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Migrants and the Making of America: The Short- and Long-Run Effects of Immigration During the Age of Mass Migration



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“Between 1880 and 1920 America became the industrial and agricultural giant of the world... This could not have been done without the hard labour, the technical skills and entrepreneurial ability of the 23.5 million people who came to America in this period.”

John F. Kennedy

The current American political discourse is heavily centred around the impact that immigrants have on the communities into which they settle. While this topic has received significant attention to date, most of the focus has been on the short-term effects of immigrants. And yet, an equally important question is the long-run impact immigrants can have in the locations into which they settle, particularly since the short- and long-term impacts may be different.

We contribute to the study of the impact of immigration by taking a historical perspective. In particular, we examine migration into the United States between 1850 and 1920 – during America’s Age of Mass Migration – and estimate the causal impact of immigrants on economic and social outcomes today, approximately 100 years later. This immigration period is important for several reasons. First, it was the largest in the history of the United States. Second, the wave of “new” immigrants that arrived during this period was not just an extension of the previous waves of immigrants. Earlier immigrants were primarily of French, Irish and English origin, but the new wave also included immigrants from southern, northern, and Eastern Europe who spoke different languages and had different religious practices.

Empirically studying the long-run impacts of immigration poses several challenges. A simple comparison of counties with and without historical immigration can be misleading since there could be omitted factors, such as geographic or climatic characteristics, that may have affected whether immigrants settled in a particular location. These characteristics may then have independently had an impact on the outcomes of interest. If we observe that counties with more historical migration are richer today, it might have been that migrants were attracted to locations with more growth potential. These areas would have grown faster, even in the absence of the migrants. If we observe that coun-

ties with more historical migration are poorer today, it might have been that migrants were only able to settle in more marginal locations, with poorer future economic growth, where land and rents were cheaper. In fact, the historical evidence seems to point in this direction. There are substantial historical accounts of congestion, legislation and discrimination keeping migrants from well-paying attractive jobs and occupations. This may have induced immigrants to settle in neighbourhoods and counties with lower future growth potential. For example, legislation in the mid-1890s in both New York and Pennsylvania excluded all foreign aliens from jobs in state and local municipal public works (Muller 1993). Legislation from Pennsylvania required residence and language requirements for foreign-born, while in Idaho legislation prevented companies from hiring aliens who had not declared their intention to stay permanently in the United States (Handlin 1948; McGouldrick and Tannen 1977, Hannon 1982).

To overcome this challenge, we exploit two facts about immigration during the Age of Mass Migration in our analysis. The first important fact is that after arriving into the United States, immigrants tended to use the newly constructed railway to travel inland to their eventual place of residence. Therefore, the timing of a county’s connection to the railway network affected the number of immigrants that settled in the county. The second fact is that the total inflow of immigrants fluctuated greatly during this period (see Figure 1). This means that in some decades, immigration was significantly higher than average (e.g., 1850s, 1880s, and 1900s) while in other decades it was significantly lower than average (e.g., 1860s, 1870s, and 1890s).

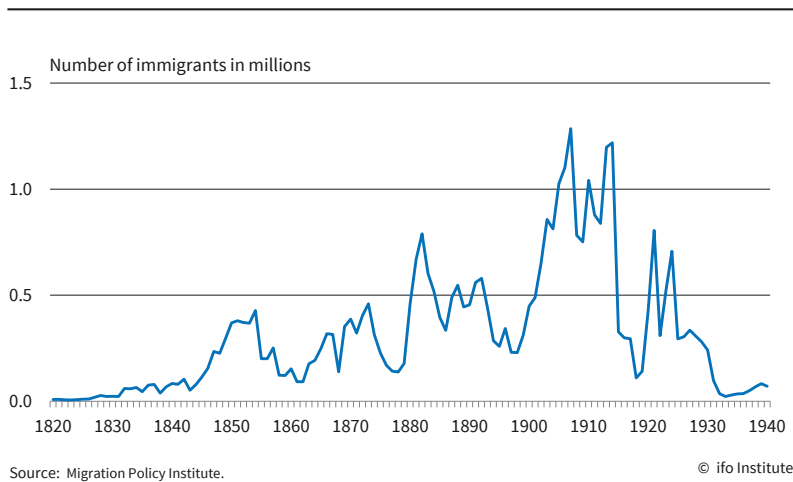
If a county was connected during periods of high immigration then it would tend to have more immigrant settlement. During this time, once a county became connected to the railway network it almost always stayed connected. Our analysis therefore compares counties that became connected at approximately the same point in time, but some counties were connected just prior to an immigration boom and others just prior to an immigration lull, and thus ended up with higher and lower levels of immigration respectively.

Our estimates suggest that immigration, measured as the average share of migrants in the population between 1860 and 1920, generated significant economic benefits today. It resulted in higher incomes, less poverty, less unemployment, more urbanization, and higher educational attainment. Moving a county with no historical immigration to the 50th percentile of our sample of counties results in a 20% increase in average per capita income today, a 3% decrease in unemployment and a 3% decrease in the share of the population living in poverty. We also identify a 31% increase in the rate of urbanization and an increase in 0.6 additional years of schooling.

One important concern with our analysis is that the long-term economic benefits of immigration may

Figure 1

Annual Flow of Immigrants to the United States, 1820–1940



have come at a high social cost, such as the erosion of social cohesion, civic mindedness or an increase in crime. However, we find no such effects. Historical immigration does not appear to be associated with any changes in long-term social outcomes.

We then examine the potential mechanisms that underlie our findings. It is possible that the long-term economic benefits that we estimate arise due to the relocation, as opposed to creation, of economic prosperity. In practice, this requires understanding how immigration into a county might have affected economic outcomes in neighbouring counties or in other counties within the same state. To test this hypothesis, we examine whether being close to a county with more historical immigration resulted in less long-term economic development today. We would expect such a relationship to be present if immigration caused economic activity to relocate to counties with more immigrants at the expense of nearby counties. We find no evidence of immigration into a county resulting in a decline in long-run economic prosperity in nearby counties. If anything, our estimates suggest that historical migration into one county may have had a positive effect in neighbouring counties.

We also consider the possibility that the effects we estimate are due to the impact of historical immigration on current levels of immigration. The evidence, however, weights against this hypothesis. While historical immigration from 1860 to 1920 is associated with a greater share of foreign-born within the population immediately after the Age of Mass Migration, this relationship faded over time, and by 1950 it had disappeared. This suggests that the positive effects we observe today on the economy are unlikely to be driven by contemporary immigration.

In our study, we also examine when the impact of immigration began to be felt. It is possible that in the short-run immigrants imposed costs in the economy and that the benefits they brought were only felt in the

medium- or long-run. The immigration backlash and the rise of social and political nativist movements at the time suggest that there may have been immediate costs to immigration. However, we find that the benefits of immigration may have been felt immediately. During the early stages of industrial development, immigration appears to have provided a large supply of labour that was necessary for the take-off of industry and for sustained modern economic growth. In fact, several historians have documented that immigrants were disproportionately represented in the

industrial workforce (Engerman and Sokoloff 2000, Alexander 2007). For example, in 1880, despite only accounting for approximately 10% of the total population, immigrants already accounted for 57% of the manufacturing workforce. From the commercial trades of the Genoese Italians to the abilities of the Eastern European Jews and Armenians, immigrants brought with them different sets of experiences and skills that allowed them to specialize in particular occupations. Consistent with these historical accounts, our analysis shows that the presence of immigrants caused a large and significant increase in manufacturing output both during the Age of Mass Migration (1860-1920) and immediately afterwards (1930). According to the magnitude of the estimated effects, moving a county with no historical immigration to the 50th percentile (an increase of 0.049) led to a 49% increase in average manufacturing output per capita from 1860-1920 and a 57% increase in 1930.

Immigrants also contributed to productivity improvements within agriculture, bringing with them knowledge about new agricultural techniques. Immigrants represented a small but important proportion of farm operators (15.3% in 1900 and 10.5% in 1920), with the vast majority of these being owner-operators (80% in 1920). We find that moving a county with no historical immigration to the 50th percentile of the distribution is associated with a 39-58% increase in 1930 farm values. However, these benefits were felt primarily just after the end of the Age of Mass Migration.

We then turn to the possibility that immigrants may have led to a greater stock of technology and human capital. We find that counties with a higher share of immigrants actually had lower enrolment rates during the period 1870-1920. We obtain a similar finding if we instead look at the average share of the total population that was literate. We find that immigration is associated with lower rates of literacy. Our finding that immigration resulted in less education in the

short-run is consistent with the fact that immigrants tended to be less educated than native-born populations, particularly towards the end of the Age of Mass Migration. The negative historical association between immigration and educational attainment could arise, in part, from the positive economic effects of immigration, which increased the opportunity cost of schooling (Atkin 2017). Our results suggest however that there was a reversal of the effects of immigration on education. In the short-run, immigrants reduced average education, while in the long-run they increased it. There are several possible explanations for this. First, it may be that the effects arise due to the long-run effect of immigrants on income, and the fact that today higher incomes are associated with more education. Other explanations have been suggested in the literature such as the fact that the presence of migrants might have led native workers to pursue less manual-intensive occupations and to obtain more schooling (Foged and Peri 2015). The reversal on educational outcomes could also have been due, in part, to higher investments in compulsory education in counties with a higher share of immigrants under the belief that exposure to American public schools would instil the desired American civic values (Bandiera et al. 2015). A final potential explanation is that although immigrants were (on average) less skilled than the native population, they may have had values and aspirational beliefs that facilitated the rapid accumulation of education among their children and/or future generations of children in their communities. This is consistent with the fact that the children of immigrants tended to be more educated than the children of natives.

Another mechanism through which immigrants could have affected early economic development is through innovation and knowledge creation. Although most immigrants were unskilled, an important subset of immigrants were highly skilled and important innovators. There are many examples of immigrants, who were involved in early industrialisation in Europe, bringing over more advanced European technologies to the United States (Rosenberg 1972). It has also been argued that the increased availability of unskilled labour due to immigration facilitated the introduction of technological and managerial innovations, such as assembly lines and the rise of the managerial firm (Abramovitz and David 2000, Chandler 1977, Denison 1974, Hirschman and Mogford 2009). Others have argued that the increase in the labour force enabled economies of scale in production, leading to increased profits that spurred innovation. To examine the impact of immigrants on innovative activity we analyse patenting rates during the Age of Mass Migration. We find a positive and significant effect of immigration on innovation during this time. An increase in historical immigration from zero to the 50th percentile (0.049) results in a 0.7% increase in the number of patents per capita. To assess the extent to which this increase in innovation is due to immigrants innovating themselves or due to

their facilitating innovation by native-born Americans, we attempt to identify the country of birth of the innovators in the patent applications. The main challenge is that the citizenship of patent applicants was not consistently reported prior to 1880. Consequently, we are only able to identify the citizenship of the patent applicant in 50% of our sample of 1,297,086 patent applications. Moreover, the Naturalization Act of 1798 enabled immigrants to become United States citizens after only fourteen years of residence in the country. Therefore, it is possible that several patent applicants are registered as US citizens despite being foreign-born. Another concern is that there were significant challenges and costs associated with obtaining a patent, which might have placed recently-landed foreigners with a limited understanding of English at a disadvantage. With these caveats in mind, we estimate the effect of immigration on the rate of patenting by inventors that reported themselves as being foreign-born. We find a positive and statistically significant effect of immigration on foreign patents. However, the magnitude of this effect is much smaller than the impact on total patents. According to the estimates, an increase in historical immigration from zero to the 50th percentile (0.049) results in an increase in foreign patenting by 0.01%. This suggests that the direct effect of immigrants on foreign patents was lower than the indirect effect of immigrants on innovation by native-born inventors. The presence of European migrants had a significant effect on the rate of innovation of US-born inventors.

A closer analysis of the types of patents that tended to be registered by European-born inventors suggests that while they were fewer in number, it is possible that many of these patents represented contributions that were particularly important for industrialisation. The importance of their contribution can be inferred by the relative citation rates of the patents (NBER Patent Citation Database). Of the patents in our sample, 16% of the patents continue to be cited in recent decades. While European patents registered by European applicants may have been small in number, they may have been disproportionately influential.

It has also been noted that immigrants contributed directly to the productivity of the United States economy through important technological innovations. One example of such an innovation is the suspension bridge by John A. Roebling, a German-born and trained civil engineer. He built numerous suspension bridges, his most noteworthy being the Niagara Falls Suspension Bridge and the Brooklyn Bridge. Other notable engineers include: Charles Conrad Schneider (born in Saxony), who constructed the famous cantilever bridge across the Niagara River in 1883; Austrian Gustav Lindenthal, who built the Hell Gate Bridge; and John F. O'Rourke, an Irish engineer, who built seven of the tunnels under the East and Hudson Rivers, and six of the tunnels of the New York subway systems. Another example is Alexander Graham Bell, who was born in Scotland in 1847 and moved to Boston in 1871. In 1876,

Bell developed an acoustic telegraph that could transmit voices and sounds telegraphically, and within a year, the Bell Telephone Company was established. Other notable inventors include: David Thomas (Welsh), who invented the hot blast furnace; John Ericsson (Swedish), who invented the ironclad ship and the screw propeller; Conrad Hubert (Russian), who invented the electric flashlight, and Ottmar Mergenthaler (German), who invented the linotype machine.

Immigrants also contributed to business innovation. For example, the historical literature shows that among individuals born from 1816-1850, immigrants are disproportionately represented among the top businessmen in the United States. Immigrants also made important contributions to the educational system of the United States (Faust 1916). For example, the concept of kindergarten was brought to the United States by a German immigrant. Ager et al. (2016) show that not only did kindergartens increase education and incomes of children, but they also had a negative impact on fertility.

These findings are consistent with arguments commonly made in the historical literature that suggest that immigrants benefitted the economy by providing an ample supply of unskilled labour, which was crucial for early industrialization. Immigrants also resulted in a small but potentially important supply of skilled individuals, who provided knowledge, know-how, skills and innovations which were economically beneficial and particularly important for industrial development.

Our paper also attempts to connect the short- and long-run effects of historical immigration by examining the full range of effects from immediately after the Age of Mass Migration until today. We look at the impact of immigration on urbanisation since this variable is available from the decadal census for the period between 1860 and 2000. We find that by 1920 there was already a large positive effect of immigration on urbanisation. This effect remains stable until about 2000, when it increases slightly. Thus, the estimates indicate that the economic benefits of immigrants were felt early and persisted over time. This is consistent with immigration affecting early industrialisation, which due to increasing returns or lock-in effects caused a persistent and long-run increase in urbanisation.

Unfortunately, unlike urbanisation, other measures are not available during the full time span. For education and per capita income, we can examine how the effects evolve over time, but only in the post-WWII era. These estimates show that we observe the same trend for education and income as we do for urbanisation. For both outcomes, we find that the benefits not only persist, but also grow over time.

A potential concern with our analysis is that decades with high aggregate immigration flows may have been different in other ways. For example, if high levels of aggregate immigration happened to have coincided with high levels of industrial development or economic

growth, then the observed difference in county performance could have been driven by the fact that certain counties were connected during decades of rapid industrialisation and growth, independent of the presence of the migrants. Our analysis directly accounts for both possibilities and shows that our effects capture the impact of immigrants alone. A second potential concern with our estimates is the possibility that the aggregate flow of immigrants could have been driven by the expansion of the railway itself. In particular, if immigrant inflows tended to increase once the railway became connected to counties with greater future growth potential, then our findings may not be attributed to the presence of the immigrants. To account for this possibility, we use weather shocks in Europe to determine the impact of flows of immigrants arriving in the United States that were not driven by the timing of the expansion of the rail network. We find that weather shocks closely predict actual flows of immigrants and that these are indeed associated with the economic benefits observed.

Our findings provide evidence that helps us better understand the impacts of immigration in the history of the United States. The first is that in the long-run, immigration has had extremely large economic benefits. The second is that there is no evidence that these long-run benefits come at short-run costs. In fact, immigration immediately led to economic benefits that took the form of higher incomes, higher productivity, more innovation and more industrialisation. Our estimates provide evidence consistent with immigration facilitating economic growth. The less skilled immigrants provided the labour force necessary for industrial development. A smaller number of immigrants brought with them knowledge, skills and know-how that were beneficial for industry and increased productivity in agriculture. Thus, by providing a sizeable workforce and a (smaller) number of skilled workers, immigration led to early industrial development and long-run prosperity, which continues up to the present day.

Despite the uniqueness of the American experience with mass migration, our findings may still be relevant for understanding the long-run effects of immigration today. The short-, medium- and long-run benefits of immigration can be significantly large, and need not come at a high social cost. This suggests the importance of taking a long-run view when considering the current challenges brought by new waves of mass migration.

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