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ABSTRACT
        If U.S. birthrates remain below the replacement level
and are relatively constant, and if immigration is constant both in
total numbers and age-sex composition, population size will
eventually become stationary, according to this policy discussion
paper. Moverover, varying the constant annual number of immigrants
produces an equal proportionate change in the size of the resulting
stationary population. A third, often overlooked factor that can
affect stationary population size is changes in immigrants' ages.
Projections of the 1980 population that assume the admission of
560,000 U.S. immigrants each year show that the ultimate stationary
population contains 14.4 million people if immigrants are admitted
only at ages 50 to 54. But when all immigrants are admitted at ages
10-14, the resulting stationary population is 328.3 million. Thus,
age at admission makes a large demographic difference—in this case,
a size difference of almost 23 to 1. The intuitive reason for the
large difference is that 50-year-old migrants are too old to
contribute descendants born in their new country. Teenage migrants,
on the other hand, contribute not only themselves but also
descendants, and their descendants will in turn further reproduce. To
the degree that national policy wants to use immigration to build up
population size or allow it to decrease, policy could take more
account of immigrants' ages. Data are presented in the text and on
tables and graphs. List of references and related titles are
appended. (Author/KH)

U.S. Immigration Policy,
Immigrants' Ages,
and U.S. Population Size

by

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FOREWORD

Issues concerning the level and composition of immigration to the United States have assumed prominent positions on the agendas of many policymakers. Perhaps nowhere are immigration's effects more keenly felt than in California, where one-quarter of all foreign-born persons in the United States currently reside.

This Policy Discussion Paper series is aimed at improving the quality of the policy-making process through a broad distribution of research findings on the consequences of immigration to California. These dissemination activities are part of The Urban Institute's larger project, Study of the Impacts of Immigration in California, funded by the Weingart Foundation, the Atlantic Richfield Foundation, the Ahmanson Foundation, and the Times Mirror Foundation. Important policy issues being addressed include (a) economic and fiscal issues associated with immigration, (b) the character and tempo of assimilation processes, and (c) the impact on California of proposals for immigration reform. All major immigrant groups to California—not just Mexicans—are being included, as are the comparative effects in northern as well as in southern California.

The Urban Institute's objective is to make a positive contribution to the policy process. It is committed to getting its work into the hands of people who can use it and rely upon it to make judgments of their own on future policy directions. Related titles are listed at the end of this paper.

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U.S. IMMIGRATION POLICY, IMMIGRANTS' AGES, AND U.S. POPULATION SIZE

Executive Summary

It is generally known that, if U.S. birthrates stay below the replacement level and are relatively constant, and if immigration to the United States is constant both in total numbers and in age-sex composition, population size will eventually become stationary. Moreover, varying the constant annual number of immigrants produces an equal proportionate change in the size of the resulting stationary population. What has gone largely unrecognized is the fact that, with the overall number of immigrants fixed, changes in immigrants' ages can also affect the stationary population size.

Projections of the 1980 U.S. population that assume that 560,000 U.S. immigrants are admitted each year show that the ultimate stationary population contains 14.4 million people if immigrants are admitted only at ages 50 to 54. But when all immigrants are admitted at ages 10 to 14, the resulting stationary population is 328.3 million. Thus age at admission makes a large demographic difference—in this case, a size difference of almost 23 to 1.

The intuitive reason for the large difference is that 50-year-old migrants are beyond the childbearing ages and do not contribute descendants born in their new country. Teenage migrants, on the other hand, contribute not only themselves but also descendants, and their descendants will in turn further reproduce. So the number of reproductive years that immigrants have in front of them is a central part of the explanation. To the degree that national policy wants to use immigration to build up population size or allow it to decrease, policy could take more account of immigrants' ages.

U.S. IMMIGRATION POLICY, IMMIGRANTS' AGES, AND U.S. POPULATION SIZE

It is generally known that the continuation of a fixed below-replacement fertility level and a fixed set of mortality rates, in combination with a constant annual number and age-sex composition of immigrants, leads ultimately to a stationary population (Espenshade, Bouvier, and Arthur, 1982). Subsequent research has shown that, everything else the same, altering the constant annual number of immigrants produces equal proportionate variation in the size of the corresponding stationary population (Espenshade and Bouvier, 1982; Espenshade, 1983). What has gone largely unrecognized is the fact that, with overall immigration constant, changes in immigrants' ages can also affect the stationary population size. The purposes of this paper are to illustrate this principle, to explain its theoretical underpinnings, and to discuss some of the tools that are available to U.S. policymakers to influence the ages of immigrants.

The effect on the size of the stationary population of holding total immigration constant and varying immigrants' ages can be illustrated using several hypothetical projections of the U.S. population. To provide a standard for comparison we have first projected the 1980 U.S. population by age and sex assuming that fertility and mortality rates remain constant at their 1980 levels and net migration is constant in absolute numbers and in age and sex distribution at the level for 1983 legal immigration. In 1980 the U.S. total fertility rate was 1.835 and life expectancies at birth were 77.5 years for women and 70.0 years for men. There were 559,800 lawful permanent residents admitted to the United States in 1983--276,200 females and 283,600 males with median ages at admission of 26.4 and 26.0 years, respectively. If

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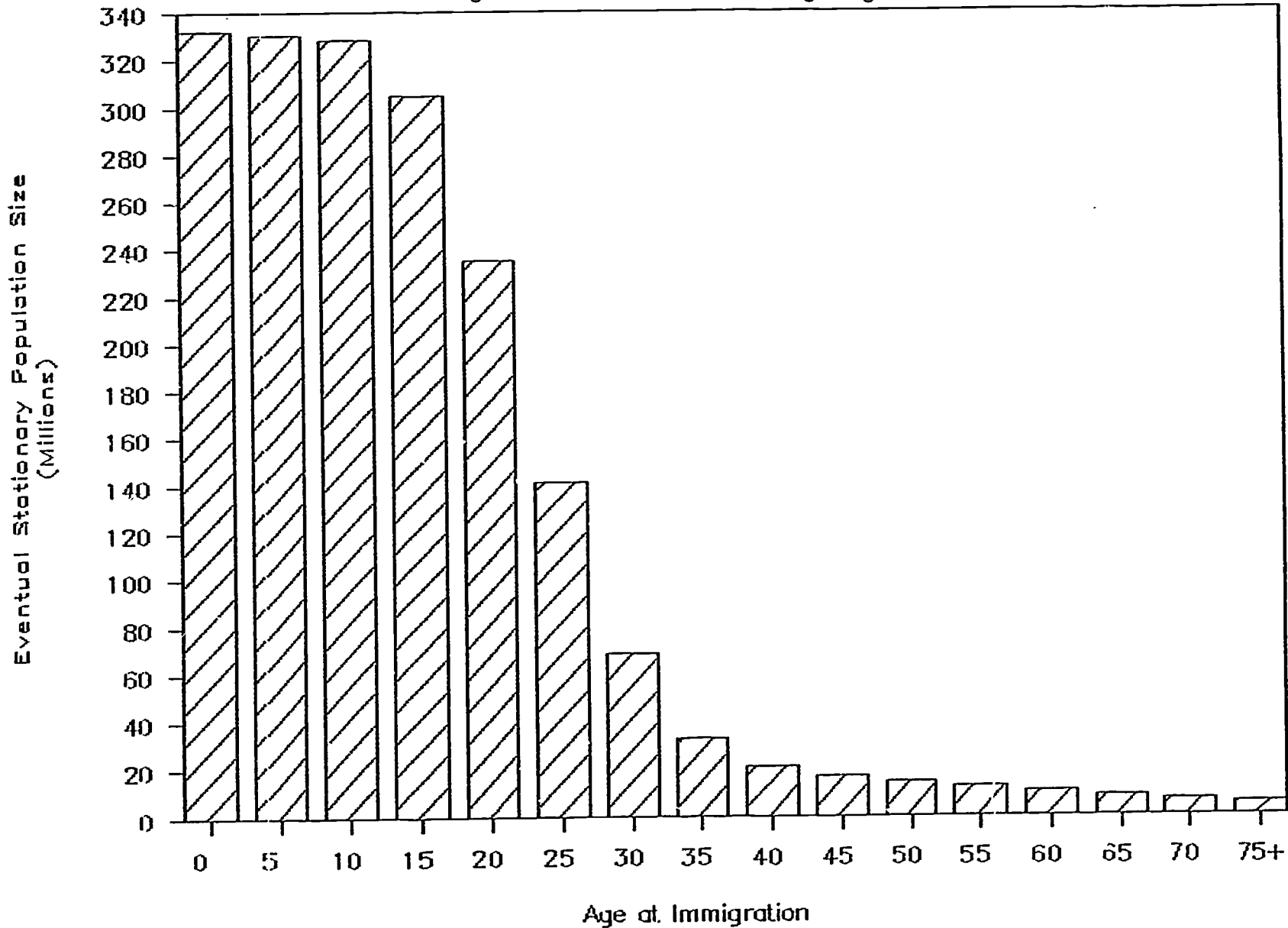these conditions remain constant, total population size eventually becomes stationary at 169.7 million.

Figure 1 shows the resulting pattern of stationary population sizes when this projection is repeated by assuming that all immigrants are concentrated in a single age group (alternately, 0-4, 5-9, ..., 70-74, and 75 years and older). Population size is largest when all immigrants are under five years of age at the time of entry. It declines slowly up to the onset of child-bearing and then falls rapidly through the peak childbearing years. The decline is gradual once again beyond the oldest ages of childbearing, and population size is least when all immigrants are confined to the oldest age group. If immigrants are admitted only at ages 50 to 54, the ultimate stationary population is 14.4 million. When all immigrants are admitted at ages 10 to 14, the resulting stationary population is 328.3 million. Thus age at admission does make a difference demographically and a very large one. Admitting all immigrants at ages 50 to 54 rather than at 10 to 14 makes an ultimate population size difference of almost 23 to 1.

Why should this be so? Why should the stationary population be so sensitive to age at admission? Intuitively, the answer must have something to do with the fact that 50-year-old migrants are beyond the childbearing ages and do not contribute descendants born in their new country. Teenage migrants, on the other hand, contribute not only themselves but also descendants, and their descendants will in turn further reproduce. Intuitively then, the number of reproductive years that immigrants have in front of them must be a central part of the explanation.

We can confirm and clarify these intuitive notions by changing the order of integration and rewriting the expression for total (female) stationary

Figure 1

U.S. Stationary Population Size
if Immigrants are Admitted at a Single Age

Age at Immigration

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population size (N) in Espenshade et al. as

$$N = [e_0/(1-NRR)] \int_0^\omega I(x) \, v(x) \, dx + \int_0^\omega I(x) \, e(x) \, dx \quad , \qquad (1)$$

where e_0 is life expectancy at birth, NRR stands for the net reproduction rate (assumed here to be less than 1), $I(x)$ is the annual number of immigrants admitted at age x, $v(x)$ is the average number of daughters remaining to be born per woman at age x in a cohort of women subject to given fertility and mortality schedules, $e(x)$ is remaining life expectancy at age x, and ω represents the oldest age attained by any individual. The effects of age at admission of immigrants are now clear. The eventual stationary population that results from the immigrant flow consists of two parts: (1) foreign-born immigrants who are still alive (second term on the right), and (2) the future population of descendants of immigrants (first term on the right).

Let us look at these two populations a little more closely. Take the immigrant population first. The term $e(x)$ represents the average length of life remaining to a new immigrant who enters at age x. Alternatively, $e(x)$ can be viewed as the size of an ultimate stationary immigrant population age x and older that the annual addition of one immigrant at age x would ultimately generate. The product $I(x)e(x)$ is the stationary population over age x that $I(x)$ annual immigrants would produce. When these products are added across all possible ages of immigrants, they yield the total stationary population eventually produced by the constant annual flow of $I(x)$ immigrants at each age x.

In the first term in equation (1), $v(x)$ is the average number of daughters remaining to be born for a female immigrant admitted at age x.

Alternatively, once a stationary population of immigrants exists, $v(x)$ may be interpreted as the constant annual number of births attributable to each immigrant woman admitted at age x. The terms $I(x)v(x)$, when added across all ages, yield the total annual number of first-generation native-born daughters of immigrant women. These births in turn each produce NRR additional births in the next (i.e., second) generation, NRR^2 births in the generation after that, NRR^3 in the one after that, and so on. Summing this series for all future generations of native-born descendants of immigrant women is equivalent to multiplying the number of first-generation births by $1/(1-NRR)$. Finally, if one person is born each year in a stationary population, the stationary population ultimately builds up to e_0 in size. So e_0 is a factor that converts births into total population size. Multiplying total native-born descendants of immigrant women by e_0 in equation (1) yields the stationary population of immigrants' descendants.

It is now clear that the age distribution of immigrants is crucial for later population size. As long as $e(x)$ and $v(x)$ have an age gradient, replacing immigrants at ages where $e(x)$ and $v(x)$ are high with the same number of immigrants at ages where they are low will reduce the stationary population size, and vice versa. In low-mortality populations, $e(x)$ reaches a maximum in the first few years after birth and then steadily declines with age until it reaches zero when the maximum age is attained. Similarly, $v(x)$ equals the net reproduction rate when x is zero, and $v(x)$ is zero whenever x is beyond the oldest age of childbearing. Between ages 0 and roughly 45 or 50, $v(x)$ increases slowly to a maximum near the onset of childbearing and then rapidly declines through the peak childbearing years. Because $e(x)$ and $v(x)$ slope downward over much of the relevant age range, increasing immigrants' ages at

admission will typically reduce the ultimate stationary population size. Older immigrants have fewer years left to live in their new country, and a larger part of their childbearing period is already behind them.

In the special case considered in figure 1 in which all immigrants are admitted at one age (x_0), equation (1) may be simplified to

$$N = I \left[\{e_0/(1-NRR)\} \; v(x_0) + e(x_0) \right] , \tag{2}$$

where I is the total number of immigrants. Writing the total stationary population size this way helps to substantiate an earlier claim about the constant ratio between level of immigration and stationary population size when immigrants' ages are held constant. But it also shows that, with total immigration constant and immigration concentrated at one age, varying that age from very young to very old traces out a curve for total population that is a weighted sum of $e(x)$ and $v(x)$. The closer NRR is to 1 the more influence $v(x)$ has in determining population size.

POLICY RELEVANCE

In practice immigrants tend to be admitted at many ages so that, even if immigration policy could influence the age pattern of immigration, results as dramatic as those in figure 1 should not be expected. Nevertheless, because population size is sensitive to immigrants' ages, it is useful to examine some of the ways that U.S. immigration policy might be used to affect the age distribution of immigrants.

First, additional age-related criteria could be incorporated into the existing system for allocating immigrant visas. Immigrant visas to the United States are primarily allocated to facilitate family reunification. The

rationing rules now in use are shown in table 1. Immigrants admitted as lawful permanent residents come in under two categories; those subject to numerical limitation (not to exceed 270,000 annually) and those exempt from numerical limits. A preference system based largely on a potential immigrant's relation to a U.S. citizen or to a permanent resident alien is used to establish eligibility and priorities for entry under the numerical ceiling.

Apart from a reference to parents of U.S. citizens under the heading of numerically exempt immediate relatives, the existing visa allocation system favors reuniting families of procreation over families of orientation, and the immigrants that such a system produces therefore tend to be relatively young. Nevertheless, the median age of legal U.S. immigrants has risen by about two years since 1970 (see table 2). Part of the explanation is that Asians are increasing among legal immigrants, and Asians are bringing their parents with greater frequency than other immigrant groups.[1] In 1976 the upward trend in immigrants' ages received an extra boost when the fifth preference category was revised to require that U.S. citizens had to be at least 21 years of age to bring in their brothers and sisters. The presumably unintentional effect this revision had when it was implemented in January 1977 is evidenced by the sharp break between the 1976 transition quarter (TQ1976)

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[1]In 1986, 45,000 parents of U.S. citizens were admitted under the exempt immediate relatives provision, and about 70 percent of these were Asians. This number is up from 34,000 parents in 1980 and 23,000 in 1978. Between 1985 and 1986 parents of U.S. citizens increased from 6.8 percent of all legal immigrants to 7.5 percent. The median age of parents in both years was 62.2 years. In addition, Cuban refugees increased from 2.5 percent of all immigrants in 1985 to 5.0 percent in 1986. Cuban refugees tend to be older than other immigrants; their median age was 36.3 years in 1986.

Table 1

United States Immigrant Visa Allocation System

I. Numerically Limited Immigrants (270,000)

Preference	Groups Include	Percentage and Number of Visas
First	Unmarried sons and daughters of U.S. citizens and their children	20% or 54,000
Second	Spouses and unmarried sons and daughters of permanent resident aliens	26% or 70,200[a]
Third	Members of the professions of exceptional ability and their spouses and children	10% or 27,000
Fourth	Married sons and daughters of U.S. citizens, their spouses and children	10% or 27,000[a]
Fifth	Brothers and sisters of U.S. citizens (at least 21 years of age) and their spouses and children	24% or 64,800[a]
Sixth	Workers in skilled or unskilled occupations in which laborers are in short supply in the United States, their spouses and children	10% or 27,000
Non-preference	Other qualified applicants	Any numbers not used above

II. Numerically Exempt Immigrants

A. Immediate relatives of U.S. citizens

Spouses; children; parents (of U.S. citizens at least 21 years of age)

B. Special immigrants

Certain ministers of religion
Certain former employees of the U.S. government abroad
Certain persons who lost U.S. citizenship
Certain foreign medical graduates

C. Refugee and asylee adjustments

a. Numbers not used in higher preference may be used in these categories.

Source: U.S. Department of Justice, Immigration and Naturalization Service, 1983 Statistical Yearbook of the Immigration and Naturalization Service, page viii.

Table 2

Immigrants Admitted to the United States by Sex and Median Age,
Fiscal Years 1970-1986

Year	Number of immigrants			Median age		
	Both Sexes	Males	Females	Both Sexes	Males	Females
1986	601,708	300,777	300,931	27.4	27.2	27.6
1985	570,009	286,141	283,868	26.9	26.7	27.0
1984	543,903	274,896	269,007	26.5	26.3	26.8
1983	559,763[a]	271,966	264,975	26.2	26.0	26.4
1982	594,131[b]	287,874	284,576	25.8	25.5	26.1
1981[c]	596,600	–	–	26.0	–	–
1980[c]	530,639	–	–	26.3	–	–
1979	460,348	219,536	240,812	26.3	26.1	26.5
1978	601,442	286,374	315,068	26.2	26.0	26.4
1977	462,315	216,424	245,891	27.1	26.8	27.3
TQ76[d]	103,676	48,283	55,393	25.7	25.6	25.8
1976	398,613	184,863	213,750	26.0	26.0	26.0
1975	386,194	180,741	205,453	25.4	25.4	25.5
1974	394,861	184,518	210,343	24.7	24.8	24.7
1973	400,063	186,320	213,743	25.0	25.2	24.8
1972	384,685	179,715	204,970	25.4	25.8	25.0
1971	370,478	172,528	197,950	25.3	25.8	24.9
1970	373,326	176,990	196,336	25.3	26.0	24.8

a. Includes 22,822 persons of unknown sex.

b. Includes 21,681 persons of unknown sex.

c. Data on sex were not available in fiscal years 1980 and 1981.

d. Refers to the transition quarter, July 1, 1976 to September 30, 1976.

Sources: 1986: unpublished data from the Immigration and Naturalization Service; 1978-1985: U.S. Department of Justice, 1985 Yearbook of the Immigration and Naturalization Service, Tables IMM 4.1 and 4.2; 1974-1977: U.S. Department of Justice, 1977 Annual Report: Immigration and Naturalization Service, Table 10A; 1970-1973: U.S. Department of Justice, 1974 Annual Report: Immigration and Naturalization Service, Table 10A. The median ages reported here for 1970-1977 differ from those tabulated in INS annual reports. The corrected data were provided by Michael Hoefer, Statistical Analysis Division, Immigration and Naturalization Service.

and 1977 of 1.4 years in the median age of immigrants.[2] One might expect that other age-related adjustments to the current preference system could also affect the trend in immigrants' ages.

Second, changing the numerical ceiling of 270,000 in table 1 and the percentages assigned to each of the preference categories might also be expected to influence the age pattern of immigration, because the median age of immigrants admitted under the numerical limits differs from the median age of immigrants exempt from numerical restrictions, and because the median age of immigrants varies according to the particular preference category in which they are admitted.[3]

Third, another approach that could be used to affect immigrants' ages is related to a recent suggestion by Barry Chiswick (1986), who argues that more weight should be given in the selection criteria to the potential productivity of immigrants in the American workplace. He favors replacing the current

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[2]Another element that might have contributed to the discontinuity between 1976 and 1977 concerns the treatment of Cuban refugees. In 1967 and 1968 Cuban refugees to the United States were exempted from numerical limits. Beginning in 1969 they were placed under western hemisphere limitations, but such a pent-up demand developed for U.S. entry that an executive order was signed in 1977 exempting Cuban refugees from limitations and thereby easing the backlog. In 1977, 69,000 Cubans were admitted as legal immigrants, and, because Cubans have an older average age than other immigrants, this factor could have raised the overall median. After 1977, the number of Cuban refugees dropped off sharply.

[3]In fiscal year 1986 the median ages of numerically limited immigrants and numerically exempt immigrants were 26.0 and 28.1 years, respectively. This difference continues a pattern from fiscal year 1985 in which numerically restricted immigrants were roughly two years younger than immigrants exempt from numerical restriction. Among immigrants subject to numerical limits, those in the first, second, and fourth preference categories are typically the youngest. In fiscal year 1986, for example, the median ages of immigrants admitted in these categories were 24.8, 24.4, and 23.7 years, respectively. Immigrants admitted in the third, fifth, and sixth preference categories had median ages of 30.7, 29.0, and 30.6 years, respectively.

preference system that emphasizes family reunification with a point system in which applicants would receive points for schooling, work experience, occupational skills, and other characteristics that would enhance their labor market productivity. Apart from the issue of how age is related to productivity, points could also be awarded for immigrants' ages to favor younger or older immigrants.

Putting aside the specific means of implementation, this analysis shows that, in the United States and other countries where fertility rates are currently below replacement, admitting older migrants makes little difference to population growth provided they are past the childbearing ages. But admitting younger immigrants makes a surprising amount of difference if much of their childbearing is in front of them. To the degree that national policy wants to use immigration to build up population size or allow it to decrease, policy could take more account of immigrants' ages.

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