

# Foreign-Born Emigration: Estimates and Rates

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U S C E N S U S B U R E A U

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## Foreign-Born Emigration: Estimates and Rates

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*In 1957, the Immigration and Naturalization Service (INS) stopped collection of data on emigration, disposing of the only direct way in which to estimate the number of foreign-born emigrants. Since that time, indirect methods have been used to estimate emigration. Employing a residual method, this paper produces contemporary emigration estimates and rates. Using Census 2000, the 2005 and 2006 American Community Survey (ACS), and National Center for Health Statistics life tables, this paper produces emigration rates for the foreign-born population and then utilizes these rates to estimate annual emigration from 2000 to 2006. Moreover, this paper evaluates the assumptions of the residual technique and assesses the estimates and rates produced by comparing them to past research.*

Immigration policy debates and research often imply that immigration is permanent, erroneously ignoring important facets of the immigration experience such as circular migration of the foreign born. The magnitude of this process is revealed by Warren and Kraly (1985) who found that out of the approximately 30 million immigrants who came to the United States from 1900 to 1980, about 10 million either returned to their home country or moved to another country. While scholars and researchers have made important contributions to the estimation of foreign-born emigration (Ahmed and Robinson 1994, Warren and Peck 1980, Warren and Kraly 1985, Woodrow-Lafield 1996, Van Hook et al. 2006), data limitations continue to plague these estimates. Despite these data limitations, variations of the residual method have been valuable tools to estimate emigration between 1960 and 1970 (Warren and Peck 1980), between 1980 and 1990 (Ahmed and Robinson 1994), and between 1990 and 2000 (Mulder 2003). However, no recent estimates have been derived using the residual method, as this method is traditionally used with data from decennial censuses. The American Community Survey (ACS) is an annual survey that provides the opportunity to produce updated estimates of

emigration. Employing Census 2000, and data from the 2005 and the 2006 ACS, this paper produces contemporary estimates and rates of emigration of the foreign born.

In response to the discontinuation of the collection of emigration data by the Immigration and Naturalization Services (INS) in 1957, Warren and Peck (1980) pioneered the use of indirect methods, in particular the residual method, to estimate foreign-born emigration for the 1960 to 1970 time period. The basic approach of the residual method to estimate emigration is to use a population in time 1, survive the population forward to calculate the expected population at time 2, and subtract the counted population in time 2 from this expected population. Ahmed and Robinson (1994) utilized a variation of this method in their seminal work estimating the number of foreign-born emigrants and emigration rates from 1980 to 1990. This method was then extended to the period of 1990 to 2000 by Mulder (2003). While this method has been crucial for estimating foreign-born emigration since the 1980s, it requires some potentially problematic assumptions: minimal coverage differential between the two data sources, accurate and consistent year of entry and nativity data, and use of appropriate mortality data (Ahmed and Robinson 1994).

In response to these limitations, alternative methods for measuring foreign-born emigration have been explored. Employing migration supplements from the Current Population Survey (CPS), Woodrow-Lafield (1996) used a multiplicity survey methodology, also known as networking sampling, to estimate emigration. This method uses questionnaire responses regarding the emigration of family members, adjusting its

weighting scheme to account for the possibility that more than one respondent can report the emigration of a particular emigrant. There are several limitations to this method. First, the method cannot account for the emigration of whole households or individuals who do not have relatives living in the United States, which leads, potentially, to an underestimate of emigration. Second, this method relies on a relatively small number of cases.

More recently, Van Hook et al. (2006) used a CPS matching method to produce rates of emigration for the foreign-born population. This study uses matched March CPS files from 1996 to 2002 to find households and individuals who appear in one rotation of the March CPS but do not appear in a second rotation the following year. This analysis of foreign-born emigration is based primarily on attrition from the CPS between time 1 and time 2 (Van Hook et al. 2006). Individuals that are not in the second rotation of the CPS, could have moved within the United States, died, moved out of the United States, or could not be matched for other reasons (Van Hook et al. 2006). The authors estimate the probability that non-matched individuals fall into the aforementioned categories. Finally, they average the individual-level probabilities to estimate the proportion of the foreign born who emigrate each year.

In contrast to the residual method, the CPS matching method does not have potential issues with coverage or year of entry data quality. However, this method does require potentially limiting assumptions. For example, it assumes that foreign-born and second-generation adults have the same non-follow-up probabilities. There are a variety of

reasons why this assumption may be problematic. For example, to the extent that poorer households have a higher likelihood for attrition in longitudinal surveys, the relative economic prosperity of the second generation may reduce their likelihood of attrition compared to the foreign born. Differences in English language ability may also result in lower non-follow-up rates for the second generation relative to the foreign born. An additional limitation of the CPS matching method is its reliance on a small sample of data.

While the multiplicity sampling and CPS matching methods have made important contributions to the emigration literature, we argue that the residual method, even with its potential limitations, is more useful for estimating foreign-born emigration and producing emigration rates. In contrast to both alternative methods, an advantage of the residual method is that it does not rely on emigration questions on survey supplements or matching of longitudinal data, which produce small samples. The residual method also has an important advantage over multiplicity sampling: the residual method accounts for the emigration of individuals who do not have relatives in the United States and the emigration of whole households. Additionally, the assumptions that the CPS matching method makes about the second-generation and foreign-born non-response likely biases those estimates upward. Specifically, using the March 2000 CPS, Van Hook et al. (2006) estimate that 1,136,000 foreign-born emigrate *each year*. After accounting for return migration, the number decreases to 875,000 per year. This estimate is far above the estimates derived from other methods (Ahmed and Robinson 1994, Mulder 2003, Oosse

1998, Warren and Peck 1980, Woodrow-Lafield 1996) all of which exhibit similar trends and have generally been in the 133,000 to 225,000 range.

## **Data and Methods**

Using Census 2000 and the 2005 and 2006 American Community Survey (ACS) data, we use a residual technique to estimate emigration of the foreign-born population between 2000 and 2005 and between 2000 and 2006.<sup>1</sup> The ACS, an annual nationwide survey, has been fully implemented in every county of the United States since 2005. We also employ 2000 through 2003 life tables, which represent the total U.S. population, from the National Center of Health Statistics (NCHS).

For our estimates of emigration from 2000-2005, we tabulate the foreign-born population whose year of entry was 1999 or earlier in Census 2000 by single year of age and sex.<sup>2</sup> We then apply the survival rates from the NCHS life tables to this population five times, each time aging the population forward one year, to obtain an estimate of the expected population of this cohort in 2005. Emigration between 2000 and 2005 of the foreign-born who entered before 1999 is calculated as the difference between this expected population and the size of the population in 2005, as estimated by the ACS. Similarly, we estimate emigration between 2000-2006, using Census 2000 and ACS 2006.

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<sup>1</sup> This paper focuses on the emigration of the household foreign-born population only. Those living in group quarters are not included.

<sup>2</sup> The year of entry restriction of 1999 or earlier is used to exclude immigrants entering the United States between 2000 and 2005. By excluding these new entrants from our analysis, we are comparing the same population cohort in 2000 (according to Census 2000) and 2005 (according to the 2005 ACS). Thus any differences are assumed to be due entirely to mortality and emigration.

The calculation described above is performed for two period-of-entry groups: first, for those who entered the United States between 1990 and 1999; and second, for those who entered before 1990. This is done to account for different emigration propensities of more recent immigrants. Specifically, more recent immigrants are more likely to emigrate than immigrants who have been in the country longer (Ahmed and Robinson 1994). Based on the results, we create average annual emigration rates for each of these period of entry groups for the 2000 to 2005 and 2000 to 2006 time periods.

We then apply the average of these rates to the foreign-born population in each year of the ACS (2000-2006) who responded that they were living in the United States one year ago. We exclude those whose residence one year prior to the survey was abroad, as they were not living in the United States and thus not at risk of emigrating. This calculation is done by period of entry: the 1990-1999 annual emigration rate is applied to the population in universe who entered within ten years of each survey year, and the pre-1990 rate to those who entered more than ten years before the survey year. For example, for ACS 2005, we apply the 1990-1999 annual emigration rate to those whose year of entry was 1995-2005, and the pre-1990 rate to those who entered before 1995. This gives us emigration estimates for each year from 2000 to 2006 and allows for an analysis of how emigration relates to period-of-entry.

We evaluate the results of this work by considering the assumptions inherent to a residual technique and how they apply to the data used. We discuss the issues of: coverage

differentials between Census 2000 and ACS 2005 and 2006; reliability of the nativity and year of entry questions; and the effect of using data from life tables that are not specific to the foreign-born population to estimate mortality. Additionally, we assess how our estimates compare to past research, and consider how they can be used to improve the Census Bureau's estimates of net international migration.

## References

Ahmed, B. and J.G. Robinson. 1994. "Estimates of Emigration of the Foreign-born Population: 1980-1990." Population Division Working Paper No. 9, U.S. Census Bureau.

Mulder, T. 2003. "Foreign-born Emigration From the United States: 1990 to 2000." Paper presented at the 2003 annual meeting of the Population Association of America, May 1-3, Minneapolis, MN.

Oosse, M. 1998. "Procedures used to estimate annual emigration rates of the foreign-born by age, sex, and 14 country of birth groups, 1980-1990." Unpublished Memorandum, Population Division, U.S. Census Bureau.

Van Hook, J., W. Zhang, F.D. Bean, and J.S. Passel. 2006. "Foreign-Born Emigration: A New Approach and Estimates based on Matched CPS Files." *Demography* 43(2): 361-382.

Warren, R. and E. Kraly. 1985. "The Elusive Exodus: Emigration from the United States." Population Trends and Public Policy Occasional Paper No. 8, Population Reference Bureau, Washington, D.C.

Warren, R. and J. Peck. 1980. "Foreign-born Emigration from the United States: 1960 to 1970." *Demography* 17(1): 71-84.

Woodrow-Lafield, K. 1996. "Emigration from the USA: Multiplicity Survey Evidence." *Population Research and Policy Review* 15: 171-199.