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The Economics of Immigration

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1. *Introduction*

THERE HAS BEEN a resurgence of immigration in the United States and in many other countries. The United Nations estimates that over 60 million people, or 1.2 percent of the world's population, now reside in a country where they were not born (United Nations 1989, p. 61). Although most immigrants choose a "traditional" destination (over half typically go to the United States, Canada, or Australia), many other countries are receiving relatively large immigrant flows. Nearly 11 percent of the population in France, 17 percent in Switzerland, and 9 percent in the United Kingdom is foreign-born. Even Japan, which is thought of as being very homogeneous and geographically immune to immigrants, now reports major problems with illegal immigration.

As a result of these changes in the "immigration market," the impact of immigration on the host economy is now being debated heatedly in many countries. The political discussion is centered around three substantive questions. First, how do immigrants perform in the host country's economy? Second, what impact do immigrants have on the employment opportunities of natives? Finally, which immigration policy most benefits the host country?

The policy significance of these questions is evident. For example, immigrants who have high levels of productivity and who adapt rapidly to conditions in the host country's labor market can make a significant contribution to economic growth. Natives need not be concerned about the possibility that these immigrants will increase expenditures on social assistance programs. Conversely, if immigrants lack the skills that employers demand and find it difficult to adapt, immigration may significantly increase the costs associated with income maintenance programs as well as exacerbate the ethnic wage differentials already in existence in the host country.

Similarly, the debate over immigration policy has long been fueled by the widespread perception that "immigrant hordes" have an adverse effect on the employment opportunities of natives. Which native workers are most adversely affected by immigration, and how large is the decline in the native wage?

Finally, there is great diversity in immigration policies across countries. Some countries, such as the United States,

TABLE 1
LEGAL IMMIGRANT FLOW TO THE UNITED STATES 1881–1990

Decade	Immigrant Flow (in 1000s)	Immigrant Flow as Percentage of Change in Population	Percentage of Population that is Foreign-Born at End of Decade
1881–1890	5,246.6	41.0	14.7
1891–1900	3,687.6	28.3	13.6
1901–1910	8,795.4	53.9	14.6
1911–1920	5,735.8	40.8	13.2
1921–1930	4,107.2	24.6	11.6
1931–1940	528.4	5.9	8.8
1941–1950	1,035.0	5.3	6.9
1951–1960	2,515.5	8.7	5.4
1961–1970	3,321.7	13.7	4.7
1971–1980	4,493.3	20.7	6.2
1981–1990	7,338.1	33.1	7.9

Sources: U.S. Department of Justice. Immigration and Naturalization Service (1993, p. 25); U.S. Department of Commerce. Bureau of the Census (1975, pp. 8, 14; 1993b, p. 50).

award entry visas mainly to applicants who have relatives already residing in the country. Other countries, such as Australia and Canada, award visas to persons who have a desirable set of socioeconomic characteristics, and still other countries, such as Germany, encouraged the migration of "temporary" guest workers in the 1960s, only to find that the temporary migrants became a permanent part of the German population. The choice of the "right" immigration policy can obviously have a significant impact on economic activity both in the short run and in the long run.

The past decade witnessed an explosion in research on many aspects of the economics of immigration. This literature is motivated mainly by the various policy concerns and provides valuable insights into all these issues. This paper does not attempt to provide an encyclopedic summary of the empirical results in the literature; instead, it surveys the themes and lessons suggested by the ongoing research. Perhaps the most important theme is that an assessment of the economic impact of immigration requires an understanding of the factors that motivate persons in the source countries to emigrate and of the economic consequences of pursuing particular immigration policies. As a result, the most important lesson is that the economic impact of immigration will vary by time and by place, and can be either beneficial or harmful. Although the discussion focuses on the experience of the United States (simply because most studies in the literature use data drawn from the U.S. decennial Censuses), we will see that much can be learned by comparing the U.S. experience to that of other host countries.

2. *Immigration to the United States: A Brief History*

As Table 1 shows, the size of the immigrant flow has fluctuated dramatically during the past century. The First Great Migration occurred between 1881 and 1924, when 25.8 million persons entered the country. Reacting to the increase in immigration and to the widespread perception that the "new" immigrants dif-

fered from the old, Congress closed the floodgates in the 1920s by enacting the national-origins quota system. This system restricted the annual flow from Eastern Hemisphere countries to 150,000 immigrants, and allocated the visas according to the ethnic composition of the U.S. population in 1920. As a result, 60 percent of all available visas were awarded to applicants from two countries, Germany and the United Kingdom.

During the 1930s, only .5 million immigrants entered the United States. Since then, the number of legal immigrants has increased at the rate of about one million per decade, and is now nearing the historic levels reached in the early 1900s. By 1993, nearly 800,000 persons were being admitted annually. There has also been a steady increase in the number of illegal aliens. Demographic studies conclude that around two to three million persons were illegally present in the United States in the late 1980s, and that the net flow of illegal aliens is on the order of 200,000 to 300,000 persons per year (U.S. General Accounting Office 1993).

Table 1 also illustrates that the size of the immigrant flow has increased not only in absolute terms, but also as a percentage of population growth. In fact, the contribution of the Second Great Migration to population growth is fast approaching the level reached during the First Great Migration, when immigration accounted for 40 to 50 percent of the change in population. As a result of these trends, the fraction of the population that is foreign-born rose from 4.7 to 7.9 percent between 1970 and 1990.

The huge increase in immigration in recent decades can be attributable partly to changes in U.S. immigration policy. Prior to 1965, immigration was guided by the national-origins quota system. The 1965 Amendments to the Immigration and Nationality Act (and subsequent revisions) repealed the national origin restrictions, increased the number of available visas, and made family ties to U.S. residents the key factor that determines whether an applicant is admitted into the country. As a consequence of both the 1965 Amendments and of major changes in economic and political conditions in the source countries relative to the United States, the national origin mix of the immigrant flow changed substantially in the past few decades. As Table 2 shows, over two-thirds of the legal immigrants admitted during the 1950s originated in Europe or Canada, 25 percent originated in Western Hemisphere countries other than Canada, and only 6 percent originated in Asia. By the 1980s, only 13 percent of the immigrants originated in Europe or Canada, 47 percent in Western Hemisphere countries other than Canada, and an additional 37 percent originated in Asia.

In recent years, the debate over immigration policy led to the enactment of two major pieces of legislation. Fueled by charges that illegal aliens were overrunning the country, Congress enacted the 1986 Immigration Reform and Control Act (IRCA). This legislation gave amnesty to three million illegal aliens and introduced a system of employer sanctions designed to stem the flow of additional illegal workers.[1] The 1990 Immigration Act permits the entry of an additional 150,000 legal immigrants annually. The legislated increase in the size of the immigrant flow makes it likely that the United States will admit a record number of immigrants during the 1990s.

[1] In 1986, the Border Patrol apprehended 1.8 million illegal aliens. Although the number of annual apprehensions declined to about one million following the enactment of IRCA, they are now back up to about 1.3 million, or 2.5 apprehensions per minute (U.S. Department of Justice. Immigration and Naturalization Service 1993, p. 156).

TABLE 2
NATIONAL ORIGIN COMPOSITION OF LEGAL IMMIGRANT FLOW TO UNITED STATES, 1931–1990

	1931–40	1941–50	1951–60	1961–70	1971–80	1981–90
	Number of Immigrants (in 1000s)					
All Countries	528.4	1035.0	2515.5	3321.7	4493.3	7338.1
Europe	347.6	621.1	1325.7	1123.5	800.4	761.6
Germany	114.1	226.6	477.8	190.8	74.4	92.0
Greece	9.1	9.0	47.6	86.0	92.4	38.4
Ireland	11.0	19.8	48.4	33.0	11.5	32.0
Italy	68.0	57.7	185.5	214.1	129.4	67.3
Poland	17.0	7.6	10.0	53.5	37.2	83.3
United Kingdom	31.6	139.3	202.8	213.8	137.4	159.2
Asia	16.6	37.0	153.2	427.6	1588.2	2738.2
China	4.9	16.7	9.7	34.8	124.3	346.7
India	0.5	1.4	3.4	10.3	164.1	250.8
Iran	0	0.5	25.5	29.6	45.1	116.2
Japan	1.9	1.6	46.3	40.0	49.8	47.1
Korea	0	0.1	6.2	34.5	267.6	333.7
Philippines	0.5	4.7	19.3	98.4	355.0	548.8
Vietnam	0	0	0.3	4.3	172.8	280.8
America	160.0	354.8	996.9	1716.4	1982.7	3615.2
Canada	108.5	171.7	378.0	413.3	169.9	156.9
Mexico	22.3	60.6	299.8	453.9	640.3	1655.8
Cuba	9.6	26.3	78.9	208.5	264.9	144.6
Dominican Republic	1.2	5.6	9.9	93.3	148.1	252.0
Haiti	0.2	0.9	4.4	34.5	56.3	138.4
Africa	1.8	7.4	14.1	29.0	80.8	176.9
Oceania	2.5	14.6	13.0	25.1	41.2	45.2
			Percentage Distribution			
Europe	65.8	60.0	52.7	33.8	17.8	10.4
Germany	21.6	21.9	19.0	5.7	1.7	1.3
Greece	1.7	.9	1.9	2.6	2.1	.5
Ireland	2.1	1.9	1.9	1.0	.3	.4
Italy	12.9	5.6	7.4	6.4	2.9	.9
Poland	3.2	.7	.4	1.6	.8	1.1
United Kingdom	6.0	13.5	8.1	6.4	3.1	2.2
Asia	3.1	3.6	6.1	12.9	35.3	37.3
China	.9	1.6	.4	1.0	2.8	4.7
India	.1	.1	.1	.3	3.7	3.4
Iran	.0	.0	1.0	.9	1.0	1.6
Japan	.4	.2	1.8	1.2	1.1	.6
Korea	.0	.0	.2	1.0	6.0	4.5
Philippines	.1	.5	.8	3.0	7.9	7.5
Vietnam	.0	.0	.0	.1	3.8	3.8
America	30.3	34.3	39.6	51.7	44.1	49.3
Canada	20.5	16.6	15.0	12.4	3.8	2.1
Mexico	4.2	5.9	11.9	13.7	14.3	22.6
Cuba	1.8	2.5	3.1	6.3	5.9	2.0
Dominican Republic	.2	.5	.4	2.8	3.3	3.4
Haiti	.0	.1	.2	1.0	1.3	1.9
Africa	.3	.7	.6	.9	1.8	2.4
Oceania	.5	1.4	.5	.8	.9	.6

Source: U.S. Department of Justice. Immigration and Naturalization Service (1993, pp. 27–28).

3. *How Do Immigrants Perform in the Host Country?*

Many studies in the modern economic literature on immigration focus on determining the trends in the skill level and earnings of the immigrant population in the host country.[2] These studies view the labor market performance of immigrants in the host country as a measure of the immigrant contribution to the economy's skill endowment and productivity. In addition, the trends in immigrant skills help determine the impact of immigration on the employment opportunities of native-born workers and on expenditures in social insurance programs.

A. *Aging and Cohort Effects*

The pioneering work of Barry Chiswick (1978) and Geoffrey Carliner (1980) analyzed how immigrant skills adapted to the host country's labor market by estimating the cross-section regression model:

$$\log w_i = X_i\phi + \delta A_i + \gamma_o I_i + \gamma_1 y_i + \varepsilon_i, \quad (1)$$

where w_i is worker i's wage rate; X_i is a vector of socioeconomic characteristics which might include education and region of residence; A_i gives the worker's age or potential labor market experience; I_i is a dummy variable indicating if the worker is an immigrant; and y_i gives the number of years an immigrant worker has resided in the United States (and is set to zero for native-born workers). In practice, the model typically includes higher-order polynomials in age and years-since-migration, and the coefficient vector (ϕ,δ) is allowed to vary between immigrants and natives. For simplicity, we restrict the discussion to the simpler specification.

The coefficient γ_0 gives the percentage wage differential between immigrants and natives at the time of arrival, while the coefficient γ_1 gives the rate at which the earnings of immigrants rise relative to the earnings of natives. The early studies of wage determination among immigrant and native men in the United States reached a quick consensus: the coefficient γ_0 was negative and the coefficient γ_1 was positive.[3] The essence of the results is summarized in Figure 1, which illustrates the predicted immigrant and native age-earnings profiles implied by Chiswick's analysis of the 1970 Census. At the time of arrival, immigrants earn about 17 percent less than natives. Because immigrants experience faster wage growth, immigrant earnings "overtake" native earnings within 15 years after arrival. After 30 years in the United States, the typical immigrant earns about 11 percent more than a comparable native worker.

Two distinct arguments were used to explain these results. At the time of arrival, immigrants earn less than natives because they lack the U.S.-specific skills that are rewarded in the American labor market (such as English proficiency). As these skills are acquired, the human capital stock of immigrants grows relative to that of natives, and immigrants experience faster wage growth. The hu-

[2] These questions are not restricted to the modern literature. Paul Douglas (1919), for example, analyzed the occupational distribution of immigrants who arrived during the First Great Migration to determine if the newer immigrants were as skilled as the old.

[3] There is a widespread, though erroneous, perception that studies based on cross-section data from other countries and other time periods reach similar conclusions. However, Chiswick's (1980) study of immigrants in Britain reports that years-since-migration has no impact on immigrant earnings. Similarly, both Francine Blau (1979) and Barry Eichengreen and Henry Gemery (1986) analyze the economic mobility of immigrants who entered the United States at the turn of the 20th century, but reach conflicting conclusions. Blau finds wage convergence between immigrants and natives, while Eichengreen and Gemery find little wage convergence between the two groups.

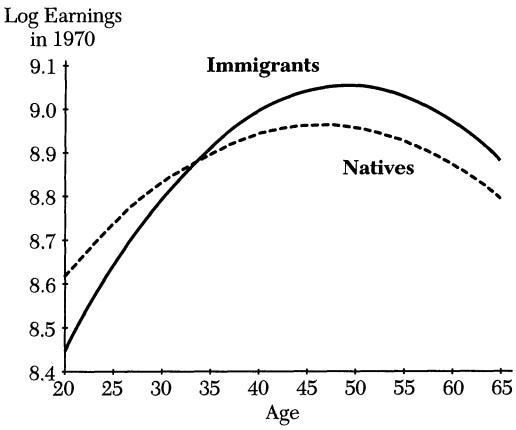

Figure 1. The Cross-Section Age-Earnings Profiles of Immigrants and Natives in the United States, 1970

Source: Chiswick (1978, Table 2, Column 3). All the variables in the regression are evaluated at the means of the immigrant sample, and immigrants are assumed to enter the United States at age 20.

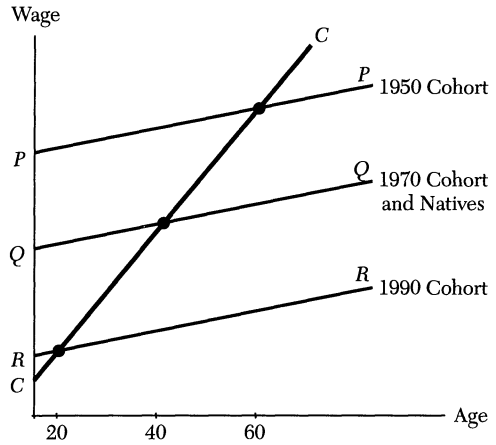

Figure 2. Cohort Effects and the Cross-Section Age-Earnings Profile of Immigrants

man capital investment hypothesis, however, does not by itself generate an overtaking point. After all, why would immigrants accumulate more human capital than natives? The overtaking point was instead interpreted in terms of a selection argument: immigrants are "more able and more highly motivated" than natives (Chiswick 1978, p. 900), and immigrants "choose to work longer and harder than nonmigrants" (Carliner 1980, p. 89). This assumption was typically justified by arguing that only the most driven and most able persons have the ambition and wherewithal to pack up, move, and start life anew in a foreign country.

The optimistic appraisal of immigrant adjustment implied by the results summarized in Figure 1 was challenged by Borjas (1985), who argued that the positive *cross-section* correlation between the relative wage of immigrants and years-since-migration need not indicate that the wage of immigrants converges to that of natives. The basic problem with the "assimilationist" interpretation of the regression in (1) is that it draws inferences about how the earnings of immigrant workers evolve over time from a single snapshot of the immigrant population. It might be the case, however, that newly arrived immigrants are inherently different from those who migrated twenty years ago. Hence we cannot use the current labor market experiences of those who arrived twenty years ago to forecast the future earnings of newly arrived immigrants.

Figure 2 illustrates the implications of this alternative hypothesis. For concreteness, consider a situation where there are three separate immigrant waves, one wave arrived in 1950, the second in 1970, and the last in 1990. Assume that immigrants enter the United States at age 20. The earliest cohort is assumed to have the highest productivity level of any group in the population, including U.S.-born workers. If we could observe their earnings in every year after they arrive in the United States, their age-earnings profile would be given by the line *PP* in the figure. Let's also assume that the last immigrant wave (i.e., the 1990 arrivals) is the least productive of any group in the population. Their age-earnings profile is given by the line *RR* in the figure. Fi-

nally, suppose that the 1970 wave has the same skills as natives; the age-earnings profiles of the two groups is given by *QQ*. There is *no* wage convergence between immigrants and natives in this hypothetical example.

Suppose we have access to data drawn from the 1990 Census cross-section. These data allow us to identify only one point on each of the immigrant age-earnings profiles. In particular, we can observe the earnings of the immigrants who arrived in 1990 when they are 20 years old; the earnings of the 1970 arrivals at age 40; and the earnings of the 1950 arrivals at age 60. The age-earnings profile generated by the cross-section data, therefore, is given by the line *CC* in Figure 2. The cross-section regression line is steeper than the native age-earnings profile, making it seem as if there is wage convergence between immigrants and natives, when in fact there is none. Moreover, the cross-section regression line crosses the native age-earnings profile at age 40, making it seem as if immigrant earnings overtake native earnings after 20 years in the United States, when in fact no immigrant group experienced such an overtaking.

Figure 2 shows how a cross-section regression can yield erroneous insights about the adaptation process experienced by immigrants *if* there are intrinsic differences in productivity across immigrant cohorts (or "cohort effects"). Cohort effects can arise as a result of changes in immigration policy. For example, the 1965 Amendments de-emphasized the role of skills in allocating entry visas, and instead makes these awards based almost entirely on whether the applicant has family ties with current U.S. residents. If this policy shift generated a less-skilled immigrant flow, the cross-section finding that more recent immigrants earn less than earlier immigrants says little about wage convergence, but instead may reflect innate differences in ability or skills across cohorts.

Cohort effects may also arise as a result of changes in economic or political conditions in the source countries and in the United States. Even if the United States had not adopted the 1965 Amendments, improving economic conditions in Western Europe would have reduced the number of immigrants from these "traditional" source countries. The changing national origin mix of the immigrant flow generates cohort effects if skill levels vary across countries or if skills from different countries are not equally transferable to the United States. Finally, cohort differences in average productivity will be observed in a cross-section when there is nonrandom return migration. If low-wage immigrant workers return to their source countries, the earlier waves have been "weeded out" and will have relatively higher earnings than more recent waves.

It is evident that both the immigrant and native populations must be "tracked" over time to correctly measure wage convergence between immigrants and natives. Most longitudinal data sets either contain very few immigrants or provide nonrandom samples of the foreign-born population. As a result, the literature has pursued the alternative of creating synthetic cohorts of immigrants by tracking specific immigrant waves across the decennial Censuses or across the Current Population Surveys (CPS). The empirical evidence typically found in these studies is summarized in Table 3, which reports the unadjusted percentage wage differential between immigrant and native men in each of the decennial Censuses between 1970 and 1990.[4]

[4] The calculations use a 1/500 random sample of native workers and a 5/100 random sample of immigrant workers in each Census (except in 1970 when the immigrant extract forms a 2/100 random sample). The resulting data set contains 920,700

TABLE 3
PERCENTAGE WAGE DIFFERENTIAL BETWEEN IMMIGRANT AND NATIVE MEN, 1970–1990

Group:	1970	1980	1990
All Immigrants	.9	–9.2	–15.2
Cohort:			
1985–1989 Arrivals	—	—	–31.7
1980–1984 Arrivals	—	—	–27.8
1975–1979 Arrivals	—	–27.6	–17.8
1970–1974 Arrivals	—	–18.9	–9.3
1965–1969 Arrivals	–16.6	-7.8	1.1
1960–1964 Arrivals	–4.4	.1	9.0
1950–1959 Arrivals	5.6	5.7	19.6
Pre-1950 Arrivals	10.3	10.6	26.2

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

Each Census cross-section shows that immigrants who have been in the United States for several decades have higher wages than natives, while more recent arrivals have lower wages. In 1990, for example, immigrants who arrived in the United States between 1950 and 1960 earned 19.6 percent more than natives, while immigrants who arrived between 1985 and 1989 earned 31.7 percent less. The data, however, also support the hypothesis that there exist cohort effects in the foreign-born population, with more recent immigrant cohorts having relatively lower wage rates. For example, the most recent cohort enumerated in the 1970 Census (i.e., the 1965–1969 arrivals) earned only 16.6 percent less than natives in 1970; the wage gap between the most recent arrivals and natives grew to 27.6 percent by 1980, and to 31.7 percent by 1990.[5]

Because of these cohort effects, the cross-section relationship between the relative wage of immigrants and years-since-migration overestimates the wage growth actually experienced by a particular cohort. The 1990 cross-section suggests that over a 20-year period (1970 to 1990), the relative earnings of immigrants grow by about 33 percentage points.[6] In fact, the relative wage of the 1965-1969 wave increased by only 18 percentage points over the 20-year period, or about half of the cross-section rate of convergence.

The implications of the data summarized in Table 3 are clear and provocative. If we interpret the difference in wages between immigrants and natives as a measure of relative skills, more recent immigrant waves are relatively less skilled than earlier waves. Moreover, immigrant wage growth is more sluggish than suggested by the early cross-section studies. It is extremely unlikely that the earnings of more recent cohorts will ever reach parity with (let alone overtake) the earnings of natives.

observations. The percent wage differential between immigrants and natives equals $100(e^x - 1)$, where x is the difference in average log wages between the groups. See Borjas (forthcoming) for a more detailed discussion of the data and of the trends in immigrant earnings.

[5] These results differ slightly from those reported by Edward Funkhouser and Trejo (forthcoming), who use CPS data from various supplements to describe the trend in immigrant skills during the 1980s. The CPS data indicate that the decline in relative skills was reversed somewhat by the late 1980s. The CPS, however, contains relatively small samples of immigrants. In addition, the national origin composition of immigrant cohorts is extremely unstable across CPS surveys. For instance, 21 percent of the cohort that immigrated between 1982 and 1984 in the June 1988 CPS is of Mexican origin, while the respective statistic *for the same cohort* in the November 1989 CPS is 37 percent. These statistics suggest that the change in the relative immigrant wage across the Current Population Surveys provides unreliable measures of both cohort effects and of the rate of wage convergence.

[6] This statistic is calculated by comparing the relative wage of the immigrants who arrived in the late 1980s with the relative wage of the immigrants who arrived in the late 1960s.

Needless to say, these findings have generated a great deal of controversy and debate. (See, for example, Chiswick 1986; Harriet Orcutt Duleep and Mark Regets 1992b; Robert LaLonde and Robert Topel 1992; and Andrew Yuengert 1994.) Many of these studies (including the original work of Borjas, 1985) point out that interpreting the intercensal trend in the relative wage of immigrants as a measure of relative changes in skills implicitly assumes that period effects influence the wage of immigrants and natives by the same relative amount. To see this point formally, consider the following generic model that characterizes the analytical framework now used in the literature. Suppose we pool all the data in two cross-sections (such as the 1980 and 1990 Censuses) and estimate the regression equations:

$$\log w_{ij} = X_j\phi_i + \delta_i A_j + \alpha y_j + \beta C_j + \gamma_i \pi_j + \varepsilon_{ij}, \quad (2)$$

$$\log w_{nl} = X_l\phi_n + \delta_n A_l + \gamma_n \pi_l + \varepsilon_{nl}, \quad (3)$$

where w_{ij} gives the wage of immigrant j; w_{nl} gives the wage of native l; X gives a vector of standardizing socioeconomic characteristics; A gives the worker's age at the time of the Census; y gives the number of years that the immigrant has resided in the United States; C is the calendar year of arrival in the United States; and π is a dummy variable indicating if the observation was drawn from the 1990 Census. To easily illustrate the identification problem, the age, years-since-migration, and calendar year-of-arrival variables are entered linearly.

The coefficients γ_i and γ_n give the period effects for immigrants and natives, respectively. The coefficient δ_n gives the aging effect for natives; the rate at which native earnings increase over the life cycle. The respective aging effect for immigrants is given by $\delta_i + \alpha$. The age-earnings profiles of immigrants and natives converge if $(\delta_i + \alpha) > \delta_n$ (assuming immigrants earn less than natives at the time of arrival).[7] Finally, the coefficient β measures the cohort effect, the rate of change in the entry wage across immigrant cohorts.[8]

It is well known that the key parameters of the regression model in equations (2) and (3) are not identified. The years-since-migration variable is a linear combination of the period effect and the cohort variable:

$$y_i \equiv \pi_i(1990 - C_i) + (1 - \pi_i)(1980 - C_i) = 1980 - C_i + 10\pi. \quad (4)$$

In order to identify the period effects, the aging effects, and the cohort effect, therefore, a restriction must be imposed on the model. One possible restriction is that the period effects are the same for immigrants and natives, or:

$$\gamma_i = \gamma_n. \quad (5)$$

Equation (5) implies that the relative wage of immigrants and natives is independent of secular changes in the wage level. We implicitly imposed this restriction on the data when we interpreted the intercensal trends in Table 3 as changes in the relative skills of immigrants. By netting out the secular trend in the native wage (i.e., by using a difference-in-differences estimator), we are simply left with the trend in immigrant productivity. Note, however, that the wage is the product of the rate of return to skills times the worker's human capital stock.

[7] Although the regression model in (2) assumes that the aging effect is the same for all immigrant cohorts, many of the empirical studies in the literature relax this assumption.

[8] The model assumes that there are no cohort effects in the native population (perhaps due to changes in the quality of education). Even though this is a standard assumption in the literature, the estimated cohort effects in the immigrant population may be sensitive to the existence of cohort effects among native workers.

TABLE 4
EDUCATIONAL ATTAINMENT OF IMMIGRANT AND NATIVE MEN, 1970–1990

Group	1970		1980		1990	
	Percent High School Dropouts	Percent College Graduates	Percent High School Dropouts	Percent College Graduates	Percent High School Dropouts	Percent College Graduates
Natives	39.6	15.4	23.1	22.9	14.8	26.6
Immigrants	48.2	18.9	37.4	25.3	36.9	26.6
Cohort:						
1985–89 Arrivals	—	—	—	—	35.2	31.5
1980–84 Arrivals	—	—	—	—	40.4	24.1
1975–79 Arrivals	—	—	36.2	30.4	42.2	24.8
1970–74 Arrivals	—	—	44.0	24.9	42.7	24.1
1965–69 Arrivals	45.2	28.3	41.6	24.7	34.1	26.2
1960–64 Arrivals	44.8	21.1	34.7	24.8	27.5	27.9
1950–59 Arrivals	47.4	17.1	31.4	23.7	25.9	27.8
Pre-1950 Arrivals	51.7	15.0	35.3	21.6	25.2	31.8

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

If period effects influence the price of skills differently for immigrants and natives, the intercensal change in relative wages could be reflecting differences in prices rather than differences in human capital.

There were historic changes in the U.S. wage structure during the 1980s and these changes did not affect all skill groups equally (Frank Levy and Richard Murnane 1992). In particular, there was a sizable increase in the wage gap between highly educated and less educated workers; and among workers within narrowly defined occupation and industry cells. It is unlikely that these changes in the wage structure affected the earnings of immigrant and native workers by the same percentage amount. The immigrant population in the United States is relatively unskilled (at least in terms of educational attainment). Because the rate of return to skills increased during the 1980s, the relative wage of immigrants would have fallen between 1980 and 1990 *even if immigrant skills had remained constant.* In other words, the changes in the wage structure could account for both the observed decline in the relative wage of successive immigrant cohorts and for the sluggish wage growth experienced by a particular cohort as it entered the 1980s.

It is unlikely, however, that changes in the wage structure account for the downward trend in relative wages across successive immigrant cohorts or for the slow wage convergence between immigrants and natives. Consider the trends in immigrant educational attainment, a skill measure that is invariant to changes in the wage structure. Table 4 documents the changes in the schooling distribution of immigrants and natives in the past two decades. In 1970, 39.6 percent of natives were high school dropouts; by 1990, only 14.8 percent of natives lacked a high school diploma. Among immigrants, 48.2

percent were dropouts in 1970, 37.4 percent in 1980, and 36.9 percent in 1990. Relative to natives, immigrants were about 21.7 percent more likely to be high school dropouts in 1970, but are now more than twice as likely to be high school dropouts.

Moreover, even though the percentage of immigrant workers who are college graduates rose during the period, the percentage of natives who are college graduates rose even faster. Immigrants were more likely to be college graduates in 1970 (18.9% for immigrants as compared to 15.4% for natives). By 1990, both groups had exactly the same probability of being college graduates (26.6%). Therefore, changes in the "quantity" of immigrants' human capital are partly responsible for the decline in the relative immigrant wage.

It is also easy to show that changes in the U.S. wage structure were not sufficiently large to account for a sizable part of the declining relative wage of immigrants across successive waves. For example, we know that the wage structure changed in different ways for various age-education groups, with groups with more education and experience having larger wage growth between 1970 and 1990. We can then use the wage growth observed in 56 age-education cells among native workers to "deflate" the wage growth of immigrants in the same age-education cells.[9] To take into account changes in wage inequality even within age and education cells, LaLonde and Topel (1992) suggest using a deflator based on an immigrant's ranking in the native wage distribution. If all workers who fall in the p^{th} percentile of the wage distribution are equally skilled, then we can use the wage growth experienced by natives in the p^{th} percentile to deflate the wage growth of immigrants who fall in the same percentile in the 1970–1990 period.[10]

Table 5 reports the changes in the deflated relative wage of immigrants between 1970 and 1990. Regardless of which deflator is used, more recent immigrant cohorts have substantially lower relative wages than earlier cohorts. The most recent cohort in 1970 earned 16.6 percent less than natives at the time of arrival. The most recent cohort in 1990 earned 29.5 percent less than natives if we use the deflator based on age-education cells, and 29.4 percent less if we use the percentile deflator. The change in the wage structure, therefore, accounts for only 15 percent of the drop in the relative immigrant wage between 1970 and 1990.

The cohort and aging effects calculated from the synthetic cohorts in the Census data may be biased because the sample composition of a particular immigrant cohort changes systematically across Censuses. Perhaps one-third of immigrants in the United States eventu-

[9] The eight age categories are: 25–29 years old; 30–34; 35–39; 40–44; 45–49; 50–54; 55–59; and 60–64. The seven education categories are: less than 8 years of schooling; 9 years; 10–11 years; 12 years; 13–15 years; 16 years; and more than 16 years. Define $\Delta_{rs}(t)$ to be the wage growth experienced by the typical native worker in age group r and education group s between 1970 and year t (t = 1980, 1990). The deflated wage is then given by $\log \hat{w}_{l,rs}(t) = \log w_{l,rs}(t) - \Delta_{rs}(t)$, where $\log w_{l,rs}(t)$ is the log wage of person l in skill group rs in Census year t.

[10] Neither deflator fully solves the problem of accounting for changes in the wage structure. The age-education deflator, for example, ignores the increase in inequality that occurred within age-education cells. The percentile deflator assumes that immigrants and natives in the p^{th} percentile are perfect substitutes. This is unlikely to be true. Newly arrived immigrants might place badly in the native wage ranking not because they are unskilled, but because they are going through an initial "testing" period. In the end, therefore, an immigrant who initially places in the p^{th} percentile may have skills that are comparable to those of natives in the $(p + q)^{th}$ percentile, where $q > 0$.

TABLE 5
PERCENTAGE WAGE DIFFERENTIAL BETWEEN IMMIGRANT, AND NATIVE, MEN, 1970–1990, DEFLATED BY CHANGES IN WAGE STRUCTURE

		Using Age-Education Deflator		Using Percentile Deflator	
Group:	1970	1980	1990	1980	1990
All Immigrants	.9	−9.4	−14.4	−8.6	−13.9
Cohort:					
1985–1989 Arrivals	—	—	−29.5	—	−29.4
1980–1984 Arrivals	—	—	−25.0	—	−25.4
1975–1979 Arrivals	—	−25.2	−15.8	−26.2	−16.0
1970–1974 Arrivals	—	−17.5	−8.8	−17.9	-8.3
1965–1969 Arrivals	−16.6	−8.2	−.2	−7.2	1.1
1960–1964 Arrivals	−4.4	−1.0	6.0	.2	7.9
1950–1959 Arrivals	5.6	3.9	13.1	5.4	17.1
Pre-1950 Arrivals	10.3	4.7	16.0	10.2	23.2

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

ally return to their countries of origin (Robert Warren and Jennifer Peck 1980). Suppose that the return migrants are mainly composed of workers with lower than average wages (i.e., the "failures"). The intercensal tracking of a particular cohort would reveal an improvement in relative wages even if no wage convergence is taking place. Alternatively, if the return migrants are "successes," the rate of wage convergence would be underestimated. Because data on the size and composition of the return migration flow is scarce, few studies systematically analyze the selection mechanism generating the return migration flow (the limited available evidence is discussed in the next section). As a result, the bias introduced by nonrandom return migration is typically ignored.

Even if there were no return migration, Rachel Friedberg (1992) and James Smith (1992) have shown that the sample composition of a particular immigrant cohort changes over time because the sample of working-aged immigrants in later Censuses includes a larger number of persons who migrated as children.[11] The economic experiences of "immigrant children" may resemble those faced by native workers. The inclusion of the immigrant children in later Censuses thus biases the estimated rate of wage convergence upward. A better measure of wage convergence, therefore, is obtained by tracking a specific immigrant cohort, defined in terms of both year-of-migration and age-at-arrival, across the various Censuses.

Table 6 summarizes the trend in the percent wage differential between a particular group of immigrants and similarly aged natives, so that immigrants who arrived when they were between 25 and 34 years old in the late 1960s are compared

[11] An earlier study by Sherrie Kossoudji (1989) used the 1976 Survey of Income and Education cross-section to estimate models of occupational mobility which differentiate between persons who migrated as children and those who migrated as adults. She finds that controlling for age-at-migration leads to flatter occupational mobility profiles among immigrants than among natives.

TABLE 6
PERCENTAGE WAGE DIFFERENTIAL BETWEEN IMMIGRANTS AND NATIVES, BY AGE GROUP AND YEAR OF ARRIVAL

	Actual Wage	Actual Wage		Using Age-Education Deflator	
Cohort/Age Group:	1970	1980	1990	1980	1990
1960–1964 Arrivals:					
15–24 in 1970	—	1.1	4.2	.9	4.5
25–34 in 1970	3.1	–.3	–.2	.0	.1
35–44 in 1970	–6.0	–6.7	1.1	–6.7	1.4
45–54 in 1970	11.1	–10.8	—	–10.9	—
1965–1969 Arrivals:					
15–24 in 1970	—	–4.6	–6.9	–6.2	–5.5
25–34 in 1970	–12.0	–5.9	–2.5	–5.4	–2.3
35–44 in 1970	–15.9	–15.3	–8.8	–15.5	–8.3
45–54 in 1970	–22.5	–21.1	—	–21.6	—
1970–1974 Arrivals:					
25–34 in 1980	—	–11.4	–11.8	–12.5	–10.4
35–44 in 1980	—	–17.7	–16.4	–17.1	–15.6
45–54 in 1980	—	–26.0	–20.7	–26.4	–20.0
1975–1979 Arrivals:					
25–34 in 1980	—	–21.3	–15.5	–21.2	–14.8
35–44 in 1980	—	–24.9	–24.1	–24.2	–23.4
45–54 in 1980	—	–29.8	–26.3	–29.8	–26.1
1980–1984 Arrivals:					
25–34 in 1990	—	—	–18.6	—	–18.2
35–44 in 1990	—	—	–25.3	—	–24.5
45–54 in 1990	—	—	–34.0	—	–33.0
1985–1989 Arrivals:					
25–34 in 1990	—	—	–23.0	—	–23.5
35–44 in 1990	—	—	–28.6	—	–28.3
45–54 in 1990	—	—	–36.2	—	–35.7

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

to natives aged 25–34 in 1970, to natives 35–44 in 1980, and to natives aged 45–54 in 1990. About half of the wage convergence implied by the statistics presented in Table 5 disappears after controlling for age-at-migration. Consider, for example, the group of immigrants who arrived between 1965 and 1969 and who were 25–34 years old in 1970. They earned 12.0 percent less than natives in 1970 and 2.5 percent less in 1990. Over a 20-year period, therefore, the relative wage of this immigrant cohort increased by 10 percentage points, in contrast to the 18 percent growth suggested by the intercensal comparison that does not control for age-at-migration and to the 33 percent growth implied by the 1990 cross-section.

Table 6 reveals that practically all immigrants, regardless of when they arrived in the country, experience the

same sluggish relative wage growth. This result is significant because it suggests that more recent immigrant cohorts have not had faster wage growth *despite* their lower starting positions.[12] In fact, immigrants who arrived during the 1970s experienced the same wage growth as those who arrived during the 1960s during their first decade in the United States. Immigrants who arrived between 1975 and 1979 and were around age 30 at the time of arrival earned 21.3 percent less than natives in 1980 and 15.5 percent less than natives in 1990, an increase of only 5.8 percentage points. This wage growth is similar to that experienced by similarly aged immigrants who arrived between 1965 and 1969; they earned 12.0 percent less than natives in 1970 and 5.9 percent less in 1980.

Many studies have confirmed that there has been an overall decline in the relative skills of successive immigrant cohorts. For example, Yuengert (1994, p. 86) finds that the relative wage of the immigrants who migrated in the late 1960s was about 9 percentage points lower than the relative wage of those who arrived in the 1950s; LaLonde and Topel (1992, p. 89) report a 22 percentage point drop in the relative wage of immigrants cohorts between the late 1960s and the late 1970s; and Funkhouser and Trejo (forthcoming, Table 6) report a 10 percentage point drop during the same period. There is also a consensus that much of the decline is due to changes in "observables." Both Funkhouser and Trejo (forthcoming, Table 6) and LaLonde and Topel (1992, p. 89) conclude that at least two-thirds of the decline can be attributed to changes in the educational attainment of immigrants relative to natives. Some studies also show that the changing national origin mix of the immigrant flow (which obviously implies changes in the observable skills of immigrants) accounts for much of the decline in skills across successive cohorts. This result will be discussed in detail below.

[12] Duleep and Regets (1992b) use the 1970 and 1980 Censuses to estimate correlations between wage growth and entry wages across national origin groups. These correlations tend to be negative, leading them to conclude that the low entry wage of the immigrants who arrived in the late 1970s did not represent their true "quality" because they would have faster wage growth than earlier immigrants. The additional data provided by the 1990 Census indicates that the less-skilled cohorts who migrated in the 1970s did not, in fact, experience faster wage growth than earlier waves.

B. *Wage Convergence Between Immigrants and Ethnically Similar Natives*

The data summarized in the previous section describe how the immigrant wage adjusts relative to that of the typical native worker. Because recent immigrant waves start off at such a disadvantage, it is not too surprising that their earnings fail to reach parity with the earnings of the average U.S.-born worker (who is typically a white person of European ancestry). A number of studies thus investigate if immigrant earnings converge to the earnings of U.S.-born workers who share the same ethnic background. These intra-ethnic comparisons can help assess if the "new immigration" will exacerbate the ethnic differences already prevalent in the U.S. labor market.

There is, however, little consensus on whether the relative skills of immigrants declined within specific ethnic groups, or on whether the wage of immigrants converges to that of ethnically similar natives. Most studies typically focus on four large ethnic groups: Mexican immigrants, other Hispanic immigrants, Asian immigrants (excluding the Middle East), and "white" immigrants (defined as per-

TABLE 7
PERCENTAGE WAGE DIFFERENTIAL BETWEEN IMMIGRANTS AND NATIVES OF SAME ETHNIC BACKGROUND
(Using Age/Education Deflator)

	Mexican			Other Hispanics			Asian			White		
Cohort/Age Group	1970	1980	1990	1970	1980	1990	1970	1980	1990	1970	1980	1990
1960–64 Arrivals												
15–24 in 1970	—	−1.8	−5.1	—	20.3	29.2	—	1.9	.2	—	2.7	10.3
25–34 in 1970	−5.8	−9.6	−16.0	9.0	16.9	19.1	6.9	15.0	11.7	9.5	7.9	10.3
35–44 in 1970	−22.4	−19.7	−14.2	8.0	8.5	13.7	−15.3	4.1	17.1	4.5	3.9	14.3
1965–69 Arrivals												
15–24 in 1970	—	−11.7	−13.0	—	.6	3.1	—	9.0	3.0	—	.5	7.1
25–34 in 1970	−26.5	−16.5	−19.5	−15.8	−3.4	.1	−17.6	9.1	8.5	.3	2.9	12.3
35–44 in 1970	−32.5	−23.0	-29.2	−15.9	−9.8	−6.5	−15.2	−13.1	−5.6	−5.4	−6.2	9.4
1970–74 Arrivals												
25–34 in 1980	—	−19.5	−21.2	—	−7.1	−1.0	—	2.7	5.3	—	−2.9	8.1
35–44 in 1980	—	−23.8	−29.3	—	−11.7	−6.8	—	−9.9	−3.9	—	−6.9	3.0
1975–79 Arrivals												
25–34 in 1980	—	−33.8	−29.5	—	−21.5	−16.7	—	−19.7	−10.2	—	−.6	11.7
35–44 in 1980	—	−38.3	−36.7	—	−22.4	−15.2	—	−28.1	−25.8	—	−1.8	4.2
1980–84 Arrivals												
25–34 in 1990	—	—	−25.0	—	—	−19.7	—	—	−14.9	—	—	12.4
35–44 in 1990	—	—	−39.6	—	—	−27.3	—	—	−28.8	—	—	10.1
1985–89 Arrivals												
25–34 in 1990	—	—	−33.9	—	—	−28.2	—	—	−24.3	—	—	4.0
35–44 in 1990	—	—	−45.1	—	—	−36.2	—	—	−30.6	—	—	−1.2
Percent of Immigrant Population Belonging to Particular Ethnic Group	9.7	18.5	26.2	11.4	13.1	16.1	8.6	16.4	21.7	62.4	36.8	21.5

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

sons originating in Europe or Canada).[13] The four native base groups are: Mexican-American natives (i.e., U.S.-born persons of Mexican ancestry); other Hispanic-American natives (all other U.S.-born persons who report being of Hispanic ancestry); Asian-American natives (non-Hispanic persons whose race is Asian); and white natives (non-Hispanic whites).

Table 7 summarizes the trends in the wage of immigrants in particular cohorts and age groups relative to ethnically similar natives in the same age group, so that Mexican immigrants aged 25–34 in 1970 are contrasted with Mexican-American natives aged 25–34 in 1970, with Mexican-American natives aged 35–

[13] Kristin Butcher (1994) describes the process of wage convergence between black immigrants and U.S.-born black workers, and finds that the labor market experience of black immigrants resembles that of black natives who had moved out of their state of birth.

44 in 1980, and with Mexican-American natives aged 45–54 in 1990. There are interesting differences in the direction and magnitude of cohort effects across the various groups. The relative wage of successive waves of Mexican immigrants declined during the past two decades. In 1970, the typical Mexican immigrant aged 25–34 who had just arrived in the United States earned 26.5 percent less than the typical Mexican-American native; by 1990, the latest wave of Mexican immigrants earned 33.9 percent less than their native counterparts. Note, however, that the wage gap between Mexican immigrants and Mexican-American natives underestimates the "true" economic status of Mexican immigrants in the United States. After all, Mexican-American natives are themselves a relatively disadvantaged group, earning 16 percent less than the typical U.S.-born worker in 1990.

The relative wage of other Hispanic immigrants and Asian immigrants also fell across successive cohorts. In contrast to these groups, the relative wage of successive waves of European and Canadian immigrants rose slightly between 1970 and 1990. The most recent "white" arrivals (aged 25–34 at the time of arrival) earned .3 percent more than white natives in 1970, but by 1990 they earned 4 percent more.

The raw data thus suggest that some groups experienced a decline in relative wages across successive cohorts, while white immigrants experienced an increase. The data also indicate that most non-Asian cohorts experienced a 5 to 10 percentage point increase in their relative wage between 1970 and 1990. For instance, the Mexican immigrant who had just arrived in the United States in 1970 and was between 25 and 34 years old earned 26.5 percent less than the typical Mexican-American native. By 1990, the wage gap had narrowed by only 7 percentage points. Similarly, the typical white immigrant in the same age group who had just arrived in the United States in 1970 earned .3 percent more than white natives, and this wage gap grew to 12.3 percent by 1990. This rate of wage convergence allows white immigrants to substantially outperform white natives after 20 years in the United States, but prevents Mexican immigrants from reaching wage parity with Mexican-American natives.

Finally, there seems to be a structural shift in the rate of wage convergence for Asian immigrants who migrated after 1970. Asian immigrants who migrated in the 1960s experienced a very high rate of wage convergence. The typical Asian immigrant who arrived in the late 1960s (and was 25–34 years old at the time of arrival) earned 17.6 percent less than Asian-American natives in 1970, and about 9 percent more in both 1980 and 1990. In contrast, a similarly aged Asian immigrant who arrived in the late 1970s earned 19.7 percent less than Asian-American natives in 1980, and 10.2 percent less in 1990. In effect, this later cohort of Asian immigrants has a rate of wage convergence which is half of that experienced by earlier immigrant waves.

Table 7 thus suggests that there is a great deal of diversity in the economic experiences of various immigrant groups in the United States. In view of this diversity, it is not surprising that there is a great deal of disagreement in the literature (which is mostly based on comparisons of the 1970 and 1980 Censuses) as to whether there has been a decline in the average skill level of successive immigrant waves within ethnic group, and on whether there is wage convergence with ethnically similar natives. For example, Smith (1992, p. 79) concludes that there is "very little within-cohort wage assimilation for [Mexican] immigrants across their labor market careers," and

that there is "strong evidence of declining labor market quality." In contrast, LaLonde and Topel (1992, p. 82) conclude that Mexican immigrants "show substantial assimilation" with "no significant evidence of a decline in immigrant quality." Even more striking, Yuengert's (1994, p. 86) examination of the same data reveals an increase in the skill level of Mexican immigrant cohorts over time, with Mexicans who arrived between 1965 and 1969 having 13 percent higher relative earnings than those who arrived in the 1950s.

There are many differences across these studies which can potentially explain the disparity in results. Smith, for example, stresses the importance of controlling for age-at-migration when estimating the rate of wage convergence, a variable that LaLonde and Topel and Yuengert ignore. In contrast, LaLonde and Topel stress the importance of controlling for the impact of changes in the wage structure on the wage of different skill groups, a factor that Smith ignores. The data summarized in Table 7 controls both for age-at-migration and for changes in the wage structure, as well as extends the span of time studied by another decade (using the 1990 Census).

Although intra-ethnic comparisons are common in the literature, there are a number of conceptual problems in these studies that have not been sufficiently appreciated. Most obvious is the aggregation bias introduced by pooling immigrants from different countries into a particular "ethnicity" (such as creating the Asian group by combining persons from countries as diverse as India, Japan, and Vietnam). Because immigrant groups from different countries differ substantially, it is doubtful that the composite "other Hispanic" or "Asian" resembles the average person in any of the national origin groups making up the ethnic category. Moreover, there are sizable changes in the national origin mix of the immigrant flow over very short time periods even within a particular ethnic group. As a result, we do not know how to interpret the cohort effects or the changes in the rate of wage convergence among Asians or other Hispanics unless we deal directly with a more primitive definition of ethnicity (i.e., the one that coincides with national origin).

Moreover, the composition of the native base in these broadly defined ethnic groups is changing systematically over time. In 1970, for example, there were few adult Cubans in the other Hispanic-American native sample. By 1990, as the U.S.-born children of the early Cuban waves enter the labor market, the wage of the other Hispanic native base is partly determined by the skill endowment of immigrant flows that arrived a generation earlier. The comparison of Hispanic immigrants to Hispanic-American natives in 1970 thus differs fundamentally from the comparison of Hispanic immigrants to Hispanic-American natives in 1990.

Most importantly, there is a sense in which these intra-group comparisons miss the point. What would we conclude if the relative wage of Mexican immigrants converged to that of Mexican-American natives, or the relative wage of Asian immigrants converged to that of Asian-American natives? The fact remains that the wage of Mexican-American natives is itself 16 percent below that of the typical U.S.-born worker, while the wage of Asian-American natives is 12 percent above. Intra-group convergence is not an interesting phenomenon if we want to identify the groups of native workers who are most likely to be adversely affected by immigration, or if we are concerned about the impact of immigration policy on poverty rates, on the costs of welfare programs, and on the contribution of immigrants to the econ-

omy's skill endowment. The costs and benefits of immigration are more closely related to how immigrants perform relative to the population average than to how immigrants perform relative to a nonrandom subset of the population.

C. *Language and the Process of Wage Convergence*

Although there are many estimates of the rate of wage convergence between immigrants and natives, we do not yet understand *why* some wage convergence takes place. For the most part, the studies investigating the differential accumulation of human capital by immigrants and natives focus on one single factor, the acquisition of "language capital" in the host country.

The early work of Gilles Grenier (1984), and Walter McManus, William Gould, and Finis Welch (1983) concluded that U.S. immigrants who are proficient in the English language have higher earnings than immigrants who are not.[14] Grenier reports that Hispanic immigrants who do not speak English pay a 17 percent wage penalty, even after adjusting for differences in education and other socioeconomic characteristics. This wage differential implies a $96,600 (in 1993 dollars) increase in lifetime earnings for a Hispanic immigrant who becomes proficient in the English language (McManus 1985). Presumably, proficiency in the host country's language increases immigrant earnings because bilingualism opens up many employment opportunities.

There also seems to be a link between English language proficiency and the rate of wage convergence between immigrants and natives. Chiswick (1991), for example, documents that an additional year of residence in the United States increases the probability of English proficiency by about 3 percentage points in a small sample of illegal aliens apprehended in Los Angeles. Moreover, adding variables measuring the worker's English skills to a cross-section earnings function reduces the coefficient of years-since-migration by 10 to 20 percent (Evelina Tainer 1988; Chiswick 1991).

In 1990, 47.0 percent of the immigrant stock in the United States did not speak English very well (U.S. Department of Commerce 1993a, p. 129). Given the apparent high returns to English language proficiency, it is worth asking why more immigrants do not pursue this human capital investment. The rate of return to language capital, however, may have little to do with the wage differential between immigrants who are English-proficient and immigrants who are not. English proficiency and earnings might be correlated simply because more able workers are likely to speak English and to earn more. Some studies correct for the endogeneity of the language variable by using instrumental variable estimators, but these attempts are not convincing. For example, Chiswick and Miller (1992, p. 265) use such instruments as the worker's veteran status, number of children, and the fraction of persons in the state who speak the same language. It is doubtful that this set of identifying instruments is correlated with English proficiency, but is not correlated with the worker's earnings capacity.

Even if language proficiency were exogenous, the returns to language capital are affected by the clustering of immigrants in ethnic enclaves, such as the Cubans in Miami's Little Havana and the Mexicans in East Los Angeles. Immigrants residing in these enclaves might face low returns to language capital because most of their economic exchanges

[14] Similar findings are reported in Carliner's (1981) study of immigrants in Canada. David Bloom and Grenier (1992) and Chiswick and Paul Miller (1992) compare the returns to language capital in the United States and Canada.

are with persons of the same ethnic (and linguistic) background. For example, almost half of the Cubans who arrived in the Mariel boatlift in 1980 worked for Cuban employers in 1986 (Alejandro Portes 1987).[15] McManus (1990) finds that the wage gap between Hispanics who are English proficient and Hispanics who are not is 26 percent for workers who live in a county that is only 10 percent Hispanic, but falls to 11 percent for workers who live in a county that is 75 percent Hispanic.

Although many studies measure the correlation between language capital and wage convergence, there are many other variables which influence the assimilation process, such as the acquisition of formal education or on-the-job training in the post-migration period, investments in geographic mobility within the host country, and differences in job search activities. Few studies, however, investigate how natives and immigrants differ in these human capital investments.[16]

4. *National Origin and the Self-selection of Immigrants*

Why did the relative wages of successive immigrant cohorts arriving in the United States decline? The empirical evidence suggests that one single factor, the changing national origin mix of the immigrant flow, can explain much of the decline (Borjas 1992b; LaLonde and Topel 1992).

[15] Borjas (1990, ch. 10) and Ivan Light and Edna Bonacich (1988) provide detailed studies of self-employment in the immigrant population.

[16] An exception is given by Ann Bartel's (1989) analysis of the internal migration decisions of foreign-born workers in the United States. Bartel finds that immigrants choose to reside in areas where there are other immigrants, and that their internal migration decision are much less sensitive to regional wage differentials than those of natives.

A. *National Origin and the Decline in Immigrant Skills*

Table 8 illustrates the huge differences in educational attainment and earnings across national origin groups in 1990. Mean years of schooling range from eight years for immigrants originating in Mexico or Portugal, to about 15 years for immigrants originating in such diverse countries as Austria, India, Japan, and the United Kingdom. Similarly, immigrants from El Salvador or Mexico earn 40 percent less than natives, while immigrants from Australia or South Africa earn 30 to 40 percent more than natives. These differences cannot be attributed to the fact that some national origin groups have lived in the United States for longer periods. There is substantial dispersion in both educational attainment and relative wages even among immigrants who have been in the country more than 10 years.

In view of the post-1950 changes in the national origin mix of immigrant flows, it is not surprising that these changes "explain" the decline in relative wages across successive immigrant waves. Borjas (1992b, p. 41) decomposes the skill decline into a portion due to changes in the national origin mix and into a portion due to the changing skill level of immigrants from specific countries. The changing national origin mix explains over 90 percent of the decline in educational attainment and relative wages across successive waves between 1960 and 1980.

To some extent, the inter-group variation in skills documented in Table 8 mirrors the dispersion in skills across the populations of the various source countries. There is, for example, a great deal of dispersion in educational attainment across countries (Robert Barro and Jong-Wha Lee 1993). Even if the immigrant flow was randomly drawn from the popu-

TABLE 8

EDUCATIONAL ATTAINMENT AND WAGES OF IMMIGRANT MEN IN 1990, BY NATIONAL ORIGIN GROUP

Country of Birth	Educational Attainment		Percentage Wage Differential Between Immigrants and Natives	
	All Immigrants	Pre-1980 Arrivals	All Immigrants	Pre-1980 Arrivals
Europe:				
Austria	14.68	14.50	38.4	40.9
Czechoslovakia	14.46	14.49	25.9	37.4
France	14.76	14.03	25.7	27.8
Germany	13.88	13.69	24.5	25.1
Greece	11.83	11.59	−.9	2.4
Hungary	13.59	13.37	27.3	31.9
Italy	10.90	10.71	16.1	17.4
Poland	12.77	12.36	−.3	19.8
Portugal	8.29	8.40	−3.1	−.1
U.S.S.R.	14.23	14.17	6.2	20.2
United Kingdom	14.60	14.35	37.2	37.9
Yugoslavia	11.75	11.47	11.5	17.5
Asia:				
Cambodia	10.22	11.71	−30.8	−14.6
China	12.82	13.20	−21.3	1.9
India	15.94	16.61	17.6	56.2
Iran	15.52	15.90	6.8	18.6
Japan	15.18	14.67	49.3	27.5
Korea	14.25	14.87	−12.0	10.8
Laos	9.98	10.49	−32.4	−28.3
Lebanon	14.16	13.90	−2.0	10.2
Philippines	14.05	14.09	−5.9	9.7
Taiwan	16.32	17.18	13.9	50.7
Vietnam	12.26	13.25	−18.9	−2.4
North and South America:				
Argentina	13.35	13.17	4.7	17.2
Canada	13.79	13.56	24.0	23.9
Colombia	12.08	12.31	−19.1	−5.5
Cuba	11.74	12.26	−15.3	−5.3
Dominican Republic	10.28	10.46	−29.2	−21.7
Ecuador	11.55	11.88	−20.6	−9.6
El Salvador	8.61	9.60	−39.7	−27.5
Guatemala	9.23	10.27	−38.2	−21.8
Haiti	11.22	12.22	−30.2	−13.6
Jamaica	11.97	12.35	−11.2	−3.1
Mexico	7.61	7.56	−39.5	−32.3
Nicaragua	11.73	12.32	−34.8	−11.3
Panama	13.41	13.44	1.9	11.3
Peru	12.99	13.13	−20.6	.3
Africa:				
Egypt	15.62	15.71	12.2	41.9
Ethiopia	13.97	15.43	−21.0	6.5
Nigeria	15.80	16.52	−18.9	−3.9
South Africa	15.91	15.93	43.6	58.4
Australia	15.21	15.10	33.0	30.5

Source: See Table 3. The educational attainment of native men in 1990 is 13.2 years.

lation of the source countries, the educational attainment of immigrants who entered the United States in the 1980s would differ from that of earlier immigrant waves.

To illustrate the importance of this compositional effect, Borjas (1992b) calculated the average schooling level of the country represented by the typical immigrant for a number of immigrant waves. The typical immigrant who arrived between 1955 and 1960 originated in a country where the average person had 9.5 years of schooling. This statistic declined to 7.7 years for the 1975–1980 flow. If immigrants were randomly drawn from the source country's population and if the rate of return to schooling is on the order of 7 percent, the declining educational attainment of the typical source country would alone be responsible for a 14 percent decline in relative wages across immigrant cohorts.

There is also a great deal of variation in other types of work-related skills across the various source countries, and these skills are not equally transferable to the United States. Clearly, the kinds of skills workers acquire in highly developed economies differ from those acquired in less-developed countries. It seems likely that skills acquired in advanced economies are more easily transferable to the U.S. labor market. In fact, there is a strong positive correlation between immigrant earnings in the United States and the level of economic development in the country of origin, as measured by the country's per capita GNP (Guillermina Jasso and Mark Rosenzweig 1986).

There has been a dramatic drop in the per capita income of the country represented by the typical immigrant entering the United States (Borjas 1992b). The average person who immigrated between 1955 and 1960 originated in a country which had a 1980 per capita GNP of $6,823 (in 1980 dollars). By contrast, the respective statistic for the typical immigrant who arrived in the late 1970s is $3,828. Because the elasticity of the earnings of immigrants in the United States with respect to per capita GNP in the source country is on the order of 04, immigrants who arrived in the late 1950s will earn about 4 percent more than those who arrived in the late 1970s, even if the immigrant flow were randomly selected from the source countries.

B. *The Self-Selection of the Immigrant Flow*

The immigrant flow, however, is not randomly selected from the population of the source countries. Borjas (1987) argues that the self-selection of the immigrant flow generates some of the national origin differentials documented in Table 8. Suppose that residents of country 0 (the source country) consider migrating to country 1 (the host country). Assume also that migration decisions are irreversible so that no return migration occurs. If they choose to remain in the source country, residents of the source country have an earnings distribution given by:

$$\log w_0 = \mu_0 + \varepsilon_0, \tag{6}$$

where w_0 gives the worker's earnings in the source country; μ_0 is the mean log earnings in the source country; and the random variable ε_0 measures deviations from mean earnings, and is assumed to be normally distributed with mean zero and variance σ_0^2.

If the entire population of the source country were to migrate to the host country, they would face the earnings distribution:

$$\log w_1 = \mu_1 + \varepsilon_1, \tag{7}$$

where μ_1 is the mean log earnings in the host country, and the random vari-

able ε_1 measures deviations from mean earnings, and is normally distributed with mean zero and variance σ_1^2. The correlation coefficient between the random variables ε_0 and ε_1 equals ρ.

The population mean μ_1 need not equal the mean earnings of native workers in the host country. The average worker in the source country, for instance, might be less skilled than the average worker in the United States. For convenience, it is useful to assume that the typical person in both countries is equally skilled, so that μ_1 also gives the mean earnings of natives in the host country. This assumption helps isolate the impact of the selection process on the skill composition of the immigrant flow.

Equations (6) and (7) summarize the earnings opportunities available to potential migrants in the source and host countries. The migration decision is determined by a comparison of earnings opportunities across countries, net of migration costs (C). Define the index function:

$$I = \log\left(\frac{w_1}{w_0 + C}\right) \approx (\mu_1 - \mu_0 - \pi) + (\varepsilon_1 - \varepsilon_0), \quad (8)$$

where $\pi = C/w_0$ gives a "time-equivalent" measure of migration costs. A worker migrates to the host country if $I > 0$ and remains in the source country otherwise.

Migration costs C will differ among workers. For instance, newly arrived immigrants may be unemployed while they look for employment, suggesting that high-wage migrants might have higher migration costs. High-wage migrants, however, are more likely to have prior job connections and better information about job opportunities, suggesting a negative correlation between migration costs C and wages. The immigrant also incurs transportation costs. It is instructive to assume initially that the time-equivalent migration costs, π, are constant in the population (so that migration costs are proportional to wages). The probability that a person migrates to the host country can then be written as:

$$P = Pr\{\upsilon > (\mu_0 + \pi - \mu_1)\} = 1 - \Phi(z), \quad (9)$$

where $\upsilon = \varepsilon_1 - \varepsilon_0$, $z = (\mu_0 + \pi - \mu_1)/\sigma_\upsilon$, and Φ is the standard normal distribution function. It is easy to show that:

$$\frac{\partial P}{\partial \mu_0} < 0, \frac{\partial P}{\partial \mu_1} > 0, \text{ and } \frac{\partial P}{\partial \pi} < 0. \quad (10)$$

The emigration rate is negatively correlated with mean earnings in the source country and with migration costs, and is positively correlated with mean earnings in the host country. Although most studies analyzing internal migration flows focus on the determinants of the size and direction of migration flows, there are other equally important questions which can be analyzed in the context of the income maximization model. For instance, which persons find it worthwhile to migrate to the host country?

This question is at the heart of Andrew Roy's (1951) well-known model of self-selection, which describes how workers sort themselves among employment opportunities (Michael Sattinger 1993). The implications of the income-maximization hypothesis for the selection of the immigrant flow are easily grasped by evaluating the conditional means $E(\log w_0 \mid I > 0)$, which gives the earnings of immigrants prior to their migration, and $E(\log w_1 \mid I > 0)$, which gives immigrant earnings in the host country. Because of the normality assumption, these conditional means are given by:[17]

[17] To derive equation (11), note that:

$$E(\log w_0 \mid I > 0) = \mu_0 + \sigma_0 E(\varepsilon_0^* \mid \upsilon^* > z),$$

where $\varepsilon_0^* = \varepsilon_0/\sigma_0$, $\upsilon^* = \upsilon/\sigma_\upsilon$. Because the conditional expectation of a normal density is linear, we can write $\varepsilon_0^* = \rho_{0\upsilon}\upsilon^* + \xi$, where $\rho_{0\upsilon}$ is the correlation between ε_0 and υ,

$$E(\log w_0 \mid I > 0) = \mu_0 + \frac{\sigma_0\sigma_1}{\sigma_v}\left(\rho - \frac{\sigma_0}{\sigma_1}\right)\lambda, \quad (11)$$

$$E(\log w_1 \mid I > 0) = \mu_1 + \frac{\sigma_0\sigma_1}{\sigma_v}\left(\frac{\sigma_1}{\sigma_0} - \rho\right)\lambda, \quad (12)$$

where $\lambda = \phi(z)/(1 - \Phi(z))$, and ϕ is the density of the standard normal. The variable λ is inversely related to the emigration rate and is positive as long as some persons find it profitable to remain in the source country ($P < 1$).

Let $Q_0 = E(\epsilon_0 \mid I > 0)$ and $Q_1 = E(\epsilon_1 \mid I > 0)$. Inspection of equations (11) and (12) indicates that there are three possible types of selection characterizing the immigrant flow:

$$Q_0 > 0 \text{ and } Q_1 > 0 \text{ if and only if } \rho > \frac{\sigma_0}{\sigma_1} \text{ and } \frac{\sigma_1}{\sigma_0} > 1. \quad (13)$$

$$Q_0 < 0 \text{ and } Q_1 < 0 \text{ if and only if } \rho > \frac{\sigma_1}{\sigma_0} \text{ and } \frac{\sigma_0}{\sigma_1} > 1. \quad (14)$$

$$Q_0 < 0 \text{ and } Q_1 > 0 \text{ if and only if } \rho < \min\left(\frac{\sigma_1}{\sigma_0}, \frac{\sigma_0}{\sigma_1}\right) \quad (15)$$

Equation (13) shows that immigrants are positively selected (i.e., have above-average earnings in both the source and host countries) when the correlation between skills in the two countries is sufficiently high *and* when the host country has more dispersion in its earnings distribution. The strong positive correlation between earnings in the source and host countries ensures that skills are portable across countries. The immigrant population is then drawn from the upper tail of the earnings distribution because the source country, in a sense, "taxes" high-ability workers and "insures" less able workers against poor labor market outcomes.

Equation (14) indicates that immigrants are negatively selected (i.e., have below-average earnings in both the source and host countries) when the correlation coefficient ρ is sufficiently high *and* when the earnings distribution in the source country has a larger variance than the earnings distribution in the host country. The immigration flow is negatively selected, therefore, when the host country taxes high-income workers and provides better insurance for low-income workers.

Finally, equation (15) describes the characteristics of a "refugee sorting," where immigrants have below-average earnings in the source country but end up in the upper tail of the earnings distribution of the host country. This sorting occurs when ρ is small or negative. The correlation ρ might be negative after a source country experiences a Communist takeover. This political system (at least in its initial stages) redistributes incomes by confiscating the assets of relatively successful persons. The model suggests that immigrants from such systems will be in the lower tail of the "revolutionary" earnings distribution, but will perform well in the host country's market economy.

Note that the type of selection characterizing the immigrant flow depends on the second moments of the earnings distributions. Put differently, because the underlying distribution of skills is being held constant, the variance of the earnings distribution proxies for the price of

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and ξ is independent of v^*. The mean earnings of immigrants in the source country are then given by:

$$E(\log w_0 \mid I > 0) = \mu_0 + \sigma_0 \rho_{0v} E(v^* \mid v^* > z).$$

Equation (11) follows directly by noting that $\rho_{0v} = (\rho\sigma_0\sigma_1 - \sigma_0^2)/\sigma_0\sigma_v$ and $\lambda = E(v^* \mid v^* > z)$. Equation (12) can be derived in an analogous manner. It is worth noting that the random variables ϵ_0 and ϵ_1 can be decomposed into observable and unobservable components so that the framework applies to selection in both types of skill characteristics.

skills, and thus serves an allocative role in the sorting of persons across countries. It is worth noting that neither the difference in mean earnings nor the level of migration costs determines the type of selection that characterizes the immigrant flow.[18] Although the first moments determine the size and direction of the flow, they do not determine if immigrants are drawn mainly from the upper or lower tails of the earnings distribution.

The empirical evidence provides some support for the equilibrium skill sorting implied by the model. Borjas (1990, ch. 7) reports that measures of income inequality in the source country, which are a rough proxy for the rate of return to skills, are negatively correlated with the earnings of immigrant men in the United States.[19] Holding constant a vector of observable socioeconomic characteristics (including educational attainment and age), the point estimates suggest that Mexican immigrant men earn about 4 percent less than British immigrants simply because of the selectivity effect resulting from Mexico having a higher rate of return to skills than the United Kingdom. Deborah Cobb-Clark (1993) finds a similar negative correlation between the earnings of immigrant women in the United States and measures of the rate of return to schooling in the source countries. Finally, Edward Taylor's (1987) case study of migration in a rural Mexican village concludes that Mexicans who migrated illegally to the United States are less skilled, on average, than the typical person residing in the village. This type of selection is consistent with the fact that Mexico has a relatively high rate of return to skills.

The discussion provides an interesting explanation of the decline in the relative skills of immigrant cohorts admitted to the United States in the postwar era. Prior to the 1965 Amendments, the allocation of visas was guided by the ethnic composition of the U.S. population in 1920, and thus favored immigration from a small number of Western European countries. The 1965 Amendments repealed the national-origins quota system and greatly increased the number of immigrants originating in Asian and Latin American countries. The new immigration, therefore, is more likely to originate in countries where the population tends to be less skilled, where skills are less easily transferable to the United States, and where the rate of return to skills is relatively high. All these factors contribute to a decline in the relative skills of successive immigrant waves.[20]

The self-selection model can be ex-

[18] Although the discussion assumed that migration costs (in time-equivalent terms) are constant, it is not difficult to incorporate liquidity constraints or variable migration costs into the model. For instance, economic conditions might motivate the least-skilled to migrate, but liquidity constraints prevent the migration of these workers. The "best of the worst" will then move if the flow is negatively selected. Similarly, if migration costs are correlated with earnings, the selection characterizing the immigrant flow may change in either direction. If, for example, migration costs are positively correlated with earnings, the immigrant flow is more likely to be negatively selected. It is easy to show that the correlation between migration costs and earnings can change the type of selection only if the variance in migration costs is sufficiently high relative to the variance in skills.

[19] Alan Barrett (1993) shows that immigrants who enter the United States using a family reunification visa have relatively lower earnings when they originate in countries where the income distribution has a large variance.

[20] Part of the national origin wage differentials may also arise from discrimination against particular groups. The literature has not investigated this hypothesis seriously because the evidence on the Hispanic/non-Hispanic or the Asian/white wage differential *among native workers* does not lend itself to a simple discrimination interpretation. Cordelia Reimers (1983) finds that much of the Hispanic/non-Hispanic wage differential is attributable to differences in observable characteristics, while Chiswick (1983) shows that Asian groups actually have higher wages than white workers, even after controlling for observable characteristics.

tended to incorporate the fact that migration decisions are reversible. Return migration can arise for two distinct reasons. First, it may be the optimal residential location plan over the life cycle. In other words, workers reside in the host country for a few years and then return to their home countries after accumulating sufficiently large levels of human capital or wealth. This mobility pattern allows some workers to attain higher utility or wealth than if the migration decision was permanent. Alternatively, return migration flows may result from mistakes in the initial migration decision.[21] Potential immigrants are uncertain about the economic conditions available to them in the destination. As a result, the actual outcomes experienced in the host country's labor market differ from the expected outcomes that guided the immigration decision. As long as return migration costs are relatively low, immigrants who experience worse-than-expected outcomes will return to their home country.

Borjas and Bernt Bratsberg (forthcoming) argue that regardless of which of these two factors generates return migration, the implications for the skill composition of the "surviving" immigrant stock are the same: return migration accentuates the selection that characterizes the initial migration flow. The intuition is illustrated in Figure 3 for the special case where earnings are perfectly correlated across countries.[22] Suppose that

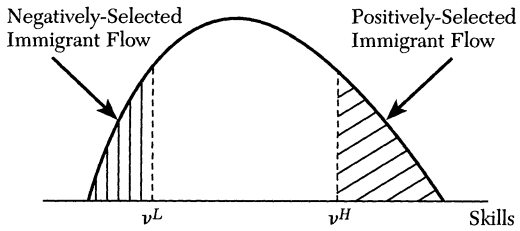

Figure 3. The Self-selection of Return Migrants

the immigrant flow is positively selected so that all workers with skill level exceeding v^H emigrate. The worker with skill level v^H is the "marginal" immigrant; he is indifferent between migrating and not migrating. As a result, the immigrants with skill level in the neighborhood of v^H are most susceptible to improved opportunities in the source country or to adverse random shocks in the host country's labor market. The return migrants are the "worst of the best." If the return migration flow is negatively selected, the immigrants have skills below v^L. The persons in the neighborhood of v^L are the marginal immigrants, and the return migrants are the "best of the worst."

The limited empirical evidence supports these theoretical implications. Fernando Ramos (1992) analyzes the return migration decisions of Puerto Ricans living in the United States. The joint study of the Puerto Rican and U.S. Censuses provides valuable information on the characteristics of Puerto Ricans living in the United States, of Puerto Ricans who remained in their homeland, and of Puerto Ricans who returned to Puerto Rico after living in the United States for a brief period. The data indicate that Puerto Rican "immigrants" in the United States are relatively unskilled, but that

[21] Eliakim Katz and Oded Stark (1987) present a model of how the immigrant flow is selected based on the assumption that there is asymmetric information in the migration decision (workers know their skills and earnings in the source country, but not in the host country).

[22] The assumption that earnings are perfectly correlated across countries implies that we can write the wage structure for country i ($i = 0,1$) as $\log w_i = \mu_i + \eta_i s$, where s is a random variable describing a worker's skills; and η_i is the rate of return to skills. Ignoring migration costs, a resident of the source country migrates when $\mu_1 + \eta_1 s > \mu_0 + \eta_0 s$. We can rewrite this decision rule as $(\eta_1 - \eta_0)\, s > (\mu_0 - \mu_1)$. Thus, there exists a threshold level of skills that separates out the migrants from the nonmigrants. Note that this result does not depend on the distribution of the random variable s.

the return migrants are relatively more skilled than the typical immigrant. The typical Puerto Rican who migrated to the United States prior to 1975 had 9.4 years of schooling, as compared to 10.8 years for a Puerto Rican who never left Puerto Rico. The Puerto Rican migration flow, therefore, is negatively selected. In contrast, the typical Puerto Rican who returned to Puerto Rico after a stint in the United States had 9.8 years of schooling.

Borjas and Bratsberg (forthcoming) find a relationship between the rate of return migration for a particular national origin group and the average earnings of the surviving stock of immigrants in the United States. In particular, a high rate of return migration for the national origin group increases the average earnings of the surviving immigrants when the immigrant flow is positively selected (i.e., originates in a country with a low rate of return to skills), and reduces the average earnings of the surviving stock when the immigrant flow is negatively selected (i.e., originates in a country with a high rate of return to skills). Even though the return migration rates in the Borjas-Bratsberg study are measured with a great deal of error, the empirical evidence suggests that return migration does accentuate the selection of immigrants at either tail of the skill distribution. Bratsberg (1993) shows that the return migration rate of foreign students in the United States differs substantially across source countries. For example, only about 3 percent of students originating in Mexico or Germany choose to remain in the United States, as opposed to nearly 30 percent of students originating in Israel, Poland, and Kenya. The data indicate that foreign students are more likely to return to wealthier countries and to countries which offer high rates of return to schooling.

Roy's framework has also been expanded to incorporate the idea that immigration decisions are made in a family context (Cobb-Clark 1990; Borjas and Stephen Bronars 1991). The maximization of family income implies that the immigrant flow contains some tied movers, persons who would not have migrated on their own but who migrate as part of the household. This approach will likely play a crucial role in understanding skill trends among immigrant women, both in terms of cohort effects and wage convergence. The early work of James Long (1980), based on the 1970 Census cross-section, suggests that the labor market experiences of immigrant women in the United States differ substantially from those of men. For example, the earnings of immigrant women are *negatively* correlated with years-since-migration. Remarkably, there has been little empirical research documenting the skill trends among immigrant women since that early study.

C. *The Host Country's Demand for Immigrants*

Even though Roy's self-selection model has influenced our thinking about how the immigrant flow is chosen from the source country's population, it is important to stress that the model only gives the "supply side" of the immigration market. Workers who wish to migrate to a particular host country can do so only if the host country's government allows it. The immigration market is highly regulated. Most countries have strict policies describing the demographic characteristics of persons who are allowed to enter the country (such as skills, national origin, or family ties with current residents). The size and skill composition of the immigrant flow, therefore, are jointly determined by the supply-side considerations stressed in the self-selection model as well as by factors which influence the host country's

demand for immigrants (or, equivalently, the supply of visas).

In general, the supply of visas is determined by the host country's political and economic gains from immigration. For instance, the returns to immigration will depend partly on the benefits accruing from admitting workers who can specialize in particular industries and occupations, and will also be determined by the impact of immigrant flows on the employment opportunities of natives as well as on the social fabric of the host country. It is also clear that there will be differential benefits from admitting skilled or unskilled immigrant flows, depending on the skill composition of the native work force and on the generosity of social insurance programs.

Unfortunately, the literature does not yet provide a systematic analysis of the factors that generate the host country's demand function for immigrants. Recent work by Jess Benhabib (1993) constructs a demand curve by noting that natives differ in their wealth, so that there will be both winners and losers from the choice of a particular immigration policy. The demand function for immigrants is then an exercise in political economy, and depends on the extent to which the winners can compensate the losers. Richard Freeman (1993) conjectures that the demand curve for immigrants might be mostly determined by discrimination against some national origin groups.

A promising exploration of the factors that shift the U.S. demand for immigrants is given by Claudia Goldin's (1994) study of the origins of the national-origins quota system. In 1915, Congress enacted legislation requiring immigrants to pass a literacy test, effectively reducing the demand for unskilled immigrants. President Woodrow Wilson vetoed the legislation. Legislators representing districts with large immigrant populations voted not to override Wilson's veto (suggesting that their immigrant constituents did not support a restrictionist policy towards unskilled workers).[23] In contrast, legislators representing districts where wages were stagnant voted to override the veto (implying that their constituents had little to gain, and perhaps much to lose, from admitting more immigrants). Therefore, it seems as if further research on the political economy of immigration policy might greatly improve our understanding of the properties of equilibrium in the immigration market.

5. *International Differences in Immigrant Performance*

The performance of immigrants in the host country's labor market has been documented in a number of other countries, including Australia (John Beggs and Bruce Chapman 1991); Britain (Chiswick 1980); Germany (Christian Dustmann 1993; Jörn-Steffen Pischke 1993); and Israel (Friedberg 1993). These international comparisons help assess the impact of differences in immigration policy. The most extensive research has been conducted on the immigrant experience in Canada, which by the early 1990s had an annual immigrant flow on the order of one percent of its population (Michael Baker and Dwayne Benjamin 1994; Bloom, Grenier, and Morley Gunderson forthcoming; and Robert Wright and Paul Maxim 1993).

Until 1961, Canadian immigration policy, like that of the United States, permitted the entry of persons originating in only a few countries, such as the United

[23] Lindsay Lowell, Frank Bean, and Rodolfo De La Garza (1986) report that Congressmen representing districts with large Hispanic populations were more likely to oppose enactment of an early version of the 1986 Immigration Reform and Control Act (which made it illegal for employers to hire illegal aliens).

TABLE 9
EDUCATIONAL ATTAINMENT AND WAGES OF IMMIGRANTS IN CANADA AND THE UNITED STATES

Cohort/Census Year	Host Country	
	Canada	United States
Educational Attainment:		
1960–64 Cohort as of 1970	10.5	10.9
1975–80 Cohort as of 1980	12.6	11.8
Natives as of 1970	9.9	11.5
Natives as of 1980	11.3	12.7
Percentage Wage Differential Between Immigrants and Natives in Host Country:		
1960–64 Cohort as of 1970	−.8	−4.4
1975–80 Cohort as of 1980	−15.8	−27.6

Source: Borjas (1993b, p. 28). The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters. The Canadian data are drawn from the 1971 and 1981 Public Use Samples of the Canadian Census, while the U.S. data are drawn from the 1970 and 1980 Public Use Samples of the U.S. Census.

Kingdom, or of persons who were dependents of Canadian residents. Major policy changes in 1962 and 1967 repealed the national origin restrictions, and shifted the emphasis towards skills requirements. Under current regulations, applicants for entry into Canada are classified into three classes: the family class (which includes close relatives of Canadian residents), assisted relatives (which includes more distant relatives of Canadian residents), and independent immigrants. Visa applicants in the last two classes are screened by means of a "point system." Points are awarded according to such factors as the applicant's education, age, and occupation. Applicants who get a passing score are awarded an entry visa.

As Table 9 shows, the point system seems to have had a major impact on the skill level of immigrants in Canada. In the early 1960s, the typical immigrant entering Canada had about half-a-year less schooling than the typical immigrant entering the United States. By the late 1970s, the typical immigrant entering Canada had almost one more year of schooling than the typical immigrant entering the United States. In addition, the typical immigrant entering Canada in the late 1970s earned 16 percent less than Canadian-born workers, while the typical immigrant entering the United States earned about 28 percent less than U.S.-born workers.[24]

A number of recent studies attempt to determine why Canada "attracts" relatively more skilled immigrants than the United States. Surprisingly, there is little difference in average skills between immigrants in Canada and in the United States *for given national origin groups* (Borjas 1993b; Duleep and Regets 1992a). In other words, the typical Italian immigrant in Canada has about as much schooling and does about as well in

[24] The evidence also indicates that Canada experienced a decline in relative wages across successive immigrant waves, although not as steep as the decline observed in the United States. Wright and Maxim (1993) suggest that the Canadian decline occurred both because of a change in the national origin mix of immigrants and because of a decrease in the share of independent class immigrants (so that the point system became less relevant over time).

the labor market as the typical Italian immigrant in the United States. The national origin mix of immigrants in Canada and the United States, however, differs substantially, with a larger fraction of the Canadian immigrant flow originating in European countries. During the 1980s, 27 percent of the immigrant flow entering Canada originated in Europe, as compared to only 10.4 percent for the United States. Therefore, part of the difference between the average skill level of immigrants in Canada and the United States is attributable to the different national origin mix of immigrants in the two host countries.

This finding raises important questions about how a Canadian-style point system works. It would be a mistake to claim that the point system is ineffective because it seems to have little impact on the education level or relative wages of specific national origin groups. An alternative, though little discussed, effect of the point system is to reallocate visas *across* source countries. Consider, for instance, the implications of how education is rewarded in the point system. In the late 1960s, a visa applicant was given 1 point per year of education, and only 50 out of 100 points were needed to "pass the test." Persons originating in countries that have a high level of educational attainment are more likely to qualify for entry than persons originating in countries where the typical person has little schooling. It is likely, therefore, that the point system plays an important role in determining the national origin mix of the immigrant flow.[25]

[25] Allan Green and David Green (1994) argue that the point system affects the skill level of immigrants because it influences the occupational distribution of the immigrant flow, with occupations that are "in demand" being much more represented in the immigrant flow. The point system thus alters the national origin mix because workers originating in countries where the occupational distribution is more compatible with the one desired by Canada have a larger probability of obtaining a visa.

The experience of immigrants in Canada differs from the experience of their U.S. counterparts in one other notable way. Baker and Benjamin (1994) document that over a 10 year period, the relative wage of immigrants in Canada might increase by at most 3 percentage points, less than half of the wage growth experienced by immigrants in the United States. This finding suggests that a fruitful avenue for future research might be to investigate why the adjustment process of immigrants differs across host countries.

As noted above, a number of studies analyze immigrant labor market performance in other host countries. There is a great deal of diversity in the results of these studies, but the evidence generally suggests that countries which have skill filters "attract" a relatively more skilled immigrant flow. Australia, for example, has a point system similar to the Canadian one. Beggs and Chapman (1991) report that immigrants in Australia have high relative wages. In contrast, Pischke (1993) finds that immigrants in Germany (who for the most part were Turkish guest workers admitted in the 1960s) have lower wages than native Germans and do not experience any wage convergence over the life cycle.

6. *The Impact of Immigrants on Native Earnings and Employment*

Do immigrants have an adverse impact on native earnings and employment opportunities? If so, how large is the loss in the economic welfare of native workers? Are all native groups equally affected by the entry of immigrants into the labor market? A rapidly growing literature now purports to document the impact of immigrants on the native labor market in a

number of host countries. As we will see below, however, a number of conceptual problems plague this literature. As a result, the accumulated empirical evidence has little to say about the underlying questions.

To understand the impact of immigration on native employment opportunities, suppose we view a labor market as a closed economy where a single competitive industry uses a linear homogeneous production function to produce Q units of a good (Joseph Altonji and David Card 1991). The production process uses both skilled and unskilled workers. The wage rates of skilled and unskilled workers are w_s and w_u, respectively. The cost function in this industry is then given by $Qc(w_s, w_u)$, where $c(w_s, w_u)$ is the unit cost function. Perfect competition implies that the price of the output, p, equals the unit cost of production, so that $p = c(w_s, w_u)$.

Both skilled and unskilled workers purchase the good. Each type-i worker ($i = s, u$) has an output demand function given by $D_i(w_i, p)$. There are N_s skilled workers and N_u unskilled workers, and the fraction of unskilled workers in the population is b. Product market equilibrium requires:

$$Q = N_s D_s(w_s, p) + N_u D_u(w_u, p). \quad (16)$$

To close the model, suppose the labor supply function of each type-i worker is $L_i(w_i, p)$. Labor market equilibrium implies:

$$N_s L_s(w_s, p) = Q c_s(w_s, w_u) \quad (17)$$

$$N_u L_u(w_u, p) = Q c_u(w_s, w_u), \quad (18)$$

where $c_i = \partial c/\partial w_i$.

Consider now what would happen if ΔN immigrants enter the labor market exogenously. Suppose that the fraction of unskilled workers in the immigrant flow equals β. Under some simplifying conditions, Altonji and Card (1991, pp. 204–05) show that the resulting change in the wage of skilled and unskilled workers is given by:[26]

$$\Delta \log w_s = \frac{\lambda}{\varepsilon_s - \delta_s} \cdot \frac{\beta - b}{b(1-b)} \cdot \frac{\Delta N}{N} = \alpha_s \frac{\Delta N}{N}, \quad (19)$$

$$\Delta \log w_u = \frac{1-\lambda}{\varepsilon_u - \delta_u} \cdot \frac{b - \beta}{b(1-b)} \cdot \frac{\Delta N}{N} = \alpha_u \frac{\Delta N}{N}, \quad (20)$$

where $\lambda = N_u D_u(w_u, p)/Q$; $\varepsilon_i \geq 0$ is the labor supply elasticity of type-i workers; and $\delta_i < 0$ is the labor demand elasticity for type-i workers.

Equations (19) and (20) give the reduced-form impact of immigration on the skilled and unskilled wage. Suppose that the fraction of unskilled workers in the immigrant flow (β) equals the fraction of unskilled workers in the native population (b). The linear homogeneity of the production function then implies that neither the skilled nor the unskilled wage changes as a result of immigration. Alternatively, if the fraction of unskilled workers in the immigrant flow exceeds the respective fraction among natives ($\beta > b$), immigration increases the skilled wage and decreases the unskilled wage.

This conceptual experiment, therefore, indicates precisely how the impact of immigration on native employment opportunities can be measured. If we could observe a number of closed labor markets which immigrants penetrate randomly, we can then relate the change in the wage of skilled and unskilled workers

[26] To derive these equations, differentiate the labor market equilibrium conditions, the product market equilibrium condition, and the zero profit condition, assuming that $\partial D_i/\partial w_i = 0$, $\partial L_i/\partial p = 0$, and that the cross-elasticities of factor demand are zero, so that the demand for skilled (unskilled) workers is independent of the unskilled (skilled) wage.

TABLE 10
ELASTICITY OF NATIVE WAGES WITH RESPECT TO THE NUMBER OF IMMIGRANTS IN LOCALITY

Study	Impact of Immigrants on:	Dependent Variable	Elasticity Estimate
Altonji and Card (1991, p. 220)	Less Skilled Natives	Weekly wages	+.01
Bean, Lowell, and Taylor (1988, p. 44)	Native Mexican Men	Annual earnings	−.005 to + .05
	Black Men	Annual earnings	−.003 to + .06
Borjas (1990, p. 87)	White Native Men	Annual earnings	-.01
	Black Native Men	Annual earnings	−.02
Grossman (1982, p. 600)	All Natives	Factor share of native workers	−.02
LaLonde and Topel (1991, p. 186)	Young Black Natives	Annual earnings	−.06
	Young Hispanic Natives	Annual earnings	−.01

to the proportion of immigrants in the population (after adjusting for the skill composition of both the native population and the immigrant flow). The estimated parameters would summarize the impact of immigrants on native employment opportunities.

Practically all empirical studies in the literature, beginning with Jean Grossman (1982), attempt to replicate this experiment by treating a city or metropolitan area as the empirical counterpart of the closed labor market in the theoretical analysis. The typical study then regresses a measure of the native wage in the locality on the relative quantity of immigrants in that locality (or the change in the wage in the locality over a specified time period on the change in the number of immigrants in the locality). Equations (19) and (20) show that the impact of immigration will also depend on the skill distribution of immigrants relative to that of natives. The empirical studies, however, typically ignore the skill differentials that exist in both the native and immigrant populations across metropolitan areas, and simply calculate the correlation between the immigrant share and the native wage.

Table 10 summarizes the results of representative studies in this literature. The across-city correlations in the United States generally indicate that the average native wage is slightly lower in labor markets where immigrants tend to reside.[27] The point estimates of the elasticity of the native wage with respect to the number of immigrants cluster around −.01 to −.02, so that if one city has 10 percent more immigrants than another, the native wage in the city with more immigrants is only about .2 percent lower. The evidence also indicates that the numerically weak relationship between native wages and immigration is observed across all types of native workers, white or black, skilled or unskilled, male or female.[28] In terms of the pa-

[27] Many of these studies also find a significant negative correlation between immigration and the immigrant wage. For instance, Grossman (1982) reports that a 10 percent increase in the number of immigrants reduces the immigrant wage by 2 percent, while Altonji and Card (1991) conclude that a 10 percent increase in the number of immigrants reduces the immigrant wage by at least 4 percent.

[28] An exception to this result is given by Altonji and Card (1991), who relate the wage change experienced by natives in a particular metropolitan area between 1970 and 1980 to the change in the

TABLE 11
ELASTICITY OF NATIVE EMPLOYMENT WITH RESPECT TO THE NUMBER OF IMMIGRANTS IN LOCALITY

Study	Impact of Immigrants on:	Dependent Variable/Remarks	Elasticity Estimate
Altonji and Card (1991, p. 220)	Less Skilled Natives	Employment-population ratio	−.038
		Weeks worked	−.062
Borjas (1990, p. 92)	White Native Men	Labor force participation rate	-.01
	Black Native Men	Labor force participation rate	+.04
Thomas Muller and Thomas Espenshade (1985, p. 100)	Black Natives	Unemployment rate	−.01
Julian Simon, Stephen Moore, and Richard Sullivan (1993)	Natives	Unemployment rate	+.001
C. Winegarden and Lay Khor (1991, p. 109)	Young White Natives	Unemployment rate	.01
	Young Black Natives	Unemployment rate	−.003

rameters of equations (19) and (20), therefore, the literature concludes that $\alpha_s \approx \alpha_u \approx -.02$.

Though most of the studies focus on the relationship between native earnings and the immigrant share in the local labor market, some studies also estimate the correlation between immigration and native labor force participation rates, hours worked, and unemployment rates. Table 11 summarizes representative results in the literature. It is evident that immigration has a weak effect on the employment of natives.

Studies of specific labor markets confirm the finding that immigration seems to have little impact even when the market receives very large immigrant flows. On April 20, 1980, Fidel Castro declared that Cuban nationals wishing to move to the United States could leave freely from the port of Mariel. By September 1980, about 125,000 Cubans, mostly unskilled workers, had chosen to undertake the journey. Almost overnight, Miami's labor force had unexpectedly grown by 7 percent. Card's (1990) influential analysis of the data indicates that the time-series trend in wages and employment opportunities for Miami's workers, including its black population, was barely nudged by the Mariel flow. The trend in the wage and unemployment rates of Miami's workers between 1980 and 1985 was similar to that experienced by workers in such cities as Los Angeles, Houston, and Atlanta, cities which did not experience the Mariel flow.

In short, the estimated correlations between native wages and the immigrant share in local labor markets do not support the hypothesis that the employment opportunities of U.S.-born workers are strongly and adversely affected by immigration. Moreover, the evidence for other host countries is similar. Pischke and Johannes Velling's (1994) study of the German labor market relies on the

share of immigrant workers in that locality. When they instrument the change in the locality's immigrant share with a second-order polynomial in the fraction of the work force that was foreign-born in 1970, the estimated elasticity is −.8. It is doubtful, however, that the immigrant share in 1970 is a valid instrument for the growth in the immigrant share.

same across-city comparisons that dominate the U.S. literature, and finds a weak negative correlation between the native wage and the fraction of immigrants in the work force; and Jennifer Hunt (1992) reports that, even though 900,000 persons returned to France within one year after the 1962 independence of Algeria (increasing the French labor force by 2 percent), there was little impact on the affected localities.[29]

The correlations estimated in this extensive literature, however, misspecify the theoretical experiment described earlier and hence do not answer the question of whether native workers are adversely affected by immigration. In particular, the comparison of economic conditions in different metropolitan areas, as well as the pre- and post-immigration comparison in a particular metropolitan area, presumes that the labor markets are closed (once immigration takes place) and that the migration flow is exogenous.

Metropolitan areas in the United States (and abroad) are not closed economies; labor, capital, and goods flow freely across localities and tend to equalize factor prices in the process. As long as native workers and firms respond to the entry of immigrants by moving to areas offering better opportunities, there is no reason to expect a correlation between the wage of natives and the presence of immigrants. As a result, the comparison of local labor markets may be masking the "macro" effect of immigration. Moreover, immigrants do not simply land in a randomly chosen metropolitan area; presumably they choose areas which provide them the best opportunities. Therefore, the correlations typically estimated in the literature have no structural interpretation; they do not estimate the demand function for native workers, nor do they estimate the reduced-form impact of immigrants on native employment opportunities.[30]

A recent study of time-series data drawn from the CPS by Borjas, Freeman, and L. Katz (1992) provides indirect evidence of the macro impact of immigration. As noted earlier, the 1980s witnessed a substantial increase in the wage gap between workers who do not have a high school diploma and workers with more education. The decade also witnessed the entry of large numbers of less skilled immigrants. Given reasonable estimates of labor demand elasticities, Borjas, Freeman, and L. Katz conclude that perhaps a third of the 10 percentage point decline in the relative wage of high school dropouts between 1980 and 1988 can be attributed to the less skilled immigration flow.[31]

To reconcile the finding that local labor markets do not seem to be affected by immigration with the possible existence of an economy-wide impact, Ran-

[29] William Carrington and Pedro de Lima (1994) report inconclusive results when they analyze the impact of the 600,000 refugees who entered Portugal after the country lost the African colonies of Mozambique and Angola in the mid-1970s, increasing Portugal's population by almost 7 percent.

[30] Some studies use the industry, rather than the local labor market, as the unit of observation and analyze native employment and wages as immigrants penetrate a particular industry (Thomas Bailey 1987; John DeNew and Klaus Zimmermann 1994; Roger Waldinger 1993). The correlations are sometimes interpreted in terms of a displacement effect. As with studies of local labor markets, these correlations have no structural interpretation as long as workers and firms can move across industries.

[31] Using CPS data, Topel (1994) also finds that the relative decline in the wage of less skilled workers during the 1980s was steepest in labor markets which had a sizable immigrant presence. It is important to stress, however, that the CPS data do not identify persons by nativity status, so that the decline in the relative wage of unskilled workers could be attributable to the fact that the unskilled wage fell because the new immigrants earn even lower wages than the unskilled native population.

dall Filer (1992) and Michael White and Lori Hunter (1993) analyze how the internal migration flows of U.S.-born workers respond to immigration. Using 1980 Census data, they find that metropolitan areas where immigrants cluster experienced lower rates of native in-migration and somewhat higher rates of natives out-migration. This pattern of native mobility, of course, dissipates the impact of immigration over the entire economy. The evidence for more recent time periods, however, seems to be mixed. Using various CPS supplements from the 1980s, Butcher and Card (1991) and White and Zai Liang (1993) estimate a positive correlation between immigration flows and the in-migration rates of natives to particular cities, while William Frey's (1994) study of the 1990 Census reveals that less skilled native workers residing in states which received large immigrant flows in the late 1980s had relatively high probabilities of out-migration.

Although native workers and firms probably "vote with their feet" and attenuate the negative or positive impact of immigration on local labor markets, this argument does not fully explain why immigration has little impact on local labor markets. Card's Mariel study, in particular, raises a number of puzzling questions. The *Marielitos* had no impact on Miami's labor market even in the year when the large migration took place. As a result, the internal flows of labor, capital, and goods can explain the apparent lack of correlation between native earnings and the presence of immigrants *only if markets adjust instantaneously*.

There exists a great deal of regional variation in many labor market characteristics and these differences are often viewed as the result of equilibrium processes that are specific to the locality and that do not disappear quickly. Olivier Blanchard and L. Katz's (1992) empirical study of regional labor market adjustments in the United States is quite instructive. They find that a one-time adverse economic shock to a state (on the order of a −1 percent demand shock on employment) reduces the state's real wage for up to 10 years before the internal migration of workers reequilibrates the wage across regions. The unresolved puzzle facing those who interpret the lack of correlation between immigration and native wages in the local labor market in terms of an economy-wide equilibrium process is clear: Why should it be that many other regional variations persist over time, but that the impact of immigration on native workers is arbitraged away immediately?

A fair appraisal of the literature thus suggests that we still do not fully understand how immigrants affect the employment opportunities of natives in local labor markets; nor do we understand the dynamic process through which natives respond to these supply shocks and reestablish labor market equilibrium.

7. *Immigration and Welfare*

Historically, the debate over immigration policy in the United States has revolved around the questions of whether immigrants assimilate in the United States and whether they take jobs away from natives. The rapid growth of entitlement programs in the past three decades introduces an additional explosive question into the political arena: Do immigrants pay their way in the welfare state?

A. *Trends in Immigrant Welfare Participation*

The early work of Blau (1984) used the 1976 Survey of Income and Education to assess if immigrants and natives had the same propensity for receiving public as-

TABLE 12
WELFARE PARTICIPATION RATES OF NATIVE AND IMMIGRANT HOUSEHOLDS, 1970–1990
(Percentage of Households Receiving Public Assistance)

Group	All Households		
	1970	1980	1990
Natives	6.0	7.9	7.4
All Immigrants	5.9	8.7	9.1
Cohort:			
1985–1989 Arrivals	—	—	8.3
1980–1984 Arrivals	—	—	10.7
1975–1979 Arrivals	—	8.3	10.0
1970–1974 Arrivals	—	8.4	9.7
1965–1969 Arrivals	5.5	10.1	9.8
1960–1964 Arrivals	6.5	9.2	8.4
1950–1959 Arrivals	4.9	7.1	6.7
Pre-1950 Arrivals	6.2	9.3	8.1

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of households where the household head is at least 18 years of age and does not reside in group quarters.

sistance (see also Leif Jensen 1988). Blau concluded that immigrant households had roughly the same probability of participating in public assistance programs as native households, but that immigrants had lower participation rates when compared to natives who had the same socioeconomic characteristics (such as household composition and educational attainment of the household head).

As with the early studies analyzing the evolution of immigrant earnings, these findings were based on studies of cross-section data sets. Beginning with Borjas and Trejo (1991), recent work analyzes the trends in immigrant welfare participation using synthetic cohorts created by pooling Census cross-sections. The results of this type of research are summarized in Table 12, which uses the 1970, 1980, and 1990 U.S. Censuses to document how immigrant participation in cash-benefit welfare programs changed over the past twenty years.[32] Immigrants were slightly less likely than natives to receive cash benefits in 1970. By 1990, the fraction of immigrant households on welfare was 1.7 percentage points higher than the fraction of native households.

Two distinct factors account for the disproportionate increase in welfare participation among immigrant households. Recent immigrant waves are more likely to use welfare than earlier waves, both relative to natives *and* in absolute terms. In 1970, only 5.5 percent of the most recent immigrant households (i.e., households that have been in the United States fewer than five years) received welfare as compared to 6.0 percent for native households. By 1990, 8.3 percent of the newly arrived immigrant households received public assistance as compared to 7.4 percent of native households. There are, therefore, significant cohort effects in welfare participation rates among immigrants.

In addition, the welfare participation rate for a specific immigrant wave increases over time. Even though only 5.5 percent of the households that migrated between 1965 and 1969 received public assistance in 1970, the welfare participation rate of this group increased to about 10 percent in both 1980 and 1990. Immigrant households, therefore, assimilate

[32] The Census data report participation only in cash benefits programs, such as Aid to Families with Dependent Children (AFDC) and Supplemental Security Income (SSI). The data do not contain any information on participation in noncash programs such as Food Stamps and Medicaid. The statistics are calculated using a 1/1000 random sample of native households in each of the Censuses and a 5/100 random sample of immigrant households (except in 1970 when the immigrant extract forms a 2/100 random sample, and in 1990 when the native extract forms a 5/1000 random sample). The resulting data set contains 1,296,699 observations.

into welfare.[33] This perverse pattern of adaptation might arise because newly arrived immigrants fear that they jeopardize their chances for naturalization if they receive public assistance, or because immigrants learn about welfare programs the longer they reside in the United States.[34]

Not surprisingly, there are huge differences in welfare participation propensities among national origin groups. Table 13 reports the welfare participation rates for selected groups. Only about 2 to 4 percent of the households originating in South Africa, Taiwan, or the United Kingdom receive public assistance, as opposed to 11 to 12 percent of the households originating in Ecuador or Mexico, and nearly 50 percent of the households originating in Laos or Cambodia.

The statistics presented in Table 13 suggest a major "structural shift" between two types of national origin groups. In particular, refugee groups tend to exhibit much higher rates of welfare participation than non-refugee groups. As noted earlier, households originating in Cambodia or Laos had a welfare participation rate of near 50 percent; those originating in Vietnam have a welfare participation rate of 25.8 percent; while those originating in Cuba or the Soviet Union have a participation rate of 16 percent. Moreover, the participation rate of refugee groups remains high even after a decade in the United States. Refugee groups that are typically thought of as being economically successful, such as the pre-1980 Cubans (who migrated prior to the Mariel flow), have a welfare participation rate of over 15 percent in 1990.

The high propensity of refugee households to enter and stay in the welfare system may be the result of government policies which supposedly ease the transition of refugees into the United States. Persons who enter the country as refugees have immediate access to a wide array of social services that neither other legal immigrants nor natives qualify for. The early introduction of refugees to public assistance programs seems to have a profound and long-term impact.

The Census data indicate that not only are the recipiency rates of immigrant households rising over time, but that the dollar costs of immigrant welfare participation are also rising. Table 14 documents that the typical native household on welfare received roughly $4,000 in cash benefits (in 1989 dollars) in all three Census years under study. In contrast, the typical immigrant household on welfare received about $3,800 in 1970, nearly $4,700 in 1980, and about $5,400 in 1990. There are sizable cohort effects in the welfare income received by immigrant households. In 1970, households who had just entered the country and were on welfare received an average of $3,800 in cash benefits. By 1990, the newly arrived immigrant households on welfare received an average of $6,400.

Unfortunately, few studies document immigrant participation in public assistance programs for other host countries. An important exception is the work of Baker and Benjamin (1993), who find that the typical immigrant in Canada had a lower probability of participating in welfare programs than the typical native. In 1991, the typical native household in Canada had a 9.4 percent welfare partici-

[33] Borjas and Trejo (1991) show that immigrant households assimilate into welfare programs even when particular age groups are tracked across Censuses.

[34] Even in 1990, the gap in welfare participation rates between immigrants and natives can be attributed to differences in observable socioeconomic characteristics, such as educational attainment and household composition. In other words, it is not "immigrant-ness" that generates high welfare participation rates in the immigrant population. Rather, it is the socioeconomic characteristics of the immigrant population.

TABLE 13
WELFARE PARTICIPATION RATES IN 1990, BY NATIONAL ORIGIN GROUP

Country of Birth	All Immigrants	Pre-1980 Arrivals
Europe:		
Austria	4.3	4.5
Czechoslovakia	4.9	4.9
France	4.8	5.9
Germany	4.1	4.2
Greece	5.5	5.6
Hungary	5.1	5.1
Italy	5.4	5.6
Poland	5.7	5.9
Portugal	7.1	7.6
U.S.S.R.	16.3	10.1
United Kingdom	3.7	4.1
Yugoslavia	5.3	5.7
Asia:		
Cambodia	48.8	24.4
China	10.4	11.1
India	3.4	4.2
Iran	7.5	4.1
Japan	2.3	3.7
Korea	8.1	8.6
Laos	46.3	34.1
Lebanon	7.3	8.8
Philippines	9.8	10.5
Taiwan	3.3	4.2
Vietnam	25.8	15.9
North and South America:		
Argentina	4.8	5.7
Canada	4.8	5.1
Colombia	7.5	8.9
Cuba	16.0	15.3
Dominican Republic	27.9	29.9
Ecuador	11.9	13.8
El Salvador	7.3	10.2
Guatemala	8.7	11.4
Haiti	9.1	9.7
Jamaica	7.5	8.7
Mexico	11.3	12.8
Nicaragua	7.8	11.8
Panama	9.0	8.7
Peru	5.9	7.8
Africa:		
Egypt	5.5	6.7
Ethiopia	5.9	3.0
Nigeria	3.2	3.3
South Africa	1.6	1.6
Australia	3.7	3.8

Source: Author's tabulations from the 1990 Public Use Sample of the U.S. Census. The statistics are calculated in the subsample of households where the household head is at least 18 years of age and does not reside in group quarters.

TABLE 14
MEAN WELFARE INCOME OF NATIVE AND IMMIGRANT HOUSEHOLDS, 1970–1990
(Calculated in Subsample of Households Receiving Public Assistance, 1989 dollars)

Group	1970	1980	1990
Natives	3,837	4,248	4,017
All Immigrants	3,806	4,662	5,363
Cohort:			
1985–1989 Arrivals	—	—	6,385
1980–1984 Arrivals	—	—	6,571
1975–1979 Arrivals	—	5,228	5,652
1970–1974 Arrivals	—	5,220	4,884
1965–1969 Arrivals	3,830	5,044	4,796
1960–1964 Arrivals	4,144	5,050	4,480
1950–1959 Arrivals	4,402	4,680	4,514
Pre-1950 Arrivals	3,629	4,022	4,262

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census. The statistics are calculated in the subsample of households where the household head is at least 18 years of age and does not reside in group quarters.

pation rate, as compared to only 7.4 percent for the typical immigrant household (Baker and Benjamin 1993, Table 1). The lower propensities of immigrants in Canada to enter the welfare system may be the result of the screen filters which hinder relatively unskilled immigrants from entering Canada (although Baker and Benjamin do not provide any direct evidence to indicate that the point system reduces expenditures in welfare programs).[35]

B. *Do Immigrants Pay Their Way?*

There has been a great deal of discussion in recent years about whether immigrants take more out of the social welfare system than they put in. Jeffrey Passel and Rebecca Clark (1994), for example, conclude that immigrants pay $27 billion more in taxes than they take out of the system, while Donald Huddle (1993) claims that immigration increases the native tax burden by about $40 billion annually.

As with all accounting exercises, these studies make many disputable assumptions which effectively determine the answer to the question. There are, however, a few facts that are directly relevant to the debate and that do not depend on accounting assumptions. Table 15 summarizes the data for the 1970–1990 period. The first row of the table reports the fraction of households in the United States that have an immigrant head. This fraction rose from 6.8 percent in 1970 to 8.4 percent in 1990. Using Census data it is easy to calculate the fraction of immigrant households in the population of "welfare households" (i.e., households that receive public assistance). In 1970, 6.7 percent of welfare households had an immigrant head, so that immigrants were slightly under-represented among welfare households. By 1990, the situation had changed dramatically: 10.4 percent of welfare households had a foreign-born head, so that immigrants were substantially over-represented among welfare households.

The Census data also indicate that in 1970, a total of $14.6 billion in cash benefits was distributed to households; by 1980, this expenditure had risen to $26.8 billion; and by 1990, to $28.6 billion (all in 1989 dollars). The third row of Table 15 reports the fraction of "welfare income" that was distributed to foreign-born households. In 1970, 6.7 percent of cash benefits were distributed to immigrant households, again indicating that immigrant were slightly under-represented in the distribution of welfare benefits. By 1990, the situation had

[35] The evidence also indicates that immigrants in Canada, like their counterparts in the United States, assimilate into the welfare system. Over a 10-year period, the probability of participating in public assistance programs for the typical immigrant in Canada rises by about 5 percentage points (relative to natives).

TABLE 15
IMMIGRANT CONTRIBUTION TO WELFARE EXPENDITURES

	1970	1980	1990
1. Percentage of Households with Immigrant Heads	6.8	7.6	8.4
2. Percentage of Households with Immigrant Heads in Population of Households Receiving Public Assistance	6.7	8.3	10.1
3. Percentage of Public Assistance Income Distributed to Households with Immigrant Heads	6.7	9.1	13.1
4. Percentage of Non–Welfare Income Received by Households with Immigrant Heads	6.3	7.0	8.3

Source: Author's tabulations from the 1970, 1980, and 1990 Public Use Samples of the U.S. Census.

changed drastically: 13.1 percent of all cash benefits were distributed to immigrant households, indicating a substantial over-representation of immigrants in welfare expenditures. Put differently, the total amount of cash benefits received by immigrant households was 56 percent higher than would have been the case if immigrants used the welfare system to the same extent as natives.

Immigrants, therefore, now receive a disproportionately high share of cash benefits. Moreover, they do not receive a disproportionately high share of non-welfare income. In 1990, immigrants received 8.3 percent of all non-welfare income (about the same as their population proportion).[36] Because immigrants do not receive a disproportionately high share of income, they also do not pay a disproportionately high share of taxes.

As noted earlier, accounting exercises that assign a dollar figure to the tax burden imposed by immigration inevitably incorporate a number of hidden and questionable assumptions. Table 16 illustrates the problem by presenting a back-of-the-envelope calculation of the tax burden in 1990. The first row reports that immigrants received $3.7 billion dollars in cash welfare benefits in 1990, or as noted earlier, 13.1 percent of expenditures in cash benefit programs. At that time, expenditures on all means-tested entitlement programs was $181.3 (U.S. Bureau of the Census, 1992, p. 357).[37] If we assume that immigrants also account for 13.1 percent of these expenditures, immigrants increase expenditures on all means-tested entitlement programs by $23.8 billion.

The next step in the calculation is to compute the taxes that immigrants pay. According to the 1990 Census, immi-

[36] Even though the typical immigrant worker earns less than the typical native, immigrants as a group do not have a disproportionately low share of non-welfare income. This discrepancy is explained by the fact that immigrants have larger labor force participation rates than natives.

[37] The means-tested entitlement programs include such programs as Food Stamps, Medicaid, low-income housing assistance, and Head Start. Expenditures on means-tested entitlement programs totaled $186.4 billion. The figure reported in the text nets out expenditures on Indian Health Services and on pensions for needy veterans from the total because few immigrants are likely to qualify for these programs.

TABLE 16
ACCOUNTING OF WELFARE EXPENDITURES AND TAXES PAID BY IMMIGRANT HOUSEHOLDS IN 1990
(in billions of dollars)

	Tax Rate	
	30%	40%
1. Cash Benefits Received by Immigrant Households (= 698, 071 Households x $5,363)	$3.7	$3.7
2. Dollar Value of Benefits from Means-Tested Programs Received by Immigrant Households (13.1% of $181.3 Billion)	$23.8	$23.8
3. Non-Welfare Income Received by Immigrant Households	$284.7	$284.7
4. Taxes Paid by Immigrant Households	$85.4	$113.9
5. Taxes Allocated to Means-Tested Entitlement Programs (8.9% of Taxes Paid)	$7.6	$10.1
6. Fiscal Burden on Native Taxpayers Imposed by Immigrant Households	$16.2	$13.7

Source: Author's tabulations from the 1990 Public Use Sample of the U.S. Census.

grant households received a total income (net of welfare payments) of $284.7 billion. Richard Kasten, Frank Sammartino, and Eric Toder (1993) have recently calculated the federal tax burden for U.S. households at various points in the income distribution. Applying their estimated tax rates to the immigrant income distribution suggests that the federal tax burden for immigrants is on the order of 22 percent. If the total tax rate (including state and local taxes) is 30 percent, immigrant households then pay about $85.4 billion in taxes.

The calculations thus indicate that immigrants pay more in taxes ($85.4 billion) than they take out of the system ($23.8 billion). But this comparison is misleading. It is, in effect, saying that immigrant taxes are only used to fund their use of means-tested entitlement programs. This assumption is justifiable if all other government programs provide pure public goods, so that expenditures in these programs are unaffected by immigration. It is likely, however, that immigrants increase the congestion associated with the provision of many of these public goods (e.g., more crowded parks, schools, and roads). In other words, the marginal cost of providing these public goods to the immigrant population is not zero. Immigrants, therefore, should be charged a user fee for the various government services.

It is obviously very difficult to determine the "correct" user fee schedule for the services provided to immigrants. We do not even know, for instance, if the marginal cost of providing many of the public services to immigrants (such as an expansion of the public school system or the construction of additional roads) is less than or greater than the average cost. Obviously, different assumptions about the marginal cost of providing services will lead to very different conclusions about whether immigrants pay their way in the welfare state. For example, a "revenue-neutral" immigration policy (i.e., one that would neither subsidize nor penalize natives for the provision of government services to the immigrant population) requires that the

average tax rate for immigrants be set equal to:

$$t_i = \frac{\Delta G_i}{Y_i}, \tag{21}$$

where ΔG_i gives the increase in government expenditures attributable to immigration, and Y_i is the income received by immigrants. This tax rate depends not only on the increase in expenditures, but also on the mean income and labor force participation rate of immigrant workers because less-skilled immigrant populations with low rates of work attachment would have to be taxed at a higher rate (for a given increase in government expenditures).

Suppose that the marginal cost of providing services to immigrants equals the average cost and that per capita income in the immigrant population equals that of natives. These assumptions imply that immigrants should be charged for the costs of the various government programs as if they were natives. In other words, if x percent of a native worker's taxes pay for defense, then x percent of an immigrants' taxes should also be allocated to pay for defense. In 1990, 91.1 percent of taxes were used to pay for programs *other than* means-tested entitlement programs. If we charge immigrants 91.1 percent of their tax payments for using these other programs, then only 8.9 percent of immigrants' taxes are left to fund their use of means-tested entitlement programs. As reported in row 5 of Table 16, immigrants would then contribute only $7.6 billion to the funding of the entitlement programs. The annual loss associated with immigration is on the order of $16 billion.[38] As this back-of-the-envelope calculation suggests, therefore, accounting exercises can lead to radically different conclusions about whether immigrants pay their way.

The calculation reported in Table 16 illustrates why the studies of Passel and Clark (1994) and Huddle (1993) reach such different conclusions. Passel and Clark estimate that immigrants pay about $70 billion in taxes, but increase expenditures in such programs as welfare and education by $43 billion, thus generating a "net surplus" of $27 billion. This calculation, of course, assumes that the marginal cost of providing all other programs to immigrants is zero. In contrast, Huddle simply concludes that immigrants pay less in total taxes than they take out of the system. Huddle's calculations, however, assume that immigrants pay only 7 percent of their income in taxes (net of payments to the Social Security system), and overestimate the costs of immigration by claiming that for every six immigrants who enter the country, one native is displaced from his job *and* joins the welfare rolls.

The cost-benefit calculation presented here focuses exclusively on immigrant participation in means-tested entitlement programs. Adding other government programs, such as Social Security, could change the results substantially. For example, it is often argued that immigrants make a net contribution to the Social Security system because many immigrants leave the United States prior to retiring and do not collect benefits, despite their having contributed to the system. It is important to realize, however, that the median age of immigration is 30, so that many immigrants pay into the Social Security system for a much shorter time span than natives, yet collect roughly the same benefits (the benefits

[38] To determine if there is a net benefit from immigration, these fiscal costs must be contrasted with an estimate of the benefits from immigration. Consumers, for example, may be able to buy cheaper goods and employers can hire some workers at lower wage rates. The literature, however, does not provide a systematic accounting of these benefits.

of a person who works for 30 years are not much greater than those of a person who works for only 15 years). Despite the potential importance of the Social Security program for any cost-benefit calculation, no studies exist which incorporate the long-run impact of immigration on the Social Security system.

The calculation also ignores the costs and benefits of providing schooling to immigrant children. The expenditures associated with putting the children through the public school system are substantial. In California alone, it is estimated that roughly $1.7 billion was spent on educating the children of illegal aliens in 1993 (California Department of Finance 1994). These costs, however, must be contrasted with the benefits of having a more educated work force later on in the life cycle. It is also the case that immigrants who enter the United States after they complete their education import "free" human capital into the United States. To the extent that immigrants do not receive their entire product as wages, substantial benefits might accrue from this infusion of human capital.[39]

8. *The Second Generation*

In 1990, 9.7 percent of the U.S. population was native-born with foreign parentage (or "second-generation"). By the year 2050, the share of second-generation persons will increase to 13.9 percent, and an additional 8.5 percent will be composed of the grandchildren of current immigrants (Barry Edmonston and Passel 1992, p. 471). The economic impact of immigration obviously depends not only on how immigrants adapt to the labor market, but also on the adjustment process experienced by their offspring.

The traditional view of this intergenerational adjustment is vividly depicted by the melting pot metaphor. Over the course of two or three generations, immigrants are transformed from a collection of diverse national origin groups into a homogeneous native population. Beginning with Nathan Glazer and Daniel Moynihan (1963), modern sociological research argues that this metaphor does not correctly portray the ethnic experience in the United States. In fact, Glazer and Moynihan (1963, p. xcvii) conclude that "the American ethos is nowhere better perceived than in the disinclination of the third and fourth generation of newcomers to blend into a standard, uniform national type." The revisionist literature suggests that many of the cultural and economic differences among immigrant groups are transmitted to their children, so that the heterogeneity found among today's immigrants becomes the heterogeneity found among tomorrow's ethnic groups.

The modern economic literature on the intergenerational mobility experienced by immigrant households is dominated by two questions. First, is there a significant improvement in economic status between the first and second generations? Second, do the national origin differentials in skills and earnings evident in the immigrant generation disappear over time?

In contrast to the voluminous literature analyzing the economic status of immigrants, few studies document the skills and labor market performance of their American-born children. Early work by Chiswick (1977) and Carliner (1980) used the 1970 Census cross-section to calculate the relative wage of various generations of Americans. The 1970

[39] Calculations conducted in particular localities, such as Los Angeles and San Diego, suggest that the costs imposed by immigration on the criminal justice system can also be substantial. There is, however, little systematic study of the extent to which immigrants participate in criminal activities. John Tanton and Wayne Lutton (1993) report that 20 percent of federal inmates in the United States are non-citizens.

TABLE 17
RELATIVE WAGES OF FIRST AND SECOND GENERATIONS IN 1940 AND 1970
(Percentage Wage Differential Relative to Third Generation)

Variable/Group	1940	1970
Log Wage		
First Generation	20.3	4.0
Second Generation	26.4	16.3
Log Wage, Adjusting for Education and Age		
First Generation	20.6	7.8
Second Generation	26.0	11.7

Source: Borjas (1993a, p. 119). The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

Census data allow the precise identification of first- and second-generation workers.[40] The generation of the remaining workers, who had both parents born in the United States, cannot be determined, but for convenience we will call them "third-generation" Americans. The last column of Table 17 summarizes the evidence provided by the 1970 Census cross-section. Second-generation workers earn about 12 percent more than immigrants and 16 percent more than third-generation workers. Both Chiswick and Carliner concluded that there was a great deal of economic mobility among the ambitious children of immigrants, but that the "hunger" disappeared by the third generation.

This conclusion, however, is premature (Borjas 1993a). In any cross section, the family ties among the three generations identifiable in the data are tenuous. At the time of the survey, many members of the first generation have just arrived in the United States and cannot have any native descendants employed in the U.S. labor market. Second-generation workers can only be descendants of immigrants who have been in the country for at least two or three decades.[41] Therefore, if there are cohort differences among immigrants and if these differences are partially transmitted to their children, the labor market performance of second-generation workers now participating in the labor market (who are the offspring of the immigrant waves that arrived 30 or 40 years ago) cannot be used to forecast the future performance of the children of newly arrived immigrants.

We showed earlier how tracking specific immigrant waves across Censuses yields a rate of wage convergence in the immigrant generation. The intercensal tracking of immigrants and their offspring also yields an estimate of the rate of economic mobility across generations.

[40] The first-generation includes persons born abroad, while the second generation includes persons who had at least one foreign-born parent. Since 1970, the Census does not contain any information on the birthplace of the parents, but instead reports information on a person's ancestry, regardless of parental birthplace.

[41] It is also extremely unlikely that the so-called third-generation workers are direct descendants of the immigrants enumerated in the Census cross-section. The persons identified as members of the third generation form a diverse collection of workers whose presence in the United States may date 40 or 400 years. Moreover, the cross-section comparison requires that working-age immigrants have American-born grandchildren who are also of working age.

TABLE 18
NATIONAL ORIGIN WAGE DIFFERENTIALS AMONG FIRST GENERATION WORKERS IN 1940, AND SECOND GENERATION WORKERS IN 1970
(Percentage Wage Differential Relative to Third Generation)

Country of Origin:	First Generation in 1940	Second Generation in 1970
Austria	32.2	23.5
Canada	28.7	12.1
Cuba	–.4	–2.5
Czechoslovakia	31.9	14.7
Denmark	33.8	12.6
France	25.7	24.6
Germany	21.9	13.7
Greece	–9.8	20.8
Hungary	28.0	22.6
Ireland	23.2	21.7
Italy	17.2	14.7
Mexico	–39.1	–14.9
Netherlands	11.1	17.5
Norway	31.0	15.5
Poland	24.9	16.6
Portugal	5.2	–.3
Romania	34.3	39.1
Spain	6.7	11.2
Sweden	30.0	19.5
Switzerland	21.9	12.4
United Kingdom	37.3	23.1
USSR	31.8	37.7
Yugoslavia	34.9	18.9

Source: Borjas (1993a, p. 124). The statistics are calculated in the subsample of men aged 25–64 who work in the civilian sector, who are not self-employed, and who do not reside in group quarters.

It is likely, for example, that the children of the immigrant stock present in the United States in 1940 show up as second-generation workers in the 1970 Census. The data reported in the first column of Table 17 indicate that immigrants in 1940 earned about 20 percent more than third-generation workers. As we saw earlier, the children of these immigrants, presumably the second-generation workers enumerated in the 1970 Census, earn only about 16 percent more than the third generation. The intercensal tracking thus contradicts the perception that second-generation workers have, on average, higher earnings than the first. There is, instead, a slight regression towards the mean. Because the immigrant stock present in the United States in 1940 had very high wages, the second-generation enumerated in 1970 had relatively lower wages than their immigrant parents.

Table 18 uses the 1940 and 1970 Censuses to document the huge wage differentials across national origin groups in both the first and second generations. In 1970, second-generation Americans of British ancestry earned about 23.1 percent more than third-generation Americans, while second-generation Mexicans earned 14.9 percent less. To measure both the "shift" in economic fortunes between the first and second generations as

well as the correlation in the mean earnings of an ethnic group across generations, it is useful to contrast second-generation Americans in 1970 with the earnings of immigrants in 1940. Let w_{2j} be the average log wage (in 1970) of second-generation Americans in group j relative to that of third generation Americans; and w_{1j} be the average log wage (in 1940) of immigrants in group j relative to that of third generation Americans. Borjas (1993a, p. 125) reports that the regression line relating the relative log wage of these two generations is given by:

$$w_{2j} = \underset{(.017)}{.070} + \underset{(.065)}{.447} w_{1j}, \tag{22}$$

where the standard errors are reported in parentheses and the regression uses the 23 national origin groups listed in Table 18.[42] The intercept reveals a 7 percent increase in earnings potential between the first and second generations that is common to all national origin groups. The empirical evidence, therefore, indicates that second-generation workers do experience a "jump" in their earnings capacity. The data, however, also reveal a strong correlation between the economic status of national origin groups in the first and second generations. The slope estimate of .45 implies that roughly half of the wage differential between any two national origin groups in the first generation persists into the second. There is some regression toward the mean, but national origin is still an important determinant of the earnings of second generation Americans. In fact, if the intergenerational correlation is on the order of .5 and is constant across generations, the evidence suggests that the ethnic skill differentials introduced by immigration will persist into the third generation and perhaps even into the fourth.

The long-run persistence of ethnic differences is evident in a recent analysis of the children and grandchildren of the immigrants who entered the United States at the turn of the 20th Century. Using data drawn from the 1910 Census, Borjas (1994) finds sizable differences in the skills and earnings of the national origin groups that made up the First Great Migration. Using data drawn from the 1940 and 1980 Censuses, and the General Social Surveys, Borjas then shows that there are sizable differences in the skills and earnings of the children and grandchildren of these immigrants. A 20 percentage point difference in the literacy rate between any two groups in the first generation implies a 1-year difference in educational attainment among second-generation workers, and a .5-year difference among third generation workers. Similarly, a 20 percent wage differential between the two groups in the first generation implies roughly a 12 percent differential in the second generation, and a 5 percent differential in the third. Ethnicity matters, and it seems to matter for a very long time.

This conclusion is not consistent with the widespread perception that the correlation between parental skills and children's skills is small and might be on the order of .2 (Gary Becker and Nigel Tomes 1986). Recent work by Gary Solon (1992) and David Zimmerman (1992), however, suggests that measurement error in parental background leads to a substantial underestimate of the correlation in earnings across generations. Correcting for this measurement error increases the intergenerational correlation to between .3 to .4. Because the regression reported in (22) uses the aver-

[42] The regression reported in (22) is based on the data summarized in Table 18. The regression, however, uses a generalized least squares estimator to account for the heteroscedasticity introduced by the sampling error in the dependent variable

age earnings of workers in each group, the relatively high intergenerational correlation between the first and second generations is partly due to the fact that the data net out a substantial amount of measurement error.

Recent work, however, suggests that measurement error alone does not explain the very high correlation in the mean earnings of ethnic groups over time. These studies argue that there are racial or ethnic externalities in the labor market which influence the human capital accumulation of persons belonging to particular racial or ethnic groups (Glenn Loury 1977). Put differently, the rate of intergenerational mobility between immigrants and their children is influenced not only by parental background, but also by the "quality" of the ethnic environment where the children grow up. These ethnic effects increase the correlation in earnings across generations and can substantially delay the convergence of ethnic skill differentials.

A simple formulation of this idea is given by Borjas (1992a), who argues that the average human capital stock in the parental generation for ethnic group j, $\bar{k}_j$, which he calls "ethnic capital," acts as an externality in the production of the human capital of children. The production function for child quality is given by:

$$\text{Child Quality} = f(\text{parental inputs}, \bar{k}_j). \quad (23)$$

The hypothesis that ethnicity has external effects on human capital accumulation has been used widely in the sociology literature. For instance, James Coleman (1988) stresses that the culture in which the individual is raised (which he calls "social capital") can be thought of as a form of human capital common to all members of that group. He argues that social capital alters the opportunity set of workers and has significant effects on behavior, human capital formation, and labor market outcomes. Similarly, in his influential study of the underclass, William Wilson (1987) argues that the presence of mainstream role models in poor neighborhoods serves an important social and economic function.[43]

To determine the relative importance of parental inputs and ethnic spillovers on the intergenerational transmission process, Borjas (1992a) estimated the following regression model in the National Longitudinal Surveys of Youth and the General Social Surveys:

$$y_{ij}(t) = \beta_1 y_{ij}(t-1) + \beta_2 \bar{y}_j\,(t-1) + \varepsilon_{ij}(t), \quad (24)$$

where $y_{ij}(t)$ measures the skills (such as education or wage) of person i in ethnic group j in generation t; $y_{ij}(t-1)$ gives the skills of his father; and $\bar{y}_j(t-1)$ gives the average skills of the ethnic group in the father's generation. All variables are measured in deviations from the mean.

It is easy to show the link between the micro model in (24) and the regression using the mean earnings of ethnic groups in the first and second generations reported in equation (22). Aggregating (24) within an ethnic group yields:

$$\bar{y}_j(t) = (\beta_1 + \beta_2)\,\bar{y}_j(t-1) + \bar{\varepsilon}_j\,(t). \quad (25)$$

The regression estimated in aggregate Census data, therefore, estimates $\beta_1 + \beta_2$. This sum yields precisely the intergenerational transmission coefficient relevant for determining the rate at which the mean skills of ethnic groups converge across generations, or "mean-convergence." If the sum is less than one, ethnic differences converge over time; if not, ethnic differences diverge. The empirical evidence indicates that β_1 is on the order of .2 to .3, and that β_2 is also on the order of .2 to .3, so that the rate of mean convergence is around .4 to

[43] The rapidly growing literature on the determinants of endogenous economic growth also stresses the hypothesis that human capital has external effects in production; see Robert Lucas (1988) and Paul Romer (1986).

.6. There is, therefore, a great deal of persistence in ethnic skill differentials over time, and about half of the persistence is due to the effects of ethnic spillovers on intergenerational mobility.

We cannot yet determine if the ethnic externalities model provides a useful approach for analyzing the long-run economic impact of immigration. Future research will have to specify the precise mechanism through which ethnic and racial spillovers operate, such as neighborhoods, schools, and religious institutions, as well as document the extent to which intra-ethnic contacts influence job search activities, occupational choice, and other labor supply and labor demand decisions.

9. *Conclusion*

The literature investigating the economic impact of immigration on the United States and on other host countries grew rapidly in the past decade. This explosion of research substantially sharpened our understanding of the economics of immigration. The stylized facts that long dominated the discussion over the costs and benefits of immigration were radically altered during the 1980s, and a number of new questions, issues, and perceptions replaced them.

To appreciate the magnitude of this upheaval, consider the perceived wisdom as of ten years ago. The available studies suggested that even though immigrants generally arrived with an economic disadvantage, their economic opportunities improved rapidly over time. Within a decade or two after arrival, immigrant earnings would approach, reach parity with, and overtake the earnings of natives of comparable socioeconomic background. Moreover, there was little evidence to suggest that immigrants had an adverse impact on native employment opportunities. Overall, the empirical evidence painted a very optimistic picture of the contribution of immigrants to the American economy.

In the past ten years, many more brushstrokes were applied to the canvas, and the theme and shape of the picture changed. The new research established a number of new stylized facts: The relative skills of successive immigrant waves declined over much of the postwar period; it is unlikely that recent immigrants will reach parity with the earnings of natives during their working lives; although there is only a weak negative correlation between the presence of immigrants in a local labor market and the earnings of natives in that labor market, immigration may have been partly responsible for the decline in the earnings of unskilled native workers that occurred during the 1980s; the new immigration may have an adverse fiscal impact because recent waves participate in welfare programs more intensively than earlier waves; immigration policy matters, so that host countries which filter applicants in terms of observable skills "attract" immigrants who are more skilled, have higher earnings, and are less likely to participate in public assistance programs; and, finally, there exists a strong correlation between the skills of immigrants and the skills of second-generation Americans, so that the huge skill differentials observed among today's foreign-born groups become tomorrow's differences among American-born ethnic groups.

An important lesson of the recent research is that immigration has a far-reaching and long-lasting impact. In a sense, we are only beginning to observe the economic consequences of the historic changes in the size, national origin mix, and skill composition of immigrants admitted to the United States during the past three decades. The Second Great Migration surely will alter the skill endowment of the labor force, the employ-

ment opportunities of native workers, and the costs of social insurance programs not only in our generation, but for our children and grandchildren as well. In addition, current immigration in the United States and in many other host countries is setting the stage for the ethnic differences in economic outcomes that are likely to be a dominant feature of labor markets in these countries throughout the next century.

In view of the economic, cultural, and political significance of the issues raised by immigration, it is not surprising that immigration policy is now a central ingredient in the debate over social policy in many countries. For the most part, this debate focuses on economic issues and uses the evidence provided by economic research to frame and formulate the discussion. Because the economic impact of current immigration will be felt for many decades to come and because the immigrant flow to many host countries continues unabated, the explosion of research that we witnessed in the past decade is sure to continue.

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