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# The Effect of Immigration on Local Labor Markets: Lessons from the 1920s Border Closure

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*In the 1920s, the United States substantially reduced immigration by imposing country-specific entry quotas. We compare local labor markets differentially exposed to the quotas due to variation in the national-origin mix of their immigrant population. US-born workers in areas losing immigrants did not gain in income score relative to workers in less exposed areas. Instead, in urban areas, European immigrants were replaced with internal migrants and immigrants from Mexico and Canada. By contrast, farmers shifted toward capital-intensive agriculture and the immigrant-intensive mining industry contracted. These differences highlight the uneven effects of the quota system at the local level.*

## I. Introduction

This paper studies the local economic effects of the 1920s border closure, one of the most fundamental changes to United States immigration policy in the

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past century. In the early twentieth century, European immigrants faced few restrictions for entry into the US, and close to one million immigrants arrived on the nation's shores each year. This era of open immigration ended in the 1920s with a series of increasingly restrictive immigration quotas, eventually limiting entry from affected countries to 150,000 a year.[1] As a result, the foreign-born share of the population fell from 14 percent in 1920 to 5 percent in 1970. Because there have been few such drastic changes in immigration policy in US history, this episode offers a rare window into how local labor markets might adapt to policies that aim to reduce immigrant flows, including a number of recently proposed restrictions in the United States and the European Union.

We find that local labor markets that were more exposed to the national immigration quotas lost more immigrant workers compared to markets that were less exposed. Yet US-born workers in these areas did not benefit from the reduced supply of immigrant workers, as measured by income score. Instead, we document two local responses to the immigration quotas. In urban areas, more affected labor markets attracted new workers, including US-born internal migrants and immigrants who were not restricted by the quotas. As a result, net labor supply did not change. By contrast, in rural areas, the loss of immigrant workers in more affected labor markets encouraged landowners to invest in more farm capital and to shift away from labor-intensive crops. The mining industry contracted in labor markets more exposed to the border closure, both in workforce and capital stock. Mining was highly dependent on immigrant labor at the time, and did not have adequate forms of substitutable capital until the 1940s.

All local labor markets in the US are potentially connected via internal migration, capital flows and trade. Our income estimates should thus be interpreted as indications of relative gains and losses. The first part of our paper documents these relative wage effects and the second part estimates labor and capital

[1]The US quotas were part of a global movement away from open immigration, mirrored by Canada, Argentina and other New World economies (Timmer and Williams, 1998).

responses.

Our research strategy relies on classifying labor markets as more or less exposed to the national immigration quota based on the historical country-of-origin composition of their immigrant population. The 1920s quota laws restricted immigration from some sending countries more than others. Most of the slots were reserved for entrants from Northern and Western European countries like Ireland and Germany, leaving only a small portion of the remaining slots available for immigrants from countries in Southern and Eastern Europe, such as Russia and Italy. Immigrants from countries in the Western Hemisphere, including Mexico and Canada, were entirely exempted from the quota laws.[2]

It is natural to think of our variation in the context of a simple difference-in-differences design. Controlling for the initial foreign-born share of an area, labor markets that had larger clusters of Russians or Italians, for example, were more affected by the policy than areas with clusters of Irish and Germans because immigrants tend to settle in areas with already established networks from their home country (Bartel, 1989). At the extreme, a labor market that had exclusively Italian immigrants would have been treated by the quota policy, whereas a labor market that had exclusively German immigrants would not. In reality, local labor markets vary more continuously in the share of their population from affected sending countries.[3]

Our estimation relies on the identifying assumption that local labor markets with a greater or lesser share of their foreign-born population from quota-restricted countries would not have diverged in the 1920s if not for the border closure. We provide evidence supporting the parallel trends assumption. First, we use a Lasso procedure to assess whether our measure of quota exposure is correlated with any

[2]Although Mexican immigrants were not subjected to a restrictive quota, the cost of entry through official entry ports rose in 1921. Mexican entrants were required to pay a ten dollar visa fee and were subjected to "a degrading procedure of bathing, delousing, medical line inspection, and interrogation" (Ngai, 2003, p. 85; Markel and Stern, 2002; Escamilla-Guerrero, 2020). Many Mexican entrants bypassed official entry ports as a result.

[3]Conceptually, our approach is similar to Clemens, Lewis and Postel (2018), who studied the ending of the Bracero guest worker program for Mexican immigrants in 1965, as well as to studies of trade liberalization on local economies (e.g., Kovak, 2013 and Dix-Carneiro and Kovak, 2017).

other initial characteristics (beyond Census region and initial foreign born share of the population) that might generate differential trends across locations.[4] Second, we assess pre-trends by considering a placebo policy date for the border closure: what if the border closure movement, which passed a literacy test in both the House and the Senate in 1896 (vetoed by President Cleveland), had been successful in restricting immigration circa 1900, rather than in the 1920s? Yet, we find that exposed labor markets did not experience declining immigration after this placebo policy, nor did they attract internal migration.

Our analysis shares some features with shift-share instruments because it relies on initial immigrant settlements to determine labor market exposure to the national quota policy (Bartik, 1991; Card, 2001). Jaeger, Ruist and Stuhler (2018) encourage caution in applying shift-share methods to the study of immigration, documenting high rates of serial correlation across decades in the areas that receive large immigration flows. However, the sharp change in immigration policy between the 1900s and 1920s lessens concerns about serial correlation in our context.[5]

Our findings are consistent with modern evidence that firms engage in a series of adaptions to the loss of immigrant labor, such as substituting into capital-intensive production (Lewis, 2011) or attracting internal migration to the area (Dustmann, Schönberg and Stuhler, 2016). We contribute to a growing consensus that a loss of immigrant labor may not generate employment opportunities for native-born workers in some industries, as immigrants can be readily replaced with mechanization or automation. This pattern has been widely documented in agriculture: Lafortune, Tessada and González-Velosa (2015) and Lew and Cater (2018) show that the slowing of immigration in the early twentieth century hastened mechanization on American farms. Similarly, Hornbeck and Naidu

[4]We find only one such covariate – the share of the labor force employed in agriculture, and then only for the urban sample (many urban labor markets at the time were close to farmland). Results are robust to controlling for trends by shared employed in agriculture.

[5]Correlations in immigrant shares over time are above 0.96 from 1980-2010, but are calculated to be 0.64 in our setting, and even lower (0.4) when focusing on post-policy years (1924-on) (Ager et al., 2020).

(2014) find that southern planters responded to black out-migration by investing in farm capital, and Clemens, Lewis and Postel (2018) document the same following restrictions against Bracero farm workers. In an urban setting, Lewis (2011) estimates that areas that received more low-skilled labor in the early 1990s were slower to adopt numerically controlled machines and other forms of factory automation.

We also add to the discussion of whether immigrant arrivals encourage native-born workers to migrate out from certain labor markets. There is a large body of work that comes to mixed conclusions about whether and to what extent immigrants "displace" US-born workers from local labor markets (Filer, 1992; Wright, Ellis and Reibel, 1997; Card and DiNardo, 2000; Card, 2001; Borjas, 2006; Peri and Sparber, 2011; Wozniak and Murray, 2012). Most recently, Dustmann, Schönberg and Stuhler (2016) document net declines in internal migration in German labor markets in response to Czech arrivals. We find that migration responses depend on the dominant local industry: we estimate a one-for-one replacement of lost immigrant workers by new in-migrants in urban settings, particularly in manufacturing. But US-born workers did not move to rural areas following immigrant losses, as farmers shifted to capital-intensive production.

A policy as all-encompassing as closing the border to new immigration has complex economic and social consequences. Some workers gained (e.g., those who moved into urban areas to take manufacturing jobs) and other workers lost out (e.g., those who remained in rural areas). Our paper complements recent work documenting the wide-ranging effects of the 1920s border closure on the US economy and society.[6] These studies show that the immigration quotas reduced scientific discovery and patentable ideas (Doran and Yoon, 2020; Moser and San, 2020), but also had a small (but detectable) effect on dampening the spread of

[6] Our paper subsumes Ager and Hansen's (2016; 2017), which were the earliest studies to analyze the effect of the immigration quotas on economic outcomes. Greenwood and Ward (2015), Massey (2016), and Ward (2017) examine how the quotas of the 1920s changed the skill selection and probability of return migration for European migrants. Collins (1997) and Xie (2017) have studied the relationship between the border closure and the advent of the Great Black Migration. Both Tabellini (2019) and Price, vom Lehn and Wilson (2020) analyze occupation-based earnings of US-born workers in cities.

communicable disease (Ager et al., 2020). Areas that experienced falling immigration after the border closure also became more receptive to redistribution (Tabellini, 2019).[7]

Together, this work adds to the broader literature about the economics of the Age of Mass Migration from Europe reviewed by Abramitzky and Boustan (2017). This work has spanned many topics, including migrant selection and assimilation (Ferrie, 1999; Abramitzky, Boustan and Eriksson, 2012, 2013, 2014, 2020; Spitzer and Zimran, 2018; Alexander and Ward, 2018; Ward, 2020; Eriksson, 2019); return migration to Europe (Bandiera, Rasul and Viarengo, 2013; Ward, 2017; Abramitzky, Boustan and Eriksson, 2019); and the long-run effects of immigrant settlement on local areas (Ager and Brückner, 2013, 2018; Burchardi, Chaney and Hassan, 2018; Sequeira, Nunn and Qian, 2019).

## II. Immigration policy in the early twentieth century

America had an open immigration policy toward European immigrants in the 150 years after its founding, punctuated by periodic outbreaks of anti-immigrant sentiment (Hutchinson, 1981; Higham, 2002).[8] The first national attempt at broad immigration restriction was a bill requiring a literacy test for entry to the US, which was proposed (but not adopted) in 1891 (Fairchild, 1917). The Dillingham Commission, which was convened by Congress in 1907 to study immigration, recommended applying literacy and wealth tests for immigrant entry, alongside numerical limits on immigration. A literacy test was eventually adopted in 1917, but, by then, was deemed ineffective, both because it was poorly enforced and

[7]Other immigration policies that have been studied by economists are the Chinese Exclusion Act of 1882 (Chen, 2015), and contemporary legislation to address undocumented migration, including the Immigration Reform and Control Act (Phillips and Massey, 1999; Freedman, Owens and Bohn, 2018) and Secure Communities (Miles and Cox, 2014). In a related modern paper, Allen, Dobbin and Morten (2018) study the expansion of border fencing to deter illegal entry from Mexico.

[8]The arrival of poor Irish immigrants escaping the Great Famine of the 1840s gave rise to the (short-lived) nativist Know-Nothing party and a series of state-level regulations – particularly in Massachusetts and New York – allowing for aliens "likely to become a public charge" to be barred from entry or deported after arrival (Hirota, 2016; Alsan, Eriksson and Nimesh, 2018; Collins and Zimran, 2019). At the national level, the Chinese Exclusion Act of 1882 was followed by a series of incremental restrictions on contract labor and the entry of criminals, paupers, and other 'undesirable' groups (Daniels, 2005; Lew and Cater, 2018; Okrent, 2020).

because literacy rates in Europe had risen rapidly.

Like today, contemporary observers in the early twentieth century debated the likely effect of immigration restrictions on the existing workforce. Jeremiah Jenks, an economist at Cornell and member of the Dillingham Commission convened by Congress to study immigration, argued that immigrants displaced the US-born from the manufacturing and mining sectors and lowered wages, writing that "it is undoubtedly true that the availability of the large supply of recent immigrant labor has prevented an increase in wages which otherwise would have resulted during recent years from the increased demand for labor" (Jenks and Lauck, 1912, p. 195). Others disagreed, suggesting that low-skilled immigrants were complements to the higher-skilled US-born workforce. Edward Steiner, professor at Grinnell College, asserted that "not many have been crowded out [by immigration]... the [US born] do not care to go back to the track, the pickax and the shovel" (Steiner, 1909, p. 190-91). The agricultural sector also lobbied against immigration quotas, asserting that immigrant workers were willing to perform farm labor tasks that the US-born workforce refused to do (Wang, 1975).

After a series of unsuccessful attempts to close the border, the era of open immigration came to an end in the 1920s. In 1921, Congress passed the Emergency Quota Act, which set an annual quota of 360,000 for immigrants from Europe (compare to around 800,000 entrants per year in the early 1910s). Entry slots were allocated by country-of-origin and were set to 3 percent of the foreign-born stock from each nationality living in the US as of 1910. The Immigration Act of 1924 (also known as the Johnson-Reed Act) made the quota system permanent and enacted two major changes to the allocation scheme: shifting the base year for measuring the immigrant stock from 1910 to 1890 and lowering the inflow from 3 percent to 2 percent of that stock per year. Setting the base year to 1890 further disadvantaged Southern and Eastern Europeans, whose numbers in the US were smaller in that year. The annual quota for affected countries was set at 150,000 in 1929 and remained largely unchanged until the 1965 Immigration and Naturalization Act (for details on the policy debates, see King, 2000; Tichenor, 2002).[9] Immigration from the Americas, including Canada, Mexico and the Caribbean, was not regulated by these acts.[10]

The country-of-origin formula differentially affected immigration from each European country. The quotas assigned to immigrants from Northern and Western Europe were relatively generous, whereas immigration from Southern and Eastern Europe was severely restricted because the immigrant stock from these countries was small in 1890. Less than 20 percent of the 1924 quota was assigned to countries from Southern and Eastern Europe. As a result, immigration from these sending regions fell from 70 percent of the total immigrant flow in the 1910s to 15 percent of the flow after 1924.

Figure 1 displays the variation in immigration flows by sending region and decade that drives our empirical strategy. Panel A documents patterns by sending country, and Panel B groups these countries into "high restriction" (i.e., Southern and Eastern Europe), "low restriction" (i.e., Northern and Western Europe) and "no restriction" (i.e., Western Hemisphere) regions. Nearly six million immigrants from high restriction countries entered the US from 1902-10. After the quota's passage, this sum fell to less than one million. Immigration from low restriction countries also fell during this period but to a lesser degree, and some of the available quota slots went unfilled, suggesting that some of this decline may not have been legislated, but instead may have been driven by changes in the underlying demand to immigrate to the US. By contrast, immigration from the Western Hemisphere increased, quadrupling from the 1900s to the 1920s.[11]

[9] After July 1, 1927, the allocation of quota slots was shifted again to a 'national origins' formula based on estimates of the national origins of the white population of the US in 1790. This rule further restricted immigration from Southern and Eastern European countries and favored immigration from the United Kingdom and Ireland over Germany and Scandinavia (King, 2000).

[10] Many Caribbean islands may have fallen under the quota of their colonial power (Putnam, 2013). However, we classify the Caribbean as unrestricted here because their population grew rapidly in the 1920s, increasing by 70 percent (compare to a 29 percent increase for Mexico). Changing the classification of the Caribbean does not appreciably affect our quota exposure measure because only two local labor markets had a sizeable share of the population from these locations in 1900 (Fort Lauderdale and Miami, FL).

[11] Around 500,000 Mexican immigrants entered the US from 1920 to 1930; Lee, Peri and Yasenov (2017) document that more than 400,000 individuals of Mexican descent, some of them US citizens, were

Economists at the time argued that immigrants from Canada and Mexico were responding to new opportunities arising from restriction of European immigration (Abbott, 1927). The qualitative history also emphasizes that Mexican arrivals increased in the 1920s in response to the border closure.[12]

## III. Research design and estimation

### *A. Measuring local area exposure to the immigration quotas*

Our goal is to measure the exposure of each local labor market to the national immigration quotas. We start by delineating local labor markets according to the 460 State Economic Areas (SEA).[13] SEAs are groups of counties that were deemed to be economically integrated as of 1950 (Bogue, 1951). SEAs are the historical equivalent of Commuting Zones used today to define local labor markets (e.g., Autor, Dorn and Hanson, 2013).[14]

Our identification strategy relies on variation across SEAs in the settlement patterns of immigrants by country of origin in the pre-quota period. The following example illustrates the quota-based "experiment" we have in mind: Consider two SEAs, $A$ and $B$. Both have the same foreign-born share in 1900, but in SEA $A$ all foreign-borns are Italians (a more restricted country) while in SEA $B$ the foreign-born stock consists only of Germans (a less restricted country). After the quota system is introduced, we would expect the immigrant inflow into highly affected SEA $A$ to be lower relative to the less affected SEA $B$.

deported to Mexico during the Great Depression.

[12]In Chicago, immigrants were replaced with "blacks and Mexicans... [contributing to] the increasing presence of these two groups within Chicago's factories during the decade [1920-29]" (Cohen, 1990, p. 165; see Moralez, 2018 on recruiting efforts to bring Mexican workers to Indiana). Mexican immigrants also pursued opportunities in rural areas. Luebke (1977, p. 421) documents that "after World War I, Chicanos or Mexican-Americans gradually replaced Russian Germans in the sugar beet fields as migrant workers" (see also Wang, 1975, p. 649).

[13]We exclude SEAs located in Hawaii, Alaska and parts of Oklahoma, which were not part of the US in a consistent manner throughout this period. One downside of SEAs as a local labor market definition is that they are nested entirely within states, which may mis-measure economic activity that crosses state lines (e.g, Kansas City, KS-MO; greater New York City, NY-NJ).

[14]Commuting Zones are less appropriate for our setting because they were defined in 1990, nearly a century after our period of interest. We demonstrate robustness to using county as a labor market definition.

Operationalizing this thought experiment requires two pieces of information for each SEA: (1) the initial population share of the SEA from each country of origin (as calculated from the complete-count Census of 1900), and (2) the intensity of quota restriction for each country of origin. In our simplest exposure measure, we classify quota intensity as an indicator, $I(Restricted_c)$, equal to one for countries $c$ with near complete restrictions (Southern and Eastern European countries) and equal to zero for those with non-binding restrictions (all other countries). Although stylized, this approach fits the data well because the law was targeted at immigrants from Southern and Eastern Europe, and the quota limits technically set for Northern and Western European countries were rarely filled (see Figure 1) (King, 2000; Tichenor, 2002; Daniels, 2005).

The resulting simple measure of *quota exposure* for SEA $j$ ($QE_1$) is thus:

$$QE_{1j} = \sum_c \frac{FB_{cj1900}}{Pop_{j1900}} \times I\{Restricted_c\} \tag{1}$$

where $FB_{cj1900}$ is the count of residents living in SEA $j$ in 1900 who were born in country $c$ and $Pop_{j1900}$ is total population of the SEA in 1900. In other words, local exposure to the national immigration quotas simply scales with the share of an area's population that was born in Southern or Eastern Europe. This approach resembles the identification strategy that Clemens, Lewis and Postel (2018) use to study the ending of the Bracero guest worker program.

We construct an alternative measure of quota exposure ($QE_2$) that incorporates variation in quota severity across sending countries. This measure requires knowing (or making some assumptions) about the share of desired immigration by sending country that was barred by the quotas. We cannot observe what the counterfactual immigration flows would have been in the 1920s in the absence of the restrictive quotas. $QE_2$ is based on a simple prediction for what immigration would have been in the 1920s based on historical time series.[15] For $QE_2$,

[15]We use nearly 100 years of unrestricted immigration for 18 country groups to predict what immi-

we replace the treatment indicator $I(Restricted_c)$ in equation (1) with a quota intensity ratio that varies from zero to one as follows:

$$QE_{2j} = \sum_c \frac{FB_{cj1900}}{Pop_{j1900}} \times QuotaIntensity_c \tag{2}$$

where $QuotaIntensity_c$ is defined as the difference between unrestricted flows (absent the policy) and quota slots in the 1920s, normalized by unrestricted flows. This ratio will be zero if the quota allocated slots are greater than or equal to the number of unrestricted flows, and it will be one if the quota is set equal to zero.

Table A1 reports the quota intensity measures for each country group. By definition, quota intensity is equal to one for the highly restricted southern and eastern European countries under $QE_1$ and equal to zero for the less restricted northern and western European countries, and for the unrestricted countries in the Western Hemisphere. Quota intensity values for $QE_2$ are remarkably similar to the stylized zeroes and ones, with an average value of 0.925 for highly restricted countries and 0.07 for less restricted countries (and zero by definition for quota-exempted countries/regions). Our main results are based on the more comprehensive measure $QE_2$ but we show results for $QE_1$ in our robustness tables.

Exposure to the national quota varies substantially across regions in the US. Figure 2 presents a heat map of quota exposure at the SEA level (based on $QE_2$) with darker shading reflecting higher exposure to the national quota. We present variation in quota exposure net of Census region indicators and our control for 1900 foreign born population share, as it will appear in our analysis. Variation in quota exposure is apparent across cities, even within the same state (e.g., Pittsburgh versus Erie, PA or Toledo vs. Dayton, OH). There are also some rural SEAs that have very high quota exposure (e.g., North Dakota and northern

gration would have been in the 1920s absent quota restrictions (see note to Table A1 for a list of country groups). In particular, we predict the number of entrants to the US every year as a quadratic function of time, where the mass migration is said to begin (t = 1) when migration first crosses the threshold of 2,000 arrivals. The model also includes an indicator for recession years as declared by the NBER, which are known to substantially reduce immigration inflows (Spitzer, 2015).

Minnesota or the Pacific Northwest). Figure A1 depicts the heat maps of foreign born share and quota exposure separately. The low rates of foreign-born share (and thus of quota exposure) in the South is clear. It is also easy to see areas where foreign-born share is high but quota exposure is low (e.g., southern Texas, eastern Michigan).

We present our main results for the full sample and separately for subsamples of urban, rural and mining areas. The Census classifies as "urban" any town with 2,500 or more residents. We consider an SEA to be urban if it had an above-median share of its population living in an urban area. The median urban share at the SEA level was around 20 percent in 1900, with SEAs near the threshold including the iron range in northern Minnesota and areas in upstate New York. We also extract a subsample of "mining areas" because the mining industry had a high concentration of immigrant workers (41 percent of mining workers were foreign born in 1900, compared to 12 percent in agriculture and 19 percent in the rest of the economy), and because the mining industry was very geographically concentrated. We define mining areas as any SEA that had at least two percent of its workforce employed in the mining industry in 1900.[16] Our final sample has 170 urban (non-mining) SEAs, 175 rural (non-mining) SEAs, and 115 mining SEAs.

### *B. Estimating the effects of quota exposure*

Our empirical analysis addresses three questions. We start by confirming that local labor markets with higher quota exposure lost more immigrant inflow after the border closure. We then ask how the drop in immigration affected measures of wages or a proxy for income for US-born workers. Finally, we investigate how local economies adapted to the loss of immigrant labor by estimating responsive worker inflows and capital investments by sector.

[16]The share of labor force in the mining sector was bimodal at the SEA level. Conditional on having at least two percent of the workforce in mining, the average SEA had 10 percent in mining.

The Census did not collect systematic data on wage or income until 1940, after this period. We thus rely on two sources of information: (1) we create a proxy for individual income using occupation and other attributes, and (2) we use aggregate data on wages in the manufacturing sector in urban areas. For our income proxy, which covers the full country, we follow Abramitzky et al. (2021) in estimating a statistical model that predicts log income from covariates in the 1940 Census (the first year with income data), and then use this model to assign income for men in earlier years. The covariates we use are a quadratic in age, indicators for 3-digit occupations and current state of residence, as well as all interactions.[17] The 1940 Census does not record income from self-employment, so we compute income for farmers (the vast majority of which are self-employed) following an approach outlined by Collins and Wanamaker (2014).[18] We also report results using the standard "occupation score," which is based on income from the 1950 Census.

We stack data from three Census decades: 1900 and 1910 before the policy and 1930 after the policy. For each outcome, we estimate the following equation:

$$y_{jt} = \alpha_j + \gamma_{dt} + \beta\left(QE_{2j} \times Post_t\right) + \Gamma\left(FB_{j1900} \times Post_t\right) + \varepsilon_{jt} \tag{3}$$

$$y_{j\tau} = \alpha'_j + \gamma'_{d\tau} + \beta'\left(QE_{2j} \times Post_t\right) + \Gamma'\left(FB_{j1900} \times Post_t\right) + \varepsilon'_{jt} \tag{3'}$$

where $t = 1900, 1910, 1930$ and $\tau = 1910, 1930$. For equation (3), $y_{jt}$ can include: the foreign-born share of the prime-age male workforce (15-65 years old), a proxy for income of US-born workers, and measures of wages, prices, and capital investments in the manufacturing, agricultural and mining sectors.[19] We use equation

[17] In particular, we interact age, age squared and 1-digit occupation indicators with covariates with Census region. Our method is similar to the machine-learning approach for computing income scores proposed by Saavedra and Twinam (2020).

[18] Specifically, we make use of the fact that the 1940 Census records the incomes of farm laborers, and that later Censuses record how much farmers earn relative to farm laborers. We thus compute farmer incomes by multiplying the income of farm laborers in 1940 with the ratio of earnings for farmers versus farm laborers in the 1960 Census, by region and immigration status.

[19] In 1920, 80 percent of individuals between 15-65 reporting a gainful occupation were male. We

(3′) to consider migration outcomes (net inflows). It is based on one pre-period observation (flows from 1900-10, $t = 1910$) and one post-period observation (flows from 1920-30, $t = 1930$).

The prime variable of interest is the interaction between exposure to the quota policy ($QE_{2j}$) and the indicator ($Post_t$) representing the period after the policy change (= 1930). The main effect of quota exposure is absorbed into SEA fixed effects ($\alpha_j$) and the main effect of $Post_t$ is included in decade-by-census region fixed effects $\gamma_{dt}$. The coefficient of interest $\beta$ is identified by comparing labor markets with different shares of residents from restricted countries before and after the policy change. Note that we exclude 1920 from our main analysis because it falls immediately after World War I (1914-18), which led to a temporary moratorium on immigration, but we reconsider results that include 1920 or control for World War I exposure in the robustness section.

Local areas can be more exposed to the quota policy because they have a higher foreign-born share of the population (*scale*) or a larger share of their foreign-born population drawn from restricted countries (*composition*). In our preferred specification, we interact the initial (1900) foreign-born share of the SEA population with the post-policy indicator ($FB_{j1900} \times Post_t$) to control for differential trends by initial foreign-born share, thereby identifying the effect of quota exposure solely from differences in composition of the immigrant population. We present results that omit the control for initial foreign-born share or that allow for alternative geographic trends in the appendix.

Our identifying assumption is that, conditional on controls for census region and initial foreign-born share of the population, areas with more southern and eastern Europeans would have followed similar economic trends absent the border closure policy. We provide two pieces of evidence to support this assumption: (1) a Lasso procedure to search for other correlates of our quota exposure measure and (2) a placebo analysis that asks what the estimates would look like if the

investigate the effect of the border closure on the female labor force participation rate below.

border had closed earlier.

## IV. Local exposure to immigration quotas and the income score of US-born workers

The quotas of the 1920s were intended to substantially reduce immigration to the US. We start in Figure 3 by documenting that local labor markets that were more exposed to the quota policy experienced declines in the foreign-born share among prime-age men (figures in left-hand column). Each graph depicts the partial relationship between quota exposure and change in share recent foreign born arrivals at the SEA level, for urban, mining and rural SEAs. The scatter plots are the graphical version of equation ($3'$), and we report the coefficient from the estimation in each image. In all location types, a 1 percentage point difference in quota exposure is associated with around a 1 percentage point decline in the foreign-born share of the workforce after the border closure (graphs in column 1).[20]

Yet, despite declines in the foreign-born workforce, US-born workers did not gain higher (occupation-based) income in more affected labor markets following immigration restriction (graphs in column 2). We focus our attention here on a sample of US-born men who lived in the SEA at both the beginning and end of each decade so that results will not be driven by selective in- or out-migration (see also Foged and Peri, 2016; Price, vom Lehn and Wilson, 2020).[21] Declining immigration in areas exposed to the border closure policy is associated neither with rising nor falling income in urban, mining or rural SEAs. In rural areas, we note one outlier with a large quota exposure (North Dakota). Dropping the

[20]Peri and Sparber (2011) demonstrate that this specification is subject to bias because the denominator of the foreign-born share (total population) is itself endogenously related to immigration as other residents may be attracted to or leave an area. We use the specification that Peri and Sparber recommend below (Table 1).

[21]To focus on men who lived in the SEA at the beginning and end of each decade, we create two linked samples – one that follows men aged 15-55 from 1900 to 1910 and the other following men aged 15-55 from 1920 to 1930 – using the Abramitzky, Boustan and Eriksson algorithm (Abramitzky, Boustan and Eriksson, 2012; Abramitzky et al., 2019). Links are established by first and last name, age and place of birth. We then collapse earnings for US-born workers by SEA.

outlier does not change the null result. For the rest of the paper, we exclude this outlier because the quota exposure in North Dakota is multiple standard deviations above the rest of the rural sample.

Table A2 documents that the relationships between falling immigration shares and the income of US-born workers are robust to a series of alternate specifications (rows 2-9). We start by considering a sample that includes all men who lived in the SEA at the beginning of the decade, rather than only men who stayed in the area. We then add an observation for the 1910-20 decade in each SEA, or the one additional control (initial share of the workforce in farming) selected by our Lasso procedure presented in Table A3.[22] Results are similar in all cases. Next, we drop two sets of outliers: SEAs with the greatest initial migration out-flows to highly treated SEAs or SEAs with the lowest quota exposure. These areas might be indirectly exposed to the quota policy via outflows of their existing US-born population. Yet, results are unchanged in this subsample, suggested that indirect effects of the quota policy on areas losing out-migrants does not bias our estimate.

Finally, we try state-specific time trends (rather than Census region), our alternative quota exposure measure, or weighting each SEA by initial population. In urban areas, declines in immigration are associated with income losses when we consider state trends rather than region trends (albeit not statistically significant). This pattern is similar to one found in a related paper by Tabellini (2019). We replicate Tabellini's result in row 10 by replacing our income score with the classic "occupation score" based on median earnings in each occupation in 1950, dropping the control for initial foreign-born share, and including

[22]Table A3 considers the relationship between our quota exposure measure and a series of available economic and demographic controls, including: log total population, share urban, share black, share literate, share of the labor force in manufacturing sector, share of the labor force in agriculture, share of the labor force holding a white collar position, log mean wages in manufacturing, log mean farm value, log mean farm output per acre, share of owner-operated farms, share of farm land under cultivation, share of cultivated farm land planted in wheat, share of farm land planted in cotton and share of farm land planted in hay/corn. None of these controls are selected by the Lasso procedure with the exception of the share of the labor force in agriculture, which is selected in the urban and mining subsamples. Recall that we define urban areas as SEAs with above median share of population in a city or town; many of these areas were adjacent to and integrated with more agricultural land, and these appear to have lower quota exposure.

state-specific trends. When we do, we find that US-born workers in urban areas experienced income declines with a magnitude consistent with Tabellini (2019).[23] Overall, we conclude that immigration restrictions had neutral to negative effects on the earnings of US-born workers in all areas – cities, rural areas and mining communities.

## V. The effect of the quota policy on labor flows

Restricting the border to new immigration did not improve the income score of US-born workers in more exposed labor markets. Why was the income of these incumbent workers not buoyed by a reduction in labor supply from abroad? The answer depends on the sector. In urban areas – and especially in manufacturing – the loss of immigrant labor was replaced on a nearly one-for-one basis by new inflows of internal migrants, as well as immigration from unrestricted countries. This pattern suggests that income for the existing workforce likely rose in urban areas immediately after the quotas were imposed, thereby attracting in new workers who reversed any initial income gains. In rural areas, farmers instead substituted toward capital-intensive crops. The mining sector, which had been heavily dependent on immigrant workers, contracted after the border closure. As a result, new workers were not attracted to these areas.

We start in this section by examining labor flows. We proxy for net in-migration to an area with change in population of prime-age men over a census decade, normalized by initial population in the base year.[24] These changes cannot be driven by fertility and, as we will see, are far too large to reflect mortality alone.[25]

[23]Note that our analysis differs from Tabellini (2019) in a number of ways. He focuses on the 180 largest cities, while we look at the whole country; he includes only the decades of the 1910s and 1920s (both of which had immigration slowdowns or restrictions), while we also contrast these decades with the open immigration of the 1900s; he uses a shift-share instrument, rather than a measure of policy exposure; and he does not use linked data and so may be picking up selective migration. Despite these differences, we do find a similar pattern when we approximate his specification.

[24]Here, we follow Peri and Sparber (2011) in dividing by initial population because final population can itself be an outcome.

[25]Ager et al. (2020) show that the border closure reduced mortality rates from infectious diseases in affected cities, but find no substantial mortality differences in rural counties. Since the implied decline in mortality from Ager, et al.'s estimate is rather small, the equivalent of 0.05 deaths per 100

We use the complete-count historical Censuses (100 percent samples) to count prime-age men by State Economic Area (SEA), overall and by demographic or occupation group.

Table 1 begins by confirming that areas with greater exposure to the quota policy experienced larger net losses of recently-arrived foreign-born men from restricted countries.[26] We find that a 1 percentage point increase in quota exposure is associated with the entry of 0.7 fewer recently-arrived immigrant men per 100 initial residents in rural areas and 1.3-1.5 fewer new arrivals in urban and mining areas, or around 650 fewer immigrants for a typical city of 50,000 residents.

We next ask how workers who were unrestricted by the quota policy responded to the reduction in immigrant flow. The loss of immigrants due to the border closure attracted other workers to urban areas (presumably due to rising wages in the short run). In urban areas, the decline of 1.5 immigrants per 100 in the population was associated with 2.6 new entrants per 100. Around one quarter of these new entrants were immigrants from the Western Hemisphere (Canada, Mexico, and the Caribbean) who were unrestricted by the quota policy. By contrast, if anything, in rural areas, we find a net outflow of unrestricted population as immigrants leave the area.

We do not find that non-white workers are attracted to cities that lost immigrant workers from Europe, which seems at odds with Collins (1997) and Tabellini (2019). We recover Tabellini's finding that immigrant departures are associated with non-white arrivals in cities when we drop the control for initial foreign born share of the population (coeff. = 0.179, s.e. = 0.086). We suspect that this relationship is sensitive to choice of controls because non-white inflows were concentrated in 5-10 major cities at the time (Boustan, 2017).

Our finding of in-migration to urban areas also contrasts with Tabellini (2019),

in the population, it can only account for 5 percent of our net in-migration estimates (see Table 1). Furthermore, Table 2 documents that most of the net in-migration is driven by young men, ages 15-39, who tended to have low mortality rates even in this period.

[26]Note that, even in 1930, the latest date in our sample, immigrants who arrived more than 10 years before the census date (= 1920) would not have been subjected to the border restriction policy and so we do not expect their numbers to fall in exposed areas.

who finds no responsive in-migration to cities that lost immigrants following the border closure. Table A4 explores this discrepancy by sub-dividing urban SEAs into likely central cities (the largest county in the SEA) and likely suburban areas (the remaining counties in the SEA). We find that immigrant departures are concentrated in central cities (losing 1.6 immigrants per 100 in the population), but that US-born white arrivals are larger in suburban areas (gaining 3.3 white US-born workers per 100 in the population). Thus, we suspect that the difference in our findings stem from geographic definitions. We focus on SEAs, our best measure of local labor markets, and Tabellini (2019) focuses on central cities alone.

We then turn to three supporting pieces of evidence suggesting that in-migration is responding to immigrant departures: first, both immigrant losses and in-migrants are most likely to be young men; second, in-migrants are concentrated in industries and/or occupations that had high initial rates of foreign-born workforce; and third, we do not find similar inflows in the decades before the policy change.

Table 2 subdivides workers by age category, separating young workers (15-39) and older workers (40-65). For brevity here and in the rest of the paper, we consolidate workers into restricted workers (= recent European immigrants) and all other unrestricted workers (= US-born, long-standing European immigrants and all immigrants from the Western Hemisphere). Both immigration and internal migration are more common activities among the young than the old. Correspondingly, we find that close to 90 percent of immigrant losses and between 67-100 percent of the responsive worker flows were concentrated among young workers. This pattern holds in all areas, lending credence to the assumption that our estimates are picking up the effect of the border closure policy on exposed areas. Other correlated attributes of local areas would likely affect both young and older workers.

Table 3 divides workers by industry. Around 50 percent of immigrant losses in urban areas were from the manufacturing sector (= 0.8/1.5); most of these losses were replaced with unrestricted workers. More than 80 percent of immigrant losses in mining or rural areas were from the mining or agricultural industries; these losses were not replaced. Table A5 instead divides each sector of the economy into occupational quintiles, based on the foreign-born share of the workforce in the occupation in 1910 nationwide. In urban and mining areas, 90 percent of immigrant losses were in the top two quartiles. Urban in-migrants replaced these lost immigrant workers nearly one-for-one. In rural areas, the immigrant losses were more widespread across the quintiles.

We explore the possibility of pre-trends before the policy change by considering a placebo policy: what if the border had closed in the 1900s, instead of the 1920s? Table 4 conducts a similar difference-in-differences exercise where the pre-period is 1890-1900 and the (counterfactual) post-period is 1900-10. Because the micro-data from the 1890 Census was destroyed in a fire, we have to rely on aggregate tables published by the Census Bureau for this exercise. The available categories do not match our preferred measures. Instead, we consider changes in all people born in a high restriction country (rather than prime-age men) for the quota-restricted group, and we consider US-born men between the ages of 18-44 for the quota-unrestricted group. The first panel reproduce results from our actual policy experiment dates using these alternate dependent variables; coefficients look similar to the main results in Table 1 in urban and mining areas, but the results are weaker in rural areas.

The second panel of Table 4 then considers the placebo experiment dates. We see no pre-trend in immigration declines in urban or mining areas exposed to the quota policy in the decades before the policy was enacted (column 3). If anything, these areas were attracting (rather than losing) immigrants when comparing the 1910s to the 1890s, which we would expect given the large inflows from Southern and Eastern Europe at the time. Furthermore, we see no evidence that US-born men were already moving in to areas exposed to the quota policy before the border closure. Rather, US-born workers were leaving these areas as immigrants arrived. This pattern suggests that our main results are, if anything, a reversal of trend, rather than a continuation of a pre-trend.

Finally, we consider sensitivity to various measurement and specification choices. We start with the baseline results in the first row of Table A6. Each row then considers a separate robustness check: dropping the initial foreign-born share control, adding the other control selected by the Lasso procedure (share of workforce in agriculture), dropping outliers with high out-migration rates or by quota exposure, adding trends by state rather than by census region, using a simpler measure of quota exposure ($QE_1$, which considers Southern and Eastern European countries to be treated by the policy to an equal degree), or weighting by an area's baseline (1900) population. Policy exposure is associated with immigrant departures in every sector and specification, except when weighting for initial population. In urban areas, the sector that has notable inflows of quota-unrestricted population in our baseline results, we estimate inflows of a similar magnitude in most cases, but the coefficient falls when we exclude the initial foreign born control (not our preferred specification). We also lose statistical power when we include state trends (rather than census region trends). The average state has only 5 urban SEAs and so adding state trends is a demanding specification for the urban subsample.

Our main analysis excludes the World War I decade. A temporary moratorium on immigration was imposed during the war (1914-1918) and so this decade was neither treated by the quota policy, nor was it properly a "pre-period" characterized by unrestricted immigration. Table A7 instead creates a direct measure of a local area's exposure to the wartime immigration embargo in a manner similar to equation (2). That is, we multiply the population share of an area from each country-of-origin by the share of immigration flow from that country halted by wartime activities (see Table A1, column 3).[27] We then stack data from three

[27]The correlation between exposure to wartime restrictions and exposure to the 1920s quota policy is

decades (1900-10, 1910-20, 1920-30) and estimate a version of equation (3′) that interacts the 1910-20 decade indicator with an area's exposure to war-related immigration declines and, as before, interacts the 1920-30 decade indicator with an area's exposure to the quota policy. In urban areas, exposure to World War I restrictions reduced immigrant inflows by 0.7 person per 100 in the 1910s, while exposure to quota restrictions reduced immigrant inflows by 0.9 persons per 100 in the 1920s. As during the quota period, immigration losses during World War I also appear to have attracted in-migrants to urban areas, but controlling for this phenomenon does not change our main result.

One possible margin of economic adjustment to the loss of immigrant workers is the entry of women into the labor force. We see no evidence of this channel in action. Table A8 documents that the quota policy did lead to the entry of fewer immigrant women, some of whom may have moved with spouses or family and some may have moved alone (column 1). Consistent with responsive internal migration for men, we see some entry of unrestricted women into urban areas and some departures from rural areas (column 2). However, we find no association between quota exposure and the share of women in the labor force in any area (column 3). If anything, women's labor force participation declines.

## VI. The effect of the quota policy on capital investment

Thus far, we have documented that there was nearly one-for-one replacement of the immigrant workers lost after border closure in urban areas, with new workers primarily moving into the manufacturing sector. By contrast, following immigration restriction, mining and rural areas lost immigrant workers from their primary sectors and these losses were not replaced. In this section, we use data from the Censuses of Manufactures, Mining Industries, and Agriculture to study how these net worker flows affected industry output and capital expenditure.[28] Manufac-

0.81 at the SEA level.

[28]These economic censuses were collected at regular intervals. Our pre-policy observations are from 1909 and 1914 (manufacturing), 1902 and 1909 (mining) and 1899 and 1909 (agriculture). Our post-

turing did not have a net decline in labor supply after the quota policy, so we do not expect to find many changes to output or to the capital-labor ratio in manufacturing. By contrast, both agriculture and mining lost workers and we explore the responses of these sectors to this falling labor supply.

As expected, we find no evidence of higher output or capital deepening in manufacturing after the border closure.[29] Table 5, Panel A reports results for a balanced panel of 246 cities with more than 10,000 inhabitants in 1909. We find no association between quota exposure and horsepower per manufacturing worker, our measure of the capital stock.[30]

The Census of Manufactures also contains information on average wages per worker (total wage bill divided by the number of workers). Here, we see a positive association between immigrant losses and rising wages for the average manufacturing worker, albeit only marginally statistically significant. The coefficient implies the following wage elasticity: a one percentage point decline in the share foreign born in an area is associated with a 1 percent rise in manufacturing wages.[31] We note here the main differences between our earlier income proxy and this measure of manufacturing wages: (1) our proxy covers the full economy, rather than only the manufacturing sector, (2) we measure earnings for the US-born only, whereas the Census of Manufactures includes all workers (including immigrants), (3) we focus on men who lived in the SEA in both the beginning and end of each decade, so there is no change in workforce composition, and (4) our proxy will only capture wage gains due to occupational switching, rather than potential wage gains within occupations.

policy periods are 1924 and 1929 (manufacturing, agriculture) and 1929 alone (mining). The censuses of manufacturing and agriculture were conducted at the county level, which we aggregate to the SEA, whereas we only have state-level data for the mining sector.

[29] Speaking at the American Economic Association meeting in 1927, economist Harry Jerome reported that, "after examining several hundred plants, he felt that it could not be said with certainty that immigration restriction had been responsible for any marked change [to the manufacturing sector]." He argued that "mechanical improvements had started during the post-war boom," not after the border closure (Abbott, 1927, p. 129).

[30] Note that the horsepower measure is not available in 1925 and so 1929 is our only post-policy observation for this outcome.

[31] This pattern is consistent with Goldin's (1994) finding that manufacturing wages fell in areas with a growing immigrant population.

In contrast to urban areas, we find that mining areas and rural areas lost workers from their major industries after the border closure. The two industries responded in different ways. First, we show in Table 5, Panel B that the agricultural sector responded to the loss of farm labor by shifting into capital intensive production. We measure the share of cultivated land planted in labor-intensive (hay and corn) versus capital-intensive (wheat) cereals, following Lafortune, Tessada and González-Velosa (2015).[32] We find that the agricultural sector in rural or mining areas with more quota exposure was more likely to plant capital-intensive wheat. We do not have data on tractor usage directly, but we do not find an effect of the quota restriction on the use of draft animals (horses and mules).[33] Consistent with a shift away from labor inputs, we find that average expenditures for farm labor (which includes wages) declined by around 3.5 percent after the border closure for every one percentage point shift in quota exposure.[34] However, we see no effect of the shift toward capital-intensive production on average farm values indicating that the quota system did not impede the profitability of farming.

In contrast, the mining sector contracted, reducing capital expenditures and output. Table 5, Panel C considers the available state-level evidence from the Census of Mining Industries.[35] We find suggestive evidence that the number of mines contracted after the border closure in states that had greater exposure to the quota policy. As the industry contracted, the number of workers declined

[32]We exclude cotton, the other labor-intensive crop in the LaFortune classification, because the ability to grow cotton is strongly tied to environmental conditions, but results look similar if we include it or if we focus only on the Northeast and Midwest.

[33]The Census of Agriculture only collected data on tractor usage starting in 1925. We regress the change in tractors in a rural SEA on the change in horses and mules from 1925 to 1929 and find a coefficient of -0.078 (s.e. = 0.009).

[34]In a Cobb-Douglas production function, capital deepening raises labor productivity and thus wages. But if capital and labor are substitutes, wages could fall as farmers shift toward capital-intensive production. Our finding is consistent with the sentiment at the time that tractors substituted for farm labor. For example, John Steinbeck famously wrote in The Grapes of Wrath: "The tractors which throw men out of work, the belt lines which carry loads, the machines which produce, all were increased; and more and more families scampered on the highways, looking for crumbs from the great holdings, lusting after the land beside the roads" (Steinbeck, 1939).

[35]Some data on mining activity exists at the county level (see, e.g., Matheis, 2016) but this series does not contain information on capital expenditure.

(see Table 3), and we see here that capital per worker also fell. The fact that the mining industry did not substitute into more capital-intensive forms of production as it lost immigrant workers is consistent with a lack of substitutable capital or available mechanization in the mining industry at the time.

The different paths observed for agriculture and mining is consistent with the availability of substitutable capital in the 1920s. The gasoline-powered tractor was newly commercially viable and diffused in the 1920s, offering landowners a labor-saving technology in the cultivation of grains (Lew and Cater, 2018). By contrast, many mining operations – including drilling, blasting and loading – were still conducted by hand in 1920, with mechanization arriving only in the 1940s (Dix, 1988).[36]

Overall, each sector adapted to the loss of immigrant labor in different ways: manufacturing sites in urban areas attracted new workers, both internal migrants from the US and unrestricted migrants from Mexico and Canada. Rather than attracting in new workers, farms in rural areas substituted the lost immigrant farm labor with more capital-intensive methods. And the mining industry, which had been particularly dependent on immigrant labor, did not substitute toward capital and instead experienced a contraction in production.

## VII. Conclusions

The era of open European immigration to the United States ended abruptly in the 1920s. A series of restrictive federal acts introduced immigration quotas that were particularly targeted at immigrants from Southern and Eastern Europe. The quotas effectively limited the annual number of immigrants admitted to the United States by more than 75 percent. This substantial nationwide decline in immigration affected local labor markets differentially depending on the initial

[36]Capital expenditure per production worker in mineral operations industries increased by 24 percent from 1919 to 1939, and then by a staggering 800 percent from 1939 to 1954 (Wright, 2006). For this calculation, we proxy for capital expenditure with “cost of supplies and purchased machinery installed,” because the capital expenditure series begins only in 1954.

presence of immigrant workers from Southern and Eastern Europe.

Our analysis exploited the differential exposure of local labor markets to the quotas due to variation in the national-origin mix of their immigrant population. Urban areas most exposed to the quota policy attracted internal migrants. By contrast, farmers in rural areas most exposed to the quota policy replaced lost immigrant workers by shifting to more capital-intensive agriculture. Perhaps because urban and rural areas quickly attracted other factors of production – either new labor or new capital – we do not find strong effects of the immigration restriction on the income scores of US-born workers at the local level. The mining industry instead contracted, shedding both workers and capital.

Such large-scale immigration restrictions are rare events, and so this historical episode has some important lessons for contemporary policy. Some workers gained from the border closure (e.g., those who moved into urban areas to take manufacturing jobs) and other workers lost out (e.g., those who remained in rural areas). However, using immigration restriction to raise the earnings of US-born workers more broadly is unlikely to be effective given the adaptability of local labor markets in substituting away from immigrant workers. In the early twentieth century, restricting immigration from Europe encouraged labor flows from Mexico and Canada into urban areas, and the investment in new capital in rural areas. Today, these sources of substitutability may be automation in the manufacturing sector or the off-shoring of high-skilled tasks like computer programming or legal services.

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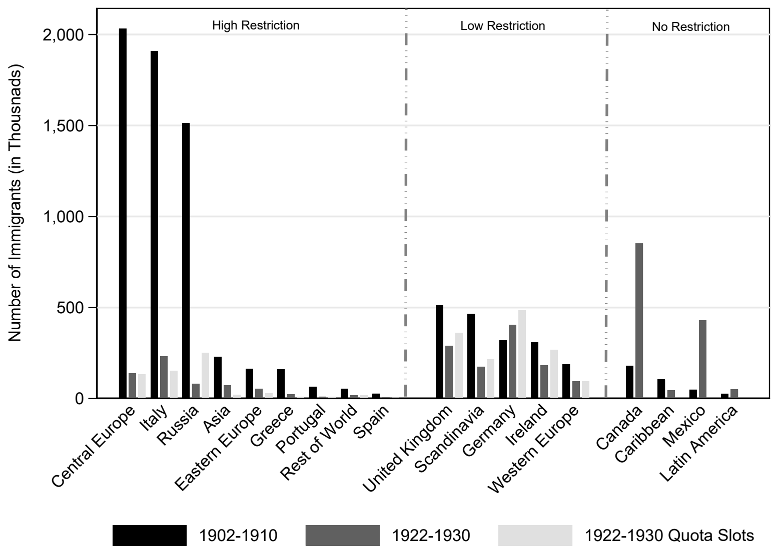
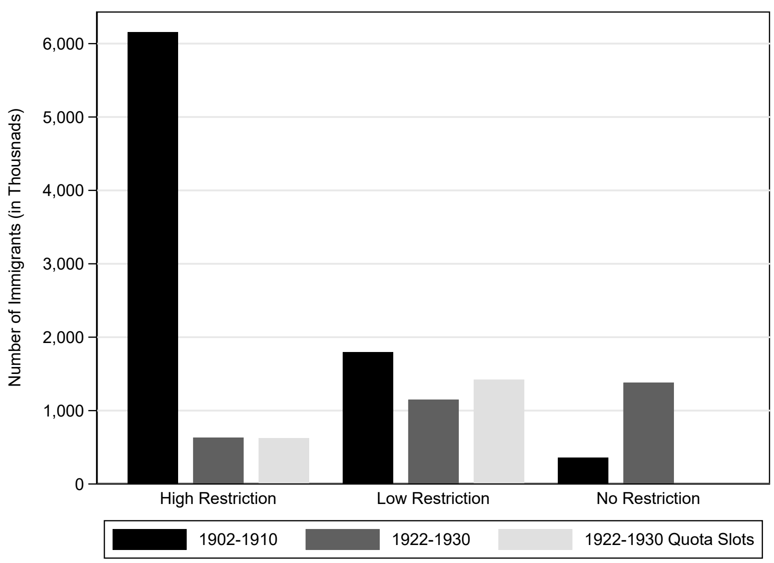
## VIII. Figures




(a) All Country Groups




(b) Aggregated Country Groups

Figure 1. : Decadal Immigrant Flows to the US by Quota Restriction Categories

*Note:* Decadal immigrant flows (in thousands) to the US from 1902 to 1910 in black, from 1922-1930 in dark grey, and decadal quota slots in light grey. In panel (a), all country groups are shown. In panel (b), country groups are separated into three categories: high restriction, low restriction, and no restriction. See Table A1 for a list of countries and their classification.
*Source:* Historical Statistics of the United States, "Immigrants, by country of last residence–Europe: 1820–1997." Ferenczi (1929); Heffer (2008).

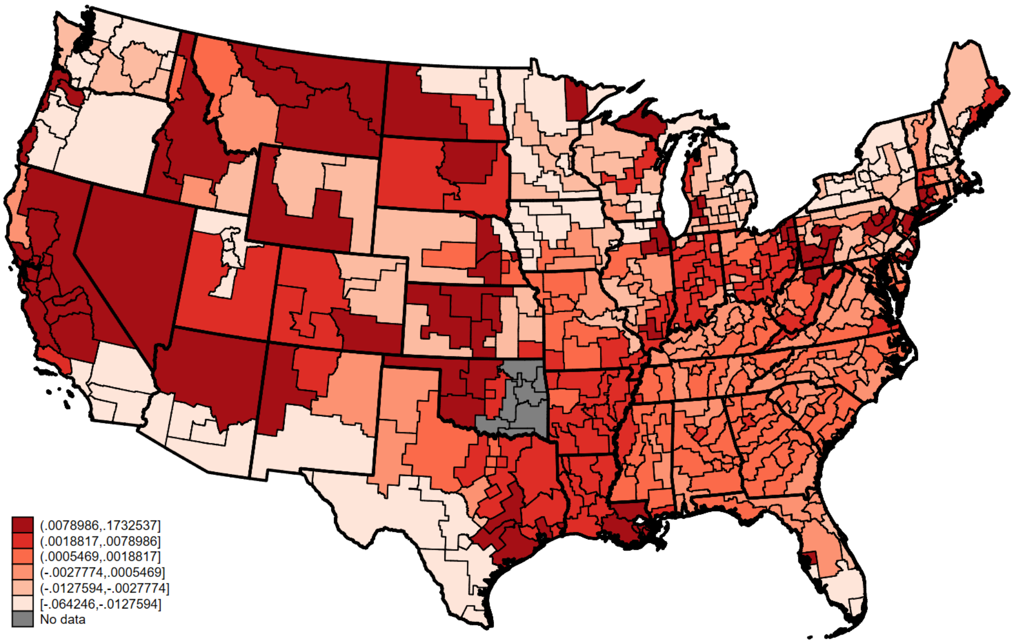



Figure 2. : SEA Quota Exposure Measure $QE_2$, Controlling for Census Region and 1900 Foreign Born Share

*Note:* The figure plots the residuals from a regression of quota exposure measure $QE_2$ on census region indicators and 1900 foreign-born share and assigns a darker red color to SEAs with larger residuals.

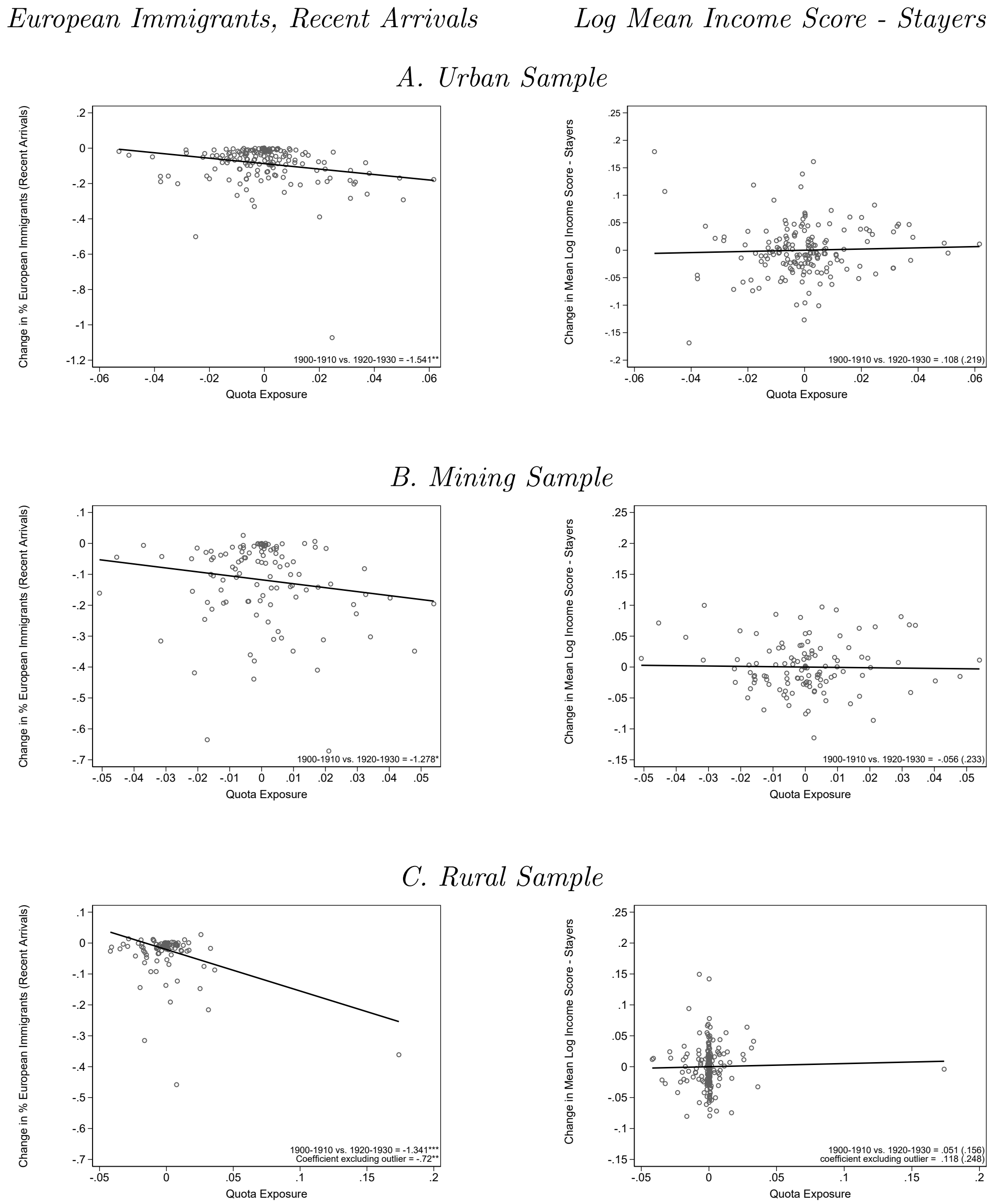



Figure 3. : The Effect of Exposure to Border Closure Policy on European Immigration and Natives' Income Score

*Note:* The figures plot the relationship between quota exposure $QE_2$ and (i) decadal change in quota-restricted working age male or (ii) mean log income score for natives in the matched sample who resided in the same SEA in the beginning and end of the 1900-1910 and 1920-1930 decades, for the urban, mining, and rural samples, respectively. The figures present a visual representation of the DID coefficients estimated in Table 1 and Table A2 by plotting the mean change in the SEA's outcome variable (between decades) and the SEA's quota exposure measure, adjusted for census region and 1900 foreign-born share. The coefficient reported in each figure corresponds to the DID coefficient presented in Column 1 of Table 1 and Row 1 of Table A2. In panel C, a coefficient excluding outlier SEA 311 in North Dakota is reported as well. Each circle represents an SEA, and there are 460 SEAs overall, 170 in the urban sample, 115 in the mining sample, and 175 in the rural sample.

# IX. Tables

Table 1—: The Effect of Exposure to Border Closure Policy on Population Change Rates

| Population Group: | European immigrants, Recent arrivals | All Unrestricted Population | Native Born White | Native Born Non-White | European immigrants, 10+ years in US | Immigrants from Western Hemisphere |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **A. Urban Sample** | | | | | | |
| Policy Exposure x Post | -1.541 | 2.595 | 1.903 | 0.119 | -0.0920 | 0.665 |
| | (0.610) | (1.276) | (0.993) | (0.185) | (0.220) | (0.193) |
| **B. Mining Sample** | | | | | | |
| Policy Exposure x Post | -1.278 | 1.177 | 0.715 | 0.239 | -0.493 | 0.717 |
| | (0.707) | (2.017) | (1.516) | (0.179) | (0.339) | (0.480) |
| **C. Rural Sample** | | | | | | |
| Policy Exposure x Post | -0.720 | -0.781 | -0.388 | -0.225 | -0.403 | 0.236 |
| | (0.352) | (2.195) | (1.812) | (0.246) | (0.354) | (0.266) |
| **D. Full Sample** | | | | | | |
| Policy Exposure x Post | -1.578 | 1.432 | 1.168 | 0.0708 | -0.345 | 0.539 |
| | (0.389) | (0.924) | (0.693) | (0.0861) | (0.196) | (0.156) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various populations. The Post variable is defined as an indicator for the 1920-1930 decade. Each column lists the dependent variable in the specifications that are defined as the decadal change in working-age male population change for the relevant population group over total working-age male population in the beginning of the decade. Panel A presents results for the urban sample of 170 SEAs, panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs and Panel D presents results for the sample of 459 SEAs. Column 1 includes European immigrants who arrived in the US in the past 10 years. The all unrestricted population group in column 2 includes all population groups that were not directly impacted by the policy change and are listed in columns 3-6 - native born whites, native-born non-whites, European immigrants who arrived in the US more than 10 years ago, and immigrants from the Western Hemisphere. In all specifications, each SEA has one observation for the 1900-1910 decade and another observation for the 1920-1930 decade. All specifications include SEA and decade fixed effects, census region time trends, and initial (1900) foreign-born share time trend. The number of observations is 340 in the urban sample, 230 in the mining sample, 348 in the rural sample, and 918 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table 2—: The Effect of Exposure to Border Closure Policy on Population Change Rates by Age Group

| **Age Group:** | **15-39 Years Old** | | **40-65 Years Old** | |
|---|---|---|---|---|
| **Population Group:** | **European immigrants, Recent arrivals** | **All Unrestricted Population** | **European immigrants, Recent arrivals** | **All Unrestricted Population** |
| | (1) | (2) | (3) | (4) |
| **A. Urban Sample** | | | | |
| Policy Exposure x Post | -1.301 | 1.733 | -0.240 | 0.863 |
| | (0.528) | (0.901) | (0.0845) | (0.400) |
| **B. Mining Sample** | | | | |
| Policy Exposure x Post | -1.142 | 0.768 | -0.136 | 0.409 |
| | (0.617) | (1.389) | (0.0934) | (0.658) |
| **C. Rural Sample** | | | | |
| Policy Exposure x Post | -0.663 | -0.867 | -0.0568 | 0.0859 |
| | (0.310) | (1.658) | (0.0477) | (0.591) |
| **D. Full Sample** | | | | |
| Policy Exposure x Post | -1.380 | 0.865 | -0.198 | 0.567 |
| | (0.339) | (0.637) | (0.0522) | (0.307) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation $(3')$ in the text for various populations. The Post variable is defined as an indicator for the 1920-1930 decade. Each column lists the dependent variable in the specifications that are defined as the decadal change in working-age male population change for the relevant population group over total working-age male population in the beginning of the decade. Panel A presents results for the urban sample of 170 SEAs, panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs, and Panel D presents results for the sample of 459 SEAs. Columns 1-2 consider the decadal change for the 15-39 years old age group over the total working age male population in the beginning of the decade. Columns 3-4 consider the decadal change for the 40-65 years old age group over the total working age male population in the beginning of the decade. European immigrants are defined as individuals who were born in Europe and who arrived in the US in the past 10 years. In all specifications, each SEA has one observation for the 1900-1910 decade and another observation for the 1920-1930 decade. All specifications include SEA and decade fixed effects, census region time trends, and 1900 foreign-born share time trends. The number of observations is 340 in the urban sample, 230 in the mining sample, 348 in the rural sample and 918 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table 3—: The Effect of Exposure to Border Closure Policy on Population Change Rates by Industry Groups

| Industry Category: | Manufacturing | Mining | Agriculture | Other Industries | No Industry Reported |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| **A. Urban Sample** | | | | | |
| **A.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | -0.795 | 0.00281 | -0.0431 | -0.391 | -0.315 |
| | (0.412) | (0.0125) | (0.0994) | (0.109) | (0.128) |
| **A.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.700 | -0.0117 | 0.481 | 1.011 | 0.415 |
| | (0.332) | (0.0621) | (0.282) | (0.632) | (0.580) |
| **B. Mining Sample** | | | | | |
| **B.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | 0.192 | -1.436 | -0.176 | 0.0569 | 0.0850 |
| | (0.245) | (0.262) | (0.0987) | (0.246) | (0.177) |
| **B.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.0905 | -0.438 | 0.323 | 0.585 | 0.616 |
| | (0.327) | (0.525) | (0.626) | (0.779) | (0.704) |
| **C. Rural Sample** | | | | | |
| **B.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | 0.106 | 0.00334 | -0.607 | -0.0697 | -0.152 |
| | (0.120) | (0.0230) | (0.219) | (0.142) | (0.0638) |
| **B.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.319 | -0.0770 | -0.0768 | -0.328 | -0.619 |
| | (0.347) | (0.0856) | (1.003) | (0.824) | (0.711) |
| **D. Full Sample** | | | | | |
| **B.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | -0.364 | -0.728 | -0.168 | -0.172 | -0.146 |
| | (0.191) | (0.185) | (0.0737) | (0.101) | (0.105) |
| **B.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.317 | -0.370 | 0.518 | 0.512 | 0.455 |
| | (0.200) | (0.160) | (0.319) | (0.405) | (0.336) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various populations. The Post variable is defined as an indicator for the 1920-1930 decade. The dependent variable in these specifications is defined as the decadal change in working-age male population reporting an industry in a specific industry group over total working-age male population in the beginning of the decade. The industry groups are defined using the census of population industry categories. Panel A presents results for the urban sample of 170 SEAs, panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs and Panel D presents results for the full sample of 459 SEAs. Sub-panels 1 show the coefficients of the interaction term from equation ($3'$) for the policy restricted population (European immigrants who arrived in the US in the past 10 years) and sub-panels 2 show the coefficients of the interaction term from equation ($3'$) for the policy unrestricted populations. In all specifications, each SEA has one observation for the 1900-1910 decade and another observation for the 1920-1930 decade. All specifications include SEA and decade fixed effects, census region and initial (1900) foreign-born share time trends. The number of observations is 340 in the urban sample, 230 in the mining sample, 348 in the rural sample, and 918 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table 4—: The Effect of Exposure to Border Closure Policy on Population Change Rates - Placebo Experiment

| **Estimation Sample:** | **Actual Experiment (1900-1910 vs. 1920-1930)** | | **Placebo Experiment (1890-1900 vs. 1900-1910)** | |
|---|---|---|---|---|
| **Population Group:** | **Foreign Born - High Restriction Countries** | **Native Born - Males Age 18-44** | **Foreign Born - High Restriction Countries** | **Native Born - Males Age 18-44** |
| | (1) | (2) | (3) | (4) |
| **A. Urban Sample** | | | | |
| Policy Exposure x Post | -1.376 | 1.323 | 0.968 | -1.850 |
| | (0.252) | (0.764) | (0.226) | (0.894) |
| **B. Mining Sample** | | | | |
| Policy Exposure x Post | -1.003 | 0.651 | 0.637 | 0.365 |
| | (0.229) | (0.948) | (0.179) | (1.171) |
| **C. Rural Sample** | | | | |
| Policy Exposure x Post | -0.201 | -0.673 | -0.322 | -9.278 |
| | (0.0983) | (1.818) | (0.203) | (6.765) |
| **D. Full Sample** | | | | |
| Policy Exposure x Post | -1.048 | 0.553 | 0.661 | -1.132 |
| | (0.153) | (0.536) | (0.129) | (0.952) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various populations. Columns 1-2 present results for the actual timing of the experiment - 1900-1910 and 1920-1930, while columns 3-4 present results for a placebo experiment where the decades compared are 1890-1900 to 1900-1910. The Post variable is defined as an indicator for the 1920-1930 decade and 1900-1910 decade in columns 1-2 and columns 3-4, respectively. The dependent variable in columns 1 and 3 is the decadal change in foreign born population from high restriction countries (see Table A1, Panel A) over total population in the beginning of the decade. The dependent in columns 2 and 4 is the decadal change in native-born males age 18-44 population over total males age 18-44 population in the beginning of the decade. Panel A presents results for the urban sample of 169 SEAs, panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs and Panel D presents results for the full sample of 458 SEAs. All specifications include SEA fixed effects and census region time trends. The number of observations is 338 in the urban sample, 230 in the mining sample, 348 in the rural sample, and 916 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table 5—: The Effect of Exposure to Border Closure Policy on Agriculture, Manufacturing, and Mining

| A. Manufacturing Sector | | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | | |
| **Outcome:** | **Log Wage per Worker** | **Log Output per Worker** | **Log Horsepower per Worker** | | |
| Policy Exposure x Post | 1.042 | 0.512 | -0.115 | | |
| | (0.687) | (0.650) | (2.013) | | |
| Number of SEAs | 203 | 203 | 203 | | |
| Number of Observations | 812 | 812 | 609 | | |
| **B. Agriculture Sector** | | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| **Outcome:** | **Log Farm Land Value** | **Share Labor Intensive Crops** | **Share Capital Intensive Crops** | **Log Mules and Horses per Worker** | **Log Wages per Worker** |
| Policy Exposure x Post | -0.0512 | -0.243 | 0.824 | -0.494 | -3.573 |
| | (2.011) | (0.537) | (0.411) | (1.740) | (1.569) |
| Number of SEAs | 289 | 289 | 289 | 289 | 289 |
| Number of Observations | 1156 | 1156 | 1156 | 867 | 867 |
| **C. Mining Sector** | | | | | |
| | (1) | (2) | (3) | (4) | |
| **Outcome:** | **Log Output per Worker** | **Log Capital Expenditures per Worker** | **Log Average Wage per Worker** | **Log Number of Mines** | |
| Policy Exposure x Post | -4.535 | -7.032 | -0.171 | -2.874 | |
| | (3.654) | (4.081) | (2.086) | (2.686) | |
| Number of States | 44 | 44 | 44 | 44 | |
| Number of Observations | 88 | 88 | 88 | 88 | |

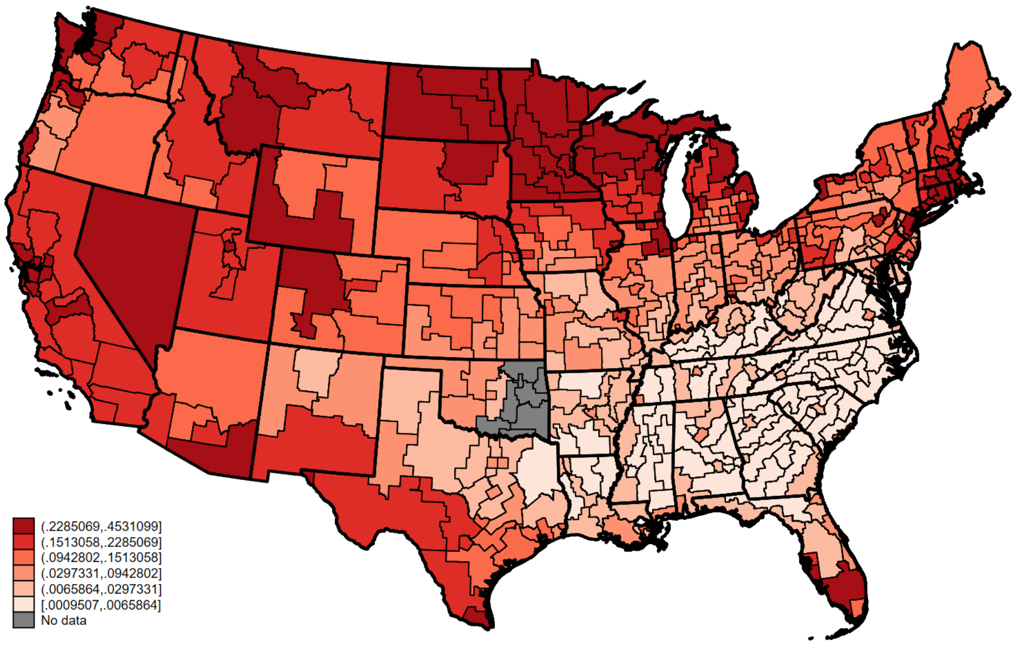
*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation (3) in the text for various outcomes. The variable Post is an indicator for post quota policy years, which are defined as 1925 and 1929 in Panel A, 1925 and 1930 in Panel B, and 1929 in Panel C. In Panel A, the sample considered includes 203 SEAs that have available data in the Census of Manufacturers in each of the years 1909, 1914, 1925, and 1929. The dependent variable in column 1 is log average wage per worker in manufacturing. The dependent variable in column 2 is log average value of manufacturing output per worker. The dependent variable in column 3 is log average horsepower per worker in manufacturing. All monetary values are expressed in 1929 dollars. In columns 1 and 2, each SEA has four observations, one for each of the years 1909, 1914, 1925, and 1929. In column 3, each SEA has three observations, one for each of the years 1909, 1914, and 1929. In Panel B, the sample considered includes 289 SEAs from the mining and rural samples that have available data in the Census of Agriculture in each of the years 1900, 1910, 1925, and 1930. The dependent variable in column 1 is log farmland value. The dependent variable in column 2 is the share of cultivated land planted in labor-intensive crops, which we define as hay and corn. The dependent variable in column 3 is the share of cultivated land planted in capital-intensive crops, which we define as wheat. The dependent variable in column 4 is log ratio of horses and mules to farm workers, where the number of farm workers is computed as the number of working-age males in farming occupations. The dependent variable in column 5 is log labor expenditures to farm workers All dollar values are expressed in 1930 dollars. In Panel C, the sample considered includes 44 states that have available data in the Census of Mining Industries in each of the years 1909 and 1929 (excluding North Dakota). The quota exposure $QE_2$ is measured at the state level for Panel C specifications. The dependent variable in column 1 is log average output per worker in mining. The dependent variable in column 2 is log average value of capital expenditures per worker in mining. The dependent variable in column 3 is log average wage per worker in mining. The dependent variable in column 4 is the log number of mines in the state. All monetary values are expressed in 1929 dollars. All specifications include SEA and year fixed effects. The specifications in Panels A and B also include region and initial (1900) foreign-born share time trends. Robust standard errors, clustered at the SEA level, in parenthesis.

# The Effect of Immigration on Local Labor Markets: Lessons from the 1920s Border Closure

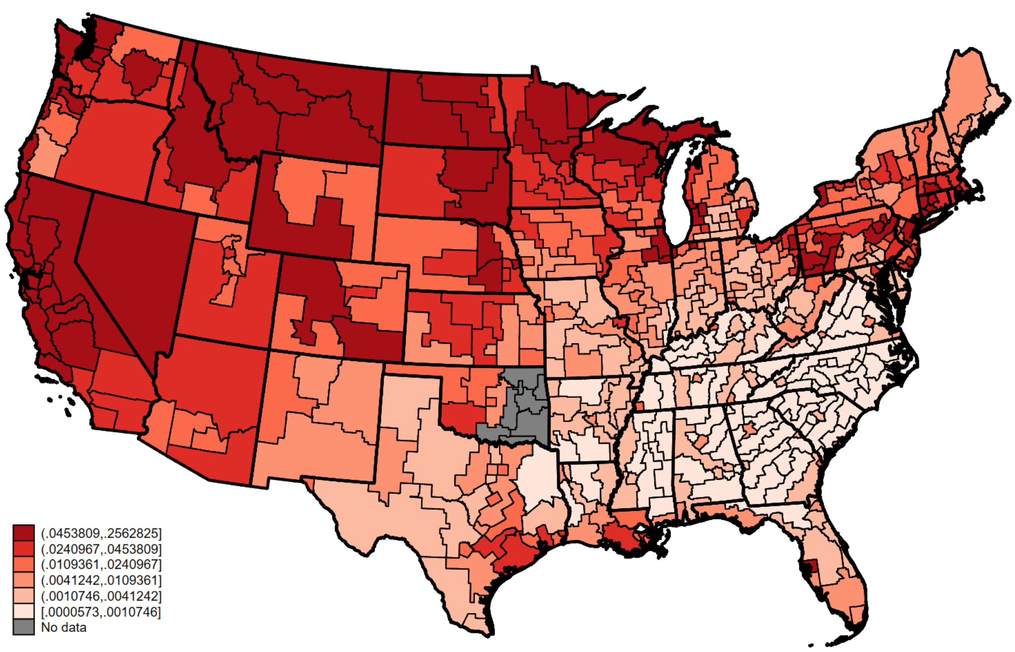
*Ran Abramitzky, Philipp Ager, Leah Boustan, Elior Cohen, Casper W. Hansen*

## Appendix Material – For On-line Publication Only

## Appendix Figures and Tables




(a) SEA Foreign-Born Share, 1900




(b) SEA Quota Exposure Measure $QE_2$

Figure A1. : SEA Foreign Born Share (1900) and Quota Exposure Measure $QE_2$

*Note:* Decadal The figures show the 460 SEAs used in the analysis and assign a darker red color to SEAs with higher foreign-born share in 1900 in (a) and to SEAs with a higher quota exposure measure $QE_2$ (see equation (2)).

Table A1—: Border Closure Policy and World War I Intensity Measures by Country

| Country Group | (1) Quota Intensity 1 | (2) Quota Intensity 2 | (3) World War I Intensity |
|---|---|---|---|
| **A. High-Restriction Countries** | | | |
| Asia | 1 | 0.947 | 0.496 |
| Central Europe | 1 | 0.968 | 0.978 |
| Eastern Europe | 1 | 0.935 | 0.957 |
| Greece | 1 | 0.965 | 0.502 |
| Italy | 1 | 0.962 | 0.887 |
| Portugal | 1 | 0.945 | 0.411 |
| Rest of World | 1 | 0.686 | 0.000 |
| Russia | 1 | 0.933 | 0.950 |
| Spain | 1 | 0.980 | 0.140 |
| **B. Low-Restriction Countries** | | | |
| Germany | 0 | 0 | 0.919 |
| Ireland | 0 | 0 | 0.789 |
| Scandinavia | 0 | 0.100 | 0.675 |
| United Kingdom | 0 | 0 | 0.795 |
| Western Europe | 0 | 0.559 | 0.716 |
| **C. Non-Restriction Countries** | | | |
| Canada | 0 | 0 | 0 |
| Caribbean | 0 | 0 | 0.112 |
| Latin America | 0 | 0 | 0 |
| Mexico | 0 | 0 | 0 |

*Note:* This table presents the list of countries used in the paper to construct the quota intensity measures and the World War I intensity measure for the different 18 country groups used in the analysis. Columns 1-2 present the country-specific quota intensity measure, according to equations (1) and (2) in the text. Column 3 presents the country-specific WWI intensity measure, constructed by multiplying the population share from each country-of-origin by the share of immigration flow halted by wartime activities. Panel A lists the high-restriction country groups, Panel B lists the low-restriction country groups, and Panel C lists the non-restriction country groups, as described in the text.

Table A2—: The Effect of Exposure to Border Closure Policy on Natives' Income Score - Robustness

| Sample: | Urban | Mining | Rural | Full |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| **1. Baseline Results (Matched Sample - Stayers)** | | | | |
| Policy Exposure x Post | 0.108 | -0.0561 | 0.0508 | -0.103 |
| | (0.326) | (0.263) | (0.102) | (0.160) |
| **2. Use Full Matched Sample** | | | | |
| Policy Exposure x Post | 0.0634 | 0.0891 | 0.103 | -0.0133 |
| | (0.293) | (0.205) | (0.104) | (0.128) |
| **3. Add 1920 Observations** | | | | |
| Policy Exposure x Post | 0.140 | 0.0212 | 0.0420 | -0.0185 |
| | (0.223) | (0.179) | (0.0636) | (0.104) |
| **4. Add Additional Controls** | | | | |
| Policy Exposure x Post | 0.148 | -0.0527 | 0.0904 | -0.145 |
| | (0.315) | (0.282) | (0.103) | (0.165) |
| **5. Exclude SEAs in Bottom 10% Quota Exposure Distribution** | | | | |
| Policy Exposure x Post | 0.400 | -0.0548 | 0.0525 | -0.0949 |
| | (0.282) | (0.267) | (0.101) | (0.162) |
| **6. Exclude SEAs in Top 10% Out-Migration to High Exposure SEAs** | | | | |
| Policy Exposure x Post | 0.0413 | 0.0370 | -0.0530 | -0.0538 |
| | (0.363) | (0.234) | (0.325) | (0.208) |
| **7. Include State Time Trends** | | | | |
| Policy Exposure x Post | -0.309 | -0.160 | 0.0582 | -0.231 |
| | (0.386) | (0.194) | (0.0673) | (0.186) |
| **8. Alternative Quota Exposure 1** | | | | |
| Policy Exposure x Post | 0.0843 | -0.00291 | 0.0316 | -0.0884 |
| | (0.276) | (0.235) | (0.0830) | (0.134) |
| **9. Use 1900 Population Weights** | | | | |
| Policy Exposure x Post | 0.157 | -0.129 | 0.0443 | 0.00214 |
| | (0.142) | (0.206) | (0.112) | (0.118) |
| **10. Log Occupational Score + No 1900 Foreign-Born Share Control + State Time Trends** | | | | |
| Policy Exposure x Post | -0.748 | -0.573 | -0.0337 | -0.472 |
| | (0.232) | (0.230) | (0.184) | (0.143) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation (3) in the text. The variable Post is an indicator for post quota policy year, which is defined as 1930. Columns 1-4 present the coefficient for the urban, mining, rural, and full sample, respectively. The outcome variable in specifications 1-9 is the log of the average predicted income score among working-age males (age 15-65) who are included in our matched sample and have resided in the same SEA in the beginning and end of each decade (”Stayers”). The outcome variable in specification 10 is the log of the average occupational score among working-age males (age 15-65) who are included in our matched sample and are ”stayers.” In the baseline specification in row 1, each SEA has three observations for the years 1900, 1910, and 1930. This specification includes SEA fixed effects and census region and initial (1900) foreign-born share time trends. The specification in row 2 includes all matched US-born individuals. The specification in row 3 adds the 1920 observations to the baseline specification. The specification in row 4 adds log 1900 total population and share of men working in farming in 1900 time trends as additional controls to the baseline specification. In row 5, we exclude SEAs with low (bottom 10 percent in each sample) policy exposure and estimate the baseline specification using the new sample. In row 6, we exclude SEAs who had high (top 10 percent in each sample) out-migration of natives to SEA with a high policy exposure (above median) and use the new sample to estimate the baseline specification. In row 7, we estimate the baseline specification using state time trends. In row 8, we use exposure measure $QE_1$ instead of our baseline policy exposure measure $QE_2$. In row 9, we weight the observation in the baseline specification using 1900 population. In row 10, we try to replicate Tabellini (2019) by using the log occupational score as the outcome variable, excluding the initial (1900) foreign-born time trend and including state time trends. In the baseline specification, the number of SEAs is 170 in the urban sample, 115 in the mining sample, 174 in the rural sample, and 459 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table A3—: Lasso Results for the Relationship Between Exposure to Border Closure Policy and 1900 SEA Characteristics

| **Sample:** | **Urban** (1) | **Mining** (2) | **Rural** (3) | **Full Sample** (4) |
|---|---|---|---|---|
| Foreign Born Share | x | x | - | x |
| Log Total Population | - | - | - | - |
| Share Urban Population | - | - | - | - |
| Share Black Population | - | - | - | - |
| Literacy Rate | - | - | - | - |
| Share Workers in Manufacturing | - | - | - | - |
| Share Workers in Agriculture | x | x | - | x |
| Share Workers Holding White Collar Occupation | - | - | - | - |
| Log Average Wage in Manufacturing | - | - | - | - |
| Log Average Farm Value | - | - | - | - |
| Log Value of Farm Output per Acre | - | - | - | - |
| Share Owner Operated Farms | - | - | - | - |
| Share Farmland Cultivated | - | - | - | - |
| Share Wheat in Cultivated Farmland | - | - | - | - |
| Share Cotton in Cultivated Farmland | - | - | - | - |
| Share Hay/Corn in Cultivated Farmland | - | - | - | - |
| Census Region FE | Yes | Yes | Yes | Yes |
| Observations | 170 | 115 | 174 | 459 |

*Note:* This table presents the coefficients selected by a lasso procedure of a cross-sectional specification where the dependent variable is the SEA quota exposure measure $QE_2$ and the potential explanatory variables are a set of 1900 SEA socioeconomic characteristics. All Lasso procedures partial out census region fixed effects prior to control selection. Column 1 shows the controls selected for the urban sample of 170 SEAs, column 2 shows the controls selected for the 115 SEAs in the mining sample, column 3 shows the controls selected for the 174 SEAs in the rural sample, and column 4 shows the controls selected for the 459 SEAs in the full sample. Controls marked with an "x" are chosen by the Lasso specification.

Table A4—: The Effect of Exposure to Border Closure Policy on Population Change Rates in Urban SEAs - Central City vs. Suburbs

| Population Group: | European immigrants, Recent arrivals | All Unrestricted Population | Native Born White | Native Born Non-White | European immigrants, 10+ years in US | Immigrants from Western Hemisphere |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **A. Largest County Only ("Central City")** | | | | | | |
| Policy Exposure x Post | -1.607 | 2.207 | 1.649 | 0.0567 | -0.247 | 0.748 |
| | (0.704) | (1.514) | (1.168) | (0.167) | (0.311) | (0.220) |
| **B. Excluding Largest County ("Suburbs")** | | | | | | |
| Policy Exposure x Post | -0.0856 | 5.065 | 3.351 | 0.766 | 0.424 | 0.523 |
| | (0.352) | (1.790) | (1.330) | (0.580) | (0.263) | (0.331) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various populations. The Post variable is defined as an indicator for the 1920-1930 decade. Each column lists the dependent variable in the specifications that are defined as the decadal change in working-age male population change for the relevant population group over total working-age male population in the beginning of the decade. In panel A, we define SEA as the largest county of the SEA in terms of 1900 population, to proxy for the central city. In panel B, we exclude the largest county of the SEA to proxy for the suburbs of the city. In all specifications, each SEA has one observation for the 1900-1910 decade and another observation for the 1920-1930 decade. All specifications include SEA and decade fixed effects, census region time trends, and initial (1900) foreign-born share time trend. In Panel A, the number of SEAs is 170 and the number of observations is 340. In Panel B, the number of SEAs is 95 and the number of observations is 190. Robust standard errors, clustered at the SEA level, in parenthesis.

Table A5—: The Effect of Exposure to Border Closure Policy on Population Change Rates by Occupation "Foreignness" Quintile

| **Occupation "Foreignness" Quintile:** | **Q1 (Lowest)** | **Q2** | **Q3** | **Q4** | **Q5 (Highest)** |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| **A. Urban Sample** | | | | | |
| **A.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | 0.0142 | -0.0753 | -0.0386 | -0.199 | -0.886 |
| | (0.0127) | (0.0300) | (0.0832) | (0.0563) | (0.464) |
| **A.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.663 | 0.317 | 0.0638 | 0.463 | 0.707 |
| | (0.266) | (0.277) | (0.210) | (0.258) | (0.377) |
| **B. Mining Sample** | | | | | |
| **B.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | -0.00480 | -0.0218 | -0.125 | 0.0137 | -1.092 |
| | (0.00694) | (0.0304) | (0.0963) | (0.0487) | (0.476) |
| **B.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.115 | 0.181 | 0.497 | 0.0197 | -0.0854 |
| | (0.119) | (0.540) | (0.375) | (0.255) | (0.758) |
| **C. Rural Sample** | | | | | |
| **C.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | -0.0340 | -0.00214 | -0.427 | -0.174 | 0.0405 |
| | (0.00765) | (0.00452) | (0.150) | (0.209) | (0.0705) |
| **C.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.0448 | -0.254 | -0.219 | -0.0129 | 0.327 |
| | (0.307) | (0.220) | (0.628) | (1.099) | (0.271) |
| **D. Full Sample** | | | | | |
| **D.1. Policy Restricted Population** | | | | | |
| Policy Exposure x Post | -0.0755 | -0.0949 | -0.0273 | -0.107 | -1.052 |
| | (0.0253) | (0.0568) | (0.00945) | (0.0504) | (0.269) |
| **D.2. Policy Unrestricted Population** | | | | | |
| Policy Exposure x Post | 0.477 | 0.312 | 0.0386 | 0.229 | 0.136 |
| | (0.288) | (0.224) | (0.0831) | (0.186) | (0.279) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various occupation categories. The Post variable is defined as an indicator for the 1920-1930 decade. The dependent variables in these specifications are defined as the decadal change in working-age male population reporting an occupation in a specific group of occupations that belong to one of the 5 quintiles of foreign-born share in occupation in 1910 (computed separately for each sub-sample), over total working-age male population in the beginning of the decade. The occupation quintiles are defined using the census of population occupation codes. Panel A presents results for the urban sample of 170 SEAs, panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs and Panel D presents results for the full sample of 459 SEAs. Sub-panels 1 show the coefficients of the interaction term from equation ($3'$) for the policy restricted population (European immigrants who arrived in the US in the past 10 years) and sub-panels 2 show the coefficients of the interaction term from equation ($3'$) for the policy unrestricted populations. In all specifications, each SEA has one observation for the 1900-1910 decade (pre) and another observation for the 1920-1930 decade (post). All specifications include SEA and decade fixed effects, census region time trends, and initial (1900) foreign-born share time trends. Robust standard errors, clustered at the SEA level, in parenthesis.

Table A6—: The Effect of Exposure to Border Closure Policy on Population Change Rates - Robustness

| Sample: | Urban | | Mining | | Rural | | Full | |
|---|---|---|---|---|---|---|---|---|
| Population Group: | European immigrants, Recent arrivals | All Unrestricted Population | European immigrants, Recent arrivals | All Unrestricted Population | European immigrants, Recent arrivals | All Unrestricted Population | European immigrants, Recent arrivals | All Unrestricted Population |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| **1. Baseline Results** | | | | | | | | |
| Policy Exposure x Post | -1.541 | 2.595 | -1.278 | 1.177 | -0.720 | -0.781 | -1.578 | 1.432 |
| | (0.610) | (1.276) | (0.707) | (2.017) | (0.352) | (2.195) | (0.389) | (0.924) |
| **2. Exclude 1900 Foreign-Born Share Control** | | | | | | | | |
| Policy Exposure x Post | -1.978 | 0.847 | -2.094 | -0.122 | -0.684 | -1.427 | -1.871 | 0.0647 |
| | (0.501) | (0.719) | (0.633) | (1.084) | (0.275) | (1.996) | (0.340) | (0.628) |
| **3. Add Additional Controls** | | | | | | | | |
| Policy Exposure x Post | -1.228 | 3.620 | -1.277 | 1.197 | -0.737 | -0.675 | -1.464 | 1.496 |
| | (0.635) | (1.258) | (0.709) | (2.082) | (0.355) | (2.167) | (0.376) | (0.944) |
| **4. Exclude SEAs in Top 10% Out-Migration to High Exposure SEAs** | | | | | | | | |
| Policy Exposure x Post | -2.161 | 1.215 | -1.093 | 1.015 | -0.319 | 0.549 | -1.511 | 0.442 |
| | (0.691) | (1.169) | (0.793) | (2.048) | (0.233) | (2.420) | (0.374) | (0.794) |
| **5. Exclude SEAs in Bottom 10% Quota Exposure Distribution** | | | | | | | | |
| Policy Exposure x Post | -1.523 | 3.300 | -1.281 | 1.151 | -0.720 | -0.743 | -1.579 | 1.434 |
| | (0.639) | (1.089) | (0.708) | (2.033) | (0.353) | (2.205) | (0.389) | (0.925) |
| **6. Include State Time Trends** | | | | | | | | |
| Policy Exposure x Post | -1.578 | 1.816 | -1.082 | 0.656 | 0.193 | -3.115 | -1.575 | 0.521 |
| | (0.641) | (1.475) | (0.581) | (2.160) | (0.320) | (3.046) | (0.420) | (0.964) |
| **7. Use 1900 Population Weights** | | | | | | | | |
| Policy Exposure x Post | -0.660 | 0.835 | -1.058 | -0.00937 | -0.367 | -1.717 | -1.102 | 0.303 |
| | (0.362) | (0.620) | (0.706) | (1.590) | (0.262) | (1.859) | (0.364) | (0.454) |
| **8. Alternative Quota Exposure 1** | | | | | | | | |
| Policy Exposure x Post | -1.632 | 2.385 | -0.989 | 1.378 | -0.925 | -1.764 | -1.591 | 1.163 |
| | (0.639) | (1.193) | (0.686) | (1.951) | (0.367) | (2.291) | (0.389) | (0.874) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation ($3'$) in the text for various populations. The policy exposure measure in specifications 1-7 is $QE_2$ and in specification 8 is $QE_1$. The Post variable is defined as an indicator for the 1920-1930 decade. Columns 1-2, 3-4, 5-6, and 7-8 present the results of the urban, mining, rural, and full sample, respectively. Each column lists the dependent variable in the specifications that are defined as the decadal change in working-age male population change for the relevant population group over total working-age male population in the beginning of the decade. The policy restricted population includes European immigrants who arrived in the US in the past 10 years. The policy unrestricted population group includes all population groups that were not directly impacted by the policy change - native born whites, native-born non-whites, European immigrants who arrived in the US more than 10 years ago, and immigrants from the Western Hemisphere. All specifications include SEA and decade fixed effects. In the baseline specification in row 1, each SEA has two observations for the 1900-1910 and 1920-1930 decades. This specification includes SEA fixed effects and census region and initial (1900) foreign-born share time trends. In row 2, we exclude the initial (1900) foreign-born time trend from the baseline specification. The specification in row 3 adds log 1900 total population and share of men working in farming in 1900 time trends as additional controls to the baseline specification. In row 4, we exclude SEAs who had high (top 10 percent in each sample) out-migration of natives to SEA with a high policy exposure (above median) and uses the new sample to estimate the baseline specification. In row 5, we exclude SEAs with low (bottom 10 percent in each sample) policy exposure and estimate the baseline specification using the new sample. In row 6, we estimate the baseline specification using state time trends. In row 7, we weight the observation in the baseline specification using 1900 population. In row 8, we use $QE_1$ exposure measure instead of our baseline policy exposure measure. In the baseline specification, the number of SEAs in the urban sample is 170, 115 in the mining sample, 174 in the rural sample, and 459 in the full sample. Robust standard errors, clustered at the SEA level, in parenthesis.

Table A7—: The Effect of Exposure to Border Closure Policy on Population Change Rate - Robustness to World War I

| **Population Group:** | **Policy Restricted** (1) | **Policy Unrestricted** (2) |
|---|---|---|
| **A. Urban Sample** | | |
| WWI Exposure X (1910-1920) | -0.668 | 0.650 |
| | (0.190) | (0.593) |
| Policy Exposure X (1920-1930) | -0.928 | 2.570 |
| | (0.439) | (1.155) |
| Number of SEAs | 170 | |
| Number of Observations | 510 | |
| **B. Mining Sample** | | |
| WWI Exposure X (1910-1920) | -0.928 | -0.425 |
| | (0.307) | (1.224) |
| Policy Exposure X (1920-1930) | -0.569 | 0.0954 |
| | (0.416) | (1.372) |
| Number of SEAs | 115 | |
| Number of Observations | 345 | |
| **C. Rural Sample** | | |
| WWI Exposure X (1910-1920) | 0.00785 | 2.163 |
| | (0.180) | (0.849) |
| Policy Exposure X (1920-1930) | -0.230 | 0.293 |
| | (0.215) | (1.574) |
| Number of SEAs | 174 | |
| Number of Observations | 522 | |

*Note:* This table presents the coefficients of the interaction between quota exposure measure $QE_2$ and an indicator for the 1920-1930 decade and the interaction between World War I exposure measure and the 1910-1920 decade indicator from equation ($3'$) in the text for various populations. The dependent variables in these specifications are the decadal change in quota restricted and unrestricted working-age male population over total working-age male population in the beginning of the decade. The policy restricted population includes European immigrants who arrived in the US in the past 10 years. The policy unrestricted population group includes all population groups that were not directly impacted by the policy change - native born whites, native-born non-whites, European immigrants who arrived in the US more than 10 years ago, and immigrants from the Western Hemisphere. All specifications include SEA fixed effects, Census region time trends, and 1900 foreign born share time trends. Panel A presents results for the urban sample of 170 SEAs, Panel B presents results for the mining sample of 115 SEAs, and Panel C presents results for the rural sample of 174 SEAs. In all specifications, each SEA has three observations for the 1900-1910, 1910-1920, and 1920-1930 decades. Robust standard errors, clustered at the SEA level, in parenthesis.

Table A8—: The Effect of Border Closure Policy Exposure on Population Change Rates and Labor Force Participation of Women

| Outcome: | Policy Restricted Population, Change Rate | Policy Unrestricted Population, Change Rate | Labor Force Participation |
|---|---|---|---|
| | (1) | (2) | (3) |
| **A. Urban Sample** | | | |
| Policy Exposure x Post | -1.126 | 0.0322 | -0.0542 |
| | (0.155) | (0.621) | (0.0740) |
| **B. Mining Sample** | | | |
| Policy Exposure x Post | -0.778 | 1.384 | -0.0537 |
| | (0.286) | (2.073) | (0.0354) |
| **C. Rural Sample** | | | |
| Policy Exposure x Post | -0.506 | -0.788 | -0.161 |
| | (0.173) | (2.013) | (0.0795) |
| **D. Full Sample** | | | |
| Policy Exposure x Post | -0.956 | 0.894 | -0.0516 |
| | (0.165) | (1.032) | (0.0427) |

*Note:* This table presents the coefficient of the interaction between quota exposure $QE_2$ and the post policy change indicator from equation $(3')$ in the text for various populations. In columns 1-2, the Post variable is defined as an indicator for the 1920-1930 decade. In column 3, the Post variable is defined as an indicator for 1930. The dependent variables in these specifications are the decadal change in policy restricted and unrestricted working-age women population over total working-age women population in the beginning of the decade and the female labor force participation in columns 1-3, respectively. Female labor force participation in these specifications is defined the share of policy unrestricted women with gainful occupation among the policy unrestricted working-age women population. Panel A presents results for the urban sample of 170 SEAs, Panel B presents results for the mining sample of 115 SEAs, Panel C presents results for the rural sample of the remaining 174 SEAs and Panel D presents results for the full sample of 459 SEAs. In columns 1 and 2, each SEA has one observation for the 1900-1910 decade and another observation for the 1920-1930 decade. All specifications include SEA and decade fixed effects, census region time trends, and initial (1900) foreign-born share time trend. The number of observations is 340 in the urban sample, 230 in the mining sample, 348 in the rural sample and 918 in the full sample. In column 3 specifications, each SEA has three observations for each of the years 1900,1910, and 1930. All specifications include SEA and year fixed effects, and trends by census region and initial (1900) foreign-born share. Robust standard errors, clustered at the SEA level, in parenthesis.