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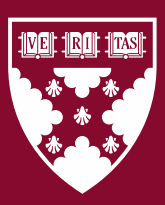

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Happily Ever After: Immigration, Natives' Marriage, and Fertility*

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Abstract

We study the effects of immigration on natives' marriage, fertility, and family formation across US cities between 1910 and 1930. Using a shift-share design, we find that natives living in cities that received more immigrants were more likely to marry, have children, and leave the parental house earlier. Our evidence suggests that immigration increased native men's employment, thereby raising the supply of native "marriageable men". We consider alternative channels—such as changes in sex ratios, natives' cultural reactions, and economic competition faced by native women—and conclude that none of them, alone, can explain our results.

Keywords: Immigration, marriage, fertility, Age of Mass Migration.
JEL Classification: J12, J13, J15, N32.

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1 Introduction

Immigration has been one of the most relevant social phenomena of the last 50 years. Between 1970 and 2020, the number of foreign born individuals living in the United States increased from 9 to roughly 45 million, with the share of immigrants in the US population skyrocketing from 4.7% to 13.7%. A large body of the literature has investigated the economic and, more recently, the political effects of immigration.[1] However, less is known about the impact of immigration on key social and demographic outcomes, such as marriage, fertility, and family formation.

This paper seeks to fill this gap by focusing on US cities between 1910 and 1930—a setting that offers several advantages. First, it is possible to exploit rich historical data, such as the full count US Censuses, not available for the post-World War II period. Second, the immigration wave of the early twentieth century is comparable in size to, if not larger than, the more recent one. During the Age of Mass Migration (1850-1920), more than 30 million Europeans moved to the United States, and, as of 1920, the US immigrant population share was as high as 14% (Abramitzky and Boustan, 2017). Lastly, the first three decades of the twentieth century were characterized by nation-wide exogenous shocks—World War I (WWI) and the Immigration Acts of the 1920s—that had large and heterogeneous effects on migration patterns of different ethnic groups. Given immigrants' propensity to cluster geographically in receiving countries (Altonji and Card, 1991; Card, 2001), these country of origin specific shocks generate variation in the number and in the composition of immigrants that US cities received between 1910 and 1930.

As in Tabellini (2020), we leverage such variation to construct a "leave-out" version of the shift-share instrument (Card, 2001) for immigration at the city-decade level. The instrument combines the geographic distribution of historical settlements of different immigrant groups with time-series variation in national flows from each sending country, net of immigrants who eventually settled in the city's metropolitan statistical area (MSA). Using this instrument, we estimate stacked panel regressions that account for city invariant and state time-varying unobservable characteristics. We find that immigration increased both marriage rates and the probability of having children for native men and women. Our estimates are quantitatively large, and imply that a 5 percentage points increase in immigration raised natives' marriage rates and the children-to-women ratio by 2 and 3%, respectively.

These results are not driven by native women simply marrying immigrant men. We find similar effects on marriage rates of both native women *and* native men. Furthermore, at the time, more than 95% of US-born married US-born men. In addition, the ethnic

[1] See Dustmann et al. (2016) and Alesina and Tabellini (2023) for a review of the literature on the economic and political effects of immigration, respectively.

segmentation of marriage markets was further reinforced by the 1907 Expatriation Act, which mandated that native women marrying foreign born individuals would lose their US citizenship and could get it back only when their husband was naturalized. Therefore, native women were also *de jure* strongly disincentivized to marry an immigrant.

Decomposing the increase in fertility between the intensive (i.e., more children per woman) and the extensive (i.e., more women having at least one child) margin, we document that the latter is quantitatively more important than the former. We also show that the increase in both fertility and marriage was entirely driven by young couples—namely women (men) aged 18-25 (20-27). Consistent with these findings, immigration induced young natives to leave their parental house and set up an independent family unit earlier. We provide additional evidence supporting our interpretation, and document that immigration lowered the share of children from native parents living in a household where the father was unskilled, and increased the share of sons (but not daughters) of native parentage aged 6-14 who were enrolled in school.

The key identifying assumption behind our analysis is that, conditional on city fixed and state time-varying characteristics, the factors that attracted immigrants from different countries prior to 1900 were uncorrelated both with post-1900 migration across European countries *and* with changes in economic and social conditions in US cities. As documented in previous work (Tabellini, 2020; Abramitzky et al., 2023), the nationwide shocks that occurred during this period create a "trend-break" in migration flows that assuages many of the concerns about the validity of shift-share designs recently discussed in the literature (Jaeger et al., 2018; Adao et al., 2019; Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022). Below we perform a number of exercises—including testing for pre-trends and allowing cities to be on differential trends along many baseline variables—to assess the robustness of our findings.

In the second part of the paper, we explore the mechanisms. We begin by showing that, in line with previous findings in Ager and Hansen (2017) and Tabellini (2020), immigration increased native men's employment.[2] In turn, this raised the supply of *native* "marriageable men" (Wilson, 1987; Autor et al., 2019), and made it easier for native men and women to marry, set up an independent household, and have children at an earlier stage

[2]These results are somewhat different from those in Abramitzky et al. (2023), who focus on the entire US and find that, on average, the 1920 immigration quotas had a muted impact on natives' employment and earnings. The difference in geographic (cities vs. the entire country) and temporal (1910 to 1930 vs. 1920-1930) contexts likely explain the discrepancy between our results and those in Abramitzky et al. (2023). Instead, our estimates are consistent with findings in Ager and Hansen (2017); Tabellini (2020); Price et al. (2020). An interesting nuance documented in Price et al. (2020), though, is that at least part of the economic gains brought about by immigration accrued to young native workers who in-migrated to cities that received more European immigrants. On the other hand, native workers who were displaced by the immigration shock left cities more exposed to immigration. As we discuss below, such heterogeneous effects do not alter either the validity or the interpretation of our results.

in their life. Next, we examine additional channels. We conclude that, although each of them might have independently affected natives' marriage and fertility, these forces are unlikely to explain our main results.

First, we document that our findings are not driven by changes in sex ratios, i.e. the relative number of men and women. While more than 60% of immigrants entering the US at the time were young men (Angrist, 2002), immigration induced not only native women but also native *men* to marry more and to have more children, suggesting that changes in sex ratios alone cannot be driving our main results. Moreover, changes in sex ratios were less relevant for natives' marriage, since immigrants and natives were unlikely to intermarry. Second, using linguistic distance from Chiswick and Miller (2005) as a proxy for cultural distance, we rule out the possibility that higher marriage rates resulted from natives' desire to preserve their own race (Bisin and Verdier, 2000; Bisin and Tura, 2019; Spolaore and Wacziarg, 2022). Also, while cultural incentives may increase endogamous marriage, they can hardly explain the better circumstances of children of native parentage, unless immigration also increased their fathers' occupational standing. Finally, we document that direct (negative) effects of immigration on female labor force participation, which might have induced women to first leave the labor force and then get married and have children, are unlikely to explain our findings. Exploiting variation across age groups, we show that the decline in female labor force participation was limited to women whose marriage rates increased in response to immigration. Given the stigma attached to the work of wives outside the home at the beginning of the twentieth century, women were likely to quit their jobs as a consequence of marriage (Goldin, 2006).

Our paper is related to different strands of the literature. First, it speaks to the growing literature on the Age of Mass Migration (Lafortune et al., 2019; Pérez, 2019; Eriksson, 2020; Abramitzky and Boustan, 2022; Collins and Zimran, 2023; Ager et al., 2023), and to two works in particular. First, Ager and Hansen (2017) study the economic effects of immigration in the same context analyzed here and, consistent with our results, document an increase in natives' marriage. We complement this work by examining a more thorough set of demographic and socioeconomic outcomes and by exploring the channels driving the effects of immigration on natives' marriage, fertility, and family formation. Second, Tabellini (2020) finds that, despite its positive economic impact, immigration triggered political backlash within the same set of cities considered in our paper. We expand on Tabellini (2020) by shedding light on the consequences that the employment growth generated by immigration had on key social outcomes, such as marriage, fertility, and family formation.

Second, our findings are related to those in Autor et al. (2019), who study the effects of Chinese import competition on marriage and fertility patterns in the US today. We com-

plement this paper by showing that a positive (rather than a negative) shock to employment opportunities of men increases (instead of reducing) marriage, fertility, and financial independence of young couples. Despite the difference in the historical context—early twentieth century vs. contemporaneous period—and in the source of the income shock—immigration vs. trade—comparing results in this paper with those in Autor et al. (2019) suggests that some key policy-relevant parameters, such as the elasticity of marriage and fertility to income, can be stable over time. At the same time, while our estimates on fertility are in line with those associated with "fracking booms" in Kearney and Wilson (2018), their paper does not find a positive effect of an employment boom on marriage rates. One possible interpretation for this difference is that the cultural environment might mediate the transmission of income shocks to social outcomes.

Our paper also speaks to the literature on the effects of sex ratios on the marriage market. Focusing on the same historical context, Angrist (2002) exploits variation in sex ratios for second generation immigrants induced by the arrival of individuals from different countries. We complement this paper by showing that immigration can impact marriage rates and fertility in receiving countries not only by altering sex ratios for second generation immigrants, but also by affecting natives' employment. The differential effect of immigration on marriage rates of native men—positive for natives with native parents, but close to zero for second generation immigrants—is also consistent with findings in Abramitzky et al. (2011), who show that in French regions where more men died during WWI, men (women) were better (worse) off in the marriage market.[3]

Finally, we contribute to the literature on the effects of immigration on female labor force participation, marriage, and fertility. Adda et al. (2020) show that the documented status of immigrants reduces intermarriage and increases separations. Our paper complements their results by focusing on *natives'* marriage and fertility. Furtado and Hock (2010) and Furtado (2016) find that the availability of cheaper childcare offered by the inflow of immigrants in recent decades allowed college educated women to have more children and work longer hours, attenuating the negative correlation between childbearing and labor force participation (Doepke et al., 2023). In our historical context, the negative effect of immigration on female labor force participation was concentrated among women in the age group that experienced an increase in fertility and marriage. In this respect, our findings are in line with the evidence provided by Goldin (1990, 2006): at the beginning of the twentieth century, upon getting married, native women quit their jobs or were fired by firms in compliance with marriage bars. Also, most women took care of their own children, and additional childbearing was rarely assigned to immigrant women.

[3] In related work, Boehnke and Gay (2022) find that, by worsening marriage prospects of single women and by lowering income of war widows, WWI had a positive and persistent effect on female labor force participation in France.

2 Historical Background

Between 1850 and 1920, during the Age of Mass Migration, more than 30 million Europeans migrated to the United States. In the first wave, from 1850 to 1890, most immigrants came from the British Isles, Germany, and Scandinavia. The second wave, from 1890 to 1920, was characterized by a steady increase in immigration from Southern and Eastern Europe, and was largely due to the decrease in migration costs caused by the introduction of steam technology (Keeling, 1999).[4] Immigrants from new regions were culturally farther from natives and significantly less skilled than those from old sending regions (Hatton and Williamson, 1998, 2006).

Changes in the composition of immigrants and concerns over their assimilation fueled a heated debate on the economic and social consequences of immigration. In response to these concerns, US Congress established a commission that recommended in 1911 the introduction of immigration restrictions. After several attempts, in 1917, Congress also introduced a literacy test requiring that all immigrants entering the United States had to be able to read and write (Goldin, 1994). Finally, in 1921 and 1924, Congress passed the Immigration Acts to limit the number of immigrants that could enter the United States in a given year by introducing country-specific quotas based on the 1890 immigrant population.[5] On top of that, European immigration was drastically reduced by the onset of WWI—especially for countries more directly involved in the conflict and that did not belong to the Allies, like Germany (Greenwood and Ward, 2015). As a consequence of these events, immigration from new sending regions was drastically reduced and the Age of Mass Migration came to an abrupt end in the 1920s.

During this historical period, many prominent scholars expressed concerns not only over the impact of immigration on natives' employment, but also on their fertility and marriage. The economist Edward Ross was among the first to propose the theory of "race suicide". According to this theory, not all immigrants were the same, and members of new, inferior races (i.e., immigrants from new sending regions) would eventually outbreed the "superior national stock" (i.e., natives and immigrants from old source countries) because industrial capitalism was conducive to the survival of the unfit (Leonard, 2005). Similarly, Francis A. Walker, the first president of the American Economic Association, argued that "the native element failed to maintain its previous rate of increase because the foreigners came in such swarms", and natives were unwilling not only to engage in competition with "these new elements of the population", but also, they did not want "to

[4] The share of immigrants that arrived from Southern and Eastern Europe skyrocketed from less than 5% in 1870 up to 40% in 1920.

[5] In 1921, quotas were specified reflecting the 1910 composition of immigrants. However, they were rapidly changed to 1890 to limit immigration from new sending countries even further (Abramitzky and Boustan, 2017).

bring sons and daughters into the world to enter that competition" (Walker, 1899, p. 424).

In contrast with these predictions, the inflow of immigrants might have increased marriage rates and fertility of native women by altering sex ratios (i.e., the relative number of men and women). At the time, more than 60% of immigrants entering the United States were young men between 20 and 35. Since in the early twentieth century the median age at first marriage was around 21 for women and 25 for men (Figure A.1), even though marriage markets were highly segmented along ethnic lines and native women lost their US citizenship if they were to marry an immigrant, immigration might have made it easier for native women to find a mate and to have children (Angrist, 2002).[6]

Yet another possibility is that immigration affected natives' marriage, fertility, and trends in family formation by altering employment and occupational standing of native men. Historical accounts tend to view immigrants as one of the key determinants of American industrialization and economic development during the Age of Mass Migration. When describing the economic impact of European immigrants, historian Maldwyn Jones wrote that "The realization of America's vast economic potential has [...] been due in significant measure to the efforts of immigrants. They supplied much of the labor and technical skill needed to tap the underdeveloped resources of a virgin continent" (Jones, 1992, pp. 309-310). Similarly, John F. Kennedy argued that "every aspect of the American economy has profited from the contribution of immigrants" (Kennedy, 1964, p. 88).

During the Age of Mass Migration, the US economy had large potentials for growth. In this context, immigrants provided a cheap and unskilled supply of labor, which could not only be absorbed, but that may have even allowed industries to expand (Foerster, 1924), in turn creating new job opportunities for native workers.[7] It is thus possible that, by increasing the supply of "marriageable men", immigration raised fertility and marriage rates not only of native women, but also of native men. Moreover, if native men could find a stable job earlier in their working life, they might have been able to leave their parental house and set up their own household earlier. Somewhat ironically, then, immigration might have had exactly the opposite effect relative to what was argued by advocates of the theory of "race suicide".

3 Data

The dataset used in this paper was assembled using the decennial full count US Census of Population, made available by IPUMS (Ruggles et al., 2015). Our analysis is based on

[6]The loss of citizenship after the marriage with an "alien" men was established by Section 3 of the Expatriation Act of 1907. The law was aimed at avoiding cases of multiple nationality among women.

[7]Tabellini (2020) and Sequeira et al. (2020) document that European immigration had a positive effect on natives' employment and on economic development, both in the short run and in the long run.

a balanced panel of the 180 US cities with at least 30,000 residents in each of the three census years from 1910 to 1930, and where at least some Europeans were living in 1900 (see Table A.1 for the complete list of cities). These places attracted more than 75% of the immigrants entering the United States after 1900. From the decennial full count US Census of Population, we collected data on city population, on the number of immigrants by country of origin at the city and at the national level, and on most of the outcomes considered in our analysis, including marital status, relationship to the household head, and the number of children.[8] To investigate the mechanisms, we also collected data on employment, labor force participation, and occupation of native men and women from the US Census.

Table 1 reports the summary statistics for the main variables used in our analysis. There is wide variation in city size, from almost 7 million (New York City in 1930) to around 30,000 (Pasadena in 1910). Also, and importantly, the fraction of immigrants varies substantially both across cities and over time: it was higher in the northeastern states of Connecticut, Massachusetts, New Jersey, and New York, and lower in the US South. As already discussed above, WWI and the Immigration Acts drastically reduced immigration: in 1910, the fraction of immigrants over city population was, on average, 0.18, but this number fell to 0.12 in 1930. The decline in the fraction of foreign born that entered the United States in the previous decade was even starker: for the average city, this number was 0.08 in 1910, but fell to 0.02 in 1930.

In Panel B of Table 1, we report the summary statistics of the main outcomes of this paper, i.e., marriage rates, fertility, and the propensity to leave the parental house for young native men and women. By the age of 33 for women and 35 for men, 65% of the native population was married. As shown in Table A.3 for 1910, among native women of native parentage, 73% were married to a native husband with both native parents, 20% to a husband with one or both foreign born parents, and only 8% to a foreign born husband. Interestingly, most of the foreign born husbands arrived to the US more than ten years before. Instead, the probability of being married with a foreign born husband was as high as 24% for second generation women.[9]

Between 1910 and 1930, among women aged 18-33, the average children to women ratio was 0.65: 34% of native women had at least one child, while those who were mothers had on average almost 2 children each. Table 1 also suggests that the decision to leave the parents' home was strongly correlated with financial independence and with the choice of getting married: the proportion of men and women who were household heads or spouses was close to marriage rates (45% and 43% for women and men respectively).

[8] Table A.2 presents the list of European countries considered in our work. To classify individuals based on their country of origin, we followed the classification made by IPUMS (Ruggles et al., 2015).

[9] In our sample, second generation women accounted for roughly one fourth of all native women.

Finally, Panel C presents the summary statistics for the key labor market outcomes considered below. In 1910, the average employment to population ratio for native men aged 20-35 in our sample was 91%, and it fell to 84% in 1930 with the onset of the Great Depression. Average labor force participation for native women was 42%, with an increasing trend over time which was slowed down by the economic downturn in 1930.[10]

Immigration data are available for all the 540 city-year observations in our sample. However, for 1920, Sacramento (CA) and New Bedford (MA) had unreasonably low values for marriage, fertility, and the other demographic outcomes considered in our work, probably reflecting misreporting in the original documents. For this reason, in our baseline specification, we drop 1920 data for these two cities, but our results remain unchanged when all 540 city-year observations are included.

4 Empirical Strategy

4.1 Estimating Equation and Instrumental Variable

To investigate the effects of immigration on natives' marriage, probability of having children, and family structure across US cities, we stack the data for the three Census years between 1910 and 1930, and estimate

$$y_{cst} = \gamma_c + \delta_{st} + \beta Imm_{cst} + u_{cst} \tag{1}$$

where y_{cst} is the outcome for city c in state s in Census year t, and Imm_{cst} is the fraction of immigrants over predicted city population.[11] In our baseline specification, we consider the stock of European immigrants that arrived in the US in the previous decade, but results are robust to extending this definition to all immigrants, irrespective of their country of origin or their arrival year. Since we always control for city and state by year fixed effects (γ_c and δ_{st}), β is estimated from changes in the fraction of immigrants within the same city over time, compared to other cities in the same state in a given year. Standard errors are clustered at the MSA level, and MSA boundaries are fixed to 1940 in order to keep geography constant.

When estimating the effects of immigration on natives' fertility and marriage, we face a key empirical challenge: the location decision of immigrants might be endogenous

[10] Until 1930, the US Census classified individuals as participating in the labor force if they were holding any gainful occupation.

[11] City population could itself be an outcome of immigration. For this reason, as in Tabellini (2020), the number of immigrants is scaled by predicted (rather than actual) city population. This variable is constructed by multiplying 1900 population by average urban growth in the US, excluding that of the Census division where the city is located. Results are unchanged when scaling immigration by 1900 population.

to local, time-varying conditions. For instance, immigrants might be attracted to cities with stronger labor markets, where marriage prospects for natives are better. This would introduce a positive bias to OLS estimates of equation (1). Alternatively, because of congestion costs, immigrants might be more likely to settle in otherwise declining cities, where marriage markets for natives are weaker. In this case, OLS estimates would be downward biased.

To deal with these and similar concerns, we follow closely Tabellini (2020) and construct a "leave-out" version of the shift-share instrument commonly adopted in the immigration literature (Altonji and Card, 1991; Card, 2001). The instrument predicts the number of immigrants received by US cities over time by interacting 1900 settlements of different ethnic groups with subsequent national migration flows from each sending region, excluding individuals that eventually settled in a given city's MSA. Formally, Imm_{cst} in equation (1) is instrumented with

$$Z_{cst} = \frac{1}{\hat{P}_{cst}} \sum_{j} \alpha_{jc} O_{jt}^{-M} \tag{2}$$

where $\hat{P}_{cst}$ is predicted city population; α_{jc} is the share of individuals of ethnic group j living in city c in 1900 (relative to all immigrants from group j living in the US in that year); and, O_{jt}^{-M} is the number of immigrants from country j that migrated to the US between t and $t-1$, net of those that eventually settled in city c's MSA.

The instrument combines two sources of variation. The first one is the change in the total number of immigrants from any sending country migrating to the United States in a given decade (O_{jt}^{-M}). Two historical episodes contributed to the high variation in the share of immigrants from various European countries over this time period. First, WWI drastically decreased immigration from Europe, especially for countries more directly involved in the War and which did not belong to the Allies. Second, the Immigration Acts of 1921 and 1924 introduced country-specific quotas based on the 1890 immigrant population. The quotas were set so as to restrict immigration from Southern and Eastern Europe, while favoring that from old sending regions such as the UK, Germany, and Scandinavia.

The second source of variation exploited by the instrument comes from the geographic dispersion in the share of individuals from each ethnic group living in different US cities in 1900 (α_{jc}). Such variation arose from the fact that, upon arrival to the United States, early settlers from different sending countries tended to locate in different US cities, since the timing of outmigration varied widely across European countries, depending on local political and economic conditions (Hatton and Williamson, 1998). One important predictor of the geographic distribution of immigrants in the US is the gradual expansion of rail-

roads during the nineteenth century: as documented in Sequeira et al. (2020), places that gained access to the railroad just before an immigration boom received more immigrants in the following decade. As a consequence, before 1900, different US cities were populated by different ethnic groups. For example, in 1900, while Italian communities were present in Boston, Philadelphia, and San Francisco, they were practically non-existent in Minneapolis. On the other hand, almost 4% of Swedes were settled in Minneapolis, but less than 1% of them were located in north-eastern cities like Philadelphia or Boston (see also Abramitzky and Boustan, 2017).

Appendix B presents a simple example to illustrate graphically how the instrument combines the time-series and cross-sectional variations.

4.2 Instrument Validity

Several recent papers discuss the conditions for the validity of shift-share instruments (Jaeger et al., 2018; Adao et al., 2019; Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022). In our setting, the key identifying assumption can be expressed as follows. Conditional on city and state by year fixed effects, city-specific factors that attracted immigrants from different European countries prior to 1900 must be uncorrelated both with post-1900 patterns of European immigration *and* with changes in socioeconomic conditions across US cities.

This assumption may be violated if the city-specific characteristics that attracted immigrants from each specific sending country before 1900 had long-lasting effects both on migration patterns of individuals from that specific country *and* on natives' marriage prospects. We provide evidence against this possibility in two ways. First, we document that the 1900-1910 change in outcomes is not correlated with the post-1910 change in immigration predicted by the instrument. Second, we allow cities to be on differential trends by interacting year dummies with several 1900 city characteristics—including the fraction of immigrants and proxies for manufacturing activity.[12]

A second threat to identification is that local shocks hit US cities while simultaneously attracting immigrants from countries that had sent more migrants to those same cities before 1900 (Borusyak et al., 2022). The "trend-break" in immigration flows generated by WWI and the Immigration Acts mitigates this issue (Abramitzky et al., 2023); it also assuages the concern of serial correlation highlighted by Jaeger et al. (2018). Tabellini (2020) presents further robustness checks in the same context of our paper, constructing alternative instruments that predict European immigration exploiting only the WWI and

[12]The interaction between the 1900 immigrant population and year dummies implies that the instrument only exploits variation in the composition of immigrants' enclaves across cities, holding constant the size of their immigrant populations.

quota shocks and weather variation across countries in Europe.

We describe all the robustness checks below, after presenting the main results.

4.3 First Stage Results

First stage results for the relationship between actual and predicted immigration are reported in Table A.4, after controlling for city and state by year fixed effects. In column 1, the dependent variable is the fraction of immigrants over actual city population, and the independent variable is the baseline instrument constructed in equation (2). Columns 2 and 3 scale both the actual and the predicted number of immigrants by, respectively, 1900 and predicted population. In all cases, the F-stat is very high, and there is a strong and statistically significant relationship between the endogenous variable and the instrument.

Figure 1 plots the residual scatterplot of the regression reported in column 3, and confirms visually the strong relationship between actual and predicted immigration.[13] From column 3 onwards, Table A.4 presents estimates for specifications where both the actual and the predicted number of immigrants are scaled by predicted city population, and explores the stability of the baseline specification to the inclusion of interactions between year dummies and 1900 city characteristics.

First, we augment the specification reported in column 3 by interacting year dummies with the (log of) 1900 city total and immigrant population (column 4).[14] Next, in columns 5 and 6, we include interactions between year dummies and, respectively, the 1904 (log of) value added by manufacture and the marriage rate of native women in 1900. Even though the F-stat falls relative to column 1, it remains well above conventional levels. Also, and importantly, neither the economic nor the statistical significance of coefficients is affected.

5 Main Results

In this section, we present three sets of results. First, immigration had a positive and large effect on marriage rates of both native women and native men (Section 5.1). Second, the inflow of immigrants raised the probability of having children for natives by increasing both the average number of children per woman and the share of young women with at least one child (Section 5.2). Third, immigration induced young native couples to leave

[13] The figure indicates that Passaic (NJ) experienced a large drop in immigration between 1910 and 1930. Reassuringly, omitting this city barely affects the slope of the regression line (red dashed line in Figure 1).

[14] This check is important since the instrument mechanically predicts higher immigration to cities that had a larger 1900 fraction of immigrants, and, at the same time, larger ethnic enclaves might have direct and time-varying effects on economic and social conditions.

their parental house earlier (Section 5.3).

5.1 Marriage Rates

In Table 2, we study the impact of immigration on natives' marriage, focusing on the age groups with the highest marriage rates, i.e., women aged 18-33 and men aged 20-35.[15] Panels A and B show results for native women and native men, respectively, estimating OLS (column 1) and 2SLS (column 2) regressions.[16] Both OLS and 2SLS estimates suggest that immigration increased marriage rates for native women aged 18-33. These effects are not only statistically significant but also economically relevant. According to the coefficient in column 2, a 5 percentage points (or, one standard deviation) increase in the fraction of immigrants raised marriage rates of native women aged 18-33 by 2.2% relative to the 1910 mean. Panel B documents that a similar pattern holds for native men aged 20-35: a 5 percentage points increase in immigration raised men's marriage rates by 2.1% relative to their baseline mean.[17] Our findings are quantitatively close, with the opposite sign, to those obtained in Autor et al. (2019), who document that, over the last thirty years, a 1 percentage point increase in import competition from China lowered female marriage rates by 1.8%.

Subsequent columns of Table 2 explore the robustness of our baseline results. First, in column 3, we test for pre-trends by regressing the 1900 to 1910 change in marriage rates on the post-1910 instrumented change in immigration. Reassuringly, in both Panel A and Panel B, the coefficient on immigration is statistically indistinguishable from zero and different from that reported in column 2. Next, in columns 4 and 5, we augment our baseline specification by interacting year dummies with the (log of) 1900 city total and immigrant population and the 1900 marriage rates, respectively. This exercise is performed to check that results in column 2 are not due to city-specific characteristics that may have simultaneously attracted more immigrants before 1900 and affected the evolution of natives' marriage rates in subsequent decades. In all cases, the point estimate remains statistically significant and quantitatively close to that estimated in the baseline specification. Finally, in column 6 we provide evidence that results are robust to scaling

[15] The median age at first marriage was around 21 for women and 25 for men (see Figure A.1).

[16] Throughout the paper, we report the mean of the dependent variable at baseline and the F-stat associated with first stage results shown in Table A.4.

[17] OLS estimates are sensitive to the inclusion of three cities (Duluth, Superior, and Tacoma), for which 1910 marriage rates were very low. The mean value of marriage rates of men aged 20-35 in 1910 was 24 percentage points lower than the mean value of the same cities in 1920, and 23 percentage points lower than marriage rates in other US cities in our sample in 1910. The latter effect corresponds to a male marriage rate 4.6 standard deviations lower in these cities compared to the rest of our sample. In Table A.5, we present estimates of OLS and 2SLS results with and without these three cities. Once we restrict the sample, OLS and 2SLS are closer in magnitude.

both the actual and the predicted number of immigrants by 1900, rather than predicted, population.

Up to now, we have reported results for the "marriage-relevant" age groups by gender. Figure 2 separately documents the effect of immigration on marriage rates of native men and women for different age groups. The effects estimated in Table 2 are driven by the youngest cohorts: a 5 percentage points increase in the fraction of immigrants raised marriage rates of native women aged 18-25 and men aged 20-27 by 3.4% and 4.0%, respectively, relative to their baseline means. The effect of immigration is not statistically significant for older cohorts. The point estimates and standard errors related to Figure 2 are reported in Table A.6, where we also consider the probability of being never married for the oldest cohorts (column 5). While immigration had no effect on the probability of being never married for men, it lowered the likelihood that women aged 34-65 remained unmarried. These patterns thus suggest that, at least for native women, our estimates are not merely capturing an "anticipatory effect" in the timing of marriage.

5.2 Probability of Having Children

In Table 3, we study how immigration affected the probability of having children for native women. The first two columns focus on the children to women ratio, while in subsequent columns we separately analyze the effect of immigration on the extensive and the intensive margin. We define the former as the share of women with at least one child, and the latter as the children to mothers ratio. In odd columns, the dependent variable is the total number of children in the household, while in even columns the dependent variable is the number of children below the age of 5. Since full count data allow us to match mothers with children only if they are living in the same household, we restrict the sample to women aged 18-33, whose children are likely to live with their parents.

Both OLS and 2SLS results, reported in Panels A and B respectively, document a positive and significant relationship between immigration and the probability of having children for native women. The point estimate in column 1 of Panel B implies that a 5 percentage points increase in immigration raised the children to women ratio by 3.3% relative to its 1910 mean. Decomposing this effect along the extensive and the intensive margins, we note that immigration increased the number of women with children and the average number of children per woman by 2.4% and 1%, respectively. Said differently, for every ten new babies born from native women, seven were due to the extensive margin, while three to the intensive margin. The magnitude of the effect is similar when we restrict our attention to children below the age of 5.[18]

[18] As before, our estimates are quantitatively in line (though with the opposite sign) with those from Autor

Between the late nineteenth century and the 1930s, the US went through a demographic transition, with a reversal of the positive relationship between income and economic growth (Galor and Weil, 2000). The fertility rate of the total white population declined substantially, with the birth rate moving from almost 50 per thousand people in 1850 to 20 per thousand in 1930 (Zelnik, 1959). The inclusion of state by year fixed effects takes care of these national trends, since the effect of immigration is estimated from changes in the fraction of immigrants within the same city over time compared to other cities in the same state in a given year. Moreover, as noted by Easterlin (1961), the decline in fertility was driven by rural areas; fertility of the urban native (white) population remained stable in this time period.[19]

In Table A.7, we separately report the effect of immigration on fertility of native women by age groups. As for marriage, the effect is driven mainly by native women aged 18-25, especially on the extensive margin: a 5 percentage points increase in immigration raised the number of women in the younger age cohort with at least one child by 3.1%.

5.3 Household Formation and Homeownership

Table 4 provides evidence that immigration induced natives to leave their parental house earlier and set up their own independent family unit. In the first two columns, we focus on women aged 18-33, while in subsequent columns we report the effects of immigration on men aged 20-35.[20] Coefficients in Table 4 imply that a 5 percentage points increase in immigration raised the probability of living in an independent family unit by 2.4% for women and 2.2% for men relative to the mean in 1910. This effect is quantitatively close to that estimated for marriage rates, suggesting that the decisions to get married and leave the parental house were part of the same lifetime plan.[21] As shown in Figure A.2, these results are driven by women aged 18-25 and men aged 20-27: for these age groups, a 5 percentage points increase in immigration raised the probability of setting up their own household by more than 3%. Incidentally, these cohorts also experienced the largest increase in marriage and fertility because of immigration.

et al. (2019), who, for the more recent period, find that a 1 percentage point increase in import competition from China reduced fertility by 2.8%.

[19] Guinnane et al. (2006) find that fertility of immigrants in the late nineteenth and early twentieth century was higher than that of natives, but converged to US standards for second generation immigrants.

[20] Both OLS and 2SLS results, reported in Panels A and B respectively, are statistically significant and close in magnitude for women. As for marriage results, OLS estimates for men are sensitive to the inclusion of three cities (Duluth, Superior, and Tacoma). In these cities, only 20% of men were household head in 1910, compared to 42% in 1920 and 39% in the other cities of our sample in 1910. 2SLS estimates are unaffected by the inclusion of these three cities.

[21] Interestingly, focusing on the contemporaneous period, Autor et al. (2019) find that a 1 percentage point increase in import competition from China, not only decreased marriage rates and fertility, but also lowered the probability of living with a spouse by 1.6%.

Consistent with the evidence provided thus far, column 5 of Table 4 shows that immigration boosted homeownership rates for native men aged 20-35. The point estimate implies that a 5 percentage points increase in immigration raised homeownership rates for natives by 1.3 percentage points, or around 5% relative to the 1910 average. Between 1910 and 1930, homeownership rates for natives in our sample increased on average by 10 percentage points, moving from 0.35 to 0.45. Our estimates suggest that the economic expansion induced by immigration can explain at least 10% of the increase in homeownership that took place in the cities in our sample from 1910 to 1930.

Stitching together the three sets of results presented in this section, our estimates paint a coherent picture of how immigration affected family formation, marriage rates, and fertility of native men and women in the urban early twentieth century US. The inflow of immigrants induced natives to get married more (and, possibly, earlier); this decision was accompanied by the choice to leave the parental house, buy a home, and set up an independent family unit. In a period in which oral contraception was not yet available (Bailey, 2006), higher fertility was probably mechanically related to marriage and family formation decisions.

6 Mechanisms

In this section, we explore the mechanisms. First, we document that immigration raised employment of native men, in turn increasing the supply of native "marriageable men" (Section 6.1). Next, we provide evidence that changes in sex ratios (Section 6.2), natives' cultural responses (Section 6.3), and direct effects of immigration on native female labor force participation (Section 6.4) cannot, alone, explain our results.

6.1 Natives' Employment and the Supply of Marriageable Men

In two important contributions, Wilson (1987, 1996) argues that the decline in marriage and the rise in the share of single-mother households in the US since the 1970s have been, at least in part, due to deteriorating employment opportunities in manufacturing. Along these lines, exploiting exogenous variation in exposure to import competition from China across US local labor markets, Autor et al. (2019) find that job losses in manufacturing caused a steep decline in marriage rates and a significant increase in the proportion of single-mother households. In this section, we investigate the possibility that a similar mechanism, with the opposite sign, was at play in our context. Specifically, we advance and empirically test the hypothesis that immigration had a positive effect on natives' marriage by increasing employment and occupational standing of native men, in turn raising

the supply of native "marriageable men".

In Table 5, we study the effects of immigration on natives' employment to population ratio, focusing on men in the "marriageable relevant" age range, 20-35. As in Table 2, columns 1 and 2 estimate the baseline specification with OLS and 2SLS respectively. In both cases, there is a strong and positive relationship between immigration and natives' employment. The coefficient in column 2, which is quantitatively very close to OLS results reported in column 1, implies that a 5 percentage points increase in immigration raised natives' employment to population ratio by 0.8% relative to its 1910 mean. As documented in Figure A.3, the effect of immigration is slightly larger for men in the age range 20-27, but remains positive and statistically significant also for those aged 28-35. The point estimate is positive and quantitatively very similar, albeit not statistically significant, for older natives (aged 36-65).

Subsequent columns of Table 5 test the robustness of these results. First, we verify that there are no pre-trends (column 3). Second, we show that results are robust to interacting year dummies with the 1900 log of city total and immigrant population (column 4) and log of value added in manufacturing (column 5). Third, we check that our estimates are unchanged when scaling both the actual and the predicted number of immigrants by 1900, rather than predicted, city population (column 6).

Results in Table 5 are somewhat different from those obtained in Abramitzky et al. (2023), who find that the 1920s Immigration Acts did not have any impact on natives' employment. We suspect that the different time period (1910 to 1930 vs. 1920-1930 only) and geography (cities vs. entire country) explain the discrepancy between our findings and those in Abramitzky et al. (2023). Our estimates are instead consistent with those in Ager and Hansen (2017), Tabellini (2020), and Price et al. (2020). Most closely related to our paper, Tabellini (2020) shows that immigration induced natives to leave occupations that were more exposed to immigrants' competition and to take up jobs where immigrants were prevented from entering, because of skill and language mismatch or because of discrimination.[22] By linking individuals across Census years, Price et al. (2020) also find that such economic gains accrued to young native workers who in-migrated to cities that received more European immigrants, whereas older native workers who were likely displaced by the foreign born moved elsewhere in the country. These heterogeneous effects do not alter either the validity or the interpretation of our results, since they are still consistent with the idea that, in this historical context, immigration increased the supply of *native* "marriageable men"—and this, in turn, increased marriage rates, the probability

[22] As noted by economist and statistician Isaac Hourwich, "the effect of immigration upon the occupational distribution of industrial wage earners has been the elevation of the English-speaking workmen to the status of an aristocracy of labor, while the immigrants have been employed to perform the rough work of all industries" (Meyer, 1981).

of having children, and family formation among natives.

6.1.1 Children, Schooling, and Economic Conditions of Families

The effects documented above suggest that immigration affected economic conditions of native families, with potentially long-lasting implications for younger generations. Consistent with this idea, Table A.8 shows that immigration lowered the share of children below the age of 10 born to native parents living in a household where the father was unskilled (column 1).[23] Similarly, even if the coefficient is not statistically significant at conventional levels, there is a positive relationship between immigration and the share of children of native parentage whose father was employed. These results suggest that, because of immigration, children of native parentage were likely to grow up in a better environment at home.

Next, in Table A.9, we show that immigration increased the fraction of sons with native parentage aged 6-14 who were enrolled in school (column 1). Somewhat interestingly, though, we do not find a similar effect for daughters (column 2), even if the 1910 average enrollment was very similar for boys and girls. One possible explanation for this pattern is that families were credit constrained and, as more resources became available, parents chose to first invest them in sons rather than in daughters (Parish and Willis, 1993; Barcellos et al., 2014).

Especially in an urban context, the employment boom generated by immigration might have increased job opportunities for male teens, leading them to drop out of school. In line with this idea, column 3 of Table A.9 documents that immigration had a negative and statistically significant effect on school attendance for native males aged 15-18.[24] The 2SLS coefficient in column 3 implies that a 5 percentage points increase in immigration lowered school enrollment rates for native males of age 15-18 by 0.7 percentage points, or 2% relative to the 1910 mean. The decline in school enrollment of native teens reported in column 3 of Table A.9 is accompanied by a symmetrical increase in their employment probability (column 4). Specifically, a 5 percentage points increase in immigration raised the employment to population ratio for native males in the age range 15 to 18 by 1.5 percentage points, or 2.5% relative to the baseline mean. It is interesting to note that, for this age group, the percent increase in employment implied by immigration is almost identical to the percent decline in school enrollment, suggesting that these two patterns were closely related to each other.

[23] Very similar results are obtained when focusing on the share of families rather than on the share of children (columns 3 and 4).

[24] Consistent with only native (young) men, but not women, being pulled into the labor force, there is no effect of immigration on school attendance for female natives aged 15-18 (results not reported for brevity).

Our interpretation is that, by increasing the opportunity cost of schooling, the economic expansion generated by immigration induced young (native) teens to drop out of school and enter the labor market earlier. As shown in column 5 of Table A.9, most of the young males pulled into the labor force entered industries that were "not specified" in the US Census, which were unlikely to provide workers with opportunities for skill or occupational upgrading.[25] These findings resonate with those in Charles et al. (2018) and Cascio and Narayan (2022) for the contemporaneous period. They also suggest that, despite its average benefits for native workers and their families, the economic boom generated by immigration may have had long-lasting, negative consequences for native teens: by entering low-growth industries and by reducing their human capital accumulation, younger generations might have increased their exposure to future economic downturns.

6.2 Changes in Sex Ratios

The literature has documented that sex ratios, i.e. the relative number of men and women, can be an important determinant of marriage and family formation decisions (Angrist, 2002; Abramitzky et al., 2011; Lafortune, 2013). Since more than 60% of immigrants entering the United States at the beginning of the twentieth century were young men, immigration likely altered sex ratios, possibly increasing the availability of potential mates for native women. However, we argue that this channel cannot explain a relevant fraction of our main results.

First, while changes in the relative number of men and women might have contributed to the increase in marriage rates and fertility of native women, they can hardly explain why immigration also raised marriage rates of native men.[26] Second, as we show in column 3 of Table 6 (Panel A), only 4% of native women had a foreign born husband; likewise, column 3 of Table A.10 documents that only 3% of native men had a foreign born wife as of 1910.In addition, the increase in marriage rates for men and women was quantitatively similar (Table 2), suggesting that natives, in most cases, were marrying each other. These observations resonate with the idea that, at the time, marriage markets were highly segmented along ethnic lines (Angrist, 2002).

Focusing on results reported in Table 6, in Panel A, we find that a 5 percentage points increase in immigration raised the probability of getting married to a husband of native

[25] In unreported results, we also found that immigration did not increase the share of native males in the age range 15 to 18 working in manufacturing. This pattern is consistent with the idea that most immigrants were working in the latter sector, and natives were unlikely to find a job there.

[26] Indirectly, higher competition in the marriage market may have induced men to increase their investment in education and on-the-job training and their earnings, as suggested by Becker (1981) in his notion of male "efficiency" (see also Angrist, 2002). However, even in this case, changes in sex ratios should have had a stronger impact on women as compared to men.

parentage by around 6% for all native women, irrespective of their parentage (columns 2 and 5). The effect of immigration on the probability of having a foreign born spouse for native women was indistinguishable from zero (column 3). For second generation women, the impact of immigration on marriage is positive and statistically significant (column 6). However, since second generation women who had a foreign born husband represented less than 2.5% of all native women, focusing on females aged 18-33 implies a negligible effect of immigration on the overall marriage rates of native women.[27] Finally, Panel B documents that these effects were mirrored by a corresponding increase in fertility precisely for couples with higher marriage rates, supporting the idea that immigration raised natives' fertility by fostering marriage in an era when oral contraception was not yet available (Bailey, 2006).

Having established that most of the effects of immigration were not driven by native women marrying foreign born husbands, in the last part of this section, we study how the inflow of immigrants affected marriage prospects of second generation men and women. Sex ratios can have important implications for the marriage market of second generation immigrants, both directly and indirectly through the allocation of bargaining power within the couple. For example, in the same historical context of our paper, Angrist (2002) finds that a higher relative number of men in their own ethnic group improved marriage prospects of second generation females.

Figure 3 documents a pattern in line with this idea: because of immigration, marriage rates of second generation women aged 18-25 increased twice as much as those of women of native parentage. On the other hand, while immigration had a positive and large effect on marriage rates for men of native parentage, it did not have any significant impact for second generation men. This finding is consistent with the idea that immigration increased competition in the marriage market for second generation men. In Table A.11, we separately report the effect of immigration on marriage rates of native men and women for different age groups and parentage, and document that all of the effect comes from the youngest cohorts represented in Figure 3 (that is, women aged 18-25 and men aged 20-27).

To sum up, even though sex ratios were affected by immigration, they can hardly explain the increase in marriage rates of natives with native parentage, a group for which the relative number of men and women in the reference population was not significantly affected. Since US born individuals of native parentage were by far the largest group among natives, their decisions disproportionately affected natives' marriage and fertility.

[27] Interestingly, Table A.10 shows a similar impact of immigration on marriage rates for all native and second generation men.

6.3 Preservation of "Natives"

Opposition to immigration was widespread during the Age of Mass Migration, with a heated aversion towards individuals coming from non Anglo-Saxon and non English-speaking countries (Higham, 2002; Leonard, 2016). Since immigrants from Southern and Eastern Europe were linguistically and culturally far from natives (Hatton and Williamson, 2006), it is possible that natives reacted to immigration by marrying more and having more children in order to preserve their own race and culture (see Section 2).

The role of culture in affecting marriage and fertility decisions has been stressed by, among others, Bisin and Verdier (2000) and Fernández and Fogli (2006), who study the transmission of cultural norms among second generation immigrants in the US. More broadly, social interactions can influence the diffusion of cultural norms and have historically contributed to the convergence of fertility rates, both within and across countries (Spolaore and Wacziarg, 2022). For instance, Daudin et al. (2016) find that the demographic transition at the end of the nineteenth century in France was affected by the diffusion of low-fertility norms through internal migration.

To test if native men and women changed their family formation decisions to preserve their own culture, we analyze whether the effect on marriage rates and fertility was stronger when natives were exposed to linguistically farther individuals (which we take as a proxy for cultural distance). Specifically, we construct an index of immigrants' linguistic distance from English, $LD_{ct} = \sum_j (sh^j_{ct} L^j)$, where sh^j_{ct} is the share of ethnic group j among the foreign born population of city c in year t, and L^j is the linguistic distance from English of country j, computed in Chiswick and Miller (2005).[28] To ease the interpretation of results, which are reported in Table A.12, we standardize our measure of linguistic distance by subtracting its mean and dividing it by its standard deviation. Differently from what we would have expected if this mechanism was driving our results, marriage rates were not differentially affected by immigrants with different linguistic distance from English. These results thus suggest that cultural considerations were unlikely to explain our key findings.

6.4 Increased Labor Market Competition for Women

From the end of the nineteenth century to the 1920s, female workers were mainly young, unmarried, and from low-income households (Goldin, 2006). Most women were employed as piece workers in manufacturing, as private household workers or laundresses, or in clerical jobs. Upon getting married, women typically quit their jobs because of the

[28] We instrument the actual ethnic shares sh_{ct} using the same logic of the instrument constructed in equation (2).

stigma attached to wives working outside the home (Cherlin, 2014). Goldin (1990) estimates that, before 1940, more than 80% of all married women exited the labor force at marriage (see Goldin, 1990, page 7). As shown in Table A.13, in our sample of cities, the 1910 average labor force participation of native women aged 18-25 was 0.49, but was substantially lower for older women (0.33 and 0.25 for women aged 26-33 and 34-65, respectively).[29]

Studying the link between immigration, female labor force participation, and fertility, Furtado (2016) shows that the availability of cheaper childcare opportunities brought about by immigration induced native women to have more children and work longer hours. In contrast with these results, at the beginning of the twentieth century, immigration may have increased competition in the labor market for women, in turn inducing them to first leave their job and then, as a consequence, to get married and have more children (Angrist and Evans, 1998). While possible, this interpretation seems to be inconsistent with the historical context studied in our paper: at that time, as already discussed above, women most frequently took care of their own children, and used to quit their job upon marriage. Moreover, even though immigrants provided a cheap and unskilled supply of labor, which in principle might have displaced women, during the Age of Mass Migration, the US economy had large potential for economic expansion (Higgs, 1971). Thus, the displacement of female workers due to immigration seems unlikely, even more so as immigrants were more closely substitutes for men than for women, and we showed above that immigration increased natives' employment.

In line with this discussion, Table A.13 documents that immigration lowered labor force participation only for native women in the age group that experienced a significant increase in marriage rates (i.e., women aged 18-25). The impact is indistinguishable from zero for all older age cohorts, including women between 26 and 33 years old, one third of whom were in the labor force.[30] In Figure 4, we report the implied coefficients for the effect of a 5 percentage points increase in immigration, and show that female labor force participation in the age group 18-25 fell by 1.6% relative to its 1910 mean. Incidentally, this effect is only slightly smaller (in absolute value) than the increase in marriage induced by immigration for women in the same age group (Figure 2). Our interpretation of these results is that immigration first induced native women to marry and have children, and then, as a consequence of these two decisions, to leave the labor force.

[29] Goldin (2006) notes that labor force participation of married women before 1940 may be underestimated because they were often reluctant to report that they had a job.

[30] Furthermore, women aged 26-33 were likely to work in the same sectors and occupations as women aged 18-25.

7 Conclusions

Immigration has long been a defining feature of the American society, and a large literature has investigated its economic and political effects. However, less is known about the impact that immigrants have on important social and demographic outcomes, such as marriage, fertility, and family formation. In this paper, we seek to fill this gap by focusing on the Age of Mass Migration (1850-1920), when more than 30 million Europeans moved to the United States. We use a shift-share design to study the impact of immigration on marriage rates, the probability of having children, and the propensity to leave the parental house for young native men and women living in US cities between 1910 and 1930.

We find that, by promoting economic activity, immigration increased the supply of native "marriageable" men who, because of their better employment prospects, became more attractive spouses. This, in turn, raised natives' marriage rates for both men and women, and induced young adults to leave their parents' house earlier in their life. Higher marriage rates, in a period when oral contraception was not yet available, raised natives' probability of having children, mainly by increasing the number of women with at least one child.

In the context studied in this paper, immigrants were beneficial to natives' economic and social outcomes. However, this does not imply that immigration will always promote fertility and marriage among young natives. In fact, if immigrants increase labor market competition for natives, they may deteriorate, rather than promote, family stability as well as the environment where children grow up. Moreover, while we showed that in the early twentieth century, immigration to US cities affected marriage rates and fertility of natives mostly through (positive) income shocks, other channels may be at play in other settings. These observations suggest that one needs to be careful when extrapolating our results to other contexts.

Findings in this paper provide motivation for future work in at least two directions. First, we have not explored how changes in the supply of "marriageable men" affected the quality of the match between husbands and wives. If higher marriage rates were associated with worse matching between partners, this might have increased divorce rates and family instability, in turn lowering children's well-being (Stevenson and Wolfers, 2007; Lundberg et al., 2016). Second, it would be interesting to investigate other contexts, when a different set of channels might be at play.

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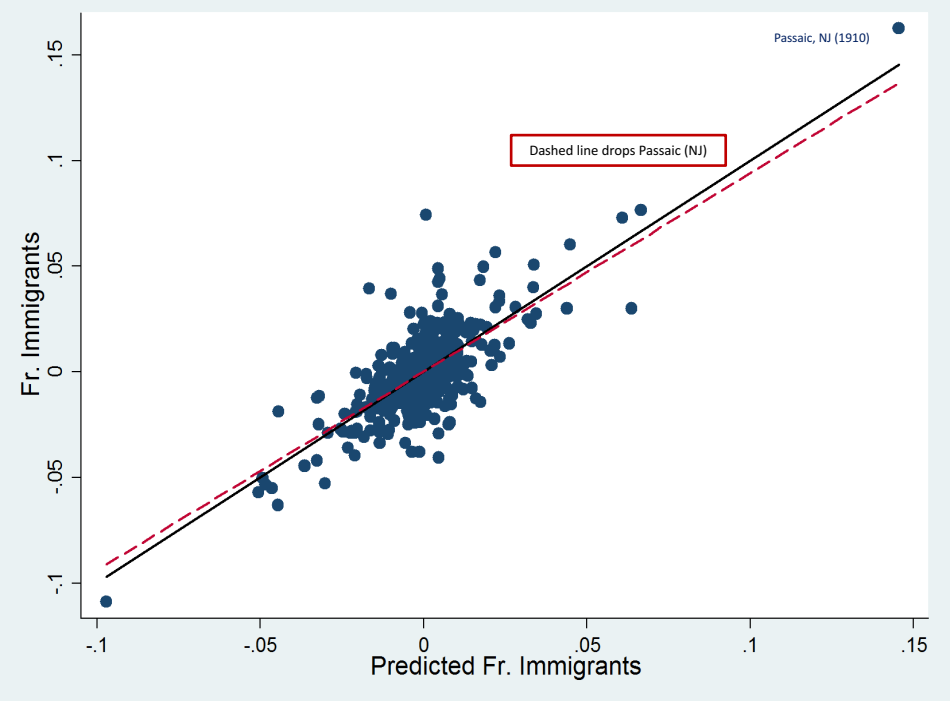
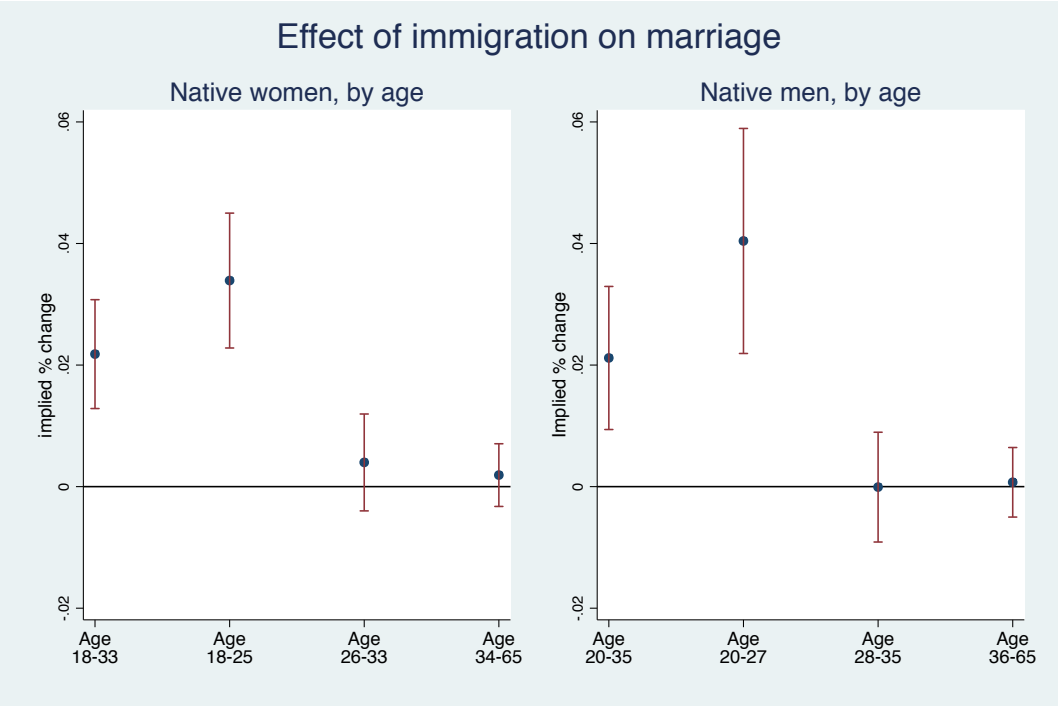
Figures and Tables

Figure 1: First Stage



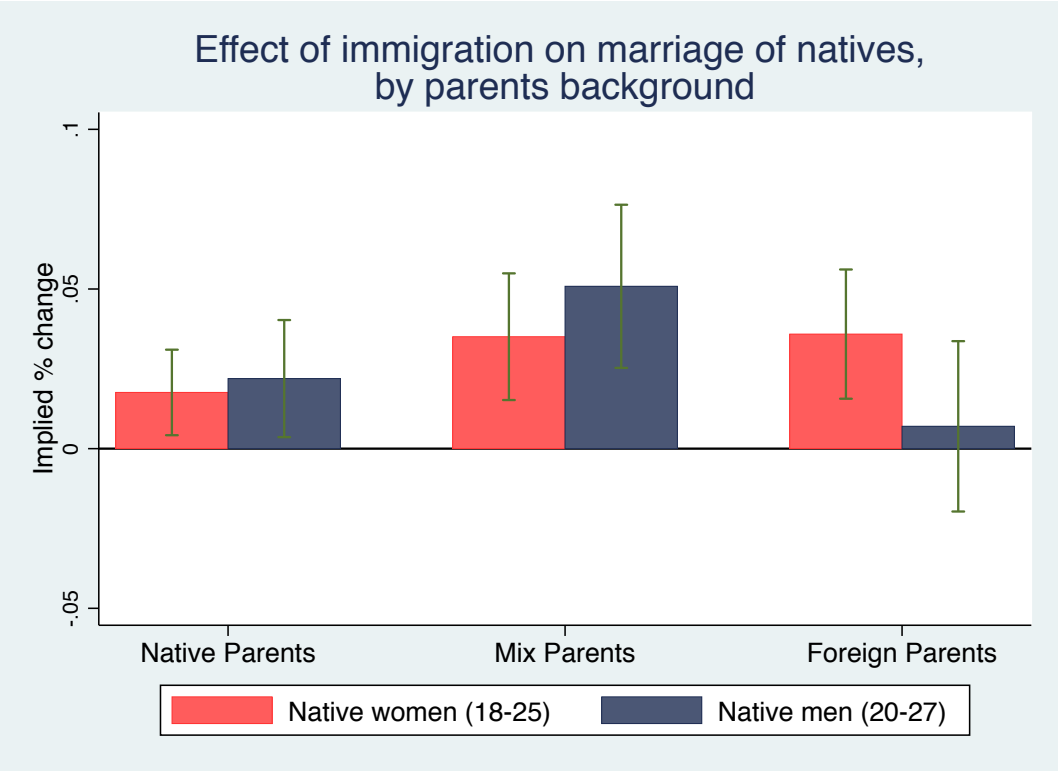
Notes: The y-axis (resp. x-axis) reports the actual (resp. predicted) number of immigrants over predicted city population in each of the three Census years, 1910, 1920, and 1930. Each point in the scatter diagram represents the residual change in a city's actual and predicted fraction of immigrants after partialling out city and year by state fixed effects. The predicted number of immigrants is constructed as discussed in Section 4.1 in the text. Predicted city population is obtained by multiplying 1900 city population with average urban growth, excluding that of the Census division where a city is located. The solid line shows the regression coefficient for the full sample (coefficient=0.990, standard error=0.063). The dotted (red) line shows the regression coefficient obtained when dropping the city of Passaic, NJ (coefficient=0.940, standard error=0.068).

Figure 2: The impact of immigration on marriage rates, by gender and age groups



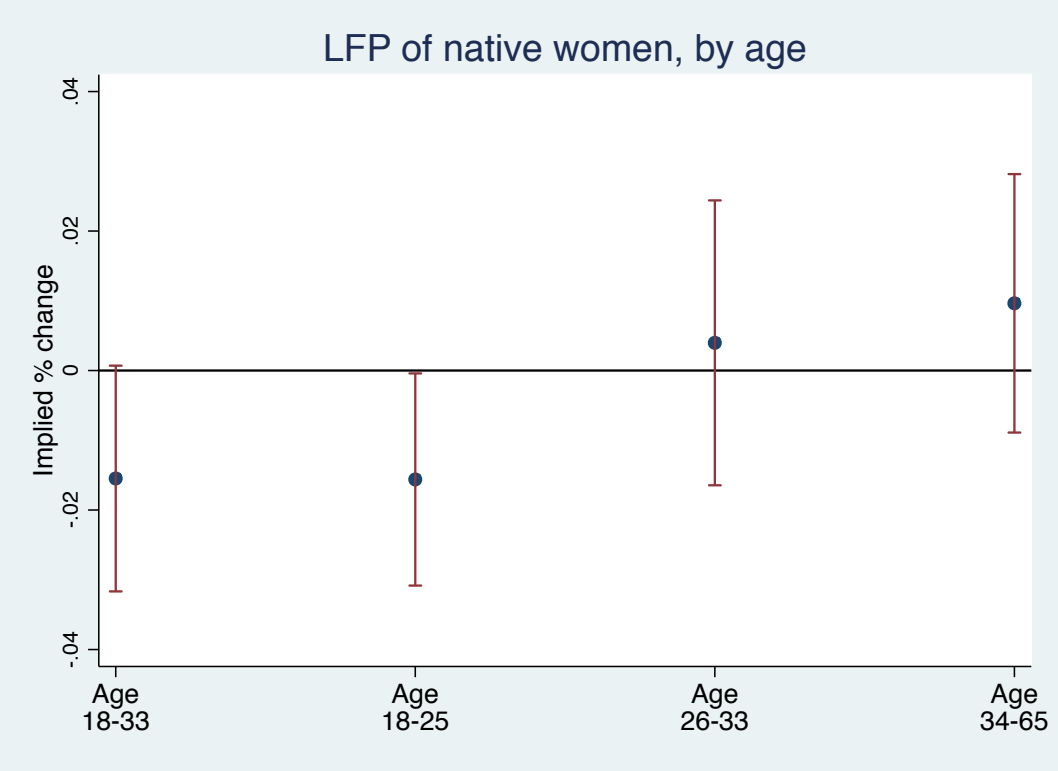
Notes: This graph shows the impact of a one standard deviation increase in the fraction of immigrants on the increase in marriage rates with respect to the mean value in 1910. We report the standardized coefficients by age group and for men and women separately.

Figure 3: The impact of immigration on marriage rates, by parentage



Notes: This graph shows the impact of a one standard deviation increase in the fraction of immigrants on the marriage rates of men and women by parentage with respect to the mean value in 1910. We report the standardized coefficients, separately by parentage and gender.

Figure 4: The impact of immigration on labor force participation, by age groups of women



Notes: This graph shows the impact of a one standard deviation increase in the fraction of immigrants on the decrease in labor force participation of women with respect to the mean value in 1910. We report the standardized coefficients separately by age group.

Table 1: Summary Statistics

	Count	Mean	SD	Min	Max
Panel A: City Demographics					
Fr. Immigrant	538	0.04	0.05	0.00	0.44
City Population (thousand)	538	190	511	30	6930
Panel B: Key Outcomes					
Marriage Rates of Women					
Aged 18-33	538	0.49	0.08	0.28	0.67
Aged 18-25	538	0.35	0.08	0.12	0.58
Aged 26-33	538	0.65	0.07	0.46	0.81
Marriage Rates of Men					
Aged 20-35	538	0.47	0.07	0.18	0.65
Aged 20-27	538	0.31	0.07	0.11	0.49
Aged 28-35	538	0.65	0.07	0.26	0.81
Fertility of Women 18-33					
Children to Women Ratio	538	0.65	0.12	0.40	1.00
Mothers to Women Ratio	538	0.34	0.05	0.21	0.49
Children to Mothers Ratio	538	1.90	0.11	1.59	2.27
Living with parents					
Women Aged 18-33	538	0.36	0.09	0.17	0.58
Men Aged 20-35	538	0.33	0.09	0.12	0.55
Living in own household					
Women Aged 18-33	538	0.45	0.08	0.25	0.67
Men Aged 20-35	538	0.43	0.06	0.18	0.60
Panel C: Labor Market					
Employment Men 20-35	538	0.90	0.05	0.71	0.98
Labor Force Participation Women 18-33	538	0.42	0.09	0.20	0.67

Notes: The Table shows the summary statistics of the main variables used in this paper for the 180 US cities with at least 30,000 residents in each Census year report. *Source:* Authors' calculations using IPUMS data.

Table 2: Immigration and Marriage of Natives

	(1) OLS	(2) 2SLS	(3) Pre-trends	(4) 2SLS	(5) 2SLS	(6) 2SLS
Panel A: Dependent Variable – Marriage Rates of Women (Age 18-33)						
Fr. Immigrant	0.238***	0.209***	0.128	0.329***	0.197***	0.154***
	(0.057)	(0.044)	(0.204)	(0.058)	(0.053)	(0.027)
F-stat		251.3	318.4	100.2	107.5	175.3
Mean dep. var. in 1910	0.45	0.45	0.45	0.45	0.45	0.45
Obs.	538	538	178	538	538	538
Panel B: Dependent Variable – Marriage Rates of Men (Age 20-35)						
Fr. Immigrant	-0.006	0.190***	0.078	0.181***	0.217***	0.121***
	(0.135)	(0.054)	(0.092)	(0.059)	(0.061)	(0.038)
F-stat		251.3	318.4	100.2	107.5	175.3
Mean dep. var. in 1910	0.42	0.42	0.42	0.42	0.42	0.42
Obs.	538	538	178	538	538	538
Pre-period			*Yes*			
Year by 1900 city				*Yes*		
and imm. pop						
Year by 1900 fr married					*Yes*	
Imm over 1900 pop						*Yes*

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the fraction of women married in the age range 18-33 in Panel A and the fraction of men married in the age range 20-35 in Panel B. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4. The mean of dependent variables is shown at the bottom of the Table. Column 3 is a falsification test (pre-trends). In Columns 4 and 5, we check the robustness of our results in column 2, by augmenting our baseline specification interacting year dummies with the (log of) 1900 city and immigrants' population and the 1900 marriage rates, respectively. Finally, in column 6, we show the robustness of our results scaling both the actual and the predicted number of immigrants by 1900, rather than predicted, population. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Immigration and Fertility of Native Women

	Dep. Variable: Fertility of Native Women (aged 18-33)					
	Children to Women Ratio		Mothers to Women Ratio		Children to Mothers Ratio	
	All Children	Children<5	All Children	Children<5	All Children	Children<5
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS						
Fr. Immigrant	0.291**	0.200***	0.132**	0.123***	0.149	0.209**
	(0.131)	(0.056)	(0.052)	(0.036)	(0.159)	(0.085)
Panel B: 2SLS						
Fr. Immigrant	0.431***	0.194***	0.165***	0.105***	0.342***	0.111**
	(0.072)	(0.037)	(0.027)	(0.026)	(0.103)	(0.052)
F-stat	251.3	251.3	251.3	251.3	251.3	251.3
Mean Dep.Var.	0.650	0.340	0.340	0.250	1.900	1.010
Obs.	538	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is: in column 1 (column 2), the total number of children (toddlers) with a native mother in the age range 18-33 over the total number of women in the age range 18-33, in column 3 (column 4) the fraction of women in the age range 18-33 who have children (toddlers) and in column 5 (column 6) the average number of children (toddlers) per mother in the age range 18-33. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The mean of dependent variables is shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Immigration and Living Choices of Natives

	(1)	(2)	(3)	(4)	(5)
	Women 18-33		**Men 20-35**		
	Living with Parents	**Living in Own House**	**Living with Parents**	**Living in Own House**	**Home-ownership**
Panel A: OLS					
Fr. Immigrant	-0.383***	0.231***	-0.493***	-0.004	0.035
	(0.086)	(0.057)	(0.131)	(0.137)	(0.113)
Panel B: 2SLS					
Fr. Immigrant	-0.285***	0.204***	-0.316***	0.171***	0.267***
	(0.043)	(0.040)	(0.045)	(0.056)	(0.099)
F-stat	251.3	251.3	251.3	251.3	251.3
Mean dep. var.	0.370	0.418	0.317	0.387	0.291
Obs.	538	538	538	538	538

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variables are listed in the top row of the Table. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Immigration and Employment of Native Men

Dep. Var. : Natives' Employment to Population Ratio (Men, Age 20-35)						
	(1) OLS	(2) 2SLS	(3) Pre-trends	(4) 2SLS	(5) 2SLS	(6) 2SLS
Fr. Immigrant	0.151***	0.152***	-0.071	0.094**	0.130**	0.113***
	(0.043)	(0.044)	(0.124)	(0.041)	(0.053)	(0.033)
F-stat		251.3	318.4	100.2	107.5	175.3
Mean dep. var. in 1910	0.911	0.911	0.911	0.911	0.911	0.911
Obs.	538	538	180	538	538	538
Pre-period			*Yes*			
Year by 1900 city and imm. pop				*Yes*		
Year by 1900 value added manuf.					*Yes*	
Imm over 1900 pop						*Yes*

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the natives' employment to population ratio in the age range 20-35 for men. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. Column 3 is a falsification test (pre-trends). In Columns 4 and 5, we check the robustness of our results in column 2, by augmenting our baseline specification interacting year dummies with the (log of) 1900 city and immigrants' population and the 1900 value added in the manufacture sector, respectively. Finally, in column 6, we show the robustness of our results scaling both the actual and the predicted number of immigrants by 1900, rather than predicted, population. The mean of the dependent variables is shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

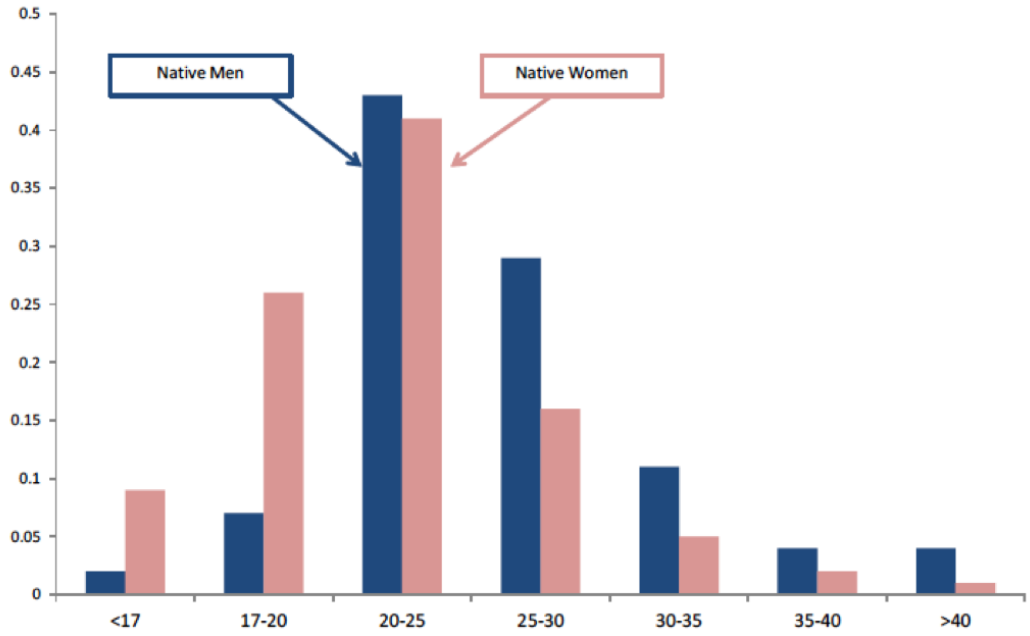
Table 6: Immigration, Marriage Rates, and Fertility of Native Women aged 18-33 (2SLS results)

	(1)	(2)	(3)	(4)	(5)	(6)
	All Native Women			**Second Generation Women**		
Husband	**All**	**Native Parentage**	**Immigrant**	**All**	**Native Parentage**	**Immigrant**
Panel A: Marriage rates						
Fr. Immigrant	0.209***	0.309***	0.001	0.193***	0.169**	0.178***
	(0.044)	(0.046)	(0.020)	(0.071)	(0.066)	(0.046)
Mean dep. var.	0.47	0.27	0.04	0.45	0.14	0.10
Panel B: Fertility (Children to Women Ratio)						
Fr. Immigrant	0.431***	0.443***	-0.005	0.359**	0.177*	0.259**
	(0.072)	(0.087)	(0.053)	(0.162)	(0.103)	(0.127)
Mean dep. var.	0.65	0.35	0.07	0.58	0.19	0.17
F-stat	251.3	251.3	251.3	251.3	251.3	251.3
Obs.	538	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. In panel A, the dependent variable is the marriage rate of women aged 18-33 by husband parentage. In panel B, the dependent variable is the children to women ratio by father parentage. We consider only children of women aged 18-33. For example, in column 2 of Panel B, the dependent variable is the number of children with a native mother aged 18-33 and a father with native parentage over the number of native women aged 18-33. Columns 4-6 focus on women who are second generation immigrants. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The mean of the dependent variables is shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

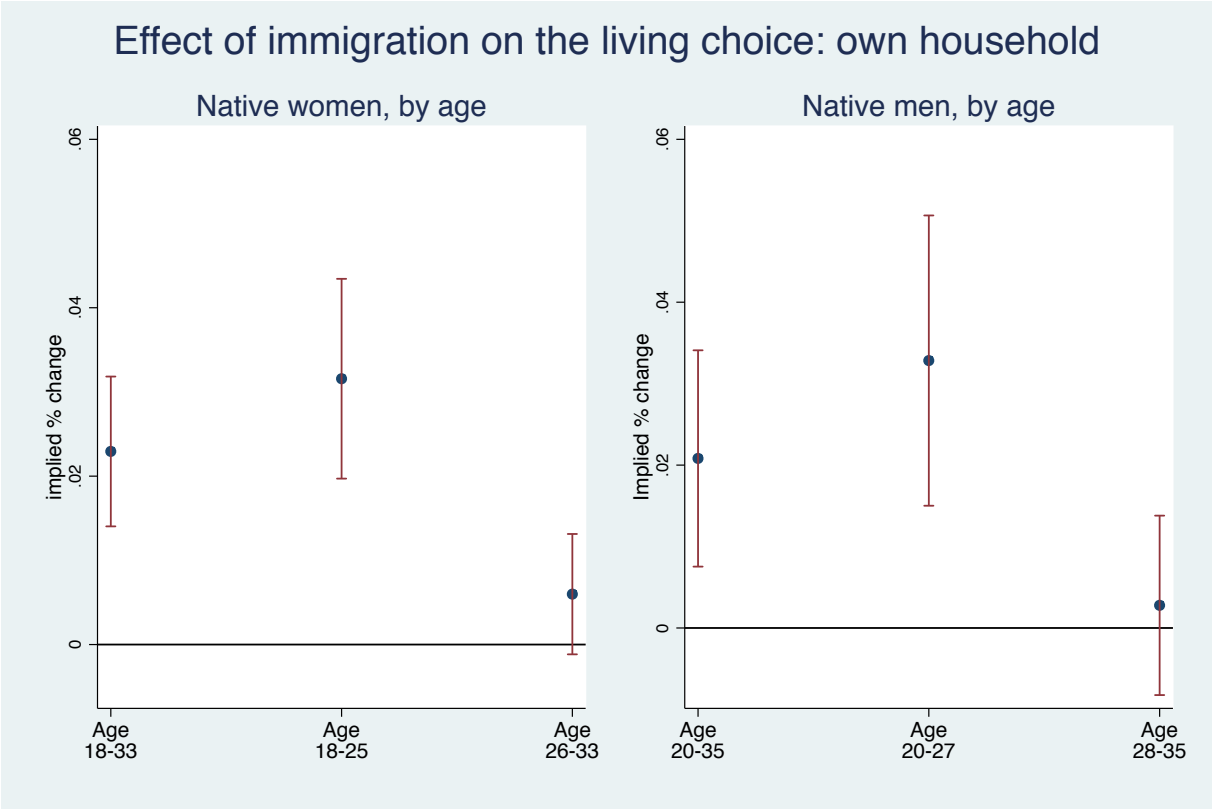
A Additional Tables and Figures

Figure A.1: Marriage rates by age group and gender



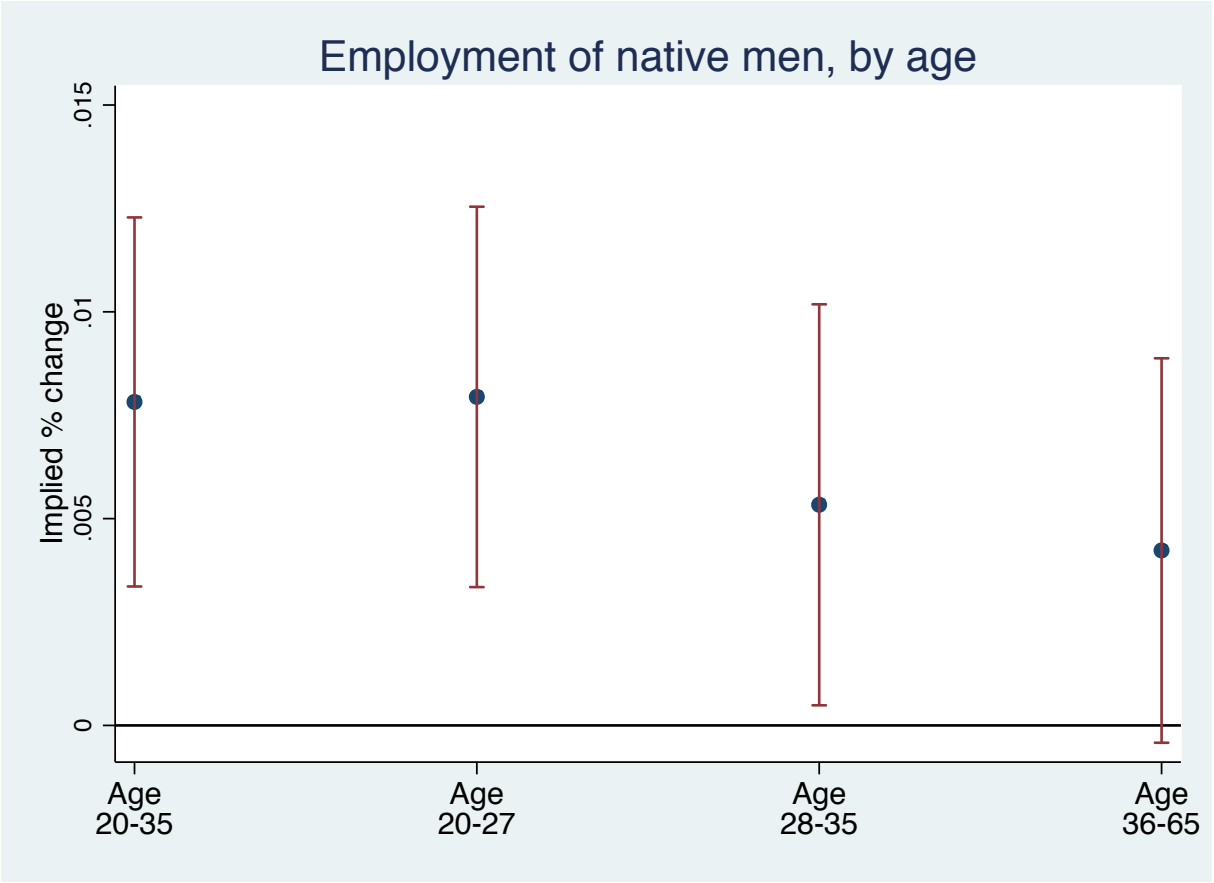
Source: Figure A.1 plots the distribution of the age at first marriage for native men and women in 1930 (the first year in which this question was asked in the US Census). See also estimates reported at https://www.thespruce.com/estimated-median-age-marriage-2303878. Authors' calculations using IPUMS data.

Figure A.2: The impact of immigration on the choice of creating an independent family unit, by gender and age group.



Notes: This graph shows the impact of a one standard deviation increase in the fraction of immigrants on the probability of being the household head or spouse by age and gender.

Figure A.3: The impact of immigration on the employment of native men by age groups and gender



Notes: This graph shows the impact of a one standard deviation increase in the fraction of immigrants on the increase in the probability of employment for native men with respect to the mean value in 1910. We report the standardized coefficients separately by age group.

Table A.1: US Cities

Akron, OH	Elizabeth, NJ	McKeesport, PA	Saint Joseph, MO
Albany, NY	Elmira, NY	Memphis, TN	Saint Louis, MO
Allentown, PA	Erie, PA	Milwaukee, WI	Saint Paul, MN
Altoona, PA	Evansville, IN	Minneapolis, MN	Salem, MA
Amsterdam, NY	Everett, MA	Mobile, AL	San Antonio, TX
Atlanta, GA	Fall River, MA	Montgomery, AL	San Diego, CA
Atlantic City, NJ	Fitchburg, MA	Mount Vernon, NY	San Francisco, CA
Auburn, NY	Flint, MI	Nashville, TN	Savannah, GA
Augusta, GA	Fort Wayne, IN	New Bedford, MA	Schenectedy, NY
Baltimore, MD	Fort Worth, TX	New Britain, CT	Scranton, PA
Bay City, MI	Galveston, TX	New Castle, PA	Seattle, WA
Bayonne, NJ	Grand Rapids, MI	New Haven, CT	Sioux City, IA
Berkeley, CA	Hamilton, OH	New Orleans, LA	Somerville, MA
Binghamton, NY	Harrisburg, PA	New York, NY	South Bend, IN
Birmingham, AL	Hartford, CT	Newark, NJ	Spokane, WA
Boston, MA	Haverhill, MA	Newton, MA	Springfield, IL
Bridgeport, CT	Hoboken, NJ	Niagara Falls, NY	Springfield, MA
Brockton, MA	Holyoke, MA	Norfolk, VA	Springfield, MO
Buffalo, NY	Houston, TX	Oakland, CA	Springfield, OH
Butte, MT	Huntington, WV	Oklahoma City, OK	Superior, WI
Cambridge, MA	Indianapolis, IN	Omaha, NE	Syracuse, NY
Camden, NJ	Jackson, MI	Oshkosh, WI	Tacoma, WA
Canton, OH	Jacksonville, FL	Pasadena, CA	Tampa, FL
Cedar Rapids, IA	Jamestown , NY	Passaic, NJ	Taunton, MA
Charleston, SC	Jersey City, NJ	Paterson, NJ	Terre Haute, IN
Charlotte, NC	Johnstown, PA	Pawtucket, RI	Toledo, OH
Chattanooga, TN	Joliet, IL	Peoria, IL	Topeka, KS
Chelsea, MA	Kalamazoo, MI	Perth Amboy, NJ	Trenton, NJ
Chester, PA	Kansas City, KS	Philadelphia, PA	Troy, NY
Chicago, IL	Kansas City, MO	Pittsburgh, PA	Utica, NY
Cincinnati, OH	Knoxville, TN	Pittsfield, MA	Washington, DC
Cleveland, OH	La Crosse, WI	Portland, ME	Waterbury, CT
Columbus, OH	Lancaster, PA	Portland, OR	Wheeling, WV
Covington, KY	Lansing, MI	Portsmouth, VA	Wichita, KS
Dallas, TX	Lawrence, MA	Providence, RI	Wilkes-Barre, PA
Davenport, IA	Lexington, KY	Pueblo, CO	Williamsport, PA
Dayton, OH	Lima, OH	Quincy, IL	Wilmington, DE
Decatur, IL	Lincoln, NE	Quincy, MA	Woonsocket, RI
Denver, CO	Little Rock, AR	Racine, WI	Worcester, MA
Des Moines, IA	Los Angeles, CA	Reading, PA	Yonkers, NY
Detroit, MI	Louisville, KY	Richmond, VA	York, PA
Dubuque, IA	Lowell, MA	Roanoke, VA	Youngstown, OH
Duluth, MN	Lynn, MA	Rochester, NY	
East Orange, NJ	Macon, GA	Rockford, IL	
East St. Louis, IL	Malden, MA	Sacramento, CA	
El Paso, TX	Manchester, NH	Saginaw, MI	

Notes: This table lists the 180 US cities with at least 30,000 residents in each Census year.

Table A.2: Sending Regions

UK	Russia
Ireland	Eastern Europe (Yugoslavia, Czechoslovakia, etc.)
Denmark	Austria-Hungary
Finland	Switzerland
Norway	France
Sweden	Belgium-Netherlands
Germany	Greece-Portugal-Spain
Poland	Italy

Table A.3: Characteristics of husbands of women aged 18-33

Husband	**Native**			**Immigrant**	
	Native Parents	*Mix Parents*	*Foreign Parents*	>10 *years*	≤ 10 *years*
Native Wife					
Native Parents	0.73	0.07	0.13	0.06	0.02
Mix Parents	0.50	0.12	0.24	0.11	0.03
Foreign Parents	0.35	0.09	0.32	0.18	0.06
Immigrant Wife					
>10 *years*	0.18	0.04	0.14	0.50	0.13
≤ 10 *years*	0.07	0.01	0.05	0.20	0.67

Notes: The Table shows the probability of marriage with husbands of different parentage for women aged 18-33 in the 180 US cities in 1910 with at least 30,000 residents in each Census year report. *Source:* Authors' calculations using IPUMS data.

Table A.4: First Stage

	Dep. Variable: Fraction of Immigrants					
	(1)	(2)	(3)	(4)	(5)	(6)
Z	0.830***	0.944***	0.990***	0.905***	0.889***	0.986***
	(0.053)	(0.071)	(0.063)	(0.090)	(0.086)	(0.066)
Immigrants over	*Actual pop.*	*1900 pop.*	*Predicted pop.*	*Predicted pop.*	*Predicted pop.*	*Predicted pop.*
Year interacted with 1900				*Immigrants and city population*	*Value added by manufacture*	*Fr. native women married*
F-stat	249.3	175.3	251.3	100.2	107.5	224.5
Obs.	538	538	538	538	526	538

Notes: the sample includes a balanced panel of the 180 US cities with at least 30,000 residents in each Census year 1910, 1920, and 1930. In Column 1 the actual number of immigrants is scaled by actual population, and the instrument is the leave-out version of the shift-share IV in equation (2) (Section 4.1). Columns 2 and 3 replicate Column 1 by scaling the actual and predicted number of immigrants by, respectively, 1900 and predicted population. From Column 3 onwards, Table A.4 presents results from specifications where both the predicted and the actual number of immigrants are scaled by predicted population. Columns 4 to 6 include the interaction between year dummies and, respectively: the (log of) 1900 city and immigrants population; the (log of) 1904 value added by manufacture per establishment; and the marriage rates of native women in 1900. F-stat refers to the K-P F-stat for weak instrument. All regressions partial out city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: Immigration and Marriage of Native Men aged 20-35

	(1)	(2)	(3)	(4)
Marriage rates of men aged 20-35				
	All Sample		**Restricted Sample**	
	OLS	2SLS	OLS	2SLS
Fr. Immigrant	-0.006	0.190***	0.077	0.147**
	(0.135)	(0.054)	(0.082)	(0.063)
F-stat		251.3		251.3
Mean dep. var. in 1910	0.42	0.42	0.43	0.43
Obs.	538	538	529	529

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report in columns 1 and 2. In columns 3 and 4, we exclude three cities (Duluth, Superior, and Tacoma) with extraordinary low marriage rates of men aged 20-35 in 1910. The dependent variable is the fraction of men married in the age range 20-35. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4. The mean of the dependent variables is shown at the bottom of the table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: Immigration and Marriage of Natives - 2SLS results

	(1)	(2)	(3)	(4)	(5)
Panel A: Women					
		Marriage rates			**Never Married**
Age Groups	**18-33**	**18-25**	**26-33**	**34-65**	**34-65**
Fr. Immigrant	0.209***	0.229***	0.053	0.025	-0.082***
	(0.044)	(0.038)	(0.054)	(0.035)	(0.019)
Mean dep. var.	0.47	0.34	0.65	0.63	0.15
Obs.	538	538	538	538	538
Panel B: Men					
		Marriage rates			**Never Married**
Age Groups	**20-35**	**20-27**	**28-35**	**36-65**	**36-65**
Fr. Immigrant	0.190***	0.236***	-0.001	0.011	-0.026
	(0.054)	(0.055)	(0.059)	(0.045)	(0.035)
Mean dep. var.	0.45	0.30	0.65	0.73	0.14
Obs.	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the fraction of women married in the different age ranges in Panel A and the fraction of men married in the different age ranges in Panel B. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The mean of the dependent variables is shown at the bottom of the Table. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Immigration and Fertility of Native Women - 2SLS results

	Dep. Variable: Fertility of Native Women					
	Children to Women Ratio		Mothers to Women Ratio		Children to Mothers Ratio	
	Age 18-25	Age 26-33	Age 18-25	Age 26-33	Age 18-25	Age 26-33
	(1)	(2)	(3)	(4)	(5)	(6)
Fr. Immigrant	0.234***	0.357***	0.131***	0.071**	0.160**	0.391***
	(0.049)	(0.122)	(0.025)	(0.034)	(0.080)	(0.137)
F-stat	251.3	251.3	251.3	251.3	251.3	251.3
Mean Dep.Var.	0.330	1.050	0.210	0.500	1.530	2.090
Obs.	538	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is: in column 1 and 2, the total number of children with a native mother over the total number of women in the age range, in column 3 and 4 the fraction of women who have children and in column 5 and 6 the average number of children per mother. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The mean of the dependent variables is shown at the bottom of the table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Immigration and Living Choices of Natives

	(1)	(2)	(3)	(4)
	Share of children < 10 (native parents)		**Share of families (children < 10, native parents)**	
	Father employed	**Father unskilled**	**Father employed**	**Father unskilled**
Panel A: OLS				
Fr. Immigrant	0.052	-0.027	0.032	-0.035
	(0.049)	(0.075)	(0.045)	(0.076)
Panel B: 2SLS				
Fr. Immigrant	0.049	-0.138**	0.024	-0.171***
	(0.037)	(0.061)	(0.034)	(0.063)
F-stat	251.3	251.3	251.3	251.3
Mean dep. var.	0.908	0.332	0.901	0.318
Obs.	538	538	538	538

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variables are listed in the top row of the Table. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Immigration and Education of Native Children

	(1)	(2)	(3)	(4)	(5)
Age group:	**Age 6-14**		**Age 15-18**		
	Fraction attending School		**Fraction attending School**	**Employment to Population**	**Share Non-Spec Industry**
	Sons	**Daughters**	**Native Male Teens**		
Panel A: OLS					
Fr. Immigrant	0.007	-0.025	-0.213***	0.371***	0.088
	(0.040)	(0.041)	(0.073)	(0.092)	(0.058)
Panel B: 2SLS					
Fr. Immigrant	0.067***	0.017	-0.131**	0.307***	0.147**
	(0.025)	(0.027)	(0.065)	(0.103)	(0.068)
Dep. var:	0.933	0.936	0.323	0.602	0.158
Obs.	538	538	538	538	538

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variables are listed in the top row of the Table. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the Table. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Immigration and Marriage Rates of Native Men aged 20-35 (2SLS results)

	(1)	(2)	(3)	(4)	(5)	(6)
	All Native Men			**Second Generation Men**		
Wife	**All**	**Native Parentage**	**Immigrant**	**All**	**Native Parentage**	**Immigrant**
Dependent Variable: Marriage rates						
Fr. Immigrant	0.190***	0.296***	0.022	0.106*	0.215***	0.063*
	(0.054)	(0.064)	(0.016)	(0.063)	(0.075)	(0.036)
Mean dep. var.	0.45	0.27	0.03	0.42	0.16	0.04
F-stat	251.3	251.3	251.3	251.3	251.3	251.3
Obs.	538	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. In panel A, the dependent variable is the marriage rate of men aged 20-35 by husband parentage. In panel B, the dependent variable is the children to women ratio by father parentage. We consider only children of women aged 18-33. For example, in column 2 of Panel B, the dependent variable is the number of children with a native mother aged 18-33 and a father with native parentage over the number of native women aged 18-33. Columns 4-6 focus on women who are second generation immigrants. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: Immigration and Marriage Rates of Natives by parentage (2SLS results)

	Marriage rates					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:	**Women Age 18-25**			**Women Age 26-33**		
Own Parents	**Native**	**Mixed**	**Foreign**	**Native**	**Mixed**	**Foreign**
Fr. Immigrant	0.127***	0.192***	0.211***	0.068	0.163	0.117
	(0.049)	(0.055)	(0.061)	(0.042)	(0.113)	(0.112)
Mean Dep. Var.	0.340	0.257	0.277	0.642	0.603	0.587
Obs.	538	538	538	538	538	538
Panel B:	**Men Age 20-27**			**Men Age 28-35**		
Own Parents	**Native**	**Mixed**	**Foreign**	**Native**	**Mixed**	**Foreign**
Fr. Immigrant	0.139**	0.227***	0.035	-0.029	0.013	0.047
	(0.059)	(0.058)	(0.067)	(0.075)	(0.091)	(0.078)
Mean Dep. Var.	0.297	0.210	0.233	0.623	0.575	0.561
Obs.	538	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the marriage rate of the group described in each panel. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: Immigration, Linguistic Distance, Employment and Marriage Rates of Natives (2SLS results)

Dep Var.:	**Employment Men 20-35**	**Marriage Rate Women 18-33**			
Own Parents		**All**	**Native**	**Mix**	**Immigrants**
	(1)	(2)	(3)	(4)	(5)
Fr. Immigrant	0.136**	0.207***	0.126**	0.282***	0.274***
	(0.066)	(0.060)	(0.064)	(0.091)	(0.102)
Ling. Distance	0.001	0.000	0.001	-0.004	-0.007
	(0.004)	(0.003)	(0.004)	(0.005)	(0.006)
Mean Dep. Var.	0.340	0.257	0.277	0.642	0.603
Obs.	538	538	538	538	538

Notes: this Table presents results of 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the marriage rate of the groups described in each panel. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The mean of the dependent variables is shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.13: Immigration and LFP of Native Women - 2SLS results

	(1)	(2)	(3)	(4)	(5)
	Dep. Var.: LFP of Native Women				
	Age 18-33 OLS	**Age 18-33 2SLS**	**Age 18-25 2SLS**	**Age 26-33 2SLS**	**Age 34-65 2SLS**
Fr. Immigrant	-0.084	-0.115*	-0.135**	0.023	0.042
	(0.083)	(0.061)	(0.067)	(0.061)	(0.041)
F-stat		251.3	251.3	251.3	251.3
Mean dep. var.	.42	.42	.49	.33	.25
Obs.	538	538	538	538	538

Notes: this Table presents results of OLS and 2SLS for a balanced panel of the 180 US cities with at least 30,000 residents in each Census year report. The dependent variable is the labor force participation of women in each range. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented using the baseline version of the instrument constructed in Section 4.1. The means of the dependent variables are shown at the bottom of the Table. KP F-stat is the Kleibergen-Paap F stat for joint significance of instruments. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B Graphical Example

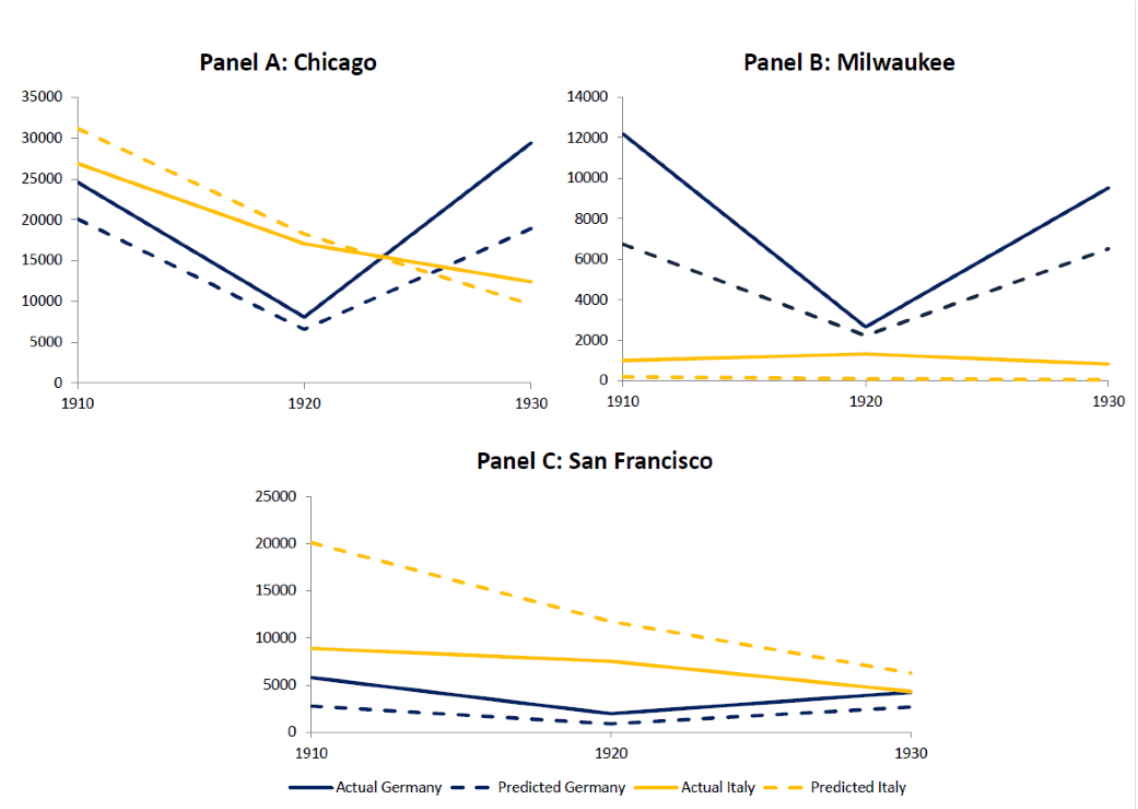
As discussed in the main text, the shift-share instrument exploits two sources of variation: first, cross-sectional variation in the share of individuals from each ethnic group living in different US cities in 1900; second, time-series variation due to changes in the total number of immigrants from any sending region entering the United States in a given decade. To illustrate how the two sources of variation are combined by our instrument, Figure B.1 presents a simple example for two ethnic groups (Germans and Italians) and three cities (Chicago, Milwaukee, and San Francisco).

German immigration fell between 1910 and 1920 due to WWI, but rebounded after 1920, as the quotas were quite generous with respect to Germany. In contrast, between 1910 and 1930, Italian immigration declined monotonically. As shown in Panel A, Chicago had large Italian and German communities in 1900. In line with the aggregate flows, both the actual (straight lines) and the predicted (dotted lines) number of Italians (yellow lines) and Germans (blue lines) arriving in Chicago fell between 1910 and 1920. However, after 1920, while Italian immigration continued its decline, Chicago experienced a positive immigration shock from Germany.

Next, Panel B presents the example of Milwaukee, a city with a relatively large German community, but with almost no Italians in 1900. For this city, variation in immigration was driven by changes in German, and not Italian, immigration. Finally, while very few Germans were living in San Francisco in 1900, Italian settlements were fairly large in this city. As documented in Panel C, the actual and predicted immigration shock for San Francisco was due to the decline in Italian immigration, and only marginally to the inflow of Germans after 1920.

The instrument in equation (2) extends this example to many cities and many ethnic groups, but the logic behind it can be grasped by looking at the patterns in Panels A to C of Figure B.1

Figure B.1: Actual and Predicted Immigration



Notes: This Figure reports the actual and predicted number of Italians and Germans arrived during the previous decade to Chicago (Panel A), Milwaukee (Panel B), and San Francisco (Panel C), in 1910, 1920, and 1930. Predicted immigration is obtained from the instrument constructed in equation (2) in the main text. *Source:* from IPUMS sample of US Census (Ruggles et al., 2015).