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ABSTRACT

This paper highlights the distinctive features of the theoretical approach taken by scholars who analyzed the impacts of the mass migration into the United States in the two decades preceding World War I. Broadly speaking, this literature was couched in terms of the "aggregate production function," and emphasized advancing technology, productivity change, and changes in factor proportions. Attention was focused on the close interrelatedness among the many diverse elements in the economy.

A notable difference between the historical studies and the recent literature on the impacts of immigration is the propensity of the current literature to concentrate only on the first-round consequences. It is easy to show that these will be harmful to resident workers who face direct competition. Economic historians writing about the earlier period of high immigration went beyond the first-round effects. Taking a long-run perspective, they identified many aspects of the mass immigration that were beneficial from the point of view of the resident population.

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Today is not the first time that high and rising levels of immigration into the United States have brought the economic consequences of immigration to the forefront of both policy and scholarly debate. Figure 1 displays the number of immigrants admitted into the United States between 1820 and 1995.[1] The long view afforded by this chart puts the recent increase in the immigration into historical perspective. The first point to make is that, high as they are, current flows only now are now approaching the record levels reached in the period before the First World War.[2] Having been there before, there is much to be gained by reviewing the scholarship on the economic impacts of immigration during this earlier period. Then as now, there was public concern that immigration would lower wages of the resident population, particularly the wages of the least-skilled Americans. Connected to this concern was and is the fear that immigration, or at least too much immigration, would fragment society and lead to social and political unrest.

In the decades before World War I there were calls, like those heard from some quarters today, to reduce immigration. Those earlier calls were heeded. In 1907 a head tax was imposed on immigrants.[3] In 1917 the immigration of illiterate adults was banned (over President Wilson's veto) and the entrance fee was raised. A country-by-country quota system was introduced in 1921 which was designed to reduce immigration flows from their pre-war level by three-fourths. In 1924 the quotas were lowered to reduce flows to approximately 20 percent of their prewar levels.[4] The quotas for each country were set with the openly racist objective of stabilizing the ethnic composition of the U.S. population. In 1965, responding to some of the same political forces that gave rise to the Civil Rights movement, the quota system was abolished.

Quotas were replaced by the "preference system" which is still in place today.[5] The new law placed an annual numerical limit on one class of immigrants, but allowed for the admission of a large and soon-growing class of persons (close relatives of U.S. citizens) who were admitted without limit. Immigrants subject to the numerical cap fell from over 80 percent of the total in fiscal year 1969 (the first year in which the new law was fully effective) to below 50 percent in fiscal year 1990 (when the act was significantly revised).

The history of U.S. immigration and immigration policy has relevance to concerns about contemporary immigration and to the design of immigration policies for the future. This chapter takes an historical approach to the difficult issues that are at the center of today's debates about the consequences of immigration. Because of the temporal distance and the long-run view that an historical approach affords, this effort can place the current concerns within the context of the country's economic development and growth. Most of the research and public debate about contemporary economic impacts of immigration focus rather narrowly on labor market and fiscal issues without taking this broader development perspective.

It is a formidable task to summarize the literature on the long-run economic and demographic consequences of the large-scale migrations to the United States in the twenty years preceding the First World War. There is an enormous literature on the subject ranging over every conceivable genre. These include nineteenth-century political broadsides, serious and masterfully-written histories, the forty-two volume report of the first Immigration Commission appointed in 1907, focused cliometric studies appearing in scholarly journals, autobiographies that witness the era of high immigration, two forthcoming histories of pre-World War I immigration (Ferrie 1997, Hatton and Williamson 1997), obscure statistical compendia, and theoretical analyses some of which are highly abstract and mathematically intricate.

The subject is also emotional, controversial, and difficult. In the past, as today, immigration policy arouses strong feelings and in some cases these have colored the analyses offered. Dispassionate inquiry is hard to find. Some authors express their conclusions with a degree of certitude that is difficult to justify from the evidence they offer. Writers on opposite sides often have failed to take account of the evidence and arguments of their opponents. The economic impact of immigration is a complex issue and one that simple models of supply and demand or even complex general equilibrium models simply do not address very well.

A final complication facing anyone who would wish to review the historical and analytical literature of the impact of pre-World War I immigration into the United States is that the general consensus on the subject reached by economic historians in the mid-1960s is currently under attack on a number of fronts by immigration economists working with modern

data. Yet, this revisionist work is so recent that for the most part the quantitative historical evidence has not yet been reexamined as part of the new agenda. The consensus of scholarly opinion reached in the 1960s was that the mass immigration into the United States during the three-quarters of a century before 1916 had, on the whole, profound positive effects on the rate of growth of the American economy and on the welfare of resident workers. Immigration is thought to have moderated the business cycle and to have had a negligible impact on the distribution of income. Those conclusions were frequently cited by supporters of immigration liberalization that led to the abolition of the quota system in 1965.

By contrast, empirical studies employing data spanning the last twenty-five years have tended to support restrictionist policies. Of course, there are many reasons why scholarly views about the impacts of the earlier and the current immigration flows might differ. Here we highlight the distinctive features of the theoretical approach taken by scholars who achieved the earlier consensus. It is an approach that is in very little evidence today.

Economic Growth and the Impacts of Immigration

Mass immigration into the United States occurred during a period of very rapid economic growth and America's ascendancy to international industrial leadership (Abramovitz and David 1973, 1996; Wright 1990; Abramovitz 1993; and Romer 1996). Most of the historians and economic historians who studied that earlier immigration tried to assess its relationship to these positive economic developments. To do so they relied, explicitly or implicitly, on a model of economic growth and of factor mobility. For those unfamiliar with this literature, it will be helpful to begin with some key definitions and a simple version of the model.

Economic Growth: There is little doubt that immigration caused the American population and the American labor force to grow more rapidly than they would have in its absence.[6] Figure 2 shows the contribution of net immigration to American population growth. During the period of mass immigration preceding World War I, immigration accounted for somewhere between a third and a half of U.S. population growth.[7]

More people meant more output. Population, after all, is fundamental to production, not only because people supply the required labor, but because the consumption of the population provides an incentive for production. Thus mass immigration made the late-nineteenth and early-twentieth American economy, measured, say, by real gross domestic product (GDP), grow more rapidly than it would have without immigration. This is, we think, what historian Maldwyn Allen Jones had in mind when he wrote in his classic book, *American Immigration*:

> The realization of America's vast economic potential has ... been due in significant measure to the efforts of immigrants. They supplied much of the labor and technical skill needed to tap the underdeveloped resources of a virgin continent. This was most obviously true during the colonial period.... But immigrants were just as indispensable in the nineteenth century, when they contributed to the rapid settlement of the West and the transformation of the United States into a leading industrial power.
>
> (Jones 1960, 309-310)

But this concept of growth, sometimes called "extensive growth," is not what economists usually mean by the phrase "economic growth." Instead, for economists, the growth of labor productivity, or the growth of per capita output, or the growth in the average real wage, or what is called "intensive growth," is the concept of greater interest. Labor productivity for the economy as a whole is measured by dividing GDP by the number of workers. Thus if productivity is to grow, GDP must grow faster than the employed labor force. If per capita output is to grow, GDP must grow faster than the population. So the question becomes: does immigration increase or reduce labor productivity? If workers are paid a wage that reflects their productivity, we can ask the same question as: does immigration increase or reduce the real wage?[8]

The statistical record is clear: intensive economic growth did take place during the era of mass immigration. Per capita GDP grew in real terms (Balke and Gordon 1986), so did labor productivity. Real wages rose (Long 1960, Rees 1960). Nonetheless, this evidence is not adequate to rule out a harmful role for immigration. During the late-nineteenth century, and, indeed for most of our history, output per worker was growing.[9] Thus, the real question is whether immigration retarded or accelerated the *rate* of intensive growth.

At first glance it would appear that there is no clear consensus among economic historians about the impact of turn-of-the-century immigration on the rate of intensive growth. The most careful of the several reviews of the historical literature, that by Jeremy Atack and Peter Passell (1994, 236-237), concluded that there was a large, positive, and "profound" effect of immigration on the rate of growth measured in per capita terms. Without immigration the rate of growth would have been slower and the resident population would have been poorer. At the same time, Jeffrey Williamson asserts that:

> The issue in American historiography...has never been whether immigration tended to suppress the rise in the real wage.... Surely, in the absence of mass migrations, the real wage would have risen faster ....
>
> (Williamson 1982, 254)

Williamson together with Timothy Hatton test the proposition that the pace of economic growth was slowed by immigration in a chapter of their forthcoming book *The Age of Mass Migration.* They conclude that late-nineteenth- and early-twentieth-century immigration "significantly retarded the growth of real wages and living standards economy-wide" (Hatton and Williamson 1997, Chapter 8).

It seems to us that there are three factors that underlie the apparent divergence of opinion about the impact of immigration: definitions of the population of interest, composition effects, and model specification.

Defining the Population of Interest: Which is the population for which the effects of immigration are to be measured? Is it the entire population, including the newly-arrived immigrants? Is it the population resident in the United States at the time of the immigrants' arrival? Perhaps it is the native-born, or even the native-born of native parentage. Are workers alone to be considered, or the workers and their dependents? Just workers and their families, or capitalists and landowners as well? Any of these populations may be a legitimate focus of attention. The appropriate definition depends upon the question being asked. One source of confusion in the literature stems from the fact that scholars have not always been explicit about the definition they have chosen.[10]

Composition Effects: To measure the impact of immigration on the wages of natives and of past immigrants, one needs to partition the population between the resident population and the new immigrants and consider changes in the welfare of the resident population alone. For the most part, however, long-term historical data on wages, income, and wealth is available only for the population as a whole. Scholars are forced to deduce the impact of immigration on the welfare of the resident population (or the native-born or the native-born of native parents) from data on the entire population.

Such a project is fraught with hazards. Average wages may fall at the same time that the wages of *both* the resident population and the newly-arrived immigrants are rising rapidly. This would occur if, say, there were a rapid influx of new immigrants who earned wages well-below those of the resident workers.

The Production Function. To assess the impact of immigration on intensive economic growth, economic historians have implicitly or explicitly relied upon a theoretical construct known as the "aggregate production function." This approach asserts that the aggregate output produced by an economy (its GNP) is determined by the quantities and qualities of its "factors of production," capital, labor, and land. Technological progress plays a role too; either because better machines and tools are used ("embodied" technical change) or because existing machines and tools are organized in better ways ("disembodied" technical change).

Capital includes machinery and buildings and other structures — all of the manufactured physical inputs into the production process that contribute to the level of output. Labor includes number of persons involved in the production process, their hours of work per day, their days of work per year, the intensity of their work effort, and their level of skill. Land includes improvements to land, natural resources and raw materials. A key feature of this theoretical construct is that it focuses attention on the productivity of factors of production and on the possibility of *substitution* among capital, labor, and land. Thus, for example, an increase in labor (perhaps from immigration) would be supposed to raise the productivity of capital and thus would create an incentive to invest and further expand the capital stock.

Model Specification: Another source of the difference of opinion stems from the fact that any assessment of the impact of immigrants requires a comparison between the historical

record and an explicit counterfactual; a comparison of "what was" with "what might have been" had immigration flows been absent or reduced. To assess the impacts of immigration the investigator must specify a general equilibrium model of both the labor and capital markets and of the production and distribution of output.[11]

The counterfactual method has a long history in cliometric work. By now it is clear that the outcomes of such exercises are quite sensitive to the specification of the formal theoretical model that describes the workings of the counterfactual universe (Fogel 1967). The aggregate production function must be specified mathematically and assigned numerical parameters. There are many technical questions. What is the degree of substitutability between the factors of production, that is, is the production function Cobb-Douglas, or CES, or Leontief? Are there economies of scale? Is the growth of the capital stock constrained by the flow of savings or by available investment opportunities? Is the model static or dynamic? The results also depend upon the assumptions built into the model about the distribution of wealth, income, and employment. Are workers paid their marginal product? Are governments redistributive? Do immigrants import or export capital? Do immigrants and native-born have different savings propensities? Is the macroeconomy Keynesian or neoclassical? Since the conclusions reached via counterfactual modeling are sensitive to the model's structure, the persuasiveness of any such exercise depends crucially upon the plausibility of the model specification.

Given this state of affairs, the most helpful thing we can do is to describe some of the prominent arguments about relevant aspects of the economy that appear in the literature. The reader will note that many of these issues are difficult to resolve with the available data and that the literature itself has given insufficient attention to the data that are available. In the absence of more empirical work, the conclusion readers reach will depend in large part upon their tastes for various theoretical constructs and their political ideologies. In the process of constructing our catalog, we will reveal our own priors. The reader is invited, at the same time, to form an opinion more compatible with his or her own tastes.

Capital Dilution: The Impact of Immigration on the Capital-Labor Ratio

An influx of immigrants who do not bring capital with them will have the effect of "diluting" the country's capital stock, that is, reducing the economy-wide capital-labor ratio. If capital and labor are substitutes (and all researchers assume that they are), this reduction in the capital-labor ratio will raise the rate of return to capital and lower the real wage of workers. The worker's wage falls, because after the influx of new labor, each worker has on average less capital with which to work. With less capital, labor's productivity and hence the wage are reduced. At the same time, each unit of capital has more labor with which to cooperate. Thus the productivity of capital and the return to capital owners is enhanced. On balance the impact of the reduction in the capital-labor ratio on the resident population is predicted by theory to be positive. Capital owners will gain and resident workers will loose, the gains of capital-owners exceeding the losses of resident workers. This is because the labor and capital owned by residents can produce more output after the arrival of the immigrants than before. Immigrants increase output by more than they take home in wages.[12]

In his discussion of the probable magnitudes of the redistribution effected by this mechanism in the modern era, George Borjas estimates that native workers loose about 1.9 percent of GDP and that native capital-owners gain approximately 2.0 percent of GDP. Borjas suggests that the relatively small net surplus — one-tenth of one percent of GDP — compared with the larger transfers from labor to capital, "probably explains why the debate over immigration policy has usually focused on the potentially harmful labor market impacts rather than on the overall increase in native income" (Borjas 1995, 8-9).

When considering the relevance of this redistribution for the period of rapid immigration in the early part of this century, we note, first, that many of the resident workers were also capital owners.[13] Lebergott (1964, 512-513) estimates that as late as 1900, about one third of the labor force were at the same time owners of land and capital. They were self-employed farm owners and the owners and operators of small retail shops and manufacturing plants. Others were providers of professional and personal services (Carter and Sutch 1996). Also we note that a substantial fraction of American household heads and workers owned their own homes. Michael Haines and Allen Goodman (1995) put the level at over one-third about the

turn of the century. To the degree that the arrival of new immigrants increased the demand for housing, owners of the existing stock of housing would enjoy capital gains.[14]

Second, a substantial fraction of the turn-of-the-century working-class population owned capital assets indirectly through the agency of insurance companies. Ransom and Sutch (1987, 386) estimate that in 1905 there were approximately nine-million Tontine insurance polices outstanding at a time when there were only about 18 million households. These Tontine policies were, in effect, self-financed pension funds invested in assets and equities whose value rose (or fell) with the return to capital.[15]

The wide-spread ownership of capital by resident workers at the turn of the century meant that any immigration-initiated redistribution of income among *individuals* was far more muted than the redistribution between labor and capital as *factors of production*. Though we know of no empirical work on this topic, the fact of widespread worker ownership of assets suggests that workers may not have been greatly harmed by capital dilution even if there was a depressing effect on their real wages in the short-run.

A third point to note in connection with the capital-dilution argument is that, whatever immigration's impact on the returns to capital, asset values, and real wages, the effects are likely to have been transitory (Easterlin 1968, 36-41). Higher returns to capital would, in a dynamic economy, increase the demand for capital; that is, it would shift the demand for investment outward. If the supply of savings is elastic or if the supply of savings shifted outward as a consequence of immigration, then the capital stock would increase, the capital-labor ratio would rise, real wages would rise, and the return to capital would fall back to normal levels.[16] We will return to these possibilities shortly.

Pressure on the Land: The Impact of Immigration on Natural Resource Utilization

Fear of environmental damage and restricted supplies of natural resources, especially land and non-renewal resources such as energy are an important source of anti-immigration sentiments in the United States today. Paul Ehrlich warned that population increase generally, and immigration in particular, would make the country:

> more crowded, more polluted, more ecologically unstable, ..., and far, far more precarious than we can possibly imagine.
>
> (Ehrlich 1982, quoted in Simon 1989, 188)

The Immigration Reform and Control Act of 1986 (which, before passage, was known as the Simpson-Rodino Bill) developed as an effort to regain control of our borders and was justified in terms of its potential in slowing the rate of growth of the U.S. population (Reynolds and McCleery 1988). Julian Simon (1989) attributes to Senator Simpson the following statement:

> The issue is whether we can or should give up benefits which stem from low population density — cleaner air, less traffic congestion, easy access to parks, and reduced anxiety levels.
>
> (Simpson 1981, quoted in Simon 1989, 188)

These concerns are relatively recent ones and were not addressed in the literature assessing the impacts of the pre-World War I migrations. In fact, the concern of contemporaries and of historians who studied the period, was the opposite one. Might immigration *slow* the rate of growth of the resident population?[17]

Nonetheless, there is a historical literature on the impacts of population growth and economic development on changes in environmental quality and on the supply of resources, including non-renewal resources. We offer a brief tour.

Immigration and Environmental Quality

The message of this work is well-summarized by David Card who notes:

> Perhaps the most important insight that economic theory offers about the impact of immigration — and a point that noneconomists typically find very confusing — is that population size per se is not necessarily a problem.
>
> (Card 1996, 5)

From the point of view of economics, environmental problems stem from poorly-articulated property rights. Upstream residents will foul rivers unless they are prohibited by law or required to pay damages. Herdsmen will overgraze the commons; fishermen will overfish ponds. In this view there is no one-to-one correlation between population size or density and environmental quality. Thus, even sparsely-settled lands can suffer serious environmental

damage (think of the near-extinction of the American bison) while areas with rapidly-growing populations can enjoy improvements (think of air quality in Los Angeles following the adoption of air quality controls). In particular, many notable improvements in environmental quality have occurred in rapidly-growing urban areas following government-initiated public health, sanitation, and zoning programs.[18]

Immigration and the Supply of Nonrenewable Natural Resources

The historical research conducted by Gavin Wright (1990) suggests that known reserves of nonrenewable resources such as petroleum and metal ores actually *grow along with* population and economic development. This is true in spite of the fact that resources are used up in the development process. The reason for the growth is that economic development provides the economic incentives to discover and extract new sources of supply. Historically, the discovery process has always outpaced utilization. The real prices of nonrenewable resources (oil, iron ore, coal, and so forth) have actually fallen over time.

Wright and Paul David and Wright (1996) credit America's ascendency to world industrial leadership about the turn of the century to the unusually rapid growth in the size of the American market. This was the result of an increase in both population and in income per capita. The rapid growth in the size of the American market meant a large potential payoff to the discovery and recovery of natural resources. Entrepreneurs responded to these incentives by making discoveries.

The Impact of the High Labor Force Participation of Immigrants

If a larger fraction of the population participates in the labor force, that will cause output per capita to rise even if the productivity of labor remains unchanged. Most economic historians place great weight on the fact that immigrants who arrived in the last era of mass migration were far more likely to participate in the labor force than the average American at the time. This pattern is shown in Table 1, which displays the share of the native- and foreign-born populations engaged in the workforce for the decennial census years 1870 through 1940. The participation rate for the foreign born is 50 percent or more from 1880 onward,

with the rate rising with the rising tide of immigration. The participation rate of the native-born is only about two-thirds of this level.

Kuznets explained the high labor force participation of immigrants in this way:

> Because the immigrants were predominantly males, because by far the preponderant proportion of them (over 80 percent) were over 14 or 15 and in the prime working ages, and because their participation in the labor force tended to be higher than that of the native population even for the same age and sex classes, the share of foreign born among the gainfully occupied was, throughout the period, markedly greater than their share in total population.
>
> (Kuznets 1952 [1971])

The data on the gender and age of immigrants is available beginning in 1820.[19] The long time series on the male share of immigrants is plotted in Figure 3. The predominance of males is a phenomenon of the entire period of uncontrolled immigration but it disappears within a decade following the imposition of limitations in 1921.[20] Figure 4 displays data on the gender composition of immigrants by age from the 1907-10 period with the most recent dat available on gender composition by age. The proportion male was well over seventy percent in the age range 18 through 40 in 1907-10. This represents a male-female ratio of more than two to one. For those in their late twenties the ratio is greater than three to one. The data from the beginning of the century, when the age of independence was younger than today, show a modest imbalance in favor of young women aged 12 through 16, undoubtedly produced by the earlier maturation of girls. In marked contrast is the relative gender equality in immigration in the modern data. In the prime migration age cohorts, women actually predominate.

The overwhelming proportion of immigrants are young adults. This is true in the past and it is so today as well. Figure 5 contrasts the age distribution of immigrants in 1907-10 with those for 1992-95. Clearly, the propensity to immigrate is strongest from ages 18 to 30 in both periods. One difference is that is the early immigrants were less likely to be accompanied by young children than is true today. This difference reflects the sharp increase in the propensity of women to migrate since the imposition of restrictions. The striking

predominance of males among the young adults who constituted the bulk of all immigrants in the past also meant that there were few children in the early immigrant flows.

If these foreign-born workers were as productive as the native-born and if their arrival did not depress the capital-labor ratio (that it *did not* is commonly supposed in the historical literature), then immigration would cause per capita income of the resident population to rise more rapidly than it would have in the absence of immigration (Gallman 1977, 30).[21]

The first element of the argument — that per capita incomes tend to rise because of the immigration-induced increase in the labor force participation rate — is well established. The balance of the argument — that immigration had a positive impact on the economic well-being of the *resident* population — depends upon two assumptions that are less-well supported by empirical work. One point has to do with possible productivity differences in native- and foreign-born workers. This issue will be discussed below, but the consensus is that any differences in the average productivity of the native- and foreign-born work force were small. The second key point -- the impact of immigration on capital formation -- has been left largely to assumption and speculation. Very little empirical work with historical data has been reported in the literature.

The Impact of Immigration on Physical Capital Formation

Simon Kuznets has argued that American economic growth was constrained by an inelastic supply of savings (Kuznets 1961). Moses Abramovitz and Paul David (1973, 1996) and David (1975) prefer a model in which expanding opportunities for investment (in turn driven by the flow of technological innovation) play the chief dynamic role, pushing out along a responsive and elastic supply of funds. The debate has not been settled.[22] What we know is that the capital stock grew and grew fast enough to prevent any decline in the capital-labor ratio. Abramovitz and David report that the capital-labor ratio grew 0.6 percent annually between 1800 and 1855, 1.5 percent between 1855 and 1890, and 1.34 percent between 1890 and 1927 (Abramovitz 1993, Table 1, 223). What was the mechanism behind this relative

increase in the capital stock? What was the likely role played by immigration? Because of the dispute, we consider two cases sequentially.

Case I: Savings Is the Constraint to Capital Formation

In this case, immigration would have to increase the rate of capital formation either by increasing the importation of capital from abroad or by increasing the flow of domestically-generated saving. Immigrants may have brought substantial amounts of capital with them when they moved. Although little empirical work has been done on this question, it is generally supposed that the amount of immigrant-supplied capital was trivial and, indeed, that any such inward flows were partially offset by an outward flow of "remittances" from immigrants to friends and relatives in the old country.[23] Alternatively, the foreign-born population may have attracted foreign investment to the American economy by alerting prospective investors in their country of origin of American investment opportunities, by borrowing from friends or relative abroad, or by acting as intermediaries connecting the foreign investor with an American borrower. Another possibility is that the higher rates of return to capital produced by the capital-dilution effect attracted capital from abroad. Brinley Thomas (1954 [1973], 1961) incorporated such a mechanism in his model of the Atlantic economy.

There is an extensive literature on international capital flows in this period (Edelstein 1982, Davis and Cull 1994), although we know of no systematic study of immigration-induced investment flows from abroad. We note the fact that much of the flow of British investment abroad was directed to economies with a high proportion of English settlers; the United States, Canada, and Australia (Edelstein 1974; Davis and Gallman 1973, 1991). Cairncross (1953) noted that since England was the primary source of international capital flows during the late-nineteenth and early-twentieth centuries, this gave the United States an important advantage.[24]

A second mechanism which might link immigration to capital formation in the saving-constrained case is the behavior of the immigrants themselves. They may have been unusually heavy savers and investors in the American economy. Such behavior was hypothesized by Ransom and Sutch (1984, 49-51) in the context of a life-cycle model of saving. They make two points. First, since the bulk of turn-of-the-century immigrants arrived as young adults,

they entered the country at a life-cycle stage when saving is typically heavy. Second, upon arrival, most immigrants owned very little in the way of marketable, tangible wealth, particularly in relation to their earning-power in their new home country. Partly this was because the immigrants had consumed much of their wealth in financing their passage to the United States; partly this was because they were poor by American standards before they left their country of origin. When they began receiving the new, higher, American income stream, they found themselves in an "asset-income disequilibrium;" that is, their stock of assets was too low relative to their current and foreseeable income. Under these circumstances they would attempt to restore the balance by saving heavily.

What evidence is there that immigrants were particularly heavy savers? There has not been much research on the question. One bit of evidence consistent with higher saving rates among the foreign-born is their differentially high rates of self-employment. These nativity-based differentials were just as evident in the past as they are today (Higgs 1976, Light and Bonacich 1988, Borjas 1986, Borjas and Bronars 1989, Aldrich and Waldinger 1990, Aronson 1991, and Carter and Sutch 1992). Since entry into self-employment requires physical and human capital acquisition, these data suggest differentially high saving rates among the foreign born. The 1910 Public Use Microdata Sample allows us to give a particularly vivid demonstration of the probable role of financial (and human) capital acquisition on the part of immigrants *after their entry into the United States*. In Figure 6 we show the fraction of the foreign-born self-employed among cohorts of men in their twenties, thirties, forties, and fifties in 1910, arrayed by the number of years they have been living in the United States. The shorter the line, the younger the cohort in 1910. This diagram suggests that newly-arrived immigrants, whatever their age, begin their American employment careers as wage workers and then increasingly move into self-employment eight to 12 years later. The consistency of the upward movement, for men arriving at different ages, suggests heavy saving rates in the years following their arrival into the United States.[25]

The saving rates of immigrants may have been higher than those of the native-born. Figure 7 displays self-employment rates by age for both the native- and foreign-born males

nonfarm workforces in 1910. We restrict the foreign-born population to those who had been resident in the U.S. for 15 years or more and were at least 33 years of age. This restriction eliminates the sojourners and also those who arrived in the United States as children. Figure 7 shows that the self-employment rates at each age of these two groups are quite similar. Both groups show movement at about the same rate into self-employment between their early thirties and mid forties. If we imagine that some of the movement of the native- (but not the foreign-) born at these ages was facilitated by the receipt of an inheritance, then the similarity of their rates of movement into self-employment suggests *heavier* saving on the part of immigrants.

A second piece of evidence of differentially high rates of saving among the foreign-born is Haines and Goodman's finding of higher home ownership for the foreign-born in several samples of household heads from the turn of the century (Haines and Goodman 1995, Table 7.3, 220-221).[26]

Whether the additional "boom in saving" triggered by immigration, hypothesized by Ransom and Sutch, was strong enough by itself to both offset the initial capital dilution and raise the overall capital-labor ratio remains an open question. What is clear is aggregate American saving rates were very high during this period. Gross saving as a fraction of gross domestic product exceeded twenty percent (Davis and Gallman 1973, 1991; Ransom and Sutch 1984). What is also clear is that the capital-labor ratio did not fall during this period — it rose. How much of that increase can be attributed to the savings of immigrants remains a question for further research and the resolution of the debate concerning the constraints to capital formation.

Case II: Demand is the Constraint to Capital Formation

If savings were supplied elastically, then a link between immigration and capital formation would have to lie in an effect of immigration on the demand for capital. But there is a strong argument for such an effect. Kuznets (1958, 34) argued that immigration would shift the demand for capital outward, by stimulating the demand for housing, urban infrastructure, and other "population-sensitive capital formation."[27] Kuznets' hypothesis is

undoubtedly correct. To complete the argument and say that immigration therefore led to more capital formation requires something more. Either saving would have to be very elastic, or the savings rate of immigrants would have to exceed that of residents as in Case I. If saving were inelastic in supply and if there had been no immigration-induced shift of the supply of saving, then the increased demand for investment would have simply pushed up the rate of interest rather than increased the capital stock. What we observe is that real interest rates were low and falling during the last half of the nineteenth century and the rose only moderately during the period of mass immigration in the early decades of the twentieth century (Temin 1971, 70-74; Williamson 1974b, 97). This evidence suggests that immigration helped stimulate the increase in the capital stock and in the capital-labor ratio by pushing out both the supply of and the demand for capital.[28]

The Impact of Immigration on Inventive Activity

America became a world leader in many technologies over the late-nineteenth and early-twentieth centuries (Mokyr 1990, 268; Wright 1990). Rapid immigration may have contributed to this ascendancy by the simple fact that the foreigners enlarged the size of the economy. A larger economy means that more is being produced at any one time. A greater volume of production meant more opportunities to discover better ways of doing things (Kelley 1972). Historians of technology have demonstrated the quantitative importance of this "learning by doing" in stimulating technological advance. Small incremental improvements, repeated many times, appear to have contributed more than well-known breakthroughs to advances in design and to reductions in the costs of production (David 1975; Rosenberg 1982). By promoting extensive economic growth, immigration gave the country's inventors and tinkerers more to do, thereby offering them more opportunities to learn.[29]

Adam Smith thought that invention was accelerated by the division of labor which in turn was limited by the size of the market (Smith 1776, 11). Robert Higgs found a link between patenting activity and urbanization in the United States during the period 1870-1920 (Higgs 1971a). Julian Simon and Richard Sullivan (1989) show a connection between population size and the invention of new agricultural techniques. Since the foreign born

enlarge the population, tend to reside in urban areas, and expand the size of the market, there is a scholarly consensus that immigration accelerates inventive activity.

Immigrants may have played a more direct role in this development as well. Some scattered evidence suggests that immigrants accounted for more than their share of the major inventive breakthroughs in this era. A list of names of the "great" American inventors suggests a disproportionate share of immigrants. Why might this be a systematic aspect of the invention process rather than a coincidence or the result of a flawed sampling procedure? A good answer, we think, is that America was the leading laboratory for invention in the world at the time, with the most advanced industries and one of the highest rates of capital formation. Thus it would be a magnet for would-be inventors, scientists, and innovators who would benefit from the working conditions, resources, and venture capital not available in their home country.

The Impact of Immigration on Technological Diffusion

Invention will have no impact on economic performance unless the new ideas diffuse; are embodied in new machines, organizations, and structures; and are actually used in the production of goods and services. The new, mass-production techniques introduced in the era of mass immigration required new machines and the redesign of the factory itself. Effective use of refrigeration technology required new railroad cars; use of the electric motor to drive machines required new designs for both the machinery and the layout of the factory. So too with continuous flow technology, department store merchandising, and nearly all of the other important innovations of this era. Immigration helped to speed the diffusion of new technologies since it enhanced the rate of growth of the population and the gross domestic product of the economy, thereby stimulating a rapid growth in the capital stock. In the process of undertaking the new investment required, the latest and most productive technology was adopted. By providing an incentive for new investment, rapid extensive growth of the economy lowered the average age of capital, bringing more of the advanced techniques into the production process (Nelson 1964). Had the country not welcomed the new immigrants to

its shores, aggregate demand would have grown more slowly, there would have been less new investment, and the diffusion of new technologies would have been delayed.[30]

The Impact of Immigration on the Exploitation of Economies of Scale

To the extent that there were and are large unexploited economies of scale in various industries (external to the firm), then the extensive growth of the economy by itself would expand per capita output. Hollis Chenery (1960), in a study of the productivity of manufacturing workers across 63 countries found that, other things equal, a doubling of a country's size would increase the productivity of its workers by 20 percent. The models of growth most often invoked by economic historians, however, do not envision such an effect as a possibility. They begin with the view that the various sources of and contributions to economic growth may be separately and independently calculated and then added up without consideration of economy-wide increasing returns. But if the research begins with such a model, one is certain to come to the conclusion, independent of the data collected and the historical research undertaken, that no single measurable source of growth is by itself very important (Abramovitz 1993). Recently Paul Romer (1986, 1996) has urged a reconsideration of the use of models that explicitly incorporate economies of scale for addressing broad-scope, long-run questions such as the one at hand.

As far as we are aware no one has explicitly tried to examine turn-of-the-century immigration as a possible accelerator of endogenous growth using the "new growth theory" advocated by Romer.[31] There is some evidence which has been put forward, however, to lend support to the notion of increasing returns that work at the level of the national economy (Cain and Paterson 1986). Louis Johnston (1990) has attempted to model these effects by suggesting that the productivity-enhancing effect of scale is proportional to the total stock of capital and he suggests a specific parameterization. Based on his study of increasing returns in the mid-nineteenth century, he suggests that the rate of growth of output might be increased by a factor equal to five percent of the increase in the capital stock on account of economies of scale and quite apart from the direct contribution of capital stock growth to economic growth. De Long (1995) suggests the true factor might be as high as 10 percent.

What would such parameters mean for the impact of immigration? If the flow of new immigrants increased the labor force by four to eight percent over a decade and eventually increased the capital stock by the same proportion, then output would be increased by 0.2 to 0.8 percentage points more than the direct effects of the increase in labor and capital would suggest. This translates to a five to ten percent increase in productivity. This extra supplement to growth, although proportional to the increase in capital, is not entirely captured in an increase in business profits. Instead the entire economy is made more productive and both labor and capital share in the "disembodied" increase in efficiency.

So far, empirical modeling with the new growth theory is in its infancy. The profession is far from persuaded that the economies-of-scale effects are or were significant and the parameterization of such effects is little advanced from educated speculation.[32] Yet in the hands of a skillful economic historian the notion of economies of scale can be made to sound plausible and in good theoretical company as well. Consider Moses Abramovitz' account:

> In the nineteenth century ... capital's share (in national income) rose substantially — by 19 percent during the first half and by another 19 percent during the second half, a 41 percent increase overall. It is this result that creates, as I say, at least a presumption that technology was advancing, not in the neutral fashion that the growth accounts assume, but in a capital-using fashion. A series of powerful, forces, each manifestly connected with technological progress, worked in this direction. First, the great expansion in the total size of the domestic market and its increasingly unified character encouraged production on a larger scale and heavier investment in the application of steam power and in more specialized capital equipment. This, indeed, is the message of all the great economists of the nineteenth and early twentieth centuries, in a line stemming from Adam Smith, running through Böhm-Bawerk, Sidgwick, and Taussig, and stretching to Allyn Young. But these men did not see the economies of scale as a source of growth separate from technological progress itself. Rather, they thought of the advances they saw with their own eyes as an emerging technology that was both capital and scale intensive. It was increasing specialized and roundabout in its organization; required increasing amounts of capital per worker to employ it; and therefore demanded larger-scale operations in its plants and in the aggregate to make the heavier use of capital economical. ... (Second, the) rise of cities, itself a requirement of scale-intensive production, was another capital-intensive development. It required heavy investment in structures for housing, trade, finance, government, and schools and, especially in its early stages, for streets,

> water supplies, sewage disposal, and urban transport. ... (Third, the) westward movement ... by attracting immigrants, enlarged the effective aggregate scale of the economy. (Abramovitz 1993, 225-226)

The Impact of Immigration on the Supply of Human Capital

Simon Kuznets made an argument for a positive impact of immigration on the native-born that suggests a very large effect coming from the importation of human capital.

> Considering the magnitude and duration of (the immigration flow), it is difficult to exaggerate its importance as a factor in the economic growth of the United States. Since immigration brought in a large labor force, the cost of whose rearing and training was borne elsewhere, it clearly represented an enormous capital investment that dwarfed any capital inflows of the more orthodox type.
>
> (Kuznets 1952 [1971])

Larry Neal and Paul Uselding elaborated on this point (Uselding 1971, Neal and Uselding 1972). They began by noting that most immigrants came to the United States as young adults and entered the labor force, thus producing output, earning wages, and consuming almost immediately upon their arrival. Their income can be thought of as the return to the "human capital" they imported when they moved to this country. Yet that human capital -- manifest both in its potential for purely physical labor and in the skills and learned abilities of immigrants -- was created in another country. The American economy (and a new American) earned the returns from the human capital that had been transferred from -- and without payment to -- the economy that spent its resources on raising the individual to young adulthood and endowing him or her with education and other valuable skills. Freed of having to pay for this importation of human capital, the American economy was able to invest the equivalent resources in physical or human capital produced at home. Neal and Uselding calculate the contribution to the U.S. capital stock of these gifts. They suggest that immigration might have contributed as much as nine percent of the capital stock by 1850, 18 percent by 1880, and 42 percent by 1912.[33] With this larger capital stock — the proportions here are larger than the same immigrants' contribution to the labor force — the national capital-labor ratio was higher than it would have been otherwise. Thus labor productivity was higher than it would have been without immigration.[34]

The Selectivity of Immigration: The Question of "Quality"

The historical literature has given considerable attention to the issue of immigrant "quality." Though the use of the term "quality" is unfortunate, the larger question is interesting. Did the United States attract the more-highly skilled, the more entrepreneurial and the more adventurous from abroad, or did it receive the "tired, ... poor, your huddled masses," the unlucky, the least educated, and the least able?[35] Presumably, "high quality" immigrants would accelerate economic growth, vitalize and enrich the society, and more quickly assimilate into the American "melting pot." "Low quality" immigrants would, it has often been charged, be more likely to become a burden on the economy, exacerbate inequality, and prove to be a disruptive social force.[36]

In 1891 Francis Walker, the first President of the American Economic Association and former Superintendent of the U.S. Census, expressed his opinion on the matter with little generosity:

> (N)o one can surely be enough of an optimist to contemplate without dread the fast rising flood of immigration now setting in upon our shores ... (T)he immigration of the present time ... is tending to bring to us no longer the more alert and enterprising members of their respective communities, but rather the unlucky, the thriftless, the worthless .... There is no reason why every stagnant pool of European population, representing the utterest failures of civilization, the worst defeats in the struggle for existence, the lowest degradation of human nature, should not be completely drained off into the United States. So long as any difference of economic conditions remains in our favor, so long as the least reason appears for the miserable, the broken, the corrupt, the abject, to think that they might be better off here than there, if not in the workshop, then in the workhouse, these Huns, and Poles, and Bohemians, and Russian Jews, and South Italians will continue to come, and to come by millions.
>
> (Walker 1891, as quoted in Handlin 1959, 73-74)

The discussion of immigrant "quality" is intimately bound up with the pull-versus-push debate about the motives underlying immigration. If immigrants were pushed out of their home country by increasing immizeration, lack of jobs, or the shortage of land, the presumption is that immigrants would tend to be individuals from the lower tail of the skill and resourcefulness distributions of their country of origin. On the other hand, if immigrants were

pulled to the United States by the attractiveness of American opportunities, they are more likely to come from the upper tail of the home-country distribution.[37]

Whether looked at from the point of view of the attributes of the arrivals or the push-versus-pull controversy, the consensus achieved by economic historians is that, before World War I, America attracted immigrants from the upper-tail of the skill distribution in their countries of origin (Easterlin 1971, Dunlevy and Gemery 1983). Even Brinley Thomas (1954 [1973], 56-62), one of the few writers who sees a strong role for push factors in motivating immigration, believed that migrants to the United States tended to come from the upper strata of their own societies. And Joel Mokyr (1983, 247-252), in his study of the migration from Ireland during the famine of the 1840s — surely an extreme example of a "push" migration — concluded that immigrants to America came from the upper tail of the Irish occupational distribution.[38]

Whether these select workers from Europe's perspective appeared as high-skilled and advantaged competitors in the American labor market is more controversial. It could be true that immigrants selected from the upper-tail of their home-country's distribution of skills and other endowments, nevertheless fell below the median of native-born American workers. Oscar Handlin in the classic history of immigration to America, *The Uprooted* emphasized the agricultural background of immigrants and asked, "What could the peasant do here?"

> He could not trade or do much to help the traders. There was some room for petty shopkeepers; he lacked the training and capital. Some handicraftsmen supplied clothes and furniture and a variety of other products to townsfolk; he lacked the skill and tools.
>
> (Handlin 1951 [1973], 58, 60)

This view also appears in some surveys of American history. The textbook by Gary Nash, *et al.* (1986, 604), for example, reports that "most immigrants" after the Civil War "had few skills." In addition, it has been asserted that the quality of immigrants fell over time. Thus, a popular textbook in economic history states that, "It is probably true that immigrants after 1880 were less skilled and educated than earlier immigrants."[39]

The quantitative evidence on skill differences between native- and foreign-born workers does not support this view, however. There appear to be no significant skill differences — at

least where these are measured by occupational differences — and the relative occupational standing of immigrants does not appear to have fallen over time. The standard reference on this topic is Peter Hill (1975, 59) who examined data from the federal occupational censuses looking for clues about the relative skills of native- and foreign-born workers.[40] He categorized occupations as either "skilled," "semiskilled," or "unskilled," using the classification devised by Alba Edwards (1943) and compared the distribution of the native- and foreign-born workforces across these categories.[41] Hill's tabulations are shown in Table 2. Compared with natives, the foreign-born were slightly less likely to have been employed in skilled positions but they were *much more* likely to have held semiskilled jobs. During the period of mass immigration foreign-born workers tended to cluster in the middle of the American occupational distribution. Proportionately native-born American workers were concentrated both above and below them on the occupational ladder.

Overall Hill concluded:

> Contrary to the opinions expressed in most of the literature, there seems to have been very little difference in the quality of the native and foreign born labor forces. Also, no definite trend is evident in these estimates, although most writers seem to feel that the later immigrants were of much lower quality than the earlier ones.
>
> (Hill 1975, 58)

Hill's conclusions represent the consensus of the economic historians: the mass immigrations before the First World War do not appear to have reduced the "quality" of the American workforce.[42]

The Impact of Immigration on the Real Wage

We come to a topic on our list of possible economic impacts of immigration that is most often used to suggest a negative impact. Throughout the period of open immigration contemporary observers and especially spokesmen for labor charged that the inflow of immigrants depressed the real wage of labor. The "more the supply of labor the lower must certainly become its price," said Henry Carey, a prominent economist in 1873 (quoted in

Lebergott 1964, 161). This, Carey argues, would not be a small and transitory effect like that produced by capital dilution, but a large and permanent reduction in real wages. Carey's reasoning, as we reconstruct it today, would appear to rest on a simple model of the supply and demand for labor analogous to the familiar supply and demand for a single commodity, say wheat. If this analysis is meant to apply to all labor, it is — of course — naive. The supply and demand analysis of labor markets only makes sense when applied to the market for a specific type of labor (say, slate miners). The macroeconomic view of the labor market is quite different. An increase in the quantity of labor employed would immediately change the demand for labor: the new labor would earn income, would spend this income, increase aggregate demand, and thus increase the demand for labor.[43] After adjusting to the shock of capital dilution, real wages would be unchanged.

As far as we are aware, all studies that conclude that immigration depressed the real wage of labor rely upon such an incomplete model such as this. Thus Stanley Lebergott (1964) seems to have had the simple model in mind when he attributed the increase in wages during World War I and the "Roaring Twenties" to restrictions on immigration:[44]

> When the immigration flow was cut off in 1914 (first by German submarines, then by legislation) wages rose markedly, as shown in Table 26.3. In the 15 years after 1914, workers' incomes rose as much as they had over the prior half-century. No speedup in entrepreneurial ingenuity or productive energies of workers was occurring at that dramatic rate. Congress, by shutting off the flow of workers from Europe, had helped push up workers' wages.

TABLE 26.3
Average Earnings of Nonfarm Workers
(IN 1914 DOLLARS)

1860	457
1914	696
1929	898

Source: Computed from Lebergott 1964, 428, 524.

If the restrictions on immigration had been the *only* change in the economy during this period and there were no dynamic responses to immigrants, then Lebergott's evidence might persuade. As it is, there are many reasons why real wages might have risen during this dynamic period.[45]

Timothy Hatton and Jeffrey Williamson (1997, Chapter 8) seem to have a more complex model in mind when they argue that rapid immigration in the two decades between 1890 and 1910 caused wages to be lower in 1910 than they would have been in the absence of immigration. Their calculations are complicated, but ultimately depend upon an assumption built into their model that an increase in the labor force produces a permanent fall in the real wage arising from capital dilution.[46] By assumption, they rule out any impact of immigration on the capital stock. They exclude all of the dynamic effects summarized above that are thought to have generated a positive effect of immigration on real wages and the rate of economic growth. The work of other economic historians suggests that dynamic responses to the labor inflows were wide-ranging and quantitatively important.[47]

At this point it is worth pointing out two facts that are not in dispute. The first is that, whatever the effect of immigration, real wages of labor rose throughout the period between the Civil War and World War I. Figure 8 displays data on the real wage in manufacturing (Long 1960, 1961; Rees 1960). There is no striking slowdown of real wage growth during the period of most rapid immigration between 1900 and 1914.

The second point is that the waves of immigrants ebbed and flowed in synchronization with the economy. When immigration rates were high, unemployment rates fell; when immigration rates slowed, the economy was depressed. We are not suggesting that immigration *led to* an improvement in employment. Rather, we reiterate the emphasis of Richard Easterlin who interpreted these patterns as evidence that immigration responded to changes in the American demand for labor (Easterlin 1968, 30-33).

In conclusion, then, there is no evidence that immigrants reduced wages nor that they lowered living standards of the resident population, nor that they raised unemployment rates.

The Impact of Immigration on Wage Inequality

While the proposition that immigration could depress all real wages the way a bumper wheat crop would depress the price of wheat is neither supported by theory nor data, the proposition that immigrants might have an unfavorable effect on the wages of some occupations or groups is another matter entirely. If, say, a large influx of slate miners from Wales were to arrive in the slate mines of Michigan, they might well increase the supply of labor relative to the demand for slate and drive down the wages of native-born workers in that industry. Since it is unlikely that the Welch slate miners would increase by a measurable degree the aggregate demand for slate in the economy, there would be no offsetting effect on demand for slate miners.[48]

If immigrants are disproportionately low-skill, then their arrival might have a negative impact on the wages of other low-skill workers. If immigrants all flock to a single region then they might soon overwhelm local labor markets. Their geographic concentration would likely harm the native-born workers in these areas, exacerbate regional income inequality, slow cultural and linguistic assimilation, and even retard the economic advancement of the immigrants themselves. The historical literature has focused on three dimensions of immigrants' impact on wage inequality: these are wage differentials based on skill, on race, and on geography.

Immigration and the Skill-Differential in Wages

Jeffrey Williamson and Peter Lindert have assembled a variety of measures of the skill differential in wages for a period spanning nearly two centuries. In Figure 9 we display one of their measures — the relative wages of skilled to unskilled urban workers for the period 1858 through 1939 (Williamson and Lindert 1980, 307).

This measure shows a pronounced *rise* in the relative earnings of the skilled between 1896 and the beginning of World War I, in other words, throughout the period of mass immigration. In the view of Williamson and Lindert, however, immigration was not responsible for this development and played only a "minor role in explaining the resurgence of

wage rate inequality at the start of this century" (Williamson and Lindert 1980, 236). Instead, they emphasize the role of the "pattern of technological progress."

> Agricultural total factor productivity actually declined, according to the Kendrick estimates, a development that should have undercut the growth in demand for common labor. Kendrick's figures further imply faster productivity growth in the rest of the economy, with productivity growth in the tertiary sector now hitting its fastest rate ever. The model tells that this acceleration of productivity in the skill-intensive tertiary sector explains why teachers, mechanics, carpenters, and other skilled groups enjoyed rising wage advantages in the first decade of this century.
>
> (Williamson and Lindert 1980, 236)

More recently Claudia Goldin (1994, 12) has looked simply at the trend in the real wages of unskilled laborers. She notes that Whitney Coombs' (1926) data on the wages of low-skilled labor (when deflated by a cost of living index) moved down after 1907 before rising again during the World War and speculates that the influx of immigrant labor and then the wartime cutoff might have been the cause.[49]

We have serious reservations about this evidence. Coombs' data, which we display in Figure 10 are a pastiche of observations drawn from a variety of sources.[50] Coombs used one primary source for the period between 1890 and 1907 and another for the period 1908-1914. On the graph we have labeled these two fragments Coombs I and Coombs II. The decline in real wages cited by Goldin is largely a matter of a change at the break in sources.[51] Moreover, the adjustment to hourly wages for Coombs II is made by a different procedure than that used for Coombs I (David and Solar 1977, 63-64). Data for the 1920s is from yet a third source, the National Industrial Conference Board. It was collected by mail questionnaires and left the definition of "unskilled" production workers to the responding firms. It is difficult to know how to compare it to the prewar data.[52]

Immigration and Racial Wage Differentials

There is another large literature that focuses on the impact of foreign immigration on the geographic mobility and relative wages of Black Americans. For the early period Brinley

Thomas (1954 [1973]) suggested that the mass immigration from Europe in the decades before World War I kept African-American "bottled up" in the agricultural South. There is no doubt that their wages in the low-productivity, stagnant, and oppressive South were lower than they would have been in the dynamic and prosperous North in the fifty years between Emancipation and World War I. Their failure to migrate in any significant numbers is one of the mysteries of late-nineteenth-century American economic history. There is no shortage of explanations in the literature, but other than Thomas' speculations, no one emphasizes the role of immigration. Ransom and Sutch (1975, 1977) emphasized the institutional structure of the crop-lien, tenant-farming system of post-Civil War agriculture in which Blacks were "locked in" by a form of "debt peonage." Wright (1986) discussed the role of the peculiar and controlling labor markets of the South. Margo (1990) stressed the inadequate Southern schooling system which left most Blacks ill-prepared to compete for urban jobs. Tolnay and Beck (1995) explored the role of extra-legal coercion. Whether the hypothetical absence of competition from European immigrants in this era would have induced Blacks to overcome these oppressive forces and begin their "Great Migration" before the 1920s is an important and unanswered historical question.

Immigration and Regional Wage Differentials

Regional wage differentials have been a persistent feature of American labor markets, at least since 1840 (Easterlin 1960, Williamson 1965, Rosenbloom 1996). One question is whether immigration acted to exacerbate or to ameliorate these differentials.

Immigrants tend to concentrate geographically in a small number of "magnet" destinations.[53] This is true today and it was also true during the earlier wave of mass immigration preceding the First World War. There are two principal hypotheses in the literature regarding the forces that create these magnets. One is that these destinations are regions of high opportunity and high wages that attract in-migration of the foreign-born and residents alike. Another view is that immigrants are attracted to cities that already have thriving immigrant communities with well-developed ethnic support networks and flock to them without reference to their relative economic prosperity.

If the first view is correct, then immigration would serve to accelerate economic growth by removing allocative inefficiencies and relieving bottlenecks. It would also tend to reduce wage inequality by expanding the labor supply in high-wage markets. The second view, by contrast, suggests that immigrants would soon overcrowd local labor markets and the ethnic neighborhoods that originally attracted them. Their geographic concentration would likely harm the native-born workers in these areas, exacerbate income inequality, slow cultural and linguistic assimilation, and retard the economic advancement of the immigrants themselves.

One recent study that bears on the relative importance of these two hypotheses was conducted by Goldin (1994), who was interested in the impacts of immigration on inter-city differences in wage rates about the turn of the century. In the cross-section, Goldin finds a strong *positive* relationship between the fraction of a city's population that was foreign-born and the city's average wage. In other words, cities with a large fraction of immigrants had the highest wages. We are persuaded by Goldin's (1994, 247) conjecture that, "immigrants sought out labor markets with high wages." Goldin also finds that the arrival of immigrants caused wage rates to rise more slowly than they might have, had the immigrants not come. More precisely, "in general, a 1-percentage-point increase in the population share that was foreign born depressed wages by about 1 to 1.5 percent" relative to cities with fewer foreign born (Goldin 1994, 250). In other words, without the influx of immigrants, wages in high-wage cities would have been higher still. Because of their propensity to move to high-wage cities, immigrants helped to equalize inter-city wage rate differences by alleviating labor shortages. Had there been no immigration, native-born workers would have moved to fill these positions and the negative wage impact would have still been felt by the native-born residents of boom cities. To blame the immigrants for the adjustment back to equilibrium is simple scapegoatism.[54]

In conclusion, the work of economic historians does not identify any systematic role for immigration in raising wage inequality during the era of mass immigration. This "result" is not surprising. Recall the evidence presented earlier indicating that immigrants fell in about the middle of the American skill distribution. In any case, while the urban skilled-unskilled wage differential *did* rise, this rise seems to have been the result of forces other than

immigration. While Blacks *did* remain bottled up in the low-wage South, this, too, seems to have been due to factors other than immigration. In the meantime, regional wage inequality was *reduced* by the propensity of immigrants to locate in high-wage cities.

Immigration and the Business Cycle

In the period of essentially unrestricted immigration before the 1920s the annual inflows were extremely sensitive to economic conditions in the United States. Prosperous years attracted far more immigrants than depression years. This cyclical sensitivity is evident in Figure 1, which displays the number of immigrant arrivals each year beginning in 1820. Between 1891 and 1895, for example, when the unemployment rate almost doubled from 4.5 to 8.5 percent, the number of immigrants fell by more than half, from 560 thousand to 259 thousand. Even more dramatic is the almost 40 percent reduction in the number of immigrants in a single year, from 1.3 million 1907 to 783 thousand in 1908 in response to a sharp jump in the unemployment rate from 3.1 to 7.5 percent between those same years (U.S. Bureau of the Census 1975 [1997], C 89 and Weir 1992, 341). Harry Jerome (1926, 208) concluded that the lag between economic activity and immigration in this period was only one to five months.

The strong sensitivity of migration to the U.S. business cycle in the pre-quota era essentially disappeared with the imposition of regulation (although the impact of the Great Depression is evident). As Figure 1 shows, in the recent period, immigration flows have increased in almost every year, with little sensitivity to year-to-year changes in macroeconomic conditions. This is because immigration is today closely regulated and because more wish to migrate than the number of visa slots available. Most successful immigrants have been waiting for admission for several years. Today, year-to-year changes in the number of immigrants reflect policy changes, not changes in demand for admission.

It was not just the inflow of immigrants that responded to economic conditions in this country; the outflow of emigrants also responded to the rate of unemployment. Kuznets and Rubin have estimated return migration for the period 1870 to 1908 based on official reports of passenger departures and several assumptions about the mix of American citizens and returning immigrants in the departure data, the mortality of foreign-born in the United States, and the

mortality of Americans when visiting abroad (Kuznets and Rubin 1954, Table B-1, 95-96).[55] These data are displayed in Figure 11 together with the official data from 1908 onwards. Figure 12 displays the departures of immigrants as a fraction of all arrivals. The return rate rose from less than ten percent in 1870 and 1881 to over seventy percent just before World War I. This increasing propensity of the U.S. to attract sojourners makes sense given the declining cost of trans-Atlantic passage due to the continual technological improvement of the steamship following the introduction of scheduled service on the North Atlantic in the 1860s (Baines 1991, Wyman 1993).

Figure 12 shows large increases in the rate of departure during the business downturns after 1873, in 1885, after 1893, and in 1908. Throughout the period preceding the First World War, the inward and outward movements of immigrants show a negative correlation.[56] In 1910 and 1913, when arrivals are up, departures are down. In 1912, when arrivals are down, departures are up. The relationship changes with the onset of the War. Both arrivals *and* departures are down during the war years and up during the immediate post-war period.

Brinley Thomas (1954 [1973]) has developed an elegant model of the "Atlantic Economy" as an integrated economic unit with flows of immigrants, goods, and capital moving in a rhythm of self-reinforcing and inversely related long-swing Kuznets cycles.[57] This raises the possibility that immigration acted as a "governor" for the economy slowing down the booms and cushioning the depressions.

Charles Kindleberger (1967), commenting on European economy in the post-World War II period, has emphasized the potentially important role that sojourners might play in moderating the business cycle. In the upturns an elastic labor supply from abroad might relieve bottlenecks, moderate wage increases, and thereby extend an expansion. In downturns a reduced labor supply can help alleviate the downward pressure on the wage rates earned by the resident population and reduce the drain on public coffers for support of the unemployed.[58]

Recently, Hatton and Williamson (1997, Chapter 8) have revived the issue of the role of sojourners in moderating the consequences of economic fluctuations in the United States. They compare the actual course of the business cycle of the 1890s with a "no-guest-worker

counterfactual" and conclude that the impact of guest workers on the business cycle was "surprisingly small." Yet this assessment is based on their finding that "free migration muted the rise in unemployment during the biggest pre-World War I depression, 1892 to 1896, by only a quarter." Size is in the eye of the beholder, but some would judge this effect as gratifyingly large.[59] Clearly an important area for further research would be to improve our understanding of the impact of the sojourner on the American economy at the turn of the century, especially in light of the possibility that temporary workers admitted as "nonimmigrants" and illegal migrants might be playing a similar role in the American economy today.

Economic Mobility of Immigrants

Joseph Ferrie (1997) has made an extensive study of immigrants who arrived in the 1840s. By matching the names of immigrants on the passenger manifests submitted by ship captains to immigration officials with individuals located in the manuscript censuses of population for 1850 and 1860, Ferrie was able to obtain estimates of the skills, wealth, and economic mobility of recently-arrived immigrants in those two years. He finds that immigrants rapidly accumulated wealth and human capital, exhibited substantial upward occupational mobility, and fared best if they entered with some skills rather than without. Compared to the rapid assimilation and improvement in status of modern immigrants, however, the pre-Civil War immigrants fared less well.

The upward mobility of immigrants and their children is illustrated by data from the 1910 census assembled by Edward P. Hutchinson (1956). He created an index of occupational concentration. Setting the proportion of foreign-born in the labor force at the scale of 100, he then calculated the relative proportion of foreign-born workers in each industry. An industry in which the foreign-born were under-represented has an index number below 100, one with a more-than-proportionate share of foreign-born workers receives an index number greater than 100. The exercise is then repeated for the native-born workers of foreign parentage. A sample of results is displayed in Table 3. The foreign-born appear to be concentrated in the lower-skilled and lower-status occupations listed at the bottom of the table. By the second

generation, however, the prestigious professional occupations of accountant, engineer, and lawyer are at or above parity and the concentration of immigrants in the low-status occupations has all but disappeared.

Concluding Observations

In this paper we have tried to highlight the distinctive features of the theoretical approach taken by scholars who analyzed the impacts of the mass migration into the United States in the two decades preceding World War I. Broadly speaking, this literature was couched in terms of the "aggregate production function." This approach emphasizes advancing technology, productivity change, and changes in "factor proportions," chiefly the capital-labor ratio. Thus capital accumulation, innovation, and change in the participation rate and skills of the labor force play the most important roles in explaining changes in the standard of living over time. The production-function approach directs attention to the close interrelatedness among the many diverse elements in the economy. Thus an increase in immigration may, in the first instance, affect only the wages of resident workers who face direct competition. But, beyond this immediate impact, immigration may have far-reaching impacts on the entire structure of the economy including the labor force participation, skill level, and sectoral distribution of the resident population; the amount and quality of capital, the organization of production, and the composition of output.

A notable difference between the historical studies and the recent literature on the impact of immigration is the propensity of the current literature to concentrate only on the first-round consequences. It is easy to show that these will be harmful to resident workers who face direct competition. Economic historians writing about the earlier period of high immigration went beyond the first-round effects. Taking a long-run perspective, they identified many aspects of the mass immigration that were very beneficial from the point of view of the resident population.

One consequence of neglecting the impact of immigration on the growth and development of the economy evident in the current literature, is to focus attention on the redistributive effects of immigration: either redistributive through the labor market or through

the tax and transfer systems of the government. These "zero sum" redistributions always create some losers. If history is any guide, however, the dynamic impacts of immigration accelerate the rate of growth so substantially that the redistributive effects are swamped. In the past, according to the consensus view, every group gained from immigration. Some gained relatively more than others, no doubt, but it is hard to find evidence that immigration reduced real wages of the resident population, worsened the income distribution, harmed the black population or exacerbated the unemployment problem.

This is not to say that a broader, more wide-ranging approach to the current immigration will necessarily turn up the same or equally positive effects. In its specifics, the American economy is very different today than it was at the turn of the century. Labor markets are more rigid, segregated, and regulated. The government engages in more redistribution. Immigration, too, is different. It is now regulated. Immigrants are more likely to be motivated by considerations of family reunification or escape from persecution or wars, than by economic opportunity. What is unlikely to have changed, however, is the intense interrelatedness of things.

Our historical overview, with its benign conclusions, is not a substitute for thinking hard about our current situation. It does suggest, however, that scholars might profitably take a longer view and shift at least some of the attention away from the redistributive issues and toward the impact of immigrants on productivity change, growth, and economic development.

ENDNOTES

1. These are the official numbers published by the U.S. Immigration and Naturalization Service in its annual *Statistical Yearbook* (1997, Tables 1 and 4). Also see U.S. Bureau of the Census, *Historical Statistics of the United States* (1975 [1997], Series C89). Before 1906 the numbers are the result of the Passenger Act of 1819 that required the captain of each vessel arriving from abroad to deliver a manifest of all passengers taken on board in a foreign port, with their sex, age, occupation, country of origin and whether or not they intended to become inhabitants of the United States. These reports were collected and abstracted for the period 1820 to 1855 by Bromwell (1855), for the period 1820 to 1874 by the Secretary of State, for the period 1867 to 1895 by the Treasury Department's

Bureau of Statistics, and since 1892 by the Office or Bureau of Immigration which is now part of the U.S. Immigration and Naturalization Service. The statistics for the period 1820 to 1910 were compiled by the Immigration Commission (1911, Volume 1, Table 1, p. 56). The defects of the official series are well known (U.S. Bureau of the Census, 1975 [1997], 97-98; Jerome 1926, 29-33; Kuznets and Rubin 1954, 55-64; Thomas 1954 [1973], 42-50; McClelland and Zeckhauser 1982, 32-35; and Schaefer 1994, 55-59). The chief biases are the following: (1) the figures apparently exclude first-class passengers for the early decades, (2) they may include some passengers who died in route, (3) before 1906 they exclude immigrants arriving overland from British North America (Canada) and Mexico, (4) immigrants arriving at Pacific ports before 1849 and at Confederate ports during the Civil War are excluded, and (5) the data measure gross rather than net immigration. Despite these limitations, the official series is thought to measure the gross flows reasonably well.

2. There are two problems with the data that understate the level of the current flows relative to the earlier waves of immigration. First, the data displayed include only legal immigrants. Illegal immigration is a significant problem today, but was practically non-existent before 1917. Current estimates (for October 1996) put the total number of undocumented aliens in the United states at roughly 5 million and the annual increase at about 275 thousand (U.S. Immigration and Naturalization Service, 1997, 186). The dashed line in the graph indicates the numbers of individuals whose status was legalized by the Immigration Reform and Control Act of 1986 (IRCA). Second, before 1925 the official data on immigration includes individuals coming into the country to work temporarily, but these temporary workers have been excluded since then. If illegal immigrants intending to settle permanently in the U.S. were included in the current flows and the temporary workers excluded from the pre-1925 flows, it is probable that current inflows of immigrants would exceed those for the 1900-1914 period.

3. Actually, the first attempts to regulate the flow of immigration dates back to the Chinese Exclusion Act of 1882 (Barth 1962). Japanese government restrictions on *emigration* meant the effective restriction of the Japanese at about the same time (Daniels 1962, Sawada 1991). The more general restrictions began with the literacy test of 1917. The head tax was first imposed in 1882, but at that time it was only 50 cents. The acts of 1907 and 1917 raised it to $4 and then $8. The cost of one-way steerage-class passage from Europe was roughly $30 throughout the period.

4. An appendix to the *Statistical Yearbook* of the Immigration and Naturalization Service (INS) has a useful summary of immigration legislation (1997, Appendix 1). Also see Hutchinson (1981) and U.S. Senate (1988).

5. The details of the preference system have been modified several times since 1965, most notably with a major reworking of the law in 1990. Today the system gives preferential status to persons with a close family relationship to a U.S. citizen or legal resident, persons with skilled occupations, professionals, and "needed" unskilled workers. These groups are subject to an overall annual limitation (466,628 in fiscal year 1995). Refugees may be admitted under presidential authority without a specific numerical limitation. A concise description of current law can be found in U.S. INS (1997, 13-26 and Appendix 2).

6. Since net immigration was positive throughout the entire history of the county before World War I, this would be a tautology except for the possibility that the flow of immigrants somehow induced a decline in the natural rate of increase of the native-born population sufficiently large to numerically cancel the inflow. This possibility was actually suggested by Francis Walker (1891, 1896). While it is true that both the fertility rate and the rate of net population growth from natural increase fell over the nineteenth and first third of the twentieth centuries, demographic studies of population dynamics lend no support to the Walker hypothesis (Thomas 1961, King and Ruggles 1990).

7. It is interesting to note that net immigration also accounts for about a third of the growth in the U.S. population today. This is true despite the fact that the numbers of arriving immigrants are smaller and the base population larger today than it was in the decades immediately preceding World War I. The reason for the relatively large contribution of immigration to American population growth today is that the rate of natural increase is so low. Data on net immigration come from McClelland and Zechhauser (1983) for 1820-1860, Kuznets and Rubin (1954) for 1870 to 1940 and the U.S. Bureau of the Census (1990 and 1993) for the recent period.

8. There are other influences on the real wage than productivity. Of particular importance in this context would be discrimination (presumably against immigrants and in favor of native-born workers) and unionization (presumably weakened by heavy immigration).

9. Annual additions to per capita output averaged 1.7 percent per year in the early era of mass immigration, between 1901 and 1913 (two business cycle peaks). (This calculation is based on figures reported in U.S. Bureau of the Census (1975 [1997], F4)). This sustained growth meant that over that 12-year period, average per capita income increased nearly 25 percent. This calculation includes the newly-arrived immigrants in the base population.

Changes in the standard of living over a lifetime are very sensitive to small changes in the annual rate of growth. For example, with an annual rate of growth of only one-percent output increases 63 percent over a 50-year period. With a two-percent growth rate the improvement is 164 percent and with a five-percent growth rate (much slower, by the way, than the rate of growth of per capita output in China today) the standard of living increases 100-fold. Small but sustained changes in the annual rate of growth can make a big difference in the standard of living over a person's lifetime.

10. Thus it becomes clear only after a careful reading that Stanley Lebergott (1964, 163) is interested in the impact of immigration on the wage rates of the entire population of workers, including the wages of the newly-arrived immigrants. Nonetheless, Hatton and Williamson cite Lebergott in support of their contention that immigration slowed the growth rate of wages of *natives* and of *past immigrants* in the early decades of this century (Hatton and Williamson 1997, Chapter 8).

11. For an early and influential example of the counterfactual method that uses a computable general equilibrium model to examine the immigration question with late-nineteenth-century data see Williamson (1974b). Williamson concludes that an "America without immigrants would not have grown very much differently from how she did in the late nineteenth century" (p. 249).

12. Edward Denison (1962, 177) suggests that workers will take home only 77.3 percent of the increase (labor's share in national income), the rest goes to the resident owners of capital and land. Other scholars estimate an even lower share for labor -- closer to 60 percent (Abramovitz 1993, Taylor and Williamson 1996).

13. This is true today, as well. Many workers own shares of pension and mutual funds that give them a direct and obvious owners' share in the nation's capital stock.

14. For evidence on the strong positive impact of immigration on the relative price of housing in New York City during the period 1830-1860, see Margo (1996).

15. A Tontine insurance policy combined a term life insurance policy with a saving fund that pooled the contributions of policy holders, invested them, and then divided the principal and accumulated returns at the expiration of the policy among the surviving policy holders. Thus if the purchaser died prematurely, his or her heirs would receive a death benefit from the insurance portion of the policy. But if the policyholder should live out the term of the contract (typically 25 or 30 years), he or she would receive a share of the savings fund which had been augmented by the contributions of policyholders who had died or defaulted on their premium payments. Tontine insurance was declared illegal and such policies were ultimately phased out after a corruption scandal in the insurance industry. On these issues see Ransom and Sutch (1987).

16. These dynamic effects can be expected to take about two to three years to work themselves out. This estimate is based on the typical length of a business cycle recovery in this period (Zarnowitz 1992, 23) and the discussion by Easterlin (1968) of the adjustment process. However, the dynamics of this adjustment process are undoubtedly complex. Quantification of the lags is difficult because economic growth can cause as well as be accelerated by immigration. There is also an extensive literature on the "sluggish" response of construction investment to shortages (Burns 1935; Derksen 1940; Abramovitz 1964, 130).

17. This is the so-called "Walker Hypothesis," put forward by Francis Amasa Walker. See endnote 6 above.

18. For an overview of the literature on the role of the public health movement in improving environmental quality and reducing mortality, see Johansson (1994).

19. U.S. Census Bureau (1975, series C138-C139); U.S. INS (1979, Table 10; 1990, Table 11; 1997, Table 12). Official data on gender are not available for 1868, 1980, or 1981.

20. The spike in 1991 is the result of the Immigration Reform and Control Act of 1986. Individuals whose status was legalized by this act were disproportionately male.

21. As already mentioned, in the short run the influx of new labor is likely to depress the capital-labor ratio before it is restored through new investment. If the capital stock is disproportionately owned by native-born residents, as was surely the case in the late-nineteenth and

early-twentieth centuries, then native-born owners of capital will benefit temporarily from higher returns to capital. Indeed, it is this higher return to capital that (in part) is thought to induce an increased volume of investment that ultimately restores the capital-labor ratio to its pre-immigration level.

22. We lean heavily toward the side of the debate that argues that savings was an active constraint on capital formation. First, our view rests upon our belief in the historical applicability of the life-cycle model of savings due to Modigliani (1966 and 1986) and the implication of that model that the supply of domestic savings is not likely to be interest elastic. Second, we are impressed with the evidence that the flow of capital from abroad in this period was relatively small in magnitude (North 1960; Simon 1960; Davis and Gallman 1973) and not very interest sensitive (Ransom and Sutch 1984). Second, we are impressed by a variety of historical studies that seem to us to support the Kuznets' version of the mechanism behind capital formation. See Williamson (1974b), David and Scadding (1974), and Ransom and Sutch (1988).

23. Douglass North (1960, 612-617) estimates the average amount of capital per immigrant at $75 in the period 1815 to 1840 and a varying sum according to nationality (per capita sums of $100 for Germans but only $25 for the Irish) for the period 1840 to 1860. For comparison, the wages of free farm laborers are estimated to have averaged $8.50 to $13.70 per month (including board) over the same period (Lebergott 1960, 462). Thus, the imported capital is less than a year's wages. In the latter part of the nineteenth century capital imports by immigrants appear to have been smaller still (Simon 1960, 672).

24. Argentina and India also received significant flows of capital from England, reflecting the substantial presence of English-born settlers in these two countries. Indeed, a key factor in directing and controlling the foreign investments appears to be community connections with the capital-sending countries. Even today, there is a close connection between flows of capital from Asia to the United States and the presence of Asian-American communities in several American cities (Light and Bonacich 1988).

25. The data plotted in Figure 6 include foreign-born who will not remain as permanent U.S. residents. There sojourners came for only a brief stay (a year or two at most) before returning to their

home country. Since temporary workers are less likely to have attained self-employment, the data for years zero, one, and two will slightly overstate the *rate* at which permanent immigrants moved into self-employment in the first few years following their arrival.

26. There exists an extensive collection of budget studies from the turn of the century which surveyed both foreign- and native-born American workers (Carter, Ransom, and Sutch, 1991). Often a question was included to ask the length of time an immigrant had been in the United States. These surveys if handled carefully might be used to estimate the differential savings propensities of immigrants and native-born workers. This work has yet to be done.

27. This effect is one of the supposed underlying causes of the strong association between immigration and the "long swings" in economic activity, known as Kuznets' Cycles (Thomas 1954).

28. Robert Gallman (1977, 30) points out that in so far as the new capital put in place as a consequence of immigration catered exclusively to immigrant demands for goods and services, then the welfare effect on the resident worker need not have been positive, though again capitalists and landowners would have gained.

29. For some empirical evidence connecting manufacturing and patenting activity see Robert Higgs (1971a), Kenneth Sokoloff (1988), Sokoloff and Zorina Kahn (1990), and Kahn and Sokoloff (1993).

30. Nathan Rosenberg (1982, 249) has also noted the role played by immigrants in accelerating the diffusion of technology from the country of their origin into the United States.

31. For several applications of an endogenous approach to growth modeling in an historical context see Louis Johnston (1990), Bradford de Long (1995), and Paul Romer (1996).

32. This state of affairs is surprising in light of the fact that the effects of scale and size on productive efficiency is "one of the oldest and most widely acknowledged sources of economic growth" (Kelley 1972, 36).

33. Robert Gallman (1977) suggests that these figures are too high. First, because they are built upon wage and work-year data that Gallman believes are too high. Second, because Uselding's (1971) estimates are based on the occupations that immigrants reported upon arrival rather than the occupations that they actually pursued in the United States. Gallman believes that some immigrants were forced to pursue occupations beneath their skill level because of discrimination and their lower level of literacy in English.

34. Gallman is critical of this argument because he feels it implicitly assumes an extreme version of the Walker Effect which Gallman rejects. To Gallman it appears that the saving which Neal and Uselding calculate would only be present if in the absence of immigration Americans chose to increase the native birth rate enough to fill the labor force gap left by the absent immigrants. In that case America would have had to invest in the child rearing and education for this shadow cohort. We suggest that this line of attack introduces an unnecessary confusion into the analysis. Kuznets' original insight was to see that immigrants not only import labor, they import human capital as well. Thus America gained a valuable productive resource and the origin countries lost one every time a young adult chose to immigrate.

35. Recall the poem by Emma Lazarus inscribed at the base of the Statute of Liberty:

Give me your tired, your poor,
Your huddled masses yearning to breath free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest tossed to me:
I lift my lamp beside the golden door.

36. The alleged poor "quality" of today's immigrants is a key issue in the current debate over immigration policy. See, for example, Borjas (1994).

37. Historical studies of immigration debate the relative importance of these "push" and "pull" forces. The consensus is that the pull forces of American opportunities dominated the push forces of European poverty, land scarcity, and military conscription (Easterlin 1968, 35-36; Cohn 1995). We note that the differential selectivity of push and pull forces is based on a threshold model of push forces in which low incomes in the origin country depress the lower tail of the income distribution below some intolerable poverty line that compels the migration of the most wretched, while those more fortunately situated can remain. On the other hand, it might also be noted that the very poor might not

have the resources to afford the long-distance migration thus moderating or even reversing the conclusion that push works to select the least able and least skilled. The pull model assumes that those with the highest ability and the most education will have the most to gain by transferring their skills to a country with a higher capital-labor ratio and a stronger growth-induced excess demand for skilled workers. The conclusion is not a certainty. Perhaps the highly-skilled can earn more at home in a poor country or perhaps their relative income position matters most to them. If so, they would prefer to be a big fish even if they have to live in a small pond. The recent literature on the selectivity of immigration in the modern period makes heavy use of a different model of selectivity developed by Roy (1951). For an application to modern immigration patterns see Borjas (1987, 1994). The Roy model focuses on cross-country differences in the variance, not just the means, of their earnings distributions. According to this model, countries with a large variance in earnings tend to attract immigrants from the upper-tail of the earnings distribution; the reverse is true for countries with small earnings variance.

38. Mokyr emphasizes, however, that the magnitude of the difference between the occupational mix of immigrants and that of the resident population of Ireland was small. Others who have reached similar conclusions include Baines (1985, 51-52), Erickson (1972, 1981, 1986, 1989, 1990), and Van Vugt (1988a, 1988b). Raymond Cohn (1992, 1995) has criticized this work for using biased samples that underestimated the numbers of laborers and farmers in the years before the Civil War. The issue is how to treat the "questionable" passenger lists. These are lists on which *every* passenger is recorded as a laborer (or farmer) usually by the use of ditto marks down the occupation column. Most researchers have excluded such lists from their samples. Cohn argues that this practice introduces a bias into the sample. When Cohen includes the questionable lists in his sample, he finds more laborers and farmers among immigrants from England and Scotland and more laborers and servants from Ireland than in the occupational distributions of these countries of origin. In the case of Germany, on the other hand, Cohn's findings are consistent with the select-immigrant hypothesis.

39. Walton and Rockoff (1994, 402). This exact sentence has passed down to this edition of the text book from Robertson (1973, 387), through Walton and Robertson (1983, 444). None of the editions offer a citation or evidence.

40. Occupations actually taken up by immigrants will not adequately indicate their skills if immigrants face discrimination in their entry into occupations. A number of scholars have argued that immigrants did in fact face occupation-based discrimination during the era of mass migration (Azuma 1994, Barth 1984, Brown and Philips 1986, Cloud and Galenson 1987, Daniels 1962, Hannon 1982a, 1982b, Higgs 1978, LaCroix and Fishback 1989, Liu 1988, Murayama 1984, and Saxton 1971). But see Chiswick (1978a, 1978b, 1988, 1991a, 1991b, 1992, 1994) for an analysis that emphasizes the role of human capital in immigrant occupational attainment. The consensus in the literature is that within occupations immigrants were paid roughly equal pay for equal work (Blau 1980, Ginger 1954, Higgs 1971b, McGouldrick and Tannen 1977).

41. Hill's occupational skill classification is as follows: Skilled — professional persons, farmers, proprietors, managers, officials, clerks and kindred workers, skilled workers and foremen; Semiskilled — semiskilled workers (mostly factory operatives); and Unskilled — farm laborers, other laborers, servant classes. Note that Hill classifies farmers as skilled, although it is standard practice to classify them as unskilled. Since the native-born were far more likely than the foreign-born to be farmers, Hill's decision raises the measured skill level of the native-born.

42. More could be done to explore this issue. The Integrated Public Use Microdata Sample (IPUMS) from the federal censuses about the turn of the century provide information on the occupations of recent arrivals by country of origin. For the nineteenth and early-twentieth centuries, the occupations reported by arriving passengers and recorded on ship manifests are also available. These data have been compiled by broad occupational grouping in *Historical Statistics of the United States* (U.S. Bureau of the Census 1975 [1997], Series C120-137) and by more detailed occupation for 1819 through 1855 in Bromwell (1855). These two sources of data might be compared with those of the resident workforce to focus more directly on the skill level of the "new" immigrants from Southern and Eastern Europe.

43. The effect of a new immigrant on aggregate demand may appear even before he or she takes a job in this country. The immigrant will have to spend and consume during the transition period between disembarkation and the receipt of the first pay check.

44. Lebergott (1984, 34) who in turn cites Lebergott (1964, 163).

45. In looking at the rate of change of real wages before and after the reduction in immigration, Lebergott was echoing an older argument of Paul Douglas (1930) who estimated a very low rate of increase of real wages (0.3 percent annually) in the period of greatest immigration, between 1890 and 1914. Douglas' estimates for the period of mass immigration was especially slow compared to the rates of growth of real wages in the period immediately preceding and following this period. Douglas' real wage estimates have been superseded by those of Albert Rees which show a reasonably rapid growth of wages (1.4 percent) during the era of high immigration.

46. Hatton and Williamson's calculations are derived using two technical concepts, the Phillips Curve and the CES production function. The Phillips Curve is an inverse relationship between the rate of wage inflation and the unemployment rate (Phillips 1958). It is derived from a model of the aggregate labor market rather than from a micro-level supply-demand model. The Phillips relationship summarizes the experience of many economies that an increase in the unemployment rate is associated with a slowing in the rate of growth of wages. Hatton and Williamson adopt this notion to predict the impact of an influx of immigrants. They argue that immigration, by increasing the labor supply, raised the unemployment rate and slowed wage rate growth. They make this argument despite the fact that unemployment by any measure was relatively low (4.7 to 4.9 percent) for the period 1900 to 1913 (Lebergott 1964, Romer 1986, Weir 1992). They ignore the strong *negative* relationship between immigration and the unemployment rate in those years which would suggest exactly the opposite impact of immigration on wages. Hatton and Williamson get around this seeming contradiction by combining the Phillips relationship with an aggregate demand for labor derived from a Constant Elasticity of Substitution (CES) production function (no economies of scale) and then, by substitution, eliminating the unemployment rate from their estimating equation. Their formulation reduces the Phillips Curve to a positive relationship between the real wage and output per worker. Hatton and Williamson estimate the change in output per worker by looking at changes in labor supply. For them, "the long run impact of labor force growth on output is simply the labor share (They use 0.6 as a constant in their analysis) times labor force growth" (Hatton and Williamson 1997, Chapter 8). Hatton and Williamson's calculation, then, is simply an empirical estimation of the transitory capital-dilution argument discussed above.

47. Hatton and Williamson also use a computable general equilibrium model to assess the impact of immigration on wages but this approach also ignores the dynamic effects of immigration and

the possibility of economies of scale. Not surprisingly, their analysis with this model supports the conclusions reached using the transformed Phillips Curve.

48. If the lower wages for miners and competition among miners drove down the price of slate, however, the quantity of slate demanded would rise and the impact on wages would be softened. There also would remain the possibility of a response by the capital stock employed in slate mining. The increased supply of labor would increase the rate of return to capital employed in the industry which would stimulate more investment, create more jobs, and tend to raise wages. Nonetheless, neither of these counterbalancing effects are likely to completely eliminate the downward pressure on wages.

49. This is a surprising suggestion in the context, since the there is no evidence that immigrants were disproportionately under skilled in this period. Despite this, if immigrants were forced by discrimination to compete for low-skilled ones they were qualified for, then this might put downward pressure on the unskilled wage. But if so, the cause of the problem would be discrimination, not immigration, and the corrective would be anti-discrimination measures, not a reduction in immigration. We take up the question of immigrant skills elsewhere in this Chapter.

50. We use the version of Coombs' data presented by Paul David and Peter Solar (1977, Table B.1 and 1, pp. 59 and 16). They converted Coombs' weekly wage quotations into hourly wage rates using data on the average length of the work week (which was falling during this period). See David and Solar (1977, 63-64). Goldin did not make such an adjustment.

51. There was a sharp recession in 1908 (unemployment jumped from 3.1 to 7.5 percent), and there was an across-the-board decline in wages as a response. There was also a large decline in gross immigration (from 1.3 to 0.8 million between fiscal 1907 and 1908) and an increase in departures (U.S. Bureau of the Census 1975 [1997], C89 and Weir 1992, 341). Net immigration fell from 767 thousand to only 210 thousand (Kuznets and Rubin 1954, 95). In fact 1907 was the peak year for immigration.

52. The National Industrial Conference Board (NICB) data begins in 1921 but there is also a retrospectively reported pre-war wage collected in 1922. This is a poor piece of evidence to link the NICB data to Coombs II.

53. For analyses of immigrant settlement patterns in the period prior to World War I see Lee (1957); Gallaway and Vedder (1971, 1972); Gallaway, Vedder, and Shukla (1974); Dunlevy and Gemery (1977a, 1977b, 1978); Dunlevy (1980, 1983); and Dunlevy and Saba (1992).

54. Goldin's estimates were made to help understand the reasons for a political sentiment to restrict immigration. In a sense it was the "scapegoat factor" that she was attempting to measure.

55. Before 1908 the official statistics on immigrants count only arrivals. They do not distinguish between permanent settlers and temporary guest workers, nor is there any comprehensive count of returning immigrants during this period.

56. However, a glance at Figure 12 reveals that the magnitude of changes in departures is much smaller than that for arrivals.

57. Albert Fishlow (1965, 200-203) has criticized the Thomas model.

58. Early writers on the business cycle such as Wesley Clair Mitchell (1913, 225-228) did not feel that immigration was likely to have been a major factor in moderating the cycle. Jerome on balance thought immigration may have exacerbated depressions, but his conclusion drew a strong rejoinder from M. C. Rorty. Jerome (1926, 120-122) was impressed by the fact that net immigration was positive even during times of depression (he was writing before the Great Depression). Rorty (who as a Director of the National Bureau of Economic Research by appointment of the American Statistical Association had the right to attach a dissenting footnote to Jerome's NBER Occasional Paper) correctly, we think, pointed out that the rate of change, and not the level, of immigration was important. The cause of the change in population should be irrelevant to population growth's impact on the business cycle. Since immigration flows slowed during business downturns, the cyclical movement of immigration can only have helped reduce the magnitude of the unemployment problem. More recent work on the business cycle tends to ignore the role of immigration, perhaps for the obvious reason that the cyclical nature of the immigration flows ended with the Quota Act. Thomas (1954 [1973]) and Bert Hickman (1973) have both suggested that the reduction in immigration was responsible for the decline in demand for housing that preceded and may have contributed to the Great Depression.

59. We have a number of technical reservations about the structure of the Hatton-Williamson counterfactual upon which their judgement is based and also about their data on unemployment in the 1890s (Carter and Sutch 1992). We strongly suspect that their procedure has biased the estimated impact downward.

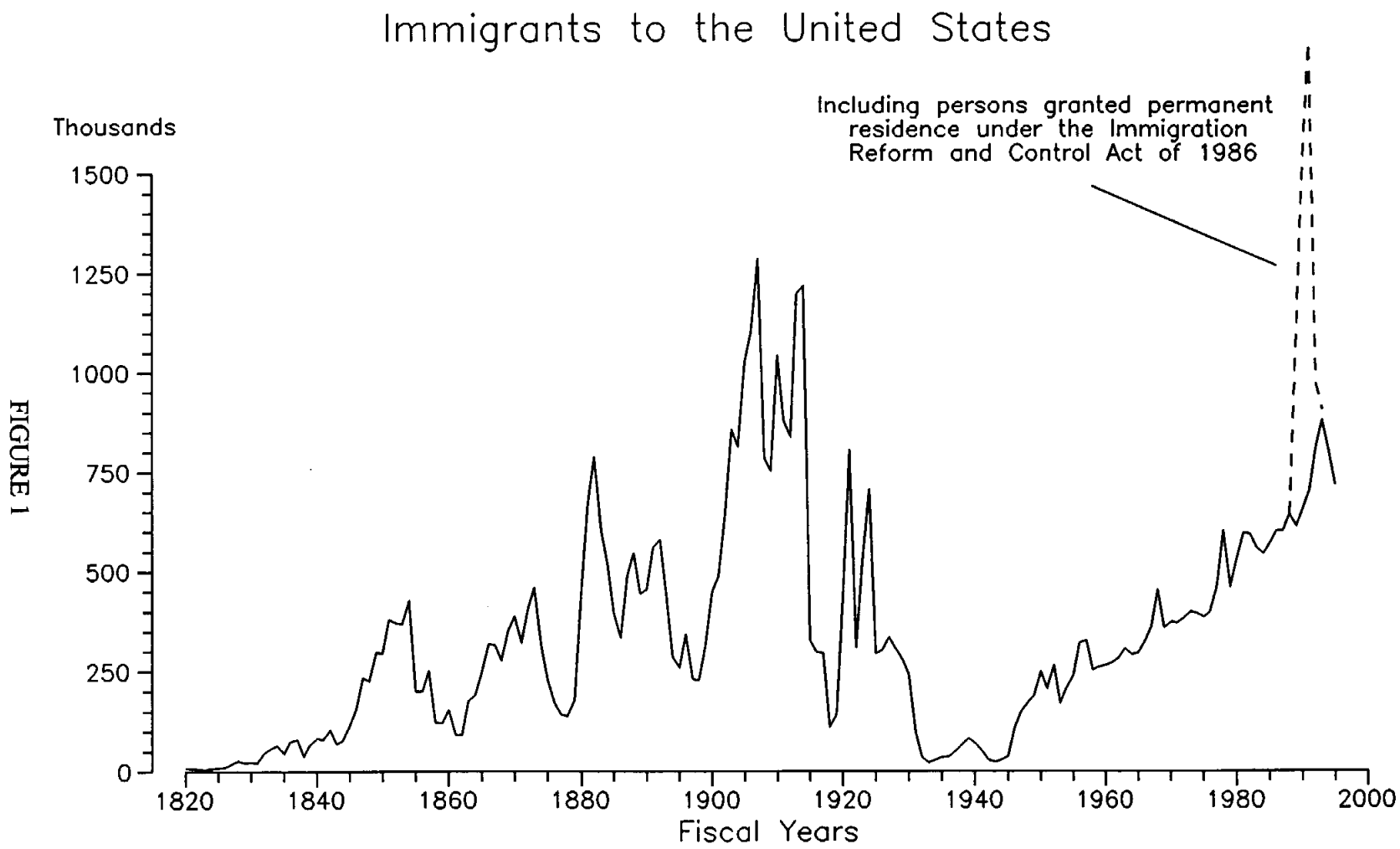
Immigrants to the United States
Thousands
Including persons granted permanent residence under the Immigration Reform and Control Act of 1986
1500
1250
1000
750
500
250
0
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
Fiscal Years

FIGURE 1

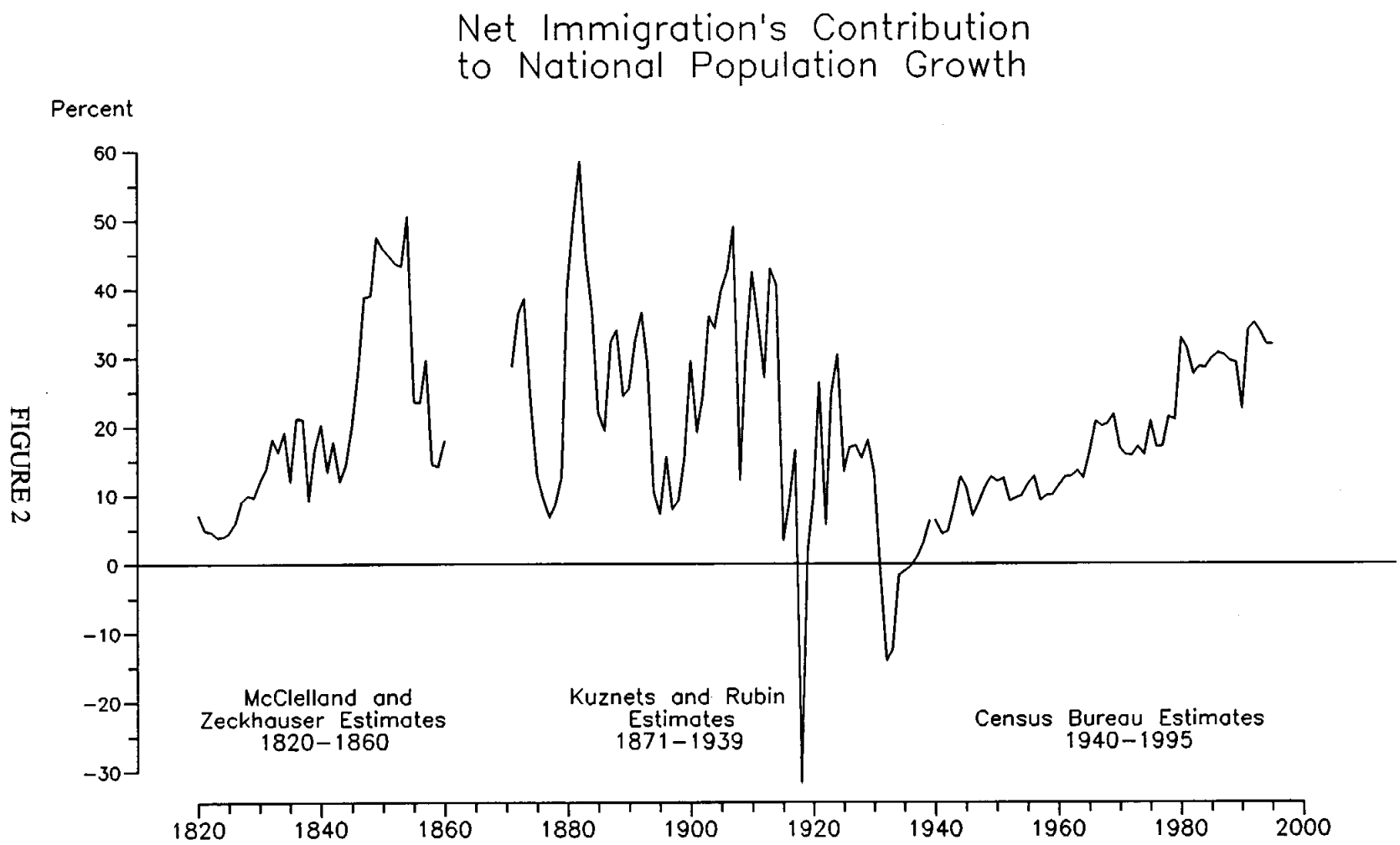
Net Immigration's Contribution
to National Population Growth
Percent
60
50
40
30
20
10
0
-10
-20
-30
McClelland and
Zeckhauser Estimates
1820–1860
Kuznets and Rubin
Estimates
1871–1939
Census Bureau Estimates
1940–1995
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000

FIGURE 2

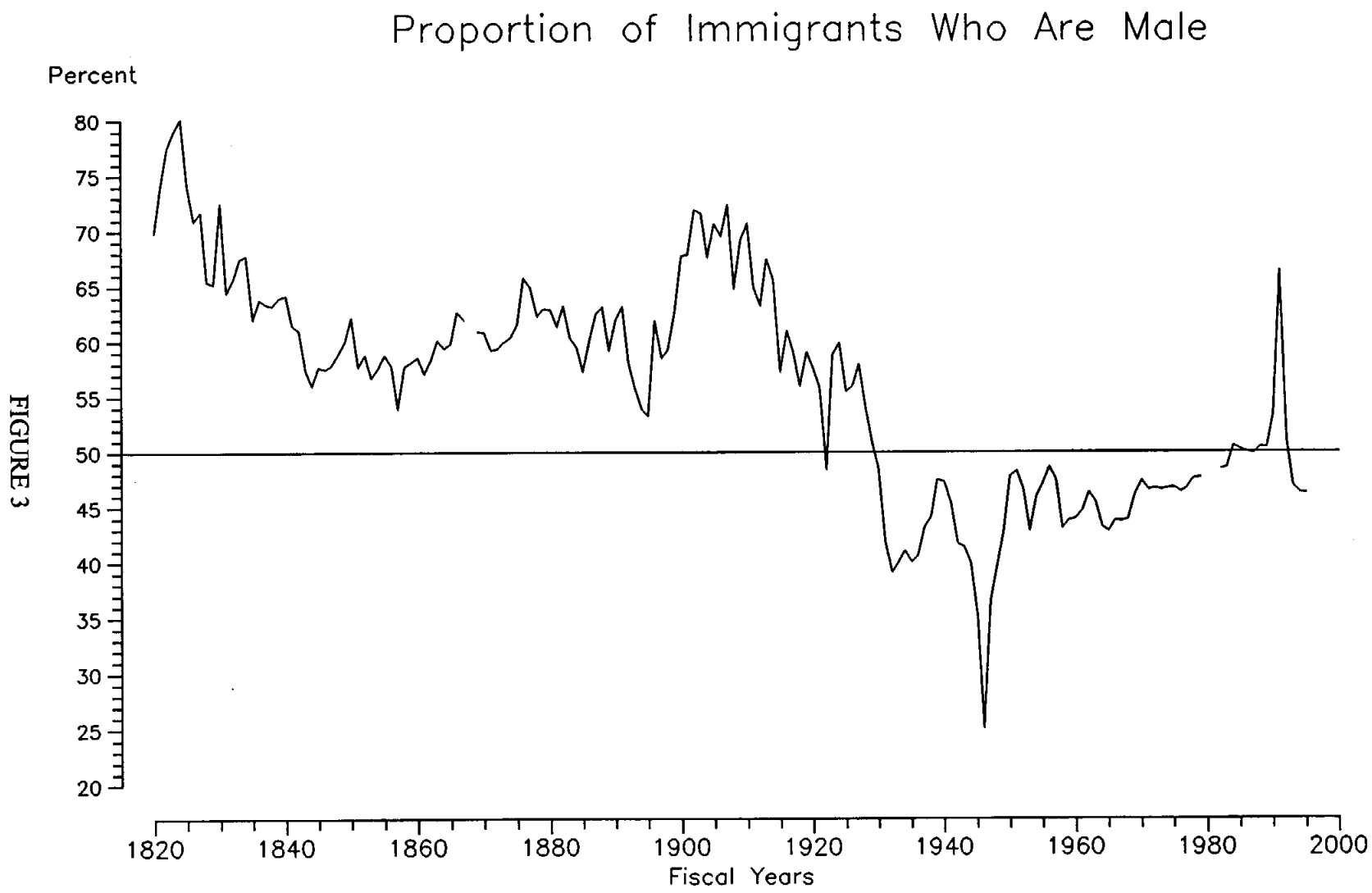
Proportion of Immigrants Who Are Male
Percent
80
75
70
65
60
55
50
45
40
35
30
25
20
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
Fiscal Years

FIGURE 3

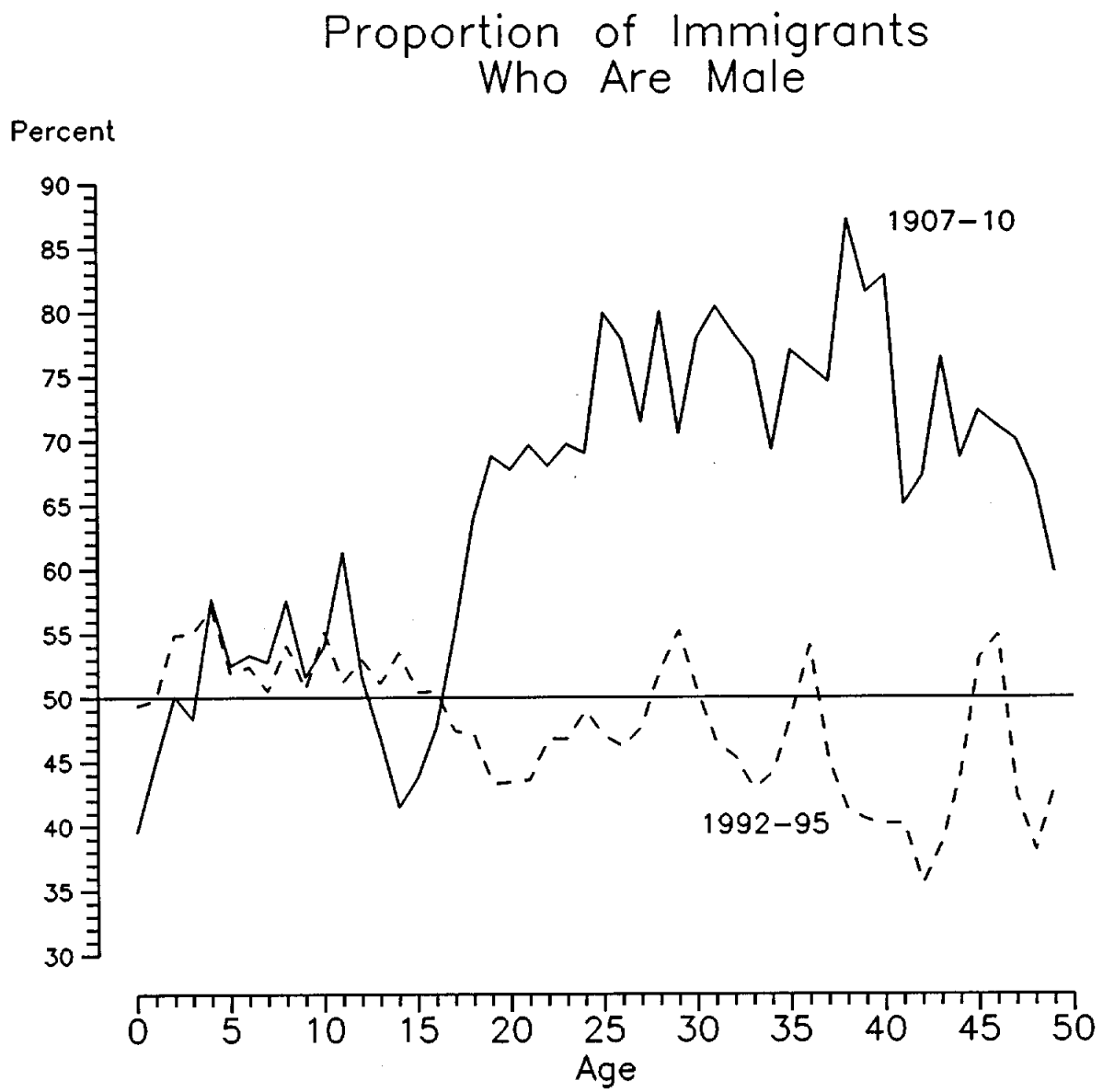
Proportion of Immigrants
Who Are Male
Percent
90
85
80
75
70
65
60
55
50
45
40
35
30
1907–10
1992–95
0
5
10
15
20
25
30
35
40
45
50
Age

FIGURE 4

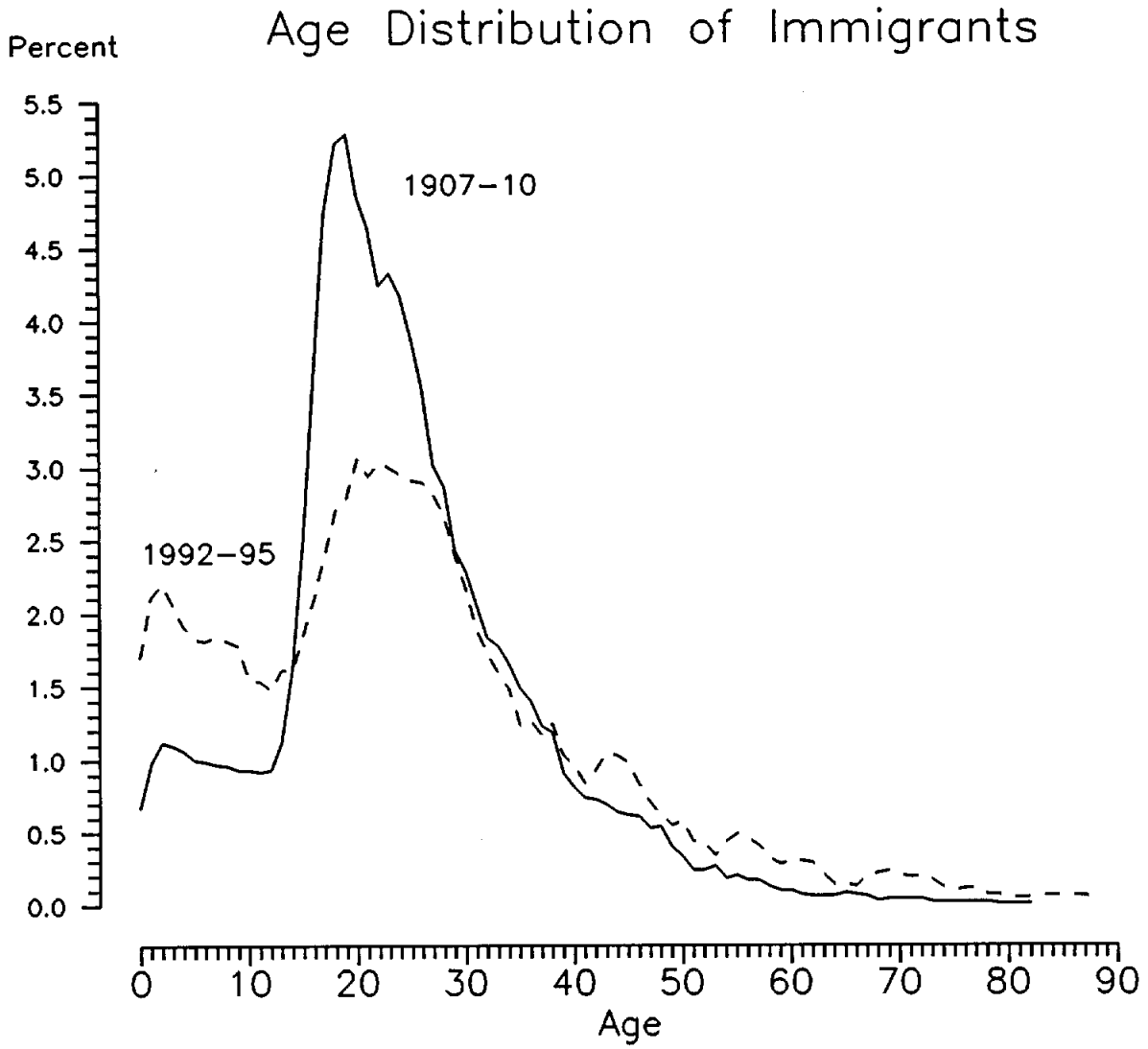
Age Distribution of Immigrants
Percent
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1907–10
1992–95
0
10
20
30
40
50
60
70
80
90
Age

FIGURE 5


Self-Employment Rates for Foreign Born, 1910
Five Age Cohorts Defined by Age in 1910
Male Foreign-Born Non-Farm Labor Force
Rate
0.30
0.25
0.20
0.15
0.10
0.05
0.00
40-44
45-49
30-35
35-39
25-29
0
5
10
15
20
25
30
35
Years in the United States

FIGURE 6


Self-Employment Rates by Age, 1910
Native-Born and Foreign-Born
Male Non-Farm Labor Force
Rate
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Native-Born
Foreign-Born
U.S. Residents for
15 or More Years
15
20
25
30
35
40
45
50
55
60
65
Age

FIGURE 7

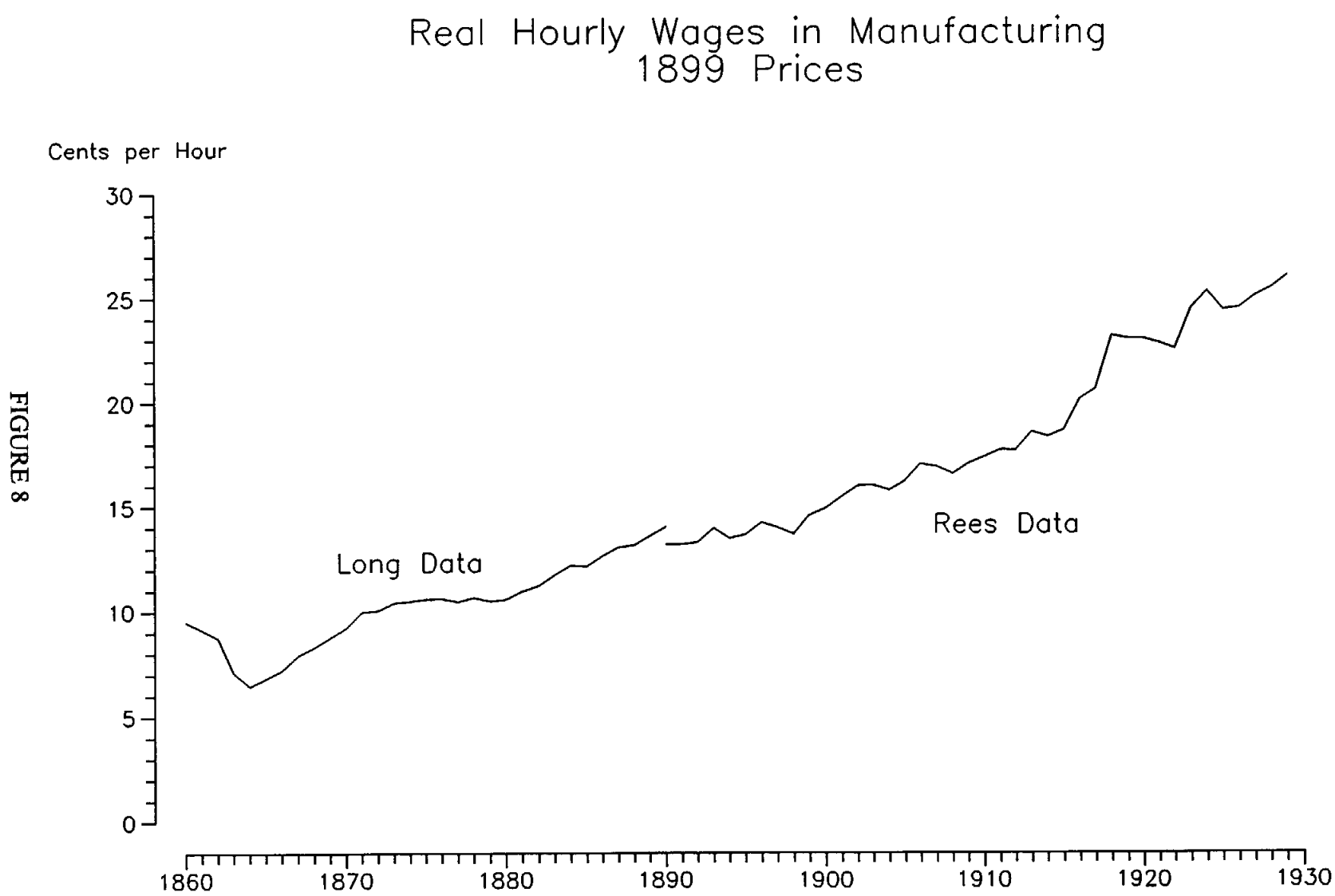
Real Hourly Wages in Manufacturing
1899 Prices
Cents per Hour
30
25
20
15
10
5
0
Long Data
Rees Data
1860
1870
1880
1890
1900
1910
1920
1930

FIGURE 8

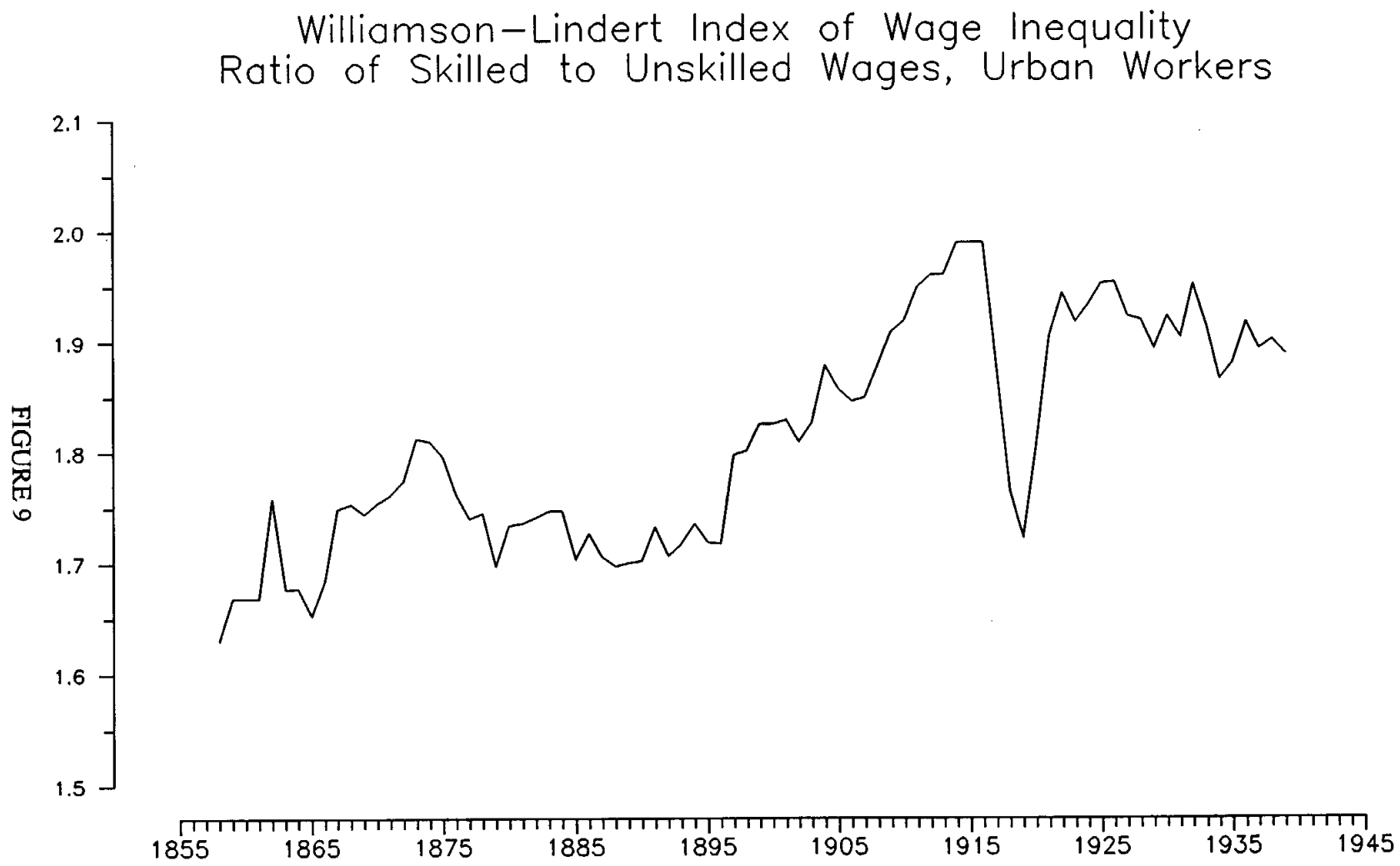
Williamson–Lindert Index of Wage Inequality
Ratio of Skilled to Unskilled Wages, Urban Workers
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1855
1865
1875
1885
1895
1905
1915
1925
1935
1945

FIGURE 9

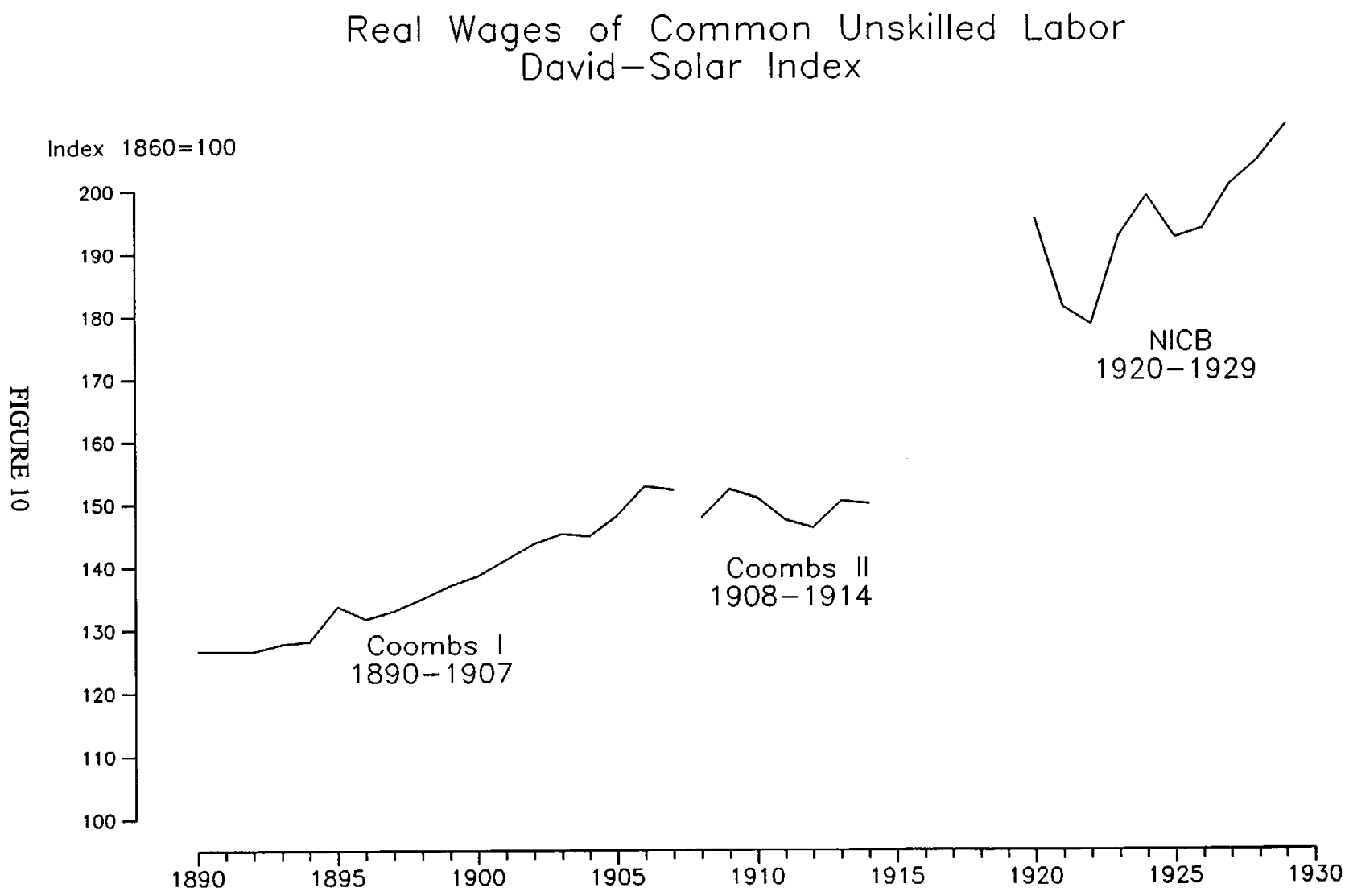
Real Wages of Common Unskilled Labor
David–Solar Index
Index 1860=100
200
190
180
170
160
150
140
130
120
110
100
1890
1895
1900
1905
1910
1915
1920
1925
1930
Coombs I
1890–1907
Coombs II
1908–1914
NICB
1920–1929

FIGURE 10

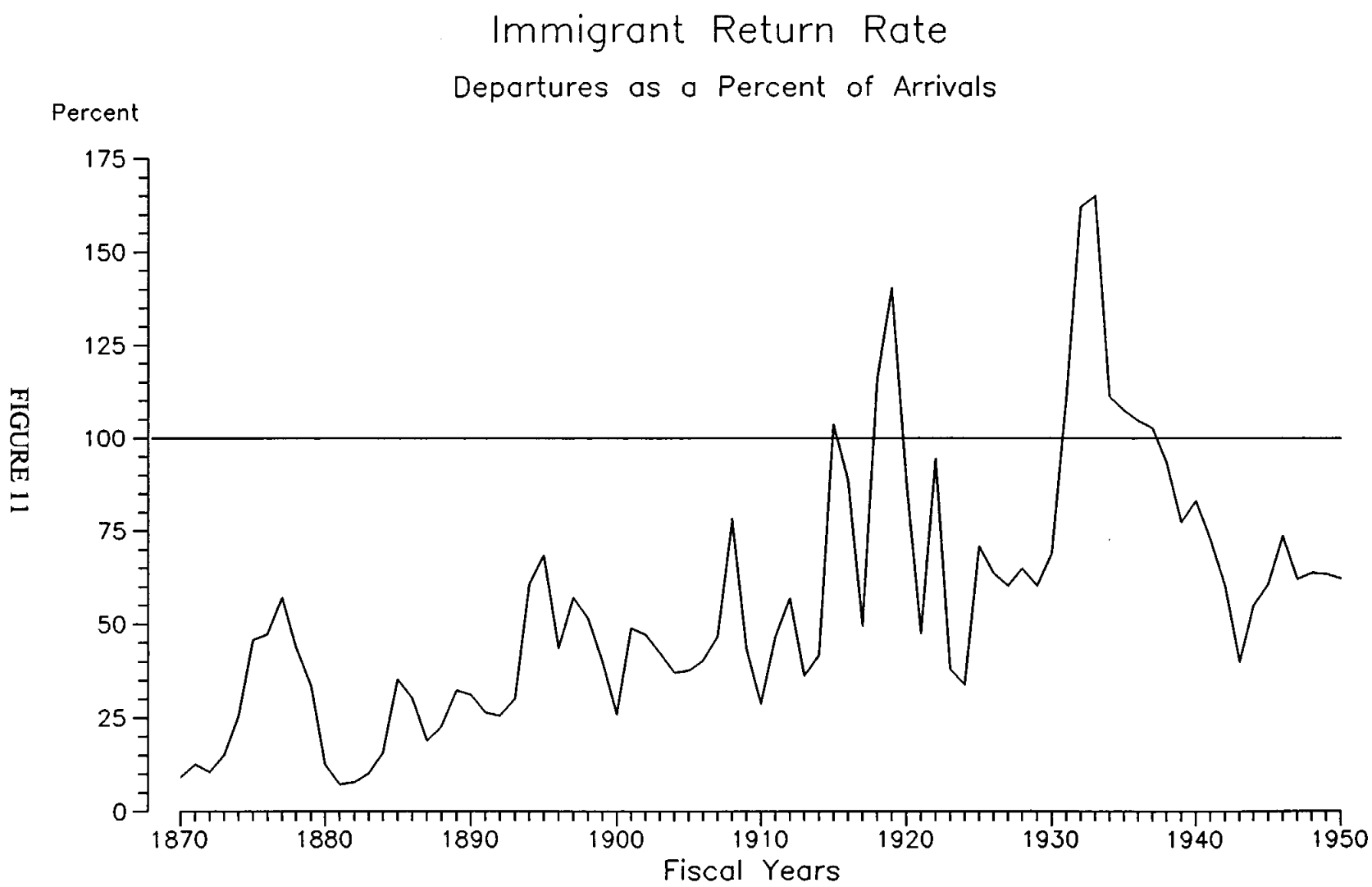
Immigrant Return Rate
Departures as a Percent of Arrivals
Percent
175
150
125
100
75
50
25
0
1870
1880
1890
1900
1910
1920
1930
1940
1950
Fiscal Years

FIGURE 11

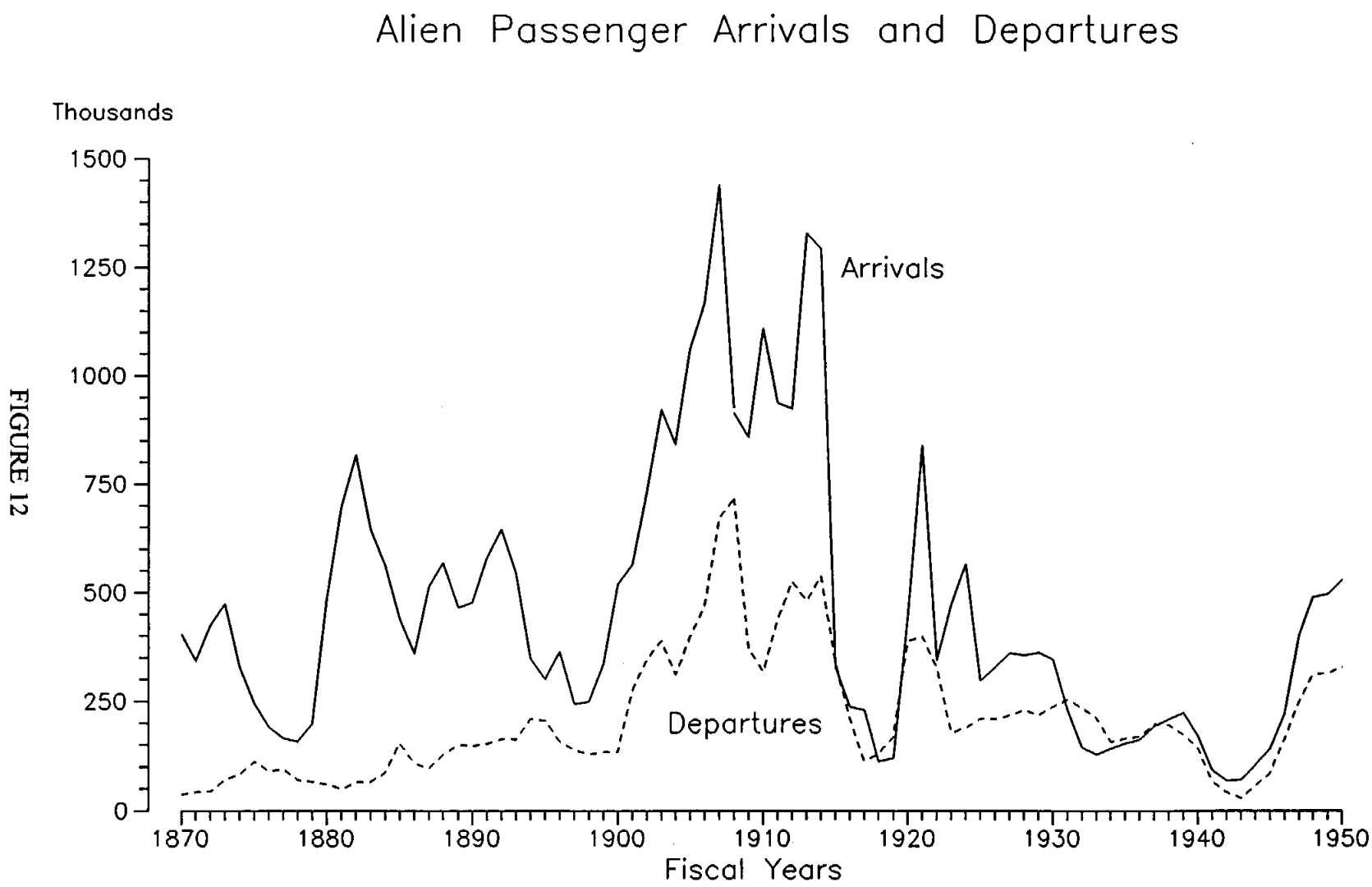
Alien Passenger Arrivals and Departures
Thousands
1500
1250
1000
750
500
250
0
Arrivals
Departures
1870
1880
1890
1900
1910
1920
1930
1940
1950
Fiscal Years

FIGURE 12

Table 1. Labor Force Participation Rate, Native and Foreign-Born, 1870-1940.

Year	Native-Born	Foreign-Born
1870	29.7	48.5
1880	32.0	52.2
1890	33.1	55.1
1900	35.5	55.5
1910	37.7	57.8
1920	37.8	55.7
1930	38.1	52.2
1940	39.1	50.5

Note: "Labor force participation rate" is defined here as the share of the total population of a given nativity that is engaged in the workforce.

Source: Calculations are based on Simon Kuznets, "Long-Term Changes in the National Income of the United States of America Since 1870," *Income and Wealth of the United States: Trends and Structure,* International Association for Research in Income and Wealth, 1952: 196-204; reprinted as, "The Contribution of Immigration to the Growth of the Labor Force," in Robert William Fogel and Stanley L. Engerman, editors., *The Reinterpretation of American Economic History*, New York: Harper & Row, 1971, Table 1: 397.

Table 2. Skill Distribution of the Labor Force by Nativity, 1870-1940.
Skill Category as a Percentage of the Total Workforce

	Skilled		Semiskilled		Unskilled	
Year	Native	Foreign	Native	Foreign	Native	Foreign
1870	43.0	36.6	12.7	23.2	44.3	40.2
1880	43.1	38.6	14.6	25.4	42.2	36.0
1890	49.4	40.5	17.3	25.0	33.3	34.5
1900	45.8	39.5	17.6	26.7	36.6	33.8
1910	*a*	41.9	*a*	23.8	*a*	34.3
1920	56.1	44.6	15.9	23.8	28.0	32.2

[a]These estimates are constructed from data in the published censuses. Data for the total native-born population are not available for 1910, although they do exist for the native white population.

Note: Hill's figures for the foreign-born in 1920 do not sum to 100 percent. Hill does not comment on this.

Source: Peter J. Hill, "Relative Skill and Income Levels of Native and Foreign-Born Workers in the United States," *Explorations in Economic History* 12(1) (January 1975), Table 6: 56.

Table 3. Occupational Distribution of the Foreign Born and the Children of the Foreign Born by Occupation, 1910.
Index Numbers for Selected Occupations with "All Occupations" Set Equal to 100.

	Foreign Born	Foreign Stock
All Occupations	100	100
Accountants	62	131
Engineers	47	104
Lawyers	25	102
Physicians and dentists	45	86
Teachers	39	75
Domestics	173	87
Charwomen, porters	208	104
Janitors	168	102
Construction laborers	169	84
Transport laborers	224	58

Source: Edward P. Hutchinson, *Immigrants and Their Children, 1850-1950*, New York: John Wiley, 1956, Table 39: 204-206, reproduced in Stanley Lebergott, *The Americans: An Economic Record*, New York: W.W. Norton, 1984, Table 26.4: 344.

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