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Michela Carlana
Marco Tabellini

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Michela Carlana† Marco Tabellini‡

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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 kids, and leave the parental house earlier. Our evidence suggests that the positive impact of immigration on native men's employment, which increased the supply of native "marriageable men", contributed to generate these patterns. Instead, alternative channels – changes in sex ratios, natives' cultural reactions, and economic competition for native women – are unlikely to, alone, explain our results. *JEL: J12, J13, J61, N32*.

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†Harvard Kennedy School and IZA (e-mail: michela_carlana@hks.harvard.edu).

‡Harvard Business School and CEPR (e-mail: mtabellini@hbs.edu).

A large literature has studied the economic effects of immigration.[1] The impact of immigrants on natives' labor market outcomes remains particularly controversial, despite the vast number of works on this topic. Some papers find that immigrants reduce natives' wages and employment (Borjas, 2003; Dustmann et al., 2017; Monras, 2020), while others show that immigration has either zero (Card, 2001, 2005) or even positive effects on natives' economic conditions (Foged and Peri, 2016; Ottaviano and Peri, 2012; Peri and Sparber, 2009). However, existing works have not focused on the "downstream" effects on marriage, fertility, and family formation plans of changed economic circumstances of natives due to immigration.

In this paper, we examine these issues in the context of European immigration to US cities between 1910 and 1930 – a setting that offers several advantages. First, it is possible to exploit rich data from the full count US Census, not available in the post-WWII period. Second, the immigration wave of the early twentieth century is comparable in size to, if not larger than, the more recent one, during which the immigrant share of the US population skyrocketed to 13% in 2010 (Abramitzky and Boustan, 2017).[2] Moreover, this period was characterized by exogenous shocks – World War I (WWI) and the Immigration Acts – that had heterogeneous effects on different European countries across decades. Since immigrants cluster geographically along ethnic lines, variation across sending regions mechanically translates into variation in the number and in the mix of immigrants received by US cities over time. We can thus exploit such variation to identify the causal effects of immigration. Finally, previous work has documented that this immigration shock had a strong, positive effect on natives' employment and occupational standing (Tabellini, 2020).[3] As a result, we can analyze an episode of immigration that generated widespread economic gains among natives to study how such gains in turn influenced family structure.

To identify the causal effect of immigration, we follow Tabellini (2020), estimating stacked panel regressions that account for city invariant and state time-varying unobservable characteristics, and constructing a "leave-out" version of the shift-share instrument (Card, 2001). The instrument combines geographic variation in historical settlements of different ethnic groups with time-series variation in national flows from each sending region, net of immigrants who eventually settled in the city's metropolitan statistical area (MSA).

Several recent papers have discussed the potential threats to the validity of shift-share designs (Adao et al., 2019; Borusyak et al., 2018; Goldsmith-Pinkham et al., 2020; Jaeger et al., 2018). In our context, the identifying assumption requires that, conditional on

[1] See the reviews by Dustmann et al. (2016) and Card and Peri (2016) among others.

[2] As of 1920, 14% of the US population was foreign born, following the migration of more than 30 million Europeans since 1850.

[3] See also Ager and Hansen (2017), Abramitzky et al. (2019), and Sequeira et al. (2020).

city fixed and state time varying characteristics, the factors that attracted migrants from different regions prior to 1900 must be uncorrelated both with post-1900 migration across European countries *and* with changes in economic and social conditions in US cities. We perform different checks – including testing for pre-trends and interacting year dummies with pre-migration city characteristics – to assess the validity of the instrument, and show that our results are robust to the use of alternative specifications.

We conjecture that the positive impact on native men's employment documented in Tabellini (2020) increased the supply of *native* "marriageable men" (Autor et al., 2019; Wilson, 1987), and made it easier for native men and women to marry, set up an independent household, and have kids at an earlier stage in their life. The central result of the paper is 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 five percentage points increase in immigration raised natives' marriage rates and the children-to-women ratio by 2 and 3% respectively relative to their 1910 levels.[4]

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, 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.

In the second part of the paper, we provide evidence that weighs against a number of alternative mechanisms. We argue that, although each of them might have independently affected natives' marriage and fertility, these forces are unlikely to explain the effects of immigration that we attribute to the supply of native "marriageable men". First, we document that our findings are not driven by changes in sex ratios.[5] Indeed, immigration induced not only native women but also native *men* to marry more and to have more kids, 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 inter-marry.[6]

[4]These results are consistent with those reported in the contemporaneous paper by Ager and Hansen (2017). We complement their analysis by examining the mechanisms and exploring additional implications for natives' family structure.

[5]Since more than 60% of immigrants entering the US at the time were young men, marriage prospects may have changed differentially for men and women (Angrist, 2002).

[6]At the time, more than 95% of US-born women married US-born men. Ethnic segmentation of marriage

Next, we consider the possibility that higher marriage rates were triggered by a cultural response among natives, motivated by the desire of preserving their own race (Bisin and Verdier, 2000; Bisin and Tura, 2019; Spolaore and Wacziarg, 2019). Using the measure of linguistic distance from Chiswick and Miller (2005) to proxy for cultural distance, we verify that the latter did not have any effect on natives' marriage. We also note that, while cultural incentives may lead to a higher probability of endogamous marriage, they can hardly explain the better circumstances of kids 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 kids, 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 findings complement those in Autor et al. (2019) by showing that a positive (rather than 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 – the similarity between our results and those in Autor et al. (2019) suggests that the way in which marriage and fertility respond to income shocks may be stable over time.[7]

1 Historical Background

Between 1850 and 1920, during the Age of Mass Migration, more than 30 million Europeans migrated to the US (Abramitzky and Boustan, 2017). Until 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, favored by the decrease in migration costs caused by the introduction of steam technology (Keeling, 1999). As a result, the share of immigrants that arrived from Southern and Eastern Europe skyrocketed from less than 5% in 1870 up to 40% in 1920 (Appendix Figure C.1, Panel A).

Immigrants from new regions were culturally farther from natives and significantly

markets was reinforced by federal legislation, which specified that native women marrying a foreign-born individual would lose their US citizenship.

[7]The increase in fertility documented in our work also resonates with findings in Kearney and Wilson (2018) and Schaller (2016) for the more recent period.

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 immigration, which culminated in the passage of the Immigration Acts of 1921 and 1924 that introduced country-specific quotas to limit the inflow of immigrants from Southern and Eastern Europe (Goldin, 1994). Already before the Immigration Acts, European immigration was curbed by the outbreak of WWI, which had a stronger impact on countries that did not belong to US allies, like Germany (Greenwood and Ward, 2015). These shocks, which led to the end of the Age of Mass Migration, induced substantial variation in immigrant flows across European countries between 1900 and 1930 (Figure C.1, Panel B).

2 Data and Empirical Strategy

2.1 Data

The main dataset is assembled from the decennial full count US Census of Population (Ruggles et al., 2020). Following Tabellini (2020), we focus on 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.[8] Collectively, these cities attracted more than 75% of the immigrants entering the US after 1900. From the Census, we collect data on city demographics, immigration, and on the key socioeconomic characteristics of natives considered in the analysis, such as marital status, relationship to the household head, number of children in the household, employment, and occupation.

On average, the immigrant share of the population in our sample was as high as 0.18 in 1910, and fell to 0.12 in 1930. The decline was even starker for immigrants arrived in the previous decade, whose share, relative to city population, plummeted from 0.08 in 1910 to 0.02 in 1930. Turning to the key outcomes of interest, at age of 33 for women and 35 for men, 65% of the native population was married. Three in four married women of native parentage had a husband with native parents, whereas less than 10% of them was married to a first generation immigrant as of 1910. Consistent with highly segmented marriage markets (Angrist, 2002), the probability of being married with a foreign born husband was instead as high as 24% for second generation women – a group that accounts for roughly one fourth of all native women. In our sample, among women aged 18-33, the average children to women ratio was 0.65; 34% of them had at least one child, while those who were mothers had on average almost 2 children each. These and additional statistics are

[8] Consistent with the literature (Abramitzky et al., 2019; Sequeira et al., 2020; Tabellini, 2020), we focus on European immigrants, but results are robust to extending the analysis to all foreign born.

presented in the supplementary material in the Online Data Appendix (Appendix B).

2.2 Empirical Strategy

Stacking the data for the three Census years between 1910 and 1930, we 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.[9] In our baseline specification, we consider the stock of European immigrants arrived in the US during the previous decade, but results are robust to extending this definition to all immigrants, irrespective of country of origin or 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.

The key challenge to our analysis is that immigrants might have moved to cities that were on differential – stronger or weaker – economic trajectories. To deal with this and similar concerns, we construct a "leave-out" version of the shift-share instrument commonly adopted in the immigration literature (Card, 2001). The instrument predicts the number of immigrants 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; 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.[10] The instrument combines two sources of variation. First, it exploits variation in the total number of immigrants from any sending country over time. Such variation was largely influenced by WWI and the Immigration Acts – exogenous shocks that affected

[9] City population could itself be an outcome of immigration. Hence, the number of immigrants is scaled by predicted (rather than actual) city population, constructed by multiplying 1900 population by average urban growth in the US, excluding that of the Census division where the city is located. Below, we also report results obtained when scaling immigration by 1900 population.

[10] Results are robust to using a specification where the number of immigrants is scaled by actual (rather than predicted) city population, and is instrumented with Z_{cst} in equation (2), i.e. the predicted number of immigrants over predicted city population.

different European countries differentially across decades. Second, the instrument relies on the geographic dispersion in immigrants' enclaves (from different countries) across US cities in 1900 (Abramitzky and Boustan, 2017).

Online Appendix C illustrates graphically how the instrument combines the time-series and cross-sectional variations.

2.3 Instrument Validity

The conditions for the validity of shift-share instruments are discussed in several recent papers (Adao et al., 2019; Borusyak et al., 2018; Goldsmith-Pinkham et al., 2020; Jaeger et al., 2018). 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 sending country) before 1900 had long-lasting effects both on migration patterns and on natives' marriage prospects. We provide evidence against this possibility in two ways. First, we show that there are no pre-trends. Second, we replicate the analysis by interacting year dummies with several 1900 city characteristics (including the fraction of immigrants and proxies for manufacturing activity).

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., 2018). The "trend-break" in immigration flows generated by WWI and the Immigration Acts mitigates this issue (Abramitzky et al., 2019); 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 quota shocks and weather variation across countries in Europe.[11]

3 Results

3.1 Natives' Employment and the Supply of Marriageable Men

In recent work, Autor et al. (2019) confirm the hypothesis advanced in Wilson (1987, 1996), and document that job losses in manufacturing caused a steep decline in marriage

[11] Similar strategies are used in Abramitzky et al. (2019) and Sequeira et al. (2020), respectively.

rates and a marked increase in the share of single-mother households since 1990 in the US. We conjecture that the strong, *positive* effect of immigration on natives' employment across US cities between 1910 and 1930 documented in Tabellini (2020) may have played a symmetric – though in the opposite direction – role for the supply of native "marriageable" men.

In Table 1, Panel A, we study the effects of immigration on natives' employment to population ratio, focusing on men in the "marriageable relevant" age range, 20-35. Columns 1 and 2 estimate the baseline specification with OLS and 2SLS respectively.[12] In both cases, there is a strong and positive relationship between immigration and natives' employment. 2SLS results, which are quantitatively close to OLS ones, imply that a five percentage point increase in immigration raised natives' employment to population ratio by 0.8% relative to its 1910 mean. Column 3 shows that there are no pre-trends, while the rest of the table documents that results are robust to additional controls (columns 4-5) and alternative specifications (column 6).[13]

The left-hand side of Panel A in Figure 1 explores the heterogeneity of results across age groups. 2SLS coefficients are slightly larger for men in the age range 20-27, but remain 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). In line with Tabellini (2020), these results indicate that immigration improved economic conditions of native families. The Online Appendix corroborates this interpretation, documenting that immigration ameliorated the economic circumstances of kids born from native parents (Table A.1), and raised their enrolment rates (Table A.2).[14] Interestingly, the employment boom generated by immigration raised the opportunity cost of schooling for male teens, who, likely pulled by new opportunities in the booming manufacturing sector, dropped out of school (Table A.2).[15]

3.2 Natives' Marriage, Fertility, and Household Formation

We now turn to our key research question: did immigration, by increasing the supply of native "marriageable men", foster marriage and fertility among natives and induce them to set up independent families earlier in life?

[12] Panel D reports first stage coefficients, and verifies that the instrument is strong.

[13] See Tabellini (2020) for a more extensive set of robustness checks.

[14] Interestingly, enrolment increased only for sons, and not for daughters. One interpretation is that parents were credit constrained and, as more resources became available, chose to invest them in sons rather than in daughters (Parish and Willis, 1993; Barcellos et al., 2014).

[15] These results resonate with those in Cascio and Narayan (2020) and Charles et al. (2018) for the more recent period.

Marriage rates. In Panels B and C of Table 1, we begin with natives' marriage, considering the age groups with the highest marriage rates, i.e., women (Panel B) aged 18-33 and men (Panel C) aged 20-35.[16] Focusing on our preferred 2SLS specification (column 2), immigration raised marriage rates for both native women and native men. According to our estimates, a 5 percentage points increase in the immigrant share raised marriage rates of native women aged 18-33 (resp. men aged 20-35) by 2.3% (resp. by 2.2%) relative to the 1910 mean.[17] Interestingly, our findings are quantitatively very close – with the opposite sign – to those in Autor et al. (2019), who document that, over the last thirty years, one percentage point increase in import competition from China lowered female marriage rates by 1.8%.

Examining the heterogeneity across age groups, Figure 1, Panel B, shows that our findings are driven by the youngest cohorts. This group arguably had a significantly higher potential "persuasion rate" (Della Vigna and Kaplan, 2007), due to the size of the population unmarried at that age. Specifically, marriage rates were, on average, around 30% for the age group of men 20-27 (women 18-25), and as high as 65% for men of age 28-35 (women of age 26-33).[18] A 5 percentage points increase in immigration raised marriage rates of native women aged 18-25 and men aged 20-27 by 3.4% and 4.0%, respectively. Reassuringly, the effect of immigration is instead not statistically significant for older cohorts. In unreported results, we found that immigration had no effect on the likelihood of remaining unmarried for native men, but did lower that for native women. This indicates that, at least for the latter, we are not merely capturing an "anticipatory effect" in the timing of marriage.

Probability of having children. In Table 2, Panel A, we turn to the probability of having children for native women, focusing on our preferred 2SLS specification (Table 1, column 2).[19] Columns 1 and 2 consider the children to women ratio, while in subsequent columns we distinguish between 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 (resp. even) columns, the dependent variable is the total number of children in the household (resp. 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

[16] The median age at first marriage was 21 for women and 25 for men (Figure B.1, Panel A).

[17] OLS estimates are sensitive to the inclusion of three cities (Duluth, Superior, and Tacoma), for which 1910 marriage rates were very low. Table A.3 verifies that 2SLS results are robust to omitting these cities and that, once the latter are excluded, OLS coefficients become very close to 2SLS ones.

[18] Since around 15% of the population did not marry during this historical period, the share of individuals in the older (28-35 for men; 26-33 for women) age group that could be induced to marry as a result of the immigration shock was thus quite low.

[19] For brevity, we do not report the first stage, but we present the first stage F-stat.

parents.[20]

As for marriage, immigration raised the probability of having children for native women. The point estimate in column 1 implies that a 5 percentage points increase in the immigrant share raised the children to women ratio by 3.3% relative to its 1910 mean. Decomposing this effect along the extensive and the intensive margin, immigration increased the number of women with children by 2.4%, and raised the average number of children per woman by 1%. Said differently, for every ten new babies born from native women, seven were due to the extensive margin, while three to the intensive margin.[21] Again, our estimates are close (with the opposite sign) to those in Autor et al. (2019), who, for the more recent period, find that one percentage point increase in import competition from China reduced fertility by 2.8%.

During this historical period, 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 white population declined substantially, with the yearly birth rate moving from almost 50 to 20 per thousand people between 1850 and 1930 (Zelnik, 1959). In our analysis, the inclusion of state by year fixed effects takes care of national trends. Moreover, the decline in fertility was driven by rural areas, while fertility of the urban native (white) population remained stable in this time period (Easterlin, 1961).

Household formation. Panel B of Table 2 provides evidence that immigration induced natives to leave their parental house earlier, buy a home, 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 turn to men aged 20-35. Our estimates imply that a 5 percentage points increase in immigration raised the probability of living in an independent family by 2.4% for women and 2.2% for men. This effect is close to that estimated for marriage, suggesting that the decisions of getting married and leaving the parental house were part of a unique lifetime plan.[22] Panel C of Figure 1 provides evidence that results are again driven by women aged 18-25 and men aged 20-27 – precisely the cohorts that also experienced the largest increase in marriage and fertility. Finally, and consistent with the evidence provided thus far, in column 5 of Table 2 (Panel B), we show that immigration boosted homeownership for native men aged 20-35.

Overall, this section paints a coherent picture of how immigration affected family for-

[20] For data availability issues, it is not possible to match women across Census years to obtain information on completed fertility. Since women changed their surname upon marriage, it is hard to match their information across Census years, especially for those aged 18-33.

[21] In unreported results, we find that, as for marriage, the effect is strongest for women aged 18-25.

[22] Autor et al. (2019) find that one 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%.

mation, marriage rates, and fertility of native men and women in the urban early twentieth century US. The inflow of immigrants allowed natives to get married more (and, possibly, earlier). This result is consistent with an increase in the supply of native "marriageable men", induced by higher employment opportunities for native men caused by immigration. Marriage 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.

4 Alternative Mechanisms

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; Lafortune, 2013).[23] Since more than 60% of immigrants entering the US at the beginning of the twentieth century were young men (Figure B.1, Panel B), immigration likely altered sex ratios, possibly increasing the availability of potential mates for native women. We now argue that this channel, alone, cannot explain our previous 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 documented above, they cannot explain why immigration also raised native males' marriage rates.[24] Second, only 4% (resp. 3%) of native women (resp. men) had a foreign born spouse as of 1910 (Table 3, column 3). Furthermore, the increase in marriage rates for men and women was quantitatively similar (Table 1, Panel B), suggesting that natives were mostly marrying with each other. This is consistent with the view that marriage markets were highly segmented along ethnic lines (Angrist, 2002).

In Table 3, Panel A, we show that a 5 percentage points increase in immigration raised the probability of marrying a husband of native parentage by around 6% for all native women, irrespective of their parentage (columns 2 and 5). While the effect of immigration on the probability of having a foreign born spouse for native women was indistinguishable from zero (column 3), it was positive and statistically significant for second generation women (column 6).[25] Since second generation women who had a foreign born husband

[23]For the literature on sex ratios, marriage markets, and female labor force participation see also Abramitzky et al. (2011), Boehnke and Gay (2020), and Gay (2019) among others.

[24]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.

[25]Table 3, Panel B, turns to all native and second generation men. The effect of immigration on the probability of having a foreign born spouse is indistinguishable from zero for native men (column 3), but is

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.[26] Finally, in Panel C, we document that the effects on marriage were mirrored by a corresponding increase in fertility precisely for couples with higher marriage rates.

Preservation of "natives". Opposition to immigration was widespread during the Age of Mass Migration, especially against immigrants from non Anglo-Saxon and non English-speaking countries (Higham, 1955; Leonard, 2016). Since immigrants from Southern and Eastern Europe were linguistically and culturally far from natives, the latter may have reacted to immigration by marrying more and having more kids in order to preserve their own race and culture.[27]

We first note that, while natives' cultural response may explain higher marriage rates and fertility, it cannot account for the better circumstances of kids of native parentage, unless immigration also increased their fathers' occupational standing. Next, we more directly test if natives changed their family formation decisions to preserve their own culture. In the Online Appendix, we construct an index of cultural distance using data on linguistic distance from English (Chiswick and Miller, 2005), and show that marriage rates were not differentially affected by immigrants with different linguistic distance from English (Table A.4).

Labor market competition for native women. Until 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 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. In our sample, 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).

The right-hand side of Panel A in Figure 1 shows that immigration decreased 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.[28] The figure also documents that female labor force

positive and significant for second generation immigrants (column 6).

[26] In the age group 18-33, second generation women were 25% of native females, and their probability of marrying with a foreign born was 10% at baseline (see the last column of Table 3, Panel A).

[27] For the influence of culture on marriage and fertility decisions see, among others, Bisin and Verdier (2000) and Fernandez and Fogli (2006).

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

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. Our interpretation of these results, consistent with the historical literature, 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.

5 Conclusions

In this paper, we exploit plausibly exogenous variation in the number of European immigrants to US cities between 1910 and 1930 using a version of the shift-share instrument. We study how a positive shock to natives' employment opportunities, which may have increased the supply of native "marriageable" men, influenced marriage rates, the probability of having children, and the propensity to leave the parental house for young native men and women.

We find that immigration raised natives' marriage rates for both men and women, and induced young adults to leave their parents' house earlier in 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 considered in this paper, immigrants were beneficial to natives' economic and social outcomes. However, this does not imply that immigration always promotes 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 in our setting immigration affected natives' marriage and fertility mostly through (positive) income shocks, other channels may be at play in 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 – something examined by Shenhav (2020) in the US context for the recent period. If the higher marriage rates estimated in our work lowered the quality of the match 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 extend our analysis to other contexts, when a different set of channels might be at play.

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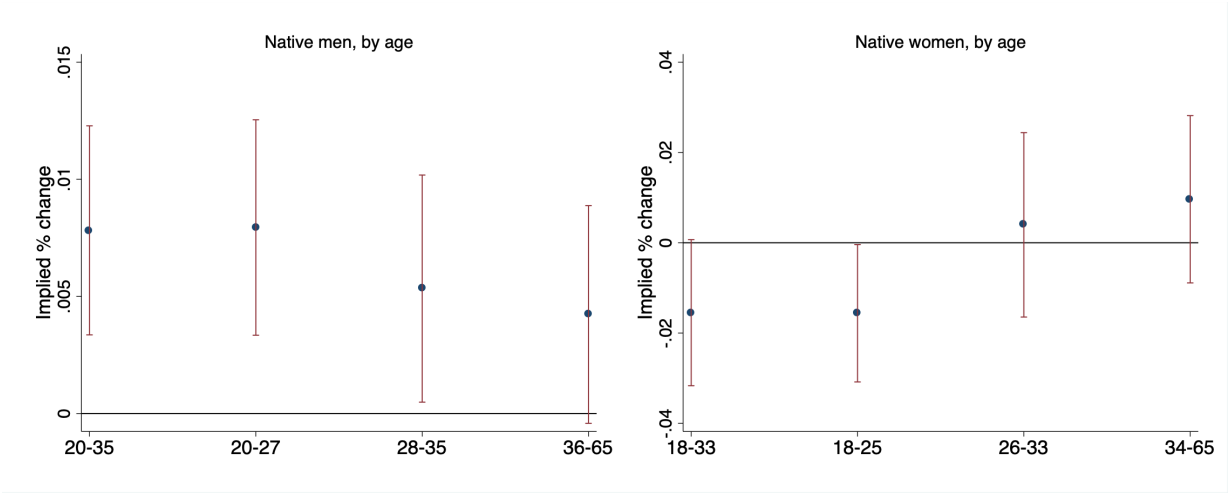
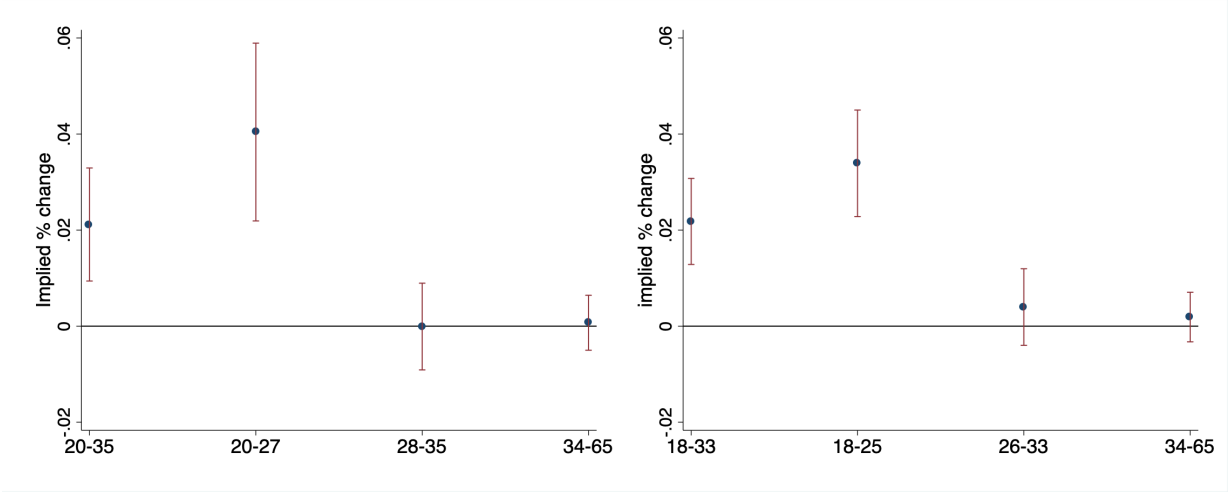
Main Exhibits

Figure 1: Effect of Immigration, by Age

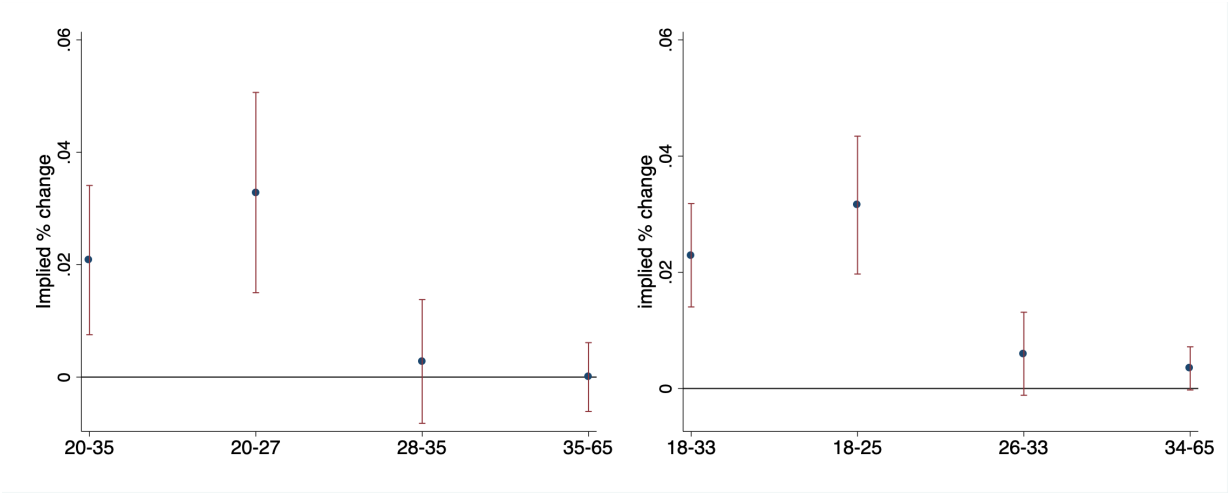
Panel A. Employment



Panel B. Marriage



Panel C. Living Choice: Own Household



Notes: The figure plots 2SLS coefficients (with 95% confidence intervals) for the effects of a 5 percentage points increase in the immigrant share on natives' employment (Panel A), marriage rates (Panel B), and probability of living in a household independent from own parents (Panel C) by age group. The left (resp. right) hand side plots refer to men (resp. women). In Panel A, right plot, the dependent variable is labor force participation (rather than employment). Point estimates (and confidence intervals) are standardized by dividing them by the 1910 mean of the dependent variable.

Table 1: Immigration, Employment and Marriage of Natives

	OLS (1)	2SLS (2)	Pre-trends (3)	2SLS (4)	2SLS (5)	2SLS (6)
Panel A.	*Natives' Employment to Population Ratio (Men, Age 20-35)*					
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)
1910 Dep Var Mean	0.911					
Panel B.	*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)
1910 Dep Var Mean	0.45					
Panel C.	*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)
1910 Dep Var Mean	0.42					
Panel D.	*First Stage*					
Predicted Fr. Immigrant		0.990	0.990	0.905	0.889	0.889
		(0.063)	(0.063)	(0.09)	(0.086)	(0.086)
F-stat		251.3	318.4	100.2	107.5	175.3
Obs.	538	538	180	538	538	538
Pre-period			*Yes*			
City and imm pop (1900)				*Yes*		
Fr married (1900)					*Yes*	
Imm over 1900 pop						*Yes*

Notes: The table presents 2SLS results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. *Fr. Immigrants* is to the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented with the shift-share instrument described in the main text. In column 3 (Panels A to C), the dependent variable is the 1900-1910 change in the corresponding outcome, which is regressed against the 1910-1930 (instrumented) change in the immigrant share. Columns 4 and 5 replicate the specification of column 2, by interacting year dummies with the (log of) 1900 city and immigrants' population and the 1900 value added in manufacturing, respectively. Column 6 scales 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 each Panel. 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.

Table 2: Immigration and Natives' Fertility and Living Choices

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A.	*Fertility of Native Women (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
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)
1910 Dep Var Mean	0.650	0.340	0.340	0.250	1.900	1.010
Panel B.	*Living Choices*					
	Women 18-33		Men 20-35			
	Living with Parents	Living in Own House	Living with Parents	Living in Own House	Home-ownership	-
Fr. Immigrant	-0.285	0.204	-0.316	0.171	0.267	-
	(0.043)	(0.040)	(0.045)	(0.056)	(0.099)	-
1910 Dep Var Mean	0.370	0.418	0.317	0.387	0.291	-
F-stat	251.3	251.3	251.3	251.3	251.3	251.3
Obs.	538	538	538	538	538	538

Notes: The table presents 2SLS results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. In Panel A, all outcomes refer to native women in the age range 18-33. The dependent variable is the total number of children (toddlers) with a native mother over the total number of women in column 1 (column 2); the fraction of women with children (toddlers) in column 3 (column 4); and, the average number of children (toddlers) per mother in column 5 (column 6). Panel B focuses on native women (resp. men) in the age range 18-33 (resp. 20-35) in columns 1-2 (resp. columns 3 to 5). The dependent variables are listed in the top row of the corresponding column. *Fr. Immigrants* is the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented with the shift-share instrument described in the main text. The means of the dependent variables are shown at the bottom of each panel. 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.

Table 3: Heterogeneous Effects of Immigration, by Natives' Parentage

	(1)	(2)	(3)	(4)	(5)	(6)
	All Native			Second Generation		
Spouse	All	Native Parentage	Immigrant	All	Native Parentage	Immigrant
Panel A. Marriage Rates						
	Women					
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)
1910 Dep Var Mean	0.47	0.27	0.04	0.45	0.14	0.10
Panel B. Marriage Rates						
	Men					
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)
1910 Dep Var Mean	0.45	0.27	0.03	0.42	0.16	0.04
Panel C. 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)
1910 Dep Var Mean	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: The table presents 2SLS results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. In Panel A (resp. Panel B), the dependent variable is the marriage rate of native women aged 18-33 (resp. native men aged 20-35) by partner's parentage. In Panel C, the dependent variable is the children to women ratio by father parentage. As described in the main text, we consider only children of women aged 18-33. For example, in column 2 of Panel C, the dependent variable is the number of children with a native mother aged 18-33 and a father with native parentage, relative to the number of native women aged 18-33. Columns 4-6 focus on second generation women. *Fr. Immigrants* is the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented with the shift-share instrument described in the main text. The mean of the dependent variables is shown at the bottom of each panel. 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.

Online Appendix - Not for publication

Table of Contents

A Online Appendix A - Additional Figures and Tables

Table A.1: Immigration and Native Fathers' Characteristics

	(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: The table presents OLS (Panel A) and 2SLS (Panel B) results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. The dependent variables are listed in the top row of the table. *Fr. Immigrants* is the fraction of immigrants arrived in the previous decade over predicted city population, and in Panel B is instrumented with the shift-share instrument described in the main text. The means of the dependent variables are shown at the bottom of the table. 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.

Table A.2: Immigration and Natives' Children Education

	(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)
F-stat	251.3	251.3	251.3	251.3	251.3
Dep. var.	0.933	0.936	0.323	0.602	0.158
Obs.	538	538	538	538	538

Notes: The table presents OLS (Panel A) and 2SLS (Panel B) results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. The dependent variables are listed in the top row of each column. *Fr. Immigrants* refers to the fraction of immigrants arrived in the previous decade over predicted city population, and in Panel B is instrumented with the shift-share instrument described in the main text. The means of the dependent variables are shown at the bottom of the table. 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.

Table A.3: Immigration and Marriage of Native Men: Robustness

	(1)	(2)	(3)	(4)
Marriage rates of native 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: The table presents OLS and 2SLS results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930 in columns 1 and 2. Columns 3 and 4 replicate columns 1 and 2 by excluding the three cities (Duluth, Superior, and Tacoma) with extraordinarily low marriage rates of native men aged 20-35 in 1910. The dependent variable is the marriage rate for native men in the age range 20-35. *Fr. Immigrants* is the fraction of immigrants arrived in the previous decade over predicted city population, and in columns 2 and 4 is instrumented with the shift-share instrument described in the main text. The mean of the dependent variables is shown at the bottom of the table. 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.

Table A.4: Immigration and Linguistic Distance

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)
F-stat	20.2	20.2	20.2	20.2	20.2
AP F-stat Fr. Immigrants	127.7	127.4	127.4	127.4	127.4
AP F-stat Ling. Distance	40.85	40.9	40.9	40.9	40.9
Mean Dep. Var.	0.340	0.257	0.277	0.642	0.603
Obs.	538	538	538	538	538

Notes: The table presents 2SLS results for the balanced panel of the 180 US cities with at least 30,000 residents in each Census year between 1910 and 1930. The dependent variable is the employment to population ratio of native men aged 20-35 (resp. the marriage rate of native women aged 18-33) in column 1 (resp. in columns 2 to 5). *Fr. Immigrants* is the fraction of immigrants arrived in the previous decade over predicted city population, and is instrumented with the shift-share instrument described in the main text. *Ling. Distance* is the (instrumented) measure of linguistic distance brought about by immigration. It is constructed by multiplying the share of immigrants from each European origin with the linguistic distance score assigned to that country by Chiswick and Miller (2005). The mean of the dependent variables is reported at the bottom of the table. F-stat is the Kleibergen-Paap F stat for joint significance of instruments and AP F-stats are the Angrist-Pischke F statistics. All regressions include city and state by year fixed effects. Robust standard errors, clustered at the MSA level, in parentheses.

B Online Appendix B - Data Appendix

In Figure B.1, Panel A, we plot the distribution of the age at first marriage for native men (blue bars) and native women (pink bars) reported in the 1930 Census.[29] The median age at first marriage was 21 for native women, and 25 for native men. As it appears from the figure, by the age of 25, more than 50% of native men and around 70% of native women were married – up from less than 10% and 35% respectively at age of 20. An additional 30% (resp. 15%) of men (resp. women) got married by the age of 30. Very few individuals, instead, reported an age at first marriage higher than 30 or 35.

Next, in Panel B of Figure B.1, we plot the share of men in the age range 20 to 35 among immigrants (darker blue bars) and among natives (lighter blue bars) and the corresponding sex ratios. As noted in the main text, and as discussed in Angrist (2002) among others, immigrants were more likely to be men, implying that sex ratios were substantially higher than 1. As expected, instead, sex ratios were close to 1 for natives.

Moving to the main variables considered in the paper, Table B.3 reports the summary statistics for the cities in our sample.[30] We would like to emphasize a few details and technical aspects. First, in 1920, the US Census did not report employment status, but rather only an indicator for holding any gainful occupation. For this year, we imputed values from the latter to proxy for employment. Second, since data for Sacramento (CA) and New Bedford (MA) has unreasonably low values for 1920, we omit these two cities for this year in the main analysis. This leaves us with 538 observations. However, reassuringly, results are unchanged when including all 540 city-Census year observations.

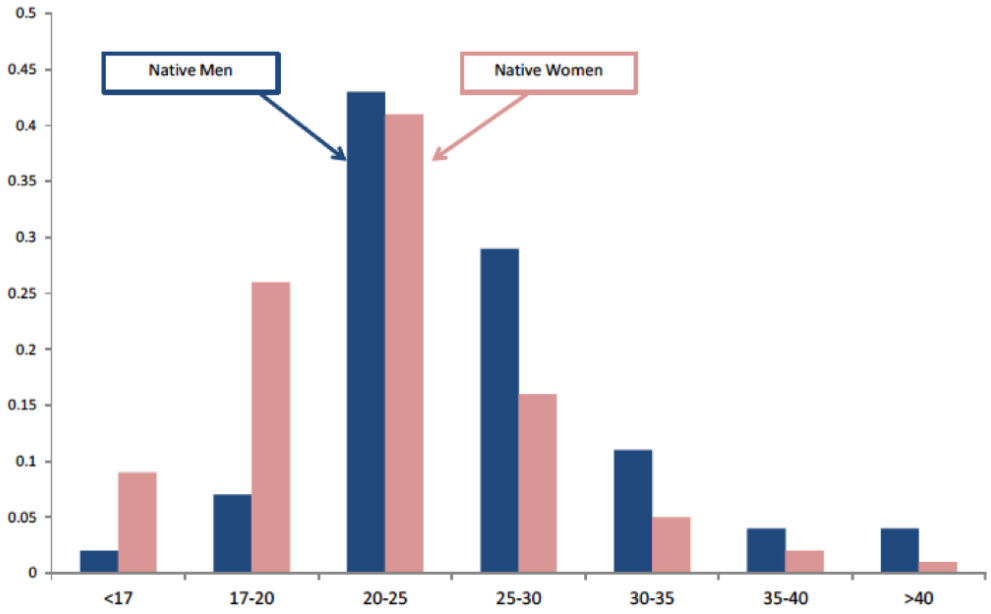
In Table B.4, we present data on the characteristics of the husbands of native women (of age 18-33) in our sample. The table shows that, as of 1910, among married native women of native parentage, 73% were married to a native husband with both native parents, 20% to a husband with one or both foreign born parents, and only 8% to a foreign born husband. Not surprisingly, most foreign born husbands had arrived to the US more than 10 years before. Reflecting highly segmented marriage markets (Angrist, 2002), the probability of being married with a foreign born husband was as high as 24% for second generation women – a group that accounts for roughly one fourth of all native women.

[29] This question was asked for the first time in 1930, and is thus not available for previous years.

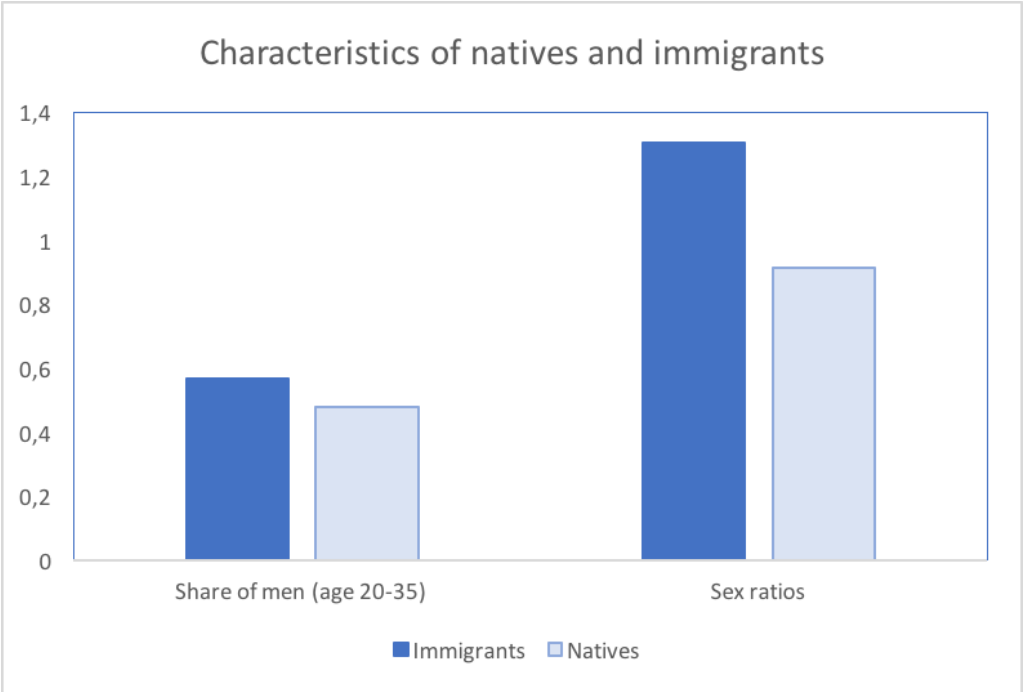
[30] Tables B.1 and B.2 report the list of cities and the classification of European origins respectively.

Figure B.1: Natives' Marriage Rates and Sex Ratios

Panel A. Marriage rates by age group and gender



Panel B. Share of men and sex ratios for natives and immigrants (in 1910)



Notes: Sex ratios in Panel B are defined as the number of native men (resp. immigrant men) in the age group 20-35 over the number of native women in the age group 18-33 (resp. immigrant women). *Source:* Authors' calculations from Ruggles et al. (2020).

Table B.1: List of Cities in the Sample

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	

Table B.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 B.3: 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 from Ruggles et al. (2020).

Table B.4: 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 from Ruggles et al. (2020).

C Online Appendix C - 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. In Figure C.1, we plot the changing share of the foreign born by region of origin (Panel A) and the number of yearly immigrants (Panel B), in thousands, entering the US during the Age of Mass Migration. The figure shows that, especially between 1900 and 1930, there was substantial variation in both the number and the composition of immigrants entering the US. This variation was largely associated to WWI and the Immigration Acts for the 1910s and the 1920s respectively.[31] In Figure C.2, we instead present evidence for the cross-sectional variation in the share of European immigrants across US cities in 1900. Consistent with historical accounts, Italian immigrants were concentrated in cities in the Northeast and in California, and were instead much less likely to settle in the Mid-West. On the contrary, Swedish immigrants had significant enclaves in Minnesota, and much smaller ones in other regions of the US.

Next, we illustrate how the two sources of variation are combined by our instrument, using a simple graphical example for two ethnic groups (Germans and Italians) and three cities (Chicago, Milwaukee, and San Francisco) in Figure C.3.

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.

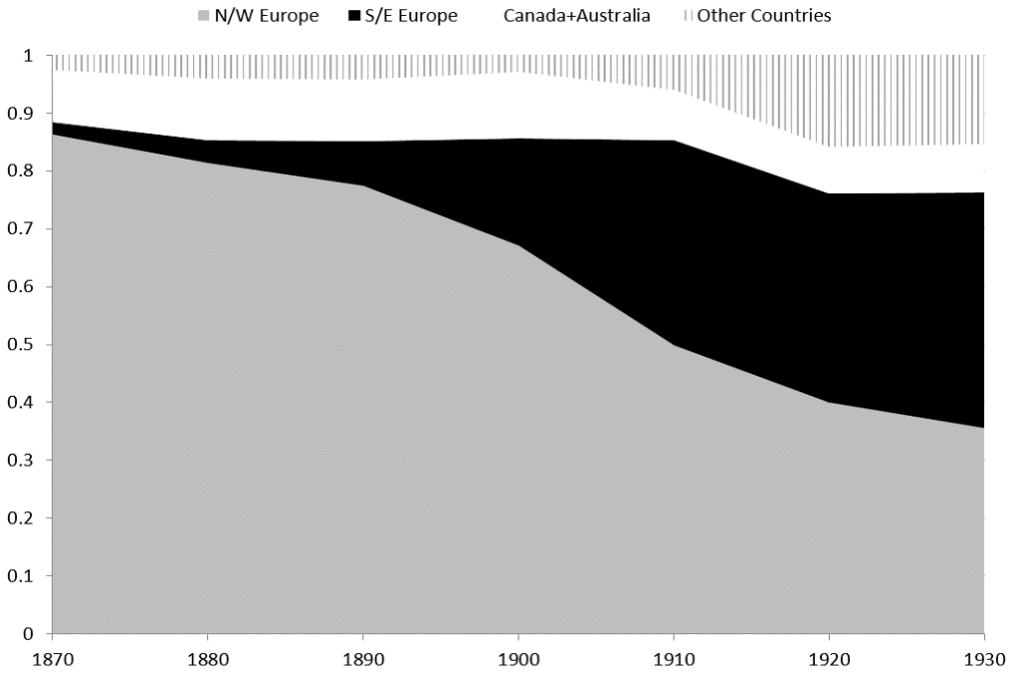
The instrument constructed in equation (2) in the main text extends this example to

[31] See also Abramitzky and Boustan (2017) and Abramitzky et al. (2019) for more details.

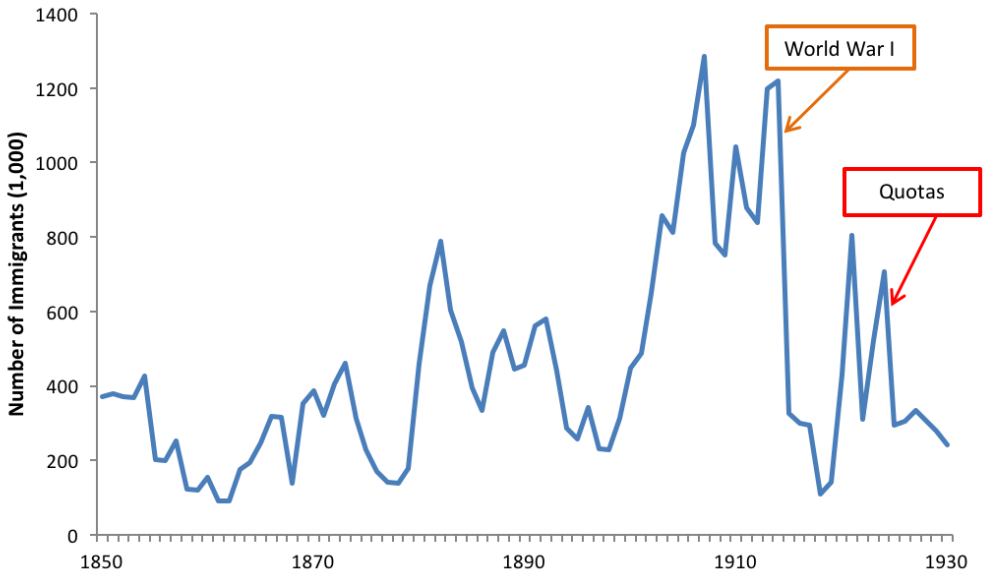
many cities and many ethnic groups, but the logic behind it can be grasped by looking at the patterns in Panels A to C of Figure C.3

Figure C.1: European Immigrants in the Age of Mass Migration

Panel A. Immigrants by Region

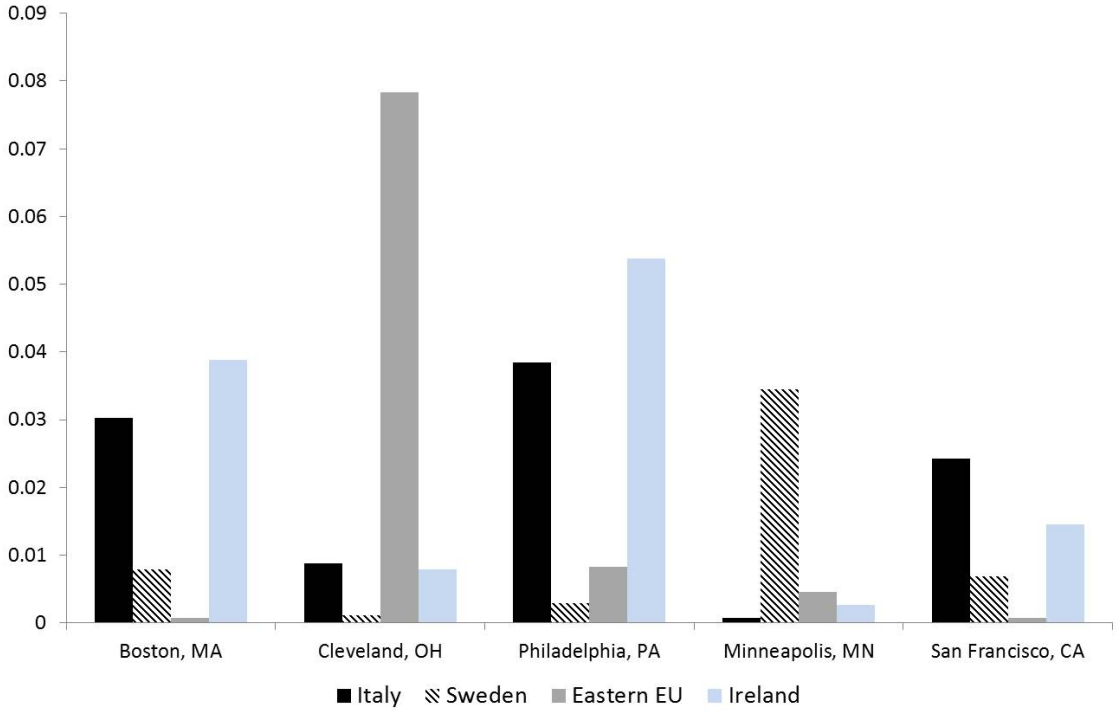


Panel B. Total Number of Immigrants (in Thousands)



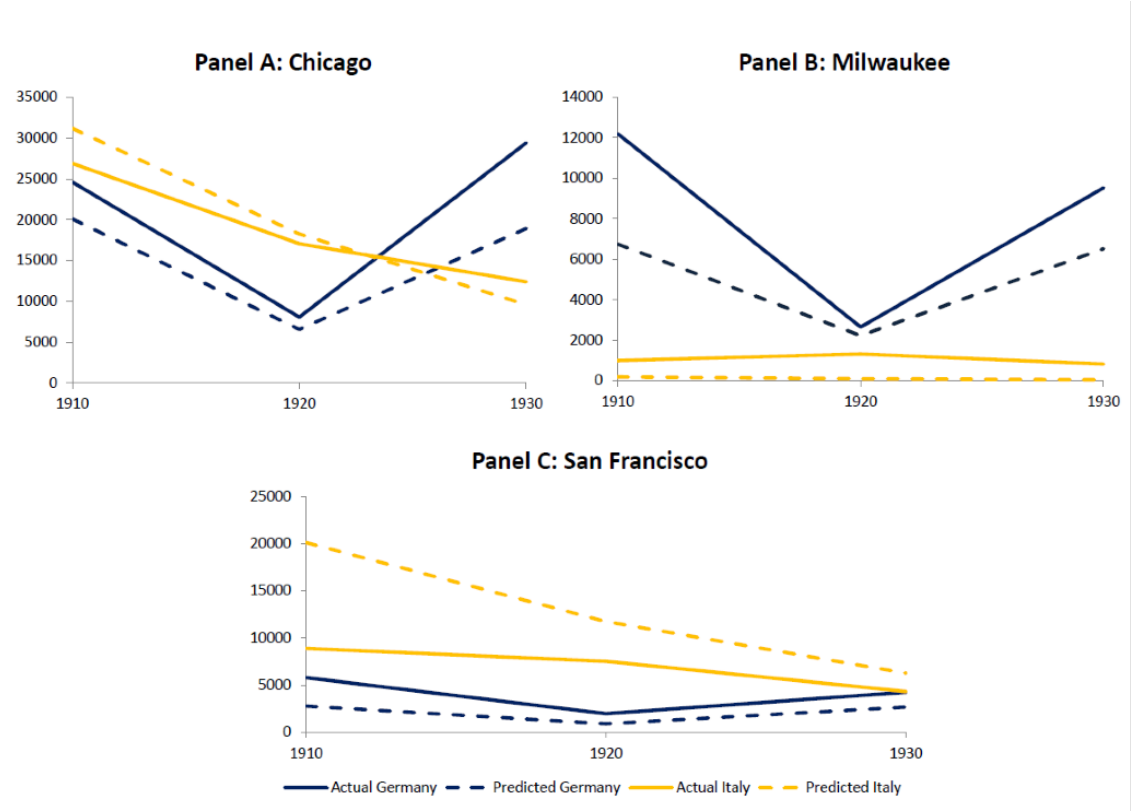
Notes: Panel A: Share of immigrant stock living in the United States, by sending region and by decade. *Source:* Authors' calculations from Ruggles et al. (2020). Panel B: Annual inflow of immigrants to the United States (1850-1930). *Source:* Migration Policy Institute.

Figure C.2: Share of Immigrants from Selected Regions Across US Cities, 1900



Notes: the figure plots the share of individuals of European ancestry living in selected cities in 1900, for selected ethnic groups. *Source:* Authors' calculations from Ruggles et al. (2020).

Figure C.3: Actual and Predicted Immigration



Notes: The 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:* Authors' calculations from Ruggles et al. (2020).