

# *Resident Impacts of Immigration: Perspectives from America's Age of Mass Migration*

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### **Abstract:**

Elementary economic models are often used to suggest that immigration depresses the wages of native-born workers. These models assume that when immigrants enter a labour market, all other features of that market remain unchanged. Such an assumption is almost never valid. Here we explore the economic impacts of immigrants during America's Age of Mass Migration a century ago. This was a period of dynamic structural change that witnessed the appearance of new industries, adoption of new technologies, discovery of new mineral resources, the rise of big business, and the geographic concentration of industries. We show that immigrants – and residents – selected destinations where labour demand and wages were rising. Thus, native workers experienced wage *increases* in the presence of heavy immigration. Models that abstract from the special characteristics of labour markets that attract immigrants misrepresent their economic impact.

### **Acknowledgements:**

The authors express their gratitude to participants at the SSRC/IOM/COMPAS/ESRC Conference for insightful comments that helped improve the argument. They would like to thank, in particular and especially Josh DeWind, for his constant support; detailed, constructive suggestions; and sage advice on writing for non-economists. Partial support for this research was provided by the National Science Foundation and the Center for Social and Economic Policy at the University of California, Riverside. Some of the work reported here was conducted while the authors were visiting faculty at the University of California's Washington Center.

### **Key Words:**

Immigration, Internal migration, Economic history of immigration, Counterfactual analysis.

Influential voices in the media and in public policy circles have sustained the impression and perhaps heightened the concern that high levels of immigration harm resident Americans by reducing their wages. This perception of “labour market flooding” – sometimes billed as “common sense” (Brimelow, 1995) – is bolstered by the logic of introductory-level microeconomic theory. That analysis begins by assuming a downward-sloping demand curve for labour in a static labour market. Under such circumstances, an immigration-induced outward shift in the labour supply curve will cause the equilibrium wage to fall. George Borjas emphasized this logic in the title of a recent paper, “The Labor Demand Curve *Is* Downward Sloping” (Borjas, 2003).

Nonetheless, an impressive number of empirical studies based on recent data find no evidence of a negative impact of immigration on resident wages. At the conclusion of a survey of the literature published in 1995, Rachel M. Friedberg and Jennifer Hunt report:

Despite the popular belief that immigrants have a large adverse impact on the wages and employment opportunities of the native-born population, the literature on this question does not provide much support for this conclusion. ... [E]mpirical estimates in a variety of settings and using a variety of approaches have shown that the effect of immigration on the labor market outcomes of natives is small. There is no evidence of economically significant reductions in native employment. Most empirical analysis of the United States and other countries finds that a 10 percent increase in the fraction of immigrants in the population reduces native wages by at most 1 percent (Friedberg and Hunt 1995: p. 42).<sup>1</sup>

Yet immigration’s impact on wages is extremely difficult to measure. This is one reason why the debate continues. Several well-known economists, with Borjas prominent among them, continue to defend the logic of the textbook labour-market model and contend that immigration reduces the economic well-being of residents (Borjas 1995, 1999a, 2003). The negative effect of immigration is hidden, they suggest, because native-born workers respond to the arrival of

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<sup>1</sup> This summary refers in particular to a series of studies reported by the National Bureau of Economic Research (NBER). See Robert LaLonde and Robert Topel (1991) and Joseph Altonji and David Card (1991). In summarizing the NBER research effort John Abowd and Richard Freeman reported that the “broad implication is that immigrants have been absorbed into the American labor market with little adverse effect on natives” (Abowd and Freeman, 1991: 22). A National Research Council Panel convened by the U.S. Commission on Immigration Reform reached the same conclusion (Smith and Edmonston 1997: 219-220). See Card (2005) and Gianmarco Ottaviano and Giovanni Peri (2005, 2006) for recent contributions that bolster the conclusion that the impact of immigration on the wages of competing native-born workers is small.

immigrants by moving elsewhere, “voting with their feet” (Borjas 1999b: 1740). As Borjas explains:

... natives may respond to the wage impact of immigration on a local labor market by moving their labor or capital to other cities. These factor flows would reequilibrate the market. As a result, a comparison of the economic opportunities facing native workers in different cities would show little or no difference because, in the end, immigration affected *every* city, not just the ones that actually received immigrants (Borjas 2003: 1338, emphasis in original).

In this view immigrants “crowd out” native workers who flee to areas less impacted by immigration. Indeed, if every arriving immigrant worker inspired one resident departure, total employment in the local market and therefore the wage would remain unchanged. The residents’ departure disperses the immigrants’ wage-depressing effect across the entire economy where it is difficult to detect precisely because it is pervasive. Therefore the question of the wage effects of immigration is intimately related to the locational choices of foreign and native workers.

The empirical evidence on this “crowding-out hypothesis” for the modern period is mixed and no consensus has been reached. Investigating data for the 1970s and 1980s, Randall Filer (1992), Borjas (2001), and several others find a negative relationship between immigration (or net immigration) and out-migration of resident workers. Research by Michael White and Yoshie Imai (1994), Richard Wright, Mark Ellis, and Michael Reibel (1997), David Card (2001), and Mary Kritz and Douglas Gurak (2001) found either no relationship between the entry of immigrants and the exit of the native-born or a positive one; that is, they find that both immigrants and the native-born moved to the same cities. Because the question of harm is, in Borjas’ words, “at the core of the immigration debate” (Borjas 1999: 62-63), the issues of locational adjustment and wage effects remains hotly contested within the economics profession.<sup>2</sup> Kritz and Gurak in a review of this debate suggest that the contradictory results reported in the literature are a product of different model specifications, the different populations

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<sup>2</sup> See Roger Lowenstein (2006) for an accessible account of the debate.

studied, the different regions, and the different time periods chosen for analysis (Kritz and Gurak 2001: 134-135).<sup>3</sup>

This chapter introduces a dynamic alternative to the static supply and demand models evoked in the debate and attempts a fresh empirical look at the economic consequences of immigration. We pay particular attention to the argument that native-born workers are pushed out of labour markets flooded by foreign workers. Our approach shifts attention away from the recent experience to the decades centred on the centennial year 1900. There are several reasons for thinking that an examination of this historical “Age of Mass Migration” may prove helpful in clarifying the scientific issues in debate and allaying public fears about contemporary immigration. During that period immigration flows were considerably heavier than they are today, especially when compared with the size of the resident population. If a negative impact of immigration is hard to find in modern data, perhaps it will reveal itself during a period of much more intense labour market pressure. If, as we shall report, there is no evidence of a negative impact, then this history will support the alternative model and its more benign implications that we put forward.

Most of the economists who argue that there ought to be significant negative impacts of immigration have taken a short-run, static point of view and thus have assumed away any relationship between immigration, structural changes, and economic growth. A long-run, dynamic, historical analysis – one that emphasizes the positive impact of immigration on economic growth – usually concludes that immigration would bring significantly large *positive* benefits to residents. This is the perspective taken by economic historians and theorists of economic growth (Williamson 1982, Greenwood and McDowell 1986, and Carter and Sutch 1999). If the objective is to measure the net effect of immigration, not just the partial short-term impact, then one needs to take a longer historical perspective and to explicitly include immigration’s impact on economic growth. Before turning attention to the empirical and theoretical issues, it is useful to summarize the similarities and differences between immigration then and now.

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<sup>3</sup> Another problem is that some of the findings are driven by two significant outliers: Los Angeles and New York City. Both cities are major ports of entry for new immigrants even today.

## **American Immigration in the Age of Mass Migration**

The several decades before World War I have been called the “Age of Mass Migration.” With the important exception of the Chinese, most of whom were barred from entering the country after passage of the Chinese Exclusion Act of 1882; America’s door was essentially open to all immigrants willing and able to come.<sup>4</sup> It was not until 1917 that the U.S. Congress took measures to restrict immigration with literacy requirements and an expanded prohibition of Asian immigration. A few years later, the Quota Law of 1921 imposed numerical restrictions for the first time on immigration from non-Western Hemisphere countries and then these quotas were reduced in 1924. The impact was dramatic. Figure 1 plots net immigration rates (net immigration per thousand members of the resident population) for the full range of the country’s history. Net rates which ran in the range of 6 to 8 per thousand in the first 15 years of the twentieth century fell below 2 per thousand after enforcement of the 1924 quotas. The Quota System was removed in 1965, replaced by the Preference System, and since then the net immigration rate has slowly drifted upward. In 2005 the rate was 3.5 per thousand, about one half the level a century earlier.

The net immigration rate can be taken as a measure of the magnitude of the impact of an immigration flow on the receiving population. Since the relative magnitude of immigration was greater in the first decade of the twentieth century than in its last decade, the impact on labour markets, including the impact on the wages of the resident population, would presumably be greater and more easily detected. To be sure, the characteristics of early-twentieth century immigrants were in some ways different from the “new” immigrants of the recent past. Furthermore, the structure of the two economies and their factor markets presented distinct institutional environments for the new arrivals to confront. But we argue that on balance these differences probably should accentuate the wage adjustments required in the earlier period relative to the recent period.

Immigration during the Age of Mass Migration was dominated by single males of young working ages. Today there are greater proportions of children, the elderly, and others who do

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<sup>4</sup> There were some health and character restrictions as well. A brief chronology of U.S. Immigration policy can be found in Barde, Carter, and Sutch (2006: Table Ad-C).

not immediately join the labour force (Carter and Sutch 1998: 290). The impact on the labour market was, therefore, likely greater than the net immigration rate would suggest since a disproportionate fraction of immigrants from that period joined the labour force. Moreover, the age distribution of the resident population was more concentrated at younger ages than is true of today's aging population (Sutch and Carter 2006, Series Aa125-144). Thus the young adults who dominated the immigrant flow at the turn of the twentieth century were more similar in age, background skills, and experience to resident workers then than now. Thus we would expect more direct competition between the two groups.

Two widely-cited studies, one by Claudia Goldin and the other by Timothy Hatton and Jeffrey Williamson, conclude that the mass immigrant arrivals during this period exerted strong downward pressure on the earnings of resident workers. But we note that both contributions embrace the textbook logic that we are sceptical of. Goldin reports, "wages were depressed in cities having an increase from 1899 to 1909 in the percentage of their populations that was foreign born" and "the results are even more supportive of the view that immigration severely depressed the wages of less-skilled labor" (Goldin 1994: 252). Hatton and Williamson conclude that "a 1 percent rise in the labor force due to immigration would have reduced the real wage in the long run by 0.4 percent ... or 0.5 percent" (Hatton and Williamson 1998: 172). Hatton and Williamson also report that crowding out was a significant phenomenon between 1880 and 1910, presumably as natives fled the regions that were attracting the immigrants as the wages in those labour markets fell in response to labour market flooding. Given the large magnitude of the immigrant flows, the age and skill mix of the immigrants relative to the existing population, and the less-structured character of the American labour market at that time, these conclusions are certainly plausible. But are they correct? This chapter takes another look.

## **Modelling the Impacts of Immigration**

Economic analyses of the consequences of immigration in both contemporary and historical settings usually take as their starting point a static model of the labour market. Using the simplest version of this model, they assume labour to be homogenous in its productivity and other relevant characteristics so that immigrant and native-born labour are perfect substitutes.

Demand for labour is assumed to be a downward-sloping function of the wage. The labour supply curve is assumed to be upward-sloping (or in some expositions to be vertical).

According to this model, demand is assumed to be unaffected by immigration itself. Thus, for example, the analysis ignores the impact of immigrants in increasing demand for final products. It assumes an economy that is closed to trade with other regions so that an inflow of immigrants cannot lead to an increase in the production of traded goods or an in- or out-migration of resident labour. The increase in labour relative to capital is not allowed to stimulate an inflow of capital or the adoption of new production techniques. We will return to relax these restrictive assumptions later. Our discussion of this simple version is intended, not as a straw man, but as a starting point for discussing our analytical framework.

Figure 2 presents the familiar graphical analysis which we have labelled the “Textbook Economy” model. Before immigration, the labour supply curve is  $S_0$ . It establishes an equilibrium wage of  $W_0$  and a quantity of resident labour hired of  $R_0$ . If a flow of immigrant workers equal to  $M$  arrives, the supply curve for labour is pushed to the right as shown by  $S_1$ . Here it is assumed that the supply of immigrant labour is perfectly inelastic, that is, wages do not influence the amount of immigrant labour supplied. The outward shift of the labour supply curve lowers the equilibrium wage to  $W_1$ , reduces the employment of residents from  $R_0$  to  $R_1$ , and increases total employment to  $R_1+M$ . The model assumes “full employment,” so the decline in resident employment is due to the voluntary withdrawal of labour services by residents unwilling to put forth the same effort at the reduced wage.

Contrary to this formulation, as students of the subject know, however, the presence of immigrants is often associated with *high*, not low wages. For example, when Friedberg and Hunt plot the average wage and salary income of the 30 largest cities in the United States in 1990 against the fraction of those cities’ population that is foreign-born they find that “cities with higher immigrant densities also have higher mean incomes. The correlation between these two variables is 0.37” (Friedberg and Hunt 1995: 31). In a study of the American economy a century earlier, Goldin also found a strong *positive* relationship between the fraction of a city’s population that was foreign-born and the city’s average wage (Goldin 1994: 247).

There is another prediction of the simple model that fails the empirical test. Real wages in sectors that employed a large and growing number of immigrants during America's Age of Mass Migration did not fall over time; they rose. Real wages at the end of the period were higher than at the beginning despite the influx of immigrants.<sup>5</sup> Figure 3 displays three real wage series for the period; one for manufacturing, one for railroads, and one for lower-skilled labour. In 1910, manufacturing employed one-third of the foreign-born men while transportation and communications employed another 12 percent (Sutch and Carter, 2006, Series Ad894-896). We have good reason to believe that a disproportionate number of the lower-skilled workers were immigrants.<sup>6</sup>

So what explains the failure of the straightforward predictions of the textbook model to accord with the facts? As we have noted, an explanation offered by some defenders of the textbook model is the possibility of native flight or "crowding out." This view takes as a starting assumption the notion that before the arrival of new immigrants the regional labour markets are in a country-wide equilibrium with an identical wage (after adjustments for particular regional conditions) prevailing in all markets. Thus the arrival of immigrants would push the local wage below the national level, inducing some residents of the impacted market to move to another area. In doing so, they restore a national equilibrium. This explanation, which we illustrate in Figure 4, is favoured by Hatton and Williamson (1998, Figure 8.4: 166). They relax the textbook assumption that native workers are confined to the local market and postulate as a consequence a highly elastic supply of resident labour, indicated here by the supply curve  $S_0$ .<sup>7</sup> If the local wage falls much below the national norm of  $W_0$ , some local workers would depart seeking higher

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<sup>5</sup> The simple model assumes one type of labour. Data reported here are averages across a variety of labour types. These averages are affected not only by the wage paid to each category of labour, but also by the relative share of the different occupations in the total. The impact of shifting relative shares on the average is called the "composition effect." Since immigrants earned lower wages than the native-born, the growth of the immigrant share of the labour force would be expected to lower the average wage. That the average *rose* despite the negative composition effects, means even stronger wage gains for immigrants, natives, or both, than trends in the average wage suggest.

<sup>6</sup> The series on lower-skilled labour is the one used by Hatton and Williamson (1998). The Hatton and Williamson wage series was developed by Williamson (1995: Table A1.1). Williamson's source for the period in question is Paul A. David and Peter Solar (1977). See Williamson (1995: 176). In Figure 3 we plot David and Solar's series for lower-skilled workers. Incidentally, the Williamson series is in error for 1889 and 1890.

<sup>7</sup> Figure 4 is essentially the same as the textbook model in Figure 2, but with a very elastic supply curve of labour replacing the rising (or even vertical) curve portrayed in many textbooks.



wages elsewhere. It might be said that they were “crowded out” by the immigrants. On the other hand, if the local wage rises above  $W_0$ , it will attract migrants from other regions. With a highly elastic supply of resident labour, the exogenous arrival of a number of immigrants equal to  $M$  will shift the labour supply curve to right as indicated by curve  $S_1$ . As drawn here, wages fall, but by very little. The impact of immigrant entry is masked by the native flight. The employment of residents falls sharply from  $R_0$  to  $R_1$ . If every arriving immigrant worker inspired one resident departure, the wage and total employment would remain unchanged. The only change would be the replacement of native workers by immigrants.

## Locational Choices of Immigrants and Natives: State-Level Analysis

Hatton and Williamson direct attention to the possibility of crowding out as depicted in Figure 4.

They write:

Local labor market studies almost certainly understate (or miss entirely) the economy-wide impact of immigration on wages. After all, immigration will only lower wages in a local labor market insofar as it increases the total supply of labor. If instead there is completely offsetting native emigration, then a rise in the immigrant share is consistent with no change in the size of the local labor force and no wage effect of immigration *compared with other local labor markets in which natives relocate*. But wages should fall (perhaps equally, perhaps not) in all locations (Hatton and Williamson, 1998: 171, emphasis in the original).

The most powerful element of Hatton and Williamson’s argument that immigration was harmful to resident workers, therefore, is their finding that crowding out was substantial.<sup>8</sup> They estimate that,

... an additional 100 foreign-born in-migrants to these northeastern states increased native-born out-migration by 40. While this is not quite the one-for-one Filer found for late-twentieth century America ..., it is substantial crowding-out nonetheless” (Hatton and Williamson, 1998: 168-169 citing Randall Filer 1992).

Hatton and Williamson’s conclusions are based on an analysis of data assembled by Hope Eldridge and Dorothy Swaine Thomas (1964) from the decennial censuses. Hatton and Williamson focus on the three decades beginning in 1880. To identify possible crowding out,

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<sup>8</sup> Hatton and Williamson also directly address the issue of whether immigrants reduce wages nationally (1998: 171-173). They adopt an approach that we find unconvincing. See Carter and Sutch (1999: 332-333) for a discussion of our reservations.

they begin by comparing regional differences in net native- and foreign-born in-migration rates calculated as a share of the native population. They call attention to three different regional patterns: (1) in the Northeast, low (but non-negligible) rates of native out-migration coupled with high rates of foreign in-migration; (2) in the South, high rates of native out-migration coupled with very low rates of foreign in-migration; and (3) in the West, large inflows of *both* the native- and the foreign-born. Hatton and Williamson concede that there was no crowding-out in the South or the West. Few immigrants were going to the South, so they could not be the reason for native departures. Both natives and immigrants were going West in large numbers, so immigrants do not appear to have thwarted the natives' westward march. If crowding out occurred, it would have to be in the populous 14 states of the Northeast that were attracting large numbers of immigrants while at the same time losing many of their native-born. It is to states in this region that the Hatton-Williamson crowding-out results reported above apply. Here we review their evidence.

Figure 5 plots for each state the net migration rates of the native- and foreign-born for the 1890s.<sup>9</sup> The surprise, in seeming contradiction to the conclusions presented by Hatton and Williamson, is the *positive* correlation between native- and foreign-born migration rates. That is, states experiencing the largest exoduses of the native born – Vermont, Maine, New Hampshire, Michigan, and (hidden just to the upper right of New Hampshire in the diagram) Wisconsin – reported very small inflows of foreign-born. The bubbles for those states are small. Immigrant inflows calculated as annual averages were less than one percent of the resident population. While on balance more native-born left these states than entered, crowding-out by foreigners does not appear to explain the exodus. More likely, the native-born left because of the poor state of New England agriculture and the attractive agricultural opportunities out West (Barron 1984). States with the heaviest inflows of the foreign-born – Rhode Island, Massachusetts, Connecticut, New York, and New Jersey – on the other hand were also *attracting* the native-born migrants.

In Figure 5 we present the same data that Hatton and Williamson use in their analysis. How is it that they reached their seemingly opposite conclusion that the arrival of 100 foreigners

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<sup>9</sup> The data for other decades is qualitatively similar. The correlation coefficients between native- and foreign-born net migrations are 0.64, 0.70, and 0.77 for the decades of the 1880s, 1890s, and 1900s, respectively. Only Wisconsin in the 1880s displayed migration patterns consistent with possible crowding-out. In that decade an 18.7 percent immigration rate was associated with an 8.2 percent outflow of the native born.

prompted the out-migration of 40 natives? We can best explain the logic of their argument by reference to Figure 6. Begin with an initial equilibrium wage in, say, the Massachusetts labour market of  $W_0$  with total employment consisting entirely of resident workers, given by  $R_0$ . The industrial boom taking place in Massachusetts at the time shifted the demand for labour curve out from  $D_0$  to  $D_1$ . In the absence of immigration, the wage would rise to  $W_h$  and resident employment would increase to  $R_h$ . But the boom also attracted immigrants to the state. Suppose that  $M$  foreign-born workers respond by moving to Massachusetts. This shifts the supply of labour curve out to  $S_1$ , defines the equilibrium wage to be  $W_1$ , and reduces resident employment to  $R_1$ . The “crowding-out” of natives that Hatton and Williamson measure is not a reduction in native employment to a level below  $R_0$ . Rather it is the difference between the hypothetical resident employment increase to  $R_h$  and the actual employment  $R_1$ . In other words, natives and immigrants were both moving to the same dynamic locations. As they accurately put it, “strong labor demand crowding in and foreign-born immigrant crowding out were both at work in this case” (1998: 167). Hatton and Williamson’s measure of a 4 for 10 “immigrant crowding out” was actually offset by “labor demand crowding in.” Natives were crowded out only in the sense that their inflow might have been larger still had the immigrants failed to arrive.<sup>10</sup>

We suggest that Hatton and Williamson’s effort to measure a hypothetical crowding out separate from the inflows induced by strong labour demand is misleading. The crowding out that is associated with a harmful impact of immigration, by definition, can only occur if wages fall below the national average. But at  $W_1$  and  $R_1$  wages are higher than in the initial equilibrium and native employment is greater. The appropriate question is whether there is a negative relationship between foreign immigration and resident migration. There is not. The state-level data on immigration and native migrant flows do not support the conclusion that immigration during this period reduced the wages of residents.

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<sup>10</sup> This definition of crowding out may overstate the case since the model rules out, by assumption, a number of processes, described elsewhere in the text, by which immigrant arrivals may increase local wages, thereby increasing their attraction to native-born workers.

## Locational Choices of Immigrants and Natives: County-Level Analysis

Earlier we showed that state-level data for the 14 states of the Northeast were characterized by a positive correlation between the destinations of resident and foreign-born workers. While state data is better than regional data, even states are too heterogeneous to reveal migration flows across labour markets. New York in 1900, after all, included both big industrial cities and thinly-populated rural, agricultural areas. To focus more directly on the relevant labour markets we examine migrant flows at the county level between 1900 and 1910. These data demonstrate that there was no crowding out. Instead, native and foreign born were migrating to the same counties.

Our county-level data comes from the published returns of the U.S. Censuses for 1900 and 1910, which reported county-level data on population disaggregated into native (white, black, and other races) and the foreign born. For 1910 we also have these population figures for those ten years of age and older.<sup>11</sup> We use these data to calculate a crude measure of net in-migration of the native and foreign-born into each county.<sup>12</sup>

Figure 7 displays a map of the U.S. that identifies what we call “Immigrant Magnet Counties.” These are the 318 counties that experienced a net increase of 1,000 or more immigrants over the decade. Bubble size is proportional to the numerical increase. It is clear from the figure that immigrants disproportionately settled in the industrial counties of the Northeast and Midwest and, to a lesser extent, along the Pacific coast. In general, the Immigrant Magnet Counties are the ones that had already established a strong immigrant presence at the end of the nineteenth century. Some evidence in support of this view is that there is a strong

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<sup>11</sup> These data are available in machine-readable format for the Inter-University Consortium for Political and Social Research (Haines 2004).

<sup>12</sup> A discussion of the method used to calculate the net migration rates is given in Sutch (1975). Some county boundaries changed between 1900 and 1910, some counties were partitioned to form new counties, and some counties changed their name. We have used the maps in William Thorndale and William Dollarhide (1987) to aggregate counties in 1910 in such a way as to produce a contiguous area that closely matched the boundary of a 1900 (or an appropriate aggregate of 1900 counties). This procedure produced approximately 2,800 county or county-like regions in 47 states or territories and the District of Columbia. The data set excludes Oklahoma and Indian Territories (1900) and the State of Oklahoma (1910). Because of incomplete enumerations four Indian Reservations (Standing Rock, Cheyenne River, Pine Ridge, and Rosebud) all in South Dakota and Williamsburg County, Virginia were excluded. Alaska and Hawaii Territories are not included.

correlation between the foreign-born population in 1900 and the net foreign in-migration over the following decade.<sup>13</sup> Perhaps immigrants' locational choices had nothing to do with high wages but instead were most heavily influenced by the presence of other immigrants, particularly their families and friends from the home country who had immigrated earlier.

Figure 8 helps to clarify the relative role of family and friends verses economic factors such as high wages in attracting immigrants in this era. It displays what we call an Immigration Impact Index for each magnet county. We define this as the increase in the number of foreign-born between 1900 and 1910 per thousand *native-born* residents in 1900. It shows that the largest increases in immigrants relative to the native population occurred in counties in the upper Midwest, Mountain, and Pacific regions, not those of the industrial northeast.

Of the 318 "Immigrant Magnet Counties" depicted in Figure 7, 72 percent experienced a positive inflow of *both* foreign-born immigrants and native in-migrants. Figure 9 presents a log-log scatter diagram that plots each of the magnet counties in a manner designed to illustrate the relationship between the total net in-migration (native and foreign born) and the net increase in the foreign-born population. The 45-degree line represents the locus of points where the increase in the foreign-born and the total in-migration are the same. Counties plotted above the 45-degree line experienced a net in-migration of *both* the native- and foreign-born. Counties below the 45-degree line experienced a net *in*-migration of foreign-born and an offsetting net *out*-migration of native born. Perhaps the arrival of the foreign-born prompted the native born to flee by depressing wages.

We can not conduct a formal test of this hypothesis since we do not have county-level wage data, but we suggest that the pattern displayed in Figure 9 is not consistent with an interpretation that the counties below the line exhibited crowding out. The sizes of the bubbles in the diagram indicate the magnitude of each county's immigration impact index. Where the impact of immigration was the greatest (indicated by large bubbles), we find that both natives and immigrants had poured into the county. In all of the counties below the line, the immigration impact index is quite low (the bubble sizes are small). Only four counties below the line had an impact index greater than the *average* index of those above the line. These patterns

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<sup>13</sup> The correlation between the logarithms of the two numbers is 0.79.

suggest that the reason for the native outflow from the counties below the line was unlikely to have been due to a proportionately heavy foreign-born inflow. We conclude that the crowding-out mechanisms did not operate during the Age of Mass Migration in any general way. Instead, natives and immigrants were both moving to the same high-wage regions. These findings suggest that the immigrant arrivals were not reducing the wages of resident workers in this period.

## **An Alternative Model of Immigration's Impact**

As we noted, switching the focus to a period a century ago prompts us to adopt a dynamic perspective that we believe may resolve the contradiction between the elementary models of immigration (including the crowding-out model) advocated by Borjas which predict a decline in wages and the empirical studies that find little or no evidence for such an effect. The simple models assume that the only change in a labour market experiencing immigration is the exogenous outward shift of the labour supply curve. This assumption is systematically violated in the real world. It is scarcely an exaggeration to say that it is *never* the case, because immigrant entry not only responds to market conditions; it also positively stimulates market change.

It is impossible to imagine a plausible sequence of events in which immigrant entry occurs in isolation of an induced stimulation of demand. To take only the most obvious consequence, the arrival of newcomers will increase the demand for final products. Immigrants have to eat and find shelter and they can be counted on to purchase many other goods and services ranging from necessities to indulgences. But, when immigrants purchase these items, output will respond and thus the demand for labour will shift out. Because the shift in the labour supply curve inevitably is accompanied by a shift in the labour demand curve, it is extremely difficult to measure a “pure” wage impact of immigration on resident wages holding “other things equal.” The inherent conceptual difficulty of this problem and – we would argue – its futility, heightened by the political implications of the results, are what make the issue of immigrant impacts so contested. We suggest that immigration is interesting and important precisely because of those features that make measurement of its wage impact within the context of the textbook model problematic.

In addition to the labour demand shifts that occur *pari passu* with the arrival of immigrants, history suggests that immigrants are generally drawn to localities, occupations, and industries experiencing innovation, growth, and evolutionary change. Economic motives seem primary even though migration to join relations, friends, and countrymen influence many. In other words, immigrants do not locate in stagnant textbook labour markets. Our first suggestion then is that immigrants differentially select destinations with high and or growing wages. The reasons why this might be true are easy to understand. Immigrants have already made the decision to leave home; they select their final destinations using economic criteria. Indeed, immigrants' selection of high wage cities was Goldin's explanation for the positive correlation between the city wage and the foreign born share that she found about 1900 (Goldin 1994: 247). A simple expression of this possibility is depicted in Figure 10, which we label the "Dynamic Economy" model. We begin with the assumption that wages in all local labour markets are in equilibrium at the intersection of the original demand and original supply curve, the point shown by  $\mathbf{W}_0$  and  $\mathbf{R}_0$ . We then let the labour demand curve in a selected city shift outward, perhaps reflecting a resource discovery. As a result, wages in that city might be expected to rise to  $\mathbf{W}_h$  and resident employment to expand to  $\mathbf{R}_h$ . However, since immigrants are mobile and attentive to economic rewards, they select the city with the dynamic economy over all others. When they do so, they cause the supply of labour curve to shift out (and become more elastic) at wages above  $\mathbf{W}_0$ . In that event, employment expands from  $\mathbf{R}_0$  to  $\mathbf{R}_1+\mathbf{M}$ . Although the resulting wage rate,  $\mathbf{W}_1$ , is below the counterfactual wage  $\mathbf{W}_h$ , it may nevertheless remain for some time above the initial level  $\mathbf{W}_0$ , and therefore above the wage in cities that did not experience the positive demand shock. Resident employment also expands from  $\mathbf{R}_0$  to  $\mathbf{R}_1$ .

Figure 10 provides a framework for interpreting Goldin's finding of a negative wage impact. When she reports, "wages were *depressed* in cities having an increase ... [in their] foreign born" (emphasis added), she is referring to the difference between  $\mathbf{W}_h$  and  $\mathbf{W}_1$ , not to a wage below  $\mathbf{W}_0$ . This subtlety is overlooked in many summaries of Goldin's contribution. Reviews of Goldin reported by Hatton and Williamson (1998: 170), Dolmas and Huffman (2004: 1129), and Graham (2004: 60) suggest that immigrants depressed wages to a level below  $\mathbf{W}_0$ . This was not the case. Resident wages were high in cities with large numbers of immigrants.

The dynamic economy model assumes a demand shock unrelated to immigration. A second mechanism that would explain the failure of immigration to have a depressing impact on wages is an *induced* demand shift, that is, a shift in demand that responds to the arrival of immigrants. More foreigners or indeed more population from any source by itself should not mean lower wages or increased unemployment because the additional people not only supply labour but add to the demand for output in a closed economy. Even if we relax the textbook assumption of a closed economy and allow local labour markets to import goods from another region to meet the expanding demand, this induced demand story will still be valid. This is because some goods and services must be produced where they are consumed – restaurant meals, construction, and educational and medical services. In addition, an open economy will respond to an increase in its labour force by expanding production of tradable commodities in which it has a comparative advantage. Thus an exogenous entry of immigrants that produces an outward shift in the labour supply curve will prompt a positive response from the labour demand side of the market. It is also conceivable that, with an open economy, the impact of immigration may increase resident wages if the expansion of local industry pursuing a comparative advantage also allows those firms to exploit economies of scale (Romer 1996; Brezis and Krugman 1996) or if strong complementarities between immigrants and residents are at work (Ottaviano and Peri 2005).

This mechanism is depicted in Figure 11, which we label the “Open Economy” model. Before the arrival of the immigrants, the market is in equilibrium at  $\mathbf{W}_0$  and  $\mathbf{R}_0$ . An exogenous inflow of immigrants then shifts the labour supply curve from  $\mathbf{S}_0$  to  $\mathbf{S}_1$  temporarily driving the wage down to  $\mathbf{W}_1$ . The relatively low wages attract new firms to the city. This response shifts the labour demand curve from  $\mathbf{D}_0$  to  $\mathbf{D}_1$ , thereby restoring the wage to its initial level. Borjas, Freeman, and Katz (1997) suggest that these shifts in industrial structure play a quantitatively important role in the adjustment of city wages to immigration shocks. If economies of scale exist, then the demand for labour might shift out even further as the region’s firms exploit their competitive advantage *viz a viz* competitors in other regions. Then wages might rise to  $\mathbf{W}_2$  and, if so, the employment of native residents would increase from  $\mathbf{R}_0$  to  $\mathbf{R}_2$ .



## Conclusion

In this chapter we examine the impacts of immigrants on the wages and employment of resident workers during America's Age of Mass Migration. In contrast to the widely-held view that immigrant wage and employment effects for this period were larger than in the modern period, we find no negative effects. Indeed, we argue that they *increased* in the presence of heavy immigrant inflows.

We use the same data as other researchers, though we add more highly-disaggregated data that strengthens our claims. Our striking conclusions stem from our modelling and its critique of the standard economist's approach. This standard approach is framed in terms of the textbook labour market model that invokes the assumption that immigrants enter otherwise static labour markets. This assumption is known to be false: immigrants select markets where labour demand is growing; their arrival stimulates further labour demand growth. Yet economists' response is to treat these conditions as technical nuisances that get in the way of precise calculations of immigration's effect as measured by the difference between the prevailing wage in some local labour market and the one that would have prevailed in the absence of immigration.

Here we take the opposite approach. For us, the endogeneity between immigration and local labour market conditions is *the central question*. During America's Age of Mass Migration we show that immigrants and residents were moving to the same dynamic labour markets. While the arrival of immigrants undoubtedly kept wages in some of these markets from rising even faster, residents experienced wage increases in the presence of heavy immigration. And the fact that wages did not rise faster extended the length of the economic boom and was good for everyone.

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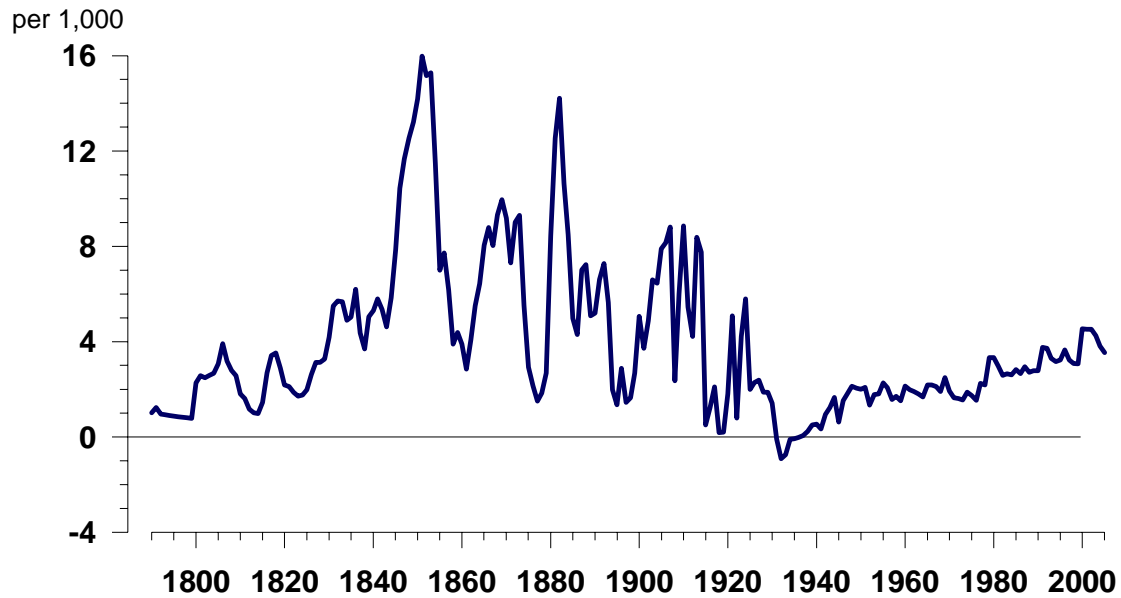
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Figure I. Net Immigration per Thousand of Resident Population



**Note:** Immigrants include both authorized and unauthorized additions to the resident population. Net immigration is the difference between immigration to the United States and emigration from the United States. This series differs from the “official” figures that measure only arrivals and not departures and because an effort is made to indicate the year of the immigrants arrival and not the year of their official admission.

**Source:** Haines and Sutch 2006 and U.S. Census Bureau 2005.



Figure II. The Textbook Economy

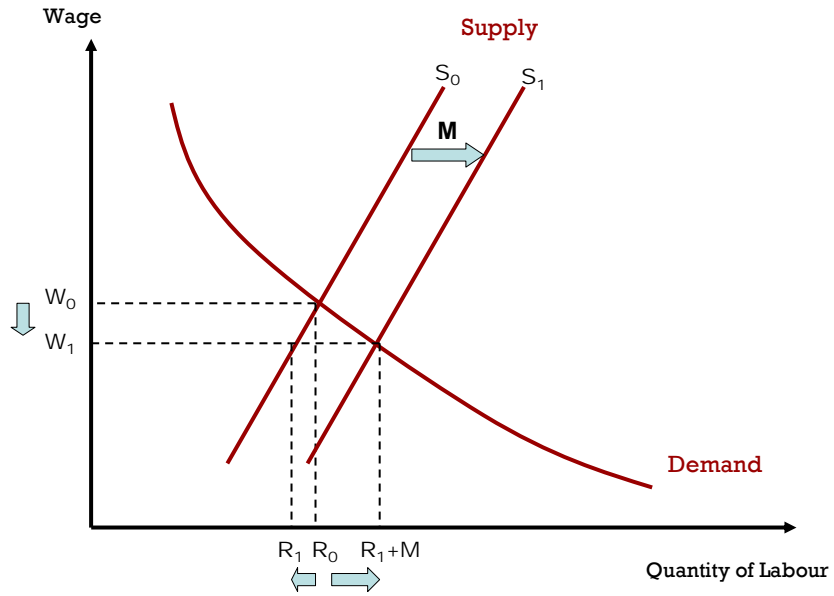
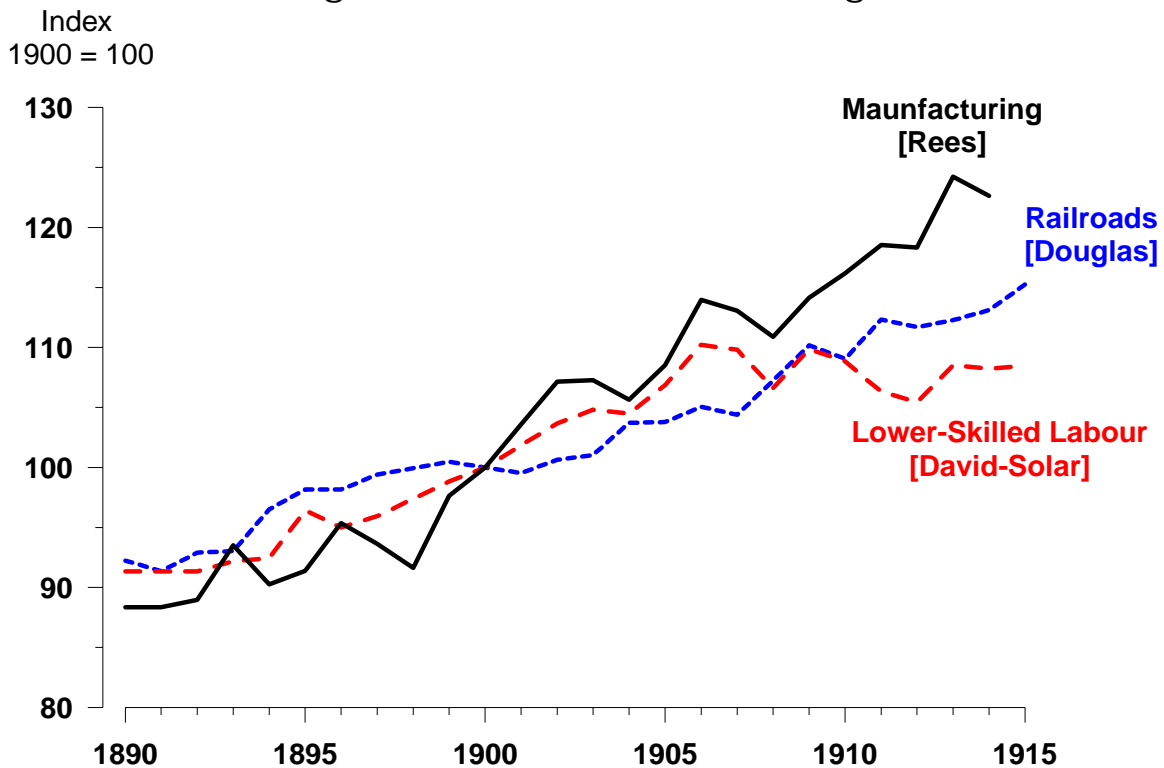


Figure III. Trend in Real Wages



**Note:** The data for “all manufacturing” are based on the hourly earnings estimates originally developed by Albert Rees (1961) and are considered superior to the manufacturing wage data estimated by Paul Douglas (1930). Douglas’ series on the weekly wages of railroad workers were derived from the reports of the Interstate Commerce Commission and are considered quite reliable. The series on low-skilled workers is taken from Paul David and Peter Solar (1977) but these are in turn based on the estimates published by Whitney Coombs (1926). Coombs based his estimates on the full-time weekly earnings of the lowest paid occupations reported for each industry by the Bureau of Labor Statistics. Since these data exclude most common labourers, the series is labelled “lower-skilled,” though Coombs and David and Solar call it “unskilled.” All three series were deflated by the David-Solar index of the cost of living (1860=100) and the resulting estimates of real wages were then converted to a common base where 1900 is set equal to 100. See the source for additional detail and for citations to the original sources.

**Source:** Sutch and Carter 2006, Series Ba4314, Ba4316, Ba4218, and Cc2.

Figure IV. Crowding Out

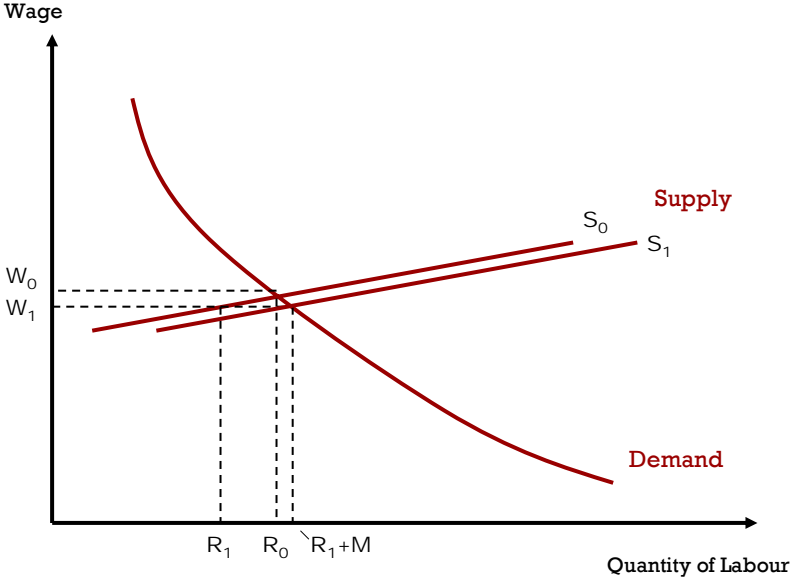
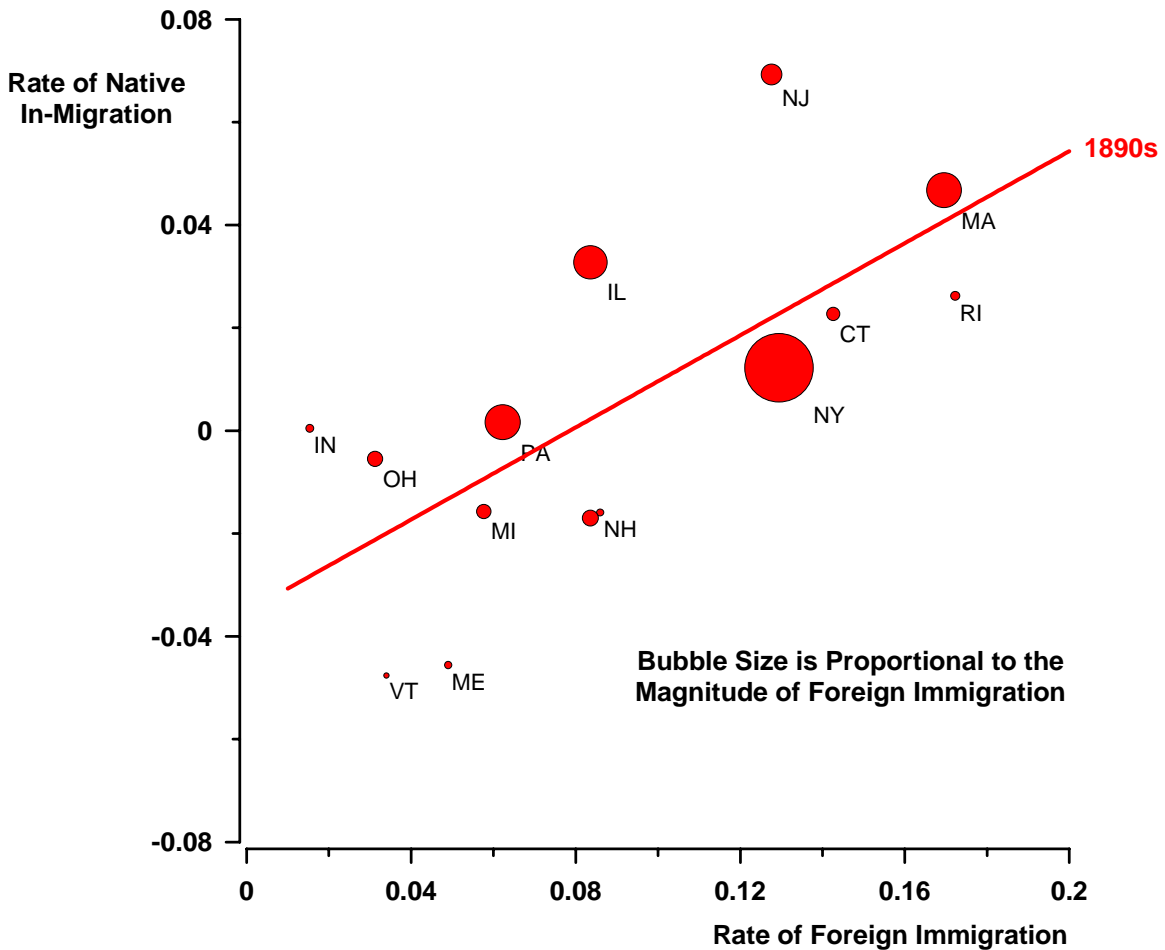


Figure V. Hatton and Williamson's Test of Crowding Out



**Notes:** The rates graphed are the net migrant flows over the decade divided by the average native-born population. Thus 0.08 represents an eight-percent inflow over a ten-year period or an average annual migration rate of eight-tenths of one percent. The state names are indicated by a two-letter code: CT, Connecticut; IL, Illinois; IN, Indiana; MA, Massachusetts; ME, Maine; MI, Michigan; NH, New Hampshire; NJ, New Jersey; NY, New York; OH, Ohio; PA, Pennsylvania; RI, Rhode Island; and VT, Vermont. The plotted point for Wisconsin is the small dot partially hidden by the plotted observation for New Hampshire.

**Source:** Eldridge and Thomas 1964: Tables A1.11, A1.12, and A1.14.

Figure VI. Hatton and Williamson's Diagram

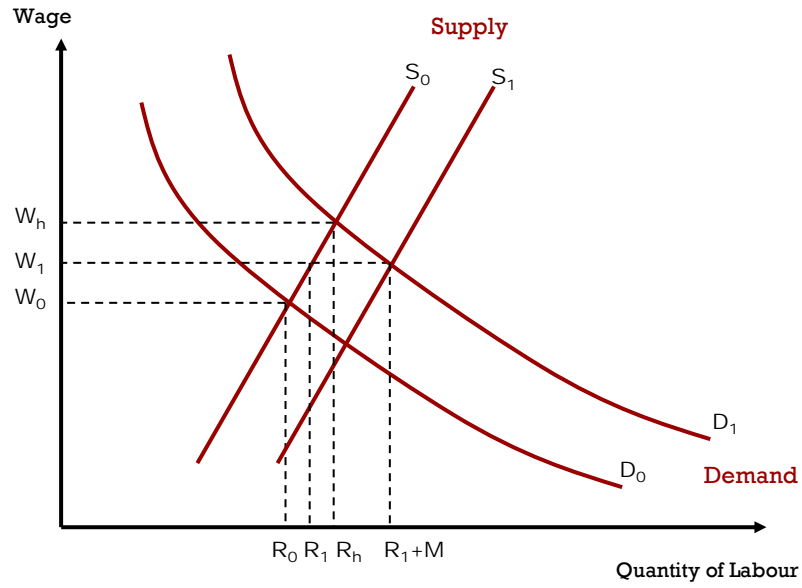
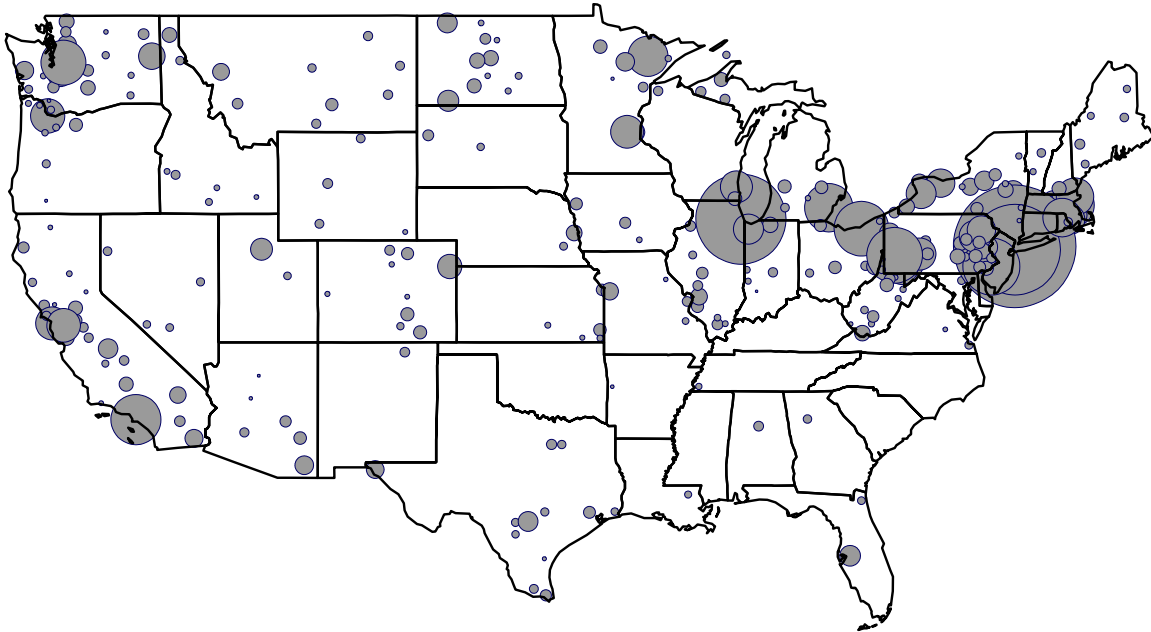


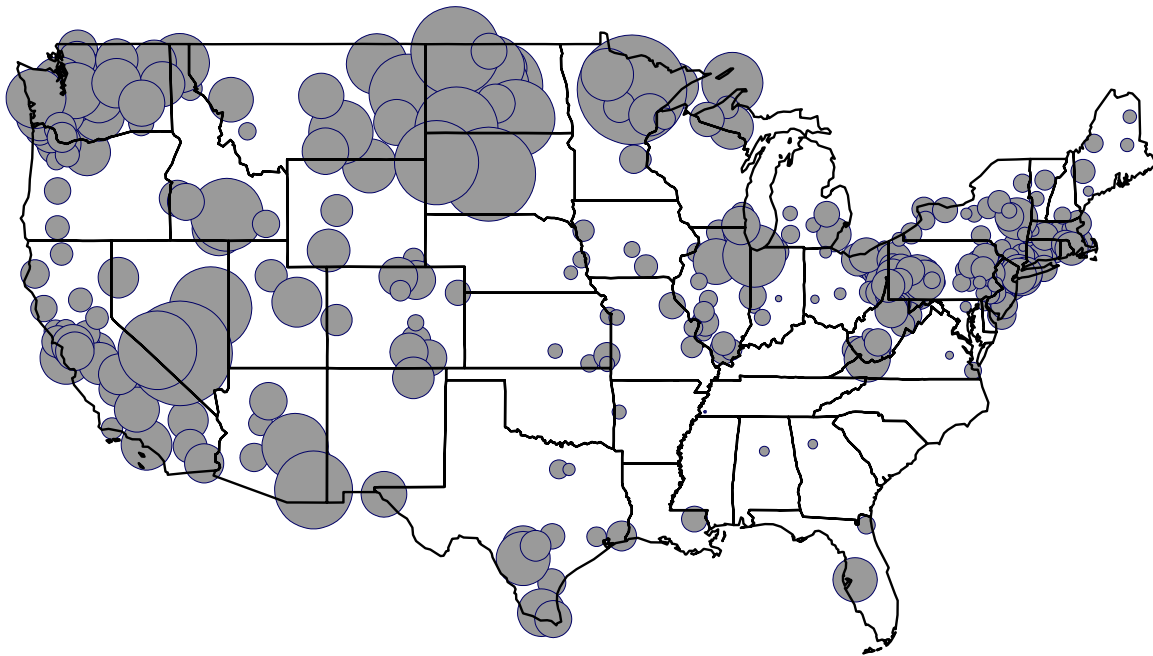
Figure VII. Immigrant Magnet Counties, 1900-1910



**Note:** All 318 counties with an increase in the foreign-born population (aged 10 and older in 1910) equal to or greater than 1,000 are indicated. The bubble size is proportionate to the numerical increase in the foreign-born with New York and Kings Counties in New York State the largest with increases of 362 and 195 thousand respectively followed by Cook County, Illinois (the site of Chicago with 193 thousand), and Philadelphia County, Pennsylvania (75 thousand).

**Source:** Haines 2004 and authors' calculations.

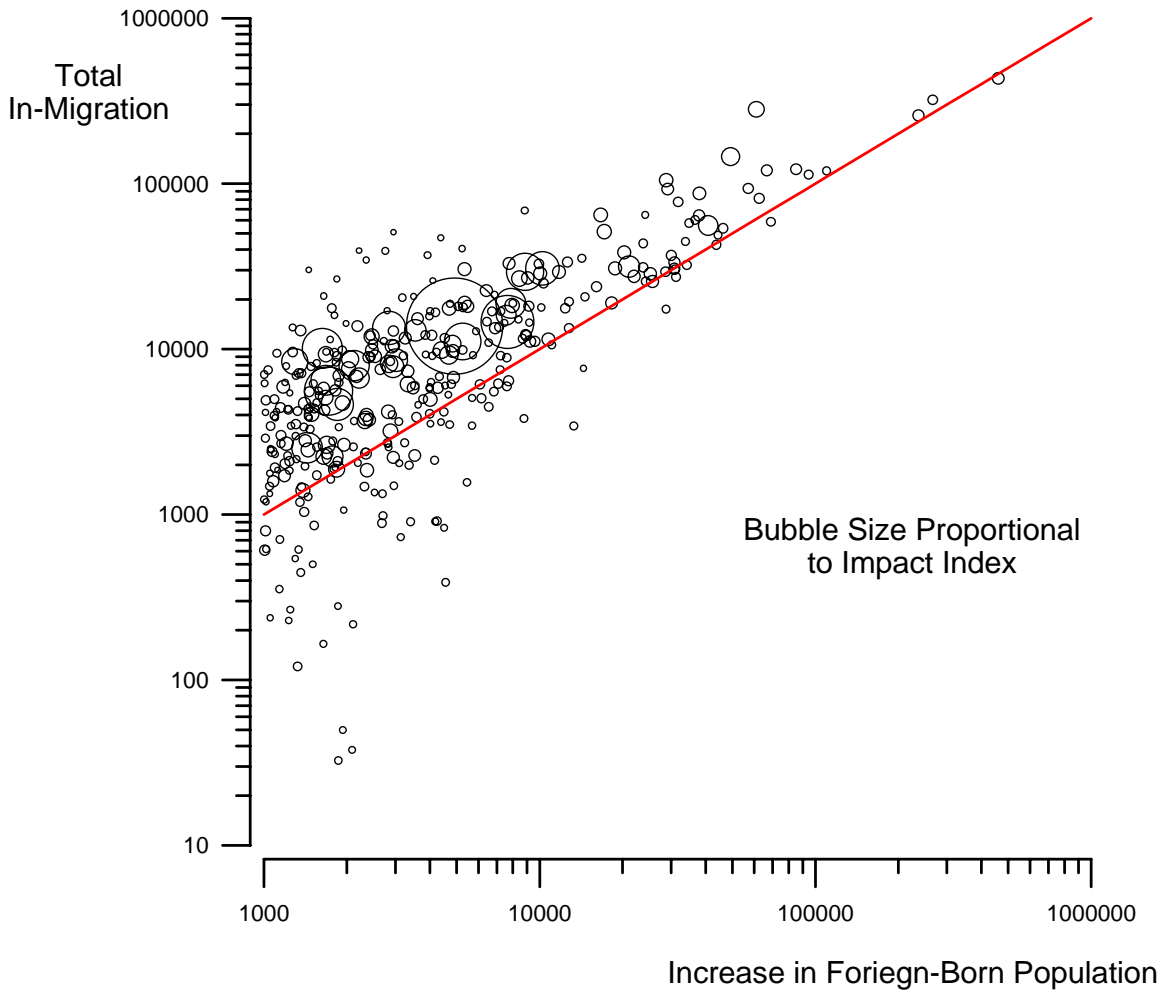
Figure VIII. Immigration Impact Index



**Note:** All 318 counties with an increase in the foreign-born population (aged 10 and older in 1910) equal to or greater than 1,000 are indicated. The bubble size is proportionate to the rate of foreign immigration.

**Source:** Haines 2004 and authors' calculations..

Figure IX. Total Net In-Migration and the Increase in the Foreign-Born Population, 1900-1910



**Note:** All 318 counties with an increase in the foreign-born population (aged 10 and older in 1910) equal to or greater than 1,000 are indicated. The bubble size is proportionate to the rate of foreign immigration. All counties above the straight line experienced both foreign immigration and native in-migration. Those below experienced native departures.

**Source:** Haines 2004 and authors' calculations.



Figure X. Dynamic Economy Model

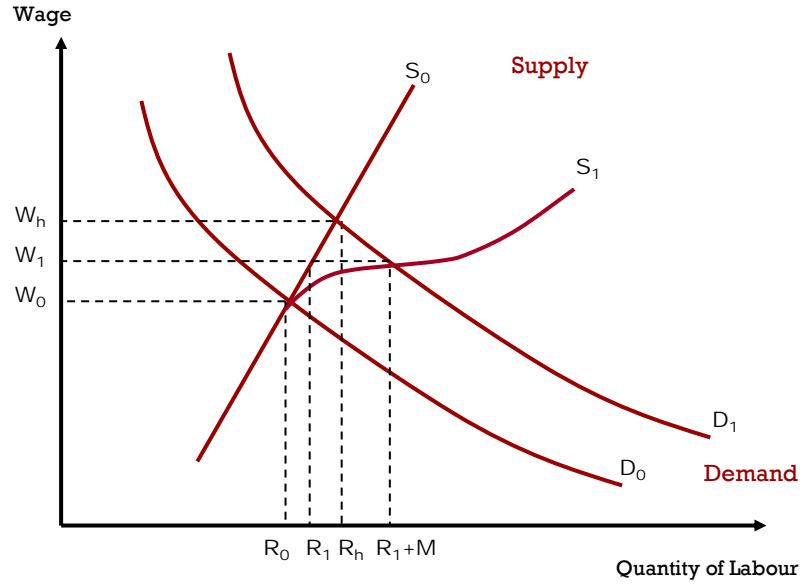


Figure XI. Open Economy Model

