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# INTERNATIONAL MIGRATION AND WORLD DEVELOPMENT: A HISTORICAL PERSPECTIVE

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## ABSTRACT

The 1920s marked the end of a century of mass migration from Europe to the New World. This paper examines analytically this pre-quota experience. The discussion is divided into two parts. The first deals with the character and dimensions of overseas emigration from Europe chiefly from the mid 19th century to World War I. The second discussions the effects of these migrations on both sending and receiving countries. The traditional literature has far more to say about the first than the second. Here we deal with the evolution of global labor markets, first as they were directly influenced by the migrations, and second as they interacted with the evolution of world commodity and capital markets. The paper argues that the impressive economic convergence which took place between 1870 and World War I can be largely explained by these forces of economic integration, rather than by technological convergence or differential human capital growth.

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# 1. INTRODUCTION

Like other countries of recent settlement, the United States has always been a country of immigrants, and that fact has been a source of debate for a least a century. Two questions have always been central to the debate. What are the economic effects on the migrants themselves and on the indigenous populations of both the sending and receiving regions? Should international migrations be regulated and, if so, how?

The United States imposed immigration quotas in 1921. While these controls have varied in intensity since, the 1920s clearly marked the end of a century of mass migration from Europe to the New World. This paper examines this experience prior to the quotas. Hopefully, it will provide evidence to guide the debate which has heightened in intensity in the United States, Europe and other parts of the world in recent years.

The discussion is divided into two parts. The first (sections 2 through 4) deals with the character and dimensions of overseas emigration from Europe chiefly from the mid 19th century to World War I. The second (sections 5 through 7) discusses the effects of these migrations on both sending and receiving countries. In some parts of the paper, the discussion is able to draw on an enormous literature, but in others we have to break new ground since some topics are only sparsely covered in the literature. This is especially true of macro-economic effects. When Frank Thistlethwaite (1960) wrote his influential survey thirty years ago, he reported that the existing literature had focussed disproportionately on the effects of migration (particularly in the United States) neglecting the causes (particularly in Europe). After three decades of research, this imbalance is now reversed.

The paper concentrates on the economic aspects of migration, and puts new emphasis on cause, effect, and the interplay between them. It also explicitly focuses on labor markets. As a result, it should help draw closer parallels between past and present. We argue that most of the historical facts which deal with causes have been and can be readily interpreted by simple micro-economic analysis. Effects are another matter entirely. For example, most of the literature on assimilation and local labor market impact, while rich in content, fails to address the central issue of macro-economic impact. We suggest that such questions can only be evaluated by the application of general equilibrium thinking to both the sending and receiving economies.

## 2. THE STYLIZED FACTS

### Characteristics of Late 19th Century Intercontinental Migration

In the century following 1820, an estimated 60 million Europeans set sail for labor-scarce New World destinations. About three fifths of these went to the United States. By comparison, earlier migration from labor-abundant Europe had been a mere trickle and other 19th century emigrations from, for example, India and China were also relative modest. The only comparable intercontinental migration was that of black slaves from Africa to the Americas and the Caribbean. Indeed, it was only in the 1840s that the movement of Europeans into North America exceeded that of Africans, and it was not until the 1880s that the cumulative total of European exceeded African immigration (Eltis, 1983, p. 255).

In sharp contrast with the coerced African migrations, the massive outflow from Europe was overwhelmingly dominated by individuals and families

who chose to emigrate voluntarily in the expectation of a more prosperous and secure life for themselves and their children. A few moved to escape religious or political persecution, and others did so in convict chains (such as the early migrants to Australia). But most moved to escape European poverty and most moved under their own initiative without either government pressure or assistance. As the technology of transport and communication improved, the costs and uncertainty of migration fell, and overseas migration came within reach of an increasing portion of the European population for whom the move offered the most gain. These forces, accompanied by European famine and revolution, gave rise to the first great surge of mass migration in the 1840s.

The mounting number of intercontinental emigrants from Europe is plotted in the upper portion of Figure 1. In the first three decades after 1846, the figures averaged about 300 thousand per annum; in the next two decades, the figures more than doubled; and after the turn of the century, they rose to over a million per annum. The European sources also changed dramatically. In the first half of the century, the dominant emigration stream was from the British Isles, followed by Germany. By mid century, these were joined by a rising tide from Scandinavia and other parts of northwest Europe. In the 1880s, these were joined in turn by a surge from Southern and Eastern Europe. As the lower portion of Figure 1 confirms, the appearance of southern and eastern European emigrants accounts for most of the rising totals. This new migration stream came first from Italy, Spain and Portugal, but they were joined by Austria-Hungary, Russia and Poland after the 1890s.

With the exception of a small stream from the United Kingdom to Australasia and South Africa, these European emigrants almost all went to the Americas. Figure 2 plots the movement to the Americas from 1846 to the quotas.

The pattern closely replicates that of total European emigration. While the migration to the Americas was dominated by the United States, after the mid 1880s the flows to South America (led by Argentina and Brazil) and Canada (especially after the turn of the century) were considerable.

These statistics are for gross rather than net emigration, a distinction which became increasingly important as the century progressed. Thus, the upward trend in gross emigration was somewhat attenuated by a parallel trend in return migration. United States migration statistics indicate that during 1908-14 return migration was 30 percent of the gross inflow. It varied greatly among different nationalities; nearly half among Italians and Spaniards but only 5 percent among Russians. The high rate of Italian return migration represents a growing trend towards temporary, often seasonal, migration (e.g., the birds of passage). Other New World countries had even higher rates of return migration; between 1857 and 1924, return migration in Argentina was 47 percent of the gross inflow.

For most questions, the rate of flow relative to country populations is a more relevant statistic than absolutes. Table 1 reports European emigration rates per decade per thousand of population. These are gross rates which therefore exaggerate the net movements, but many of the figures are very high nonetheless. Rates of more than 50 per thousand were common in several decades for some northwest European countries like Norway and Ireland, and several southeast European countries recorded very high rates in the first decades of this century. Table 2 reports immigration rates for several New World countries. These are even larger than the emigration rates from the Old World. Magnitudes of this order must have had significant economic effects on both sending and receiving labor markets even were they adjusted for return

migration.

Who were the migrants? The early migrant streams were often characterized by farmers and artisans from rural areas travelling in family groups with the objective of settling permanently and acquiring land at the frontier. But as the century progressed, and as Europe itself industrialized, the migrants from any given country were less likely to originate with agriculture and to migrate in family groups. For example, as early as the 1830s emigrants from Britain were mainly from non-farm occupations (Erickson, 1990, p. 25), a country which at that time had already enjoyed a half century of industrialization. However, the increased importance of the less industrialized southeast Europe as an emigrant source implied that the proportion of immigrants from rural Europe rose, and that their average skills and literacy fell.

Late 19th century migrants can therefore be characterized as follows. First, they were typically young adults. Only 8 percent of the immigrants entering the United States between 1868 and 1910 were over 40 and another 16 percent were under 15. Thus, the migrants exhibited very high labor participation rates. Second, the emigrants were dominated by males who accounted for 64 percent of all immigrants to the United States between 1851 and 1910. Females formed a higher proportion for some emigrating countries like Ireland, where they accounted for 48 percent between 1851 and 1913. In other cases, like Italy and Spain, females typically comprised less than a quarter of the total. Third, the emigrants tended to be single and emigrated as individuals rather than in family groups. There was, however, still a significant minority who emigrated in family groups, often young couples with small children. In general, however, the migrants carried a very low

dependency burden with them to the New World. Fourth, although the bulk of emigration was made up of young single individuals without government assistance, the vast majority were assisted by previous emigrants currently resident in the receiving countries. This took the form of remittances, pre-paid tickets, accomodation and subsistance upon arrival in the destination country, and help with job search. Finally, the emigrants were mainly unskilled. No doubt this was due in part to the fact that they were young. After all, many of the emigrants would have acquired skills had they remained in their home country; many certainly acquired them in their destination country.

The evidence suggests, therefore, that those who emigrated had the most to gain from the move, and, therefore, were most responsive to labor market conditions. By emigrating when young, they were able to reap the rewards over most of their working lives. By moving as single individuals, they were able to minimize the costs of the move including earnings foregone in passage and during job search. Such costs were reduced still further by the assistance of friends and relatives in the destination countries. Since the emigrants were typically unskilled, they also had little country- or technology-specific human capital invested and hence stood to lose few of the rents from such acquired skills. This picture reinforces the widespread notion that economic motives were uppermost in driving late 19th century mass migrations.

## 3. THE DETERMINANTS OF INTERNATIONAL MIGRATION

### Emigration in the Long Run

Comparative emigration has been examined by Easterlin (1961), Tomaske

(1971), Massey (1988), Baines (1991) and others. One of the main challenges facing these scholars has been to explain why emigration rates were not always highest from the poorest countries whose populations would have gained most from the move, and why emigration rates often rose from low levels as successful development took place at home. After all, conventional theory would suggest that successful development (e.g., rising wages) at home would make the move overseas less attractive.

For any given country, the central stylized fact is as follows: During the course of modern economic growth, emigration rates rise steeply from low levels, the rise then begins to slow down, emigration rates reach a peak, and subsequently they fall off. This stylized fact has emerged from studies of both the time series of aggregate emigration for a number of countries (Akerman, 1976, pp. 25-32) and of the local emigration rates within individual countries (Gould, 1980b, pp. 282-9). One explanation stresses the costs of migration. Although there is a strong incentive to flee pre-industrial poverty, the costs may be prohibitive for all but the most wealthy. After all, the potential migrant cannot get loans for the move and his income is too close to subsistence to make it possible to accumulate the necessary savings. Thus, enormous wage gaps between a booming, resource rich New World and a stagnant, resource poor Old World country can be quite consistent with low emigration rates. As industrialization takes place in the home country, real wage rates rise and the constraint on migration supply is gradually released: more and more potential emigrants can now finance the move, and, in contrast with conventional theory, the home wage and emigration are positively correlated. At later stages of development, when the constraint is released, and if the wage gap between the home and overseas country continues to

decline, the emigration rate would also decline from the peak.

Another possibility recently re-emphasized by Massey (1988) is that industrialization itself raised labor mobility. In many qualitative accounts of European emigration, the key factor is economic development at home -- not just rising wages but the whole array of events which accompany industrialization. As a historian of Norwegian emigration put it: "Mass emigration occurred in the period of disruption when Norway was becoming part of the world economy, when industrialization was beginning, when new means of transport were creating a national market, when a money economy was transforming the old social order, when international competition in an age of free trade was causing Norwegian farmers to struggle for their lives and when internal migration reached unprecedented proportions, with a new social mobility being created within Norway itself" (Semmingsen, 1960, pp. 152-3; see also Thistlethwaite, 1960, p. 38). Above all, European industrialization involved reduced attachment to the land and a rise in wage labor. The combination of more commercialized agriculture, more consolidated landholdings, diminished smallholdings, the erosion of common rights, and relatively high and rising wages in the booming cities all served to produce a rural exodus (Williamson, 1990). The rise of overseas emigration was correlated with the growth of internal migration and can be viewed as part of the same phenomenon (Baines, 1991, pp. 53-7, 60). Although cities sometimes competed with overseas destinations for rural emigrants, they also generated a labor force more responsive to labor market signals.

Another event typically associated with industrialization is the demographic transition. In his pioneering paper published over thirty years ago, Richard Easterlin (1961) examined the relationship between European

emigration and population growth. If emigration was a true vent for surplus population, then countries with relatively high rates of natural increase should have exhibited higher emigration rates than those with low rates of natural increase. This would explain why, for example, France with one of the lowest rates of natural increase in Europe also had one of the lowest emigration rates, and conversely why Norway with one of the highest rates of natural increase also had one of the highest emigration rates: a country's position along the demographic transition mattered. Comparing average country emigration rates with rates of natural increase lagged twenty years, Easterlin found a strong positive correlation between 1861 and 1910. However, the comparison of trends across countries yielded a much weaker correlation.

Easterlin viewed the rate of natural increase twenty years earlier as a proxy for the current rate of labor force additions: "relatively high additions to the labor market would be expected, other things remaining equal, to result in labor market slack (comparatively slower growth in wages, less secure employment, etc.) and to lead to relatively higher emigration" (1961, p. 332). If so, then this would be better captured by an index of current labor market conditions, such as the real wage, which would reflect the net impact of both labor supply and demand. However, there is an alternative interpretation of Easterlin's correlation: if high rates of natural increase were driven chiefly by rising birth rates and falling infant mortality rates then it could act as a proxy for the proportion of the population who, twenty or thirty years later, were in the prime emigration age group. Since this age cohort had a higher propensity to emigrate, one might observe higher emigration rates associated with higher lagged natural increase even holding the real wage constant.

No adequate measure of internationally comparable real wage rates were available to Easterlin, and thus he had to make do with Mulhall's crude per capita income estimates. Based on such data, he argued that there was a negative relationship with home per capita income once lagged population growth was taken into account. Econometric analysis by Tomaske (1971) showed that natural increase played a role only if the lagged dependent variable was included, and even then natural increase was statistically insignificant.

These findings reinforced a point often made in the qualitative literature that there was considerable persistence or path dependence in emigration rates. The influence of letters from friends and relatives abroad containing information about prospects overseas is well docutmented, and such information is likely to have reinforced the decision to emigrate. Furthermore, there is abundant evidence that current emigrants' cost of passage was financed by previous emigrants. As we have already pointed out, the evidence takes the form of large emigrant remittences and frequent use of pre-paid tickets. There is reason to believe, therefore, that recent immigrants were likely to be the key link in what is often described as "chain migration."

The present authors (Hatton and Williamson, 1992a) have improved on these previous studies in several ways. Most importantly, we have been able to utilize a recently developed data base documenting internationally comparable unskilled real wage rates (Williamson, 1992). This data base makes it possible to breathe new life into the debate. These data have three principal advantages over what was available to Easterlin and Tomaske. First, they offer an income measure far more relevant to the decision facing potential emigrants. The wage rates were taken from urban occupations which were

ubiquitous in all countries (such as the building trades), and they were deflated by cost of living estimates that were developed from purchasing power parity constructs. Second, since these real wage indices are comparable across time and space, we were able to pool the country time series in the emigration analysis, something earlier studies were unable to do. Third, since we have comparable real wage estimates for major immigrant New World countries, we are able to construct wage gaps between sending and receiving regions which are comparable across countries and over time.

The key results from regressions on pooled data for decade averages and for 11 European countries were as follows: First, the lagged dependent variable matters, confirming path dependence. Second, and consistent with earlier studies, there is strong evidence that the wage gap had a strong positive effect on emigration rates. This variable performed better than the domestic wage alone, confirming the importance of relative rather than absolute wages in determining migration decisions. Third, the rate of natural increase lagged twenty years had a significant effect on emigration rates just as Easterlin argued. Fourth, there is some evidence that the level of economic developed mattered. When the share of the labor force in agriculture is allowed to interact with the wage gap, emigration is shown to be more responsive to the wage gap as the share of the labor force in agriculture declined.

The evidence suggests that a parsimonious economic model can explain much of the stylized facts of European emigration. When time trends were included they were not significant, suggesting that there were no common influences arising from declining transport costs or from some autonomous rise in the propensity to emigrate.

Emigration from and Immigration to Localities: Persistence versus Diaspora

Emigration varied greatly within countries among regions and localities with apparently similar characteristics. This fact has led some observers to doubt that cross sectional variation in emigration intensity can be adequately explained by standard economic variables. Dudley Baines (1986) found that such models had very little power to explain inter-county emigration from Britain. In his well-known survey paper, John Gould (1980b, pp. 282-98) pointed to the wide dispersion of provincial emigration in Italy, Portugal and Hungary prior to 1913 (see also Puskas, 1976). This dispersion narrowed over time as aggregate emigration rates increased. Gould interpreted this within-country convergence as a "diffusion" process through which the habit of emigration spread across localities through time. As more and more localities joined in, the aggregate emigration rate rose and the inter-local variation declined.

A number of studies have pointed to idiosyncratic, or non-economic, reasons why emigration got started earlier in some localities than others. There is, however, a growing body of evidence that economic conditions also influenced local variation in emigration rates. In mid-century, a prominent feature associated with areas of heavy emigration in northwest Germany was a well developed cottage linen industry. Such "proto-industrial" areas as these, where cottage industry was interlocked with agriculture (especially seasonally), had higher rates of natural increase than other rural areas. They were also vulnerable to rising factory competition, and thus had increasing problems absorbing young labor generated by rapid population growth two decades previously. Thus, "emigration was highest where there were many agriculturists but little agriculture" (Kamphoefner, 1976, p. 182). In the East Elbian region, the rise of large estates converted agricultural workers

to wage laborers, restricting their opportunities to acquire smallholdings; "With few smallholdings available, young people faced late marriage or none at all and a lifetime of complete dependency on the owners. Many were pushed out of East Elbian society, or rather, never allowed to enter it; but in America there was land to be had, their own land" (Walker, 1964, p. 164). The inequality of landholding was also much greater in Swedish emigrating localities than in the New World, and it was on the rise (Soltow, 1987).

Similar conditions existed in Ireland which remained largely rural in the late 19th century. A recent study by the present authors examined the determinants of inter-county emigration, pooling the data for the four census years 1881-1911 (Hatton and Williamson, 1992b). The results strongly support the view that economic and demographic forces explain much of the inter-county variation. While large agricultural employment shares were correlated with high emigration rates, a higher share of land holdings below 5 acres reduced emigration. The county wage gap relative to the New World and the incidence of poverty (the proportion on poor relief and the proportion in poor quality housing) both had the expected positive effect on emigration. Finally, average family size had a strong positive influence on emigration.

In countries where there were rapidly growing urban centers, migrants were drawn from the contiguous rural hinterland into urban industry, and overseas emigration was consequently lower than from more remote rural areas. Such urban influences have also been identified in the Scandinavian countries, particularly around major ports. Migration to the city was often the first tage in migrating overseas (Carlsson, 1976, pp. 130-40; Semmingsen, 1972). In the long run, local cities and destinations overseas were competing alternatives and emigration was often simply rural-urban migration on an

intercontinental scale (Thomas, 1972). More recent findings that internal migration and emigration did not move inversely (Baines, 1986) is not necessarily inconsistent with this view of destinations as competing alternatives since urban booms at home and abroad were often positively correlated.

Migrants from a given locality often followed a well-trodden path beaten by earlier emigrants to specific overseas locations. Thus, more than 90 percent of the Dutch from the province of Zuid settled in the communities of Patterson in New Jersey, Nordeloos in Michigan, Pella in Iowa and South Holland in Illinois (Swierenga, 1991, p. 150). However, these migration streams were modified over time and for any given source country there was a growing diaspora within the United States. Indeed, recent evidence suggests such forces were at work even in the late ante bellum period (Ferrie, 1992), where a large share of the immigrants "passed through" New York while moving on quickly to inland labor markets.

Even if emigration can be traced to economic factors in the country of origin, studies like Swierenga's cited in the previous paragraph appear to suggest that settlement patterns in the United States were chiefly driven by the existence of previously established communities. As the 'friends and relatives' effect would suggest, the stock of past immigrants of the nationality concerned was an important influence on the location of new immigrants (Gallaway, Vedder and Shukla, 1974; Dunlevy and Gemery, 1977). There is also evidence that the 'new immigrants' were more strongly attracted by the stock of previous immigrants from their countries and less by differences in state per capita income than was true of 'old immigrants' (Dunlevy and Gemery, 1978). Nonetheless, studies which have analyzed the

intended destinations of immigrants arriving in the United States at the turn of the century show clearly that state per capita income was important in the location decision.

Clearly, there is a great deal of persistence revealed by late 19th century overseas emigration patterns. But these were continuously modified, largely due to changing economic circumstances. One might therefore ask to what extent emigrants viewed New World destinations as closely competing options (Gould, 1979, p. 626). To our knowledge, this question has never been explicitly confronted either for British emigrants or those from any other country in the late 19th century.

## Emigration in the Short Run

One of the most prominent features of 19th century emigration rates is their sharp year to year variation associated with industrial crises. These are illustrated for the UK and the US in Figure 3. The pioneering studies by Harry Jerome (1926) and Dorothy Thomas (1941) examined the relationship between migration and business cycles. Jerome found that immigration into the United States was determined chiefly by the American business cycle and that conditions in the sending countries played only a weak role in conditioning the timing of the migrations. In her study of Swedish emigration, Thomas found that domestic conditions were important, and sometimes decisively so, in determining the outflow. Since then a sizeable econometric literature has grown up in which variables representing economic conditions in sending and receiving countries have been used to explain emigration over time. This literature blossomed in the 1960s and 1970s, and it has been admirably surveyed and subjected to a searching critique by Gould (1979). We will not

recount these studies in detail here, but rather will concentrate on their main findings and on the methodological issues they raise.

Much of this literature has tried to assess the relative strength of 'pull' abroad and 'push' at home. There has been little consensus as to how these terms should be defined; our strong preference would be to reserve them to describe the underlying labor market fundamentals (Williamson, 1974). The literature often disagrees with our position, the discussion instead typically hinging on whether the coefficients on variables representing conditions abroad are larger or more significant than those representing conditions at home. Thus, Allen Kelley (1965), Lowell Gallaway and Richard Vedder (1971) and Harry Richardson (1972) found conditions abroad to be most important while Maurice Wilkinson (1970), John Quigley (1972) and O. Magnussen and G. Sigveland (1978) found push at home to matter most.

Two types of variables have typically been included to deal with conditions in the two countries. These represent prospective earnings, proxied either by GNP per capita or the average wage, and employment opportunities proxied by the unemployment rate or some other cyclical variable. A simple time series model for migration (M) using unemployment (U) and wage rates (W) would be:

$$M = M(Uf, Uh, Wf, Wh) \qquad (1)$$

where variables subscripted f are for the receiving country and those subscripted h are for the sending country. Using this kind of model, Kelley (1965), David Pope (1981) and Richardson (1972) concluded that wages were not important but rather that unemployment rates were central. By contrast,

Wilkinson (1970) and Quigley (1972) found highly significant coefficients on absolute or relative wages. More recently, Pope (1981) has combined employment rates and wage rates to form expected income variables along the lines originally suggested by Michael Todaro (1969).

As many observers have pointed out, it makes little sense to consider the prospective emigrant as acting solely in response to home or foreign labor market conditions; emigration decisions must surely have been based on some comparison between the two. In the absence of an explicit model, however, it is impossible to infer that asymmetry between the estimated coefficients necessarily violates the postulate that emigrants rationally chose between the alternatives facing them. Similarly, it can hardly have been unemployment alone that mattered since we almost always observe net migration flowing towards those countries with the higher wage rates. Yet, when unemployment and wage rates have been included in the same regression, the former usually dominates, especially unemployment in the receiving country.

One way to rationalize these earlier findings is to assume that emigrants were concerned with the expected income difference but that they were risk averse. If utility is logarithmic and the uncertainty is due to the probability of finding a job, then the probability that an individual will migrate can be described by the following expression:

$$Mi = a1 + a2\log(1-Uf) - a3\log(1-Uh) + a4\log(Wf/Wh) + a5Zi \qquad (2)$$

where Mi takes the value of one if the individual migrates, zero if not, and Zi represents individual preferences and migration costs. Under risk aversion, we would expect $a2 > a4$, rather than $a2 = a4$ as in the risk neutral Todaro

case. In addition, there are two reasons to expect a2 > a3. First, it has sometimes been argued that while a fall in the home employment rate increases the incentive to emigrate, it also reduces the ability to finance the move for those who have become unemployed. Second, for those who remain employed, staying at home may involve little risk, but emigrating always involves searching for a new job. Hence, greater uncertainty attaches to expected income abroad.

Most time series studies have found lags to be important, particularly the lagged dependent variable (Gould, 1979, p. 658). In some cases, the large and significant coefficient on the lagged dependent variable has been interpreted as the 'friends and relatives' effect discussed above. But in time series it is likely to serve another purpose as well. Since the migration decision is esentially foward looking, it should depend on the discounted stream of future income in the two locations. If estimates of these streams are generated by past observations, then this fact would be captured by the lagged dependent variable.

This line of reasoning presents an apparent conundrum: If migrants compare the net present value of future income streams over their remaining lifetimes, the result should not be greatly affected by short run economic fluctuations, and hence we would not expect sharp fluctuations in migration. Shouldn't the expected net present value of moving today be positive even if labor market conditions in the destination country are poor this year? Yes, but it might be even higher if the migrant were to wait until next year when conditions are likely to improve. It pays to wait. This suggests that the distinction sometimes invoked in the literature between <u>whether</u> to go and <u>when</u> to go is artificial: it is a joint decision made simultaneously.

These considerations can be translated into a simple dynamic model. If we start with (2), aggregate over individuals, and then apply these dynamics, we obtain the following estimation equation for the aggregate emigration rate:

$$\begin{aligned}\Delta M_t = {} & b1 + b2\Delta\log(1-Uf)_t + b3\Delta\log(1-Uh)_t + b4\Delta\log(Wf/Wh)_t + \\ & + b5\log(1-Uf)_{t-1} + b6\log(1-Uh)_{t-1} + \\ & + b7\log(Wf/Wh)_{t-1} + b8Z_{t-1} - b9M_{t-1} \ . \end{aligned} \tag{3}$$

This is a simple error correction model in which the change terms capture the short run dynamics and the level terms capture the long run effects. If the timing effects are powerful, then we should expect b2, b3 and b4 to be "large" relative to b5, b6 and b7. In long run steady state, the migration function is (dropping time subscripts):

$$M = \frac{b1}{b9} + \frac{b5}{b9}\log(1-Uf) + \frac{b6}{b9}\log(1-Uh) + \frac{b7}{b9}\log(Wf/Wh) + \frac{b8}{b9}Z \tag{4}$$

Models of this type have not yet been fully explored with late 19th century data. Preliminary results, however, suggest that they are strongly supported by UK emigration data. Our results from a restricted version of this model also explain well emigration from Ireland 1876-1913 where the short run variation in the US employment rate seems to have been particularly strong in determining the timing of emigration (Hatton and Williamson, 1992b), just as Jerome argued. But wage rates were also important and the parameter estimates suggest that a ten percent rise in the Irish wage relative to the American wage would reduce the annual emigration rate by 4.3 per thousand in the long run.

Estimates for immigration into Australia and Argentina also support the model and offer new insight into Latin migrations. In sharp contrast with the assertions of W. Arthur Lewis (1978) and Carlos Diaz-Alejandro (1970), Alan Taylor (1992) used the model to show that the immigrant labor supply facing Argentina was not only less than perfectly elastic, but was almost precisely the same as Australia. Taylor also shows the impact of policy exclusion, cultural perference, and segmentation; poorer migrants from southern Europe headed to South America in such large numbers that real wages were lower there than in the rest of the New World, but their explicit or implicit exclusion from the rest of the New World added to the wage gaps between Mediterranean and overseas labor markets.

Did Migration Serve to Dampen Unemployment During New World Industrial Crises?

As we have seen, migrants were sensitive to economic conditions in receiving countries, particularly the United States. A number of writers have argued that elastic migrant supplies served to mute the effect of industrial crises on unemployment in the New World: they fed booms and mitigated slumps, thus leveling out unemployment during business cycles. According to Tyrrell, "the United States was, like some West European countries in the 1970s, able to 'export' part of its unemployment problem by a massive repatriation of Mediterranean labor in the era before World War I" (1991, p. 147). Similarly, Keyssar notes 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, p. 79).

The relation between American unemployment and immigration can be seen in Figure 4. Two main features deserve note. First, the annual number of

immigrants generally fell short of the annual unemployed. Since immigration includes includes all migrants and not just labor force participants, immigrant workers fell short of the unemployed by even more. But second, there is a clear inverse correlation between immigration and unemployment. Thus, changes in those unemployed would have been far higher in the absence of changes in net immigrant arrivals. For example, the surge in those unemployed up to the late 1870s would have been almost half again as large in the absence of the fall in the number of immigrants, and the fall in those unemployed from 1898 to 1907 would have been even sharper in the absence of the surge of immigrants. This, of course, is a statement about statistics; what we need is explicit economic analysis of the short run operation of American labor markets, but no such analysis has yet been performed. Neverthless, Figure 4 suggests that immigration had the same dampening effect on unemployment rates that 'guestworkers' are thought to have had on unemployment in post World War II France and Germany. And this without any government intervention. It also suggests that any effort by macro economists to assess the evolving instability of the American economy prior to and after the interwar period is incomplete if it ignores the role of international migration.

## 4. ASSIMILATION: WERE MIGRANTS COMPLEMENTS OR SUBSTITUTES FOR NATIVES?

### Immigrant Assimilation

In his well-known book The Uprooted, Oscar Handlin (1951) argued that late 19th century American immigrants were poorly assimilated. He argued that they were largely from rural peasant backgrounds and were unable to adapt easily to American labor markets. They faced cultural and economic barriers

which were only overcome after several generations. They crowded into ghettos -- suffering poverty, squalor and disease, segmented from the rest of society.

Handlin's thesis has been severely criticized in the four decades since 1951. Perhaps this fact is not surprising since The Uprooted was not based firmly on quantitative evidence nor did it offer explicit comparisons with native Americans. The new view paints a more benign picture. It argues that immigrants were able to adapt to American labor markets and that the clash of cultures was not nearly as sharp as Handlin suggested. By gathering in ethnic communities, they were able to maintain some of their traditions, culture and customs while integrating into American life. Furthermore, immigrant communities had positive benefits. Social and kinship networks provided structure for mutual aid. This included information and access to jobs in a manner more effective than was true even for blacks moving up from the South (Briggs, 1977; Bodnar, 1985).

Nevertheless, immigrants tended to have lower earnings. Why?

While Handlin argued that immigrants had difficulty gaining access to good jobs, the evidence that the foreign born suffered higher unemployment than the native born is weak at best. The Commissioner of Labor survey for 1901 reported that the average unemployment rate for foreign born household heads was 10.1 percent as compared with 8.3 percent for the native born. This was due both to slightly higher incidence and slightly longer duration, a finding confirmed more recently by a detailed analysis of 1910 Census data (Margo, 1990, p. 56). Similar results were reported for late 19th century Massachusetts (Keyssar, 1986, pp. 79-89). However, these differences appear to be explained almost entirely by differences in the two groups' occupations.

So, why the difference in occupations?

As evidence of occupational discrimination, some writers have quoted official statistics showing that male immigrants had earnings as low as two-thirds of the native born. When one controls for human capital endowments, however, the wage gap between native and foreign born becomes much smaller and sometimes even evaporates entirely. Robert Higgs (1971) found that there was no difference in the predicted earnings of native and foreign born after controlling for literacy and ability to speak English. Using different controls, McGouldrick and Tannen (1977) found a 5-10 percent difference between immigrants from southeast Europe and the native born; and similar results were reported by Eichengreen and Gemery (1986) -- about 6 percent, and Hannon (1982a, 1982b) -- about 7 percent. Although these results suggest that immigrant earnings were lower in part because of their more modest skill endowments, they also received somewhat lower returns on their skills.

Modern day immigrants in America also receive lower earnings upon arrival, but they tend to catch up, and in some cases overtake, the native born as they acquire skills and experience (Chiswick, 1978). In contrast, late 19th century immigrants who acquired skills prior to arrival had lower earnings growth after arrival than natives (Hannon, 1982a, 1982b; Eichengreen and Gemery, 1986; Hanes, 1991). This suggests that: at best, there was some convergence in earnings over time, but that a significant gap remained even after 10 or 20 years; or, at worst, that the gap persisted across generations. Indeed, George Borjas (1985) has argued that cross section estimates overstate any late 20th century evidence of earnings convergence since immigrant quality deteriorated between the 1950s and the 1980s. According to this argument, any steep profile of immigrant earnings since arrival reflects, at least in part,

the low earnings capacity of more recent immigrant cohorts. Given the late 19th century rhetoric about the decline in immigrant quality, one might have expected a similar upward bias on the "catch up" parameter. The fact that steeper earnings profiles (compared with the native born) have not been consistently observed suggests either that there was no decline in quality or that assimilation was slower then than it is now.

Differences in earnings reflected in part differences in occupational attainment, and slower upward mobility seems to have limited immigrant catch up. For example, Stephan Thernstrom (1973) found that Boston immigrants had less upward occupational mobility than the native born, especially among the "new" Irish and Italians. It was particularly difficult for many of the immigrant groups to break out of the manual occupations. It has been suggested that access to the better jobs was limited by prejudice. Inability to speak or write in English can account for some but not all of this experience. For example, the Irish did not fare any better than did the Italians.

Comparisons between immigrants and natives involve problems of selectivity, as Borjas (1989) has shown. Late 19th century immigrants into the United States clearly had lower levels of education than natives, and to some extent this reflected the lower levels of human capital in the countries from whence they came. Yet, if immigrants were also above average in ability, motivation or other unmeasured characteristics, then they should on that score have performed better in the labor market, and the degree of "discrimination" they faced would have been larger than that measured by the studies cited above. So, were immigrants favorably or adversely selected? We simply do not know, but it is interesting to note recent findings that the flatter earnings profiles of late 19th century immigrants in the United States was shared by

native interstate migrants (Hanes, 1991). Flatter earnings profiles were apparently a characteristic of all migrants, not just of foreigners. This would suggest that migrants were adversely selected, rather than discriminated against. Needless to say, more research is needed on this important issue.

Were Immigrants and Natives Complements or Substitutes?

If their skills were sufficiently lower or if the labor market was sufficiently segmented, immigrants might not have been close substitutes for native labor as a whole even though they might have been substitutes for unskilled parts of the native labor force. This is an important issue for determining the impact of immigration on native born wages and living standards. It is an issue that formed the background to much of the immigration debate prior to World War I. Oddly enough, the same debate rarely emerged in the Old World where, by inference, emigrants must have been viewed as close substitutes for those who stayed behind. We focus, therefore, on immigrant labor markets in the New World.

There have been few efforts to explore directly the degree of substitutability between native and immigrant labor in the late 19th century. James Foreman-Peck (1992), however, has performed such a test for United States manufacturing in 1890. He estimated a translog production function treating immigrant and native labor as separate factors of production. His results showed that these two types of labor were not complements: bigger immigrant supplies did not increase the marginal product of native labor. 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 textiles despite the fact that the

former employed immigrant labor while the latter did not.

Immigrant labor competed directly and on almost equal terms with native labor in unskilled occupations. Nevertheless, different immigrant groups were concentrated in different occupations. Thus, for example, while Italians accounted for only 4.2 percent of the population in 1900, they accounted for 55 percent of the male barbers and hairdressers, 97 percent of the bootblacks, 34 percent of the shoemakers, 18 percent of the masons and 16 percent of the pedlers (Baily, 1983, p. 285). Immigrants as a whole were much more evenly distributed across occupations, although they were still concentrated in relatively unskilled jobs. It might be hypothesized that immigrants as a whole tended to bid down the wage for all workers in the occupations (or localities) where they were concentrated, but there is little direct evidence on this point. If it were true, one might have expected an outpouring of studies citing a correlation between occupational (local) wages and occupational (local) immigrant employment shares. Few such studies exist, and for good reason: to the extent that immigrants crowded into certain occupations (or localities), they displaced native and "older" immigrant labor, who then migrated to other occupations (localities).

Given the relatively high occupational and spatial mobility in late 19th century America, immigration was likely to have affected unskilled wages relative to skilled wages economy-wide, rather than simply wages among some unskilled groups. Between the mid 1890s and World War I, the wage gap between the skilled and unskilled grew and this trend has frequently been associated with the flood of "new" immigrants. Yet, the overall skill composition of the labor force changed little. The widening pay gap was driven instead chiefly by rapid technical change in manufacturing, and consequently unbalanced derived

demand growth favoring skilled labor (Williamson and Lindert, 1980, pp. 208-9, 236). Furthermore, on the labor supply side the ranks of the urban unskilled were augmented by a rural influx which was highly sensitive to both urban employment conditions and wage rates (Hatton and Williamson, 1992c).

The same argument can be applied to spatial wage gaps. Most immigrants went initially to major cities on the East Coast while a substantial number traveled directly to inland cities such as Chicago, Pittsburgh and Milwaukee. Even if they all crowded into the East Coast cities, it seems unlikely that there would have been more than the most transient effect on spatial wage gaps. The American population has always been characterized by high mobility. Such well-known facts do not by themselves prove that wage gaps were quickly arbitraged, but they are certainly suggestive.

Although they have not been pursued on late 19th century data, a number of contemporary studies have attempted to measure the impact of immigration on wage rates using cross-section evidence across localities. Most of the studies listed by Julian Simon (1989, Chp. 12) are based on this type of evidence. Both he and Borjas (1990) conclude that the impact of immigration on the wages of natives is negligable. To the extent that their conclusion rests largely on the evidence from such cross-section local labor market studies, it should be interpreted with caution. After all, there is reason to believe that the effects so measured will be downward biassed: labor mobility should tend to dissipate quickly any immigrant-induced wage gaps across localities. Even if immigrants themselves were geographically concentrated and relatively immobile (but they were not: Ferrie, 1992), this process would still occur through the mobility of the native labor force.

Although there is little evidence for the 19th century of the kind cited

in the debate about late 20th century immigration into America, we have no reason to believe that it would be any more appropriate in a historical context. To repeat, immigrants and natives were occupationally and geographically mobile enough to cast serious doubt on the validity of local labor market analysis. Time series analysis also raises difficulties, this time in the form of a classic identification problem. Answers from either approach are therefore unlikely to be convincing.

In short, there is no evidence from late 19th century America which suggests that immigrants and natives were complements. The presumption that they were close substitutes cannot be rejected.

## 5. MACRO IMPACT: THE EVOLUTION OF GLOBAL LABOR MARKETS

### The Central Issue

As Section 7 notes, the historical evidence has motivated recent interest by macroeconomists in long-run economic convergence. The bottom line is that currently industrialized nations converged on one another over the past century or so, poor countries growing faster and rich countries growing slower.

This experience is documented by per capita GNP, by labor productivity per worker hour, and by real wage rates. However, convergence did not take place without interruption: divergence was the rule during early industrialization under protectionist regimes and modest international migration flows prior to the mid 1850s; dramatic convergence took place up to 1913 while international trade boomed, capital flows were enormous, and international migrations were large enough to be called "mass"; the long run convergence ceased during and between the World Wars as world commodity trade and capital markets collapsed and international migrations slowed to a trickle in the face of quotas and a Great Depression; and the convergence resumed in the post-World War II period as international trade and capital markets gradually regained pre-World War I levels of integration, and "guest worker" and illegal migrations rose to significant levels.

The central question relevant to this conference is: What role did this experience with international migration play in contributing to long run convergence? In particular, did the mass migrations between 1870 and 1913 make a significant contribution to convergence? If so, can we infer that the disappearance of the mass migrations in the interwar period also contributed

to the cessation of convergence? If not, international migrations are unlikely to have played a significant role in contributing to convergence at any time during the century and a half since the mid 19th century.

These migrations may have contributed to the evolution of globally integrated labor markets in two ways. First, they may have contributed to long run convergence in living standards as suggested above. Second, they may have contributed to globally integrated labor markets in the sense of co-integration -- that is, a high correlation between real wages, unemployment and other labor market characteristics in the shorter run. These two aspects of global labor market integration need not have been the same. That is, long run real wage convergence need not imply that the observed mass migrations were a major contributor since technological and accumulation "catching-up" forces may have done most of the work. Furthermore, high correlations between short run changes in national wages and unemployment do not necessarily imply that those labor markets were closely linked by mass migrations, or that low correlations imply that those labor markets were weakly linked by migrations. After all, big wage gaps between labor-scarce and labor-abundant economies at any point in time may have been due to asymmetric shocks in labor demand rather than to lack of labor market integration on the migrant-supply side, and small wage gaps may have been due to shared shocks rather than to well integrated global labor markets. Any effort to sort these issues out requires explicit models of wage determination which control for demand shocks -- like industrial crises and terms of trade shocks, and such studies are yet to be performed for the late 19th century era of mass migrations.

While it is the impact of international migration on the wage gap between sending (poor) and receiving (rich) regions that matters, and not simply the

impact of the migrations on real wage trends in sending and receiving regions by themselves, let's start at the beginning with the receiving region.

## The Standard Partial Equilibrium Story

In the absence of increasing returns, all comparative static models in the classical tradition predict that migration tends to make labor cheaper in the immigrating country and scarcer in the emigrating country, especially in the short run when potential dynamic accumulation responses can be ignored. The first active policy debate over the magnitudes of such effects appeared, not surprisingly, in Britain where the First Industrial Revolution was unfolding. The immigrants were the Irish, and they exhibited exactly those characteristics which the first part of this paper noted more generally: they were unskilled, they were young adults, and they entered urban labor markets. Fear of an Irish glut was already apparent in the 1825 Select Committee on Disturbances in Ireland and in the 1827 Select Committee on Emigration, and Malthus himself was concerned about wages falling to an Irish "potato standard" in Britain. Between the 1820s and the 1850s, the Irish-born in Britain rose by more than a half million (Williamson, 1990, p. 143) and their entrance into British labor markets was manifested by high pauper and poor-relief incidence among the immigrant Irish and the unskilled native-born with whom they competed for jobs. It was also manifested by a high incidence of the Irish among low-wage occupations, pushed into marginal service employment by the labor glut. Such employment included Mayhew's (1861) street traders and what in the Third World literature is now called the "unorganized" service sector (Williamson, 1988). In the short run, the impact was most pronounced in the northern cities, the main points of Irish entry. In the longer run, Irish

presence tended to lower real earnings of the unskilled everywhere as local labor gluts spread, through internal migration, to all parts of Britain (Williamson, 1990, Chp. 5).

The real issue, however, is not whether the Irish tended to lower real wages in Britain, but rather the extent to which real wages and living standards were lowered compared with a First Industrial Revolution without the Irish immigrants. Simple partial equilibrium analysis should help motivate our thinking about immigrant labor absorption in Britain. As we shall see, two critical parameters are required to evaluate Britain's immigrant absorptive capacity in the first half of the 19th century: the elasticity of demand for unskilled labor and the elasticity of supply of what we shall call the native-born (although the latter obviously includes previous immigrants). Suppose the domestic labor supply is augmented by an exogenous influx of Irish ("pushed", as they were, by Malthusian population pressure on Irish arable, the Irish potato famine in the late 1840s, and the demise of Irish cottage industry in the face of British factory competition). Suppose also that the domestic labor market is given sufficient time to surmount downward wage rigidity (otherwise the analysis would be in terms of unemployment). What real wage decline was required to induce British firms to hire the Irish-augmented labor force? If we view Figure 5 as a description of urban labor markets in Britain, high native-born labor-supply elasticities are appropriate since they reflect the presence of a large rural sector (more than half of the labor force in the 1830s) which served as alternative employment for the potential British city immigrant. Thus, the high native-born labor-supply elasticity implies "discouraged" native-born crowded out of city labor markets by "unfair" Irish competition, and large changes in the ethnic composition of the urban labor

force are implied as well. The more were the British responsive to the crowding-out, the less would a real wage decline have been necessary to accommodate the Irish. High-demand elasticities for unskilled labor would have implied high absorption rates on the demand side, therefore inducing only modest crowding-out of the native-born and implying an equally modest real wage decline to accommodate the new immigrants.

Figure 5 is drawn under the assumption that the Irish immigration was exogenous, so that the Irish-augmented labor supply shifts to the right by equal amounts at every wage level. In other words, push forces in Ireland are assumed to have done all the work, while the pull of labor-market conditions in Britain's cities is ignored. Suppose instead that the Irish also responded to employment conditions in Britain (as they certainly did in the late 19th century: Hatton and Williamson, 1992b), higher wages attracting them and lower wages discouraging them. How would Figure 5 be revised? The aggregate labor-supply curve would be more elastic so that the same exogenous push forces in Ireland would serve to crowd out some of the Irish themselves, and a portion of the Irish would return home discouraged. These two cases, one with push only and one with both push and pull, are described in Figure 6. Here, we see that when the migrants are in addition responsive to employment conditions in Britain's cities, fewer native-born are crowded out and the real wage declines by less ($w_p$ versus $w_{pp}$). To the extent, therefore, that we take the Irish immigrations as exogenous, their impact on lowering the British real wage would be overstated. However, it also follows that their impact on raising the real wage in Ireland would be understated. In terms of the British-Irish wage gap, therefore, it makes little difference whether the migrations were pushed or pulled. Presumably, the same would be true of any other assessment of 19th

century international migrations on real wage gaps.

When Figure 5 is implemented by a four-sector, open computable general equilibrium (CGE) model estimated for the 1820s, we emerge with the following assessment: aggregate labor demand was sufficiently elastic to have absorbed the immigrants relatively easily. Nonetheless, the Irish immigrations did, of course, lower real wages. While the unskilled real wage actually rose by 0.92 percent per annum between 1821 and 1851, it would have risen by 1.06 percent per annum had there been no more Irish immigrants after 1821 (Williamson, 1990, p. 153). The difference, 0.14 percent per annum, seems small (about 15 percent of the actual rise in real wages), but suppose the same magnitude with opposite sign was true of Ireland? This would imply that, relative to Britain, Irish wages rose by something like 0.3 percent per annum more than in fact they would have in the absence of migration. Figures like these imply a significant contribution to the behavior of the wage gap between Ireland and Britain over the twenty years following 1830: in the absence of migration, the wage gap between Ireland and Britain would have been 5 or 6 percent larger in the 1850s than it was.

We will have more to say about the likely impact of 19th century international migrations on wage convergence below, but this example should serve to set the stage. Our attention so far has been on immigrant absorption since that was the focus of debate in British Parliament when the rural Irish were flocking to better jobs in Britain's cities during the famine decade of the 1840s and before. It is not difficult, however, to find debates about the impact of mass emigrations on European sending countries during the late 19th century. For example, in the early 1880s Knut Wicksell, then a relatively young economic theorist and a neo-Malthusian, argued that emigration would

solve the pauper problem which blighted labor-abundant and land-scarce Swedish agriculture (Wicksell, 1882; cited in Karlstrom, 1985, p. 1). Wicksell challenged more empirically-oriented economists to do the analysis which would offer an assessment of the labor market impact at home on the Swedish exodus to the New World, an event which attracted much public debate at that time. The Swedish economists Eli Heckscher and Bertil Ohlin (in Flam and Flanders, 1991) stated the problem more formally about four decades later. The response to Wicksell's challenge came with a century lag, but Urban Karlstrom (1985, p. 155) recently used a CGE to estimate that the real rural wage in Sweden would have been almost 10 percent lower in 1890 had not the emigrations in the previous two decades taken place.

A Word About Crowding-In and Crowding-Out

In Figures 5 and 6, immigrants "rob jobs" from the native-born (a phrase taken from the work of David Pope and Glen Withers (1990) on Australian immigration). The number of native-born crowded out, however, are not equal to the number of immigrants themselves since falling real wages serve to create more jobs in both figures. How many were actually crowded-out in Britain during the famine decade and before depended on three forces: the elasticity of labor demand in Britain's cities, the rural options facing the native-born (e.g., the native-born labor supply), and the rural options facing the Irish back home (e.g., the pull effects). Any assessment of the impact of international migrations should confront the issue of who gains and who loses, and crowding out of native-born (in this case, discouraged rural workers who failed to migrate to city jobs filled instead by the Irish) is a good place to start. Furthermore, if pre-1913 international labor migrations really made an

important contribution to the evolution of global labor market integration, then we should see evidence of it in terms of crowding out.

Two 19th century examples confirm the importance of these crowding out effects.

Once again, the early 19th century Irish migrations to Britain offer one such example. In this case, there are two places to look for the discouraged native-born in the historical record: low migration rates from the poor agrarian South to the booming industrial North and low out-migration rates from British agriculture to urban employment. The relatively modest migration from England's poor agrarian South to the industrializing North drew much comment at that time, and the 1836 Report of the State of the Irish Poor in Great Britain (p. xxvi) made it plain that it was Irish crowding-out that accounted for it. The First Annual Report of the Poor Law Commission made it clear that James Phillips Kay saw things the same way. Second, when the Irish immigration rate reached its peak in the 1840s, the rate of immigration from British agriculture reached its trough, a correlation which certainly supports the crowding-out view. The application of CGE analysis to the period confirms the historical correlation: in the absence of Irish immigration in the 1840s, the annual out-migration rate from English agriculture would have almost doubled, from 0.7 to 1.2 (Williamson, 1990, p. 155).

The second example was offered some time ago by Brinley Thomas (1972, Chp. 5). United States foreign immigration occured in fits and starts: relatively low in the depressed 1870s, the depressed 1890s, the war-constrained 1910s, and the quota-constrained 1920s; and relatively high in the booming 1880s and the booming 1900s. Black emigration from southern farms to northern cities behaved inversely: relatively high in the 1870s and the 1890s,

and especially in the 1910s and 1920s when World War I and the subsequent quotas suppressed foreign competition. A more careful assessment would be needed to sort out the influence of agricultural depression pushing southern blacks North, but the correlation is, nonetheless, suggestive of powerful foreign immigrant crowding-out effects. Some have argued that exactly the same forces, though weaker, have been at work in the United States during the 1980s (Borjas, Freeman and Katz, 1991).

What Was the Macro Impact of the Late 19th Century Mass Migrations?

Are population growth or migration a good thing or a bad thing? The debates are at least as old as the industrial revolution when both began their rise, first in Britain and then among the followers. As Michael Greenwood and John McDowell (1988, pp. 1745-7) point out, the migration debate certainly has a long history in the United States. It reached a crescendo in 1911 after the Immigration Commission had pondered the problem for five years. The Commission concluded it was a bad thing, contributing to poor working conditions, and those findings surely helped create the quota legislation implemented in the 1920s. But how did the Immigration Commission reach its conclusion? And how do modern economists reach their conclusions regarding today's migrations?

Like the more general population debate (Kelley, 1988), historical correlations between migration and real wages are unlikely to offer any clear answer to the question: Did emigration (immigration) raise (lower) real wages? After all, immigrants were always pulled into the United States in the 19th century when the economy was booming for other reasons -- e.g., the 1830s, the late 1840s and 1850s, the late 1860s and early 1870s, the 1880s and the 1900s. They avoided the United States when the economy was undergoing macroeconomic

bust and slowdown -- e.g., most of the 1840s, most of the 1870s, and most of the 1890s. Historical correlations like these tell us about immigrant response to labor demand conditions in the United States, not about the absorption of the immigrants along some stable labor demand curve.

The same can be said for the intertemporal cross-section in Figure 7 where real wages and population growth are plotted for the century 1870-1988. The evidence presented there surely does not imply that faster immigrant-augmented population growth raised real wages, but rather that scarce labor encouraged a supply response. Part of that supply response took the form of high fertility and low mortality, and part of it took the form of migration. Thus, the major emigrating labor abundant countries tend to lie to the left in the figure while the major immigrating labor scarce countries tend to lie to the right. Furthermore, a good share of the implied population redistribution was attributable to migration, especially in the late 19th century. Up to 1913, immigration accounted for 50 percent of Argentina's, 32 percent of the USA's and 30 percent of Australia's population increase (Taylor, 1992, Table 1.1; Williamson, 1974, p. 248). Between 1871 and 1890, emigration reduced Swedish population increase by 44 percent (Karlstrom, 1985, pp. 155, 181), while, based on emigration rates, even bigger shares must have characterized Ireland, Italy, Norway and Great Britain.

In spite of the long-standing debate on the impact of late 19th century mass migrations, no one to our knowledge has explored the likely quantitative magnitudes in any systematic way. Furthermore, the literature typically asks what the impact on the receiving (or less frequently, the sending) region was alone, rather than asking questions about convergence between them. The difference matters. After all, if real wages were growing at 5 percent per

annum in the labor scarce country and 6 percent in the labor abundant country, and if the 1 percent difference were attributable entirely to external migration, we might correctly conclude that migration accounted for "only" one-tenth of real wage growth in the labor scarce immigrating country (half of the 1 percent, 0.5 percent, divided by 5 percent) and for less than one-tenth in the labor abundant emigrating country (0.5 percent divided by 6 percent), while incorrectly concluding that migration didn't matter much when in fact it accounted for all of the (significant) convergence. The moral of the story is that we must explore the two regions simultaneously.

The way to proceed, of course, is to develop a model in which the long run impact of the migrations can be assessed. We favor the application of CGE models, but we are well aware of the debatable assumptions which may drive the results. That the models focus on long run supply side forces seems appropriate, but we also assume the absence of scale economies, accumulation responses, and influences on the rate of technological change. It seems to us sensible to first ask whether those migrations would have mattered to the evolution of international wage gaps if standard classical, comparative static assumptions were approximated by reality. With first order impacts estimated, we can then explore whether the relaxation of the classical assumptions are likely to overturn our interpretation of history.

While an historical assessment of the impact of the late 19th century mass migrations is our ultimate goal, we begin by reporting in Table 3 the few estimates on sending and receiving regions that have been offered recently, two of which have already been cited above. All of them generate estimates by imposing a no-migration counterfactual on some CGE model of the sending or receiving region. The two cases of late 19th century mass migration both

yield far bigger effects than that for the Irish immigrations into early 19th century Britain: the emigrations from Sweden in the 1870s and 1880s (most of which went to the USA) served to raise real wages there by 4.9 percent per decade; the immigrations into the United States from 1870 to 1910 (some of whom were Swedes) served to lower real wages there by 2.5 percent per decade. Simple addition implies that mass migrations served to erode the US wage advantage relative to Sweden by 7.4 percent per decade, or perhaps as much as 30 percent over the four decades 1870-1913. Swedish real wages were only 25 percent of United States real wages in 1870, but they had climbed to 58 percent of the United States by 1913, so that the wage gap declined by 33 percentage points. This very tentative calculation suggests that almost all of the impressive erosion in the American-Swedish wage gap between 1870 and 1913 was attributable to the mass migrations. Of course, it is also true that it would have taken another six decades, had the same (enormous) rate of Swedish emigration and US immigration continued, to eliminate the wage gap entirely. That is, had overseas migration been the only force at work, it would have taken a century to eliminate the 1870 real wage gap between New World labor-scarce America and Old World labor-abundant Sweden.

If Sweden and America were typical, this tentative empirical application of classical thinking suggests that the mass migrations must have contributed a great deal to the evolution of global labor markets and to real wage convergence in the late 19th century, much like Wicksell predicted.

The argument can be strengthened by its application to another pair of countries, the United States and Britain. A recent paper by one of the present authors (Williamson, 1992) constructed a purchasing-power-parity adjusted urban unskilled real wage data base for 15 countries over the very long run.

The 1870-1913 evidence is summarized in Figure 8 by a coefficient of variation, C(15), and it documents considerable convergence. Furthermore, the late 19th century real wage convergence is similar in magnitude to the better-known convergence after World War II. Perhaps most interesting, however, is the finding that most of the late 19th century real wage convergence can be attributed to an erosion in the real wage gap between the Old and New World (Dno in Figure 8), and not to any significant convergence within the Old World (Do) or within the New (Dn). Around 1870, real wages in the labor scarce New World (Argentina, Australia, Canada and the USA) were much higher than in the labor abundant Old World (Ireland, Great Britain; Denmark, Norway, Sweden; Germany; Belgium, Netherlands, France; Italy and Spain), 136 percent higher. By 1895, real wages in the New World were "only" 100 percent higher, and in 1913 they were "only" about 87 percent higher. In short, the real wage gap between Old World and New fell 36 percentage points over the twenty-five years up to 1895, and by 49 percentage points over the forty-three years up to 1913. The Old World caught up quite a bit with the New. While the magnitudes were less dramatic, what was true of Old and New World was also true of the two countries which best represented each: in 1870, real wages in the USA were 67 percent higher than in Britain while in 1895 they were "only" 44 percent higher, and in 1913 "only" 54 percent higher. That is, the Anglo-American real wage gap fell by 23 percentage points over the twenty-five years up to 1895, and by 13 percentage points over the forty-three years up to 1913. Britain caught up a bit with the United States, a surprising finding given all that has been said about Britain losing her leadership to America (although it must be said that all of the British "catch up" took place prior to 1895, not afterwards, when American industrial ascendancy was most dramatic: Wright,

1990).

The contribution of commodity price convergence to this factor-price convergence has been assessed elsewhere (O'Rourke and Williamson, 1992), and we shall have more to say about it below. We now ask: How much of the Anglo-American real wage convergence between 1870 and 1913 can be explained by total British net emigration and total American net immigration? The open, multi-sector British and American CGEs are described elsewhere (O'Rourke and Williamson, 1992), but they are in the classical, comparative static tradition: in the counterfactual experiment, land, capital and technologies are, at least initially, kept fixed; only labor is allowed to vary in the no-American-immigration and no-British-emigration counterfactuals. The US labor force (here proxied by population) would have been 14.4% smaller in 1895 without the net immigrations 1870-1895, and 22.8% smaller in 1913 without the net immigrations 1870-1913. The British labor force (again, proxied by population) would have been 4.8% larger in 1895 without the net emigrations 1870-1895, and 7.6% larger in 1913 without the net emigrations 1870-1913. What would the impact on these two economies have been had these migrations not taken place? The results are presented in Panel A of Table 4 (based on Hatton, O'Rourke and Williamson, ongoing), and they are big. In 1913, real wages would have been 24.7% higher in the US and 6.1% lower in Britain. The Anglo-American real wage gap was actually 54 percent in 1913; without the late 19th century migrations it would have been almost 105 percent. The Anglo-American real wage gap fell by about 13 percentage points between 1870 and 1913; without the late 19th century migrations it would have <u>risen</u> by about 38 percentage points.

There would have been no Anglo-American convergence without international migration. Wicksell's classical assumptions suggest that overseas migrations

made a critical contribution to economic convergence between Old World and New in the late 19th century.

Relaxing Wicksell's Classical Assumptions

Optimists in the migration debate would, no doubt, argue that the classical assumptions made thus far overstate the impact of the late 19th century mass migrations. What follows is a list of the ones which, we suspect, the optimists would stress.

First, we have assumed that labor is homogeneous. Natives and migrants are both unskilled, and they compete for the same jobs. As we pointed out in Section 4, economists assessing recent American experience with immigration tend to view migrants and natives more as complements. While we offered argument as to why the modern complementarity position should be viewed with caution, there is reason in any case to think that conditions were quite different a century ago. After all, skilled labor was a much smaller share of the labor force in both sending and receiving regions in the late 19th century than it is now; skills (post-literacy formal education in particular) were much less important to 1890 technologies than they are to 1990 technologies. Furthermore, human capital gaps between migrants and native born were much smaller than they are today (especially in the 1980s: Borjas, 1991), and as Section 4 argued, there is very little evidence to suggest that foreign labor faced discrimination, entered segmented occupations, or lacked mobility. Substitutability is far more likely to have characterized labor markets in the late 19th century than complementarity.

Second, the optimistic view stresses that migrants contribute to a demand boom along Keynesian lines. This view was certainly true of the historical

long swing literature of the 1950s and 1960s when Keynesian thinking was in vogue (Thomas, 1954; Easterlin, 1968; Abramovitz, 1961, 1968). A modern version has recently been offered to account for the view that immigrants never robbed Australian jobs in the past (Pope and Withers, 1990). While this view might be credible in the short run, it is unlikely, in our view, to be credible for periods spanning forty years.

Third, the optimistic view stresses increasing returns, and it is now firmly embedded in the new growth theory (Lucas, 1988). In spite of all that has been said about increasing returns, however, there has been no persuasive evidence offered to confirm it for the 19th century.

Fourth, there is what American economic historians call the Walker Effect (Neal and Uselding, 1972). The argument is that had American labor been even more scarce in the absence of the immigrants, native fertility rates would have risen to take up the slack. Since real wage trends explain so little of New World experience with fertility changes (Lindert, 1978), it seems unlikely that a native fertility response would have mattered much in muting the impact of the mass migrations. The same can be said of the Old World where late 19th century fertility declines corresponded so frequently with the mass emigrations (e.g., Teitelbaum, 1984).

Finally, there are the more conventional accumulation and comparative advantage responses to consider. Might there have been immigrant-induced long run supply-side responses which simultaneously shifted the labor demand curve to the right just when immigrant-induced rightward shifts in labor supply were taking place? We find these arguments more compelling, and the next section will explore them at length.

## 6. INTERDEPENDENCE BETWEEN MARKETS: LABOR, CAPITAL AND COMMODITIES

Ever since Eli Heckscher and Bertil Ohlin made their pioneering contributions shortly after World War I, trade theorists have understood that real wage convergence can take place in the absence of international migrations: both capital flows and commodity trade can, at least in theory, serve as substitutes for labor migration. What role did the integration of international capital and commodity markets play in forging a global labor market and contributing to real wage convergence? In spite of the importance these issues have played in the trade literature, no one, to our knowledge, has explored their empirical relevance for the late 19th century, the period that motivated Heckscher and Ohlin in the first place. We start with international commodity markets and then turn to capital markets.

### The Factor-Price-Equalization Theorem

The factor-price-equalization (FPE) theorem has been a durable tool in trade theory for seventy years. The Heckscher-Ohlin paradigm has it that countries tend to export commodities which use intensively the factors in which they are well endowed while they tend to import commodities which use intensively the factors in which they are poorly endowed. Thus, commodity trade acts as if to equalize factor endowments among trading partners. Furthermore, as this audience certainly knows, it can be shown under (very) restrictive assumptions that a move from no trade to free trade can in fact equalize factor prices where wide differences existed before. Consider this example: Let falling transport costs and declining tariff barriers tend to equalize prices of traded commodities. Countries will now export more of the

goods which exploit their favorable factor endowment. The demand for the abundant and cheap factor booms while that for the scarce and expensive factor slumps. Thus, commodity price equalization tends to produce factor price equalization, although theory is ambiguous about how much.

Both Heckscher and Ohlin were Swedes, and thus they were very familiar with the small open economy. Indeed, when Heckscher was writing in 1919 and Ohlin in 1924, they were motivated by the commodity price equalization trends which they thought had taken place between the Old World and the New in the late 19th century (see the new translation edited by Flam and Flanders, 1991). Their economic metaphor was driven by primary foodstuffs: what economic historians now call the invasion of grains from the New World, driven by the sharp decline in transport costs, served to lower the relative price of grains in the Old World (like Sweden) and raise it in the New World (like America). Britain and the Scandinavian countries did not respond to the challenge with tariffs, although countries on the continent did (Kindleberger, 1951). What occured in the late 19th century was exactly the kind of exogenous relative price shock which is supposed to set factor-price equalization in motion. According to the FPE theorem, the invasion of grains should have raised real wages in the Old World free-trade zone while lowering them in New World, *ceteris paribus*. Did it?

Actually, there are three questions here, not just one. First, were factor endowments really the key determinants of trade patterns in the late 19th century? Second, was there pronounced commodity price convergence in the late 19th century? Third, if the first two propositions hold, in addition did commodity price convergence make a significant contribution to the observed real wage convergence?

Consider the first question. Two recent and influential papers by economic historians have analyzed the determinants of comparative advantage in British and American manufacturing in the late 19th century. Nick Crafts and Mark Thomas (1986) find support for the Heckscher-Ohlin hypothesis, since endowments explain the pattern of trade in British manufacturing between 1910 and 1935, as well as the United States in 1909. Gavin Wright (1990) finds the same in accounting for the evolution of US trade patterns between 1879 and 1940. More recently, Antoni Estevadeordal (1992) has found more support based on a large sample of 18 countries around 1913. Indeed, the 1913 evidence is far more supportive of the Heckscher-Ohlin hypothesis (Estevadeoral, 1992, p. 9) than Edward Leamer (1984) was able to report for a comparable data set covering the period 1958 to 1975. Finally, it seems relevant to note that William Whitney (1968) found no evidence of a Leontief Paradox in the US 1899 data.

Consider the second question. Economic historians have long been aware of the revolutionary decline in transport costs underlying overseas trade in the late 19th century. Douglass North (1958, p. 537) called the deline "radical" both for railroads and ocean shipping. Since Britain imported foodstuffs and raw materials, and since these bulk commodities "were fundamental beneficiaries of the cheapening transport costs" (p. 544), he thought it was clear that it contributed in Britain to "lower priced foodstuffs and therefore rising real wages, and to lowering in the cost of industrial raw materials" (p. 545) and therefore, we take it, rising rates of industrialization. Although North doesn't say so, symmetry suggests that real wages must have been lowered in the US while industrialization must have been suppressed, *ceteris paribus*.

When deflated by a US general price index, North's freight rate index along American export routes dropped by more than 41 percent between 1870 and 1910. His wheat-specific American east coast real freight rate index fell by even more, about 53 percent. Similar evidence has been offered more recently by Knick Harley (1988), based on British overseas coal freight rates.

In assessing the "radical" decline in overseas freight rates, the cost reductions along the rails between Chicago and New York, or even the erosion in Civil War tariffs, what mattered, of course, was its impact on the price convergence of tradables. Almost without exception, the literature has explored the question by looking at the international grain market. This is certainly true of Charles Kindleberger's (1951) important contribution to the debate over the Old World defensive policy response to the grain invasion, and it is also true of Knick Harley's (1980, 1986) writings on late 19th century transport, trade and settlement. It turns out, however, that Anglo-American price convergence was far more comprehensive. A recent paper by Kevin O'Rourke and one of the present authors (O'Rourke and Williamson, 1992) has shown that while Liverpool grain prices exceeded Chicago prices by 60.2 percent in 1870, they exceed Chicago prices by only 14.2 percent in 1912. The price gap for meat and animal fats declined from 93 percent to 18 percent over the same period. The price gap for iron products fell from 80 to 20 percent, cotton textiles from 14 to 1 percent, and so on. Quite clearly, there was dramatic convergence of tradable prices between Old World and New between 1870 and World War I.

Consider now the third question. In an effort to assess the FPE theorem, a computable general equilibrium (CGE) has been estimated for both Britain and the US, and the models have then been used for counterfactual analysis

(O'Rourke and Williamson, 1992). The results are summarized in Panel A of Table 5. The table offers estimates of the impact of commodity price equalization on Anglo-American factor prices for both the earlier 1870-1895 period as well as the full 1870-1913 period. Our interest here is in the real wage gap. As we indicated above, the Anglo-American real wage gap declined in fact by 23 percentage points up to 1895. Table 5 (Panel A) suggests that about half of that convergence can be assigned to commodity price equalization forces, about 10 percentage points. Over the full period 1870-1913, it served to reduce the wage gap by about 21 percentage points, a figure which exceeds the actual measured convergence over the four decades as a whole suggesting that the effects of the superior American industrial performance was dominant after 1895 (consistent with Wright, 1990). In short, commodity price equalization played a significant role in contributing to real wage convergence up to 1895, and in muting the divergence effects of superior American industrialization thereafter.

Note, in addition, that commodity price equalization served to erode relative capital scarcity in America. Compared with the rest of the economy, agriculture was less capital intensive in both American and Britain. Thus, the price shocks served to lower the return to capital in America (where, in response, the relative size of agriculture rose) and to raise it in Britain (where, in response, the relative size of agriculture fell). On net, commodity price equalization served to erode the rate of return gap (which favored "capital scarce" America) by almost 30 percentage points. These results suggest that if world capital markets were perfectly integrated, commodity price equalization must have served by itself to accelerate accumulation in Britain relative to America, to increase the capital-labor ratio in Britain

relative to America, thus to reinforce real wage convergence. Panel B of Table 5 suggests, however, that these accumulation responses could have had only a modest impact: an assumption of perfectly elastic world capital flows in response to the price shocks implies that induced real wage convergence up to 1913 would have been 26.3 percent (perfectly elastic capital flows) rather than 21.1 percent (no capital flows). Thus, our results are robust to assumptions about world capital markets, at least in terms of the FPE theorem.

Did Capital Chase after Labor, and Did It Matter?

In the simple two-factor model, labor should migrate from the low-wage to the high-wage country, and capital should migrate from the high-wage (low returns) to the low-wage (high-returns) country. The better integrated are world capital markets, the faster the real wage convergence. And if world capital markets become better integrated over time, the rate of convergence should accelerate, and if world factor markets break down, convergence should slow down.

Crude correlations would appear to be consistent with these predictions. After all, there was dramatic real wage convergence during the second half of the 19th century, trends which appear to track evolving world capital market integration. The size of the international capital flows were very large, with Britain at the center (Edelstein, 1982). Furthermore, there is evidence that world capital markets were better integrated around 1890 than they were around 1980 (Zevin, forthcoming). In addition, real wage convergence ceased from the start of World War I to the end of World War II, three decades during which global capital markets collapsed.

Crude correlations may be misleading, however, since the two-factor model

is an inadequate characterization of late 19th century history. What really distinguished the Old World from the New was natural resource endowment, and that fact motivates the concept of New World "dual scarcity" (Temin, 1966). Resources were abundant there, while both capital and labor were scarce. And there is plenty of evidence that capital chased after labor as a consequence: that is, labor emigrated from capital exporting Old World countries (like Britain, Germany and France) and labor immigrated into capital importing New World countries (like Argentina, Australia, Canada and the USA).

If capital chased after labor, can it still be said that the overseas mass migrations really contributed to long run real wage convergence? We need two pieces of information to confront this important question. First, did the flow of labor dominate the flow of capital to the New World so as to lower the capital-labor ratio there compared with the Old World? Second, what happens to real wage gaps in the no-migration counterfactual when global capital markets are assumed to be perfectly integrated?

Given the impressive size of the literature on late 19th century capital flows and mass migrations, one would have thought it would be a simple matter to find evidence assessing the net impact of <u>both</u> flows on capital-labor ratios in the sending Old World and the receiving New World. However, we are unaware of any such estimates. Capital-deepening over time can be written as $d(K/L) = (K/L)*\{[dKD/K - dLD/L] + [NFI/K - MIG/L]\}$. The first term in this expression refers to domestic and the second to foreign sources of capital-deepening (NFI is equal to the current account balance and MIG is equal to net migration). It is the second term which interests us, and Table 6 offers some evidence for five countries, one immigrant country (the United States) and four emigrant countries (Germany, Great Britain, Italy and Sweden). The

American case is clear: while European capital did chase after the migrants going to America, labor dominated capital migration, so that in combination they served to lower the rate of capital-deepening. From 1870 to 1913, those external factor flows served to lower the rate of capital-deepening by about 0.5 percentage points per annum: external factor flows into the United States cut the rate of capital-deepening by a seventh (-0.47/[2.65+0.47]= -0.151). In Sweden, capital did not chase after labor, but rather she exported labor and imported capital. The net impact was enormous, serving to increase the rate of Swedish capital-deepening by a factor of five (1.33/[1.60-1.33]= +4.93). While Italian capital chased after labor in the last half of this period, emigration dominated: external factor flows served to increase the rate of capital-deepening by 80 percent (0.63/[1.41-0.63]= +0.780). In these three important cases, international factor migration contributed to convergence between the rich New World and the poor Old World. Germany and Britain are exceptions to the rule. Here capital chased after labor in such large amounts that it must be said that international factor migration inhibited convergence: external factor flows lowered the rate of capital-deepening in Britain by two-thirds (-2.48/[1.16+2.48])= -0.681) and in Germany by a sixth (-0.46/[2.27+0.46]= -0.168).

It must be said, of course, that correlation does not necessarily imply causation: although we have used the words "capital chased after labor" in describing Germany and Britain, there may have been third factors pulling both of them abroad. The distinction is important. We need an explicit model to sharpen the focus. So, let us turn now to the second question: What happens in the no-migration counterfactual reported in Table 4 when capital is allowed to chase after labor, when world capital markets are treated as perfectly

integrated? Panel B offers the results. But before we look at Panel B, note in Panel A the impact on the return to capital in the no-migration counterfactual when international capital is assumed immobile. The capital-labor ratio rises (falls) in the United States (Great Britain) so the return to capital falls (rises). Thus, if capital is now allowed to be perfectly mobile, it will retreat from America and stay home in Britain, muting the impact of migration's effects. Now look at Panel B. In 1913, real wages would have been 6.5% higher in the US and 3.3% lower in Britain. The Anglo-American real wage gap was actually 54 percent in 1913; without the late 19th century migrations, and without that part of the capital flows that chased after the migrants, the real wage gap would have been about 69.2 percent. The Anglo-American real wage gap fell by about 13 percentage points between 1870 and 1913; without the late 19th century migrations, and without that part of capital flows that chased after the migrants, the real wage gap would have risen by about 15 percentage points.

The moral of the story is that international migration contributed to real wage convergence between Old World and New even if we allow for perfect capital market integration. The central reason why these results are so robust is, of course, the important presence of a third factor in the late 19th century, natural resources.

## 7. CONVERGENCE AND THE EVOLUTION OF GLOBAL LABOR MARKETS IN HISTORY

The literature on economic convergence has reached enormous proportions: started by economic historians like Alexander Gerschenkron (1952) and Moses

Abramovitz (1979, 1986), it has flourished recently under the leadership of William Baumol (Baumol et al., 1989), Robert Barro (1991; Barro and Sala-I-Martin, 1991) and many others. It has also generated a "new growth theory" in which human capital accumulation and endogenous technical progress plays a richer role. With the exception of the economic historians, few of these economists have paid serious attention to history. And even the economic historians have paid little attention to contribution which international commodity, labor and capital market integration has played in the process; rather, the stress has been on the forces of technical change and human capital formation.

This paper has suggested that commodity, labor and capital market integration are likely to have been at the heart of the convergence process during the late 19th century when convergence was dramatic, these markets were well integrated, and the mass migrations were large. Between 1913 and 1945, war, government intervention, and the collapse of these markets retarded those forces of convergence. They resumed in the 1950s.

We need to learn much more about these global market forces, and the complex interdependence between capital, labor and commodity markets is likely to be central to any comprehensive explanation that emerges. In addition, to assess the contribution of immigration to the long-run convergence process will require more macro general equilibrium thinking than has been true of the literature to date. In any case, we hope we have persuaded this audience that history should be kept at center stage in the enterprise.

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Table 1

European Emigration Rates by Decade
(per 1000 mean population)

| Country | 1851-60 | 1861-70 | 1871-80 | 1881-90 | 1891-1900 | 1901-10 |
|---|---|---|---|---|---|---|
| Austria-Hungary | | | 2.9 | 10.6 | 16.1 | 47.6 |
| Belgium | | | | 8.6 | 3.5 | 6.1 |
| British Isles | 58.0 | 51.8 | 50.4 | 70.2 | 43.8 | 65.3 |
| Denmark | | | 20.6 | 39.4 | 22.3 | 28.2 |
| France | 1.1 | 1.2 | 1.5 | 3.1 | 1.3 | 1.4 |
| Germany | | | 14.7 | 28.7 | 10.1 | 4.5 |
| Ireland | | | 66.1 | 141.7 | 88.5 | 69.8 |
| Netherlands | 5.0 | 5.9 | 4.6 | 12.3 | 5.0 | 5.1 |
| Norway | 24.2 | 57.6 | 47.3 | 95.2 | 44.9 | 83.3 |
| Sweden | 4.6 | 30.5 | 23.5 | 70.1 | 41.2 | 42.0 |
| Switzerland | | | 13.0 | 32.0 | 14.1 | 13.9 |
| Finland | | | | 13.2 | 23.2 | 54.5 |
| Italy | | | 10.5 | 33.6 | 50.2 | 107.7 |
| Portugal | | 19.0 | 28.9 | 38.0 | 50.8 | 56.9 |
| Spain | | | | 36.2 | 43.8 | 56.6 |

Source: Ferenczi and Willcox (1929), pp. 200-1.

Table 2

New World Immigration Rates by Decade
(per 1000 mean population)

| Country | 1851-60 | 1861-70 | 1871-80 | 1881-90 | 1891-1900 | 1901-10 |
|---|---|---|---|---|---|---|
| Canada | 99.2 | 83.2 | 54.8 | 78.4 | 48.8 | 167.6 |
| United States | 92.8 | 64.9 | 54.6 | 85.8 | 53.0 | 102.0 |
| Cuba | | | | | | 118.4 |
| Argentina | 38.5 | 99.1 | 117.0 | 221.7 | 163.9 | 291.8 |
| Brazil | | | 20.4 | 41.1 | 72.3 | 33.8 |

Source: See Table 1.

Table 3

Three Estimates of the Impact of 19th Century International Migrations on Real Wages

| Migration Direction | Country and Period | Impact on Real Wages Total | Impact on Real Wages per Decade | Source |
|---|---|---|---|---|
| Emigration | Sweden 1871-90 | +9.4% | +4.9% | Karlstrom [1985], p. 155 |
| Immigration | Britain 1821-51 | -4.1 | -1.4 | Williamson [1990], p. 153 |
| Immigration | USA 1870-1910 | -9.9 | -2.5 | Williamson [1974], p. 249 |

Table 4

Counterfactual: What Would Have Been the Impact on Britain and the United States Without International Migrations and Capital Flows? (in percent)

| Variable | United States | | Great Britain | | United States less Great Britain | |
|---|---|---|---|---|---|---|
| | 1870-95 Flows on 1895 Economy | 1870-1913 Flows on 1913 Economy | 1870-95 Flows on 1895 Economy | 1870-1913 Flows on 1913 Economy | 1870-95 Flows on 1895 Economy | 1870-1913 Flows on 1913 Economy |
| PANEL A: Labor Migration only, with no Capital Flow Response: Capital Does Not Chase After Labor | | | | | | |
| Urban real wage | +16.1 | +24.7 | -4.0 | -6.1 | +20.1 | +30.8 |
| Return to capital | -17.0 | -21.3 | +3.7 | +6.0 | -20.7 | -27.3 |
| PANEL B: Labor Migration with Elastic Capital Flow Response: Capital Chases After Labor | | | | | | |
| Urban real wage | +4.2 | +6.5 | -2.1 | -3.3 | +6.3 | +9.8 |
| Return to capital | 0 | 0 | 0 | 0 | 0 | 0 |

Source: Hatton, O'Rourke and Williamson (ongoing). Entries refer to percentage change in variables' levels. See text. The estimated CGE's underlying the experiments can be found in O'Rourke and Williamson (1992).

Table 5

The Estimated Impact of Anglo-American Commodity Price Equalization on Factor Prices (Deflated by Cost of Living Index): 1870-1913 (in percent)

| Variable | Price shock apportioned between: United States | Great Britain | Great Britain minus United States |
|---|---|---|---|
| **PANEL A: Without International Capital Flows** | | | |
| Early Period: 1870-1895 | | | |
| Urban wage | +0.1 | +10.5 | +10.4 |
| Land rent | +5.0 | -32.3 | -37.3 |
| Return to capital | -3.4 | +9.8 | +13.2 |
| Wage rental ratio | -4.9 | +42.8 | +47.7 |
| Full Period: 1870-1913 | | | |
| Urban wage | +0.3 | +21.4 | +21.1 |
| Land rent | +13.4 | -54.2 | -67.6 |
| Return to capital | -9.2 | +20.5 | +29.7 |
| Wage rental ratio | -13.1 | +75.6 | +88.7 |
| **PANEL B: Perfectively Elastic International Capital Flows** | | | |
| Early Period: 1870-1895 | | | |
| Urban wage | +1.2 | +14.3 | +13.1 |
| Land rent | +5.2 | -32.4 | -37.6 |
| Wage rental ratio | -4.0 | +46.7 | +50.7 |
| Full Period: 1870-1913 | | | |
| Urban wage | +1.7 | +28.0 | +26.3 |
| Land rent | +13.6 | -54.2 | -67.8 |
| Wage rental ratio | -11.9 | +82.2 | +94.1 |

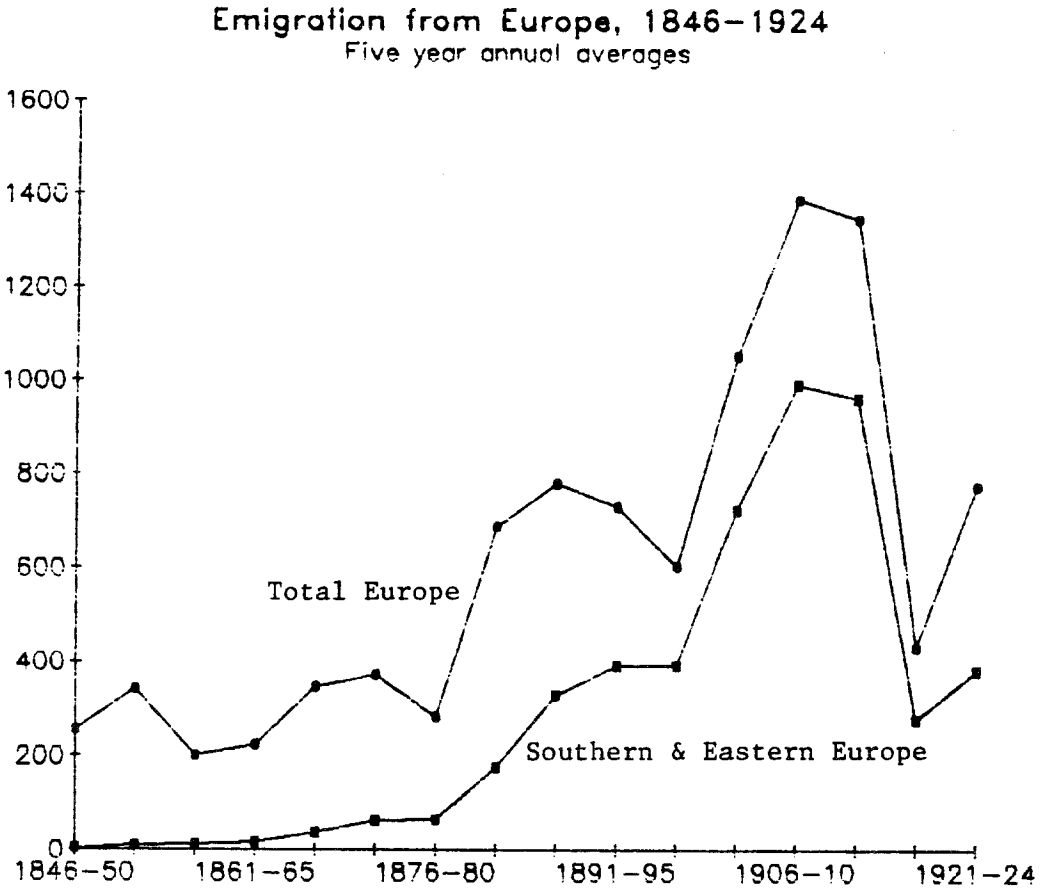
Source: O'Rourke and Williamson [1992], Tables 2 and 3.

Table 6

Impact of International Migration and Capital Flows
on Capital-Deepening in Five Late 19th Century Countries: Per Annum Growth
(in percent)

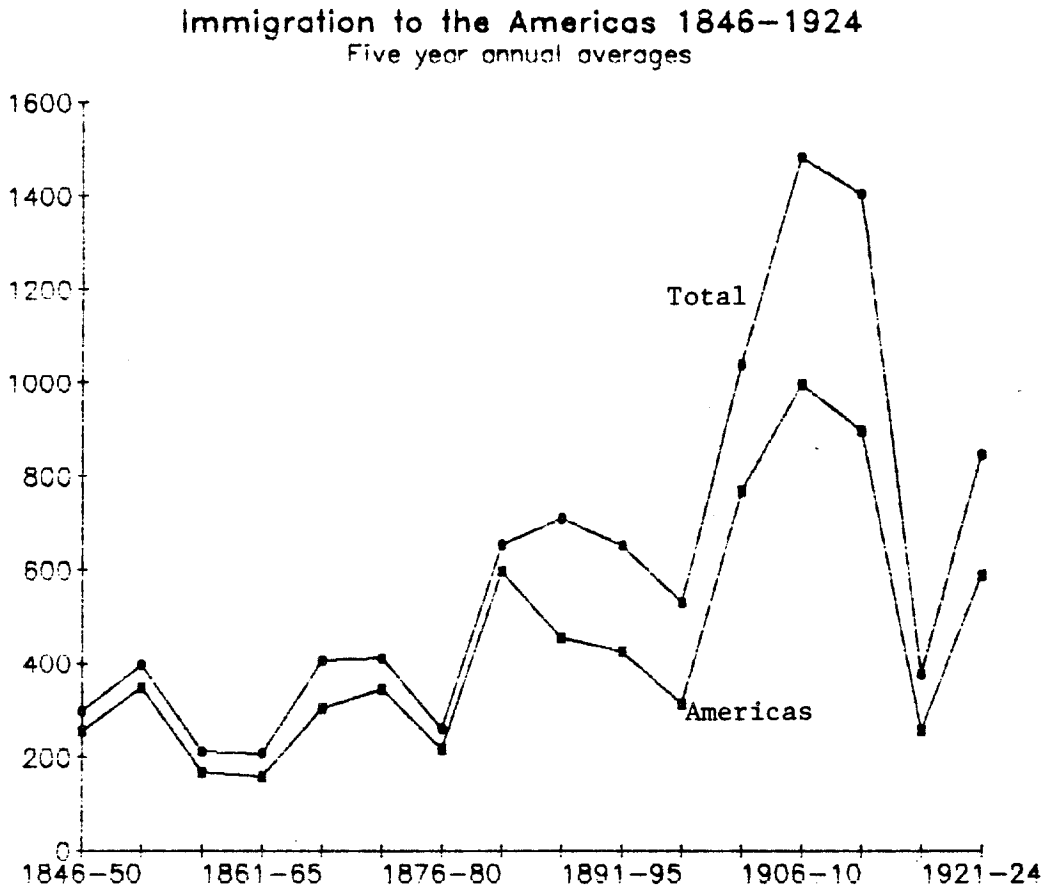
| Country | (1) NFI/K | (2) MIG/P | (3) = (1)-(2) | (4) Actual K/L |
|---|---|---|---|---|
| UNITED STATES | | | | |
| 1870-1879 | 0.28 | 0.48 | -0.19 | -0.04 |
| 1880-1889 | 0.43 | 0.78 | -0.35 | 3.16 |
| 1890-1899 | 0.07 | 0.34 | -0.27 | 3.54 |
| 1900-1913 | 0.15 | 0.74 | -0.89 | 3.66 |
| 1870-1913 | 0.13 | 0.60 | -0.47 | 2.65 |
| GREAT BRITAIN | | | | |
| 1870-1879 | -2.70 | -0.26 | -2.43 | 1.67 |
| 1880-1889 | -3.04 | -0.40 | -2.64 | -0.14 |
| 1890-1899 | -2.28 | -0.16 | -2.12 | 2.05 |
| 1900-1913 | -3.08 | -0.42 | -2.66 | 1.11 |
| 1870-1913 | -2.80 | -0.32 | -2.48 | 1.16 |
| SWEDEN | | | | |
| 1870-1879 | 0.76 | -0.23 | 0.99 | 1.74 |
| 1880-1889 | 1.40 | -0.73 | 2.13 | 0.47 |
| 1890-1899 | 0.59 | -0.38 | 0.97 | 1.75 |
| 1900-1913 | 0.96 | -0.30 | 1.25 | 2.26 |
| 1870-1913 | 0.93 | -0.40 | 1.33 | 1.60 |
| GERMANY | | | | |
| 1870-1879 | -0.83 | -0.14 | -0.69 | 0.36 |
| 1880-1889 | -0.81 | -0.29 | -0.52 | 3.26 |
| 1890-1899 | -0.38 | -0.12 | -0.26 | 2.95 |
| 1900-1913 | -0.43 | -0.03 | -0.40 | 2.47 |
| 1870-1913 | -0.59 | -0.13 | -0.46 | 2.27 |
| ITALY | | | | |
| 1870-1879 | 0.01 | -0.38 | 0.39 | 1.57 |
| 1880-1889 | 0.44 | -0.54 | 0.98 | 0.18 |
| 1890-1899 | -0.48 | -0.68 | 0.20 | 0.87 |
| 1900-1913 | -0.47 | -1.32 | 0.86 | 2.67 |
| 1870-1913 | -0.15 | -0.78 | 0.63 | 1.41 |

Figure 1




Source: Ferenczi and Willcox (1929), pp. 230-1. The figures are in thousands.

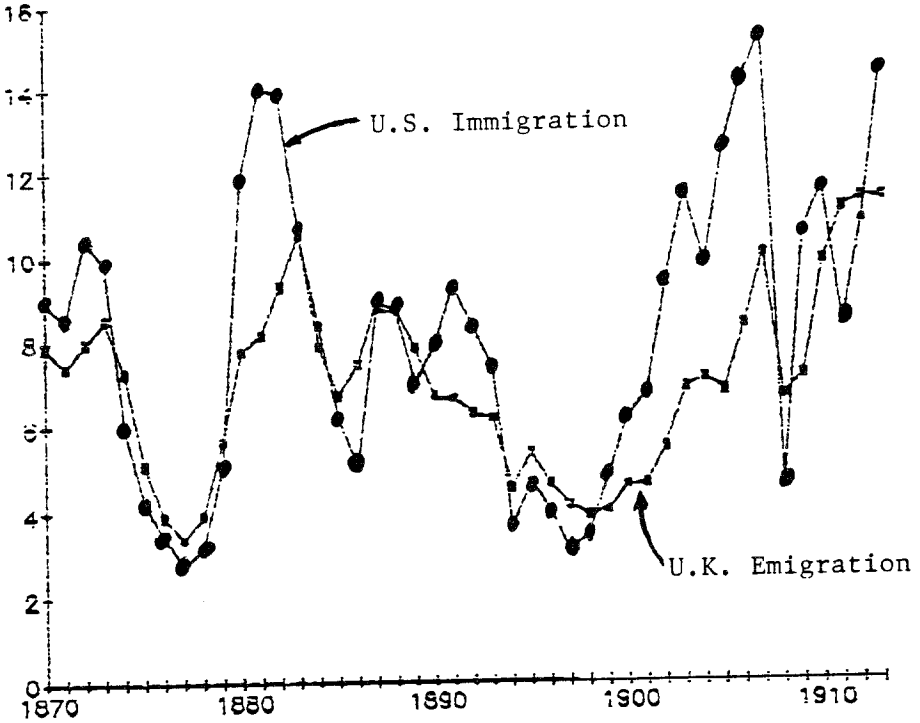
Figure 2




Source: Ferenczi and Willcox (1929), pp. 168 and 262. The figures are in thousands.

Figure 3

U.S. Immigration and U.K. Emigration
Rates per 1000 Population, 1870–1913




Source: See Table 1.

Figure 4

Source: Immigration figures are taken from the same source listed in Figure 3. Unemployment figures are from Vernon (1992).

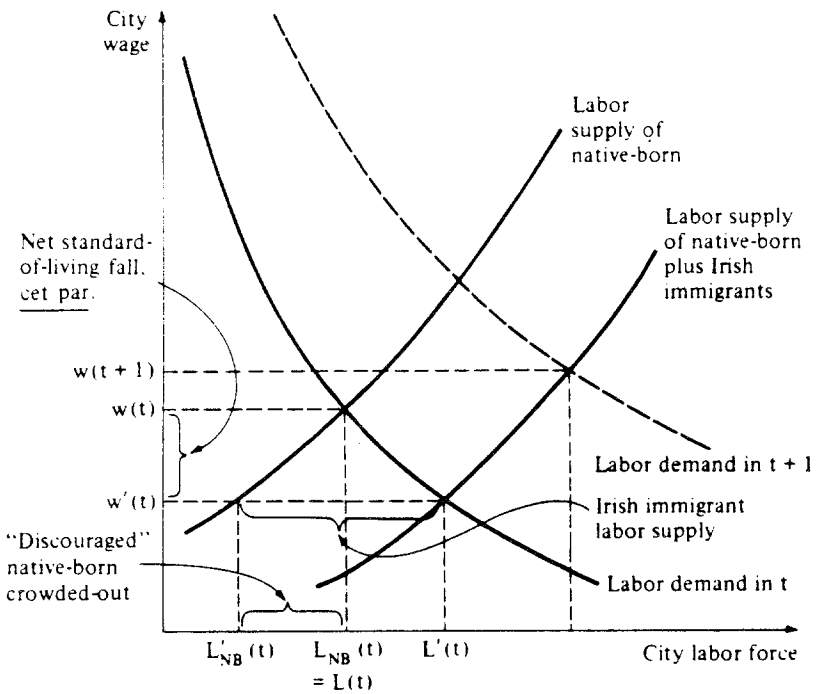



Figure 5. Labor Absorption in British Cities with Immigrants Pushed from Ireland: Source: Williamson (1990), p. 145.

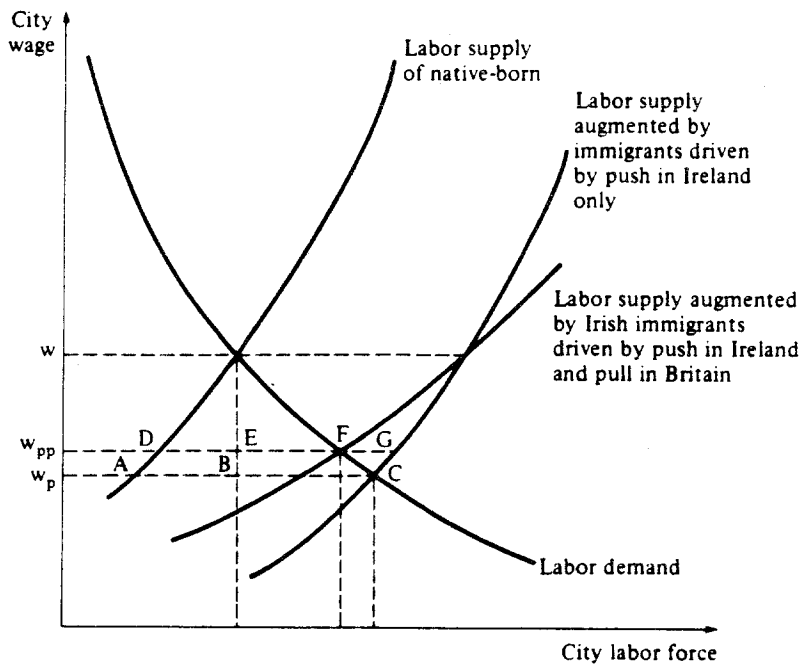
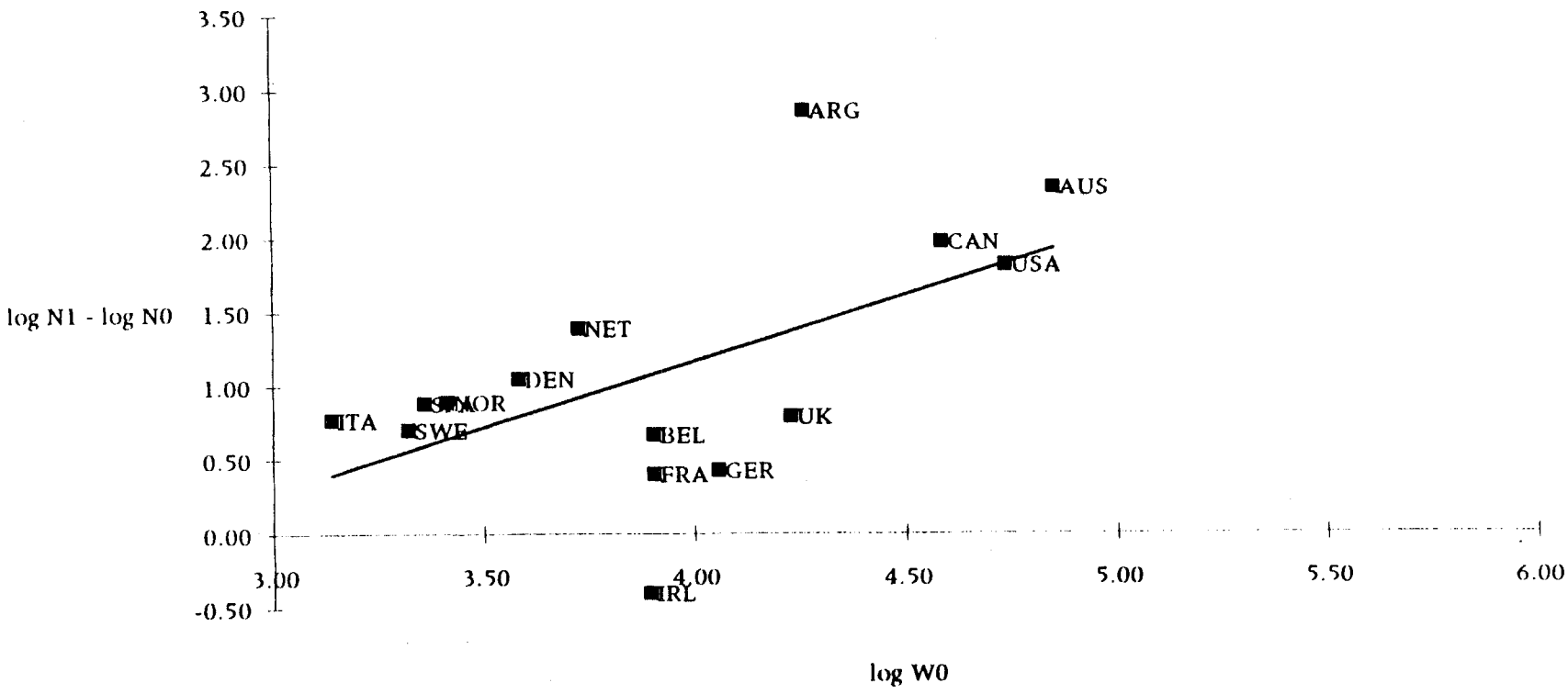


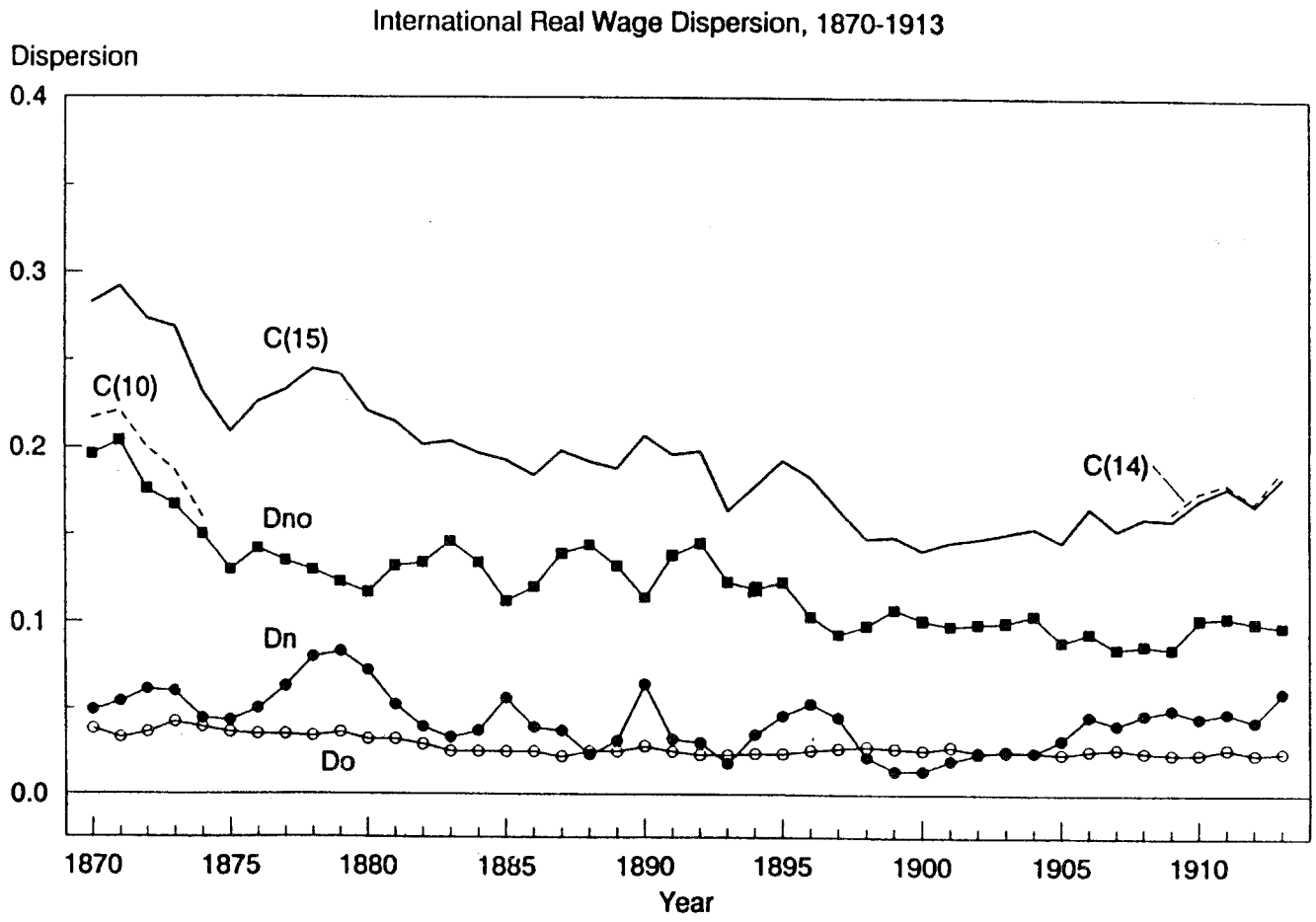

Figure 6. Immigrant Absorption in British Cities with Immigrants Pushed and Pulled from Ireland: Source: Williamson (1990), p. 146.

Figure 7. Real Wages and Population Growth 1870-1988




Source: Williamson, 1991, Figure 9.

Figure 8




Source: Williamson (1992).