The Winners and Losers of Immigration: Evidence from Linked Historical Data[*]

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Abstract

Using recent innovations in linking historical U.S. Census data, we follow nearly 10 million native men over time to understand the impact of immigration on natives from 1910-1930. Exploiting historical immigrant settlement patterns and changes in aggregate immigrant inflows due to global conditions and U.S. policy, we find that natives are more likely to move out of cities that experience increases in immigration. Increased immigration does not significantly affect individual-level incomes on average, but there is substantial heterogeneity. Increased immigration favored older, more-skilled and white workers relative to younger, lower-skilled and non-white individuals. Our results point to evidence of increased labor market competition from immigrants inducing affected workers to move away from their original cities of residence. A large portion of the economic gains observed at the local labor market level are driven by native move-ins to areas receiving new immigrants. Our findings underscore the need to follow individual outcomes over time for a complete understanding of the economic impacts of immigration.

Keywords: Economic Impacts of Immigration, Migration, Local Labor Markets, Linked Data, Occupational Mobility

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1 Introduction

In spite of a large amount of research on the topic, there yet remains substantial debate about the economic impact of immigration on natives.[1] Many papers study the impact of immigration on natives at the local labor market level, contrasting average labor market outcomes in areas exposed to higher levels of immigration relative to areas with less immigration. Several recent papers use this approach with historical U.S. data from the early 20th century, when changes in global conditions and U.S. immigration policy generated substantial changes in immigrant inflows to the United States (Ager and Hansen (2017), Sequeira et al. (2020), Tabellini (2020), and Abramitzky et al. (2023)). These papers often find substantial economic benefits to natives from immigration. However, during this time period, US-born natives were highly mobile (Zimran, 2022). Thus, local labor market analysis may not paint a complete picture of the economic impact of immigration if there is a selective migration response to changes in immigration, failing to identify the full range of individuals impacted by these changes.[2] Furthermore, local labor market analyses may be ill-suited to understanding the distributional consequences of immigration, especially as they vary by initial occupation or other mutable characteristics which may change in response to immigration.

In this paper, we study the average and distributional impacts of immigration on natives' economic outcomes using a new dataset, the Census Tree, that allows us to link a large volume of U.S. Census records between 1910-1920 and 1920-1930. This dataset, originally developed in Price et al. (2021), covers nearly 60% of the male population living in a sample of U.S. cities in these years, providing nearly 10 million observations of linked men, a sample significantly larger than is possible with other common linking methods. The panel structure of our data allows us to focus our analysis on the direct impact of immigration on individuals already residing in cities prior to changes in immigrant inflows, including those individuals who ultimately move away. Our analysis focuses on both the average effects of immigration on native economic outcomes, as well as how these effects vary by individual age, skill, and racial background, allowing us to identify the relative "winners" and "losers" of changes in immigration over this time period.

[1] For partial summaries of this large literature, see Borjas (1999), Card (2005), Card (2009), Kerr and Kerr (2011), Lewis and Peri (2015), Peri (2016) and Dustmann, Schoenberg, and Stuhler (2016).
[2] This point was given substantial attention in earlier work in the literature on immigration, such as Borjas, Freeman and Katz (1996, 1997), Card and DiNardo (2000), Card (2001), and Borjas (2006). This point is also raised for more recent analyses of the economic impact of immigration in Borjas and Edo (2021) and Lee et al. (2022).

To estimate the impact of immigration on economic outcomes, we focus on changes in the fraction of newly arrived immigrants in each city's population. This fraction is likely to be correlated with economic outcomes for a variety of reasons, such as immigrants choosing to settle in more prosperous regions of the country. To generate exogenous variation in the fraction of the population who are immigrants, we follow a similar identification strategy as Tabellini (2020), using the pre-existing relationship between immigrant settlement patterns (i.e., enclaves) across cities and aggregate changes in immigration flows from different countries of origin to instrument for changes in the fraction of new immigrants (see also Card, 2001).[3] However, our results are robust to using variation in immigration generated by U.S. immigration quotas in the 1920s and the immigration restrictions of World War I, as in Abramitzky et al. (2023).

We find that increased immigration leads to increased out-migration and labor force participation by natives, but no changes in income. Although increases in immigration did not change average incomes, increases in immigration did significantly alter the distribution of income changes over time. We find that there is, on average, an "insurance effect" from increased immigration – workers in cities with increased immigration were less likely to make an occupational switch to a lower-paying occupation, signifying a reduction in downward labor market risk. However, although increases in immigration reduced the average downward labor market risk to workers, they also tilted the distribution of that risk, reducing the incidence of small declines of income, while significantly increasing the risk of a large income loss (more than 75 log points).

We also find substantial heterogeneity in how workers of different ages, skill levels, and racial backgrounds are impacted by changes in immigration. Increased immigration increased incomes for older, higher skilled and white workers, but reduced incomes for low-skilled and non-white workers.[4] This suggests that one effect of immigration in this period of history was to exacerbate existing earnings inequality. Furthermore, increased immigration did not have an

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[3] Much recent work has focused on understanding identification using these shift-share instruments – for example, Jaeger et al. (2018) and Goldsmith-Pinkham et al. (2020). As discussed in Section 3 and Online Appendix B, we show that shift-share measures of predicted immigrant inflows exhibit minimal serial correlation and that our results using these measures are robust to including pre-trends or allowing for differential trends based on local labor market characteristics.

[4] We note that Ager and Hansen (2017) and Xie (2017) also study the impact of increased immigration for non-white workers, with Ager and Hansen (2017) similarly finding a negative impact on non-white earnings from immigration and Xie (2017) arguing that reductions in immigration contributed to the Great Migration of black workers from the South to the North.

impact on migration for older and higher skilled workers, but increased migration for younger and lower skilled workers. Increases in labor force participation are only observed for white workers and young workers, with no impact on prime-aged labor force participation or for non-white workers.

We further analyze outcomes for workers who moved out of their original cities and find suggestive evidence that increased labor market competition from immigrants induced out-migration by natives. We present three pieces of evidence that support such a displacement effect. First, immigration increased out-migration towards larger labor markets within state, labor markets with higher average income, and labor markets with a higher concentration of immigrants. Second, workers who move away from their cities see no income gains from immigration, and have lower incomes on average, suggesting that moving to larger labor markets is not associated with increased economic benefits.[5] Finally, we find a strong positive correlation between the occupations whose workers were most likely to move out in response to immigration and the occupations immigrants were most commonly employed in. Thus, increased labor competition from new immigrants may have led a subset of native workers to move elsewhere in search of better economic opportunities.[6]

Finally, we relate our findings at the individual level to estimates of the economic impacts of immigration at the local labor market level. Similar to Ager and Hansen (2017) and Tabellini (2020), when we estimate the impact of immigration at the local labor market level, we find that increased immigration generated higher average incomes for native workers. This is in contrast to our findings at the individual level, which show no average impact on earnings. A decomposition of our local labor market estimates reveals that the key driver of this difference is selective migration by natives. Once the local labor market estimation sample is limited to workers originally residing in the labor market, including those who may have subsequently moved, the positive effect of immigration on income disappears. However, we find increased immigration led to more move-ins who were positively selected and experienced large income

[5] We note, of course, that we cannot attach a causal interpretation to evidence on the economic outcomes for movers, as migration is an endogenous choice. However, we consider this descriptive evidence to be supportive of the overall hypothesis of worker displacement from increased labor market competition due to immigration.
[6] We argue in Section 5 that the economics losses experienced by workers who move away from their original cities may understate the losses induced by increased labor market competition, as workers who move may be positively selected on net gains from migration (Borjas et al. (1992), Dahl (2002), Piyapromdee (2021)). For example, non-white workers observe some of the largest income losses from immigration, but are not more likely to move in response to immigration, potentially due to higher costs of moving.

gains when moving. This suggests that a large component of the local labor market gains from immigration did not accrue to individuals originally residing in that labor market.

Related Literature

Our paper relates to a large literature on the economic impacts of immigration, especially those papers assessing the internal migration response of natives to changes in immigrant flows. Early work such as Card and DiNardo (2000), Card (2001), and Borjas (2006) debated whether or not there was a "skating rink" effect of immigration, with new immigrants pushing out natives, "knocking them off the ice." While the presence of such an effect was debated in these papers and subsequent work by Peri (2011) and Peri and Sparber (2011), these studies are all limited by their inability to directly observe individuals over time, and thus are limited to studying net flows of individuals by skill group. In contrast, we are able to assess the effect of immigration on gross native migration flows and observe the effects of immigration for those individuals who actually migrate away. With this data, we find the presence of a significant "skating rink" effect for young and low-skilled workers in cities with increased immigration in the early 20th century.

Our paper is also related to more recent empirical work analyzing the impacts of immigration on native migration, such as Cattaneo et al. (2015) and Foged and Peri (2016). Foged and Peri (2016) use linked panel data from Denmark to estimate the dynamic impacts of immigration. Unlike the US, internal migration in Denmark is extremely low and thus plays virtually no role in the economic response to immigration. Cattaneo et al. (2015) also consider a panel of European workers, but do not study the geographic mobility of these workers in response to immigration. They do, however, find evidence that increases in immigration lead to upward occupational mobility, with natives switching to occupations with higher pay, and some evidence that downward occupational switching declined. We find evidence of the latter effect, a reduction in downward occupational switching, but we find no evidence for increased upward occupational mobility on average, though we do find evidence of this for higher skilled workers.

The most closely related literature to our work is recent papers studying the impact of immigration in the late 19th and early 20th century United States (Sequeira et al. (2020), Ager and Hansen (2017), Tabellini (2020), Abramitzky et al. (2023)). A common thread in these papers is that they generally find modest to substantially positive economic impacts of increased immigration at the local labor market level. Recent work has also found that immigration in this period of time had many other positive impacts, such as increased innovation – see Doran and Yoon (2018), Sequeira et al. (2020), Burchardi et al. (2020), and Moser and San (2020). Our findings confirm the positive average impacts of immigration on the U.S. economy in this period of history. Our analysis extends these conclusions by analyzing the individual-level impact of immigration. Following people over time allows us to observe the native internal migration response and identify the distribution of the economic impacts for native workers. In so doing, our evidence suggests that while there were positive gains overall from immigration, increased labor market competition for younger, lower-skilled and non-white workers may have led to adverse labor market consequences for these workers. We note that the existence of these adverse effects in the distribution may help explain the existence of native political opposition to immigration, despite the significant positive average impacts it brought to the economy (see Tabellini, 2020).

2 Data

The data we use for our analysis is full count U.S. Census data for the years 1900, 1910, 1920 and 1930, obtained from IPUMS (Ruggles et al. (2021)). We primarily focus on males ages 16-65, both because labor force participation outside of these ages is very low and because individuals under the age of 16 do not have data regarding labor force participation in these Census waves. We omit women from our baseline results because female labor force participation rates are generally very low during this period and because linking Census records across time for women often results in lower match rates. However, the linking data we use give us a substantial sample of women over this time period, and in Online Appendix C, we report results for women ages 16-65.

We focus our analysis on workers residing in all U.S. cities which are consistently observed in each of the four Census waves in our data.[7] We drop six cities from our data because of either missing labor force participation data in the 1920 Census (Bangor, ME; New Bedford, MA; Sacramento, CA) or because they are extreme outliers in immigrant inflows

[7] According to Census definitions, for an incorporated area to be considered a city, it needed to have at least 25,000 total persons. In practice, however, many cities listed in Census data have populations lower than this threshold.

(Duquesne, PA; Monessen, PA; Steelton, PA).[8] Our final sample is comprised of 471 cities across 44 U.S. states; a map showing all these cities can be found in Online Appendix A. We focus our analysis on cities because the majority of immigrants resided in cities in this time period (see Eriksson and Ward, 2022). In the Census, between 60-70% of all immigrants and 65-80% of all recently arrived (past 10 years) immigrants observed in the Census resided in one of our sample cities (see Online Appendix A).[9] And by 1930, roughly 90% of recently arrived immigrants resided in geographic areas defined in the Census as cities.

In the Census waves we study, a significant amount of labor market information is based on workers' occupations. For example, a worker is defined as being in the labor force if they report a "gainful occupation." As a result, the measure of labor force participation we examine as an outcome more closely corresponds to what we would now consider to be employment.[10]

Furthermore, prior to the 1940 Census, there were no direct measures of a worker's income or education, so we use imputed measures of income and educational attainment based on workers' occupations, called "occupation scores" and "education scores." Workers' income is imputed using the median income in 1950 paid to the occupation they are employed in and is measured in hundreds of 1950 dollars.[11] One limitation of this measure of income is that a workers' income can only change when they experience an occupational switch; thus, income changes in our data will be intrinsically tied to occupational switching. To proxy workers' educational attainment, "education scores" measure the percent of workers in that occupation in 1950 who had completed one or more years of college.

Central to our analysis is our ability to follow individual workers over time across Census waves. To link individual observations together across time, we use the Census Tree database, initially developed in Price et al. (2021).[12] This database utilizes genealogical data from the

[8] These three cities that are outliers with respect to immigrant flows have very large immigrant populations from Southern Europe. These cities sprung up as "steel towns," centered around steel mills, which proactively recruited immigrants to come work in and found these areas. The local labor markets of these cities are thus significantly different than other cities in our sample. However, our results are robust to their inclusion; details available by request.

[9] This focus on cities is not uncommon in existing literature (e.g., Tabellini, 2020). However, a careful analysis of the impact of immigration on rural areas can be found in Abramitzky et al. (2023).

[10] A measure of employment closer to modern measurement conventions is available in 1910 and 1930 but not in 1920.

[11] For a very small number of observations, IPUMS has not yet been able to assign a 1950 occupation code value, instead assigning a value with the label "Not yet classified." These observations are dropped from our analysis.

[12] As this database is continually expanding, we use a particular snapshot of the data, obtained in August 2022.

world's largest internet genealogy platform, FamilySearch.org, to link Census records across time. The Census Tree is constructed from both the observed person links across Census years within FamilySearch.org, and from machine learning linking algorithms trained on data from Family Search. This training set includes millions of matched pairs of census records that have been hand-linked by users on FamilySearch doing family history research. Using these data, we obtain samples of workers linked between 1910-1920 and workers linked between 1920-1930.[13] Our linked sample includes individuals who moved out of our sample cities.

We present summary statistics for our final estimation sample, split by Census waves, in Table 1, as well as statistics from the full count Census data for comparison. For linked individuals, we also report how each variable changes on average across the two linked Census waves. Using Census Tree links, we can link roughly 4 million individuals from 1910 to 1920 and 5.4 million individuals from 1920 to 1930, giving us a total sample of nearly 10 million individuals linked between two Census. Given a total number of roughly 16 million records in the raw Census data, this implies a linking rate of nearly 60%.

Our linked sample compares favorably with the full count Census data.[14] The most notable differences between the full sample and our linked sample is that men in our linked data are more likely to be white and more likely to be married. These differences are perhaps unsurprising, given the well-known difficulty in linking black men in this period of time and given that using family structure data is often used to link individuals in the same household. However, in Online Appendix B, we show that our results are robust to inverse probability weighting to balance our sample to be consistent with the composition of the total population.

In Online Appendix A, we compare the set of links obtained from the Census Tree database to links from the Census Linking Project (Abramitzky et al. 2022, based on original work done in Abramitzky, Boustan and Erikkson, 2014) and the IPUMS Multigenerational Longitudinal Panel (Helgertz et al., 2023). There is a significant amount of overlap between these databases – more than 80% of Census Linking Project links and more than 95% of IPUMS

[13] We focus on 1910-1920 and 1920-1930 as much of the variation in aggregate immigration flows during this period was driven by global shocks (like WWI) and legislative quota restrictions. This is not true from 1900-1910, so the immigrant enclave instrument is likely to suffer from the concerns outlined in Jaeger et al. (2018). See Section 3 for more details.

[14] We do not report t-tests for the differences of means for the linked and full samples, mainly because, given our large sample size, even very small differences in means are statistically significant, even if not economically significant.

MLP links are contained in the Census Tree. However, of all three databases, the Census Tree dataset has the largest set of links, with more than double the number of links in the Census Linking Project and 50% more links than the IPUMS Multigenerational Longitudinal Panel.

In Online Appendix A, we also provide evidence on how sample characteristics and migration rates vary across different data sources used to construct links.[15] Sample characteristics of links formed using Census Tree and Census Linking Project data are more similar to the Full Count Census (particularly for race and marital status) than links formed using the IPUMS panel. Migration rates in the links formed using Census Tree and Census Linking Project data are higher than those observed in the IPUMS links, however, migration rates in the Census Tree data are comparable to the subset of hand-linked data obtained from FamilySearch.org. Given the high quality of the underlying genealogical data linking records in Family Search, this abates concerns about migration rates in the Census Tree being due to measurement error in linking records.

3 Empirical Approach

Our analysis focuses on labor market outcomes at the individual level, with treatment assigned on the basis of the labor market in which the individual originally resided. Thus, we study the set of workers originally present in a given labor market prior to changes in immigration there. For our results using worker-level data, we rely on a first differences specification to difference out any fixed individual-level or origin-city-level characteristics that affect our outcomes of interest, as follows:

$$\Delta Y_{iacst} = \beta_1 \Delta FracImmig_{ct} + \Gamma_{st} + \alpha_a + \varepsilon_{iacst} \quad (1)$$

where ΔY_{iacst} represents the change in the labor market outcome Y for person i of age a residing in city c in state s between $t-10$ and t. Our key independent variable is $\Delta FracImmig_{ct}$, the change in the fraction of the city population who are recent European immigrants between $t-10$ and t for the city c in which the individual resided in time period $t-10$. Consistent with Tabellini (2020) and Abramitzky et al. (2023), we focus on European immigrants, given that changes in immigration flows to the United States between 1910 and 1930, due to world events

[15] We also consider robustness exercises to our main analyses with linked data where we use Census Linking Project and IPUMS links in the analysis; further discussion is available in Section 4 and Online Appendix B.

and U.S. policy, primarily impacted European immigrants.[16]

We include state by year fixed effects, Γ_{st}, meaning that our estimates of the effects of immigration at the individual level compare individuals in different cities within the same state where the two cities faced differential changes in the fraction of city residents who are immigrants. Because the life cycle profiles for labor force participation and earnings are so steep for young workers (see Online Appendix A) and our specification studies 10-year differences, we also include age fixed effects, α_a, to identify effects for workers relative to changes that would have otherwise occurred over their life cycle. In all specifications, we cluster errors at the MSA level and each person is given equal weight.

The primary set of outcomes we study are changes in labor force participation, changes in income (proxied by the log occupation score of the worker's occupation), changes in residence (i.e., moving out of the city), and changes in occupation. We also study subsets of these changes, such as changing labor force entry or exit, changes in occupation coinciding with an increase or decrease in income, and specific destinations to which workers may have moved to (e.g., out of state, to larger or smaller cities, etc.)

3.2 Instrumental Variables Approach and Identification

A natural concern with identifying the labor market impacts of immigration using changes in the fraction of the city population who are immigrants is that immigrants are not randomly assigned to cities, but may selectively choose cities they settle in. If this selection is on the basis of trends in labor market outcomes or other city features correlated with those outcomes, this will bias our estimates of the impacts of immigration. As a result, we follow a similar approach to Tabellini (2020) and do not directly estimate the specification in (1), but consider a two stage least squares setting, where we instrument for changes in the fraction of recent European immigrants in the city population using a shift-share instrument (as in Card, 2001).

Our instrument constructs predicted changes in the share of immigrants in each city using the year 1900 settlement patterns of immigrants from different regions of origin and the total in-

[16] We note that in this period of history, the largest changes in immigration were, on average, decreases in immigration (see Table 1), with some regions affected more than others. However, for ease of interpretation, we describe our results in terms of increases in immigration.

flows of immigrants from each region from 1910-1930. Formally, we construct the predicted change in the share of the population who are immigrants for each city c in each time period $t \in \{1920,1930\}$, $\Delta PredFracImmig_{ct}$, as:

$$\Delta PredFracImmig_{ct} = \frac{1}{\hat{P}_{c,t}} \sum_{i} \omega_{i,c,1900} Immig_{i,-c,t} \qquad (2)$$

where $\hat{P}_{c,t}$ is the predicted population of city c in the time period t, $\omega_{i,c,1900}$ is the fraction of all immigrants of region of origin i who reside in city c in the year 1900, and $Immig_{i,-c,t}$ is the total immigrants in-flows to the United States from region i between time periods $t-10$ and t, omitting the inflows that ultimately resided in city c. Our predicted city population measure follows the approach of Tabellini (2020), using average decadal population growth in urban areas (leaving out growth in the Census division of each city) to project forward city sizes after 1900. This avoids the concern raised in Card and Peri (2016) that immigrant inflows could endogenously affect city population sizes. Summary statistics for the instrument are reported in Table 1 and additional details of how this instrument is constructed (including a listing of all regions of origin used) are available in Online Appendix A.

The key identifying assumption when using this instrument is that the variation in immigrant settlement patterns in 1900 is unrelated to subsequent changes in labor market outcomes (see Goldsmith-Pinkham et al., 2020). We present several robustness analyses to support this assumption in Online Appendix B, showing that our analysis is robust to controlling for age-specific pre-trends in labor market outcomes from 1900-1910 and that results with this instrument are robust to controlling for time trends in city characteristics.

We also consider additional sources of variation in immigration across cities, using plausibly exogenous variation in immigration driven by the Immigration Acts of the 1920s and World War I, as in Ager and Hansen (2017), Tabellini (2020), and Abramitzky et al. (2023). Immigration policy between 1910 and 1930 heavily restricted immigrant in-flows from certain European nations, initially due to WWI (restricting in-flows from non-Allied nations), and then later due to the Immigration Acts of 1921 and 1924, which imposed region-specific immigration quotas. As argued in both Tabellini (2020) and Abramitzky et al. (2023), this source of variation substantially reduced the serial correlation in immigrant inflows over time, and thus is unlikely to conflate the short run and long run responses of the economy to immigration (a concern raised in Jaeger et al., 2018).[17] Our results using these alternate sources of variation are described in more detail in Online Appendix B. We find similar results as in our baseline specification.

We note, however, that our results remain of interest even in the case where the identifying assumption is not satisfied. Given that we are starting from the same populations and same instruments for changes in immigration as existing literature, to the extent that we find differences in results observed at the individual and local labor market levels, this suggests that selective migration is important to consider in evaluating the impacts of immigration in this historical context.

4 Economic Impacts of Immigration

4.1 Average Impacts of Immigration

Table 3 presents our results for the average impact of changes in immigration on individual workers. We report results for the outcomes of: whether or not workers moved out (column 1); changes in labor force participation (column 2); labor market entry and exit (columns 3 and 4); changes in log occupation scores, conditional on being in the labor force in both time periods (column 5); occupational switching (column 6); and whether or not there was an upward or downward occupational switch, measured by changes in log occupation scores (column 7 and 8).[18] Between 1910 and 1920, the absolute value of the average change in the fraction of new immigrants in our sample cities is approximately five percentage points (see Table 1). We thus use this figure as a benchmark for describing our results (i.e., dividing our estimated coefficients by 20; see also Tabellini, 2020). We report the first stage estimates of the impact of our instrument on actual changes in the fraction of immigrants in Online Appendix A.

At the individual level, increases in immigration lead to increases in out-migration and labor force participation, but have no impact on incomes. A five percentage point increase in the fraction of immigrants in a city thus increases the probability of moving out of the original city by 3.2 percentage points and increases labor force participation by 0.9 percentage points.

[17] Prior to using the WWI and quota instrument directly, we find that a correlation across decades in changes in predicted immigration, our original shift-share instrument, of -0.36. This low, and even negative serial correlation, mitigates concerns about conflating short-run and long-run impacts of immigration, as discussed in Jaeger et al. (2018).

[18] Formally, labor market entry is defined as the incidence of making a transition from out of the labor force to in the labor force and labor market exit is defined as the incidence of making a transition from in the labor force to out of the labor force.

Increased labor force participation comes primarily through increased entry to the labor force (0.7 percentage points), but also through a decrease in exit from the labor force (0.2 percentage points). We find no impact of immigration on incomes, though we cannot rule out moderate positive effects.

In terms of occupational mobility, we find that workers in areas with increased numbers of immigrants were less likely to change occupations. A five percentage point increase in the fraction of immigrants in the city reduces occupational switching by 1.3 percentage points.[19] The economic interpretation of this finding is, on its own, ambiguous, as lower occupational switching could be a positive outcome, representing more labor market stability, or a negative outcome, representing difficulty making career advancements. Looking at the probability of making an upward or downward occupational switch, we find that increased immigration has no significant impact on upward occupational switching, but does substantially reduce the probability of making a downward occupational switch. Thus, increased immigration may provide some labor market insurance for natives, reducing the incidence of negative labor market shocks which would cause a career regression.

Prima facie, it may seem hard to square the fact that increased immigration has no impact on occupation scores with the finding that workers are both less likely to make a downward occupational switch and no less likely to make an upward occupational switch. To reconcile these findings, in Figure 1, we present results for the probability of observing a log occupation score change of different amounts, in increments of 0.25 log points. This allows us to trace out how the distribution of income changes shifted in response to changes in immigration.

Although average incomes were unaffected by increased immigration, the distribution of income changes changed significantly. Consistent with the reduced incidence of downward occupational switching seen in Table 3, we see that the likelihood of making a switch to an occupation that pays up to 25 log points less than the current occupation is substantially reduced, and that there is also a smaller reduction in slightly larger decreases, between 50 and 75 log points. However, we also observe that the probability of switching occupations and losing 75 log

[19] Even with more than 300 three-digit occupations and occupational transitions occurring over 10 years, the baseline rate of occupational switching of 62% reported in Table 3 seems high. There is likely a nontrivial amount of spurious occupational switching in the data due to how interviewers coded worker responses and how these were mapped to occupations; this problem persists even in current labor market data (see, for example, vom Lehn et al., 2022). The incidence of switching is lower when using one-digit occupations, possibly in part due to less measurement error; estimating occupation switching results using one-digit occupations generates similar results.

points or more of one's current income *increases* with increases in immigration. Since these income changes are measured conditional on remaining in the labor force, these career regressions are low probability events on average, occurring to only 2-3% of workers.[20] However, the estimated effect of a five percentage point increase in the share of immigrants is to increase this probability by 1.2 percentage points, increasing the incidence of this tail risk by 50%. Thus, increased immigration both reduced average labor market risk and tilted the profile of that risk, with increased risks of a large negative shock and much lower risks of a small negative shock. For upward occupational switching, we also observe a shift in the distribution of risk, with an increased probability of a small upward move up the job ladder, but a reduced probability of a larger move up the ladder.

4.2 Heterogeneity in Individual-Level Impacts by Age, Education and Race

We now turn to heterogeneity in individual responses to changes in immigration, i.e., who are the "winners" and the "losers" of increased immigration. We first consider heterogeneity in the impacts of immigration on individuals based on their age and education/skill. We also report results for workers outside the labor force who do not have an education score. As an alternative measure of education/skill, we also show in Online Appendix C that similar results are found if we use quintiles of workers' occupation scores.

To analyze heterogeneity in worker outcomes from immigration, we augment our specification in (1) to allow for heterogeneous impacts across workers in different groups indexed by g:

$$\Delta Y_{iacst} = \sum_{g} \left(\beta_g \Delta FracImmig_{ct} * \mathbb{I}_{i \in g} + \Phi_g \right) + \Gamma_{st} + \alpha_a + \varepsilon_{iacst} \qquad (3)$$

where $\mathbb{I}_{i \in g}$ is an indicator function for individual *i* being a member of group g and Φ_g are fixed effects for each group g. We consider three different group definitions in separate specifications: 10 year age bins (16-25,…,56-65), quintiles of the education score distribution, and white and non-white.[21] These specifications fully interact changes in immigration with all possible groups and do not include a stand-alone term for immigration, meaning that the coefficient β_g is the

[20] We also note that since we measure median income of the occupation, a sizable portion of these losses may come by moving to occupations where a larger fraction of workers are not working full-time hours.
[21] In the case of age groups, the fixed effects for each age group are absorbed in the already present year by year age fixed effects.

marginal effect of increased immigration for workers in group *g*.

Figure 2 plots the estimated coefficients from regressions studying age (top row) and education groups (bottom row); detailed regression output tables for these results are available in Online Appendix C. We find substantial heterogeneity in the impact of immigration across workers of different ages and education levels. We see that younger workers and workers with lower education scores (and nonemployed workers) are more likely to move out in response to immigration increases, whereas there is no statistically significant increase in migration for older and more educated workers. We also see that changes in income vary significantly by age and income, with older and higher educated workers seeing significant increases in income in response to increases in immigration. In contrast, there are no statistically significant income gains for young workers and statistically significant income losses for workers with education scores in the bottom 40%. These results suggest that increases in immigration exacerbated economic inequality among natives.

In Online Appendix C, our full regression results provide further evidence on the channels whereby these income changes are happening, particularly for workers with different levels of education. We find that income losses for low-skilled workers come about through two channels that contrast with our results for the average worker – a reduced likelihood of upward occupation mobility and an increased likelihood of downward occupational mobility. More educated workers see outcomes similar to those seen on average in Table 3 – (strong) insurance against downward occupational switching, but insignificant changes in upward occupational mobility opportunities.[22]

We also see from Figure 2 that the impact of immigration on labor force participation is concentrated among younger and older workers, with labor force participation increasing among younger workers and decreasing amongst older workers.[23] Prime-aged workers see no significant changes in labor force participation; there is also no significant change in labor force participation among already employed workers, regardless of their education score. As can be

[22] However, when we measure education/skill using quintiles of the occupation score distribution (in Online Appendix C), we do see an increase in upward occupational mobility for workers in the top two quintiles of occupation scores.

[23] Given the large labor force exit effect for older workers, one concern about our findings of relatively increased incomes for older workers is that this is due to selection, with low-income older workers exiting the labor force. However, we find that these gains in income for older workers persist even when controlling for education score, suggesting selection is unlikely to be the driving factor for these gains.

seen in Online Appendix C, these changes in labor force participation primarily come from increased labor market entry by young workers and increased labor market exit by older workers. Given the high rates of labor force participation for men over this time period (see Table 1), we interpret this large increase as immigration accelerating labor force entry for younger workers and not increasing labor force participation from workers who would otherwise not participate. In general, it is difficult to interpret the results in terms of welfare, as increased labor force participation for the young may be due to higher returns to labor force participation or rising economic necessity within households. Regardless of the interpretation, the key finding we emphasize is that the labor force participation increase induced by increased immigration is observed solely for young workers and not for prime-age or older individuals.

We also consider the heterogeneous impacts of immigration across the racial background of workers. Table 4 presents results where we interact treatment with being a white or non-white (primarily black; see Table 1) worker. Increased immigration had very different impacts on white and non-white workers. We focus on outcomes for non-white workers since these workers are a significant minority in our sample (6%) and thus white worker outcomes are almost identical to the average outcomes seen in Table 3. Non-white workers do not increase out-migration in response to immigration, though we cannot rule out a negative migration effect. We also find that there is no significant change in labor force participation for non-white men and that these men experience substantial income losses with increased immigration. We estimate that for a five percentage point increase in the fraction of new immigrants in the population, non-white earnings fell by 1.4 percent. With a slight increase in white earnings (0.3 percent), our findings imply that increased immigration exacerbated racial inequality in earnings.

Our results also suggest that non-white workers became "stuck" in their current occupations. While non-white workers also saw a significant insurance effect from immigration with lower incidence of downward occupational switching, they saw a larger reduction in upward occupational mobility. Given the already low earnings of non-white workers at this time, the lack of mobility opportunities for these workers may explain why incomes fell, but there was no change in out-migration. With less opportunity for progression to better employment opportunities, non-white workers may have lacked the resources to move to better opportunities elsewhere.

In summary, we observe that immigration raised out-migration by younger, lower skilled, and white workers and decreased earnings for lower skilled and non-white workers. For non-white workers, increases in immigration cause them to get "stuck" in their current occupation, eliminating opportunities for mobility; for lower-skilled workers, increases in immigration cause reductions in upward mobility and increases downward mobility. Given these findings, in spite of some ambiguity of how to interpret our findings for labor force participation, we argue that young workers, workers with lower levels of education/skill, and non-white workers are the "losers" from increased immigration and older, white, and more educated workers are the "winners" of increased immigration.

4.3 Additional Outcomes and Robustness Exercises

We present a variety of additional results in Online Appendices B and C. In Online Appendix B, we show that our results are robust to the following variations: reweighting observations in our linked sample to be consistent with population demographics (i.e., race, marital status, age and initial city of residence); using an alternative identification strategy with variation in predicted immigration based on WWI and U.S. Immigration Policy in the 1920s as our instrument for the fraction immigrants in each city; allowing for possible differential trends in city characteristics (racial composition, skill ratios and manufacturing employment shares); and using 1900-1910 data to control for age-specific pre-trends for changes in individual outcomes for those workers who originally reside in each city (including those workers who move away). We also discuss how our results vary if we use alternative approaches to link workers across Census waves, using either Census Linking Project or IPUMS MLP data instead of the Census Tree.

In Online Appendix C, we present the following additional results: results for women's labor market outcomes; results when we use OLS instead of IV; additional details regarding distributional impacts of immigration by age and education/skill; and how results vary by small and large cities and for children of native parents and children of immigrants. For women, we find broadly similar results to the average results for men in Table 3, with some evidence of some income gains (although, given low rates of female labor force participation, this effect is for less than 15% of women,). When we use OLS instead of IV, our results look very similar to our baseline results along most dimensions, aside from out-migration, for which increased immigration no longer has a significant effect. This is not surprising, however, given that immigrants likely select their location of residence on local labor market characteristics that are likely appealing to natives as well, which would reduce the average out-migration response for workers in these labor markets. We note that labor market outcomes may vary based on city size, as smaller cities may feature different mobility opportunities and differential rates of local attachment. We find that immigration to smaller cities does not induce out-migration, and has a modestly positive effect on incomes, as natives experience increases in upward occupational mobility with increased immigration.[24] Finally, we find that the effects of increased immigration do not vary much based on the birthplaces of individuals' parents; this is perhaps not surprising given that in this period of history, a large fraction of residents in cities were children of immigrants (35-40%; see Table 1).

5 Where and Why Natives Moved Away

Given that our linked data allows us to study the internal migration patterns of natives, we now explore in greater detail how immigration impacted native migration. In Section 4, we showed that increased immigration increased native out-migration, particularly for young, less educated, and white workers. Now, we analyze how immigration affected *where* people moved to and how immigration affected movers and stayers differently. We then conclude this section with some suggestive evidence that increased immigration may have led to native labor market displacement.

We first analyze where workers went when leaving their cities in response to increased immigration. We do this by interacting the outcome of a worker moving away from their original city with characteristics of the location they moved to. The different move characteristics we consider are moves outside of the state economic area (clusters of similar counties within a state, as originally defined by the Census Bureau), moves out of state, moves to a rural area (a location not defined as a city in that year), moves to a bigger or smaller city, moves to a state economic area with a high or low immigrant share (in 1910), and moves to state economic areas with high or low average occupational scores (in 1910). We plot the estimated IV coefficient on changes in the fraction of immigrants for each of these move outcomes in

[24] One possible explanation for these findings is that in small cities, local ties are stronger, both reducing the incidence of out-migration and facilitating networking opportunities that enable upward occupational mobility in the face of increased labor market competition by newly arriving workers.

Figure 3.

Increased immigration not only increased moves out of cities, but also changed the distribution of locations movers ended up in. Increases in immigration increased the rate at which workers moved out of state economic areas, moved to rural areas, and moved to bigger cities, while reducing the rates at which workers moved out of state or to smaller cities. Since most of the increase in migration is for moves outside a workers' state economic area, this suggests that the primary out-migration of natives is not relocation to more affluent suburbs near workers' original cities (Boustan, 2010).

One possibility for why workers are leaving their original cities is because of prejudice towards immigrants. If this was a core motive behind workers' decisions to move, we might expect to see migration towards locations that have smaller shares of immigrants in the population. However, we see no statistically significant increase in migration towards state economic areas with low shares of immigrants in the population and we see a significant increase in migration towards areas with high shares of immigrants.

Movers were also more likely to move to areas with higher average occupation scores. In general, we conclude that increased immigration generates increased moves of significant distance (i.e., not just to local suburbs) to larger, richer labor markets, as measured by population, immigrant share and average incomes.

To better interpret the economic content of these moves, we now consider evidence regarding differential economic impacts of immigration on workers who stayed versus workers who moved. Table 4 shows results where we interact treatment with whether or not a worker moved out or stayed, while also controlling for the average effects for movers (following the same specification as in (3)). Because native out-migration may respond to changes in immigration, we cannot interpret differences in outcomes between movers and stayers as causal. However, we consider our findings on differential economic outcomes for movers and stayers as suggestive evidence to further our understanding of the full picture of the economic consequences of immigration.

We observe that the outcomes for movers when there is increased immigration are significantly different than for both other movers and workers who stay. Increased immigration increased labor force participation for both movers and stayers, though slightly more for movers than stayers. However, stayers observe income gains with increases in immigration, whereas movers do not see any significant increase in income (and are already more likely to experience an income loss on average). These differences appear to be driven by differences in upward economic mobility. Both movers and stayers, in response to immigration, are less likely to make a downward occupational switch, but stayers are more likely to make an upward switch, whereas movers are less likely to make such a switch.

With the available data we have, we cannot directly assess the causal motives for why some workers move out of a city when there is increased immigration and some don't. However, the combined findings that workers moved to larger labor markets and lost income when they moved is supportive of a displacement effect for workers who end up leaving the local labor market. We explore this displacement hypothesis further by analyzing out-migration effects and immigrant work patterns at the 1-digit occupation level.[25] We estimate a specification where we interact changes in immigrant share with an indicator for being initially employed in each of the eight 1-digit occupations (listed in Table 1). We then plot the coefficient on migration for each of those nine occupations against the share of recently arrived immigrants (measured using the Full Count Census for all cities) employed in each of those nine occupations; results are shown in Figure 4 (and full regression output is available in Online Appendix C).

We observe a substantial positive correlation between the occupations which immigrants work in and the occupations with high out-migration coefficients in response to increased immigration. This is supportive of the idea that as immigrants enter cities and seek work in certain occupations, this increases local labor supply, generating either lower wages and/or higher non-employment for workers originally employed in those jobs. Some of those workers then leave the local labor market, seeking improved economic fortunes elsewhere. Workers who remain do so selectively, potentially due to complementarities with the skills and abilities of newly arrived immigrants. We thus argue that workers who move away from their original cities of residence are often "losers" of immigration, whereas those who stay are "winners."

Furthermore, these estimated disparities for workers who move away from their original cities may understate losses experienced by workers exposed to immigrant competition. Workers who move in response to increased labor market competition may be positively selected among the set of workers facing increased labor market competition (Borjas et al., 1992; Dahl, 2002; Piyapromdee, 2021) and thus these workers moving away may fare much better than

[25] We focus on 1-digit occupations to reduce potential bias from occupational misclassification.

workers who face greater barriers to geographic mobility. For example, we observed in Table 3 that for non-white workers, who may have faced greater barriers to mobility, increased immigration led to largely negative labor market outcomes.[26] Thus, the income losses experienced by non-white workers may have come from increased competition from new immigrants, exacerbated by barriers to moving.

6 Comparison to Findings at the Local Labor Market Level

We conclude with a comparison of our estimates of the economic impact of immigration at the individual level to estimates of the economic impact of immigration at the local labor market level, which has been the primary focus of recent literature studying this time period (i.e., Ager and Hansen (2017), Tabellini (2020), and Abramitzky et al. (2023)). We do this by estimating the impacts of immigration at the local labor market in a specification similar to ones used in existing literature and then compare these findings to our results at the individual level and to results in the existing literature. We then show how to reconcile these differences between local labor market results and individual specifications.

6.1 Local Labor Market Level Estimation Specification

We estimate the impact of immigration at the local labor market level using the following specification:

$$\Delta Y_{cst} = \beta_1 \Delta FracImmig_{ct} + \Gamma_{st} + \varepsilon_{cst} \tag{4}$$

where ΔY_{cst} is the change in the labor market outcome of interest for city c in state s between t and $t - 10$ (where t is either 1920 or 1930), the key independent variable is the change in the percent of the population who are immigrants in that city and time period ($\Delta FracImmig_{ct}$), and Γ_{st} represents state by year fixed effects. We cluster standard errors at the MSA level and each city is given equal weight. We estimate results at the local labor market level using 2SLS with the same instrument as we used in our individual specification (as defined in (2)).

While this specification is very similar to our individual level specification in (1), there are several important differences. First, our individual results restrict our sample to workers who

[26] We note that, in this period of time, migration rates for black workers are actually higher than migration rates for white workers (see Online Appendix A). However, a substantial portion of this migration is inter-state migration associated with the First Great Migration, with black workers leaving the South for the North. Once these moves are excluded, migration rates for black workers are lower than migration rates for white workers.

are ages 16-65 in the first of the two linked Census years, meaning these workers are 26-75 in the second of those Census years. This contrasts with studying local labor market samples of workers ages 16-65 in both Census years, implying a changing cohort composition over time in the local labor market samples, as the formerly old workers (56-65) are not observed in the second Census wave and a new cohort of young workers is present instead. Because our individual specification follows the same workers 10 years later in their life cycle, we control for age fixed effects in our individual specification; we do not control for these age fixed effects in our local labor market specification. Furthermore, our local labor market specification weights each city equally instead of weighting each person equally in our individual specifications. We also restrict our sample to workers that can be linked over time, whereas local labor market specifications do not require this restriction, being able to use the full Census sample.

The most important distinction between the individual level specification and the local labor market specification, however, is that treatment in the individual specification is assigned to the individual on the basis of the *original* labor market the person resided in. That is, our individual specification focuses on workers originally residing in a given city, including those who may have moved out and excludes new move-ins to that city. Our individual level specifications thus account for the selective migration response to changes in immigration, capturing the worker level impacts of immigration for the original workers in a given labor market.

6.2 Comparing Results at the Local Labor Market and Individual Levels

Table 5 presents estimates of the impact of immigration at the local labor market level. Column 1 presents our shift-share IV estimates based on the estimation specification in (4). However, successive columns in Table 5 make modifications to the local labor market specification to more closely resemble our individual specification. These successive modifications effectively provide a decomposition of the differences in our local labor market and individual specifications.

Our results in Column 1 show that, at the local labor market level, increases in immigration increase both labor force participation and average log occupational scores.[27]

[27] We look at the average of log occupational scores and not the log of average occupational scores, as some of our modifications to the local labor market specification include subtracting out age-specific means, which could

Specifically, a five percentage point increase in the share of immigrants in a city increases labor force participation by 0.8 percentage points (although this is imprecisely estimated) and increases average log occupation scores by 1 percentage point. These results are very similar to those of Ager and Hansen (2017) and Tabellini (2020), who find that comparable increases in immigration increased labor force participation by roughly 1.5 percentage points and raised incomes by 0.5 to 1.3 percentage points.[28]

Although the results for labor force participation are similar to our individual level results, the effects of immigration on income at local labor market level are much more positive than the smaller, insignificant estimates observed in Table 2 from our individual specification. We now analyze what explains these differences by gradually adjusting the local labor market specification to match our individual specification.

First, in Column 2, we re-estimate the local labor market specification, but use our linked sample, constructing each city's outcomes using the set of individuals in that city that can be linked over time. We find almost identical, and slightly more precise results for this sample, suggesting that restricting the sample to linkable persons does not explain our different findings for the effects of immigration on income.

In Column 3, we further adjust the local labor market specification in three ways. First, we weight cities by their population size (measured using the linked data population), mimicking the individual level weighting of the individual specification. Second, we adjust the age window for the data to be consistent with our individual specifications, which analyze changes in labor market outcomes for the same worker over a ten year period. To do this, we look at changes in labor market outcomes for workers ages 16-65 years old in the first of the two Census waves and

generate negative values for some cities. However, in specifications where we don't make such modifications, analyzing changes in the log of average occupational scores generates very similar results.

[28] We note that Abramitzky et al. (2023) obtain different findings for the effect of immigration on workers' incomes. Using a sample of linked men who are initially ages 15-55, Abramitzky et al. (2023) find no significant relationship between increases in immigration and changes in average income scores at the local labor market level, in contrast to our finding of income gains for stayers in Table 5. There are many potential differences between our specifications which may account for these different estimates. Abramitzky et al. (2023) explore some of these differences relative to findings in Tabellini (2020). One additional specific difference is that Abramitzky et al. (2023) do not include age fixed effects to control for the life cycle patterns of these workers. As we show in Online Appendix C, when only modifying local labor market specifications to follow the same cohorts of workers over time without controlling for life cycle patterns in earnings, the effect of immigration on incomes falls significantly. Because life cycle profiles in earnings are so steep, especially for young workers, we emphasize that controlling for age fixed effects is important for properly understanding how incomes evolve in response to economic shocks when studying linked samples of the same workers over time.

workers ages 26-75 years old in the second Census wave, no longer fixing the sample to compare outcomes for 16-65 year old workers in both Census waves. Finally, we construct the average value of each labor market outcome for each age level (within our linked data) and subtract off these means from observed labor market outcomes. Effectively, this residualizes our dependent variable, just like the inclusion of age fixed effects does in our individual specification.[29] We see that these three additional modifications in Column 3 have minimal impact on the local labor market level estimates of economic impact of increased immigration. In Online Appendix C, we report the impact on local labor market estimates of making each of these modifications separately.

Finally, in Column 4, we adjust the local labor market specification in one final way to account for the effects of selective migration. We now analyze changes in city-level outcomes where the residents of the city in the second of the two Census waves are defined as those workers who originally resided in the city in the first year of Census wave. That is, we analyze the average effects of immigration for those workers who originally resided in that city, including those workers who may have moved out and excluding those workers who may have moved in. We find that accounting for selection migration generates point estimates for the effects of immigration on labor force participation and incomes that are virtually identical to what we observe in Table 2 at the individual level.[30] Understanding the native migration response is thus important for identifying the individual effects of immigration.

Our findings in Table 5 suggest that a significant portion of the estimated income gains at the local labor market level must be attributable to native in-migration in response to immigration. We confirm this result in Table 6, where we present estimates at the individual level similar to Table 4, broken out by individuals who stayed in their original labor market and individuals who moved in to that labor market.[31] Namely, we assign the treatment of changes in

[29] A full residualization would involve both residualized changes in the immigrant share and state by year fixed effects in these specifications. However, the effect of not residualizing these variables for age is small, as will be seen as we discuss Column 4.

[30] We note that the reason we do not have the exact same regression results is because 1) we do not residualize changes in immigrant share or state by year fixed effects for age, and 2) there is selection in which workers appear in the labor force in consecutive time period, which may modestly affect how we have residualized log occupation scores for age effects. However, given the very close similarity of these results to those in Table 2, the effects of these differences from the individual specification estimation are small.

[31] Similar to our analysis in Table 4, we cannot assign a causal interpretation to differences in stayers and move-ins in this specification because moving is an endogenous choice. However, this evidence provides descriptive

the immigrant share based on the city where each individual resides in the second of the two linked years, so our estimation sample is now comprised of workers who stayed in their original labor market and workers who moved in to that labor market. We find a significant move-in effect, with increases in immigration increasing move-ins to these cities. New move-ins on average experienced income increases when moving, and that these increases were larger when they moved to areas receiving more immigrants.[32] Thus, while increased immigration did boost average incomes in local labor markets, a significant portion of these gains did not accrue to workers originally residing in these labor markets.

7 Conclusion

We study the impact of immigration on the labor market outcomes of natives at the individual level over the years 1910-1930, when immigration flows to the United States changed significantly due to changes in global conditions and domestic policy. Using linked data, we find that increases in immigration increased labor force participation and out-migration, but had no significant impact on natives' incomes. We also find that increased immigration generated an "insurance effect," reducing downward occupational switching. However, we also see that increased immigration changed the distribution of downward risk in the labor market, with large reductions in incomes becoming more likely.

With our linked data on individual workers, we are further able to identify the relative "winners" and "losers" of immigration. Younger, lower-skilled, and non-white workers are "losers" from increases in immigration, experiencing income losses and in some cases, reduced opportunities for upward economic mobility and higher rates of out-migration. Workers who move away from labor markets which had increases in immigration appear to fare worse than those who stay, providing suggestive evidence of labor market displacement due to increased labor market competition from newly arrived immigrants.

Our individual level findings contrast with evidence at the local labor market level which

information about forces that may account for the positive impact of immigration observed in local labor market specifications.

[32] These new move-ins may have come from locations outside our sample or from cities within the sample. Even if all move-ins were from within our sample, the positive income gains for move-ins are not inconsistent with the income losses for move-outs seen in Table 4, as the comparison groups in these specifications differ – move-ins are compared to the individuals in the cities they arrive in in Table 6, but move-outs are compared to individuals in the cities they left in Table 4.

finds larger positive effects for worker incomes. We find that the differences between these results are generated by individual level results accounting for selective migration. This implies that a significant portion of economic gains from immigration accrued to workers not originally residing in the local labor market. These findings may provide some rationale for the puzzle identified by Tabellini (2020), that although there are, on average, economic benefits at the local labor market level from increased immigration, there is yet substantial political opposition to immigration. Furthermore, given that a significant portion of the economic benefits to native who stay in their local labor markets is achieved through reducing the incidence of negative shocks, it is possible that even those natives who benefit from immigration may not realize the insurance benefits they receive from immigration. As a result, while there are average economic gains from increased immigration, these gains may be unappreciated by natives and insufficient to temper native motives for opposition to immigration.

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Table 1: Summary Statistics of Full and Linked Samples, All Cities

	1910 Cohort			1920 Cohort		
	Full Sample	Linked Sample	Δ Among Linked	Full Sample	Linked Sample	Δ Among Linked
	(1)	(2)	(3)	(4)	(5)	(6)
Age	33.10	32.57		34.25	33.52	
White	0.91	0.94		0.90	0.94	
Black	0.09	0.06		0.10	0.06	
Other Race	0.00	0.00		0.00	0.00	
2nd Generation Immigrant	0.39	0.42		0.36	0.38	
Married	0.51	0.56	0.17	0.55	0.60	0.17
Never Married	0.46	0.41	-0.22	0.41	0.37	-0.21
Divorced	0.01	0.00	0.00	0.01	0.01	0.01
In Labor Force	0.93	0.93	0.02	0.92	0.93	0.01
Occ. Score	27.77	28.46	1.07	28.17	28.96	0.73
Education Score	14.15	14.81	0.79	14.15	14.95	1.55
No Occ.	0.06	0.06	-0.01	0.07	0.06	-0.01
One Digit Occupations						
Laborer/Other	0.15	0.12	0.00	0.14	0.11	0.00
Services	0.06	0.05	-0.00	0.05	0.04	0.01
Clerical	0.11	0.12	-0.03	0.11	0.11	-0.03
Operatives	0.17	0.17	-0.03	0.17	0.18	-0.03
Sales	0.09	0.09	-0.01	0.08	0.08	0.03
Craftsmen	0.22	0.23	0.01	0.23	0.25	-0.02
Managers/Officials	0.09	0.10	0.03	0.09	0.10	0.04
Professional/Technical	0.05	0.06	0.01	0.06	0.06	0.02
City-level Recent Immigrant Share	0.10	0.10	-0.04	0.06	0.06	-0.02
City-level Immigrant Shift-Share	0.04	0.04	-0.04	0.00	0.00	-0.00
Moved Cities		0.31			0.31	
Observations	6,933,096	4,011,564	4,011,564	9,177,672	5,442,285	5,442,285

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Individuals are linked over time using Census Tree links, originally introduced in Price et al. (2021). Sample restricted to men 16 to 65 that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Sample includes cities that are identified in all census waves between 1900 and 1930. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. *2nd Generation Immigrant* is an indicator that equals one if at least one of the individual's parents was born outside of the United States. *Occ. Score* is the median total income for individuals that had that occupation in 1950 and more accurately captures occupational status or occupational mobility rather than earnings. *Education Score* is the percentage of people in the occupation in 1950 who had completed one or more years of college and proxies for the skill-level of the occupation. *Moved Cities* is a binary variable that equals one if they moved from the city they were residing in during the first Census wave.

Table 2: Average Impact of Immigrant Flows on Economic Outcomes of US Born Men, Linked Individuals

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants	0.64**	0.18**	0.14**	-0.04**	0.04	-0.25***	0.05	-0.26***
	(0.25)	(0.08)	(0.06)	(0.02)	(0.04)	(0.08)	(0.04)	(0.06)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. *Moved Out* is an indicator that equals one if the individual moved cities between the two census waves. Δ*In Labor Force* is the difference between labor force participation status in the two census waves. *Enter LF* is an indicator that equals one if the individual was not in the labor force in the first wave but was in the second. *Exit LF* is an indicator that equals one if the individual was in the labor force in the first wave but was not in the second. Δ*Log Occ. Score* in the change in the log occupation score between the two census waves. Δ*Occ.* is an indicator that equals one if the individual changed three digit occupations between the two census waves. Δ*Log Occ. Score* > 0 is an indicator that equals one if the individual's log occupation score is higher in the second census wave than in the first wave, indicating a switch to a higher paying occupation. Δ*Log Occ. Score* < 0 is an indicator that equals one if the individual's log occupation score is lower in the second census wave than in the first wave, indicating a switch to a lower paying occupation. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table 3: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Race

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*White	0.68***	0.19**	0.14**	-0.05**	0.06*	-0.21***	0.08*	-0.25***
	(0.25)	(0.08)	(0.06)	(0.02)	(0.04)	(0.07)	(0.04)	(0.06)
Δ Fraction Immigrants*Non-white	-0.47	-0.16	-0.13	0.04	-0.43***	-1.10***	-0.70***	-0.26***
	(0.33)	(0.14)	(0.11)	(0.04)	(0.15)	(0.16)	(0.17)	(0.07)
Non-white	0.00	-0.02***	-0.02***	0.00	-0.00	0.04***	0.01	0.04***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Race is observed during the first census wave. Nearly all non-white men are black. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table 4: Heterogeneous Impacts by Migration Status of Immigrant Flows on Economic Outcomes of US Born Men, Linked Individuals

	Moved (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants	0.64**							
	(0.25)							
Δ Fraction Immigrants*Stayer		0.15**	0.11*	-0.04	0.11**	-0.29***	0.09*	-0.33***
		(0.08)	(0.06)	(0.03)	(0.05)	(0.09)	(0.05)	(0.07)
Δ Fraction Immigrants*Move-out		0.25***	0.16**	-0.09***	0.02	-0.47***	-0.11*	-0.32***
		(0.09)	(0.08)	(0.03)	(0.08)	(0.10)	(0.06)	(0.11)
Move-out		0.00	0.02***	0.02***	-0.07***	0.13***	0.01***	0.12***
		(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. "Move-out" refers to individuals who moved out of their city of residence in the first census wave. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table 5: Local Labor Market Impact of Immigrant Flows on Economic Outcomes of US Born Men

	All	Linkable	Age Adjustments and Pop. Weighted Linkable	Age Adjustments and Pop. Weighted Follow Movers
	(1)	(2)	(3)	(4)
		Δ In the Labor Force		
Δ Fraction Immigrants	0.16	0.18*	0.14*	0.18**
	(0.11)	(0.10)	(0.08)	(0.07)
Dependent Mean	-0.02	-0.02	0.01	0.00
Observations	918	918	918	918
		Δ Log Occupation Income Score		
Δ Fraction Immigrants	0.20*	0.21**	0.22***	0.06
	(0.11)	(0.09)	(0.06)	(0.04)
Dependent Mean	0.01	0.00	0.00	-0.02
Observations	918	918	918	918

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Observation is a decadal difference at the city level, meaning there are two observations per city, from 1910 to 1920 and from 1920 to 1930. Only US born men 15-65 in the initial census wave are included. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (4), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. State by year fixed effects are included. In column (2) we restrict the sample to individuals that have Census Tree links before constructing the city-level average to verify that the aggregate effects are similar when looking at the selected sample of linkable individuals. In column (3) we make three modifications. First, we subtract single-age specific 10-year changes in outcomes to residualize by age (similar to age fixed effects). Second, we restrict the sample in the second survey wave to 26 to 75 year olds, to map into the ten year aging of the sample in the individuals specification. Third, we re-weight the city-level observations by the number of men used to construct the city-level averages, to match the individual-level weighting in the individual-level specification. In column (4) we make all of the same adjustments as in column (3), but we assign men to the city that they were observed in during the first census wave before constructing the city-level averages, thus including movers. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table 6: Post-Shock Residents: Heterogeneous Impacts by Migration Status of Immigrant Flows on Economic Outcomes of US Born Men, Linked Individuals

	Moved (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants Δ Fraction Immigrants	1.56***							
	(0.34)							
Δ Fraction Immigrants*Stayer		0.04	0.02	-0.01	0.05	-0.39***	-0.04	-0.31***
		(0.07)	(0.05)	(0.03)	(0.06)	(0.09)	(0.08)	(0.05)
Δ Fraction Immigrants*Move-in		-0.04	0.01	0.05	0.77***	-0.26*	0.48**	-0.70***
		(0.10)	(0.10)	(0.03)	(0.19)	(0.15)	(0.20)	(0.09)
Move-in		0.02**	0.03***	0.02***	0.15***	0.16***	0.17***	-0.01*
		(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Dependent Mean	0.35	0.92	0.07	0.04	3.24	0.66	0.39	0.25
Observations	9,969,859	9,985,789	9,985,789	9,985,789	8,777,164	8,777,164	8,777,164	8,777,164

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the *second* census wave in 1920 or 1930. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. Individuals are assigned to their second wave city when assigning the instrument value. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

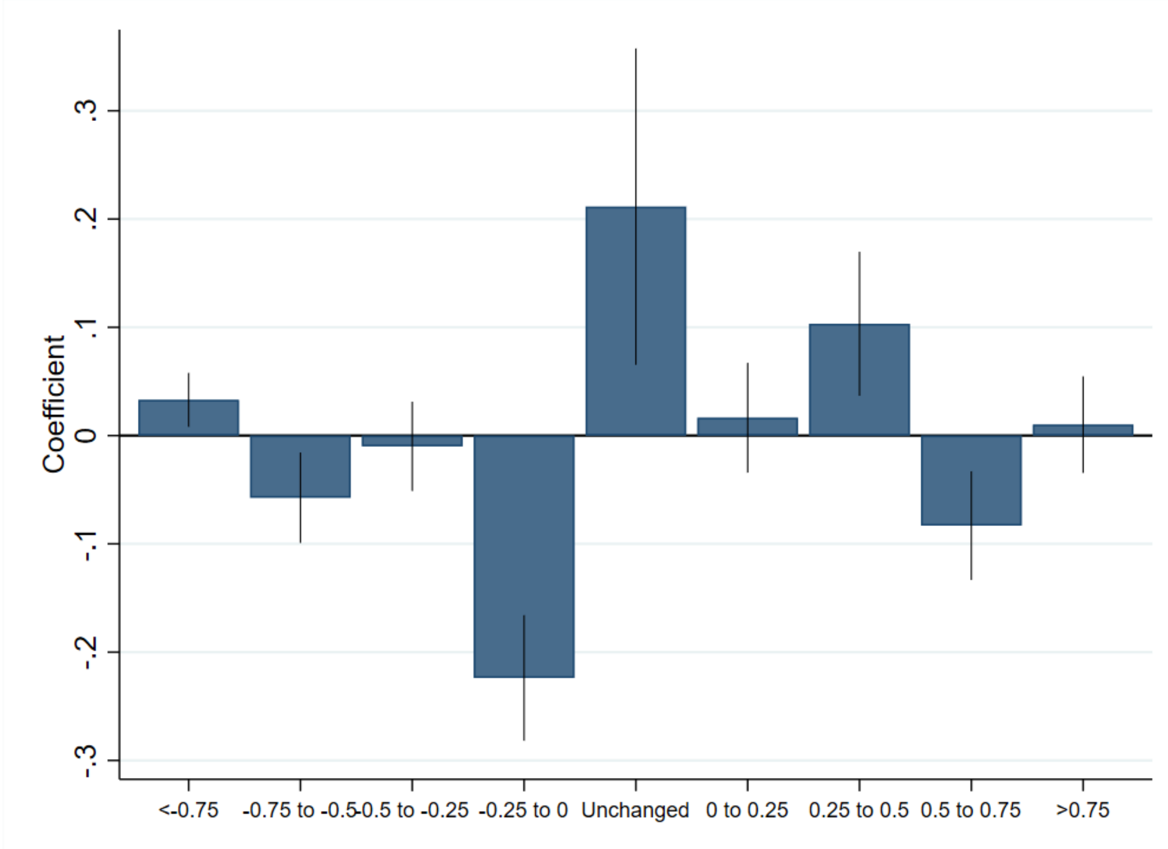

Figure 1: Distribution of Changes in Log Occupation Score In Response to Immigrant Flows

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

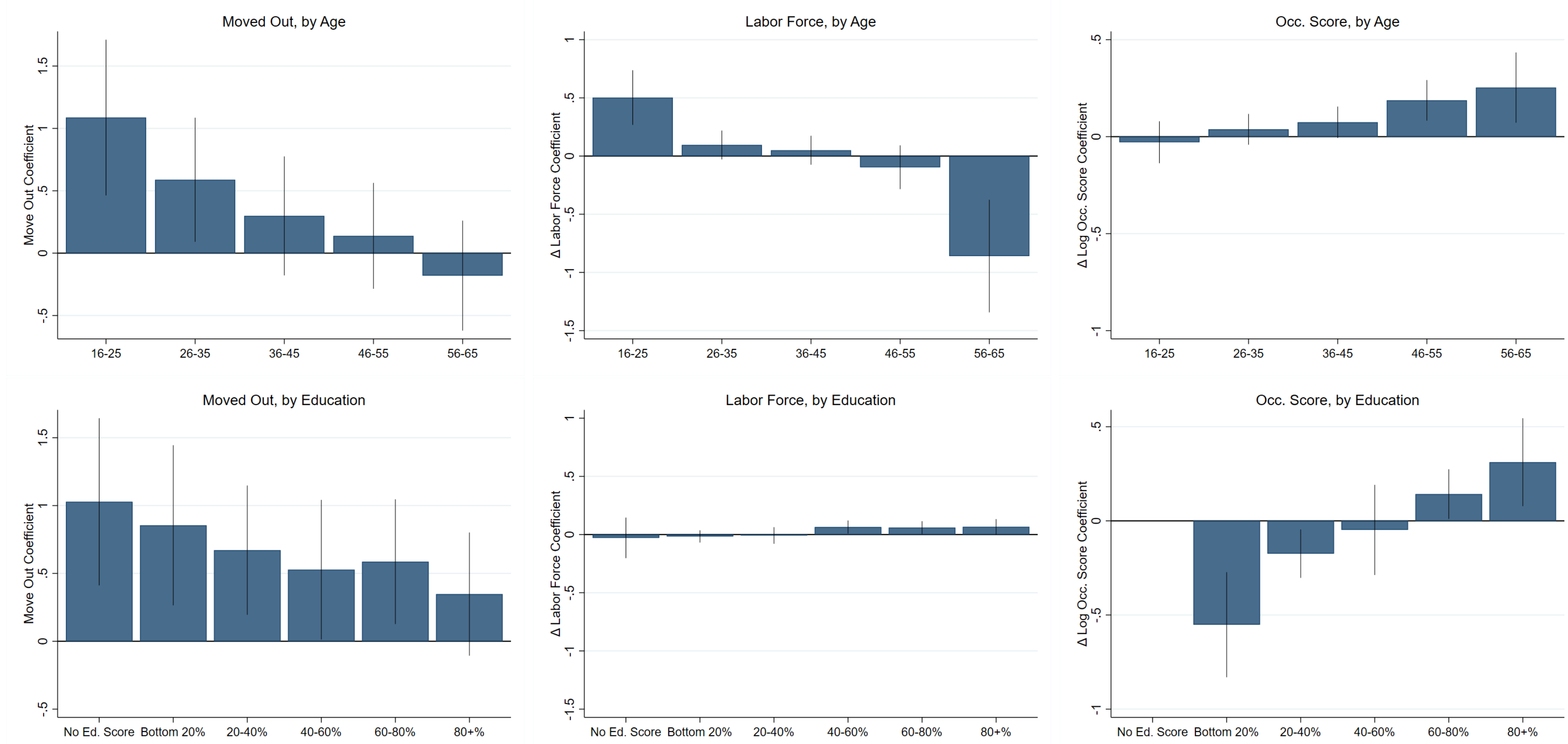

Figure 2: Heterogeneous Impacts of Immigrant Flows by Age and Education Score

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

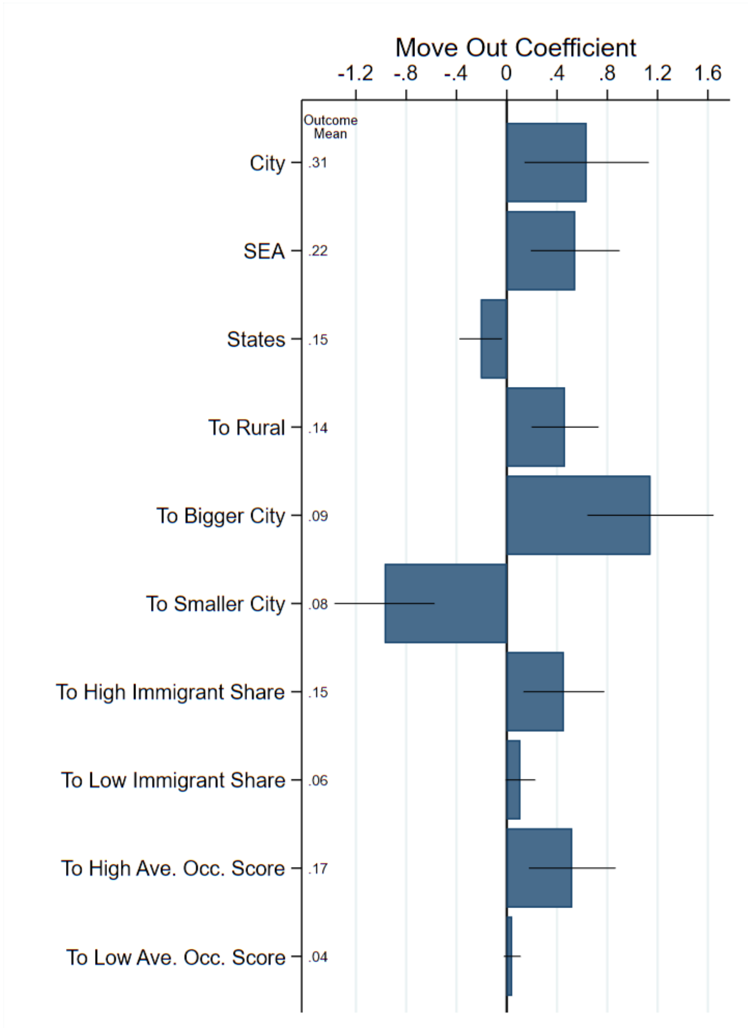

Figure 3: Where did US Born Men Move To?

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Geocodes from Berkes, Karger, and Nencka (2022) used to map people into state, SEA, and city. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

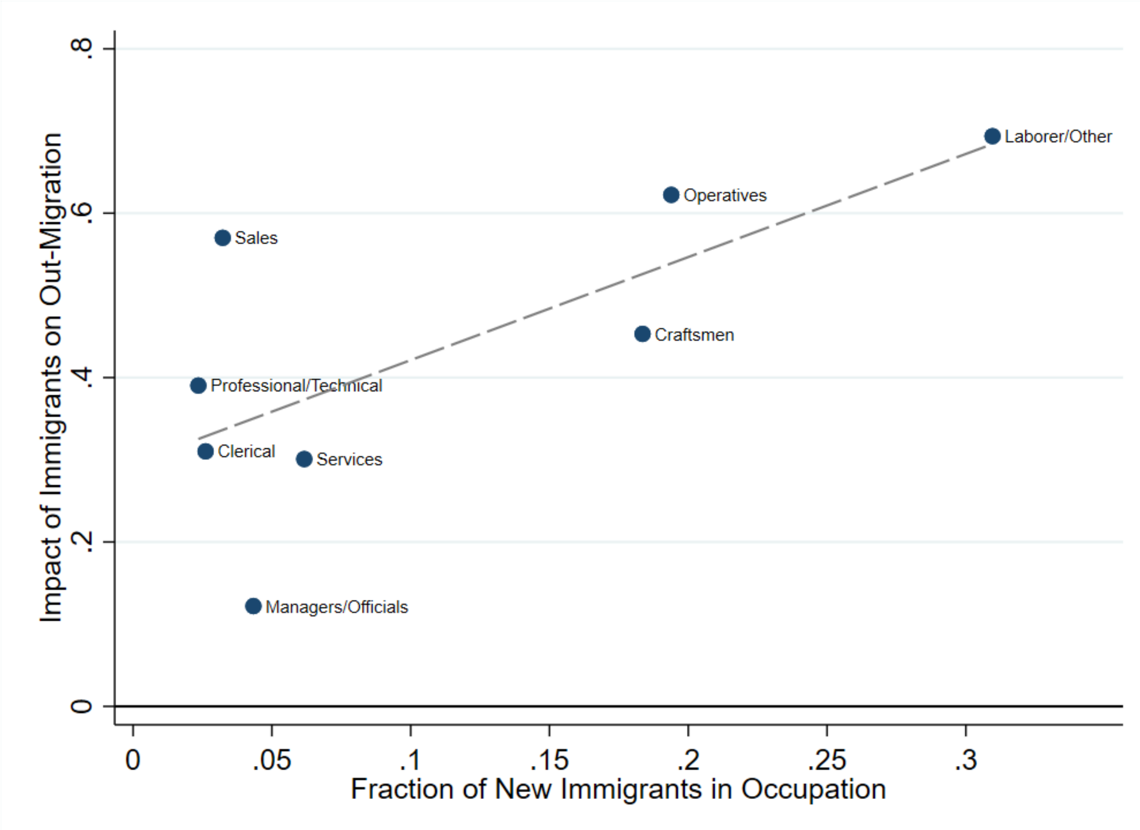

Figure 4: Potential Displacement: New Immigrant Occupations and Out-Migration Responses

Notes: The fraction of recent immigrants in each occupation are obtained from the 1920 and 1930 full count census. For the point estimates on the y-axis, the sample is restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates on the y-axis correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. Impacts on out-migration are the coefficients from Table C3.

Appendix A Additional Data Details

Appendix A.1 Map of Cities in Estimation Sample

Figure A.1 plots a map of all cities used in our analysis, with each circle weighted by the level of the population in 1900.

Appendix A.2 Immigrant Concentration in Cities

Figure A.2 plots the fraction of the male Full Count Census total population, immigrant population, recent immigrant population and recent European immigrant population residing in our sample cities in each wave of the Census. Although only roughly 40% of the total U.S. male population lived in our sample cities from 1900-1930, 60-80% of immigrant populations resided in these cities. We further note that if we consider any geographic location classified as a city in the Census year 1930 (though not necessarily in our sample if that location was not consistently classified as a city in the 1900-1920 waves), the share of recent immigrants residing in cities is in excess of 90%. Thus, the large majority of new immigrant arrivals resided in U.S. cities in this time period.

Appendix A.3 Life Cycle Profiles for Men's Labor Force Participation and Occupation Scores

Figure A.3 plots the share of men in the labor force and the average occupation score for men (conditional on being in the labor force) at each age from 16-65. These life cycle profiles are constructed as the average values of labor force participation and occupation scores at each age, averaged across the 1910-1930 Censuses.

Appendix A.4 Comparison of Linking Methods

Tables A.1 provides additional detail of how the Census Tree linked data compares to linked data obtained from the Census Linking Project (Abramitzky et al. 2022), henceforth CLP, and the IPUMS Multigenerational Longitudinal Panel (Helgertz et al., 2023), henceforth IPUMS MLP. For CLP data, we consider both links created using the ABE-exact (standard) method and the ABE-NYSIIS (standard) method.[1] Table A.1 presents summary statistics for males in the Full Count Census (for both the 1910-1920 and 1920-1930 cohorts) for the two components of the Census Tree – FamilySearch.org genealogical records and machine learning based links generated by the BYU Record Linking Lab (RLL) – and for CLP and IPUMS MLP data. Table A.1 also presents the degree of overlap in links between these data sources.

The first thing we observe is that the Census Tree data has a significantly larger number of observations than either version of the CLP data or the IPUMS MLP data. The Census Tree data contains 9.4 million linked observations for the 1910-1920 and 1920-1930 cohorts combined, compared to roughly 4 million for either CLP set of links or 6.3 million links from

[1] We note that the published CLP data for linking 1910-1920 also includes a set of links from early vintages of the Census Tree project. We do not include those links with CLP data as part of this comparison.

IPUMS MLP. Thus, the Census Tree data has more than double the number of observations in CLP and 50% more observations than IPUMS MLP data.

In general, we observe that all linking methods produce fairly representative Census samples. However, these linked datasets all tend to underrepresent non-white men and overrepresent married men. This lack of representativeness is slightly more pronounced in the IPUMS MLP data, than in either the Census Tree or CLP data.[2]

We also observe that the share of individuals who move out of their original city of residence varies significantly across datasets. Our baseline Census Tree sample for the 1910-1920 cohort has a move-out rate of approximately 31%; the two components of the Census Tree have similar move rates of 28% (FamilySearch.org) and 33% (Record Linking Lab). On the other hand, CLP data has a much higher move rate, in excess of 40%, and IPUMS MLP has a notably lower move rate of 23%.[3] If we take as given the core data in FamilySearch.org as a reference point for the actual move rate for this population, the final Census Tree data provides the most representative method in terms of out-migration rates for this sample.[4]

We also note that Census Tree data encompasses the large majority of links observed in CLP and IPUMS Data. 80-83% of links in CLP data are found in Census Tree data, and 97% of links in IPUMS data are contained in the Census Tree. Of the links in CLP that are not observed in the Census Tree (20%), about half (or 10% of the total links) represent disagreements in which pair of observations should be linked across Census waves. If we use the conservative CLP data, there is much more overlap between CLP and Census data, with only 3% being links that disagree with the Census Tree. Thus, Census Tree data appears to largely be an expansion of linked observations observed in CLP and IPUMS data and does not present a large degree of disagreement over which records are appropriately linked together.

Appendix A.5 Additional Detail on Instrument Construction and First Stage Results

Our baseline analysis uses the following instrument for predicted immigration changes in each city (equation (3) in the text):

$$\Delta PredFracImmig_{ct} = \frac{1}{\hat{P}_{c,t}} \sum_{i} \omega_{i,c,1900} Immig_{i,-c,t}$$

where $\Delta PredFracImmig_{ct}$ is the predicted share of the population who are immigrants for each city c in each time period $t \in \{1920, 1930\}$, $\hat{P}_{c,t}$ is the predicted population of city c in the time period t, $\omega_{i,c,1900}$ is the fraction of all immigrants of region of origin i who reside in city c

[2] One potential reason that married men are so overrepresented in IPUMS MLP data is that the algorithm used to link records (see Helgertz et al., 2022)) includes data about household members. Households with additional household members, such as married households, will thus be easier to link using this algorithm and thus overrepresented in the final data.

[3] If we use the conservative CLP data, these move rates drop to 34%, but the number of observations drops by roughly 30%.

[4] Family Search data has been used as a “truth set” in previous assessments of the quality of linked data such as Abramitzky et al. (2021).

in the year 1900, and $Immig_{i,-c,t}$ is the total immigrants in-flows to the United States from region i between time periods $t - 10$ and t, omitting the inflows that ultimately resided in city c.

The predicted population, $\hat{P}_{c,t}$, for each city is constructed as the population of each city in the year 1900 multiplied by the average urban population growth between the two Census years being studied. Formally, this is constructed as:

$$\hat{P}_{c,t} = Pop_{c,1900} * g_t^{-c}$$

where g_t^{-c} is the average population growth across all cities between Census years t and $t - 10$, constructed leaving out the population growth in the census division that city c is in.

The region of origin (*i*), is meant to capture the concentration of pre-existing immigrants similar to the newly-arriving immigrants, as this might influence the location choice of new arrivals. We follow an algorithmic approach when defining regions of origin. First, consistent with Tabellini (2020) and Abramitzky et al., (2023) we focus on immigrants coming born in Europe, as this is where the WWI and 1920s quota restrictions were the most binding. For each origin country in Europe we calculate the number of individuals living in the US in the 1900 census that were born in that country. If there were less than 10,000 individuals born in that country, we reassign them to the closest neighbor in the same subregion (i.e., Northern Europe, United Kingdom and Ireland, Western Europe, Southern Europe, Central/Eastern Europe, Russian Empire). For example, Spain is reassigned to Portugal while Iceland is reassigned to Norway, the closest neighbors in Northern Europe. If the nearest neighbor also does not meet the 10,000 threshold, it is again assigned to the nearest geographic neighbor in the same subregion (e.g., Albania is assigned to Greece and then Greece is assigned to Italy.). For some census respondents, a specific country is not specified (ns), but just a region (e.g., United Kingdom, ns). Individuals in these groups are reassigned to the country in the same subregion that had the largest number of immigrants in 1900. So, for example, United Kingdom, ns, is reassigned to Ireland. The country region assignments are listed in Appendix Table A.2. These source region grouping differ slightly from those used by Tabellini (2020) and Abramitzky et al., (2023), but as seen in Appendix Table A.3, this does not significantly affect our first stage estimates. Average effects and heterogeneity patterns are also similar when using the region definitions of Tabellini (2020) and Abramitzky et al., (2023).

As an alternative identification strategy, we also consider (as in Ager and Hansen (2017), Tabellini (2020) and Abramitzky et al. (2023)) constructing predicted immigration for each city based on not only the pre-existing settlement patterns of immigrants of different regions of origin, but also on the basis of changes in U.S. immigration policy. Immigration from non-allied European countries was substantially reduced during World War I and then the Immigration Acts of the 1920s placed quotas on immigration from certain regions of the world. Thus, these changes in policy provide an alternative way of constructing plausibly exogenous variation in immigration over time.

Formally, we construct two instruments, one for WWI (affecting immigration between 1910 and 1920) and one for the Immigration Acts of the 1920s (affecting immigration between 1920 and 1930), as follows. Predicted immigration between 1910 and 1920 is constructed as:

$$\Delta PredFracImmig_{c,1920} = \frac{1}{\hat{P}_{c,1920}} \sum_i \omega_{i,c,1900} Immig_{i,1910}\,(World\ War\ I\ Intensity_i)$$

where *World War I Intensity* is the measure taken from Abramitzky et al. (2023) Appendix Table A1 and $Immig_{i,1910}$ is the total inflows of immigrants to the US between 1900 and 1910 from region i. For Allied regions, the instrument predicts little constraint in immigration over this time period, whereas the non-allied regions, the instrument predicts a substantial decline in immigration.

For the period 1920 to 1930, the instrument is constructed as

$$\Delta PredFracImmig_{c,1930} = \frac{1}{\hat{P}_{c,1930}} \sum_{i} \omega_{i,c,1900} (Quota\ Intensity\ 2_i)$$

where $Quota\ Intensity\ 2_i$ is the measure taken from Abramitzky et al. (2023) Appendix Table A1, which captures restrictions imposed by the Immigration Acts of 1921 and 1924 and $Immig_{i,1920}$ is the total inflows of immigrants to the US between 1910 and 1920 from region i. Intuitively, for regions facing low quotas, which heavily restricted immigration from those regions, the instrument predicts substantially lower inflows.

Table A.3 reports our first stage results at both the city and the individual level for the shift-share instrument used in our primary specifications, as well as the first stage when using the WWI and Quota Instruments described in Appendix B. In each case, we observe that the F-stats are large. Generally, the instruments are predictive of immigration flows in the direction we would expect, with a positive sign on the shift-share instruments based purely on historical immigrant settlement patterns and a negative sign on the WWI/Quota based measures (indicating reductions in immigration due to tighter restrictions).

Appendix A. Additional Tables and Figures

Table A1: Summary Statistics, Overlap, and Uniqueness of Linking Methods

	Full Sample (1)	Census Tree (2)	Family Search (3)	RLL (4)	CLP Exact (5)	CLP NYSIIS (6)	MLP (7)
Age	33.76	33.11	33.78	32.72	32.86	32.77	33.78
White	0.91	0.94	0.99	0.91	0.95	0.94	0.96
Black	0.09	0.06	0.01	0.08	0.05	0.06	0.04
Other Race	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2nd Generation Immigrant	0.38	0.40	0.34	0.43	0.39	0.39	0.41
Married	0.53	0.59	0.68	0.53	0.56	0.56	0.64
Never Married	0.43	0.39	0.31	0.44	0.41	0.42	0.34
Divorced	0.01	0.00	0.00	0.01	0.01	0.01	0.00
In Labor Force	0.92	0.93	0.93	0.93	0.93	0.93	0.94
Occ. Score	28.00	28.75	29.76	28.15	28.85	28.74	29.22
Moved Cities		0.31	0.28	0.33	0.41	0.44	0.23
Share of Full Sample	1.00	0.59	0.22	0.37	0.26	0.26	0.39
Share Links in Census Tree					0.83	0.80	0.97
Share Unique Links Not in Census Tree					0.08	0.10	0.02
Share Links Disagree with Census Tree					0.09	0.10	0.01
Observations	16,110,768	9,453,849	3,486,580	5,967,269	4,146,592	4,232,216	6,295,923

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as “Not Yet Classified” are dropped from the sample. Individuals are linked over time using the Census Tree links originally introduced in Price et al. (2021), but we also compare samples using the Census Linking Project (CLP) (Abramitzky et al., 2022) exact and NYSIIS standard links, as well as IPUMS Multigenerational Longitudinal Panel (MLP) links. Family Search and Record Linking Lab (RLL) links are a subset of our Census Tree sample. Family Search includes links from the Family Search genealogical platform while RLL uses the machine learning techniques originally outlined in Price et al. (2021) on the Family Search training data. “Moved Cities” is a binary variable that equals one if they moved from the city they were residing in during the first Census wave.

Table A2: Regions of Origin for Instrument Construction

Source Regions	Included Countries (code)
Denmark	Denmark (400)
Finland	Finland (401), Lapland, ns (403)
Norway	Norway (404), Iceland (402)
Sweden	Sweden (405)
England	England (410)
Scotland	Scotland (411)
Wales	Wales (412)
Ireland	Ireland (414), United Kingdom, ns (413), Northern Europe, ns (419)
Belgium	Belgium (420), Luxembourg (423)
France	France (421), Monaco (424)
Netherlands	Netherlands (425)
Switzerland	Switzerland (426), Liechtenstein (422), Western Europe, ns (429)
Italy	Italy (434), Albania (430), Greece (433), Malta (435), San Marino (437), Vatican City (439), Southern Europe, ns (440)
Portugal	Portugal (436), Andorra (431), Gibraltar (432), Spain (438)
Austria	Austria (450)
Czech Republic/Slovakia	Czechoslovakia (452)
Germany	Germany (453), Central Europe, ns (458), Eastern Europe, ns (459)
Hungary	Hungary (454)
Poland	Poland (455)
Romania	Romania (456), Bulgaria (451), Yugoslavia (457)
USSR/Russia	Other USSR/Russia (465), Estonia (460), Latvia (461), Lithuania (462), Baltic States, ns (463)

Notes: Consistent with Tabellini (2020) and Abramitzky et al., (2022) we focus on recent immigrants from European origins. We create origin regions as follows. First, we identify origin countries that have more than 10,000 people living in the US in the 1900 Census. If a source country has less than 10,000 people in the US, it is assigned to the nearest geographic neighbor in the same region (i.e., Northern Europe, Central Europe, Western Europe). If that country also has fewer than 10,000 people it moves to the next closest neighbor. For the “not specified” origins (e.g., Western Europe, ns) we attach these to the source region that has the highest population in the US as of 1900. Otherwise, only the reported source countries available are used.

Table A3: First Stage Relationship Between Immigrant Share and Enclave Instrument Measures

	Δ Immigrant Share			
		Tabellini (2020)	Abramitzky et al.	Abramitzky et al.
	Baseline	Groups	(2023) Groups	(2023) WWI/Quota Measures
	(1)	(2)	(3)	(4)
	Individual-level Estimates			
IV Measures	0.28***	0.28***	0.31***	-0.26***
	(0.04)	(0.03)	(0.05)	(0.01)
F-Statistic	53.90	73.87	44.23	707.61
Dependent Mean (in levels)	-0.03	-0.03	-0.03	-0.03
Observations	9,453,849	9,453,849	9,453,849	9,453,849
	City-level Estimates			
IV Measure	0.26***	0.25***	0.23**	-0.35***
	(0.07)	(0.06)	(0.09)	(0.03)
F-Statistic	16.53	19.60	5.82	112.20
Dependent Mean (in levels)	-0.03	-0.03	-0.03	-0.03
Observations	918	918	918	918

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the first stage estimates associated with equation (1). Because it is estimated in a first difference, only one observation per person per decade pair is included. Column (1) uses the measure defined in the paper and used throughout. Column (2) uses the same source country groups defined by Tabellini (2020). Column (3) uses the same source country groups as defined by Abramitzky et al., (2022). Column (4) uses the continuous WWI and Quota measures outlined in Abramitzky et al., (2022). State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

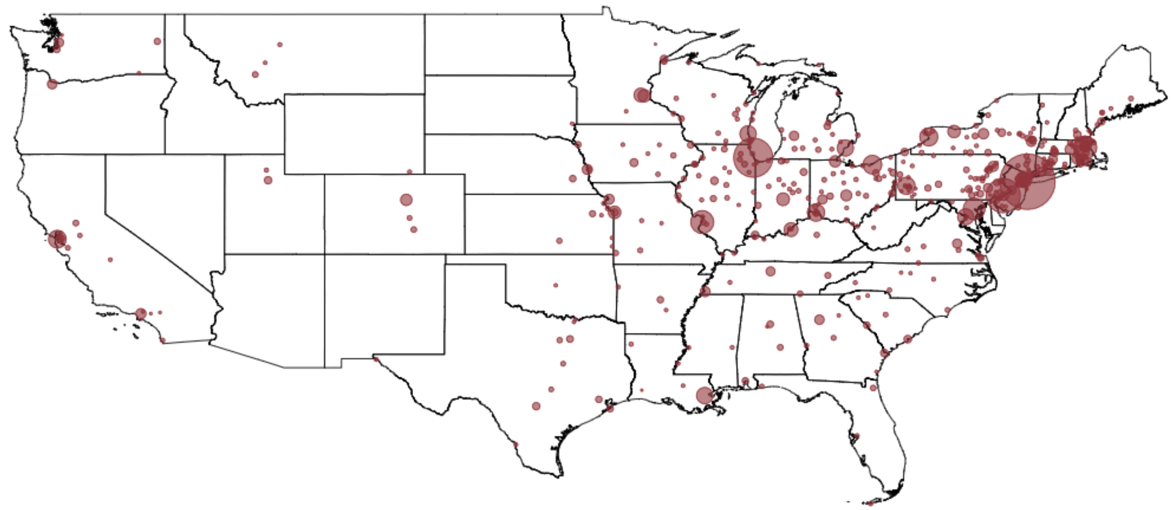

Figure A1: Location of Cities in Analysis Sample, Weighted by 1900 Population

Notes: Cities in our analysis sample are plotted, with the size weighted by the city population in 1900. Our sample includes all cities which are consistent reported in the 1900, 1910, 1920, and 1930 full count census. The smallest population we observe in our sample cities in 1930 is 1,845.

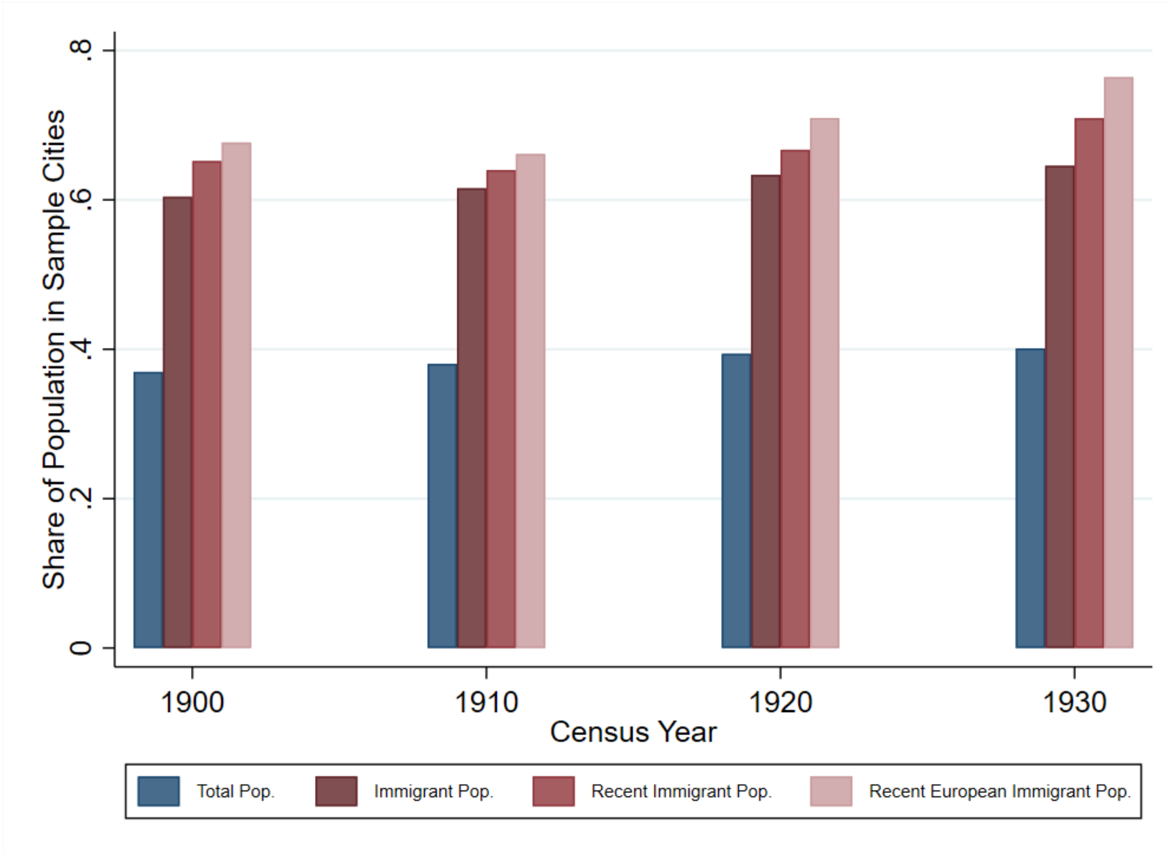

Figure A2: Fraction of US Population in Sample Cities

Notes: Data obtained from the 1900 to 1930 full count census. The share of the total population, immigrant population, recent immigrant population (arrived in the last 10 years), and recent European immigrant population is plotted for each Census wave.

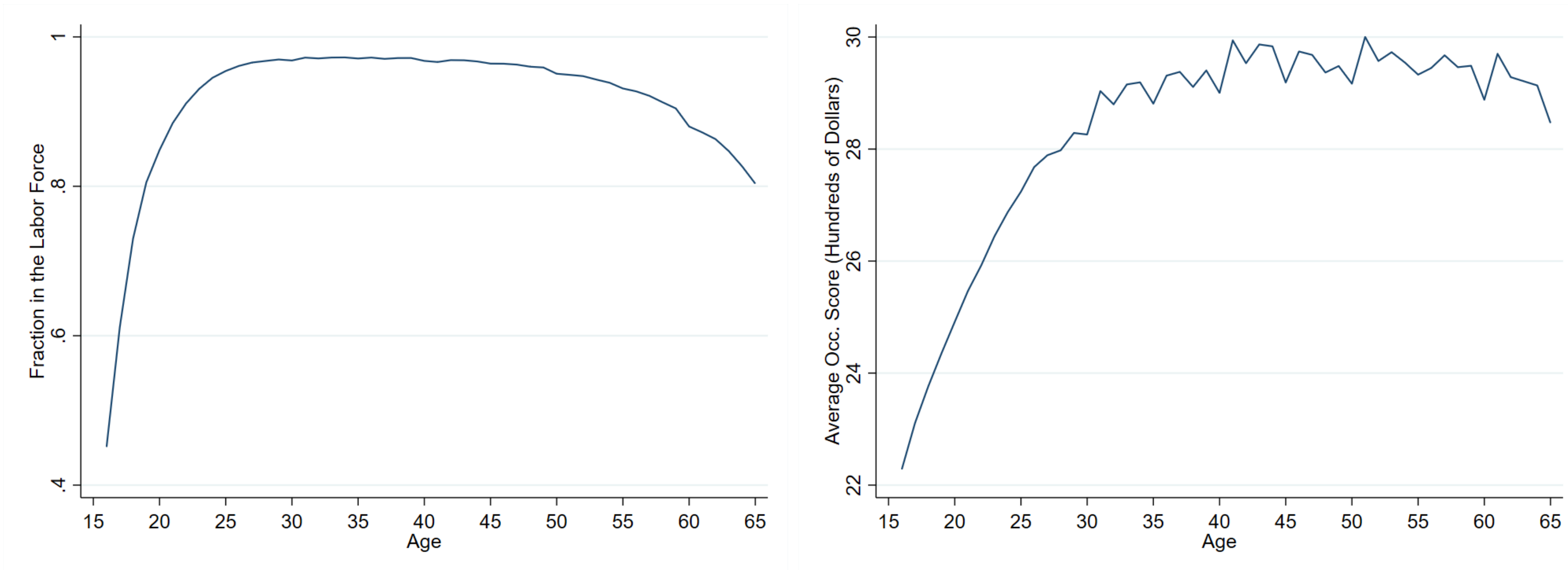

Figure A3: Labor Force Participation and Occupation Score Life-cycle Profile for US Born Men

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as “Not Yet Classified” are dropped from the sample. The Occupation Score is the median total income (in hundreds of 1950 dollars) of all people with that occupation in 1950.

Appendix B Robustness Exercises

Appendix B.1 Robustness to Inverse Probability Weighting the Data to Improve Representativeness

Tables B.1 and B.2 and Figure B.1 present our results (average impacts, heterogeneity by age, education, and race; compare to Tables 2 and 3 and Figure 2) where we inverse probability weight our sample along the dimensions of age, race, marital status, and city of residence in the initial wave to better capture the representativeness of original Full Count Census sample. Our findings are very similar to our baseline results.

Appendix B.2 Robustness to Controlling for 1900-1910 City-Age Pre-Trends

In Table B.3, Table B.4 and Figure B.2, we consider the robustness of our results to including pre-trends computed off of individual data. To do this, we use Census Tree links for 1900-1910, and we measure for each city the average changes in each outcome variable at each individual age. These city-age averages are constructed using all men who lived in a given city in 1900, regardless of whether or not they resided in the city in 1910.

Table B.3 reports our average individual findings, Figure B.2 reports our findings for heterogeneous treatment effects across age and education, and Table B.4 reports our findings for heterogeneous treatment effects across race. The notable differences we detect when controlling for these pre-trends is that the coefficients on out migration and change in labor force participation are reduced in magnitude. However, the standard errors on these estimates are sufficiently large so we cannot reject that this effect is different from our baseline estimate. And we observe that the heterogeneity in migration patterns (and all other outcomes) by age, education, and race are consistent with our baseline findings.

Appendix B.3 Robustness to Controlling for Additional City Characteristics

Table B.5 presents our average individual results when controlling for additional city characteristics (i.e., allowing for differential trends in individual outcomes based on certain features of their original city of residence). We alternatively include controls for the “skill ratio” in the city (the share of workers with an education score above 50 divided by the share of workers with an education score below 50), the share of black workers in the city, and the share of workers employed in manufacturing in the city.[1] We find that accounting for these city characteristics has minimal impact on our findings for migration, labor force status and occupational income scores, and while unreported, we similarly find that the distributional effects for each outcome remain similar to our baseline results as well.

[1] These robustness exercises are similar to several robustness exercises considered in Tabellini (2020).

Appendix B.4 Robustness to Using Variation from Immigration Policy and World War I

In Table B.6, Table B.7 and Figure B.4, we report our core findings using the WWI/Quota-based instrument described in Appendix A. When using this instrument, the effect of immigration on labor market outcomes is very similar, though the effect of immigration on out-migration more than doubles in size, as does the effect on changes in labor force participation.[2] The effect on log occupational scores is now slightly negative, though only marginally significant. Similar changes in the average effects of immigration can be seen across workers of different racial backgrounds, different ages, and different education levels, but the differences in the effects of immigration across these groups remains similar to our baseline findings.

Appendix B.5 Robustness to Alternate Linking Strategies

Finally, in Table B.8, we present average individual results where we use different data sources to construct linked samples and find similar results when using other linked data sources, with some variation in the magnitude of the move-out effect (although we cannot reject that these estimates are the same as our baseline results). For brevity's sake, we do not report results displaying heterogeneous impacts by age, education, and race, however we find that these results are consistent with our baseline findings.

[2] We note that some of the differences in these results stem not from the WWI/Quota instrument so much as using the regions of origin defined by Abramitzky et al. (2023). For example, about 1/3 of the increase in the migration coefficient is realized just by conducting our baseline analysis with the basic shift-share instrument with the regions of origin defined by Abramitzky et al. (2023).

Appendix B. Additional Tables and Figures

Table B1: Inverse Probability Weighting: Average Impact of Immigrant Flows on Economic Outcomes of US Born Men

	Moved Out	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants	0.61**	0.18**	0.14**	-0.04**	0.04	-0.30***	0.02	-0.27***
	(0.26)	(0.08)	(0.07)	(0.02)	(0.04)	(0.08)	(0.04)	(0.06)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as “Not Yet Classified” are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. We use 10-year age bins, race bins, marital status, and initial wave city in a logit regression to predict whether or not the individual can be linked on the full census in our sample cities. We then re-weight individuals in the regression by the inverse of the logit predicted probability of linking. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table B2: Inverse Probability Weighting: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Race and Origin

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*White	0.68***	0.19**	0.14**	-0.05**	0.06*	-0.21***	0.08*	-0.25***
	(0.25)	(0.08)	(0.06)	(0.02)	(0.04)	(0.07)	(0.04)	(0.06)
Δ Fraction Immigrants*Non-white	-0.47	-0.16	-0.13	0.04	-0.43***	-1.10***	-0.70***	-0.26***
	(0.33)	(0.14)	(0.11)	(0.04)	(0.15)	(0.16)	(0.17)	(0.07)
Non-white	0.00	-0.02***	-0.02***	0.00	-0.00	0.04***	0.01	0.04***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. We use 10-year age bins, race bins, marital status, and initial wave city in a logit regression to predict whether or not the individual can be linked on the full census in our sample cities. We then re-weight individuals in the regression by the inverse of the logit predicted probability of linking. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table B3: Robustness of Impact of Immigrant Flows on Economic Outcomes of US Born Men, Accounting for Potential 1900 Pre-Trends

	Moved Out	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants	0.39**	0.11*	0.06	-0.04**	0.04	-0.21***	0.05	-0.24***
	(0.16)	(0.06)	(0.05)	(0.02)	(0.04)	(0.07)	(0.04)	(0.06)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,452,109	9,321,089	9,321,089	9,321,089	8,284,316	8,284,316	8,284,316	8,284,316

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. Each regression controls for the outcome observed for people of the same exact age in the same city, differenced between 1900 and 1910 to control for age-by-city specific pre-trends in the outcome. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table B4: Robustness of Heterogenous Impact of Immigrant Flows on Economic Outcomes by Race, Accounting for Potential 1900 Pre-Trends

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*White	0.44***	0.12*	0.07	-0.04**	0.06	-0.17**	0.08*	-0.23***
	(0.16)	(0.06)	(0.05)	(0.02)	(0.04)	(0.07)	(0.04)	(0.06)
Δ Fraction Immigrants*Non-white	-0.71***	-0.22*	-0.19*	0.04	-0.43***	-1.06***	-0.70***	-0.25***
	(0.23)	(0.13)	(0.11)	(0.04)	(0.15)	(0.15)	(0.17)	(0.07)
Non-white	0.01	-0.02***	-0.02***	0.00	-0.00	0.04***	0.01	0.04***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,452,109	9,321,089	9,321,089	9,321,089	8,284,316	8,284,316	8,284,316	8,284,316

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. Each regression controls for the outcome observed for people of the same exact age in the same city, differenced between 1900 and 1910 to control for age-by-city specific pre-trends in the outcome. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table B5: Robustness of Impact of Immigrant Flows on Economic Outcomes of US Born Men to Pre-Existing Trends

	Baseline	1900 Skill Ratio*Cohort	1900 Fraction Black*Cohort	1900 Emp. Share Manufacturing*Cohort
	(1)	(2)	(3)	(4)
			Moved Out	
Δ Fraction Immigrants	0.64**	0.63**	0.64**	0.68***
	(0.25)	(0.25)	(0.24)	(0.26)
Dependent Mean	0.31	0.31	0.31	0.31
Observations	9,453,849	9,453,849	9,453,849	9,453,849
			Δ Labor Force	
Δ Fraction Immigrants	0.18**	0.18**	0.19***	0.20**
	(0.08)	(0.08)	(0.07)	(0.08)
Dependent Mean	0.93	0.93	0.93	0.93
Observations	9,322,856	9,322,856	9,322,856	9,322,856
			Δ Log Occ. Score	
Δ Fraction Immigrants	0.04	0.05	0.04	0.05
	(0.04)	(0.04)	(0.04)	(0.04)
Dependent Mean	3.30	3.30	3.30	3.30
Observations	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. The 1900 Skill Ratio is number of non-immigrant men 16 to 65 in occupations with education scores under 50 over the number in occupations with education scores over 50. The 1900 manufacturing share is the share of all workers in manufacturing. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table B6: Average Impact of Immigrant Flows on Economic Outcomes of US Born Men, WWI and Quota Restriction IV

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants	1.73***	0.48***	0.40***	-0.08***	-0.11*	-0.23***	-0.02	-0.15**
	(0.36)	(0.07)	(0.06)	(0.02)	(0.06)	(0.08)	(0.06)	(0.07)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1). Rather than using the immigrant share instruments, we use the WWI and Quota measures reported by Abramitzky et al., (2023). Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table B7: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, WWI and Quota Restriction IV

	Moved Out	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants*White	1.78***	0.50***	0.41***	-0.08***	-0.09	-0.20**	0.02	-0.15**
	(0.36)	(0.07)	(0.06)	(0.02)	(0.06)	(0.08)	(0.06)	(0.07)
Δ Fraction Immigrants*Non-white	0.40	0.01	-0.02	-0.03	-0.87***	-1.08***	-1.06***	0.15
	(0.38)	(0.12)	(0.12)	(0.04)	(0.18)	(0.14)	(0.14)	(0.17)
Non-white	0.00	-0.02***	-0.02***	-0.00	-0.01**	0.04***	0.00	0.05***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3). Rather than using the immigrant share instruments, we use the WWI and Quota measures reported by Abramitzky et al., (2023). Because it is estimated in a first difference, only one observation per person per decade pair is included. Rather than using the immigrant share instruments, we use the WWI and Quota measures reported by Abramitzky et al., (2023). State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table B8: Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Linking Method

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
	Baseline: Census Tree (Family Search + RLL Links)							
Δ Fraction Immigrants	0.64**	0.18**	0.14**	-0.04**	0.04	-0.25***	0.05	-0.26***
	(0.25)	(0.08)	(0.06)	(0.02)	(0.04)	(0.08)	(0.04)	(0.06)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206
	CLP Exact Standard Links							
Δ Fraction Immigrants	0.71**	0.20***	0.17**	-0.03	0.01	-0.20**	0.00	-0.16**
	(0.30)	(0.08)	(0.07)	(0.02)	(0.04)	(0.09)	(0.05)	(0.07)
Dependent Mean	0.41	0.93	0.06	0.05	3.31	0.68	0.35	0.31
Observations	4,146,592	4,145,911	4,145,911	4,145,911	3,655,212	3,655,212	3,655,212	3,655,212
	CLP NYSIIS Standard Links							
Δ Fraction Immigrants	0.74***	0.21**	0.18**	-0.03	0.04	-0.18*	0.04	-0.18**
	(0.28)	(0.09)	(0.07)	(0.02)	(0.05)	(0.09)	(0.05)	(0.07)
Dependent Mean	0.44	0.93	0.06	0.05	3.30	0.69	0.35	0.32
Observations	4,232,216	4,231,447	4,231,447	4,231,447	3,718,397	3,718,397	3,718,397	3,718,397
	IPUMS MLP Links							
Δ Fraction Immigrants	0.48**	0.13**	0.10**	-0.03	0.04	-0.13**	0.08*	-0.18***
	(0.23)	(0.06)	(0.05)	(0.02)	(0.04)	(0.06)	(0.05)	(0.06)
Dependent Mean	0.23	0.94	0.05	0.04	3.32	0.60	0.33	0.26
Observations	6,295,923	6,285,767	6,285,767	6,285,767	5,635,097	5,635,097	5,635,097	5,635,097

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920 that are linked by the specified linking method. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Links in the second and third panel are obtained from the Census Linking Project (CLP) (Abramitzky et al., 2022) and use the exact and NYSIIS standard links. Links in the fourth panel use the IPUMS Multigenerational Longitudinal Panel (MLP) links. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

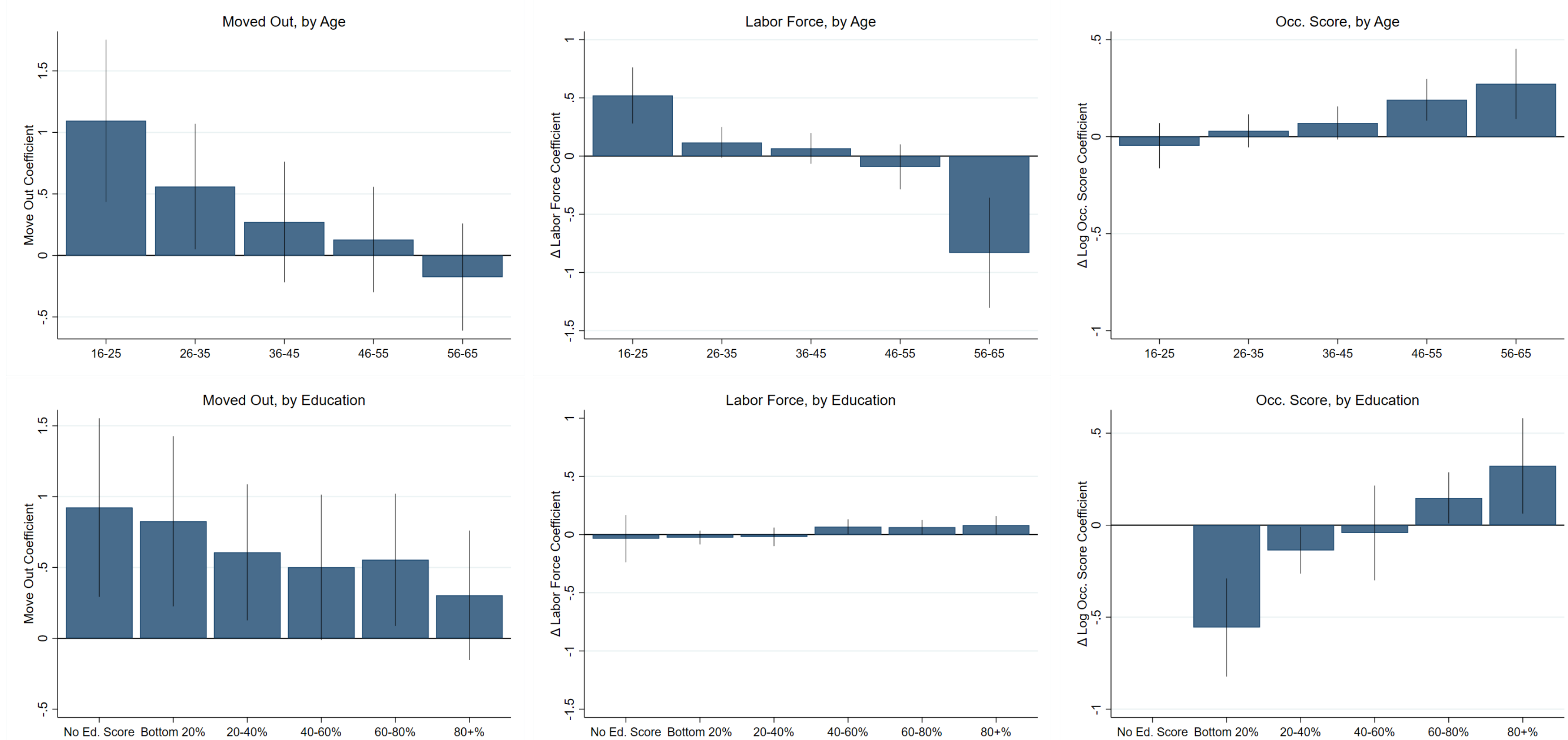

Figure B1: Heterogeneous Impacts of Immigrant Flows by Age and Education Score, Inverse Probability Weighted

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. We use 10-year age bins, race bins, marital status, and initial wave city in a logit regression to predict whether or not the individual can be linked on the full census in our sample cities. We then re-weight individuals in the regression by the inverse of the logit predicted probability of linking. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

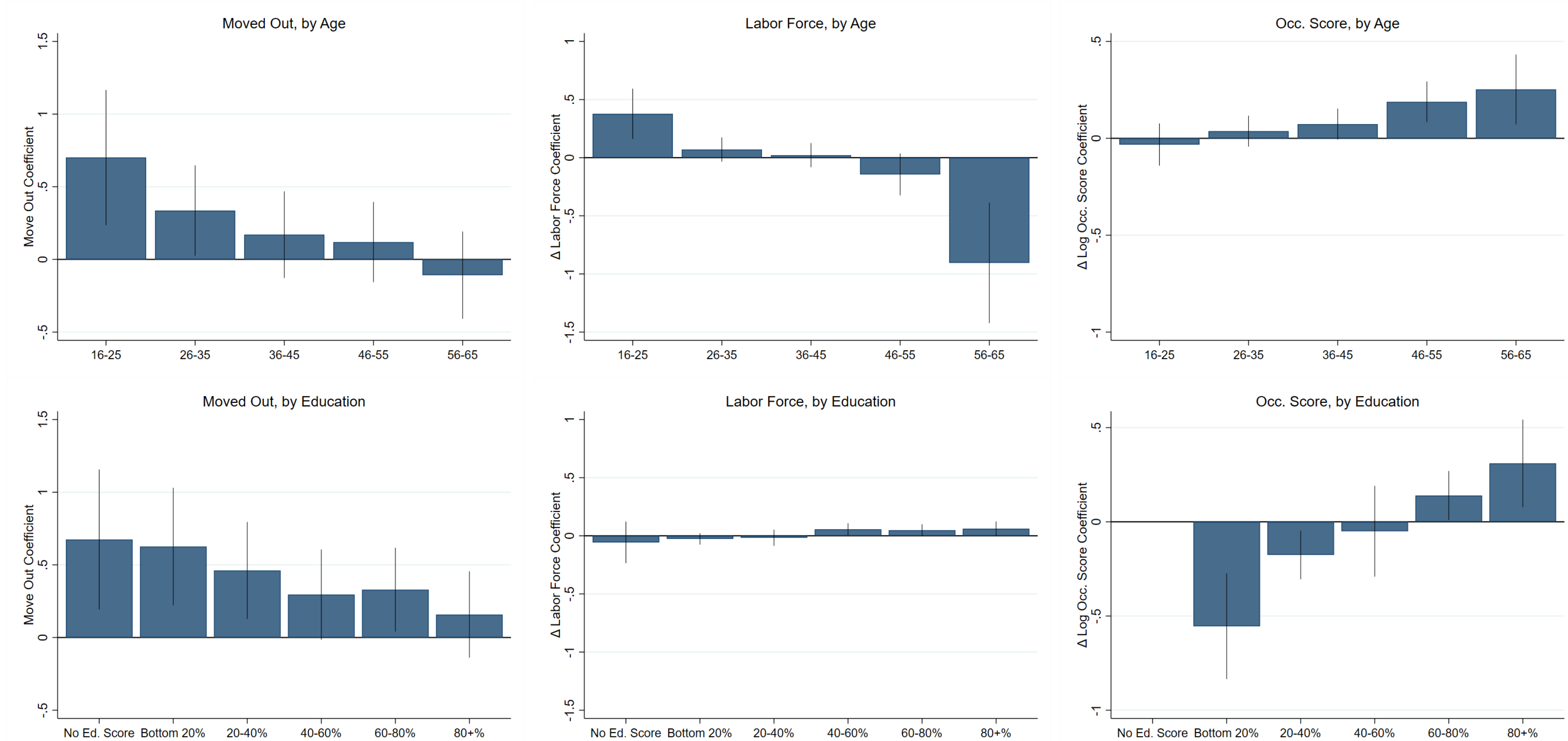

Figure B2: Heterogeneous Impacts of Immigrant Flows by Age and Education Score, Accounting for Potential 1900 Pre-Trends

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. Each regression controls for the outcome observed for people of the same exact age in the same city, differenced between 1900 and 1910 to control for age-by-city specific pre-trends in the outcome. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

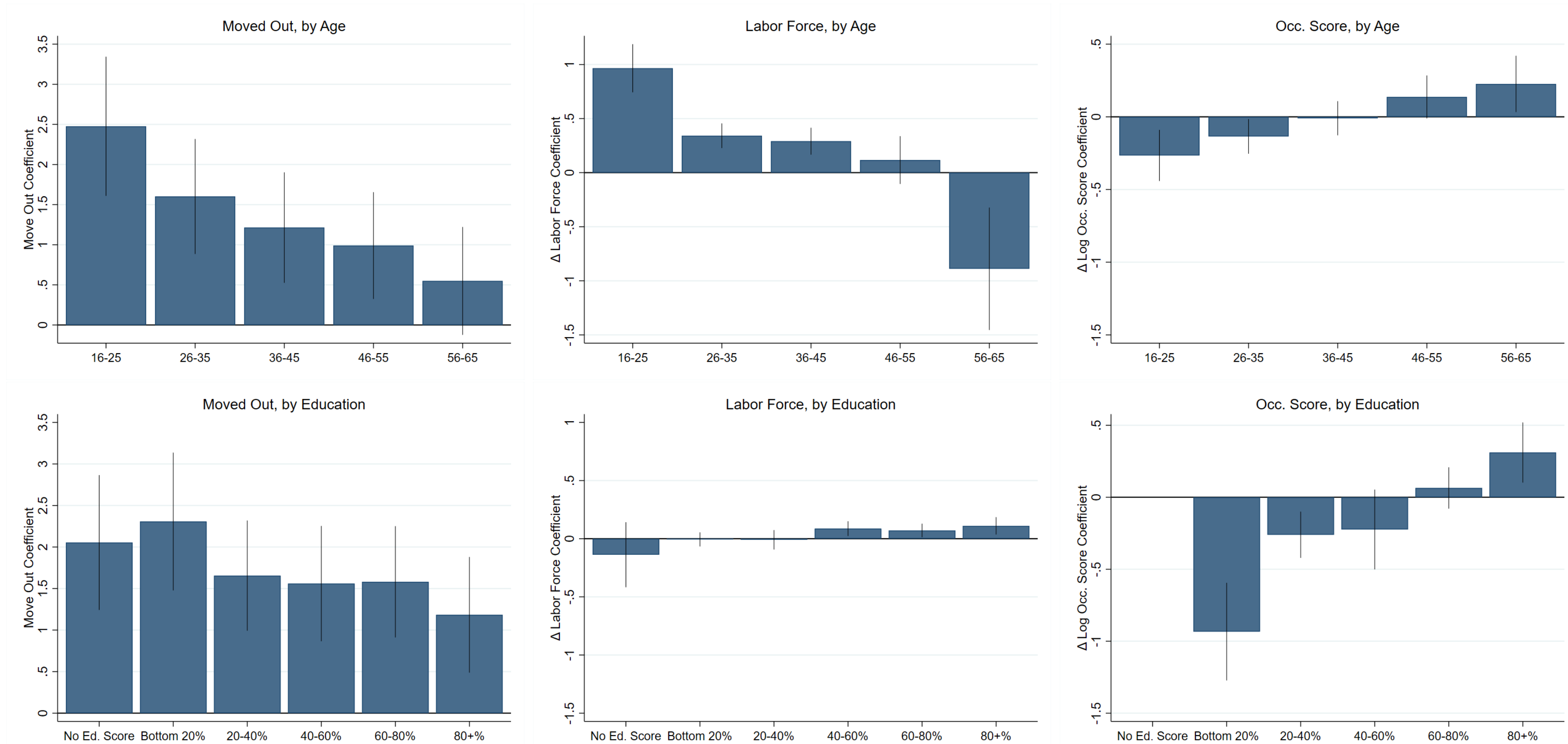

Figure B3: Heterogeneous Impacts of Immigrant Flows by Age and Education Score, Using Abramitzky et al. (2020) Quota Instruments

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3). Rather than using the immigrant share instruments, we use the WWI and Quota measures reported by Abramitzky et al., (2023). Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Appendix C Additional Results

Appendix C.1 Additional Regression Details for Results in Table 3, Figure 2 and Figure 4

Tables C.1, C.2, and C.3 report full regression results for the regression coefficients plotted in Figures 2 and 4, where we study differences in the impact of immigration on workers by worker age, education, and initial occupation.

Appendix C.2 Results for Women

Table C.4 reports average results for women. With our linked data, we can generate a large sample of women in the data, more than 10 million observations in total.[1] However, once we condition on labor force participation in consecutive Census waves (as in columns 5-8 of Table C.4), that number drops to less than 1.5 million.

Increased immigration led to increased out-migration for women, but no increases in labor force participation and a small positive impact on wages. However, given that the sample of women who remain in the labor force across two consecutive Census periods is small and likely highly selected, we are hesitant to reach strong conclusions based on these findings.

Appendix C.3 Results With Effects Varying by Initial Occupation Score Quintile

Table C.5 presents our results where we use quintiles of the occupation score distribution as an alternative proxy for worker skill (instead of education score). We find a very similar pattern of the impact of immigration across worker skill levels using this alternative measure, with workers in lower skill occupations seeing higher out-migration rates and income losses relative to workers initially employed in higher-skill occupations.

Appendix C.4 OLS Results

In Table C.6 we report our baseline results at the individual level where we estimate the impact of immigration using OLS with the variation in fraction of recent European immigrants in the city population. We find that many of our results are very similar to our baseline findings in Table 5 – natives are more likely to be in the labor force, less likely to switch occupations, and particularly less likely to make a downward occupational switch.

The most notable difference in our findings is that we no longer detect a significant out-migration response with increased immigration. We do not find this surprising, however. Immigrants likely select their residence on the basis of local labor market characteristics that also appeal to native workers (which may also explain the small, but now significant estimated gains to incomes with added immigration). As a result, we would naturally expect that the underlying move-out rate for natives in these cities is lower, which biases the out-migration response negatively.

[1] Notably, this is a slightly larger sample than we obtain for men. The most likely reason for this difference is that the time period we study intersects with both WWI and the Spanish Influenza outbreak, both of which disproportionately affected men.

Appendix C.5 Heterogeneous Impacts of Immigration Across Cities of Different Sizes

Table C.7 reports our results for the impact of immigration where we allow for an interaction between the change in the fraction of immigrants in the city and the size of the city (bigger or smaller than 30,000 residents). We include a control for being a large or small city and then instead of including a stand alone treatment variable for increases in immigration, we interact treatment with both city sizes, meaning the interaction terms can be interpreted as the average effect of immigration in big or small cities.

We find several notable differences in the impact of immigration across small and larger cities. Increases in immigrants in large cities generates outcomes very similar to our baseline findings – increased out-migration, increased labor force participation, no effect on incomes, and reduced downward occupational switching. In contrast, increases in immigration in small cities induce no out-migration, less (though imprecise) increases in labor force participation, increases in income, and both a decrease in downward occupational switching and an increase in upward occupational switching. These differences may suggest a different degree of social capital in larger and small cities – workers in smaller cities may have strong local ties, reducing their incentives to migrate and creating additional opportunities for upward mobility in response to increased immigration. We leave further exploration of these differences for future research.

Appendix C.6 Heterogeneous Impacts of Immigration Across Workers with Native Born Parents and Second Generation Immigrants

Table C.8 reports our results on how the impact of immigration differs across native workers whose parents are also born in the United States versus workers who have at least one parent born in a foreign country. We find minimal differences between the outcomes for these two types of workers. That said, second-generation immigrants here comprise 35-40% of city populations in our data (see Table 1), and so second-generation immigrants were not a small minority in this period of history and thus less likely to see significantly different outcomes than workers with native born parents.

Appendix C.7 Modifying Local Labor Market Specifications

Table C.9 extends the analysis of Table 5 by separately exploring what happens to our results estimated at the local labor market level when considering the following four separate adjustments to the specification: 1) restricting the sample to only workers who can be linked across Census waves (Column 2); 2) restricting the sample to only workers who can be linked, and subtracting off age-specific means in changes in the fraction of immigrants and changes in labor market outcomes, effectively residualizing these results for age fixed effects (Column 3); 3) restricting the sample to only workers who can be linked, but changing the age groups of workers being compared in two consecutive Census waves to focus on similar birth cohorts, comparing outcomes for 16-65 year olds in the first year with outcomes for 26-75 year olds in the second year; and 4) weighting each city proportional to its population.

Of particular note are the results in Column 4, which show what happens when following studying a sample of linked workers across two Censuses and following the same birth cohorts over time, but without controlling for age fixed effects. When age fixed effects are not included, changing the age ranges being studied over time has a significant impact on the estimated effects of immigration at the local labor market level. But as seen in Table 5, when combining this adjustment with residualizing variables for age, these changes go away.

Appendix C.8 Removing Age Fixed Effects from Individual Specifications

Table C.10 reports our baseline results for the average individual level impacts of immigration from Table 2 and our results split by movers and stayers in Table 4, but without including age fixed effects. We see the omission of age fixed effects flips the effect of immigration on labor force participation and also marginally reduces incomes, via reduced opportunities for upward mobility. We also observe that the observed benefits of immigration to stayers in Table 4 are largely eliminated, with reductions in labor force participation and no gains in income.

Appendix C. Additional Tables and Figures

Table C1: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Age

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*Age 16-25	1.09***	0.50***	0.41***	-0.10***	-0.03	-0.15**	0.07	-0.18***
	(0.31)	(0.12)	(0.10)	(0.03)	(0.05)	(0.07)	(0.06)	(0.06)
Δ Fraction Immigrants*Age 26-35	0.59**	0.10	0.01	-0.09***	0.04	-0.26**	0.04	-0.26***
	(0.25)	(0.06)	(0.05)	(0.03)	(0.04)	(0.10)	(0.06)	(0.07)
Δ Fraction Immigrants*Age 36-45	0.30	0.05	-0.03	-0.08***	0.07*	-0.36***	-0.02	-0.30***
	(0.24)	(0.06)	(0.05)	(0.02)	(0.04)	(0.09)	(0.05)	(0.08)
Δ Fraction Immigrants*Age 46-55	0.14	-0.10	-0.06	0.03	0.19***	-0.38***	0.07	-0.41***
	(0.21)	(0.09)	(0.05)	(0.06)	(0.05)	(0.09)	(0.07)	(0.09)
Δ Fraction Immigrants*Age 56-65	-0.18	-0.86***	-0.12**	0.74***	0.25***	-0.21***	0.19	-0.37***
	(0.22)	(0.24)	(0.06)	(0.21)	(0.09)	(0.08)	(0.13)	(0.11)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C2: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Education Score

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*Ed. Score Missing	1.03***	-0.03	-0.23**	-0.20***				
	(0.31)	(0.09)	(0.10)	(0.07)				
Δ Fraction Immigrants*Quintile 1	0.85***	-0.02	0.01	0.03	-0.55***	-0.32***	-0.61***	0.31***
	(0.30)	(0.03)	(0.01)	(0.02)	(0.14)	(0.09)	(0.13)	(0.08)
Δ Fraction Immigrants*Quintile 2	0.67***	-0.01	0.00	0.01	-0.17***	-0.33*	-0.28***	0.13
	(0.24)	(0.04)	(0.02)	(0.03)	(0.06)	(0.17)	(0.08)	(0.15)
Δ Fraction Immigrants*Quintile 3	0.53**	0.06**	0.01	-0.05**	-0.05	-0.38***	0.08	-0.41***
	(0.26)	(0.03)	(0.01)	(0.02)	(0.12)	(0.12)	(0.13)	(0.10)
Δ Fraction Immigrants*Quintile 4	0.59**	0.06**	0.03	-0.03*	0.14**	-0.39***	0.00	-0.38***
	(0.23)	(0.03)	(0.02)	(0.02)	(0.07)	(0.13)	(0.06)	(0.10)
Δ Fraction Immigrants*Quintile 5	0.35	0.07**	-0.00	-0.07**	0.31***	-0.40**	0.12	-0.52***
	(0.23)	(0.03)	(0.01)	(0.03)	(0.12)	(0.18)	(0.08)	(0.18)
Dependent Mean	0.31	0.93	0.06	0.04	3.31	0.64	0.34	0.28
Observations	9,421,457	9,291,448	9,291,448	9,291,448	8,258,646	8,258,646	8,258,646	8,258,646

Notes: Sample includes all US born men 16 to 65 that can be linked across two census waves: 1910 to 1920 and 1920 to 1930 and were residing in a city that can be identified in the 1900, 1910, 1920, and 1930 census in 1910 or 1920 respectively. Occupations are grouped into quintiles of the share of individuals in that occupation in 1950 that had any college education. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. We also control for education quintile bin indicators as in equation (3). Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C3: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Occupation Group

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
Δ Fraction Immigrants*No Occ.	1.08***	-0.14	-0.46***	-0.31***				
	(0.31)	(0.09)	(0.16)	(0.10)				
Δ Fraction Immigrants*Laborer/Other	0.86***	-0.57***	-0.41***	0.16***	-0.54***	-0.97***	-0.99***	0.04
	(0.29)	(0.11)	(0.09)	(0.04)	(0.16)	(0.24)	(0.22)	(0.09)
Δ Fraction Immigrants*Services	0.43*	0.07	0.07	-0.00	-0.03	-1.01***	-0.24	-0.59***
	(0.23)	(0.06)	(0.04)	(0.05)	(0.19)	(0.36)	(0.20)	(0.15)
Δ Fraction Immigrants*Clerical	0.43*	0.11**	0.08**	-0.03	0.11*	-0.11	0.13*	-0.22***
	(0.24)	(0.05)	(0.03)	(0.02)	(0.05)	(0.08)	(0.07)	(0.07)
Δ Fraction Immigrants*Operative	0.79***	0.07	0.05	-0.03	0.07	-0.11	0.22**	-0.25
	(0.26)	(0.05)	(0.04)	(0.02)	(0.09)	(0.18)	(0.09)	(0.19)
Δ Fraction Immigrants*Sales	0.67***	0.12**	0.06*	-0.06*	0.39***	-0.96***	-0.07	-0.89***
	(0.23)	(0.05)	(0.03)	(0.03)	(0.07)	(0.26)	(0.08)	(0.20)
Δ Fraction Immigrants*Craftsmen	0.62**	0.05	0.04	-0.01	0.21***	0.27*	0.38***	-0.06
	(0.27)	(0.04)	(0.03)	(0.02)	(0.06)	(0.15)	(0.07)	(0.13)
Δ Fraction Immigrants*Manager/Official	0.24	0.11**	0.04	-0.07**	0.59***	-0.60**	0.31***	-0.90***
	(0.24)	(0.05)	(0.03)	(0.03)	(0.15)	(0.25)	(0.06)	(0.25)
Δ Fraction Immigrants*Professional/Technical	0.51**	0.16***	0.04	-0.12***	0.47***	-0.25**	0.35***	-0.60***
	(0.23)	(0.06)	(0.03)	(0.04)	(0.12)	(0.13)	(0.07)	(0.15)
Dependent Mean	0.31	0.93	0.06	0.04	3.31	0.64	0.34	0.28
Observations	9,421,457	9,291,448	9,291,448	9,291,448	8,258,646	8,258,646	8,258,646	8,258,646

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. We also control for occupation bin indicators as in equation (3). Because it is estimated in a first difference, only one observation per person per decade pair is included. Occupations are listed by average occupation score, from lowest to highest. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table C4: Impact of Immigrant Flows on Economic Outcomes of US Born Women, Linked Individuals

	Moved Out	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score>0	Δ Log Occ. Score<0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants	0.52**	-0.06	0.01	0.07	0.15*	-0.46***	-0.24**	-0.28***
	(0.22)	(0.08)	(0.07)	(0.06)	(0.08)	(0.17)	(0.11)	(0.09)
Dependent Mean	0.29	0.26	0.10	0.12	2.91	0.52	0.26	0.23
Observations	9,984,025	9,844,285	9,844,285	9,844,285	1,321,620	1,321,620	1,321,620	1,321,620

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to women 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C5: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by Occupation Score

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*Occ. Score Missing	1.00***	-0.03	-0.23**	-0.20***				
	(0.31)	(0.09)	(0.10)	(0.07)				
Δ Fraction Immigrants*Quintile 1	0.71***	-0.03	0.03*	0.05**	-0.64***	-0.82***	-0.89***	0.12
	(0.26)	(0.03)	(0.02)	(0.03)	(0.17)	(0.15)	(0.18)	(0.07)
Δ Fraction Immigrants*Quintile 2	0.74***	0.02	0.02	-0.00	-0.06	-0.13	-0.20*	0.06
	(0.26)	(0.03)	(0.02)	(0.02)	(0.07)	(0.11)	(0.10)	(0.12)
Δ Fraction Immigrants*Quintile 3	0.58**	0.06**	0.02	-0.04**	0.13*	-0.25***	0.15	-0.27***
	(0.24)	(0.03)	(0.02)	(0.02)	(0.08)	(0.09)	(0.12)	(0.08)
Δ Fraction Immigrants*Quintile 4	0.57**	0.06**	-0.01	-0.06***	-0.01	0.47***	0.32***	0.16
	(0.27)	(0.03)	(0.01)	(0.02)	(0.08)	(0.12)	(0.08)	(0.14)
Δ Fraction Immigrants*Quintile 5	0.22	0.05*	-0.01	-0.06**	0.46***	-0.34	0.29***	-0.63***
	(0.24)	(0.03)	(0.01)	(0.03)	(0.11)	(0.20)	(0.07)	(0.18)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. We also control for occupation score quintile bin indicators as in equation (3). Because it is estimated in a first difference, only one observation per person per decade pair is included. Occupations are grouped into quintiles of the occupational income score. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C6: Impact of Immigrant Flows on Economic Outcomes of US Born Men, OLS

	Moved Out	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants	0.17	0.17***	0.14***	-0.02***	0.07**	-0.14***	0.02	-0.14***
	(0.23)	(0.03)	(0.03)	(0.01)	(0.03)	(0.04)	(0.04)	(0.03)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. OLS estimates corresponding to equation (1) are provided, we do not instrument for the immigrant share. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table C7: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by City Size

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
				By City Size				
Δ Fraction Immigrants*Big City	0.52**	0.14**	0.10*	-0.04*	0.03	-0.28***	0.02	-0.26***
	(0.22)	(0.07)	(0.06)	(0.02)	(0.04)	(0.09)	(0.05)	(0.07)
Δ Fraction Immigrants*Small City (Under 30K)	-0.23	0.09	0.07	-0.02	0.15*	-0.05	0.19**	-0.21***
	(0.21)	(0.08)	(0.07)	(0.02)	(0.08)	(0.10)	(0.08)	(0.08)
Big City	-0.05***	-0.01***	-0.01***	0.00*	-0.00	0.00	-0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as “Not Yet Classified” are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. Small cities are cities with fewer than 30,000 people in 1900. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. $p<0.01$ ***, $p<0.05$**, $p<0.1$*.

Table C8: Heterogeneous Impact of Immigrant Flows on Economic Outcomes of US Born Men, by 2nd Generation Status

	Moved Out (1)	Δ In Labor Force (2)	Enter LF (3)	Exit LF (4)	Δ Log Occ. Score (5)	Δ Occ. (6)	Δ Log Occ. Score> 0 (7)	Δ Log Occ. Score< 0 (8)
Δ Fraction Immigrants*No Foreign-Born Parent	0.42*	0.11*	0.07	-0.04**	0.02	-0.27***	0.01	-0.24***
	(0.24)	(0.07)	(0.06)	(0.02)	(0.04)	(0.09)	(0.05)	(0.07)
Δ Fraction Immigrants*Foreign-Born Parent	0.35*	0.15**	0.12**	-0.02	0.09**	-0.36***	0.04	-0.36***
	(0.21)	(0.07)	(0.06)	(0.02)	(0.04)	(0.09)	(0.04)	(0.07)
Foreign-Born Parent	-0.10***	-0.02***	-0.01***	0.00***	0.01***	-0.03***	-0.01***	-0.02***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (3), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. Because it is estimated in a first difference, only one observation per person per decade pair is included. *Foreign-Born Parent* is an indicator that equals one if at least one of the individual's parents was born outside of the United States. State by year fixed effects are included. Age fixed effects are also included to compare same-aged people across cities. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C9: Local Labor Market Impact of Immigrant Flows on Economic Outcomes of US Born Men, Role of Each Channel Separately

	All	Linkable	Age Residualized Linkable	Age Adjusted Linkable	Population Weighted
	(1)	(2)	(3)	(4)	(5)
			Δ In the Labor Force		
Δ Fraction Immigrants	0.16	0.18*	0.09	-0.14**	0.14
	(0.11)	(0.10)	(0.09)	(0.06)	(0.09)
Dependent Mean	-0.02	-0.02	0.00	0.02	-0.02
Observations	918	918	918	918	918
			Δ Log Occupation Income Score		
Δ Fraction Immigrants	0.20*	0.21**	0.18**	0.04	0.27***
	(0.11)	(0.09)	(0.08)	(0.10)	(0.07)
Dependent Mean	0.01	0.00	-0.00	0.04	0.00
Observations	918	918	918	918	918

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Observation is a decadal difference at the city level, meaning there are two observations per city, from 1910 to 1920 and from 1920 to 1930. Only US born men 15-65 in the initial census wave are included. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (4), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*. State by year fixed effects are included. In column (2) we restrict the sample to individuals that have Census Tree links before constructing the city-level average to verify that the aggregate effects are similar when looking at the selected sample of linkable individuals. In column (3) we subtract single-age specific 10-year changes in outcomes to residualize by age (similar to age fixed effects). In column (4) we restrict the sample in the second survey wave to 26 to 75 year olds, to map into the ten year aging of the sample in the individuals specification. In column (5) we re-weight the city-level observations by the number of men used to construct the city-level averages, to match the individual-level weighting in the individual-level specification. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.

Table C10: Role of Age Fixed Effects in Individual-level Estimates

	Moved	Δ In Labor Force	Enter LF	Exit LF	Δ Log Occ. Score	Δ Occ.	Δ Log Occ. Score> 0	Δ Log Occ. Score< 0
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Fraction Immigrants	0.55**	-0.08**	0.00	0.08***	-0.08*	-0.49***	-0.19**	-0.25***
	(0.24)	(0.04)	(0.04)	(0.03)	(0.04)	(0.11)	(0.08)	(0.06)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206
	Sample: In City Before Immigrant Flow							
Δ Fraction Immigrants	0.55**							
	(0.24)							
Δ Fraction Immigrants*Stayer		-0.17***	-0.06**	0.11***	-0.05	-0.56***	-0.20**	-0.31***
		(0.05)	(0.03)	(0.04)	(0.05)	(0.14)	(0.09)	(0.07)
Δ Fraction Immigrants*Move-out		0.15*	0.13	-0.02	-0.04	-0.57***	-0.22**	-0.30***
		(0.08)	(0.09)	(0.03)	(0.08)	(0.13)	(0.09)	(0.11)
Move-out		0.02**	0.03***	0.01***	-0.06***	0.15***	0.03***	0.11***
		(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Dependent Mean	0.31	0.93	0.06	0.04	3.30	0.64	0.34	0.28
Observations	9,453,849	9,322,856	9,322,856	9,322,856	8,287,206	8,287,206	8,287,206	8,287,206

Notes: Data obtained from the 1910, 1920, and 1930 full count US census. Sample restricted to men 16 to 65 with Census Tree links that were born in the United States and residing in one of our sample cities during the first census wave in 1910 or 1920. Individuals whose occupation is recorded as "Not Yet Classified" are dropped from the sample. Estimates correspond to the two-stage least squares estimates from equation (1), using the immigrant shift-share in equation (2) to instrument for Δ*Fraction Immigrants*, except age fixed effects are not included. Because it is estimated in a first difference, only one observation per person per decade pair is included. State by year fixed effects are included. Standard errors are corrected for clustering at the metropolitan area level. p<0.01 ***, p<0.05**, p<0.1*.