

## *Social Security and the Emigration of Immigrants*

*by Harriet Orcutt Duleep\**

Each year the Social Security Administration forecasts the financial status of the Old-Age, Survivors, and Disability Insurance (OASDI) programs by projecting trends in key variables such as the labor-force participation and earnings of the U. S. population. In the difficult task of projecting the long-term financial status of Social Security, assumptions are made concerning the relationship of immigrants to Social Security. An important aspect of that relationship is the emigration of immigrants.

This article describes the general assumptions related to the level and timing of emigration that underlie projections of Social Security's financial status and examines how closely these assumptions fit research findings based on a variety of data sources. Previous trends in emigration and factors that may affect current and future levels of emigration are described. The article also presents theoretical expectations and empirical evidence concerning the timing of emigration.

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Over the past decade, more than a third of the Nation's population growth was due to immigration. This influx of new immigrants will have a profound effect on Social Security by affecting the size and composition of the population contributing to and benefiting from the Old-Age, Survivors, and Disability Insurance (OASDI) program. The extent to which immigration influences the Social Security system is affected by the emigration of immigrants. Emigration affects how many immigrants contribute to the system, how long immigrants contribute to the system, and whether immigrants are eventually eligible for Social Security benefits. Although reasonably good estimates of the number of legal immigrants are available on an annual basis from the Immigration and Naturalization Service (INS), little is known about emigration, other than that the vast majority of emigrants are immigrants. This lack of information led the 1991 Advisory Council on Social Security to conclude:

Because of lack of data on emigration and other-than-legal immigration, even present levels of net immigration are only educated guesses that may be far from accurate. (Social Security Administration 1991, p. 33).

This article describes the general assumptions related to emigration that underlie projections of Social Security's financial status and examines how closely these assumptions fit research findings. The first section provides a simplified overview of how immigration enters into the Social Security projections and summarizes the assumptions that are made about the magnitude and timing of emigration. The second section focuses on the magnitude of emigration, first describing previous trends in emigration and then discussing factors that may affect current and future levels of emigration. The following sections focus on the timing of emigration. The first one proposes four hypothetical models of the decision to emigrate and explores the implications of these models for the timing of emigration. The next section sheds empirical light on the timing of emigration. The article concludes with a discussion of the correspondence be-

tween research findings and the assumptions concerning the magnitude and timing of emigration that underlie projections of Social Security's financial status.

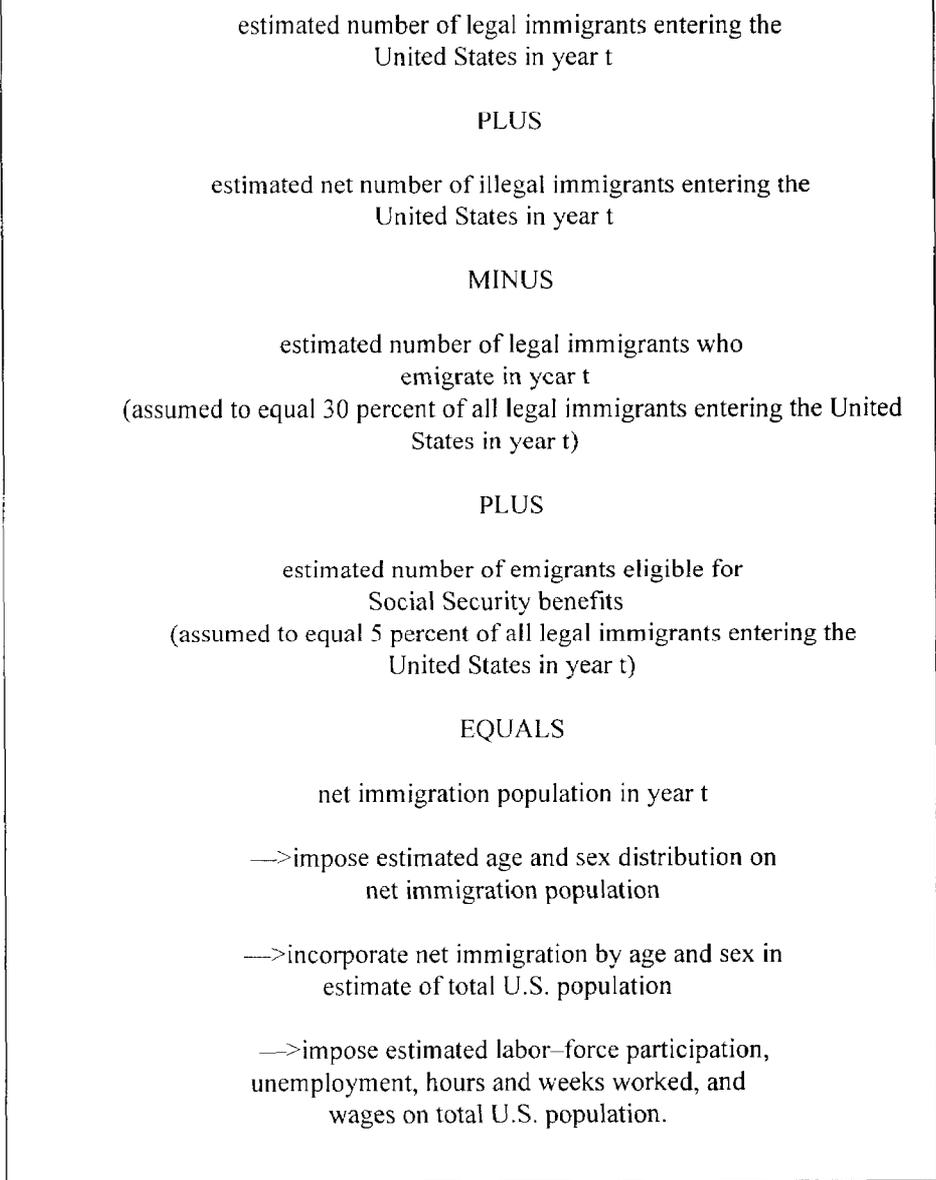
### ***Emigration and Social Security Projections***

Each year the financial status of the OASDI program is forecast by the Social Security Administration by projecting trends in key demographic and economic variables based on historical aggregate trends as well as educated guesses about the likely direction of future trends. Estimated trends in economic variables, such as labor-force participation and earnings, are imposed upon estimated trends in the size of the age- and sex-specific populations that contribute to and benefit from Social Security. Estimates of net immigration are one component of these population projections: they are derived by subtracting from the number of persons who immigrate those who emigrate.

Chart 1 provides a simplified schematic overview of how immigration enters into Social Security projections in a particular year and the assumptions concerning the magnitude and timing of emigration that underlie the actuarial projections of Social Security's financial status.<sup>1</sup> To arrive at an estimate of net immigration in a particular year, Social Security actuaries begin with the estimated number of legal immigrants entering the United States in that year. To this number the estimated net number of illegal immigrants is added. From the resulting total, the estimated number of legal immigrants who emigrate in that year is subtracted. This number is currently assumed to equal 30 percent of the number of legal immigrants admitted in the year.<sup>2</sup>

The resulting number would generally be referred to as net immigration. However, net immigration, from the perspective of Social Security's actuarial projections, is total immigration minus the emigration of all immigrants who emigrate "out of the system." The actuarial projections assume that some of the legal immigrants emigrate after having worked sufficient quarters to be eligible for Social Security benefits. Although

Chart 1.—Schematic overview of immigration in Social Security projections



these immigrants no longer reside in the United States, they are still considered to be part of the Social Security system and are added back into the increase in population due to immigration.

The number of emigrants in a particular year who are assumed to have become insured for current or future receipt of Social Security benefits is assumed to equal 5 percent of the number of legal immigrants admitted in that year. Subtracting 5 percentage points from the emigration rate of 30 percent to account for emigrants who have been in the

United States long enough to be fully insured implies that of those who emigrate, 17 percent (or 5/30) emigrate after becoming eligible for Social Security benefits and 83 percent (100 percent minus 17 percent) leave the United States before becoming eligible for Social Security benefits. As 40 quarters of work in covered employment is typically required today to become fully insured,<sup>3</sup> and most immigrants start to work shortly after coming to the United States,<sup>4</sup> these assumptions roughly translate into assuming that 83 percent of all immigrants who

emigrate do so before residing in the United States 10 years, and 17 percent emigrate after residing in the United States 10 years or more.<sup>5</sup>

Since the emigrants who are assumed to eventually receive benefits are added to the total population upon which labor force and earnings behavior is imposed (chart 1), there is no explicit treatment of potential differences in labor-force variables between these emigrants and the native born (or immigrants who do not emigrate). The work patterns of these emigrants would most closely approximate the native born if they began contributing to the system in their twenties and emigrated close to retirement age.

In a symmetrical fashion, since the 83 percent of all emigrants in a given year who are assumed to emigrate before becoming fully insured are subtracted from the total population prior to the imposition of labor-force and earnings characteristics, there is an implicit assumption that these immigrants leave without contributing to the system. This assumption would most closely approximate reality if immigrants who do not become fully insured emigrated soon after immigration.

In summary, a total of 30 percent of all legal immigrants are assumed to emigrate. Of those who emigrate, 83 percent are assumed to emigrate before having acquired sufficient quarters of coverage to be eligible for Social Security benefits. Since it generally takes 40 quarters to become fully insured, this assumption is approximately consistent with the assumption that 83 percent of those who emigrate leave during their first 10 years in the United States. Seventeen percent of all emigrants are assumed to leave after working sufficient quarters to be eligible for Social Security benefits or, in general, after living at least 10 years in the United States. These emigrants are added to the general population for whom labor-force characteristics are assumed.

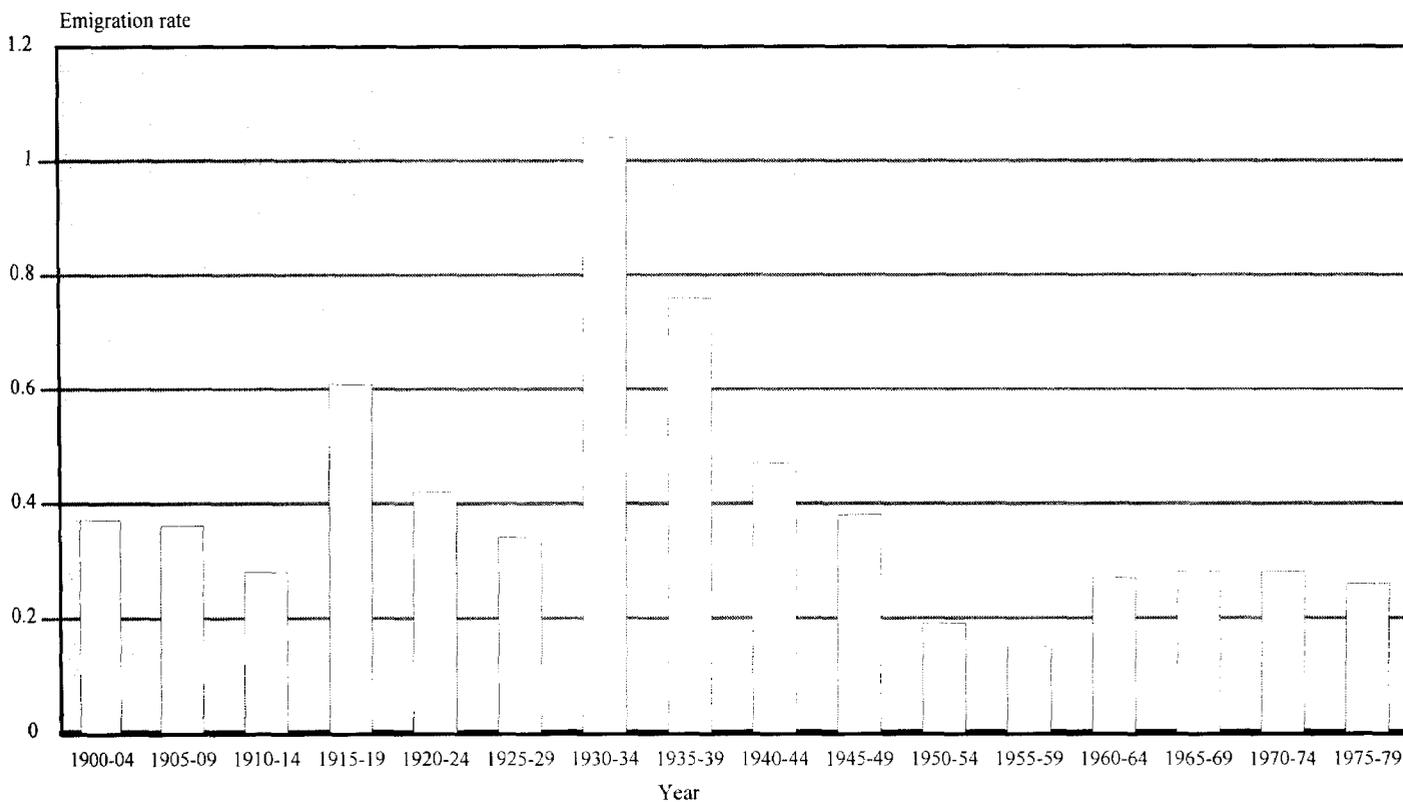
### *The Magnitude of Emigration*

This section and the following one focus on the magnitude and the timing of emigration, weaving together various strands of research, and examining how closely the Social Security assumptions fit the resulting assemblage of research findings.

The basis for the actuarial assumption that the number of all legal immigrants who emigrate in a given year is equal to 30 percent of the number of legal immigrants admitted in the year comes from dividing total legal emigration over a long period of time by total legal immigration during the same time span. Before 1950, the Government collected annual statistics on those who left the United States. Using this record and other sources of information, it was estimated that between 1908 and 1957 some 15.7 million immigrants were admitted for permanent residence and 4.8 million immigrants emigrated (Bureau of the Census 1960).<sup>6</sup> An assumed emigration rate of approximately 30 percent arises, since 4.8 million divided by 15.7 million is 0.3057.

However, rates derived from totals measured over long periods of time may hide volatility. As shown in chart 2, emigration has been far from stable.<sup>7</sup> Over the last century the emigration rate (defined as the number of immigrants who emigrated during a 5-year period divided by the number of immigrants admitted during the same time period) has fluctuated from an all-time high of

Chart 2.—Emigration over time, 1900-79



104 percent in 1930-34, when more people left the country than entered it, to an all-time low of 15-20 percent in the 1950's. This variability underscores the importance of understanding factors affecting emigration in order to more confidently predict the future.

Several considerations suggest that current and future emigration may be lower than emigration in the past.<sup>8</sup> The post-World War II era has been characterized by increasing levels of immigration and by dramatic changes in the composition of immigration.

Prior to the Immigration Act of 1965, U.S. immigration policy was dominated by the national origin system, which allocated visas to countries dependent upon the national-origin composition of the U.S. population in 1920 and excluded almost all Asian immigration. In addition, there was a preference system in place that allocated quota visas among applicants on the basis of occupational skills (Hutchinson 1981); among immigrants from Eastern Hemisphere countries, half of all visas were granted on the basis of occupational skills. Various changes diminished the importance of the national origin system over time, and in 1965 it was replaced by a system that admitted immigrants primarily on the basis of kinship ties and, to a much lesser extent, occupational skills.<sup>9</sup>

Partly due to changes in legislation and partly in response to changing economic opportunities in Europe relative to the United States, recent immigrants come predominantly from Asian and Hispanic countries, which is in marked contrast to earlier immigration, that was dominated by European immigration (table 1). The current country-of-origin composition of U.S. immigration is not expected to change in the foreseeable future (Bureau of the Census (Day) 1992). In general, the countries dominating U.S. immigration are economically underdeveloped countries. Recent immigrants are also primarily admitted to the United States on the basis of kinship ties as opposed to occupational skills.

In addition to profound changes in the country-of-origin composition of U.S. immigration, there has also been a post-1960 growth in refugee admissions.<sup>10</sup> As

Table 1.— National origin composition of immigrant flow: Percent of immigrants by place of origin

Period	Asia	Europe	Canada	Latin America
1941-50 .....	3.6	60.0	16.6	17.7
1951-60 .....	6.1	52.7	15.0	24.6
1961-70 .....	12.9	33.8	12.4	39.2
1971-80 .....	35.3	17.8	3.8	40.3
1981-89 .....	41.6	11.0	2.3	41.9

Source: Immigration and Naturalization Service (1990) pp. 3-4.

Borjas (1990, p. 33) notes, "The fraction of total immigration attributable to refugee admissions increased from 6 to 19 percent between the 1960's and the 1980's and is rapidly approaching the level reached immediately after World War II (25 percent), when a large flow of displaced persons entered the United States."

Summarizing these various trends, David Reimers (forthcoming) writes:

"Historically, most immigrants to the United States have hailed from Europe.... As a result of refugee policies, changes in immigration law and amnesties for undocumented aliens, American immigration patterns have undergone major changes in the last 30 years. The numbers have been steadily up since the end of World War II. About 3 million came in the 1960's, 4 million in the 1970's, and 6 million in the 1980's. Immigration will probably be near 10 million in the 1990's, making it the decade of the largest number of immigrants in American history. And the newcomers...have come from South and East Asia, the Middle East, Mexico, the Caribbean, and South America. European immigration accounted for only about 10 percent of newcomers in the 1980's.... Only 5 percent of immigrants after 1965 came under the occupational categories; the vast majority used the family preference system.... The backlog of persons awaiting an American visa in early 1992 was almost 3 million, mostly in Third World countries. Thus, unless Congress decides to revamp immigration policy again, we will see continued domination of immigration from the same nations that prevailed in the 1980's."

Although research on the determinants of emigration is scant, several findings suggest that the recent trends in the composition and magnitude of immigra-

tion may be accompanied by lower emigration.

Using INS data on immigration, naturalization, and alien address registration, Jasso and Rosenzweig (1990) calculated annual changes in the population of permanent resident aliens between 1960 and 1980.<sup>11</sup> They concluded that, "persons from Europe appear to have the highest propensity to leave the United States, and persons from Asia the lowest, with Western Hemisphere immigrants in an intermediate place" (Jasso and Rosenzweig 1990, pp. 145-146). Studies of interstate migration within the United States and Canada have found that the higher the income and the lower the unemployment rate of the state of origin relative to the current state of residence, the higher the rate of return migration (DaVanzo 1976, and Vanderkamp 1972). Just as the attractiveness or "quality of life" of the place of destination relative to the place of origin has been found to be a key factor motivating migration within the United States (Liu 1975), the attractiveness of the country of origin, in terms of its economic, social, and political climate, likely affects emigration. Immigrants migrating from countries that are relatively less attractive than the United States would be less likely to return to these countries than immigrants migrating from countries that are comparable to the United States. These considerations suggest that changes in the country-of-origin composition of U.S. immigration from European countries to Asian and Hispanic countries and to less developed nations could work to lower emigration rates.

Immigrants to the United States from regions such as Eastern Europe and countries such as Cuba, characterized by high

refugee admissions, have had low emigration rates (Warren 1979, and Jasso and Rosenzweig 1990). Indeed, it is the predominance of refugees during the 1950's that probably accounts for the very low emigration during this period (see chart 2). One would expect the post-1960's rise in refugee admissions to contribute to lower emigration rates as well.

Migration studies suggest that proximity to family and friends is a key factor in the decision to migrate: people tend to migrate towards areas where family and friends are present, and the presence of family and friends in the place of origin discourages migration (Lansing and Mueller 1967, Fabricant 1970, Greenwood 1969, and Nelson 1959). It logically follows that the greater the presence of family and friends in the United States, the lower the likelihood of emigration. Theoretically, the development of kinship-based immigrant communities in the United States (reflecting the predominance of kinship-based admissions) should lower emigration.

A characteristic of recent immigrants is that they are starting at substantially lower earnings than earlier immigrants with similar levels of education (Borjas 1992). Various types of theoretical and empirical evidence suggest that immigrants with low entry earnings, relative to other immigrants, have relatively high earnings growth (Chiswick 1978a, 1978b, 1979; and Duleep and Regets 1992, 1994(a), 1994(b), 1994(c)) and that reductions over time in the entry earnings of immigrant cohorts (defined by country of origin, age, and education) are associated with increases in earnings growth (Duleep and Regets 1994(c)). The high earnings growth of immigrant cohorts with low entry earnings likely reflects high rates of investment following immigration in U.S.-specific skills by immigrants initially lacking such skills. Theoretically, the greater the investment in U.S.-specific skills, the lower the propensity to emigrate since time in the United States would be needed to reap the rewards of the investment. As such, one might expect reductions in the entry earnings of immigrants (within age and education categories) to be associated

with reductions in the propensity to emigrate.<sup>12</sup>

The relationship between the entry earnings of immigrants and their subsequent emigration can be explored by computing the median earnings of immigrants within cohorts defined by year of immigration, country of origin, and age, and then computing the 10-year emigration rate for each cohort by counting how many immigrants are in the same cohort 10 years later using the subsequent decennial census. Using the 1970 and 1980 censuses, the median earnings in 1970 of cohorts of immigrants who entered the United States between 1965 and 1970 were related to their 10-year emigration, as estimated by differences in cohort sample size between 1970 and 1980. This analysis reveals that immigrant cohorts with high entry earnings have higher emigration rates than immigrant cohorts with low entry earnings. The positive correlation between entry earnings and emigration persists within educational categories.<sup>13</sup> An implication of this finding is that the precipitous overtime decline in the education-adjusted entry earnings of immigrants may be accompanied by a lower propensity to emigrate.

The preceding considerations suggest that the emigration rates for today's immigrants are likely to be lower than the historical estimates that guide the assumptions used to project Social Security's financial status. Indeed, the Census Bureau's mid-range population projection for the years 1992 to 2050 assumes an annual immigration of 1,040,000 and annual emigration of 160,000, with an implied emigration rate of 15.38 percent.<sup>14</sup> Underlying the Census Bureau's projections of net immigration is the idea that when immigration is high, emigration rates will be low and when immigration is low, emigration rates will be high. The rationale behind this assumption is that the same factors that attract large numbers of immigrants should logically lead to low propensities to emigrate. Since the Census Bureau's mid-range net immigration projection assumes high immigration, the corresponding emigration rate is assumed to be low.

Many factors likely affect emigration, such as the country of origin, the basis of admission (kinship versus occupational skills), and, particularly, the percent of the immigrant stock that are recent immigrants; since most emigration occurs shortly after immigration, the larger the percent of recent immigrants in the immigrant stock, the higher the emigration rate, other things being equal.<sup>15</sup> However, as shown in chart 3, simply ranking the emigration rates in chart 2 according to the size of total immigration does reveal a general tendency for high levels of immigration to be associated with low emigration rates, as suggested in the Census Bureau's projections. There is also a strong inverse relationship between emigration rates and the number of immigrants in two distinct periods of immigration history—the early 20th-century period of high immigration (1900-24) and the World War II/post-World War II era (1940-59)—as well as the potential beginning of an inverse relationship in the period following the Immigration Act of 1965 (1965-79). As high immigration is expected in the future, the apparent inverse correlation between immigration size and emigration rates provides further fodder for the notion that current and future emigration rates may be relatively low.

### *The Timing of Emigration: Theoretical Expectations*

In addition to the magnitude of emigration, when emigration occurs also affects the contributions that immigrants make to the system. Evidently, the longer immigrants live and earn in the United States, the larger their tax contributions to the system will be. When immigrants leave the United States also affects the likelihood of their subsequently receiving benefits.

Hypothetically, what type of emigration patterns might we expect? One theory of emigration is that the less successful are more likely to emigrate.<sup>16</sup> According to this model, emigrants may be persons who came to the United States with certain expectations that were not met. What are the implications of this model for the timing of emigration? To

the extent that human capital acquired in the United States is not perfectly transferable to the country of origin, the opportunity cost of being in the United States, in terms of foregone investment in the country of origin, would increase the longer an immigrant stayed in the United States. (Forms of human capital investment that may not be completely transferable from the United States to the country of origin include obvious ones such as learning English for an immigrant from a non-English speaking country to more subtle ones such as the formation of work-related contacts.) At the same time, human capital specifically relevant to the immigrant's country of

origin, acquired before migrating, would obsolesce. For both reasons, the cost of a mistaken immigration would increase with time spent in the United States. Accordingly, emigration would be expected to occur soon after immigration. The nonpecuniary costs of emigration would likely rise as well with duration in the United States as attachments to the U.S. home, way of life, and friends grow. These increasing nonpecuniary costs of emigration would also work to make the probability of emigration fall with time in the United States.

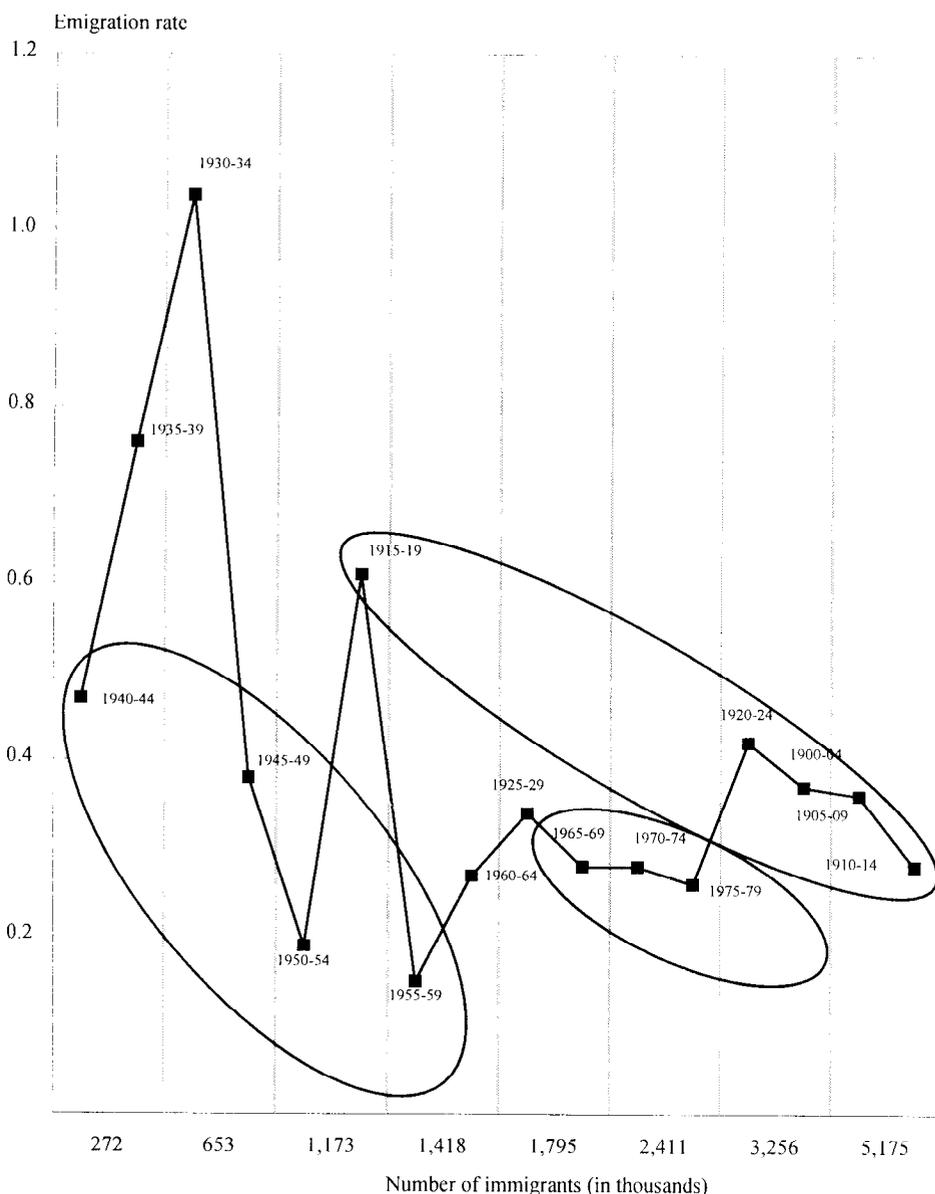
Emigrants may also be individuals who never intended to stay permanently in the United States. Such persons likely

use U.S.-acquired capital and skills to improve their job opportunities and earnings in their country of origin. For instance, knowledge gained and contacts made from a stay in the United States might help a country-of-origin business that markets to the United States. This type of immigration would be of short duration as well since, following an initial adjustment period, the incremental gains in future earnings in the country of origin from additional time spent in the United States would likely decrease, while the costs of being away from the country of origin in terms of obsolescence of country-of-origin human capital would increase.<sup>17</sup> Furthermore, the nonpecuniary costs of being away from one's home country, relatives, and friends would increase the longer an immigrant was in the United States.

The preceding considerations suggest that, in the absence of other factors, emigration would generally occur shortly after immigration and that the probability of emigration would fall with time in the United States.

Social Security insurance is one factor that might delay emigration among persons who never intended to stay in the United States and among persons who want to emigrate after some U.S. experience. Being fully insured under the Social Security system, which is a necessary requirement for most Social Security benefits, requires that a person work a certain number of quarters in Social Security covered employment.<sup>18</sup> For persons who turned 21 after 1950, 40 quarters (which would require a minimum of 10 years, if continuously employed) are required to become fully insured.<sup>19</sup> For persons born earlier, fully insured status generally requires at least one quarter of coverage per year elapsing after 1950 and before the year in which the individual turns 62.<sup>20</sup> An important aspect of becoming fully insured is that it can be achieved at any time during a person's work career and does not necessarily require employment close to the time of benefit receipt. Thus, immigrants could work the requisite number of quarters during their twenties, emigrate in their early thirties, and receive Social Security old-age benefits when they retire

Chart 3.—Immigration and emigration, 1900-79



30 years later in their countries of origin.<sup>21</sup>

The closer an immigrant's duration in the United States was to the required number of quarters of coverage, the more likely that emigration would be postponed until fully insured status was achieved. Accordingly, one would expect a surge of emigration at the number of years in the United States corresponding to the required work period for Social Security fully insured status. Furthermore, one would expect this type of emigration to increase the older immigrants are when they immigrate to the United States, since the present value of retirement benefits increases with age at immigration, while the cost of foregone investments—in terms of staying longer in the United States than would otherwise be optimal—likely decreases with age at immigration.

Alternatively, emigrants might be immigrants who follow a work in the U.S./retire in country of origin model of immigration and emigration. In this model, immigrants have decided it is to their advantage to spend their working lives in the United States. However, upon retirement work-related factors are no longer relevant to the decision as to

where to live. Other concerns, such as a desire to spend one's retirement years in the country of origin or cost-of-living differences between the United States and the country of origin, could dominate. Given these factors, one might expect an increase in emigration with the onset of retirement. Beyond retirement age, emigration would be unlikely since the decision as to where to spend retirement would probably be made to maximize time in that location.

In the work in the U.S./retire in the country of origin model, the probability of emigration at retirement should increase with the age at which immigrants first entered the United States. The younger the age at immigration, the longer the preretirement time period over which nonpecuniary attachments to the United States would strengthen and country-of-origin attachments would weaken. Both factors would make emigration at retirement age increasingly less likely the younger the age of immigration.

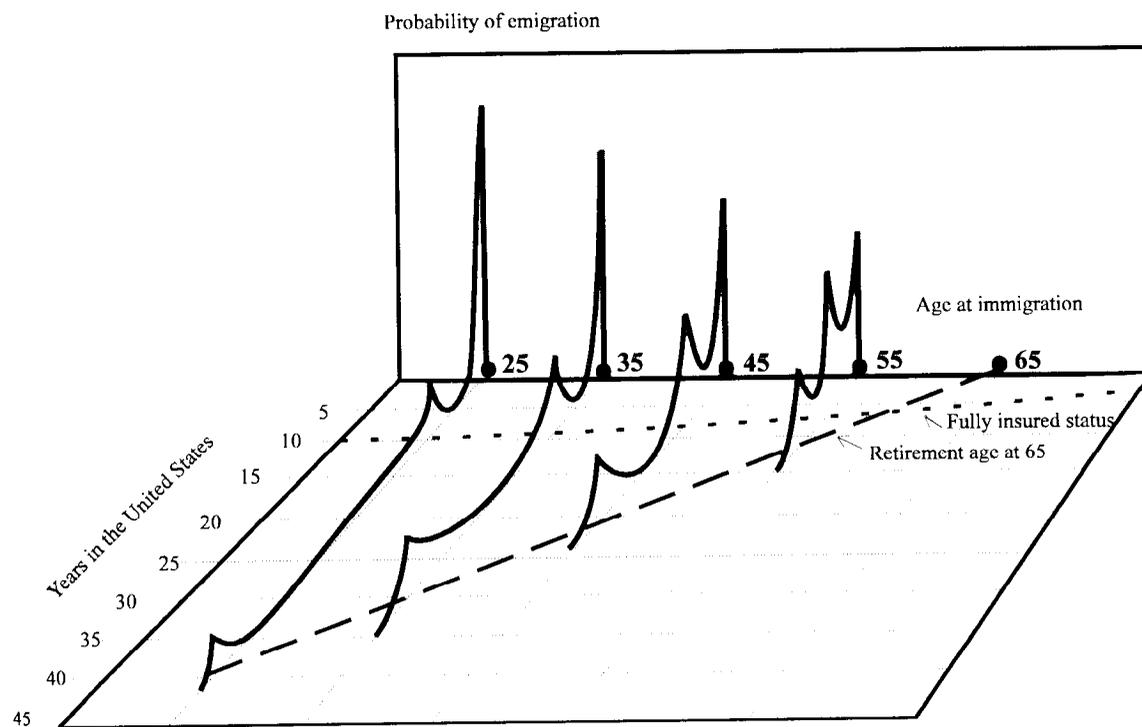
In summary, theoretical considerations suggest that most emigration will occur soon after immigration and that the probability of emigration after achieving Social Security benefit eligibility will increase with the age at which immi-

grants first enter the United States. These theoretical considerations are jointly displayed in chart 4. This chart shows the probability of emigration as a function of years in the United States and age at immigration. The dashed line in the age-at-immigration/years-in-the-U.S. plane delineates the retirement age, assumed to be 65. For example, this line shows that a person who immigrated to the United States at age 25 would reach the retirement age of 65 after 40 years in the United States. The dotted line shows the minimum duration in the United States (given an immigrant's date of birth) required to become fully insured under Social Security.<sup>22</sup> According to theoretical expectations, emigration tends to be concentrated in the first few years after immigration. However, the older the age at immigration, the more likely that immigrants will emigrate after staying in the United States long enough to become fully insured and/or at retirement age.

### *The Timing of Emigration: Empirical Evidence*

By piecing together results from various studies, a sketch of when emigra-

Chart 4.—The timing of emigration: theoretical expectations



tion occurs may be drawn. The next section first examines the distribution of emigrants according to whether they leave the United States before or after 10 years (the minimum time period generally required for Social Security insurance) and the U.S. duration of those who emigrate before 10 years of U.S. residence. Following this, information relevant to the U.S. work patterns of emigrants who worked in the United States long enough to become eligible for Social Security benefits is analyzed.

### ***The Prevalence of Emigration Before 10 Years of U.S. Residence: Insights from INS and Census Data***

During the period 1908-50, the Government collected annual statistics on those who left the United States. Using this record of information, Warren and Kraly (1985) estimated that about 75 percent of the immigrants who emigrated during this period did so in their first 5 years of U.S. residence. If it is assumed that at least an additional 5 percent emigrate after 5-10 years of U.S. residence, then the Warren and Kraly estimate suggests that at least 80 percent of the immigrants who emigrated left the United States before 10 years of residence, and at most 20 percent left after 10 years or more of residence.

For the years following 1950, analysts have had to make comparisons between INS records of legal immigration and census counts of immigrants to infer the amount of emigration. An inherent ambiguity in these estimates is that INS records do not include illegal immigrants, whereas the extent to which census records include illegals can only be estimated.<sup>23</sup>

For the period 1960-70, Warren and Peck (1980) estimated emigration by taking the number of foreign-born persons counted in the 1960 census ( $C_{1960}$ ) and adding the number of immigrants who entered the country between 1960 and 1970 according to INS records ( $I_{1960-70}$ ). The sum ( $C_{1960} + I_{1960-70}$ ) provides an estimate of the number of immigrants that should have been in the

United States in 1970 had no emigration occurred.<sup>24</sup> The amount of emigration that occurred between 1960 and 1970 ( $E_{1960-70}$ ) is then calculated by subtracting the number of foreign born counted in the 1970 census ( $C_{1970}$ ) from the number of foreign born that should have been in the country in 1970 in the absence of emigration, or  $E_{1960-70} = (C_{1960} + I_{1960-70}) - C_{1970}$ .

By using information from the 1970 census as to when immigrants entered the country, Warren and Peck were able to estimate the 1960-70 emigration of two groups of immigrants: immigrants who were in the United States in 1960 and immigrants who entered during the 1960's. Evidence on the timing of emigration is obtained by comparing the emigration rates of these two groups. If the probability of emigration were constant with years of residence in the United States, then the rate of emigration over a 10-year period for the sample limited to recent immigrants (those who entered during the 1960's) should be similar to the rate of emigration for the sample that included longer-term immigrants (those who were in the United States in 1960).<sup>25</sup> Warren and Peck found that the emigration rate is much higher for the sample limited to recent immigrants. For men aged 25-64 in 1960 who immigrated to the United States between 1960 and 1970, the emigration rate was 22.1 percent. This compares to a rate of 4.1 percent for the sample of foreign-born men of the same age group who were in the United States in 1960, and thus included immigrants who were both recent immigrants in 1960 as well as long-term residents. The much higher emigration rate for the sample that is limited to recent immigrants suggests that emigration is concentrated in the first 10 years of U.S. residence.

If we assume that 4.1 percent is the emigration rate of immigrants who have been in the United States 10 years or more and 22.1 percent is the emigration rate of immigrants who have been in the United States less than 10 years,<sup>26</sup> then this suggests that a total of 25.3 percent of a cohort of immigrants may emigrate at some point.<sup>27</sup> Using this as our esti-

mated total emigration rate suggests that about 87 percent (22.1/25.3) of all emigrants leave the United States before 10 years of residence, and 13 percent leave after 10 years of residence.

Borjas and Bratsberg (1990) estimated emigration for the period 1970-80. They compared the number of immigrants who entered between 1975 and 1980, according to INS statistics, with the number of immigrants recorded in the 1980 census who reported having entered the United States between 1975 and 1980. Adjusting for expected mortality during 1975-80 and subtracting the 1980 census count from the 1975-80 INS count provides an estimate of the number of 1975-80 immigrants who emigrated in their first 5 years of U.S. residence. Borjas and Bratsberg found that 17.5 percent of the immigrants who entered the country during 1975-80 had emigrated by 1980. They also compared the number of immigrants, reported by INS, who were admitted to the United States between 1970 and 1980 with the 1980 census count of immigrants who reported having immigrated in the last 10 years. This comparison indicated that 21.5 percent of the 1970-80 entrants had emigrated by 1980.

If we assume that the cohort of immigrants entering the United States during 1970-74 experienced the same emigration rate during their first 5 years as did the 1975-80 cohort, then this suggests that roughly 17.5/21.5, or 81 percent, of those who emigrate within the first 10 years do so within the first 5 years. According to Warren and Kraly (1985), emigration during the 1970's was about 27 percent of immigration during the 1970's. Using the Warren/Kraly estimate of emigration as an estimate of total emigration for a cohort of entering immigrants<sup>28</sup> and combining it with the Borjas/Bratsberg estimates suggests that 17.5/27 or 65 percent of all immigrants who emigrate do so in the first 5 years of U.S. residence, and 21.5/27 or 80 percent of emigrants emigrate within the first 10 years of U.S. residence.

These analyses provide evidence that emigration is highly concentrated in the initial years of U.S. residence. A major-

ity of the immigrants who emigrate do so within 5 years of U.S. residence, and about 80 percent or more emigrate within the first 10 years. Only 13 to 20 percent of the immigrants who emigrate appear to do so after 10 years. This range encompasses the current actuarial assumption that 17 percent of all emigrants emigrate after becoming eligible for benefits.

Furthermore, these patterns of emigration appear to be stable over time. Given the historical constancy in the percent of all emigrants who leave the United States after 10 years, a better approach in Social Security projections may be to assume that a constant percent of emigrants emigrate after 10 years, rather than assuming that 5 percent of all immigrants emigrate after 10 years. Using the current approach, the percent of all emigrants who leave after 10 years will vary with the emigration rate (assumed to be a certain percentage of the number of legal immigrants admitted during that period). For instance, if the number of emigrants during a given time period was assumed to be 20 percent of the number of immigrants during that time period (instead of the currently assumed 30 percent), then the projected percent of emigrants who emigrate after 10 years would be 5 percent divided by 20 percent, or 25 percent, instead of 17 percent (5/30). If the number of emigrants was assumed to be 35 percent of the number of immigrants, the projected percent of emigrants who emigrate after 10 years would be 14 percent (5/35). Yet, the preceding analysis suggests that the percent of emigrants who leave after 10 years may not systematically vary with the level of emigration. A preferable procedure may be to assume (once the level of emigration has been chosen) that a constant percent of emigrants emigrate after attaining Social Security eligibility.<sup>29</sup> The analytical review presented here suggests that the appropriate percentage of emigrants who eventually receive Social Security benefits is in the neighborhood of the currently assumed 17 percent.

**The Emigration of Social Security Insured Immigrants: Insights from Data on Social Security Retired-Worker Beneficiaries Living Abroad**

Before economic parameters are imposed, the Social Security projections group emigrants who have worked sufficient quarters to become eligible for benefits with the general population. The work histories of these emigrants are not distinguished from the work histories of the native born or of immigrants who do not emigrate. The comparability of the work histories of Social Security insured immigrants who emigrate and the work histories of the native born and immigrants who do not emigrate depends upon the age at which these immigrants first begin to work in the United States and how long they work in the United States before emigrating.

Insights on the U.S. work histories of immigrants who emigrated after becoming eligible for Social Security benefits may be derived from Social Security data that were collected and merged for these immigrants from 1971 through 1976.<sup>30</sup> As most of the retired-worker beneficiaries abroad are foreign born (about 94 percent), these data generally pertain to

immigrants. In 1975 and 1976, most of the U.S. retired-worker emigrants were between ages 62 and 80, with the largest number in the 70-74 age range.<sup>31</sup>

Chart 5 shows the number of retired-worker beneficiaries in 1976 by years since last residence in the United States.<sup>32</sup> Most people who are retired-worker beneficiaries recently lived in the United States before retiring abroad. Indeed, in 1976, 80 percent of the retired-worker beneficiaries last lived in the United States less than 14 years prior to 1976. Since all persons who were retired-worker beneficiaries in 1976 were at least 62 (the minimum age for retirement benefits), this suggests that, at most, 20 percent of this retired-worker population had worked in the United States and then emigrated before the age of 48.<sup>33</sup> Ninety percent of all retired-worker beneficiaries last lived in the United States less than 20 years prior to 1976. Accordingly, at most, 10 percent had worked in the United States and emigrated before the age of 42, or 20 years before the earliest retirement age. These statistics suggest that it is very unlikely for immigrants entering the United States at the beginning of their working careers to emigrate shortly after becoming fully insured.

Chart 5.—Number of retired-worker beneficiaries by years since last residence in the United States

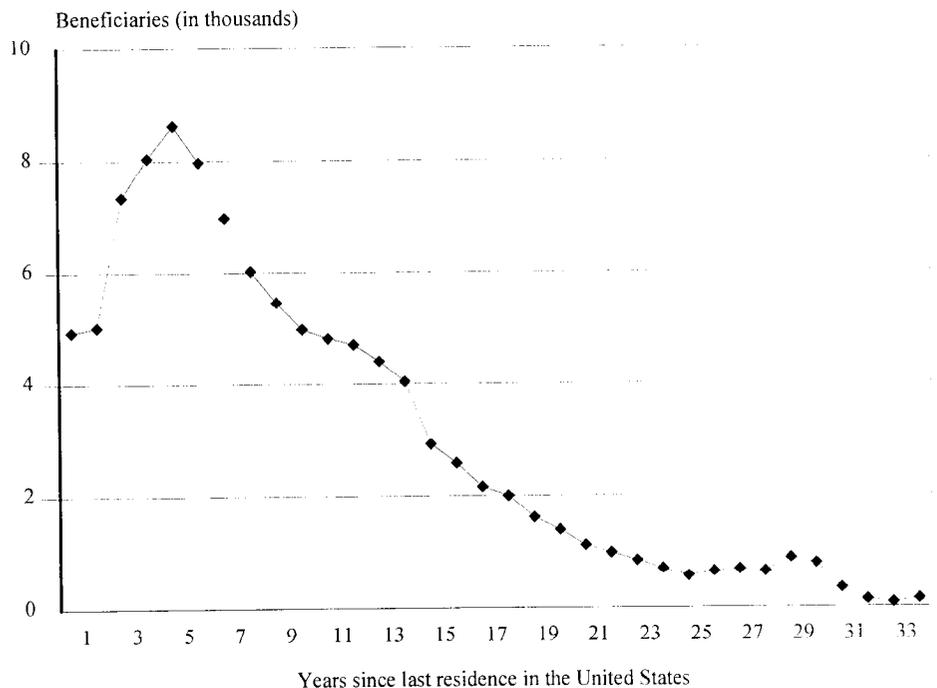
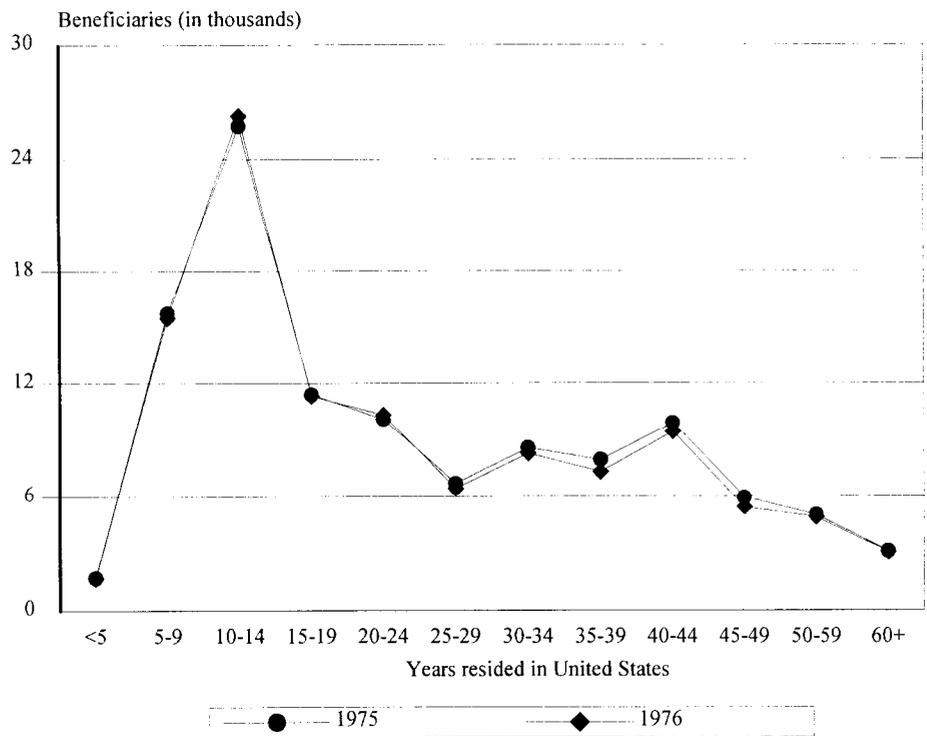


Chart 5 also shows that after 5 years the number of retired-worker beneficiaries tends to decrease monotonically as the years since last residence in the United States increase. To the extent that retired-worker beneficiaries abroad are composed of persons who emigrate soon after becoming fully insured, the inverse relationship between number of retired-worker beneficiaries and years since last residence in the United States is consistent with the theoretical expectation that the importance of becoming fully insured to the emigration decision increases the older an immigrant's age at immigration.

Using data from 1975 and 1976, chart 6 shows the distribution of retired-worker beneficiaries living abroad by the number of years they resided in the United States.<sup>34</sup> For retired-worker beneficiaries who lived at least 10 years in the United States, the pattern shown in chart 6 suggests that emigration becomes less likely the longer an immigrant resides in the United States.

Since most retired-worker beneficiaries leave the United States at older working ages,<sup>35</sup> 65 minus the number of years resided in the United States provides a rough proxy for the ages these immigrants entered the United States. Using this approximation, the inverse relationship shown in chart 6 between the number of retired-worker beneficiaries and years resided in the United States suggests that emigration at retirement increases with the age at immigration. We would expect, however, a smoother and more pronounced increase with age at immigration in the probability of emigration (which takes into account the total population of immigrants by age at immigration) than is implied by the relationship between the number of emigrants and years resided in the United States shown in chart 6. This is because immigration is relatively high at young ages, reaching a peak at ages 25-29 (which roughly corresponds to the 40-44 years resided in the United States category in chart 6), and then dramatically decreases with age. Thus, dividing the number of emigrants in chart 6 by the size of the corresponding age-of-immi-

Chart 6.—Retired-worker beneficiaries living abroad by years resided in the United States



gration cohort to obtain emigration rates will accentuate the positive relationship between emigration at retirement and age of immigration.

Chart 7 shows the relationship between the proxy age of immigration and the probability of being fully insured and emigrating at retirement age.<sup>36</sup> According to chart 7, it is very unlikely for an immigrant entering the United States in his or her twenties to work until retirement and then emigrate. As anticipated, the older the age at which a person immigrates to the United States (until the late fifties), the more likely he or she will emigrate upon retirement.

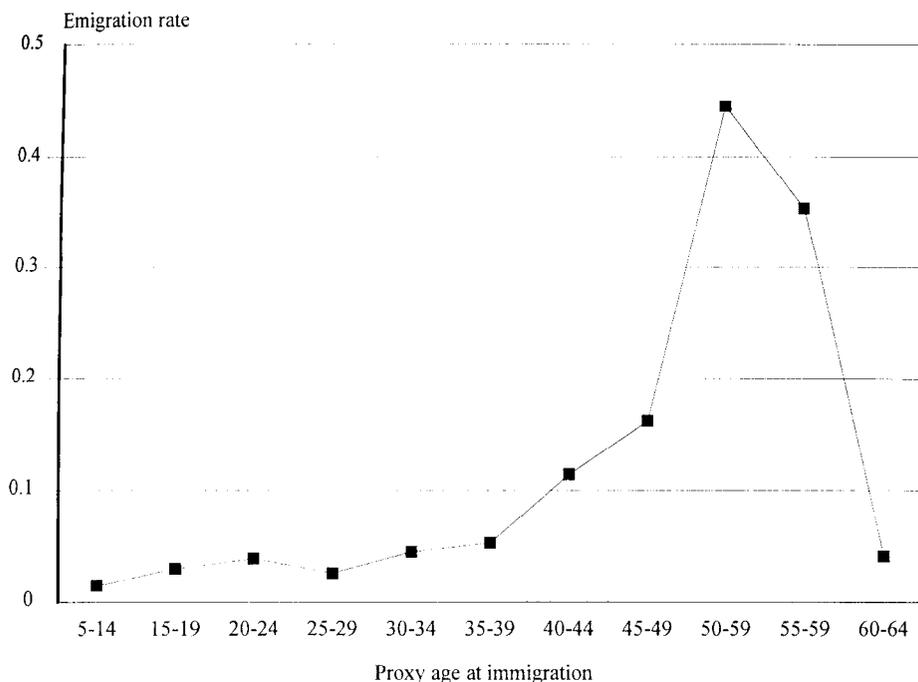
The apparent increase in emigration at retirement with age of immigration shown in chart 7 is consistent with the theoretical implications of the work in the U.S./retire in country of origin model of emigration presented earlier in which the probability of emigration at retirement increases with age at immigration. Yet, if this model explained the emigration behavior of all retired-worker beneficiaries, we would not expect to see a spike in chart 6 at 10-14 years resided

in the United States. This spike suggests that obtaining eligibility for Social Security benefits is a factor in the timing of emigration from the United States.<sup>37</sup> Combining the concentration of retired-worker beneficiaries at 10-14 years resided in the United States with the evidence in chart 5, indicating that it is very unlikely for immigrants entering the United States at the beginning of their work careers to emigrate shortly after becoming fully insured, suggests that the importance to the emigration decision of becoming fully insured likely increases with age at immigration.

In summary, the evidence on retired-worker beneficiaries suggests the following conclusions:

- It is unlikely that immigrants entering the United States as young adults will work just sufficiently long enough to be eligible for Social Security benefits and then emigrate.
- The longer immigrants reside in the United States, the less likely they will emigrate.

Chart 7.—The probability of emigrating at retirement age and being fully insured, by age at immigration (approximated relationship)



- As the age at immigration to the United States increases, the more likely immigrants will emigrate at retirement age.
- Obtaining eligibility for Social Security insurance influences the timing of emigration; its importance appears to increase with the age at immigration to the United States.

Various recent changes in legislation, such as legislation denying benefits to dependents who have never resided in the United States and the growth in totalization agreements,<sup>38</sup> could have affected the U.S. work patterns of emigrants who are eligible for Social Security benefits. It is also possible that the availability of benefits for older workers not requiring 40 quarters of coverage, which is no longer relevant to today's entering immigrants, had an important effect on these patterns as well as historical changes in the work period required for Social Security insurance and the minimum age at which persons can receive retirement benefits.<sup>39</sup> These and other changes underscore the importance

of further research with more recent data on the residence and work patterns of retired-worker beneficiaries living abroad.

Social Security projections do not distinguish between the work histories of emigrants who leave the United States after becoming fully insured and the work histories of the native born or other U.S. immigrants. The statistics on retired beneficiaries living abroad reveal that most of the retired-worker beneficiaries are in their seventies, most lived in the United States recently, and most were in the United States for less than 15 years. Combining these three pieces of information suggests that the majority of immigrants who emigrate after becoming eligible for benefits immigrated to the United States relatively late in their working careers, which is in marked contrast to the majority of immigrants who enter the United States at younger working ages. Barring further study with more recent data, it would appear that the U.S. working lives of immigrants who emigrate after becoming fully insured tend to be much shorter than the working lives of the native born and of immi-

grants who do not emigrate. This conclusion was also reached in a General Accounting Office (GAO) analysis of 313 beneficiary accounts randomly selected from all accounts of beneficiaries who live abroad on which payments were being made in 1981. Based on this sample, the average alien retired- or disabled-worker beneficiary living abroad in 1981 had earned about 39 quarters of Social Security credits, corresponding to approximately 9.8 years of Social Security-covered employment. For comparison with the Social Security beneficiary population at large, the GAO report noted that, "The average Social Security beneficiary in 1978 had earned 82 quarters of Social Security credits, or an equivalent of 20.5 years of [Social Security] employment." (General Accounting Office 1983, p. 8.)

### Conclusion

Each year the Social Security Administration forecasts the financial status of the OASDI programs by projecting trends in key variables such as the labor-force participation and earnings of the U.S. population. In the difficult task of projecting the long-term financial status of Social Security, assumptions are made concerning the relationship of immigrants to Social Security. This article has focused on an important aspect of that relationship: the emigration of immigrants.

Actuarial projections of the financial status of Social Security assume that 30 percent of all legal immigrants emigrate. This assumption comes from dividing total emigration over a long period of time by total immigration during the same time span. Yet, the historical record of emigration has been far from stable. This variability underscores the importance of understanding factors affecting emigration in order to more confidently predict the future. In forecasting the future financial status of Social Security, three alternative projections are made that incorporate demographic and economic assumptions which are, to varying degrees, more or less favorable

to Social Security's financial status. The same emigration rate is assumed in all three projections.

There are, however, several factors that suggest that the emigration rate of the future may be lower than the emigration rate of the past. In general, emigration rates are high for immigrants from economically developed countries, such as Western European countries that previously dominated U.S. immigration, and low for immigrants from Third-World countries that currently dominate U.S. immigration. Refugees have had consistently lower emigration rates than non-refugees. Recent immigration has been dominated by kinship-based admissions; the development of kinship-based immigrant communities should, theoretically, inhibit emigration. Recent immigrants also appear to be investing more heavily in U.S.-specific human capital than previous cohorts of immigrants; higher investment in U.S.-specific skills should be associated with a lower propensity to emigrate. Changes in the country-of-origin composition of U.S. immigration, the post-1960 rise in refugees, a possible increase in kinship-based immigrant communities, and the apparent increase in immigrant investment in U.S.-specific skills are factors that may result in lower emigration rates than the historical estimates that guide the assumptions underlying projections of Social Security's financial status.

In addition to the magnitude of emigration, the timing of emigration affects Social Security's financial status. The longer immigrants live and earn in the United States, the larger immigrant tax contributions to the system will be. When immigrants leave the United States also affects the likelihood of their subsequently receiving benefits. Forty quarters of work in Social Security covered employment are typically required in order to be fully insured. Thus, whether immigrants emigrate before or after 10 years is of considerable interest.

The actuarial projections assume that 17 percent of the immigrants who emigrate do so after becoming eligible for Social Security benefits. The analytical

review presented in this article bolsters the current actuarial assumption as it suggests that the percentage of emigrants who emigrate after 10 years is in the range of 13-20 percent.

In the Social Security projections, the work characteristics of emigrants who leave after becoming fully insured are not explicitly distinguished from those of immigrants who do not emigrate or from those of the native born. The work patterns of these emigrants would most closely approximate the native born if they began contributing to the system in their twenties and emigrated close to retirement age. However, based on an analysis of data on Social Security retired-worker beneficiaries living abroad, it would appear that unlike most adult immigrants, who enter the United States at the beginning of their work careers, immigrants who emigrate after becoming fully insured generally enter the United States at relatively late ages and then emigrate close to retirement age, 10 to 15 years later. As such, their U.S. work patterns and tax contributions to the Social Security system are quite distinct from those of the native born and from those of immigrants who do not emigrate.

Since the emigrants who are assumed to emigrate before becoming fully insured are subtracted from the Social Security population prior to the imposition of labor-force and earnings characteristics, there is an implicit assumption in the Social Security projections that these immigrants leave without contributing to the system. This assumption is consistent with the findings of the analytical review in so far as most immigrants who leave before 10 years appear to emigrate within the first 5 years of U.S. residence.

These conclusions are based on a coarsely woven net of various strands of research, audacious assumptions, and rough approximations. A clearer understanding of the emigration behavior of immigrants requires more research with better data.

The 1991 Advisory Council on Social Security concluded that even estimates of present levels of net immigration may be

far from accurate because of a lack of knowledge concerning emigration and illegal immigration. This article has focused on the emigration of immigrants. It should be noted, however, that better estimation of the size of the illegal population is intimately related to improvements in the ability to measure emigration. As explained by Jasso and Rosenzweig (1990, p. 123):

...studies of the number of illegal foreign born have for the most part made use of information on the changes in the size of the population of the foreign born to infer the size of the illegal population or its growth rate. But, apart from legal immigration and deaths (which are either counted in administrative data or which can be accurately predicted), the foreign-born population will change its size because of both the entry of illegal aliens and exits by the foreign born, neither of which have been recorded in any administrative data since 1957. Counting the illegal population thus requires an estimate of the magnitude of emigration.

The general importance of learning more about emigration was recently stressed in a report by the General Accounting Office (1988, p. 4):

[The] improvement in the ability to measure emigration would provide a more realistic indicator of the long-term effect of immigration to the United States; ...improve the ability to forecast trends in immigration; ...be useful for estimating the rate, size, and distribution of U.S. population growth; ...and improve the ability to estimate the changes in the number of illegal immigrants.

To this list of reasons for improving our knowledge of emigration, improving the ability to forecast Social Security's financial status should be added.

## Notes

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<sup>1</sup> Many important aspects, such as age-sex distributions and the difference between the U.S. population and the Social Security area population, are left out of this schematic overview of the projection process.

<sup>2</sup> Three actuarial projections are made which incorporate three different sets of assumptions about demographic and economic trends. The same assumption about the percent of legal immigrants who emigrate is made for all three projections. Estimates of native-born emigration, about which little is known, are not incorporated in the actuarial projections. Refer to Warren and Kraly (1985) for information on the emigration of U.S. citizens.

<sup>3</sup> If a person is fully insured, most types of Social Security benefits can be paid or provided on his/her Social Security earnings record. (Refer to notes 18 and 19 of this article and to Social Security Administration 1993(a) and 1993(b) for information on the rules determining eligibility for Social Security benefits.)

<sup>4</sup> The labor-force participation of immigrant women is initially lower than that of native-born women but then approaches native-born levels with time in the United States. (Refer to C. Reimers 1985; MacPherson and Stewart 1989; and Duleep and Sanders 1993, 1994(a), and 1994(b). For a review of other relevant studies, refer to Duleep and Sanders 1993.

<sup>5</sup> Generally speaking, it would take 10 years to work 40 quarters assuming no episodes of unemployment or absences from Social Security covered employment. Refer to notes 18 and 19 for more details on how Social Security credits are earned.

<sup>6</sup> For a review and discussion of historical sources of emigration information, refer to Warren and Kraly 1985.

<sup>7</sup> The numbers that underlie chart 2 are from Warren and Kraly 1985.

<sup>8</sup> Lack of information prevents us from even knowing what current emigration rates are.

<sup>9</sup> Spouses, minor children, and parents of U.S. citizens were admitted without regard to numerical limitations. Of the numerically restricted visas, 80 percent were reserved for the adult children and siblings of American citizens (as well as their spouses and children) and for the spouses and children of legal, permanent resident aliens. Only 20 percent of the 270,000 numerically restricted visas were allocated to applicants on the basis of their occupational skills. The Immigration Act of 1990 increased occupation-based admissions from 54,000 to 140,000 a year. This reform was not sufficient, however, to alter the essentially family-based nature of U.S. immigration.

<sup>10</sup> The increase in refugee admissions has affected the country-of-origin composition of immigrants as well (D. Reimers, forthcoming). Unlike other legal immigrants, refugees do not need to have relatives in the United States or specific occupational skills to qualify for admission. Instead, their admission to the United States is based on the threat of persecution in their country of origin. For a discussion of U.S. refugee policy and a history of relevant legislation, see Bhagwati (forthcoming) and Reimers (forthcoming).

<sup>11</sup> The observed population of permanent resident aliens refers to the number of persons in a given year who reported their addresses to the INS under the Alien Address Report Program. For further details, refer to the appendix of chapter 3 in Jasso and Rosenzweig 1990.

<sup>12</sup> The theoretical argument that posits a positive relationship between entry earnings (adjusted for education) and emigration is three-pronged: (1) low-entry earnings are associated with high-earnings growth; (2) high-earnings growth likely reflects investment in U.S.-specific skills and capital; and (3) investment in U.S.-specific skills and capital should lower the propensity to emigrate.

<sup>13</sup> Chiswick (1980, appendix 4-A) also noted (although for a different analytical purpose) that immigrants in country- or region-of-origin groups with low rates of immigrant earnings growth (as measured by cross-sectional data) tended to have higher rates of return migration than immigrants in groups with high-earnings growth. A problem with using cross-sectional or cohort data to analyze the relationship between estimated earnings

growth and emigration is that estimates of immigrant-earnings growth may be affected by emigration. A rigorous test of the relationship between immigrant-earnings growth and emigration will have to await analysis with longitudinal data on individual immigrants.

<sup>14</sup> The high net immigration projection assumes an annual immigration of 1,470,000 and annual emigration of 100,000, with an implied emigration rate of 6.80 percent. The low net immigration projection assumes an annual immigration of 610,000 and annual emigration of 259,982, with an implied emigration rate of 42.62 percent (Bureau of the Census (Day) 1992, pp. xi, xxvii). These projections include both legal and illegal immigration.

<sup>15</sup> Ideally, the Census Bureau's hypothesis should be tested in a multivariate framework. In addition, the hypothesis that emigration rates will be low when immigration is high might be more appropriately tested by either including the size of the U.S. population as an explanatory variable in the estimating equation or by using the number of immigrants relative to the U.S. population as an explanatory variable instead of the absolute number of immigrants.

<sup>16</sup> Yezer and Thurston (1976) first proposed this theory of return migration in a study of migration within the United States.

<sup>17</sup> Note that this type of immigration could also lead to frequent entries of short duration into the United States.

<sup>18</sup> "The Social Security Administration determines if a person has fully insured status, currently insured status, or insured status for establishing a period of disability by the number of Social Security credits earned. Social Security credits, previously called quarters of coverage, are earned for a certain amount of work covered under Social Security.... Even though insured status is required before the payment of any type of benefit and establishment of a period of disability, a fully insured status is only one requirement for determining whether a particular benefit will be paid or provided. It does not mean that all types of benefits can be obtained on the person's Social Security record, nor does it have anything to do with the amount of benefits that can be paid." (Social Security Administration 1993(a), pp. 25-26). Refer to Social Security Administration 1993(a),

pp. 30-32 for a table showing the type of insured status required for each type of Social Security benefit.

<sup>19</sup> The expression "continuously employed" is somewhat loosely used here. Social Security credits are earned by working at a job covered by Social Security. In general, to earn a credit in a calendar quarter for years prior to 1978, the individual must be paid \$50 or more in wages in that quarter for covered employment or credited with the maximum taxable wages for that year. (For rules covering self-employment and agriculture labor for years prior to 1978, refer to Social Security Administration 1993(a), pp. 32.) For years after 1977, the amount of annual wages or self-employment income necessary to acquire a specified number of quarters of coverage is determined by a formula that reflects national percentage increases in average wages (Social Security Administration 1993(a), pp. 32-33). For further details on the rules determining how credits are earned, refer to Social Security Administration 1993(a), pp. 32-35.

<sup>20</sup> The decreasing number of required quarters with earlier birth years is to accommodate the shorter potential working life under covered employment for persons who were already in the work force when the Social Security system was initiated. For more detail on the current and past rules governing eligibility for Social Security benefits, refer to Social Security Administration 1993(a) and 1993(b).

<sup>21</sup> This contrasts with Disability Insurance, which requires recent employment to be eligible for benefits.

<sup>22</sup> This line is drawn assuming continuous employment and as if all of the immigrants entered the United States in 1970. The later the assumed year of immigration, the more the broken line would approach a straight line at 10 years in the United States.

<sup>23</sup> Studies estimating the size of the illegal immigrant population include Passel and Robinson (1987) and Warren and Passel (1987).

<sup>24</sup> This description is a highly simplified account of the Warren and Peck (1980) methodology. For instance, in addition to adjusting for expected mortality, Warren and Peck adjust for the net migration of foreign-born students and differences between the 1960 and 1970 censuses in census undercount.

<sup>25</sup> In actual fact, the 1960-70 emigration of immigrants who entered the United States during the 1960's measures emigration over a period of 10 years or less.

<sup>26</sup> The figure of 4.1 percent overestimates the emigration rate of immigrants who have resided in the United States 10 years or more, since immigrants who had recently immigrated were included in the 1960 population for which this rate was computed.

<sup>27</sup> The total emigration rate is calculated in the following way:  $0.221 + 0.041(1 - 0.221) = 0.253$ . To arrive at a total emigration rate requires assuming that the emigration of a cohort of immigrants may be approximated by piecing together emigration rates for immigrants who have been in the United States varying lengths of time.

<sup>28</sup> The Warren and Kraly estimate of the emigration rate is derived by dividing the number of immigrants who emigrated during a 5-year period by the number of immigrants admitted during the same time period. An average of their emigration rates for 1970-74 and 1975-79 (0.284 and 0.261, respectively) is 0.27. Warren and Kraly did not intend for their emigration rate estimates to portray the expected total emigration of a given cohort as is done here. To use their estimates in this manner requires two assumptions. One assumption is that there are no year-of-immigration cohort effects in emigration. That is, persons who immigrated during the 1950's, for instance, are assumed to have the same probability of emigrating after a given number of years as persons who immigrated in the 1960's. More troubling is the assumption that the size of entering immigrant cohorts is constant over time. To see that this assumption is required, consider first a cross-sectional estimate of the emigration rate across year-of-immigration cohorts using data that measures whether emigration occurred during 1975-79. The cross-sectional estimate would be computed in the following way: (number who emigrated 0-4 years after immigration/number who immigrated 1975-79) + (number who emigrated 5-9 years after immigration/number who immigrated 1970-74) + (number who emigrated 10-14 years after immigration/number who immigrated 1965-69), and so forth. The Warren-Kraly estimated emigration rate for 1975-79 is computed as (number who emigrated 1975-79/number who immigrated 1975-79), which could also be written as (number who emigrated 1975-79 and who had immigrated 1975-79/number who immigrated 1975-79) + (number who emigrated 1975-79 and who had immigrated 1970-74/number who immigrated 1975-79) + (number who emigrated 1975-79 and who had immigrated 1965-69/number who immigrated 1975-79), and so forth. The Warren/Kraly estimated emigration rate and the cross-sectional esti-

mate would be equivalent if the number who immigrated 1975-79 = the number who immigrated 1970-74 = the number who immigrated 1965-69, and so forth.

<sup>29</sup> Of course, if the assumed emigration rate, as defined earlier, never changes in the actuarial projections, then this suggestion is irrelevant.

<sup>30</sup> The data tabulations that form the basis for this analysis may be found in Social Security Administration (1971-76).

<sup>31</sup> In 1976, 46 percent of the Social Security beneficiaries residing abroad were retired-worker beneficiaries, 3 percent were disabled-worker beneficiaries, 21 percent were the dependents of retired and disabled workers, and 30 percent were survivor beneficiaries.

<sup>32</sup> "Years since last residence in the United States," was tabulated from responses by beneficiary applicants abroad to a question on "last year resided in the United States" on SSA Form 21. This question is no longer included on the form. Data from 1971-75 reveal the same patterns as the 1976 data shown in chart 5.

<sup>33</sup> A majority of retired-worker beneficiaries was at least 70 years of age in the 1976 sample. By assuming all retired-worker beneficiaries were 62 in 1976, these calculations overstate the percent of all retired-worker beneficiaries who had worked in the United States and then emigrated before the age of 48.

<sup>34</sup> SSA Form 21 asks how long Social Security beneficiary applicants abroad resided in the United States. The data for 1971-74, which are in more aggregated year categories, show the same basic pattern.

<sup>35</sup> This is an implication of the recent United States residence of most retired-worker beneficiaries living abroad (chart 5) combined with the fact that all of the retired-worker beneficiaries were at least age 62.

<sup>36</sup> Chart 6 shows the number of retired-worker beneficiaries living abroad by years resided in the United States. Chart 7 takes this information and imposes several assumptions to get some idea of how the probability of emigrating at retirement age and being fully insured likely changes with the age at immigration. First, it is assumed that all of the retired beneficiaries emigrated at age 65. (An implication of the information contained in chart 5 is that most retired beneficiaries emigrated at older working ages.) Using this assumption, the number of retired-worker beneficiaries living abroad by age at immigration can be approximated by using 65 minus

the number of years resided in the United States as a proxy for age at immigration. Determining how the probability of emigration at retirement age likely changes with age at immigration requires taking into account the population of immigrants by age at immigration. This was done by dividing the number of retired-worker beneficiaries living abroad arranged in 5-year categories of years resided in the United States by the age distribution of the 1975 entering cohort of immigrants (multiplied by 5). By using the 1975 age distribution, no account is taken of the varying levels of immigration across the years when retired-worker beneficiaries entered the United States.

<sup>37</sup> For persons at least age 62 in 1975, only 24 or fewer quarters of work in covered employment were required to be fully insured.

<sup>38</sup> Totalization agreements provide for limited coordination of the United States OASDI program with the comparable programs of other countries (Butcher and Erdos 1988). The agreements were authorized for the United States by an amendment to the Social Security Act in 1977. The following countries currently have totalization agreements with the United States: Belgium, Canada, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

<sup>39</sup> Historical changes in the requirements for various Social Security benefits are described in Social Security Administration 1993(a), and 1993(b).

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