

## **Recent Innovations in the U.S. Census Bureau's Method of Estimating Foreign-Born Emigration**

**Mark A. Leach**

Population Division  
U.S. Census Bureau  
[mark.a.leach@census.gov](mailto:mark.a.leach@census.gov)

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### **Abstract**

This paper will present results from U.S. Census Bureau research to improve estimates of foreign-born emigration from the United States using the residual method. From the 1970s to the late 2000s, the Census Bureau estimated emigration by measuring change in the U.S. foreign-born population between two subsequent decennial censuses. More recently, the Census Bureau uses data from Census 2000 and the American Community Survey to estimate population change since 2000. Recent estimates based on other data sources and methods reveal that the residual method tends to underestimate emigration flows, however. To address this, we research ways to maintain the strengths of the residual method while addressing its shortcomings. We expect that our results will show that emigration estimates are improved both by shortening the time period in which foreign-born population change is observed and by estimating emigration separately for foreign-born subgroups known to exhibit different patterns of migration. (148 words)

## Extended Abstract

Emigration is one of the most difficult components of population change to measure. Few governments have the resources, ability, or inclination to track how many people leave a country, so comprehensive data on outmigration are scarce. Estimating an emigration flow is still essential to estimate demographic change and population totals accurately. While the number of people leaving to reside outside the United States is small relative to the total population and even the number of immigrants it receives, emigration is significant enough to affect the resident population over time and the size and composition of the foreign-born population in particular (U.S. Census Bureau 2008).

With immigration, and likely emigration, increasing in the 1950s and 1960s, demographers at the U.S. Census Bureau developed the residual method to estimate the annual flow of U.S. foreign-born emigration (Warren and Peck 1980). The method estimates emigration indirectly by measuring change in the foreign-born population, after accounting for mortality and recently-arrived immigrants, between two subsequent decennial censuses. The Census Bureau continues to use the residual method mostly as it was developed. One exception is using data from the American Community Survey (ACS), which has replaced the Census Long Form as a primary data source on the U.S. foreign-born population. In 2008, the Census Bureau began incorporating data from the ACS to measure change in the foreign-born population since 2000.

Alternative estimates of U.S. emigration based on other data sources and methods indicate that the residual method likely underestimates emigration (Passel and Cohn 2009; Rendall, Brownell and Kups 2011; Schwabish 2011; Van Hook et al. 2006). These alternative estimates often are based on data sources that include information only for a particular national origin group, come from restricted data sources, or use complex modeling techniques, each of which makes it difficult or impossible to use to produce national-level emigration estimates. Because of these limitations, the residual method remains an attractive option in spite of its shortcomings.

This paper will present research that seeks to understand and address the primary weaknesses of the residual method. We plan to investigate two modifications of the Census Bureau's current use of the residual method. The first, which we expect will have a greater impact of the two changes, is to use five years of annual data from the ACS to estimate change in the foreign-born population over periods of two to four years. For population estimates released in 2013, the Census Bureau's current method observed change in the foreign-born population over ten to twelve years using data from Census 2000 and the 2010-2012 ACS. Observing change over two- to four-year observation horizons, however, may better reflect the timing of when immigrants typically return to their home country when they do not settle in the United States. To the extent that most emigration occurs within four years, a ten-year residual period will result in average annual emigration that underestimates emigration during a four-year period because it includes years when emigration diminishes. For example, the current method observes emigration of foreign born who arrived prior to 2000. If emigration by this population mostly occurred between 2000 and 2004, average annual emigration and an annual emigration rate will be biased downward if relatively little emigration occurs in 2005 through 2010 and those years are included in the residual estimate. We expect that using a relatively shorter time period will result in higher emigration rates that better reflect reality, especially among recent arrivals who have

the greatest propensity to return home. Rates for earlier arrivals may not change given that they have such a low propensity to emigrate after ten years in the country so a shorter observation period likely will not make a difference.

In addition to recent arrivals, the Mexican-born population is another group for which we expect to find significantly different results with this method change. Previous research based on other data sources and methods has shown that Mexican immigrants exhibit higher rates of emigration relative to other foreign-born groups and that residual-based estimates likely underestimate Mexican-born emigration (Schwabish 2011; Van Hook et al. 2006).

A second change we plan to investigate is to calculate rates of emigration separately for nine foreign-born subgroups instead of four. Table 1 shows our proposed change in groupings. Currently, the Census Bureau estimates emigration rates for four foreign-born subgroups based on a combination of national origin (Mexican born or all other) and arrival cohort (in the United States less than or equal to 10 years or more than ten years). Expanding the number of estimation subgroups allows for a greater degree of variation in rates of emigration between groups and better reflects different patterns of migration and settlement. For example, research has previously shown that Mexican-born men have relatively high rates of return migration while Mexican-born women have a lower propensity to return (Riosmena 2004). The Census Bureau’s current method does not allow for different emigration rates between these groups and likely underestimates male emigration while overestimating female emigration. We expect that estimating emigration rates for additional groups not only will produce a more precise national estimate but also better reflect the demographic composition of the emigrant population.

**Table 1. Current and Proposed Foreign-Born Subgroups for Estimating Emigration Rates and Totals.**

Current Method: Four Groups	Proposed Method: Nine Groups
1. Mexico, Year of Entry (YOE) <= 10	1. Mexico, YOE <= 10, Male
	2. Mexico, YOE <= 10, Female
2. Mexico, YOE > 10	3. Mexico, YOE > 10
3. Other Countries, YOE <= 10	4. Other Latin America and Caribbean
4. Other Countries, YOE > 10	5. Canada, Oceania, Europe, YOE <= 10
	6. Canada, Oceania, Europe, YOE > 10
	7. Asia, YOE <= 5
	8. Asia, YOE > 5
	9. All Other

Note: YOE = Year of Entry

The final conference paper will compare estimated emigration rates and totals for the current and proposed methods and further discussion of the strengths and weaknesses of each.

## References

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