *Aug 13*, 3.

Timmer, A. S. & Williamson, J. G. (1998). Immigration policy prior to the 1930s: Labor markets, policy interactions, and globalization backlash. *Population and Development Review*, *24*(4), 739–742.

US Bureau of the Census (1949). *Historical Statistics of the United States 1789-1945. A supplement to the Statistical Abstract of the United States*. Washington D.C.: US Government Printing Office.

Verduzco, G. (1995). La migración mexicana a Estados Unidos: recuento de un proceso histórico. *Estudios Sociológicos*, *13*(39), 573–574.

Villarreal, A. (2014). Explaining the decline in Mexico-US migration: The effect of the Great Recession. *Demography*, *51*(6), 2203–2228.

Ward, Z. (2017). Birds of passage: Return migration, self-selection and immigration quotas. *Explorations in Economic History*, *64*, 37–52.

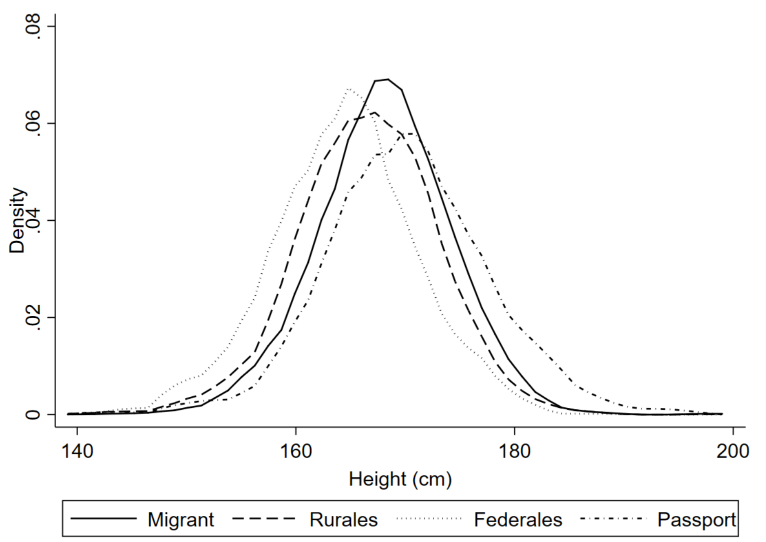
Wells, N., Goddard, S., & Hayes, M. J. (2004). A self-calibrating Palmer drought severity index. *Journal of Climate*, *17*(12), 2335–2351.

Woodruff, C. & Zenteno, R. (2007). Migration networks and microenterprises in Mexico. *Journal of Development Economics*, *82*(2), 509–528.

Wright, G. (1990). The origins of American industrial success, 1879-1940. *The American Economic Review*, 651–668.

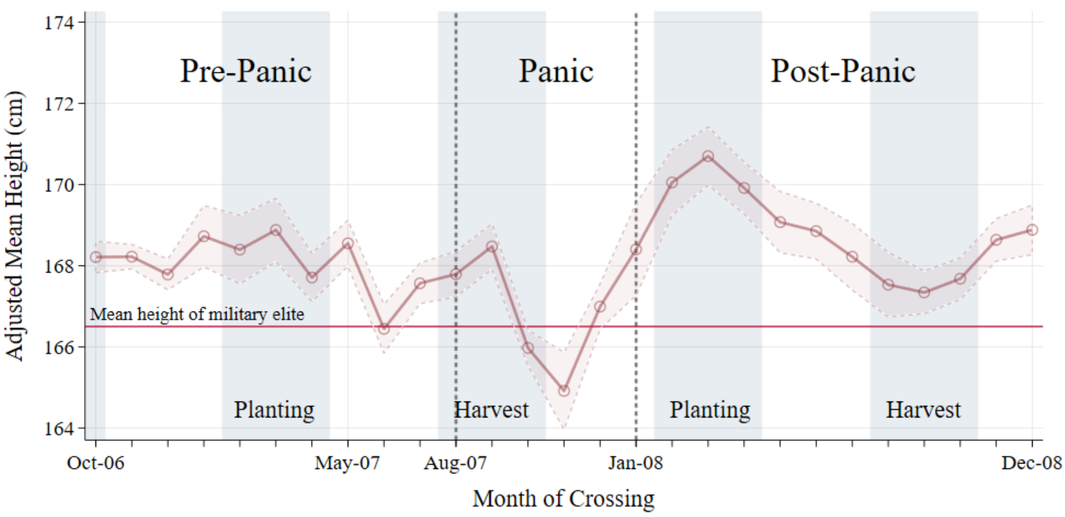
FIGURES AND TABLES

Figure 1: Kernel density estimates of height



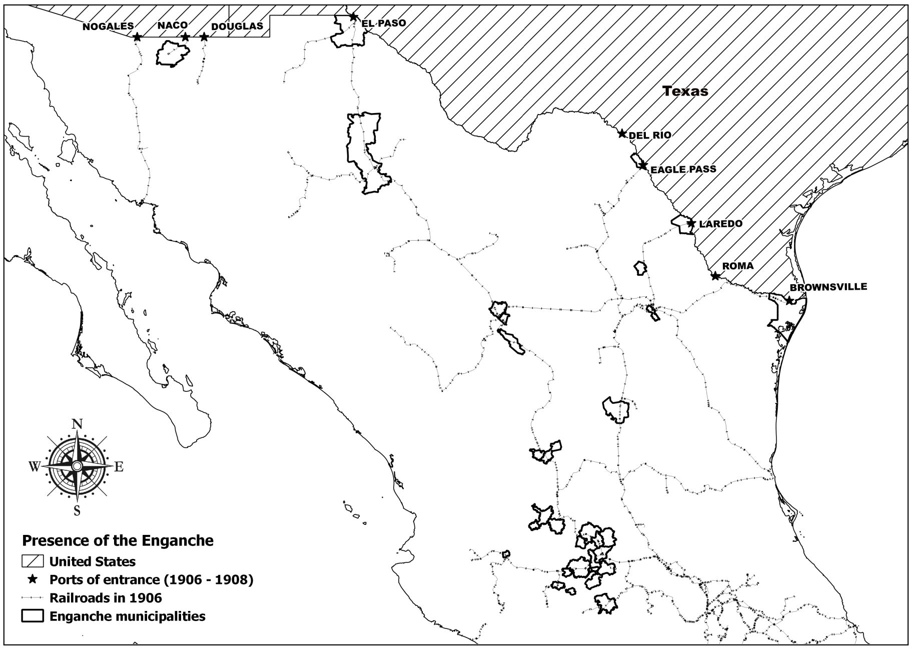
Source: Migrant sample from Mexican Border Crossing Records–Microfilm publication N° A3365. Military and Passport samples from López-Alonso (2015).
Notes: The samples approximate normal distributions. The military data are not truncated, confirming that the 160 cm minimum-height requirement to join the army was not enforced.

Figure 2: Migrant self-selection and the Panic of 1907



Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Notes: **May-07:** By May 1907, the US had fallen into a short but severe recession. **Aug-07:** In August 1907, the Secretary of the Treasury announced the deposit of 28 million dollars to banks across the US for relieving the expected stringency in money supply and bring back confidence to the financial system. **Sep-07:** From September to December 1907, a severe liquidity crisis developed and payments to depositors of commercial banks were suspended. **Jan-08:** In January 1908, payments to depositors were fully restored. To estimate the adjusted values, we regress individual height on a full set of fixed effects that control for municipality of birth, year of birth, month of crossing, and entrance port. We cluster standard errors at the year-by-month level. The military elite represents the intermediate ranks of the height distribution in Mexico.

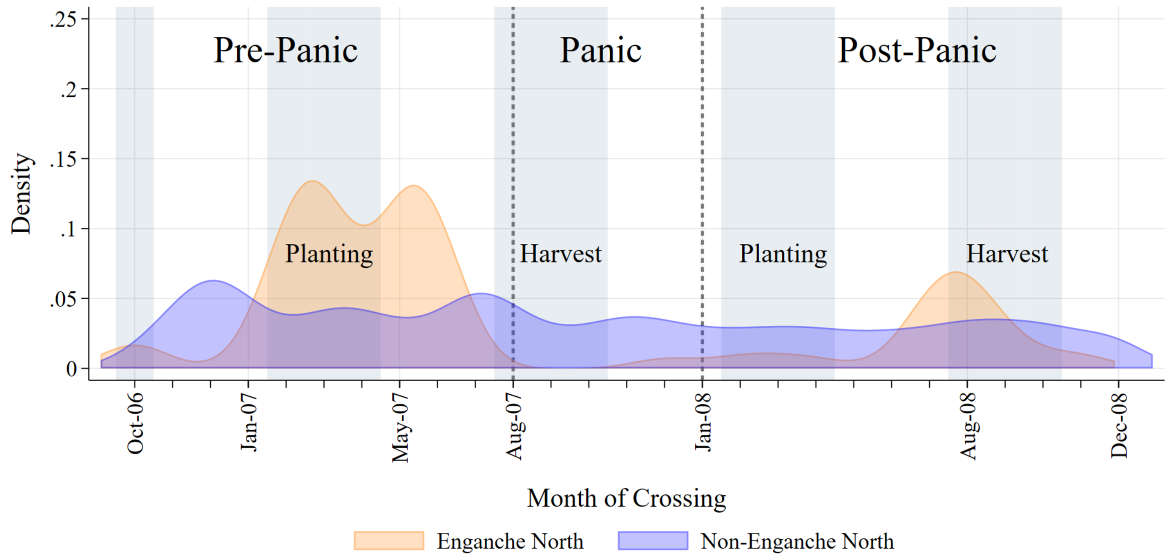
Figure 3: Spatial distribution of the enganche (1906–08)



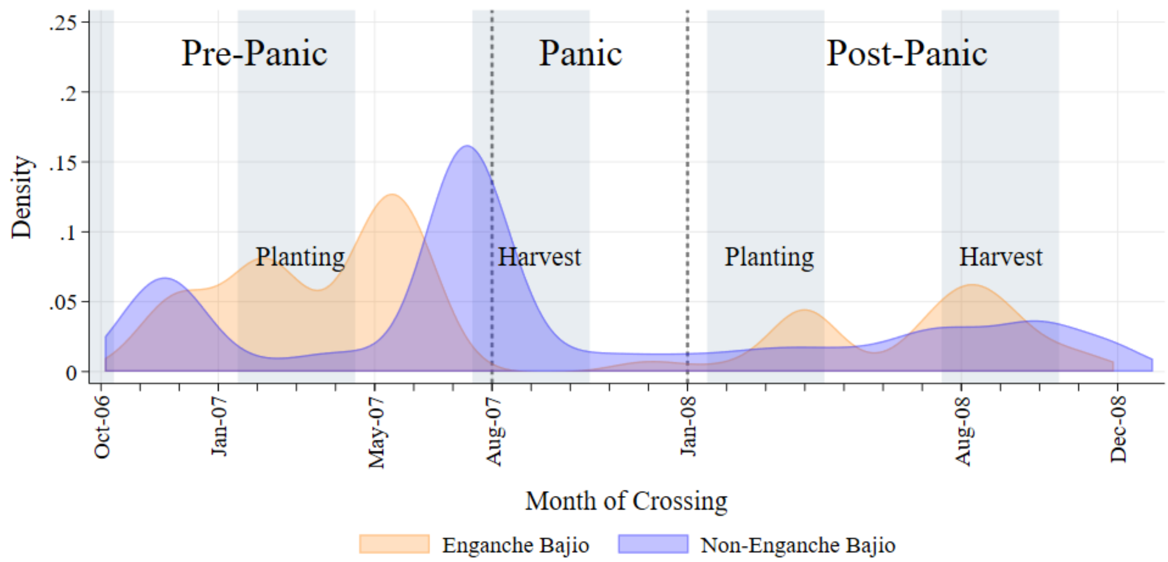
Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Notes: The polygons display the municipalities with presence of the *enganche*, a system of labor recruiting that reduced migration costs. Recruiters or *enganchadores* covered the transportation costs of the migrant in exchange of future labor service.

Figure 4: Distribution of the migrant sample, 1906–1908

A. North

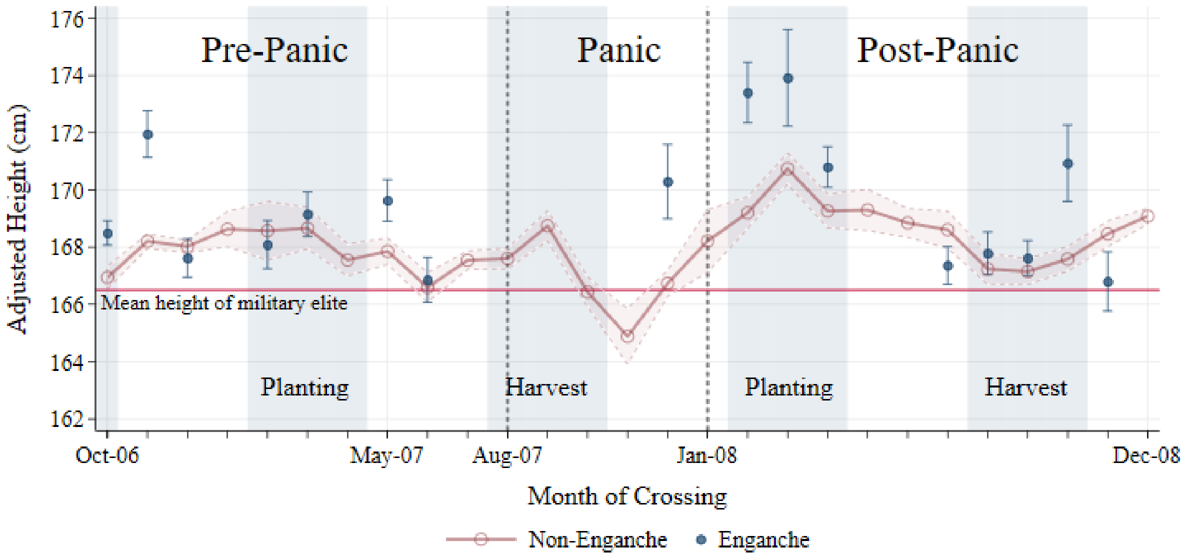


B. Bajio



Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Notes: The figure shows kernel density estimates of the migrant sample by source region. Previous literature documents that Mexican immigration was more intense during the planting (February–April) and harvest (August–October) seasons. The density of *enganche* immigration (recruited migrant workers) increases during these periods. The evidence also suggests that the *enganche* operated throughout the year before the Panic of 1907, suggesting that labor recruiting could have also been practiced in sectors other than agriculture. The Panic of 1907 "broke" the existing seasonal immigration patterns and neither the *enganche* nor the *non-enganche* immigration returned to their pre-Panic levels during 1908.

Figure 5: Adjusted height of enganche and non-enganche migrants, 1906–1908



Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Notes: We estimate the adjusted values regressing individual height on state-of-birth, year-of-birth, year-month of crossing, and entrance-port fixed effects. We cluster standard errors at the year-month level.

Table 1: Summary statistics

	Migrants	Federales	Rurales	Passport
Average Height (cm)	168.0	164.4	166.6	170.1
Average Age (years)	31.2	35.3	29.7	48.3
Literate (%)	38.4	45.3	49.5	100.0
Region of Birth (%)				
North	45.5	18.7	2.9	13.4
Bajio	52.5	27.3	60.6	30.0
Center	1.8	42.8	33.0	47.3
South	0.3	11.3	3.5	9.3
Occupational Skill Class (%)				
Unskilled	89.1	73.3	47.8	3.7
Skilled	7.7	24.1	49.3	34.5
Professional	2.2	2.6	3.0	61.8
Seasonal migration (%)	51.6	na	na	na
Marital Status (%)				
Married	59.2	na	na	na
Single	39.0	na	na	na
Widowed	1.8	na	na	na
Cash in hand–US dollars (median)				
North	10.0	na	na	na
Bajio	1.0	na	na	na
Center	20.0	na	na	na
South	10.0	na	na	na
Observations	3,609	1,249	5,300	1,339

Source: Mexican Border Crossing Records, Microfilm publication N° A3365. Military and Passport samples from López-Alonso (2015).
Notes: We classify the regions of birth and occupations following López-Alonso (2015, p. 127 & 128). We limit the sample to men because the military data do not report geographic information for women. We consider individuals that had reached their terminal height at the moment of registration: individuals between 22 and 65 years old. Seasonal migrants are those individuals who migrated during the planting (February–April) and harvest (August–October) season of the crops (cotton, grapes, lettuce, sugar beet, and other vegetables and fruits) in which Mexicans were usually employed (Cardoso, 1980; Clark, 1908).

Table 2: Self-selection of Mexican migrants, 1906-1908
Dependent variable: height (centimeters)

	1	2	3	4	5	6
	Complete Sample				North	Bajio
Panel A. Federales						
Migrant	3.268***	2.132***	2.217***	2.330***	1.267**	2.531***
	(0.381)	(0.442)	(0.430)	(0.496)	(0.525)	(0.915)
Observations	4,858	4,858	4,822	4,822	1,848	2,227
R-squared	0.077	0.114	0.117	0.159	0.091	0.067
Panel B. Rurales						
Migrant	1.611***	0.534**	0.569**	0.615**	0.631	0.485
	(0.212)	(0.224)	(0.248)	(0.281)	(0.679)	(0.322)
Observations	8,896	8,896	8,860	8,860	1,769	5,087
R-squared	0.038	0.052	0.053	0.088	0.087	0.052
Panel C. Passports						
Migrant	−1.983***	−3.162***	−2.138***	−2.714***	−1.716	−2.913**
	(0.242)	(0.290)	(0.446)	(0.594)	(1.676)	(1.444)
Observations	4,948	4,948	4,901	4,901	1,793	2,286
R-squared	0.032	0.056	0.059	0.093	0.082	0.110
Birth cohort	Yes	Yes	Yes	Yes	Yes	Yes
Birth region	No	Yes	Yes	Yes	No	No
Skill class	No	No	Yes	Yes	Yes	Yes
Birth cohort×Birth region	No	No	No	Yes	No	No
Birth cohort×Skill class	No	No	No	Yes	Yes	Yes

Source: Mexican Border Crossing Records, Microfilm publication N° A3365 and López-Alonso (2015).
Notes: Mexican migrants were 2.3 cm taller than the ordinary soldiers (federales), 0.6 cm taller than the military elite (rurales), and 2.7 cm shorter than Mexico's upper social class (passport holders). Therefore, Mexican immigration in the early twentieth century was characterized by an intermediate or positive selection on height. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Robust standard errors, clustered by birth cohort, in parenthesis.

Table 3: Impact of the Panic of 1907 on self-selection patterns
Dependent variable: height (centimeters)

	1	2	3	4	5	6	7	8	9
		Federales			Rurales			Passports	
Migrant	2.372***	2.366***	2.226***	0.673***	0.564**	0.431	−1.610***	−2.418***	−2.526***
	(0.501)	(0.602)	(0.622)	(0.237)	(0.275)	(0.278)	(0.574)	(0.761)	(0.791)
Migrant×Panic	−1.858***	−1.876***	−2.140**	−1.587***	−1.535***	−1.948**	−1.584***	−1.334***	−1.653**
	(0.218)	(0.237)	(0.823)	(0.217)	(0.214)	(0.744)	(0.212)	(0.227)	(0.736)
Migrant×Post Panic	0.068	−0.222	0.125	0.339	0.224	0.522	0.342	0.302	0.614
	(0.250)	(0.238)	(0.417)	(0.259)	(0.269)	(0.451)	(0.268)	(0.287)	(0.478)
Observations	4,822	4,822	4,822	8,860	8,860	8,860	4,901	4,901	4,901
R-squared	0.137	0.180	0.181	0.067	0.101	0.101	0.077	0.112	0.113
Controls×Time period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls×Birth cohort	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Season×Time period	No	No	Yes	No	No	Yes	No	No	Yes

Source: Mexican Border Crossing Records, Microfilm publication N° A3365 and López-Alonso (2015).
Notes: The Panic of 1907 changed significantly migrant selection. Immigrants became less positively selected during the crisis. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Robust standard errors, clustered by birth cohort, in parenthesis. Interactions in the control variables denote full sets of interactions.

Table 4: Height differences between seasonal and non-seasonal migrants
Dependent variable: height (centimeters)

	1	2	3	4	5	6
	Complete Sample		North		Bajio	
Season	0.091		0.245		−0.044	
	(0.195)		(0.277)		(0.287)	
Planting		1.327***		1.035***		1.600***
		(0.251)		(0.298)		(0.581)
Harvest		−0.489**		−0.674*		−0.283
		(0.213)		(0.366)		(0.262)
Observations	3,573	3,573	1,615	1,615	1,886	1,886
R-squared	0.087	0.095	0.073	0.082	0.042	0.048

Source: Mexican Border Crossing Records–Microfilm publication N° A3365 and López-Alonso (2015).
Notes: The omitted category is non-seasonal migrants. All models include a full set of interactions of control variables with birth cohort dummies. The control variables include region of birth and occupational skill class. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Robust standard errors, clustered by the birth-cohort, in parenthesis.

Table 5: Impact of the enganche on migrant selection patterns.
Dependent variable: height (centimeters)

	1	2	3	4	5	6
Comparison sample: Military elite (Rurales)						
Migrant	0.398	0.673***	0.394	0.370	0.376	0.303
	(0.254)	(0.237)	(0.255)	(0.262)	(0.265)	(0.274)
Migrant×Panic		−1.587***	−1.346***	−1.948**	−1.959**	−1.972**
		(0.217)	(0.294)	(0.744)	(0.761)	(0.773)
Migrant×Post Panic		0.339	0.604**	0.983**	0.837*	0.691
		(0.259)	(0.298)	(0.486)	(0.492)	(0.519)
Enganche	0.651**		0.728**	1.137**	1.127**	0.936*
	(0.244)		(0.316)	(0.505)	(0.503)	(0.531)
Enganche×Panic			1.371	1.305	1.333	1.926
			(1.845)	(1.908)	(2.008)	(2.042)
Enganche×Post Panic			−0.778	−3.280**	−3.326**	−3.113**
			(0.865)	(1.312)	(1.331)	(1.414)
Observations	8,860	8,860	8,860	8,860	8,860	8,860
R-squared	0.054	0.067	0.068	0.069	0.069	0.103
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls×Time period	No	Yes	Yes	Yes	Yes	Yes
Season×Time period	No	No	No	Yes	Yes	Yes
Season×Enganche×Time period	No	No	No	Yes	Yes	Yes
Droughts×Time period	No	No	No	No	Yes	Yes
Controls×Birth cohort	No	No	No	No	No	Yes

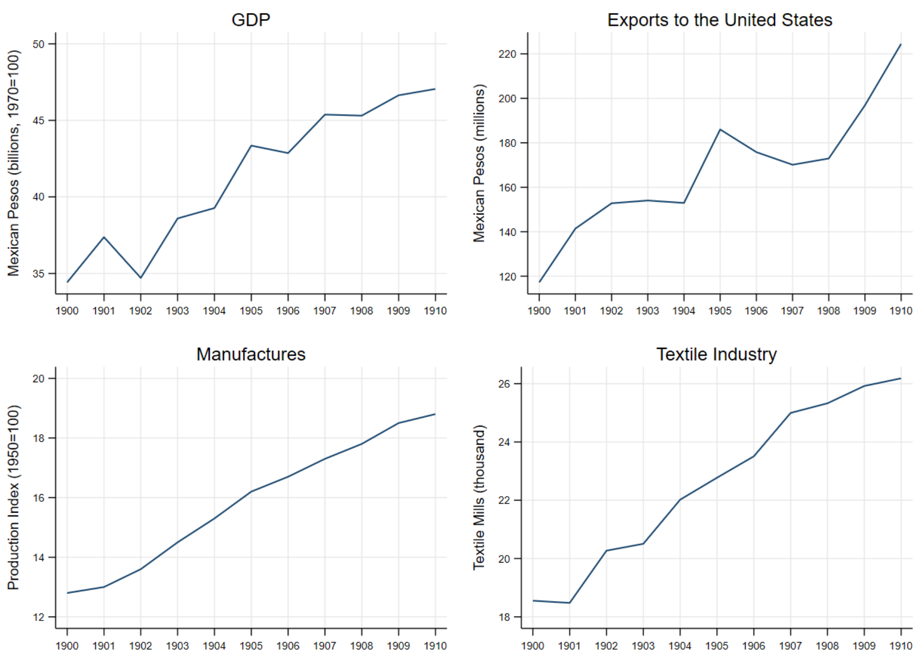
Source: Mexican Border Crossing Records–Microfilm publication N° A3365 and López-Alonso (2015).
Notes: * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Robust standard errors, clustered by birth cohort, in parenthesis. Interactions in the control variables denote full sets of interactions.

ONLINE APPENDIX

Figure A.1: Mexican migration regions and entrance ports (1906–08)

Notes: We classify the regions of birth following López-Alonso (2015, p. 127).

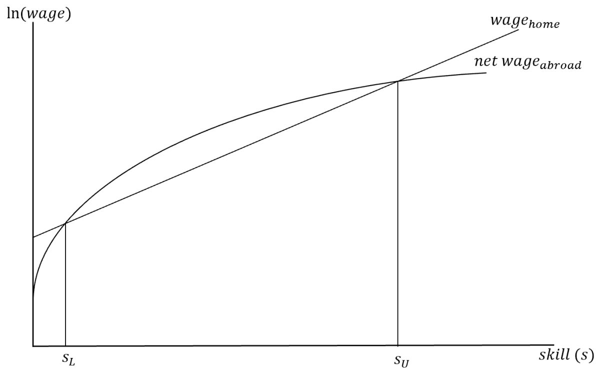
Figure A.2: Mexican economy during the Panic of 1907



Sources: GDP, Banco de México; Exports, El Colegio de México (1960); Textile industry, Barjau Martínez (1976); Manufactures, Robles (1960).

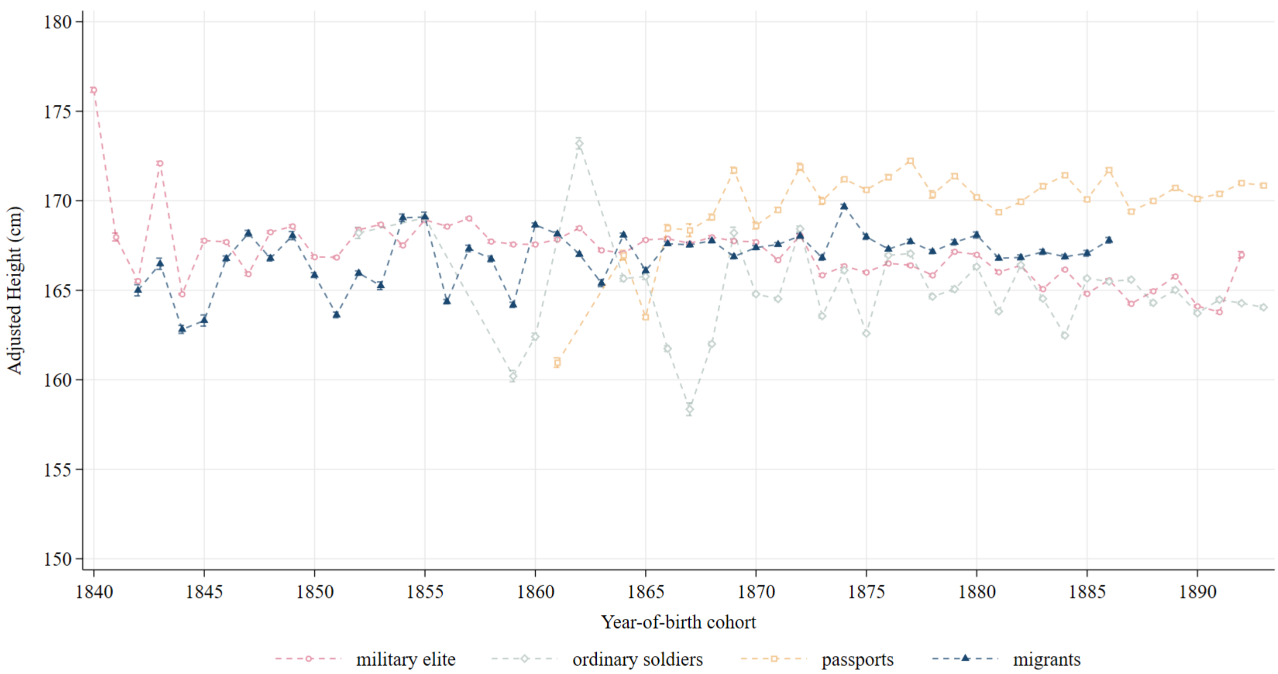
Notes: The US financial crisis of 1907 did not affect the production of manufactures nor the expansion of the textile industry—both are usually used to illustrate the economic growth and modernization of Mexico from 1890 to 1910 (Gómez-Galvarriato, 2009). The crisis depressed regional trade in 1907, but exports to the United States began to recover from 1908. In addition, there is no evidence of mass unemployment nor bankrupt companies in Mexico during or after the Panic of 1907.

Figure A.3: Self-selection of migrants



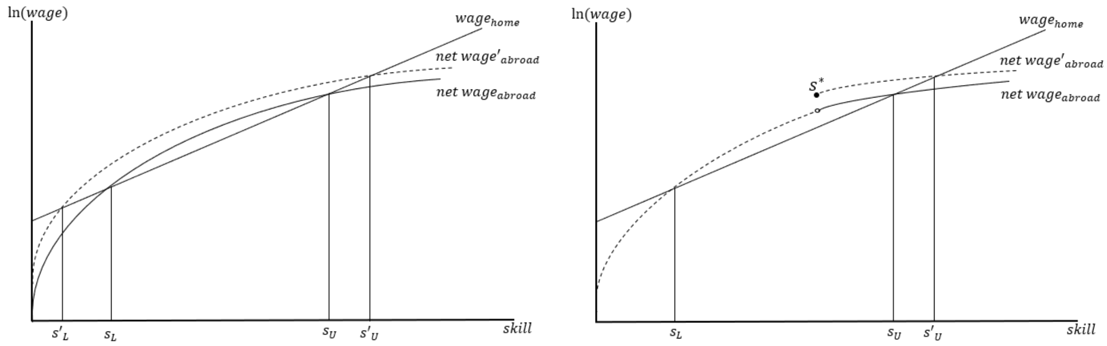
Source: Adapted from Chiquiar & Hanson (2005).
Notes: The diagram depicts the main implication of Chiquiar and Hanson's framework. If migration costs are large enough and credit constraints sufficiently biding, immigration from home countries with high earnings inequality can be characterized by an intermediate selection despite predictions of negative selection from the Borjas-Roy model. This is because high returns to skill at home dissuade the high skilled from migrating ($S > S_U$), and high migration costs price out the poor and low skilled from migrating ($S < S_L$). Mexican earnings data for the period are scattered and unreliable (López-Alonso, 2007). Available Gini coefficient estimates (United States: 0.54; Mexico: 0.51) may not be comparable and provide little information about differences in returns to skill between countries. Hence, predictions about the selection of Mexican immigration are ambiguous. See Lindert & Williamson (2016, p. 174) and Moatsos et al. (2014, p. 206) for income inequality estimations.

Figure A.4: Average height by birth cohort



Source: Mexican Border Crossing Records, Microfilm publication N° A3365. Military and Passport samples from López-Alonso (2015).
Notes: We estimate average height by year-of-birth cohort adjusting for region of birth.

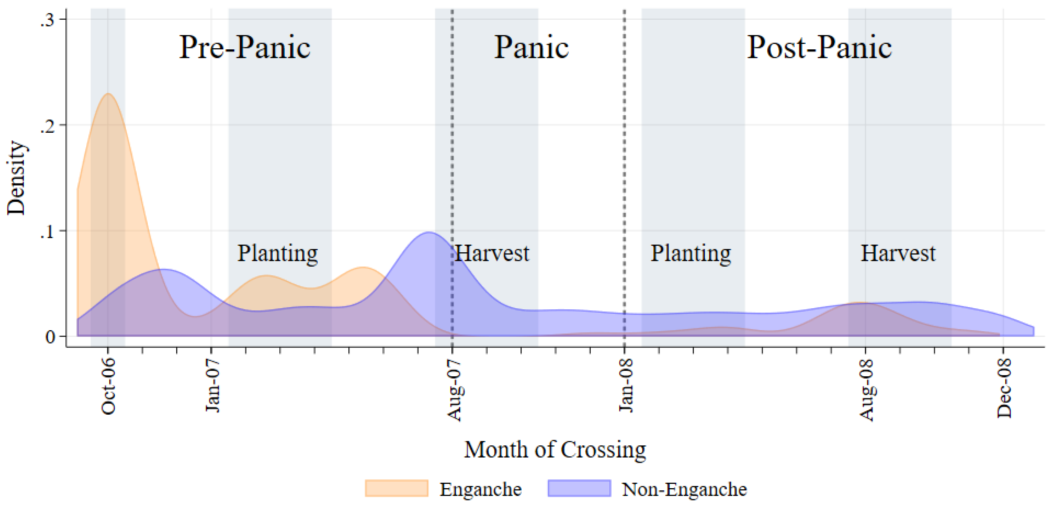
Figure A.5: Migrant self-selection and labor recruiting



A. Random recruiting ***B. Positive selective recruiting***

Source: Adapted from Chiquiar & Hanson (2005).
Notes: Chiquiar & Hanson (2005) consider a nonlinear relationship between net wages (US wages minus migration costs, $net\ wage_{abroad}$) and skill. As a result, migrants from countries with relatively high earnings inequality will tend to be drawn from the intermediate ranks of the skill distribution. This is because the higher returns to skill at home dissuade the high skilled to migrate ($s > s_U$) and the high migration costs price out the poor and low skilled from migration ($s < s_L$). Random recruiting decreases migration costs at all skill levels (Panel A). This means an upward shift of the $net\ wage_{abroad}$ curve. As a result, more individuals will migrate from both ends of the skill distribution. Selective recruiting decreases migration costs only at some skill levels, resulting on more individuals migrating from a specific part of the skill distribution (Panel B). The effect of selective recruiting on the direction (degree) of migrant selection depends primarily on the chosen recruitment threshold (s^*), which reflects the employers' preferences. Panel B illustrates the case of positive selective recruiting, i.e., employers prefer migrant workers with above-average skills.

Figure A.6: Distribution of the migrant sample, 1906–1908



Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Note: The figure shows kernel density estimates of the migrant sample. Previous literature documents that Mexican immigration was more intense during the planting (February–April) and harvest (August–October) seasons. The density of *enganche* immigration (recruited migrant workers) increases during these periods. The evidence also suggests that the *enganche* operated throughout the year before the Panic of 1907, suggesting that labor recruiting could have also been practiced in sectors other than agriculture. The Panic of 1907 "broke" the existing seasonal immigration patterns and neither the *enganche* nor the *non-enganche* immigration returned to their pre-Panic levels during 1908.

Table A.1: Average height (cm) across regions (men)

	North	Bajio	Center	South
Migrant	169.2	167.0	167.9	165.4
	(6.0)	(5.9)	(7.2)	(5.4)
Rurales	167.4	166.8	166.0	166.3
	(6.39	(6.3)	(6.4)	(5.7)
Federales	166.8	165.2	163.7	161.3
	(6.9)	(6.6)	(5.9)	(5.7)
Passports	171.3	171.1	169.4	168.9
	(7.3)	(7.5)	(7.3)	(7.1)
Observations	2,208	5,850	2,978	461

Source: Mexican Border Crossing Records, Microfilm publication N° A3365. Military and Passport samples from López-Alonso (2015).
Notes: Standard deviations in parenthesis. We classify the regions of birth following López-Alonso (2015, p. 127). We limit the sample to males because the military data do not report geographic information for females. We consider individuals that had reached their terminal height: individuals between 22 and 65 years old.

Table A.2: Composition of Mexican immigration across periods

	Pre-Panic Oct 1906–Jul 1907	Panic Aug 1907–Jan 1908	Post-Panic Feb 1908–Dec 1908
Panel A. Complete Sample			
Average Height (cm)	168.1	167.3	168.4
Average Age (years)	30.5	31.8	32.3
Occupational Skill Class (%)			
Unskilled	91.6	88.3	83.8
Skilled	5.4	7.8	12.8
Professional	2.0	2.8	2.6
Enganche (%)	36.2	1.2	13.2
Observations (%)	58.0	16.0	25.8
Panel B. North			
Average Height (cm)	169.8	168.2	168.9
Average Age (years)	30.4	32.1	32.8
Occupational Skill Class (%)			
Unskilled	86.2	85.0	82.6
Skilled	9.5	11.1	14.0
Professional	2.5	2.2	2.1
Enganche (%)	27.3	1.8	15.5
Observations (%)	50.0	17.0	32.5
Panel C. Bajio			
Average Height (cm)	166.9	166.6	167.6
Average Age (years)	30.5	31.5	31.7
Occupational Skill Class (%)			
Unskilled	96.7	94.3	86.9
Skilled	2.2	3.6	10.7
Professional	0.7	1.4	2.1
Enganche (%)	42.7	0.7	10.2
Observations (%)	64.9	14.8	20.1

Source: Mexican Border Crossing Records, Microfilm publication N° A3365.
Notes: We classify the regions of birth following López-Alonso (2015, p. 127). We consider individuals that had reached their terminal height: individuals between 22 and 65 years old. The Panic of 1907 affected both the scale and composition of Mexican immigration.

Table A.3: Impact of the enganche on migrant selection patterns.
Dependent variable: height (centimeters)

	1	2	3	4	5	6
A. Federales						
Migrant	2.066***	2.372***	2.117***	2.089***	2.089***	2.096***
	(0.444)	(0.501)	(0.522)	(0.555)	(0.555)	(0.654)
Migrant×Panic		−1.858***	−1.622***	−2.229***	−2.480***	−2.432**
		(0.218)	(0.295)	(0.752)	(0.840)	(0.932)
Migrant×Post Panic		0.068	0.328	0.702	0.560	0.306
		(0.250)	(0.294)	(0.482)	(0.494)	(0.491)
Enganche	0.665***		0.736**	0.919*	0.919*	0.916*
	(0.248)		(0.322)	(0.506)	(0.506)	(0.523)
Enganche×Panic			1.363	1.524	1.756	2.597
			(1.849)	(1.943)	(2.014)	(1.971)
Enganche×Post Panic			−0.786	−3.061**	−3.118**	−3.095**
			(0.874)	(1.300)	(1.319)	(1.395)
Observations	4,822	4,822	4,822	4,822	4,822	4,822
R-squared	0.119	0.137	0.139	0.140	0.141	0.184
B. Passports						
Migrant	−2.252***	−1.610***	−1.792***	−1.824***	−1.824***	−2.610***
	(0.456)	(0.574)	(0.593)	(0.604)	(0.604)	(0.807)
Migrant×Panic		−1.584***	−1.356***	−1.970***	−2.222***	−1.912**
		(0.212)	(0.292)	(0.703)	(0.796)	(0.836)
Migrant×Post Panic		0.342	0.593*	0.961*	0.818	0.776
		(0.268)	(0.312)	(0.516)	(0.523)	(0.554)
Enganche	0.652***		0.711**	0.967*	0.967*	0.820
	(0.239)		(0.318)	(0.501)	(0.501)	(0.547)
Enganche×Panic			1.388	1.475	1.707	2.107
			(1.843)	(1.931)	(2.001)	(2.040)
Enganche×Post Panic			−0.761	−3.110**	−3.167**	−3.101**
			(0.880)	(1.306)	(1.325)	(1.413)
Observations	4,901	4,901	4,901	4,901	4,901	4,901
R-squared	0.060	0.077	0.078	0.080	0.080	0.116
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls×Time period	No	Yes	Yes	Yes	Yes	Yes
Season×Time period	No	No	No	Yes	Yes	Yes
Season×Enganche×Time period	No	No	No	Yes	Yes	Yes
Droughts×Time period	No	No	No	No	Yes	Yes
Controls×Birth cohort	No	No	No	No	No	Yes

Source: Mexican Border Crossing Records–Microfilm publication N° A3365 and López-Alonso (2015).
Notes: * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Robust standard errors, clustered by birth cohort, in parenthesis. Interactions in the control variables denote full sets of interactions.

Identification of enganche migrants

To identify *enganche* migrants, we first collapse the migrant sample by source municipality (s), destination county (d), year-month of crossing (t), and port of entrance (p):

$$w_{sdtp} = \sum i_{sdtp}. \tag{5}$$

We then standardize the size of each migration flow (w_{sdtp}) using the mean (μ_{sdp}) and standard deviation (σ_{sdp}) of the corridor (source-destination-port combination) to which the flow belongs:

$$z_{sdtp} = (w_{sdtp} - \mu_{sdp})/\sigma_{sdp}. \tag{6}$$

Note that the *z-scores* (z_{sdtp}) allow us to identify unusual, large migration flows relative to mean size of the flows belonging to the same migration corridor. Previous literature documents that labor contractors commonly hired between 30 and 400 migrants depending on the nature of the jobs and season of the year (Clark, 1908; Durand, 2016). *Enganche* advertisements of the time confirm this information (advertisements available upon request). Hence, we identify as *enganche* flows those migration flows of at least 30 migrants and whose size falls at least one standard deviation above the average size of the flows in each migration corridor:

$$enganche_{sdtp} = \begin{cases} 1 & \text{if } w_{sdtp} \geq 30 \text{ and } z_{sdtp} \geq 1 \\ 0 & \text{if } otherwise. \end{cases} \tag{7}$$

Finally, all individuals belonging to an *enganche* flow are considered *enganche* migrants.

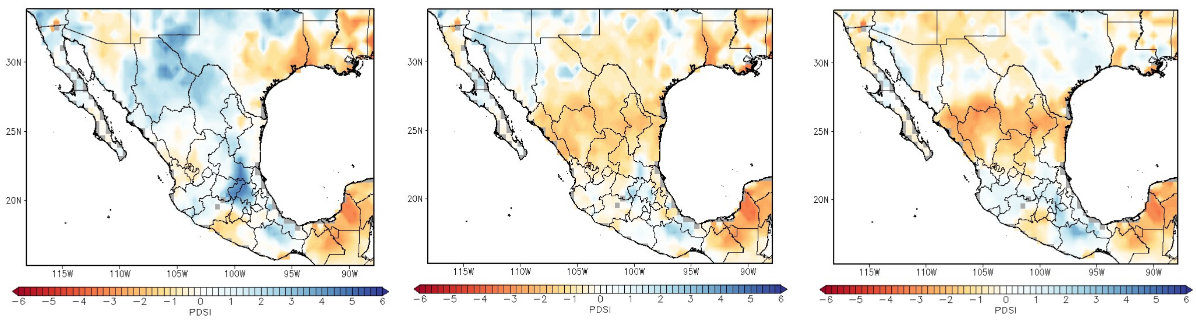
Identification of Mexican locations affected by droughts

We identify droughts at the municipality level using the Mexican Drought Atlas, which reports reconstructions of a self-calibrating Palmer Drought Severity Index (PDSI) on a 0.5° latitude/longitude grid centered over Mexico from AD 1400-2012 (Stahle et al., 2016). The PDSI uses temperature and precipitation data to calculate a standardized dryness index that spans from -6 (dry) to +6 (wet), with values below -2.0 (+2.0) representing moderate droughts (wet spells) (Wells et al., 2004). Figure A.7 shows that moderate droughts affected specific regions of the country, namely the central plateau, northeast, and Yucatan peninsula. This evidence coincides with historical literature documenting regional droughts from 1906 to 1910 in Mexico (Clark, 1908; Contreras, 2005; Mayet et al., 1980).

To identify migrants whose decision to move was potentially driven by the presence of droughts, we first classify the migrants' reported localities of origin into municipalities using the 1910 Mexican census. We then consider that migrant i was affected by droughts if she comes from a municipality m with an estimated PDSI value of -2.0 or lower:

$$drought_{im} = \begin{cases} 1 & \text{if } PDSI_{im} \leq -2.0 \\ 0 & \text{if } otherwise. \end{cases} \tag{8}$$

Figure A.7: Droughts in Mexico, 1906-1908



Jan - Dec 1906 *Jan - Dec 1907* *Jan - Dec 1908*

Source: Stahle et al. (2016).
Notes: The maps display Palmer Drought Severity Index (PDSI) values at the local level. The PDSI uses temperature and precipitation data to estimate relative dryness. It is a standardized index that spans from -6 (dry) to +6 (wet). PDSI values below -2.0 represent moderate droughts, while values above +2.0 represent moderate wet spells. The panel shows the presence of droughts in specific regions during 1908; particularly, in the states of Chihuahua, Coahuila, Durango, Nuevo León, Sinaloa, and Tamaulipas (see Figure A.1 for guidance). In these states, the average local PDSI value ranges from -2.2 to -2.7.