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THE IMPACT OF IMMIGRATION
ON AMERICAN LABOR MARKETS
PRIOR TO THE QUOTAS

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ABSTRACT

Current debate on the impact and assimilation of immigrants into the American labor market sounds remarkably like the debate which eventually triggered the imposition of the quotas in the 1920s. Then as now observers failed to agree on exactly what the impact of the mass migration was on labor markets. Despite its relevance to current discussion, there has been almost no quantitative effort to assess late nineteenth century impact, while instead analysis has been obsessed with assimilation issues. This paper redresses this imbalance by confronting three macro-impact questions that are just as relevant today as they were almost a century ago: Did late nineteenth century American immigrants act as a flexible (guestworker) labor supply? Did they flow into occupations where job creation was fast, or did they displace natives in occupations where job creation was slow? Did immigrants reduce the growth of wages and living standards for natives while increasing their unemployment? We use econometrics and computable general equilibrium models to get surprising and unambiguous answers.

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"It is undoubtedly true that the availability of the large supply of recent immigrant labor has prevented the increase in wages which otherwise would have resulted during recent years from the increased demand for labor" (Jenks and Lauck 1926: 207).

"There is absolutely no statistical proof of an oversupply of unskilled labor resulting in a displacement of native by immigrant laborers" (Hourwich 1922: 11).

These quotes certainly have a modern ring but they were generated by the contentious debate following the appearance of the Immigration Commission's Report of 1911. The Immigration Commission concluded that the impact was negative — unskilled immigrants displaced both natives and older immigrant cohorts and undercut their living standards. The debate which followed from 1911 to the present has largely discredited the Report for its racial overtones, its selective collection of data, and its sloppy analysis of the evidence once collected. Right or wrong, however, the 1911 Immigration Commission's big question is still with us: Did immigrants crowd out residents and lower their living standards?

Oddly enough, analysts then and now have focused their attention instead on the Commission's views regarding the process of immigration assimilation. For the assimilationists the questions have been: How quickly were immigrants assimilated into American life and culture? Did immigrants arrive disadvantaged and did they face discrimination in labor markets? How long did it take them or their offspring to catch up with natives? Was economic performance related to European cultural, religious, ethnic and economic background? Did the "new" immigrants from southern and eastern Europe assimilate less rapidly and less completely than their predecessors from the North and West?

Yet the major preoccupation of contemporary observers was not assimilation but instead

the macro impact of the immigrants on employment conditions, living standards and wages in American labor markets. And by comparison, it has hardly received any serious quantitative attention. This paper will try to redress this imbalance by confronting three macro-impact questions that are just as relevant today as they were almost a century ago: Did late nineteenth century immigrants act as a flexible labor supply in America much like late twentieth century guestworkers are often said to have done in Europe? Did immigrants flow into occupations where job creation was fast, or did they displace natives in occupations where job creation was slow? Did immigration reduce the growth of wages and living standards of natives while increasing their unemployment? We elaborate on each question in the remainder of this introduction.

First: Since immigration responded to conditions in American labor markets, did this ebb and flow act as a safety valve? The seasonal and cyclical movements of these "birds of passage" echo the Bracero program of early postwar America as well as the guestworker system in Europe since the 1950s. While acknowledging that immigration responded to host country labor market conditions, the Immigration Commission thought it did little to ease unemployment during industrial crisis and took the view that temporary migrants were, on balance, undesirable since they were not committed to assimilating into American society. By contrast, modern economists and historians have lamented the loss of this "guestworker" flexibility, imposed by the quotas in the 1920s and operating only through illegal immigration since. So, did immigration smooth the cyclical ups and downs in unemployment as retrospective observers wistfully imagine?

Second: Did immigrants displace or crowd out natives in industries and occupations where job creation was slow? Did they take unskilled jobs that natives were no longer willing to do? Did they enter industries and occupations where job creation was fast, thereby easing bottlenecks which would otherwise have slowed the rapid pace of American industrialization?.

Which was it? The Immigration Commission took an unambiguous position:

"[The immigrants] were not, as a rule, engaged at lower wages than had been paid to the older workmen for the same class of labor but their presence in constantly increasing numbers prevented progress among the older wage earning class, and as a result that class of employees was gradually displaced" (Vol. 1: 39).

"Congestion of immigrants in large cities has long been one of the most unfavorable features of the modern problem of immigration" (Vol. 1: 727).

These claims closely parallel modern concern about the competition between immigrants and unskilled black or Hispanic Americans. And they echo concern with native-born crowding out in major cities like Los Angeles, New York and Miami. So, did the late nineteenth century immigrants crowd out natives in slow-growing industries and locations, or did they ease bottlenecks in fast-growing industries and locations?

Third: Was the Immigration Commission right when it argued that

"through lack of industrial progress and by reason of large and constant reinforcement from abroad ... [immigration] kept conditions in the semi-skilled and unskilled occupations from advancing" (Vol. 1: 37).

This is the big question posed by the Commission, by late nineteenth century observers and by late twentieth century economists. No agreement was reached then and no agreement has been reached now. But the Immigration Commission was simply not equipped to answer the question since their economics was too crude to be able to disentangle the effects of immigration from the effects of other forces determining real wages, living standards and employment. Modern economists certainly have more sophisticated tools, but they have hardly been applied at all to the pre-quota period when the immigrant influx reached its crescendo. Was the Immigrant Commission right? The answer is important given that the subsequent quota legislation was motivated by the 1911 Report.

This essay addresses these three questions using evidence drawn from the period that first generated the debate. First, we develop new evidence showing that the guestworker effect in the

late nineteenth century was modest. Immigrants did not greatly ease cyclical and structural adjustments in the American labor market. Second, we address the issue of displacement and crowding out. Immigrants did displace natives in northeastern cities, causing profound adjustments in native migration and labor supply. Third, we appeal to the second finding to reject as totally inappropriate the "local labor market" approach of modern labor economists in assessing the macro impact of the immigrants in late twentieth century America. Instead, we take two alternative approaches to estimating the impact of immigrants on natives' real wages and living standards: annual time series and computable general equilibrium. Both approaches suggest that immigration lowered the real wage significantly.

The Guestworker Hypothesis

Late twentieth century governments have sought to regulate the flow of immigrants and their composition in order to bring total labor supply closer to total labor demand and to manipulate the composition of immigration thus helping erase growth-induced imbalances across different sectors and occupations. These workers, often given only temporary immigrant status and usually relatively unskilled, have become widely known as guestworkers. Analysis of the impact of this guestworker labor supply on the host country probably starts with Charles Kindleberger's Europe's Postwar Growth (1967). The central idea of Kindleberger's book is the role of elastic labor supplies in facilitating fast growth in labor-constrained western Europe. Individual country studies have since concluded that Kindleberger was right (e.g., Marshall 1973: 3–19, 77–111; Rogers 1985; Straubhaar 1988).

Why is it, then, that most observers now believe that an effective and efficient European guestworker system is largely a myth? In the words of one, any

"hopes of using immigrants as guestworkers to manage labor supply and solve problems of unemployment were dashed by the failure of repatriation policies in

the late 1970s" (Hollifield 1992: 77).

Many, of course, went home. Indeed, one study focuses exclusively on the role of cyclical downturn on return migration of the guestworker (Kayser 1972). Still, the failure of the guestworker system cited in these accounts is that too many stayed on when employment conditions deteriorated.¹ Thus, while the West European guestworker system worked well on the postwar upswing it worked badly on the downswing, or so the critics say.

Is there any reason to believe that the open migration system of the late nineteenth century worked any better than this modern guestworker system? It seems likely. The so-called new American immigrants in the late nineteenth century behaved pretty much the same way as the late twentieth century European guestworkers: like Michael Piore's characterization of postwar industrial-country immigrants, the American immigrants were unskilled, took low-wage jobs, saw themselves as temporary and responded to booms and busts in the host country labor market (Piore 1979: 3). Furthermore, American immigrants in the late nineteenth century did not have access to the elaborate safety-net and social contract offered by the late twentieth century welfare state. Thus, they had less reason to stay on during hard times. In addition, over the quarter century 1890–1915 immigrants had a far bigger impact on the US labor market (foreign-born were about 15 percent of the total labor force) than the guestworkers had on West European labor markets over the quarter century 1950–1975 (with the exception of Switzerland, from 4 to 8 percent of the total labor force: Rogers 1985: Table 1–1, 11). Thus, there is reason to believe that the guestworkers were more effective in smoothing out unemployment over industrial booms and busts then than they are now.

¹ When Stephen Castles (1986) writes an "obituary" for the system, it is by way of noting that host countries were unprepared for those temporary workers who became permanent. For recent accounts of postwar European immigration and immigration policy see Booth (1992), Collinson (1993) and Hollifield (1992).

Some observers — mostly historians — have seen these parallels and suggested that open United States immigration policy provided just such an elastic labor supply which cushioned the effects of cyclical booms and busts on the domestic labor market. In their view, it also fed the growing sectors of the economy thus minimizing bottlenecks which more inelastic domestic labor supply might have otherwise created. Thus, Ian Tyrrell has recently argued that the United States

"was, like some West European countries in the 1970's, able to export it's unemployment problem by massive repatriation of Mediterranean labor ... in the era before World War I" (1991: 147).

Similarly, Alexander Keyssar asserted that

"workmen in Europe and Canada constituted a reservoir of labor that was tapped when needed and that reabsorbed jobless workers when business was slow in Massachusetts" (1986: 79).

Two economists, Vernon Briggs (1985: 158) and Thomas Muller (1985: 113) agree. Indeed, they have lamented the loss of the flexibility which temporary foreign workers offered prior to World War I, now restricted by quotas and thus operating only through illegal immigration.

Contemporary observers certainly saw some advantage in the seasonal and cyclical flow of immigrants and the increasing rates of return migration, particularly to southern Europe. Indeed, "birds of passage" was a popular phrase some seventy or eighty years before it reappeared as the title of Michael Piore's book (1979). When W.B.Bailey wrote in the November 1912 issue of the American Journal of Sociology, the term "birds of passage" was sufficiently common to persuade Bailey to use it as the title of his article. He then went on to describe the southern European immigrants:

"the arrival of tens of thousands of this class in good seasons undoubtedly tends to limit the rise in wage rates in this country and thus furnishes grounds for the criticisms of labor leaders, but when hard times come these same laborers return home and reduce the supply at the very time when demand is beginning to fall off" (Bailey 1912: 394).

A contemporary of Bailey's, Cyrus Salzberger, stated in the same year that

"the so-called bird of passage instead of being a menace to our industrial conditions is their greatest help. He gives flexibility, comes when there is demand for his work and departs when the demand is over."

Three years earlier, in the 1909 Annals of the American Academy of Political and Social Science,

A. Pecorini observed that Italian immigrants

"poured in just when the crying need for this country was for mill workers and unskilled laborers of every kind for the building industries. No wonder."

In 1906, J. Foster Carr described the immigrants as "a stream of workers that ebbs and flows to America in instant response to demand" (this, and the above, all quoted in Nelli, 1983: 43–5).

But the phrase "birds of passage" was used so commonly around the turn of the century that it even appears in the 1901 Report of the Industrial Commission (1901, vol. 15, p. lxxviii).

It appears that the guestworker notion was as popular before World War I as it was after World War II.

A New Look at Jerome

The most comprehensive investigation of the relationship between immigration and domestic conditions remains that done seventy years ago by Harry Jerome (1926), a decade or so following the appearance of the 1911 Report. Jerome's primary concern was to identify the role of host country employment conditions in pulling Europeans overseas to the US. This has become the more famous Jerome immigrant-demand hypothesis in the literature. His second concern is less well known and it is an early version of the guestworker hypothesis: to determine whether immigration acted as a safety valve thus making unemployment less severe in US slumps than it would have been otherwise. Jerome did not have access to comprehensive measures of employment or output to confront the first question, but he documented in great detail the strong positive correlation between immigration and various indicators of economic activity. Although most of his time series analysis used index numbers, Jerome did pause to ponder the

second question by looking at immigrant magnitudes relative to levels and changes in factory employment (1926: 95–122). He concluded that immigration was likely to have been small compared with absolute changes in numbers unemployed, but that continued immigration in slumps certainly tended to aggravate the unemployment problem (1926: 122).

We can shed further light on this issue by comparing net worker immigration with unemployment — both of which were unavailable to Jerome — taking each as percentages of the labor force. The series for net immigration has been constructed for separate groups by age and sex based on the studies of Simon Kuznets and Ernest Rubin (1954), and of Everett Lee and his associates (1957). As the Appendix shows, each age and sex specific net immigration series is multiplied by the relevant United States age and sex specific activity rate to obtain a measure of net worker immigration. This series is then divided by the civilian labor force estimates of David Wier (1992) for 1890–1913, and J.R. Vernon (1994) for 1870–1889. This series can then be compared with the unemployment estimates from the same sources. In addition, they can be compared with percentage deviations from trend in Christina Romer's (1989) real output series, output aggregates which were also unavailable to Jerome.

These comparisons appear in Figure 1. In the average year, net immigration augmented the labor force by 0.87 percent although that figure fluctuated widely between a low of 0.18 percent in 1895 and a high of 1.65 percent in 1883. Jerome was right: swings in the net worker immigration rate were small relative to the much wider swings in the unemployment rate, and smaller still when compared with the percentage swings in real output. But there is that clear inverse correlation between unemployment and the immigration rate, a testimonial to the importance of US employment conditions on the timing of the European emigrant's move. This correlation was explored at length by scholars interested in the long swing back in the 1950s and 1960s (Thomas 1954; Abramovitz 1961, 1968; Easterlin 1966, 1968; Williamson 1964), and our

own exploration of European emigration amply demonstrates the same (Hatton and Williamson 1995: Chapter 4).

The first column in Table 1 reports a Jerome immigrant-demand equation where the number of worker immigrants is regressed on the total number employed and time; it implies that every increase of 100 workers employed raised on average the number of worker immigrants by 15. This strongly supports the most famous of Jerome's hypotheses that late nineteenth century immigration was very sensitive to employment conditions in the United States. But Jerome's immigrant-demand hypothesis deals with the determinants of immigration. In contrast, the guestworker hypothesis deals with the impact of immigration and thus focusses on the relationship between the change in the employment rate (a flow) and the immigration rate (another flow), not the level of the employment rate (a stock) and the immigration rate. The second column of Table 1 reports a guestworker regression of the number of worker immigrants on the change in employment; it yields a coefficient of only 0.06, a tiny guestworker effect. The third and fourth columns show that the guestworker effect was even smaller (and statistically insignificant) before 1890. It appears that the guestworker effect became significant only after 1890, but stayed tiny.

But have we asked the wrong question? If immigration remained low over a protracted and serious recession such as the 1890s (due to the low level of employment), then the cumulative effect of immigrant scarcity would be to retard labor force growth and attenuate the unemployment bulge. In order to explore this alternative test of the guestworker hypothesis, Wier's labor force estimates are adjusted to take into account fully the impact of worker immigration (Appendix). A counterfactual labor force is then calculated which would have emerged had the annual number of immigrants between 1890 and 1913 been constant at the average for the period as a whole. Under the "no guestworker" counterfactual, more of the

immigrants would have arrived earlier in the period and fewer later on. Holding worker immigration constant over long swings and business cycles implies a new counterfactual "no guestworker" labor force and a corresponding counterfactual unemployment rate. Figure 2 plots the result: the unemployment bulge in the 1890s would have been bigger and persisted longer than it did in fact. The "no guestworker" unemployment rate would have reached 10.7 percent at the 1896 peak, rather than 9 percent. Alternatively, the "no guestworker" unemployment rate would have risen by 6.7 percentage points between 1892 and 1896, rather than by 5.1 percentage points (e.g., the guestworkers muted the impact of industrial crisis on unemployment by $[6.7-5.1]/6.7 = -24\%$). The "no guestworker" unemployment rate would have been 7.6 percent in 1904 rather than 5.2 percent, and it would have risen by 1.1 percentage points between 1902 and 1904, not 1.8 percentage points.

The nonfarm unemployment levels were, of course, higher in both actual and counterfactual labor markets. Under the plausible assumptions that overt unemployment was absent in agriculture and that European immigrants entered non-farm labor markets exclusively (Appendix), Figure 3 plots the urban guestworker effects. While the levels are bigger, the share of unemployment changes explained by immigrants is the same as before in Figure 2. Between 1892 and 1896, the "no guestworker" nonfarm unemployment rate rose by 10.8 percentage points compared with 8.4 percentage points in fact (muting the impact of industrial crisis on nonfarm unemployment by 22%).

Are these figures big or small? Surprisingly small, it seems to us.² Immigration did not

² It might appear that our calculations are biased downwards by the assumption that immigrants did not have a significant impact on aggregate demand and thus employment rates, taken here to have been exogenous to the immigrations. David Pope and Glen Withers (1993, 1994) would quarrel with this assumption based on their analysis of Australia, as, no doubt, would Richard Easterlin (1966, 1968) and Moses Abramovitz (1961, 1968) based on their analysis of the American long swing. On the other hand, we ignore the very real possibility that some of the guestworkers competed directly with secondary members of the work force. These secondary

operate as a very important safety valve on a year to year basis. While the cumulative impact during a series of boom or depression years could have been more significant, as it evidently was in the 1890s, the guestworker impact was still surprisingly modest in the age of free migration, serving to mute the rise in unemployment during the biggest pre-World War I depression, 1892 to 1896, by only a quarter.

The Guestworker Effect: Easing Labor Supply Bottlenecks?

There is a second pair of questions underlying the guestworker hypothesis: Did the immigrants flow disproportionately in to rapidly growing, high-wage industries and occupations thereby lessening the need for intersectoral migration of the existing native labor force and easing short run bottlenecks? Or did they crowd in to slow growing, low-wage industries and occupations undergoing relative decline, thus crowding out unskilled natives? These competing views can be examined by comparing the share of immigrants in a given occupation with the growth of the total numbers in that occupation. If that share was high and rising in rapidly expanding industries and occupations, then immigrants could be regarded as the "shock troops" of structural change.³ We have examined the share of male immigrants in 106 occupations in 1900 and the change in that share between 1890 and 1900 — the only pair of census years in which both the same occupational definitions and the share of immigrants are available. These

workers helped contribute to the procyclical movement in the labor force of which so much was made by Robert Coen (1973) and Christina Romer (1986a) in their debates with Stanley Lebergott (1964). In short, we don't know whether the estimates offered in the text set an upper or a lower bound.

³ The term comes from Sidney Pollard (1978) who characterized the Irish in early industrializing Britain the same way. Williamson (1986) disagreed. The exchange between Pollard and Williamson over the impact of the Irish immigrants on British workers from the 1820s to the 1850s exactly parallels this later debate in America. The issues are the same, only the names have been changed.

occupations can be divided into the socioeconomic classification suggested by Alba Edwards (1917) and placed on a six-point scale from the highest to the lowest skill (e.g., unskilled = 6 and professional = 1). Unemployment incidence is measured as the proportion of the workers in a given occupation who experienced some unemployment in the previous year. Of course the data are for native-born and foreign-born stocks, not the current inflows. However, they are all we have.

The first column of Table 2 reports a regression for the share of the foreign-born across occupations in 1900. The coefficient on occupational score is positive and significant, confirming that immigrants found employment more frequently in unskilled jobs, compared with natives. The coefficient on unemployment incidence is insignificant and close to zero, indicating that the foreign-born did not move disproportionately into industries and occupations with low unemployment rates. The coefficient on total occupational growth is negative, suggesting that immigrants located in slow-growth rather than high-growth sectors. But perhaps it is the second column of Table 2 that is more relevant, where the correlates with the change in the foreign-born share between 1890 and 1900 are reported. These were years of high unemployment and thus low immigration, so the share foreign-born among all occupied males fell across the decade, from 23.1 percent to 20.9 percent. Nonetheless, the foreign-born share tended to fall most in the fastest growing occupations and least in the slowest growing occupations.

There is no evidence to support the view that occupations which were dominated by the foreign-born in 1890 grew faster over the subsequent decade. Nor is there any evidence to support the view that immigrants in the 1890s flowed disproportionately into high-growth sectors and high-growth occupations. In fact, the evidence suggests the contrary: immigrants flowed disproportionately into the slowest growing occupations, a fact that holds for the late twentieth century as well.

We have a ready explanation for this result: assuming occupational growth reflects shifting comparative advantage, and assuming that the US was exploiting its comparative advantage in skill, resource and capital intensive industries, then relatively fast growing sectors should have generated relatively buoyant demand for skilled labor and sluggish growth for unskilled labor (Williamson and Lindert 1980: Chapters 9 and 10). Thus, unskilled immigrants should have flooded into unskilled labor intensive industries (and thus occupations) where growth was slower. Indeed, and to repeat, these findings are consistent with those from the 1980s and 1990s when the flood of new less-skilled immigrants into services and import-competing manufacturing has raised concern (Baumol et al. 1989; Borjas 1994). The evidence from the 1890s also seems to confirm a mismatch between labor demand which was shifting away from unskilled occupations (e.g., becoming more skilled) and booming immigrant labor supplies that were declining in quality (e.g., becoming less skilled). It had, of course, inequality implications a century ago (Williamson and Lindert 1980; Williamson 1982) just as it does today (Goldin and Margo 1992; Borjas, Freeman, and Katz 1992). It crowded out native unskilled (including southern blacks; Thomas 1972: 130–4 and Chapter 18) and thus widened the gap between the working poor and the rest. In this sense, the Immigrant Commission and today's Congress share the same concern.

What we have said about occupations need not, of course, apply to regions. While immigrants may not have flooded (relatively) the fast growing industries, surely they flooded the fast growing regions. So, did immigrants move into the most rapidly expanding states, thus easing excess demand in local labor markets? This time we examine the proportion of foreign-born in the total population across states for the intercensal periods 1880–90, 1890–1900 and 1900–10. These data are pooled to produce the regression in Table 3. The result shows that for three regions — New England, the Mid-Atlantic and the South Atlantic — states whose populations

grew rapidly experienced a significant rise in foreign-born density. This reflects the well-known fact that immigrants moved to the cities in the most rapidly growing states on the eastern seaboard. By contrast, the more rapid was the growth of a state's population in the West North Central or in the Mountain region, the more the share of foreign-born (native-born) in the population fell (rose). They avoided most of the South. Thus, while immigrants moved disproportionately into the most rapidly growing centers on the East Coast, they did not do so elsewhere in the US.⁴

Were immigrants therefore crowding out the natives in the fast-growing East Coast regions?

Were Immigrants and Natives Substitutes? Was There Crowding Out?

Immigrants may have been guided to labor market destinations by economic opportunity,⁵ but that fact does not tell us whether immigrants displaced or crowded out natives

⁴ All of the evidence presented in Table 3 deals with population rather than labor force. Given that movers (whether native or foreign-born migrants) have higher labor participation rates than stayers, we suspect that the results would be even stronger if done on the labor force.

⁵ A number of studies have examined the intended destinations of immigrants arriving in the United States at the turn of the century (Dunleavy and Gemery 1977, 1978; Dunleavy 1980, 1983; Dunleavy and Saba 1992). Broadly speaking, these studies find that immigrants selected their destinations in response to a consistent set of variables. They migrated towards states on the eastern seaboard (close to New York), towards those offering relatively high incomes, and towards those with high population densities. These studies also confirmed that the stock of previous migrants from a given country and the lagged emigration rate both had a big influence on the current emigrant's decision (see also Hatton and Williamson 1995: Chapters 2-4): that is, there was strong historical persistence operating on the foreign-born location decision in the US. The presumption, therefore, is that foreign-born destinations differed from those of the native-born. Mere inspection of the regional distributions of immigrants and natives suggests that there were differences in their migration behavior within the United States and more sophisticated studies support this view (Gallaway and Vedder 1971; Gallaway, Vedder and Shukla 1974). A recent study of the intended destinations of Canadian immigrants in 1912 has argued that immigrants also went to destinations and sectors which offered the best use of their skills (Green and Green 1993). Insofar as these skills differed from those of natives, immigrant settlement patterns might be expected to differ from those of the native-born.

in the occupations and regions they entered. There are, of course, crude but compelling correlations, the best example of which was offered almost a quarter of a century ago by Brinley Thomas (1972: 130–4 and Chapter 18). Thomas noted an inverse rhythm between southern black emigration to the North and foreign immigration over the long swing. The exit rate out of the South was high in the 1870s, high in the 1880s, high during World War I, and high after the quotas, all of which were years of low European immigration. Is this evidence of unskilled European immigrants crowding out unskilled (black, male, southern) Americans? Or is it evidence that during a slump, when unemployment was high in eastern cities and immigration low, things were even worse for southern agriculture thus pushing farm labor up North in spite of the high unemployment incidence there? Thomas' correlations do not necessarily imply crowding out until we have controlled for labor demand.

Some economists have recently addressed the same crowding out issue for the 1970s and 1980s. Randall Filer (1992) examined native-born migration patterns for 272 geographical areas in 1975–80. After controlling for local labor market characteristics, he found that an influx of foreign-born to an area crowded out native workers about one for one, an apparent vindication of Brinley Thomas. Perhaps the most notable natural experiment was preformed by Castro when the Mariel boatlift brought the 1980 influx of Cubans into Miami. David Card (1990) found that this influx of 45,000 Cubans, equivalent to 7 percent of the Miami labor force at that time, had almost no long run effect on the city's labor force or on the wages of competing groups of whites, blacks and other hispanics. This occurred

"because of a change in the net migration of natives and older cohorts of immigrants rather than a change in the inflow rate of new immigrants" (Card 1990: 256).

That is, employment and wages in the local Miami labor market were left unaffected since so many natives vacated the market, apparently one for one, and moved on to other US cities.

However, other studies suggest that the same results might not hold for different periods (Butcher and Card 1991), including, we suppose, the late nineteenth century free migration period.

It all depends on how well labor markets were linked between cities. Perhaps a truly well-integrated national labor market was absent then (Rosenbloom 1990, 1994; Sundstrom and Rosenbloom 1993). Perhaps, but even so there was that enormous and continuing westward movement which was so much a part of US internal migrations at that time. Census evidence testifies to the large-scale migration of the native-born. While 13.7 percent of the US population in 1900 was foreign-born, a larger share, 17.7 percent, were interstate migrants (not living in their state of birth: Hill 1906: 279). Net migration of the native-born was dominated by the movement towards the West North Central, Mountain and Pacific states. Thus, while 42.6 percent of the residents of Western divisions were migrants from other divisions, only 4 percent of the North Atlantic residents were. While some foreign immigrants went west upon arrival or subsequently (Ferrie 1992), the westward movement largely involved natives. Immigrants tended to concentrate in the urban northeast.⁶

Was therefore some proportion of the northeastern native-born crowded out (pushed West) by the mass immigration from Europe? Intercensal estimates of net migration of native-born and foreign-born have been offered by Hope Eldridge and Dorothy Thomas (1964) using the method of cohort depletion. The resulting migration patterns

"produced a sort of 'dovetailing' of native migration losses with foreign-born migration gains in the industrial sections of the Northeast and the North Central, especially in the decades before World War I" (1964: 65).

Table 4 is based on their figures, and it documents net migration of native-born and foreign-born

⁶ Both native-born and foreign-born favored city location, but this was especially true of the latter: in 1900, 17.3 percent of the population in cities greater than 25,000 were native interstate migrants and 26 percent were foreign-born (Hill 1906: 277).

both divided by the regional native-born population. But before we examine the table, consider the three possibilities offered in Figure 4. Native-born labor supply (S_N) to a given region is upward sloping to reflect migration across borders, exogenous foreign immigration is added to give total labor supply ($S_N + \text{MIG}$) and the three cases of regional labor demand (D_L) are: stagnant, modest boom and big boom. In case 1, stagnant regional labor demand insures massive native-born crowding out (L_N retreats to the left to L_N^1 , reflecting native out-migration to another region); in case 2, modest regional labor demand results in no crowding out at all (L_N remains the same in the presence of the new immigrants, and there is no native out-migration); and in case 3, regional labor demand dominates so that native-born are crowded in (L_N moves to the right to L_N^3 , reflecting native in-migration) even though immigrants have flooded the region.

Figure 4 has an obvious moral: we have to control for regional labor demand. Thus, the crude correlations suggested by Table 4 may or may not tell us much about crowding out. Nonetheless, it illustrates that the small and somewhat intermittent net out-migration of natives from New England, the Mid-Atlantic and the East North Central were accompanied by high rates of net foreign-born in-migration. Although native out-migration was modest, it must be remembered that very rapid industrial growth was taking place in the Northeast between 1880 and 1910 (Wright 1990). Strong labor demand crowding in and foreign-born immigrant crowding out were both at work in this case (Case 2 in Figure 4). The old South exhibits higher rates of native out-migration and very small foreign-born in-migration. Weak labor demand was the primary force at work in this case (Case 1 in Figure 4). The pull of the West is clearly seen in the large rates of in-migration to the Mountain and Pacific regions and, to a lesser extent, the West South Central. In this case, very strong labor demand was the primary force at work (Case 3 in Figure 4). Thus, the evidence in Table 4 cannot be used to test for immigrant crowding out

without controlling for labor demand, even in the East.⁷

What follows is an effort to control for labor demand and to focus on the region where crowding out was likely to have mattered most — the Northeast. We explain the net in-migration rate of natives to the 14 states comprising New England, the Mid Atlantic and the East North Central across the three intercensal periods, yielding a panel data set consisting of 42 observations. Native migration is explained by wages at the beginning of the decade and other structural characteristics such as the agricultural employment share, the manufacturing employment share and the urban employment share. To test the displacement hypothesis, the net in-migration of foreign-born as a proportion of the native population is included. We also include total employment growth as a proxy for buoyant labor demand. While it may not an ideal measure of demand, other suitable measures of labor demand at the state level are, alas, absent.

Table 5 reports ordinary least squares (OLS) and instrumental variables (IV) regressions. The OLS results in the first column of the table suggest some evidence of immigrant crowding out, but the only significant variables in the regression are employment growth and the 1890s dummy (the 1890s being a poor growth decade compared with the ones preceding and following). However, neither the immigrant influx nor the employment growth measure can be viewed as exogenous since both should have been influenced by the migration behavior of natives, as Figure 4 has already suggested. Hence, we must instrument these two variables. The instruments used are the ratio of foreign-born to natives at the beginning of the decade and the proportion living in cities with a population of 100,000 or more. Since these variables are evidently important determinants of the immigrant inflow, they ought to be good instruments for the in-migration of

⁷ But as Filer points out, in the presence of demand shocks driving internal migration, an inverse relationship between native-born and foreign-born migration is suggestive of crowding-out even though it could also be present where there is in-migration of both native-born and foreign-born. The question is whether an influx of immigrants into a local or regional labor market tends to increase the out-migration or lower the in-migration rate of natives.

foreign-born though not necessarily for demand growth. The result in the second column of Table 5 is that foreign-born crowding out becomes more powerful and statistically significant. It suggests that an additional 100 foreign-born in-migrants to these northeastern states increased native-born out-migration by 38. While this is not quite the one-for-one Filer found for late twentieth century America or that Card found for Miami in 1980, it is substantial crowding out nonetheless.⁸

The net westward movement in search of better economic opportunities brought with it a convergence of regional wage rates (Easterlin 1960; Williamson 1965, 1980; Rosenbloom 1990, 1994; Barro and Sala-i-Martin 1991), although the South was not part of the process (Wright 1986). Hence, fewer immigrants arriving on the East Coast would have led to less competition in eastern cities, a slower westward movement of population (both native-born and foreign-born) and perhaps a slower relative decline in the western wage.

The Immigration Commission lamented the concentration of immigrants in the cities, and their unwillingness to enter agriculture despite the fact that so many of them came from rural backgrounds, but this is hardly surprising given that real wages in agriculture were lower than those in unskilled urban occupations.⁹ If more immigrants had entered agriculture, the urban-rural wage gap would have increased and more rural native-born Americans would have migrated to the cities. This is not simply speculation since our own recent analysis of rural-urban migration

⁸ However, with the exception of employment growth and the 1890s dummy, none of the other variables are significant and the coefficient on the wage does not give the expected positive sign. It might be suggested that the agricultural and manufacturing shares and the degree of urbanization are acting as proxies for the wage, and the negative sign on the agricultural employment share and the positive signs on both the manufacturing employment share and the urban population share suggest this. However, excluding the wage in columns (3) and (4) of Table 4 makes very little difference to the results.

⁹ In 1900, for example, the farm real wage was about 70 percent of the urban unskilled real wage (Hatton and Williamson, 1992: 269).

and wage gaps (Hatton and Williamson 1992) has shown that if migrant entry into urban labor markets led to higher unemployment or lower real wages there, then this in turn slowed the rate of rural-urban migration and kept the rural wage lower than otherwise. Similarly, in the absence of the immigrant inflow to the industrial north, blacks would have moved up from the South in greater numbers in the late nineteenth century as they ultimately did during World War I and after the quotas (Thomas 1972: 130–4).

The Impact of Immigration on Wages: Looking at Cross-Sections

The key immigrant absorption question, however, has always been this: What effect did current immigration have on the wage rates of natives, and those of past immigrants? Although the preceding sections have something to say about the way immigrants were absorbed in the late nineteenth century American economy, we, like the Immigrant Commission before us, have failed so far to confront this key question. It is time to do so.

The evidence surveyed above argues that, for a given occupation and region, immigrants received roughly the same wages as natives. The Immigration Commissioners would have agreed: their report firmly stated that it was unusual for employers to engage immigrants at wages lower than those prevailing in the industry and occupation to which they were recruited. In modern terminology, the Commission observed little evidence of labor market segmentation between immigrants and natives. Cliometric analysis concurs. But were immigrants (less skilled labor) complements or substitutes for natives (more skilled labor) in production? If they were complements, then immigration could have raised the productivity and hence the wages of the more skilled native workers. James Foreman-Peck (1992) recently estimated a translog production function for United States manufacturing in 1890, treating immigrant and native labor as separate factors of production. His results showed that these two types of labor were not

complements: bigger immigrant labor supplies did not increase the marginal product of native labor.¹⁰

These results, generated by different methods and sources, suggest that immigration lowered wages in American labor markets (or lowered the increase in workers' wages there), a view strongly held by the Immigration Commission but derided by critics such as Hourwich. According to the Commission, immigrant labor supply

"has undoubtedly had the effect of preventing an increase of wages to the extent which would have been necessary had the expansion of local industries occurred without the availability of the southern and eastern Europeans" (1911, vol.8: 440, see also Jenks and Lauck 1926: 206–7).

As Hourwich pointed out, the same should apply to all immigrants, but he rejected the idea implicit in such counterfactual statements, preferring instead to emphasize that substantial gains in real wages had in fact taken place since the 1880s and to infer from this that immigration had not retarded the growth of wages (1922: 295–307). However, comparing real wage growth in the period from the 1890s to 1914 with that in the 1920s has led such authorities as Paul Douglas (1930: 564) and Stanley Lebergott (1964: 163) to conclude that mass immigration slowed the rate of growth of real wages in the earlier period.¹¹

We have already noted that economists have generated a sizeable literature dealing with the effects of the immigration of the 1970s and 1980s. One of the largest estimated effects of modern US immigration on native wage rates comes from a recent study by Joseph Altonji and

¹⁰ Foreman-Peck's results are consistent with the earlier observations of McGouldrick and Tannen (1977) who found no differences in the productivity performance of New England and southern textile industries despite the fact that the former employed immigrant labor, while the latter did not.

¹¹ Douglas found that the real wages of unskilled workers declined between 1900 and 1914 and remained roughly constant overall between 1890 and 1914. These estimates were questioned by Rees who found faster growth in manufacturing earnings between 1900 and 1914 but who did not rule out the possibility that immigration during this period may still have retarded real wage growth (1930: 126).

Card (1991). They examined the effects of changes in the share of immigrants across SMSA's between 1970 and 1980 on low-skilled natives' wages. They found that a 1 percentage point increase in the share of foreign-born lowered the wage of low-skilled natives by between 0.3 and 1.2 percent. Such effects are somewhat smaller than, but consistent with, late nineteenth century assessments. However, the Altonji and Card study appears to be the exception to the rule since several influential surveys concluded just the opposite, that the impact of immigration on wage rates in the post-World War II period has been tiny (Greenwood and McDowell 1986, 1994; Simon 1989: Chapter 12; Borjas 1990, 1994). The studies cited in these surveys and elsewhere have often tried to infer the effects of immigration by looking across local labor markets within the United States.

These local labor market studies are flawed since they almost certainly understate (or miss entirely) the economy-wide impact of immigration on wages. After all, immigration will only lower wages in a local labor market insofar as it increases the total supply of labor. If there is instead completely offsetting native emigration, as seen in the study of Filer cited above, then a rise in the immigrant share is consistent with no change in the size of the local labor force, and no wage effect of immigration compared with other local labor markets in which natives relocate. But wages should fall (perhaps equally, perhaps not) in all locations. These effects are not measured by the local labor market studies if local labor markets are well connected. Even if there was no correlation between the inward movement of immigrants and the migration patterns of natives, the latter would probably obscure the total labor force impact of immigration.¹² Our own state level evidence for the Northeast presented in Table 5 indicates that there was a powerful crowding out effect but that it was not complete and hence an immigrant influx to a

¹² As Borjas (1994: 1699) puts it: "As long as native workers and firms respond to the entry of immigrants by moving to areas offering better opportunities there is no reason to expect a correlation between the wage of natives and the presence of immigrants."

given state typically did not increase the total state labor supply by an equal amount.

The Impact of Immigration on Wages: Looking at Time Series

Although it has rarely been attempted for the United States, a recent study by David Pope and Glen Withers (1994) tried to gauge the impact of immigration on wages in Australia using aggregate time series from 1861 to 1913. They found no negative effect; indeed the effect while small was positive. But their study looked only at the impact of current and lagged immigration, not at the total impact of the immigrant-augmented labor force. Labor's marginal product and the wage should be associated with the total labor supply, not with the current addition to that supply; and the current addition should include all sources, not just immigration, since, after all, Australian immigration may have been offset by changes in native labor supply, potential offsets that were ignored by Pope and Withers. In another study, the same authors (Pope and Withers 1993) also found little effect of immigration on the Australian unemployment rate in the long run, concluding that immigrants did not "rob" jobs from Australians. This second finding ought not surprise any reader since the Australian economy ought to have adjusted back to its long run equilibrium unemployment rate after an immigration-induced labor supply shock, but with a lower real wage. It is the first finding of no immigration-induced negative wage effects that deserves critical assessment.

One way to examine directly the impact of immigration on the real wage is to estimate the wage adjustment mechanism. By altering labor supply and unemployment in the short run, immigration should drive down the wage along some long run Phillips curve. The wage adjustment mechanism we favor is the standard Phillips curve which follows:

$$\Delta \log(W)_t = \alpha_0 + \alpha_1 \Delta \log(P)_t + \alpha_2 \log\left(\frac{E}{L}\right)_t \quad (1)$$

where W is the nominal wage, P is the price level (cost of living), E is employment, L is the civilian labor force, and both α_1 and α_2 are expected to be positive. Labor's marginal product condition (assuming a CES production function) implies:

$$\log(E)_t = \beta_0 + \beta_1 \log\left(\frac{W}{P}\right)_t + \log(Q)_t + \beta_2 t \quad (2)$$

where Q is real output and t is a time trend to capture technical change. We expect β_1 to be negative, and in the special Cobb-Douglas case it should equal -1 . Substituting (2) into (1) and rearranging gives:

$$\begin{aligned} \Delta \log\left(\frac{W}{P}\right)_t = & \frac{\alpha_0 + \alpha_2 \beta_0}{1 - \alpha_2 \beta_1} + \frac{\alpha_1 - 1}{1 - \alpha_2 \beta_1} \Delta \log(P)_t + \frac{\alpha_2}{1 - \alpha_2 \beta_1} \log\left(\frac{Q}{L}\right)_t \\ & + \frac{\alpha_2 \beta_1}{1 - \alpha_2 \beta_1} \log\left(\frac{W}{P}\right)_{t-1} + \frac{\alpha_2 \beta_2}{1 - \alpha_2 \beta_1} t \end{aligned} \quad (3)$$

This model is consistent with many empirical Phillips curve formulations although it includes a term for output relative to the labor force, rather than simply detrended output (or the 'output gap') and it includes the lagged real wage level (the error correction term).¹ This formulation clearly produces an inverse relationship between the real wage and the total labor force (holding output constant). In long run steady state, where wages and prices are constant,

¹ Sachs (1980), James (1989), Allen (1992) and Hanes (1994) all provide estimates for the pre World War I period. But they each estimate the equivalent of equation (1) rather than combining it with the marginal productivity condition for labor to yield a term for the lagged real wage as in equation (3).

the equation can be written:

$$\log\left(\frac{W}{P}\right) = -\frac{\alpha_0 + \alpha_2 \beta_0}{\alpha_2 \beta_1} - \frac{1}{\beta_1} \log\left(\frac{Q}{L}\right) - \frac{\beta_2}{\beta_1} t \quad (4)$$

An increase in the labor force due to immigration would cause the wage to fall until the 'natural' rate of unemployment was restored.

This model has been estimated on annual observations for 1890–1913, using the immigrant-adjusted labor force estimates reported in the Appendix. The real wage and price indexes are from Williamson (1995) and real GNP is from Romer (1989). The first equation in Table 6 offers strong support for the model with all coefficients significant. The price change coefficient is negative, a plausible result consistent with incomplete adjustment of nominal wage to price change, and the labor productivity coefficient is positive, also consistent with theory. The lagged real wage coefficient is negative, results again consistent with theory.²

When the output and labor force terms are entered separately in the second equation, the coefficients are predictable — of opposite sign and almost equal in magnitude, but the labor force has a low level of significance. This is because of its collinearity with the time trend which also loses significance. When the time trend is eliminated in equation (3), the labor force term also becomes strongly significant. Finally, equation (4) imposes the restriction that labor productivity and the lagged real wage take on equal coefficients with opposite signs, consistent with a Cobb-Douglas world. This restriction cannot be rejected against either equation (1) or

² The negative coefficient on the time trend is not, however, consistent with theory. A possible reason for this is that the error correction term, which arises from the first order condition for labor, should, in principle, reflect the producer price index rather than the cost of living index. Since the cost of living index fell relative to the GNP deflator, this might account for the negative trend component. In initial estimation, the ratio of the cost of living to GNP deflator was included as a separate variable but it never took a significant coefficient.

equation (2).³

The long run solution to these equations suggests that, holding output constant, an increase in the labor force by one percent would lower the real wage by from 1 percent (equation 4) to 1.25 percent (equation 1), other things constant. But other things were not constant since a larger immigrant-augmented labor force would have caused output to expand as well. Under perfect competition and CES assumptions, the long run impact of labor force growth on output is simply the labor share times labor force growth. Adding this endogenous output response, and taking labor's share to be 0.6 (Taylor and Williamson 1994: A11), implies that a one percent rise in the labor force due to immigration would have reduced the real wage in the long run by 0.4 percent (equation 4) or 0.5 percent (equation 1). Based on the net series offered in the Appendix, immigration after 1890 augmented the 1913 US labor force by 11.6 percent. The estimates above suggest that in the absence of this net immigration the real wage would have been 4.6 to 5.8 percent higher in 1913. These figures are very close to Claudia Goldin's (1994) recent cross-section estimate that immigration reduced the wage by about 7 percent between 1890 and 1915, her somewhat larger figure allowing for two more years of immigration.⁴ Despite the likely downward bias associated with estimating the impact of immigration from (local labor market) cross-section, Goldin's results roughly agree with the ones derived here from time series.⁵

³ The computed chi-squared statistics for these restrictions are 0.34 and 1.92 respectively compared with the 5 percent critical values of 3.84 and 5.99.

⁴ Goldin finds that across cities between 1890 and 1915 a one percentage point increase in the share of foreign-born in the population decreased unskilled wage rates by about 1 to 1.5 percent. Furthermore, these results also appear for artisans and for different industry groups.

⁵ These orders of magnitude are also supported when the marginal productivity condition for labor is estimated on panel data across countries and decades. The results indicate that in the absence of immigration from 1870 to 1910, the US real wage would have been 12 percent higher in 1910 (Taylor and Williamson 1994: 29).

The Impact of Immigration on Wages: Computable General Equilibrium

Local labor market and time series estimates both fail to capture adequately the full impact of immigration on national wages. They make no allowance for output shifts between sectors, events with macro factor-demand implications which are likely to have taken place in response to immigration. That is, they ignore the fact that international trade and domestic demand might have helped accommodate the immigrant influx.⁶ Nor do they allow capital to chase labor across the Atlantic, offsetting the decline in the capital-labor ratio which American immigration would otherwise have induced. The best way to accommodate such complications is to evaluate the effects of international migration in the context of a computable general equilibrium model.

Computable general equilibrium models are certainly not new to economists since they are common in development, international trade, public finance and economic history (Shoven and Whalley 1992). They have been used to analyze contemporary migration problems (Hamilton and Whalley 1984) as well as historical migration problems (Williamson 1974; Williamson 1990: Chapter 6; Boyer, Hatton and O'Rourke 1994; O'Rourke, Williamson and Hatton 1994; O'Rourke and Williamson 1995). The first effort to apply computable general equilibrium to late nineteenth century United States estimated that immigration lowered real wages by 11 percent from 1870 to 1910 (Williamson 1974: 387), a period twice as long as the time series in the previous section which yielded 4.6–5.8 percent.⁷ Doubling our time series estimate to make it comparable with the longer period yields something like 9–12 percent, almost identical to

⁶ By trade, we refer, of course, to the so-called the Heckscher-Ohlin factor price equalization theorem. In collaboration, one of the present authors has shown these trade effects to have been significant in the late nineteenth century (O'Rourke and Williamson 1994; O'Rourke, Taylor and Williamson 1993).

⁷ The 4.6-5.8 estimate for the 1890-1913 period was also confirmed by Williamson and Peter Lindert (1980).

Williamson's earlier estimate of 11 percent.

More recently, we have implemented with Kevin O'Rourke another CGE experiment. The model is detailed in full elsewhere, but it is worth sketching out its structure here (O'Rourke, Williamson and Hatton 1993: Appendix 1). The American economy is described by four producing sectors — food (A), agricultural intermediates (I), manufacturing (M), and services (S). There are three primary factors of production — land (R), labor (L) and capital (K), two "produced" factors — agricultural labor (L_a) and non-agricultural labor (L_{na}), and two imported goods — tropical commodities (T) and foreign manufacturers (Mf). Finally, an artificial good, 'foreign exchange', is used in modelling trade flows and services.

The production functions can be written as:

$$\begin{aligned}
 A &= A(L_{a_a}, K_a, R_a) \\
 I &= I(L_{a_i}, K_i, R_i) \\
 M &= M(L_{na_m}, K_m, I_m, T_m, A_m) \\
 S &= S(L_{na_s}, K_s, M_s)
 \end{aligned}
 \tag{5}$$

where the left-hand side variables are outputs, X_i is the input of factor X into sector i.

Production in both agricultural sectors is Cobb-Douglas, production in the other two sectors is CES, and all four obey constant returns to scale.

The model allows for rural-urban wage gaps which are determined endogenously by the pseudo-production function which deals with internal migration:

$$(L_a, L_{na}) = L(L_r)
 \tag{6}$$

Pseudo-production functions are also used to model trade flows. Export 'sectors' convert the export good into foreign exchange while import 'sectors' convert foreign exchange into the

import good. The US is assumed to be 'small' (a price taker) in the markets for food, manufactures and tropical goods, but it is assumed to be 'large' (a price setter) in the market for agricultural intermediates (cotton). Thus, the production function converting cotton exports into foreign exchange exhibits decreasing returns to scale (cotton demand in foreign markets facing US firms is downward sloping). Services are taken to be non-traded, so domestic demand equals domestic supply and service prices are fully endogenous.

The representative consumer is endowed with labor, land and capital. This representative consumer maximizes a Cobb-Douglas utility function over food, manufactures, services and tropical goods. Perfectly competitive general equilibrium is defined by price equals cost for every sector, demand equals supply for every commodity, and consumer income equals rents on all endowments. The CGE determines endogenously 13 (commodity and factor) prices, 9 activity levels and the total income. The model is calibrated using factor share, factor employment and sectoral output data from 1869 (O'Rourke, Williamson and Hatton 1993: Appendix 1).

In order to use the CGE model to assess the impact of immigration on wages (and other variables), the next step is to estimate the counterfactual labor force, that is, the labor force that would have emerged in the absence of any net immigration from 1870 onwards. Rather than simply cumulating the annual net inflows as we did in the short-run time series analysis, we now work from the stock of foreign-born enumerated in the United States census for 1910 (or 1890).²⁰ By deducting those estimated to have arrived before 1870, and by applying age/sex

²⁰ Our interest now is in the long-run impact of the immigrants. Cumulating net immigrant flows as in the short-run time series analysis takes no account of the subsequent withdrawal of the immigrants from the labor force through retirement or death. Nor does it take account of the labor market entry of immigrants who arrived in the US as children, or, more importantly, of the children of immigrants who were born in the US and who ultimately entered the labor market. Such effects increase in importance the longer the time period considered. However, while the calculations reported here take these factors into account, they do not allow for the possibility that immigration lowered native-born birth rates -- the so-called Walker Effect (a glutted labor market causing marriage postponement, fewer births within marriage and higher infant

specific participation rates to the remainder, the direct contribution of immigration to the labor force is derived for 1910 (or 1890). In addition, we also allow for the labor force impact of the children of immigrants (based on the fertility of foreign-born females: O'Rourke, Williamson and Hatton 1993: Appendix 2). These calculations suggest that the US labor force would have been 13 percent smaller in 1890 without the net immigration from 1870 to 1890, and about 27 percent smaller in 1910 without the net immigration from 1870 to 1910. Alternatively, immigration after 1870 served to augment the US labor force by 15 percent in 1890 and 37 percent in 1910.²¹

The impact of immigration is estimated by comparing two model runs from 1870 to 1910: one using the actual labor force, and one using the counterfactual 'no immigration' labor force. The comparison is made under two alternative assumptions about international capital markets. The first treats the US as completely closed to world capital markets and assumes that the capital stock is unaffected by the more slowly growing labor force in the 'no immigration' counterfactual. While a very bad assumption, it is commonly made even in current debates about the impact of immigration on American or European labor markets. Nonetheless, we show the results in the upper panel of Table 7 and the effects are very big. In the absence of the immigrations after 1870, the urban real wage would have been 14 percent higher in 1890 and 34 percent higher in 1910. With an impact that big, no wonder the Immigration Commission produced a massive report in 1911 which supported quotas!

But note in the upper panel of Table 7 that the counterfactual return to capital declines sharply since it works with less (immigrant) labor. Symmetrically, rates of return to capital must

mortality), or that immigration had a native-born discouraged worker effect at least among members of the secondary work force. We think such effects were small, but their possible existence implies an upper bound to our estimates.

²¹ If the children of immigrants are ignored, the 1910 US labor force would have been about 18 percent smaller in the absence of the immigration after 1870.

have been higher with more (immigrant) labor. Well then, what happens when foreign capital from Britain and elsewhere in Europe is allowed to chase after the emigrants going to the United States? While economic historians are pretty sure that some of the capital that flowed from Europe to North America was chasing after labor, we don't know how much. Suppose one makes the extreme assumption that the international capital market was perfectly arbitrated and that the United States was 'small' relative to the world capital market.²² Under these assumptions, less capital would have migrated across the Atlantic and in the 'no immigration' counterfactual the marginal product of capital would have remained constant. While the rise in the marginal product of labor would therefore have been attenuated, the rise would not have been eliminated since land-labor ratios would still have been higher under the capital mobility assumption. Our estimate in the lower panel of Table 7 indicates that the 'no immigration' urban real wage would have risen much less under these elastic world capital flow assumptions — 3.7 percent by 1890 and 9.2 percent by 1910.

Conclusions

Our findings about the impact of mass migration on the late nineteenth century American labor market shed light on several important historical debates, but they are also relevant to debate about immigrant impact in the late twentieth century. It appears that the ebb and flow of immigration did little to ease cyclical booms and busts in unemployment. Hence immigration was not the effective guestworker safety valve some contemporary observers (wistfully) imagine. Nor did immigrants fill structural gaps in the labor market in a way which would have eased the structural disequilibrium created by the dramatic industrialization of that time. Instead,

²² Robert Zevin (1992) and Maury Obstfeld (1994) have both shown that world capital markets were at least as well integrated in the 1890s as in the 1980s, perhaps even better.

immigrants tended to fill less-skilled niches in slower-growing occupations (crowding out unskilled natives there) while natives tended to fill the more-skilled niches in fast-growing occupations. Furthermore, the immigrant influx to the Northeast caused significant geographic displacement of native workers, and, presumably, blocked black emigration from the rural South.

The findings that immigrants at least partially displaced natives in local labor markets suggests that macroeconomic analysis of the impact of immigration on wages should be preferred over cross-section or local labor market analysis. Local labor market studies typically conclude that late twentieth century immigration has had trivial impact on wages and living standards of American workers. In contrast, our macro assessment of the late nineteenth century shows this impact to have been large even when moderated by endogenous output mix and accumulation responses. That is, our results from aggregate times series indicate that an immigrant-expanded labor force reduced real wages by as much as 6 percent between 1890 and 1913. Alternatively, allowing for the full set endogenous macroeconomic adjustments, including complete international capital mobility, our CGE model implies that immigration reduced real wages by about 9 percent between 1870 and 1910. Immigration significantly retarded real wage growth and living standards improvement in late nineteenth century America.

So what of the contentious debates which surrounded the Immigration Commission Report of 1911? The report was widely criticized then by contemporaries, and since by historians, largely due to its racial overtones, sloppy analysis and incomplete or selective use of the vast body of evidence it collected. Despite these unfortunate shortcomings, it appears that the Commission was right regarding macro impact. This paper confirms three assertions which emerged from the 1911 Report: the guestworker effects were weak, thus offering little moderating influence on wide unemployment rate variance over booms and busts; immigrants displaced native workers and did little to fill the gaps created in more skilled occupations by

rapid industrialization; and immigration significantly retarded the growth of real wages and living standards economy-wide. Would the same conclusions apply to the present?

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Table 1
The Relationship between US Immigration and Employment
(dependent variable: immigrant workers)

Variable	1870–1913	1870–1913	1870–1889	1890–1913
Constant	-1507.60 (7.13)	157.89 (3.03)	126.94 (1.37)	288.77 (0.56)
Employment level (thousands)	0.15 (8.07)			
Employment change (thousands)	0.06	0.001 (1.89)	0.07 (0.014)	(1.89)
Time	-59.57 (7.81)	-4.75 (0.94)	2.49 (0.14)	-16.52 (0.51)
Time squared	-0.53 (4.89)	0.17 (1.63)	0.11 (0.14)	0.38 (0.80)
R ²	0.71	0.29	0.10	0.44
RSS/1000	162.53	391.78	163.74	912.22
DW	1.24	0.78	0.53	1.05
LM(1)	6.05	17.85	11.79	6.51
RESET	0.19	0.90	5.60	0.48

Notes: t-statistics in parentheses. LM(1) is the test statistic for the Lagrange Multiplier test for serial correlation. RESET is the test for functional form based on the regression of the residuals on the squared fitted values. Both tests are chi squared (1): critical value 3.84.

Table 2
Immigrant Share, Occupational Growth and
Unemployment Incidence

Variable	Proportion of Foreign-born in 1900	Change in Foreign-born proportion 1890-1900
Constant	0.18 (4.46)	-0.003 (0.26)
Occupational rank	0.03 (3.63)	-0.006 (2.04)
Unemployment incidence, 1900	-0.02 (0.16)	0.02 (0.70)
Growth of total occupied 1890-1900	-0.09 (1.66)	-0.03 (1.61)
R ²	0.15	0.07
RSS	1.76	0.18
RESET	1.74	2.23
HETERO	2.92	2.95

Notes: t-statistics in parentheses. RESET is defined in Table 1. HETERO is the test for heteroskedasticity based on the regression of the squared residuals on the squared fitted values. The index of occupational rank is based on Edwards (1917): 1 = professional; 2 = proprietor, manager and official; 3 = clerk and kindred worker; 4 = skilled worker and foreman; 5 = semiskilled worker; 6 = unskilled worker.

Table 3**Changing US Foreign-born/Native Ratios and Regional Labor Force Growth**

Variable	In 48 States, 1880–1890, 1890–00, 1900–10 (total population)
Constant	–0.07 (1.76)
Growth of Population in:	
New England	1.22 (4.06)
Mid-Atlantic	0.94 (3.33)
South Atlantic	0.61 (2.74)
East North Central	0.29 (0.96)
West North Central	–0.18 (2.36)
East South Central	0.12 (0.31)
West South Central	0.03 (0.10)
Mountain	–0.14 (1.96)
Pacific	0.14 (1.49)
1890s Dummy	–0.13 (3.59)
1900s Dummy	0.05 (1.33)
R ²	0.39
RSS	3.78
RESET	0.02
HETERO	0.19

Notes: See notes to Table 2.

Table 4

**US Native Net Internal Migration and Immigration
(average per 1000 per year)**

Region	<u>Rate of native in-migration</u>			<u>Foreign-born in-migration</u>		
	1880s	1890s	1900s	1880s	1890s	1900s
New England	-1.27	-1.50	-1.60	14.16	12.98	14.07
Mid-Atlantic	-1.92	1.42	-0.05	11.95	9.97	16.09
South Atlantic	-2.98	-2.99	-2.40	0.85	0.57	1.17
East North Central	-5.16	0.36	-3.40	9.43	5.26	7.21
West North Central	8.14	-5.46	-5.99	11.48	3.55	4.46
East South Central	-6.26	-4.31	-7.11	0.42	0.17	0.28
West South Central	6.60	7.31	7.62	1.87	1.70	1.89
Mountain	32.04	14.06	24.79	17.96	7.59	11.66
Pacific	32.79	14.00	38.78	20.83	7.69	19.37

Source: Calculated from Eldridge and Thomas (1964), Tables A1.11, A1.12 and A1.14. Migration rates are per 1000 of the average native-born population per decade.

Table 5

Displacement of Natives by Immigrants, US Northeast 1880–1910
(dependent variable: native net in-migration rate)

Variable	(1) OLS	(2) IV	(3) OLS	(4) IV
Constant	−0.004 (0.01)	0.002 (0.01)	−0.12 (2.12)	−0.12 (1.77)
Foreign-born in-migration	−0.18 (1.60)	−0.38 (2.46)	−0.18 (1.58)	−0.35 (2.32)
Employment growth	0.37 (5.17)	0.40 (4.31)	0.36 (5.39)	0.38 (4.53)
Share of labor force in agriculture	−0.06 (0.67)	−0.06 (0.68)	−0.05 (0.67)	−0.07 (0.73)
Share of labor force in manufacturing	0.13 (1.32)	0.11 (0.96)	0.14 (1.42)	0.11 (1.01)
Share of population urban	0.02 (0.36)	0.06 (0.40)	0.01 (0.29)	0.05 (1.03)
Log unskilled wage	−0.02 (0.04)	−0.02 (0.40)	−	−
1880s dummy	−0.02 (1.54)	−0.01 (0.93)	−0.02 (1.59)	−0.01 (0.90)
1890s dummy	0.03 (4.23)	0.03 (3.87)	0.03 (4.27)	0.03 (3.95)
R ²	0.84	0.83	0.84	0.83
RSS	0.012	0.013	0.012	0.013
RESET	0.92	0.90	1.08	0.77
HETERO	0.00	0.87	0.00	0.57

Notes: See notes to Table 2.

Table 6
Wage Adjustment Equations, US 1890–1913
 (dependent variable: $\Delta \log(W/P)$)

Variable	Equation			
	(1)	(2)	(3)	(4)
Constant	5.31 (4.71)	4.55 (1.04)	6.47 (4.49)	5.33 (4.29)
$\Delta \log P_t$	-0.53 (2.38)	-0.53 (2.30)	-0.53 (2.34)	-0.45 (2.56)
$\Delta \log(Q/L)_t$	0.60 (4.11)			
$\log Q_t$		0.61 (3.83)	0.57 (4.16)	
$\log L_t$		-0.52 (1.12)	-0.71 (3.43)	
$\log(W/P)_{t-1}$	-0.49 (3.21)	-0.50 (2.80)	-0.47 (2.93)	
$\log(Q/L)_t - \log(W/P)_{t-1}$				0.55 (4.82)
time	-0.003 (1.69)	-0.006 (0.46)		-0.002 (3.51)
R ²	0.56	0.57	0.56	0.56
RSS	0.004	0.004	0.004	0.004
DW	1.93	1.90	1.96	1.78
LM(1)	0.001	0.02	0.01	0.27
RESET	0.13	0.06	0.26	0.001

Notes: See notes to Table 1.

Table 7
Computable General Equilibrium Results
With "No Immigration After 1870" Counterfactual
(in percent)

	Effect by 1890	Effect by 1910
Assuming no capital flows response:		
Urban real wage	14.4	34.0
Return to capital	-14.5	-23.0
Assuming elastic capital flows response:		
Urban real wage	3.7	9.2
Return to capital	0	0

Source: O'Rourke, Williamson and Hatton 1994: 209

U.S. Immigration and Economic Activity

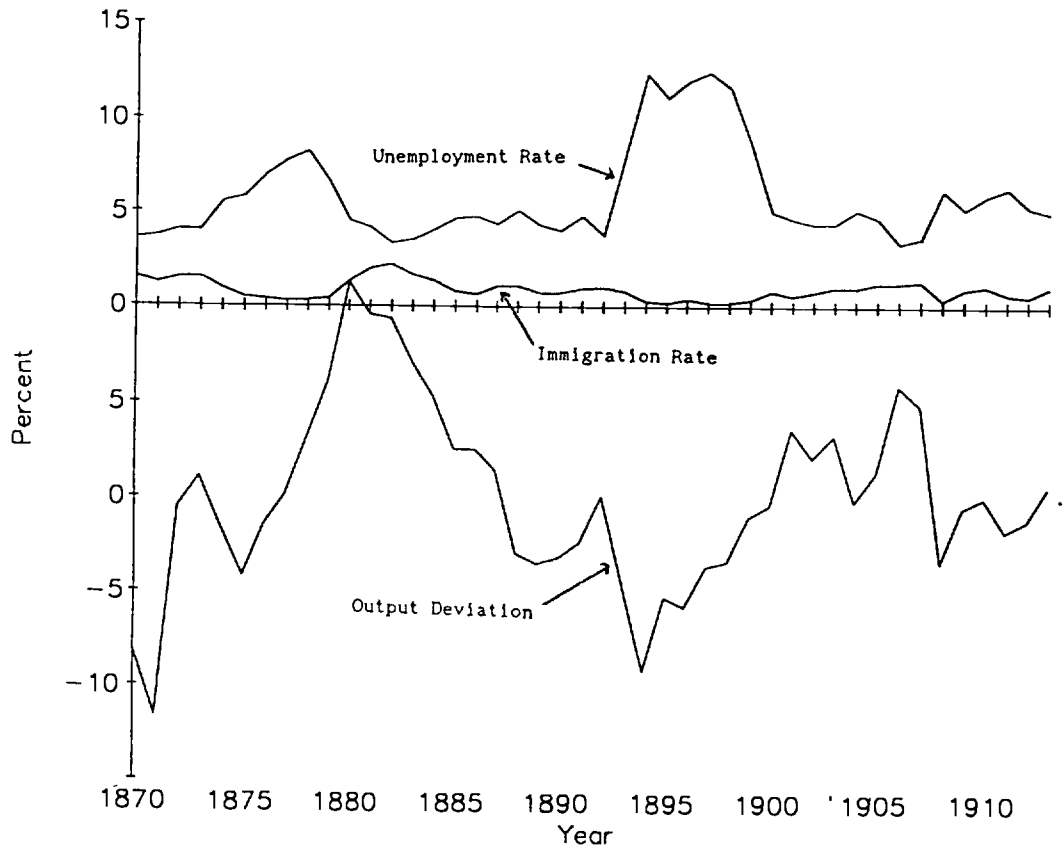


Figure 1

The "Guestworker Effect," 1890-1913
Unemployment Rates

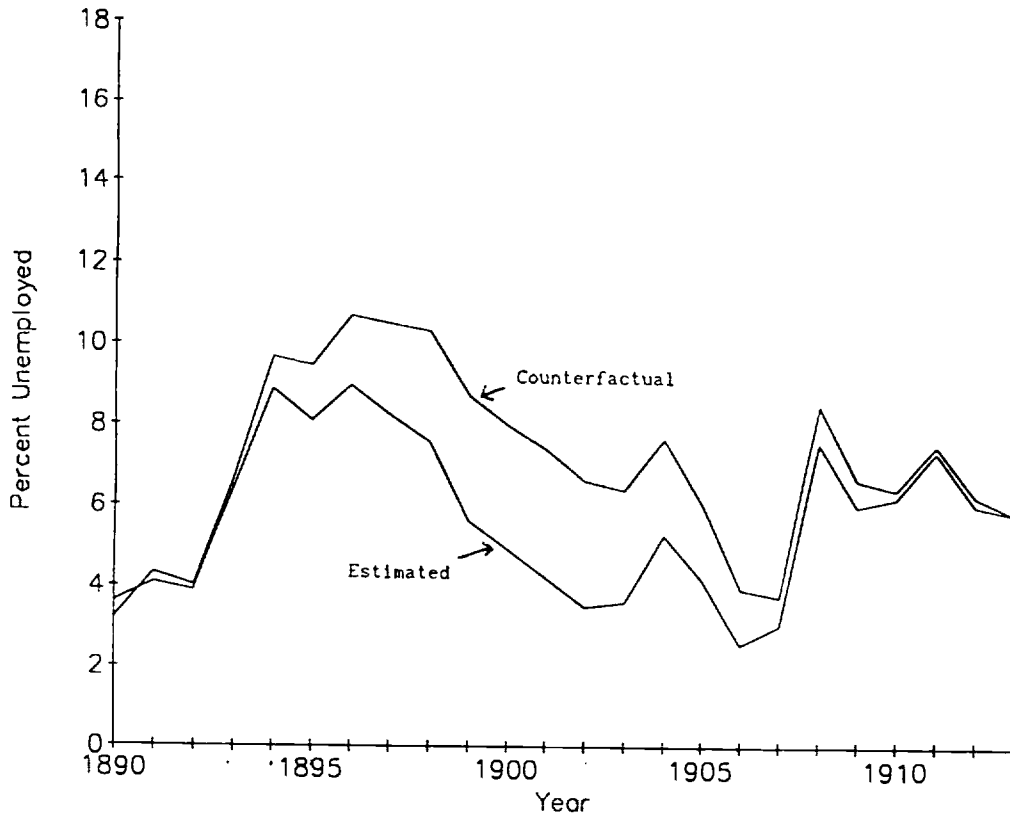


Figure 2

The "Guestworker Effect," 1890-1913
Non-Form Unemployment Rates

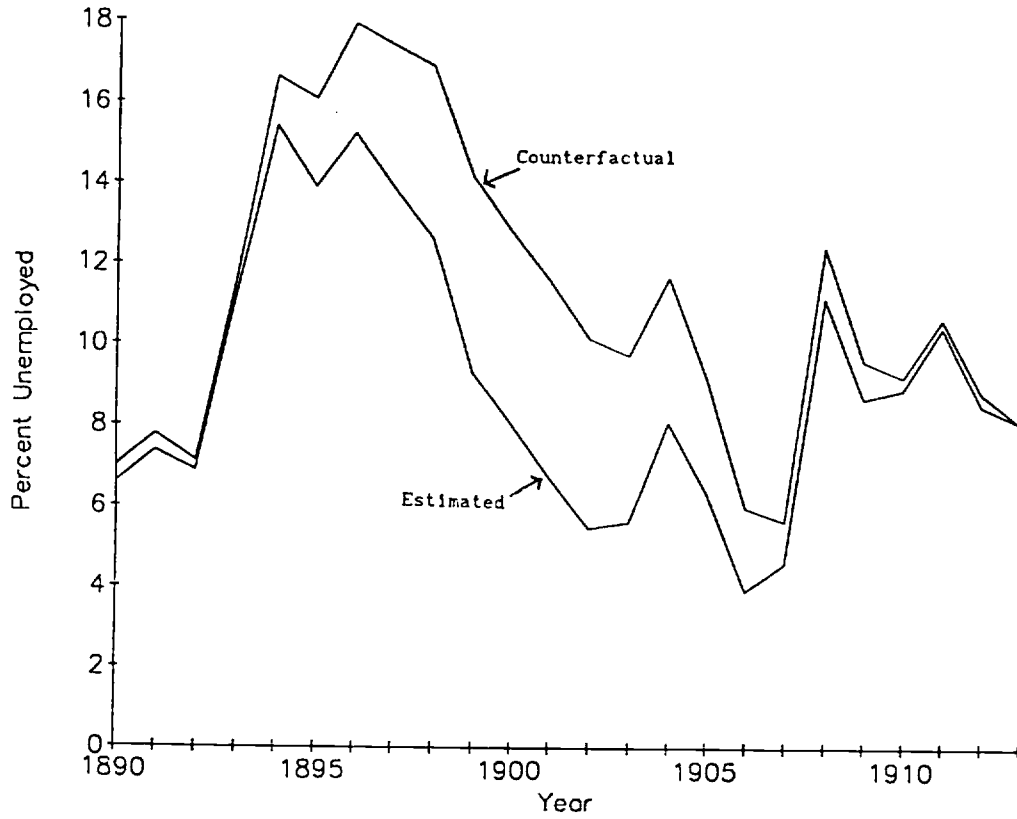


Figure 3

Did U.S. Immigrants Crowd Out Natives? Three Cases

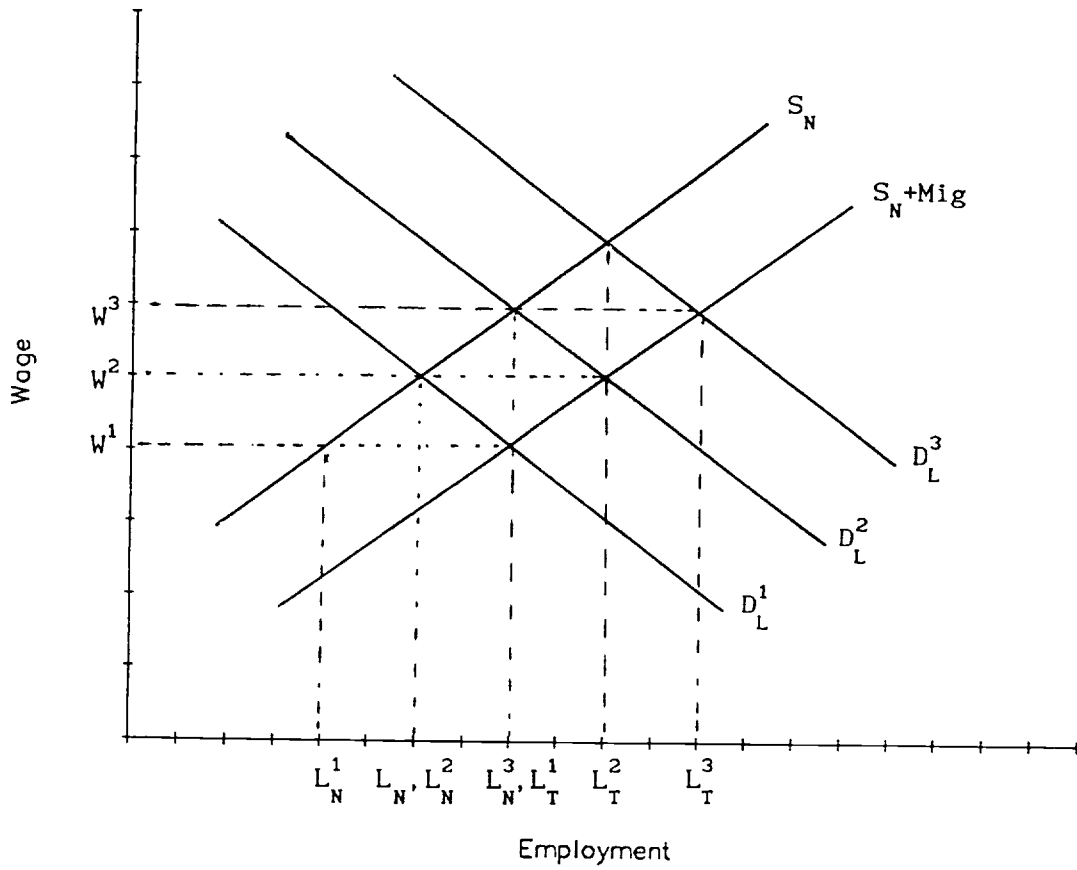


Figure 4

Appendix

Revised Estimates for United States Net Worker Immigration 1870–1913

and the Civilian Labor Force 1890–1913

Net Worker Immigration 1870–1913

In order to determine the impact of immigration on the labor force we need an annual series describing net immigration of working age immigrants. The series for gross immigration are well-known but it was not until 1908 that the Immigration and Naturalization Service began to collect data on gross emigration. There is, however, information on steerage passenger movements to and from the United States. The various biases in these statistics have been discussed many times by Jerome (1926), Davis (1931), Thompson and Whelpton (1933), Kuznets and Rubin (1954), Thomas (1954) and others. Their main drawbacks are that they understate true gross flows, exclude some non-steerage passengers, and ignore movements across the land borders (especially with Canada). The most widely accepted estimates of the net movement of aliens are those offered by Kuznets and Rubin (1954: 95–6) who applied a series of adjustments to the raw data.

We base our 1870–1913 estimates on the Kuznets/Rubin net arrivals, applying to it estimates of immigrant composition so as to emerge with annual estimates of net immigration by age and sex. Finally, we convert each age-sex net population flow into labor force or worker equivalents. The first step uses the decadal estimates of age/sex-specific net migration which Lee et al. (1957) constructed for foreign-born and native-born whites using forward census survival techniques. These estimates are used to allocate the Kuznets/Rubin net arrival totals into age/sex groups (five year intervals, e.g., 15–19, 20–24 etc.). The decadal age/sex composition is applied to every year within that decade, and we assume that the age and sex distribution of white migrants applied to much smaller flow of non-whites as well. This procedure yields annual net immigration for each

age/sex category. Finally, we apply the labor force participation rates from the 1890 Census to these age/sex-specific series (by the same five year intervals, e.g., 15–19, 20–24 etc.) in order to derive the labor force or equivalent-worker content of net immigration. The data are reported in Appendix Table 1 for total immigrants and equivalent workers 1870–1913.

Labor Force Estimates 1890–1913

The debate surrounding Stanley Lebergott's (1964) unemployment estimates for 1890–1913 focused on the numerator — number unemployed, but it also generated some discussion about the denominator — the civilian labor force. Christina Romer (1986a, 1986b) and David Wier (1986, 1992) have both offered adjustments, particularly for the 1890s.¹ Lebergott himself made some allowance for the effect of fluctuations in net immigration for the 1900s, and Weir did the same for the 1890s. Rather than rely on their adjustments for the annual contribution of immigration, we made our own. We therefore removed the immigration adjustments from the Wier/Lebergott series and added back in our own series from Appendix Table 1 (equivalent workers) to adjust for the contribution of net immigration.

The resulting figures that are used to derive the unemployment rates in Figures 2 and 3 are given in Appendix Table 2. The total labor force is taken from Weir and the adjusted total labor force reflects our effort to adjust for the contribution of net immigration, as already explained. The adjusted nonfarm labor force is constructed by applying Weir's nonfarm labor force shares (Weir 1992: Appendix D, pp. 336–44) to our adjusted total labor force series.

The counterfactual total labor force is derived by computing the average annual net (worker equivalent) immigration for the whole period 1890–1913, and then applying that average

¹ Robert Coen (1973) also offered a critical assessment of the 1920s and 1930s, but his work falls outside of our period of interest.

to every year. The counterfactual nonfarm labor force is calculated similarly. These are called the "no guestworker" counterfactuals in the text since they do not allow the immigrants to respond to US business cycles and long swings. Given the total and nonfarm employment figures in Appendix Table 2, it is a simple matter to calculate the actual and counterfactual unemployment rates cited in the text and plotted in Figures 2 and 3. The non-farm unemployment rate, actual and counterfactual, assumes that all the immigrants went to non-farm occupations (an assumption only weakly violated by the end of the century) and that there was no overt unemployment in agriculture.

Appendix Table 1

**Net Immigration Estimates:
Totals and Equivalent Workers 1870-1913
(000's)**

Date	Total	Equivalent Workers	Date	Total	Equivalent Workers
1870	365.6	184.1	1892	480.1	244.1
1871	300.0	151.2	1893	380.9	193.7
1872	378.9	190.7	1894	137.2	69.8
1873	401.7	202.3	1895	94.8	48.2
1874	245.1	123.4	1896	204.7	104.0
1875	132.8	66.8	1897	105.0	53.4
1876	100.2	50.5	1898	121.0	61.5
1877	71.0	35.9	1899	201.0	102.2
1878	89.2	44.9	1900	385.1	223.5
1879	132.0	66.4	1901	287.9	167.1
1880	423.4	219.6	1902	386.2	224.1
1881	644.7	334.3	1903	532.1	308.9
1882	751.7	389.8	1904	530.0	307.7
1883	578.7	300.1	1905	662.4	384.6
1884	473.7	245.7	1906	697.5	404.9
1885	283.7	147.2	1907	767.2	445.5
1886	250.0	129.6	1908	210.1	122.0
1887	415.8	215.6	1909	544.0	315.9
1888	437.9	227.0	1910	818.5	391.7
1889	314.7	163.2	1911	512.1	245.1
1890	328.0	166.9	1912	402.2	192.4
1891	426.2	216.7	1913	815.2	390.0

Appendix Table 2Alternative United States Labor Force Estimates 1890-1914
(000's)

	Total Labor Force (Weir)	Adjusted Total Labor Force	Adjusted Non-farm Labor Force	Counter- factual Total Labor Force	Counter- factual Non-farm Labor Force	Total Employment (Weir)
1890	22772	22682	12391	22736	12445	21868
1891	23382	23283	12916	23341	12974	22332
1892	24038	23930	13487	23965	13522	23003
1893	24649	24559	14040	24621	14102	22981
1894	25168	25060	14465	25274	14679	22834
1895	25679	25568	14897	25955	15284	23501
1896	26220	26129	15383	26632	15886	23788
1897	26712	26634	15812	27305	16483	24439
1898	27209	27140	16243	27971	17073	25090
1899	27753	27678	16704	28627	17653	26130
1900	28374	28345	17295	29291	18241	26956
1901	29153	29174	18258	30175	19259	27947
1902	29904	29916	19163	30913	20160	28874
1903	30698	30723	19854	31632	20763	29616
1904	31441	31548	20472	32370	21294	29894
1905	32299	32388	21201	33047	21860	31042
1906	33212	33248	21769	33723	22244	32398
1907	34183	34173	22680	34423	22930	33135
1908	34916	34944	23706	35293	24055	32310
1909	35721	35839	24676	36093	24930	33704
1910	36709	36831	25571	36914	25654	34559
1911	34478	37601	26494	37661	26554	34845
1912	37932	37987	26851	38076	26940	35708
1913	38675	38686	27712	38686	27712	36454