

---

# **Plans for Producing Estimates of Net International Migration for the 2010 Demographic Analysis Estimates**

Renuka Bhaskar, Melissa Scopilliti, Frederick Hollmann, and David Armstrong  
Population Division  
U.S. Census Bureau  
Working Paper No. 90

*This paper was prepared for the U.S. Census Bureau Workshop: 2010 Demographic Analysis Technical Review, Suitland, Maryland, January 8, 2010.*

*This report is released to inform interested parties of ongoing research and to encourage discussion of works in progress. Any views expressed on statistical, methodological, and technical issues are those of the author and not necessarily those of the U.S. Census Bureau.*

## Introduction

Demographic Analysis (DA) is an important tool for measuring coverage of the population in the decennial census. For DA to provide an accurate measure of coverage, reliable estimates of births, deaths, immigration, and emigration are essential. An evaluation of the initial DA 2000 estimates by component suggested a possible underestimation of net international migration (NIM) (Robinson, Adlakha, and West, 2002). Detailed analyses were conducted to evaluate assumptions in the initial DA estimates and alternative assumptions were used to produce a new set of estimates, which included higher levels of immigration. The analyses completed for DA 2000 demonstrated the difficulties in measuring net international migration as well as the importance of reliable immigration estimates.<sup>1</sup> This paper outlines the methods that will be used for DA 2010 to develop the NIM component of the national DA estimate.

Over the past decade, the Census Bureau has undertaken a major initiative to improve its ability to measure net international migration. The implementation of the American Community (ACS) provides us with critical demographic information between decennial censuses that was not available in previous decades. In addition to this new data source, the Census Bureau has dedicated significant resources to researching methods for measuring immigration. We have developed new methods of estimating components of migration through this research, which are currently used in the Census Bureau's annual population estimates. This methodology, referred to as the Residence One Year Ago (ROYA) method, is considered an improvement over previously used measures of immigration (Kennedy-Puthoff, Bhaskar, and Rastogi, 2008) and will be the basis of our DA 2010 estimates for the 2000 to 2010 time period.<sup>2</sup>

For DA 2010, we will produce different components of international migration than those produced for DA 2000. The selection of the components included for DA 2010 is driven

---

<sup>1</sup> Papers describing the methods used to produce DA 2000 component estimates of international migration are available on the Population Division's Working Paper website located at <http://www.census.gov/population/www/techpap.html>.

<sup>2</sup> The term "ROYA method" is used in this paper to represent the overall methodology currently used to estimate all components of net international migration, though some components are not estimated based on place of prior residence data.

by available data. The components that we plan to include in DA 2010 and those produced for DA 2000 are listed below.

**Components of NIM: DA 2010**

- Foreign-born immigration
- Foreign-born emigration
- Migration from Puerto Rico to the United States
- Migration from the United States to Puerto Rico
- Net international migration of native civilians
- Armed Forces Overseas

**Components of NIM: DA 2000**

- Legal immigrants
- Legal emigrants
- Temporary migrants
- Net civilian citizen migrants
- Residual foreign born
- Net migration from Puerto Rico
- Net Armed Forces overseas

As noted above, DA 2010 will not include separate estimates of legal immigration, the residual foreign born, or temporary migration.<sup>3</sup> Instead, we will use data from the ACS to measure the foreign-born immigration component, which will be produced using the ROYA method.<sup>4</sup> The ACS includes all foreign born regardless of legal status. For DA 2010, we will start with DA 2000 as the population base and produce flow estimates of each of the NIM components listed above. The final DA estimate of NIM will reflect the accumulation of change from April 1, 2000 to April 1, 2010 based on annual flow estimates of the NIM components and will be produced by age, sex, race, and Hispanic origin.<sup>5</sup>

---

<sup>3</sup> The residual foreign-born population included: persons who were in the United States legally but were not yet included in the official estimates of immigrants and refugees; people who were in the United States awaiting action on their immigration requests (quasi-legal); unauthorized migrants; and unmeasured error associated with uncertainty in the components included in the residual calculation (Costanzo et al., 2002).

<sup>4</sup> Additional estimates will be produced using the alternative methods described in the sensitivity analysis section.

<sup>5</sup> Demographic Analysis will be produced by age, sex, and for two race groups: Black and non-Black. For additional research, NIM components will be produced by Hispanic origin and by more detailed race categories.

Another important difference from DA 2000 is that for DA 2010 we plan to conduct a more extensive sensitivity analysis of the NIM estimates. As will be described later in this paper, the sensitivity analysis will be used to determine the extent of variation in each component estimate of NIM. The results will be used to produce upper and lower bounds to our component estimates of migration during the decade.

In addition, we will examine alternative data sources and estimates produced using administrative data. For example, we plan to use data on legal permanent residents to estimate the flow of immigrants to the United States that could be expected to eventually adjust to permanent legal status, which will provide a lower bound for comparison with our ROYA-based estimates of foreign-born immigration. We will also produce a stock estimate of the foreign-born population in 2010 using vital statistics data and information from the ACS. Each of these alternatives will be described in more detail later in this paper.

## **Planned Methodology and Data**

### The ROYA Method

The ROYA method includes production of the following components of NIM:

- Foreign-born immigration
- Foreign-born emigration
- Migration between the United States and Puerto Rico (estimated as a net from 2000-2004 and as separate components (immigration and emigration) for 2005 and later estimate years)
- Net international migration of native civilians
- Net overseas movement of the Armed Forces population

For the foreign-born population, we estimate immigration and emigration separately.<sup>6</sup> The foreign born who reported in the ACS that their place of residence in the year prior to the survey was “abroad” are considered immigrants. To estimate emigration of the foreign born, we use a residual method to produce rates of emigration by period of entry to the United States. We age forward the foreign-born household population in Census 2000 using life tables from the National Center for Health Statistics to obtain the expected population in a particular year (e.g., 2005). We then compare the expected foreign-born population to the foreign-born population in that year estimated by the ACS (e.g., ACS 2005). Subtracting the estimated from the expected population produces a residual, which serves as the basis for emigration rates for the time period (e.g., 2000 to 2005). We perform this calculation for two period-of-entry groups: the foreign born who entered the United States between 1990 and 1999; and the foreign born who entered before 1990. An average of the rates for each period-of-entry group is then applied to the population at risk of emigrating each year (i.e., the foreign-born population in the ACS who indicated that they were living in the United States one year ago) to obtain annual estimates of emigrants for 2000 to 2010. We produce the estimate of net international migration of the foreign-born population by subtracting the number of emigrants from the number of immigrants. Net international migration of the foreign born represents the largest subcomponent of NIM, accounting for over 90 percent of the total NIM estimate.

To estimate net migration between the United States and Puerto Rico, we use data on place of prior residence from the ACS and the Puerto Rico Community Survey (PRCS), where possible. The PRCS was first implemented in 2005. For 2005 and later years, we estimate annual migration flows directly using data from the ACS/PRCS question on place of residence one year ago. People in the ACS who indicated that they lived in Puerto Rico one year ago are considered immigrants. People in the PRCS who indicated that they lived in the United States one year ago are considered emigrants. For 2000 to 2004, we use prior research (Christenson, 2002) to establish a base estimate of net

---

<sup>6</sup> The term “foreign born” in this paper refers to those who were not U.S. citizens at birth, and includes both noncitizens and naturalized U.S. citizens.

migration between the United States and Puerto Rico for 2000 and linearly interpolate between the 2000 net estimate and the 2005 net estimate to generate the estimates for 2001 to 2004.

Estimates of net native migration continue to be based on research that used data from census and statistical reports from other countries to estimate native migration levels during the 1990s (Gibbs et al., 2003). To estimate the net overseas movement of the Armed Forces population, we use data collected and provided by the Defense Manpower Data Center.

Table 1 shows estimates of NIM from April 1, 2000 to June 30, 2009 that were produced using the ROYA method and included in the Vintage 2009 population estimates. The cumulative estimate of net international migration was 8.9 million during this period.

#### Sensitivity Analysis of NIM Estimates for DA 2010

For DA 2010, we plan to use the ROYA-based method to produce flow estimates for the components of NIM. In addition, we will conduct a sensitivity analysis to assess the variability that may exist in our estimates and to examine the impact of changes in the NIM estimates on the DA estimate of the resident population. Inputs into the sensitivity analysis will be derived by varying assumptions in our current methodology and by using alternative methodologies to estimate the components of NIM. The following sections review the alternate assumptions and methodologies being considered for each component.

#### *Foreign-Born Immigration*

Foreign-born immigration is the largest component of the net international migration estimates. The estimate is based on the foreign-born population in the ACS whose residence one year ago was abroad. Figure 1 shows ROYA-based estimates of foreign-

born immigration with 90-percent confidence intervals.<sup>7</sup> Note that the estimates shown in Figure 1 differ slightly from those used in our population estimates. Our population estimates include an additional estimate for foreign-born immigrants under age one because they are not in the universe for the residence one year ago question. The foreign-born immigration estimates are also smoothed using three-year moving averages for years prior to 2005 to account for the smaller sample size of the ACS before it was fully implemented. We plan to make these modifications to our immigration estimates for DA 2010. With these additional assumptions, we estimate that 11.2 million foreign-born immigrants entered the United States from April 1, 2000 to June 30, 2009.

Two main assumptions of using the ROYA method to estimate foreign-born immigration are: 1) controlling the American Community Survey to Census 2000-based estimates fully accounts for the potential under-representation of foreign-born immigrants in the ACS and 2) residence one year ago is an accurate measure of annual foreign-born immigration flows. For DA 2010, we will produce alternate estimates of foreign-born immigration for our sensitivity analysis by varying these assumptions.

The first assumption we will analyze is the potential under-representation of recent foreign-born immigrants in the ACS. To account for under-representation in the ACS, the ACS is controlled to population estimates produced by the Population Estimates Program (U.S. Census Bureau, 2009). The ACS data are controlled so that the number of housing units and people by age, sex, race, and Hispanic origin match the Census Bureau's official population estimates. Differential coverage of those who have immigrated in the last year within these control categories or imprecision in the population controls may result in variation in the survey-based estimates of foreign-born immigration. An assumption in the ROYA methodology is that under-representation in the ACS is accounted for through the application of the population controls. For DA 2010 we will examine the implications of this assumption for our ROYA-based

---

<sup>7</sup> Foreign-born immigration is estimated using data from the ACS, which is based on a sample and is subject to sampling variability. The degree of uncertainty in the estimate arising from sampling variability is represented through the use of the 90-percent confidence interval. The confidence interval can be interpreted as providing a 90-percent probability that the upper and lower bounds contain the true value.

estimates by testing alternative assumptions of coverage in the American Community Survey.

One approach we are developing involves applying adjustment factors to single-year ACS data prior to the weighting to population controls. These adjustment factors are calculated by comparing pre-population controlled data from ACS 2000 to data from Census 2000 by broad demographic characteristics. By applying these adjustment factors to the residence one year ago abroad population in the ACS, we can evaluate the sensitivity of our ROYA population to alternative assumptions of coverage. This method assumes that adjustment factors developed using data from ACS 2000 are applicable to later years of the ACS, that coverage of the foreign-born population is the same as coverage of the residence one year ago abroad population, and that there is no variation in coverage within each cell used for adjustment.

A second assumption of the foreign-born immigration estimate that we plan to vary is the measure from the ACS used to estimate foreign-born immigration. The ROYA method uses data from the ACS question on place of residence in the prior year. As part of our sensitivity analysis, we plan to include a series of foreign-born immigration estimates based on data from the ACS question: “When did this person come to live in the United States?” The foreign born whose reported year of entry was the year before the survey year are considered foreign-born immigrants. Figure 2 includes estimates of foreign-born immigration using residence one year ago and estimates using year of entry. Year of entry produces higher estimates of foreign-born immigration than residence one year ago (Figure 2). A potential issue specific to this method is the validity of data on year of entry. Research by the Census Bureau indicates that there are some accuracy and consistency issues with year of entry reporting, particularly for those who have entered the United States multiple times (De La Cruz and Logan, 2009; Harris et al., 2007). However, the data provide an alternative measure of foreign-born immigration that will be incorporated in our sensitivity analysis.



### *Foreign-Born Emigration*

Emigration is a particularly difficult component of migration to measure due to a lack of reliable data. Our estimates of foreign-born emigration are currently based on rates developed through a residual method using data from Census 2000 and the ACS (2005 through 2008). We use this residual to calculate rates of emigration by period of entry, and then apply these rates to the foreign-born population eligible to emigrate in each year of the ACS to estimate annual foreign-born emigration (Bhaskar, Rastogi, Kennedy-Puthoff, 2008). The foreign-born emigration estimates used in our 2009 population estimates are shown in Table 2. We estimate that 2.1 million foreign born emigrated from the United States between April 1, 2000 and June 30, 2009. A majority of these emigrants, 1.6 million, are estimated to have recently entered the United States.<sup>8</sup> As described earlier, emigration is estimated by applying emigration rates to the stock of the foreign-born population in each year of the ACS. A main reason the level of emigration has increased for most estimate periods is because the size of the population eligible to emigrate (the foreign born population in the ACS) increased during most time periods.

Residual methodologies with decennial census data have been used in the past to measure emigration. The incorporation of data from the ACS provides a more updated measure of emigration. However, there are several important limitations to this method, including: an assumption that coverage differentials between Census 2000 and the ACS are minimal; a lack of foreign-born specific death rates; and a reliance on the accuracy and consistency of year of entry and nativity reporting. While there are very limited alternatives to this approach, we plan to continue to research foreign-born emigration. We are examining the residual method to determine whether we can provide more updated estimates using more recent years of ACS data. In addition, we plan to evaluate other data sources and methods as a basis for comparison with our estimates, such as the August 2008 CPS migration supplement.

---

<sup>8</sup> Recent entrants are defined as those who entered the United States within 10 years of the estimate year.

### *Net Native Migration*

The migration of natives is another difficult component to estimate because of a lack of adequate data. The estimates currently used in the population estimates program are derived from prior research which used publicly available data from censuses and statistical reports from 16 countries to estimate net native migration in the 1990s (Gibbs et al., 2003).<sup>9</sup> The group of countries included in the research accounted for 58 percent of Americans living abroad according to State Department data. Gibbs et al. (2003) used an intercensal cohort survival method and generated an estimate of average annual net native migration of 18,000 leaving the United States each year. The population estimates program uses this estimate of 18,000 and assumes it is constant in each estimate year. There are several problems with this methodology including: the lack of a “place of birth” variable in some countries (making it necessary to use citizenship); a lack of data for many countries; an inability to identify military personnel; varying data collection times; and an inability to capture the fluidity of migration patterns (Gibbs et al., 2003).

Given concerns with the quality and timeliness of the data used to produce our current estimates of net native migration, we plan to research possible alternatives to include in our sensitivity analysis. One alternative involves an approach similar to the current method, but uses more recent and extensive data from censuses in other countries. This work produced an estimated average net migration flow of around 45,000 natives leaving the country each year (Schachter, 2008).<sup>10</sup> This method suffers from some of the same weaknesses as the method currently used in the population estimates program.

As a second alternative, we will evaluate whether data from Census 2000 and the ACS can be used to estimate native migration flows. We are exploring the possibility of using

---

<sup>9</sup> The following countries were included by Gibbs et al. (2003): Australia, Belgium, Canada, Germany, Great Britain, Greece, Ireland, Israel, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland.

<sup>10</sup> Schachter (2008) included data for 84 countries. A notable addition from Gibbs et al. (2003) is Mexico, which enumerated a large stock of people born in the United States in their 2000 Census.

a residual method, similar to our method of estimating foreign-born emigration, to estimate the emigration of natives. This method uses Census 2000 as the base population. Births and return migration of natives are added and deaths subtracted to calculate the expected population at a certain time point. The difference between the “observed population” (as measured by the ACS) and our estimated expected population provides an estimate of native emigration. This method is limited by coverage differentials between Census 2000 and the ACS, reliance on ACS-based estimates of native immigration, and the lack of native-born specific death rates. However, it will provide an alternative estimate of native emigration for our sensitivity analyses.

We also hope to use administrative data from tax records obtained from the Internal Revenue Service to estimate the international migration flows of natives. The methodology will begin by comparing taxpayer’s country of residence in one year to the country of residence in the following year. If a person is residing in the United States during the first year and residing in a foreign country during the second, they will be classified as a native emigrant. Conversely, if a person resides abroad during the first year and is in the United States during the second, they will be classified as a native immigrant. This project is in the initial stages and there are no indications of its viability yet.

We plan to use these different methodologies to develop multiple estimates of native immigration and emigration for the 2000 to 2010 period to incorporate into our sensitivity analysis. While each method has limiting assumptions, the use of several different methods will give us a range of net native migration during the decade.

#### *Movement Between the United States and Puerto Rico*

Movement between the United States and Puerto Rico is a small portion of our NIM estimates. We made substantial improvements to our methodology for estimating this component beginning in the Vintage 2008 population estimates. Our current method

uses data from the ACS and PRCS on residence one year ago. This component is not a main focus of DA research and no alternative estimates are planned for DA 2010.

### *Armed Forces Overseas*

For DA 2010 we will estimate the Armed Forces Overseas population as of April 1, 2010 using data from the Department of Defense's Defense Manpower Data Center (DMDC). We will use the most recent DMDC estimate of the Armed Forces Overseas population and project forward to April 1, 2000. We are currently researching methods of estimating deaths to the Armed Forces Overseas population from April 2000 to April 2010 and evaluating methods of assigning race to this population.

### Alternative Data and Methods

In addition to the sensitivity analysis of the ROYA-based method, we are exploring the following options to further assess the ROYA-based estimates: 1) development of immigration estimates based on administrative data on people adjusting to legal permanent resident status and 2) development of a stock estimate of the foreign born based on administrative data on natives and the distribution of nativity in the ACS.

### *Legal Permanent Resident Data*

We plan to use administrative data from the Department of Homeland Security's Office of Immigration Statistics to estimate the number of immigrants who 1) arrived in the United States between April 1, 2000 and April 1, 2010 and 2) adjusted to legal permanent resident (LPR) status. The administrative records are based on admissions to LPR status from July 1, 1972 to September 30, 2008. The data include records of new arrivals admitted to the country as legal permanent residents and records of "adjustees," or those immigrants who were already present in the United States when they adjusted to LPR status.

The methodology involves three broad steps. First, the data will be arranged by immigrant date of arrival rather than time of admission to LPR status. This is important

because year of arrival can be substantially different from year of admission to LPR status. Second, the number of future admissions to LPR status, for both new arrivals and adjustments of status, are projected to April 1, 2010. Third, the data are tabulated by demographic variables including age, sex, race, and Hispanic origin. Race and Hispanic origin will be assigned based on information on country of birth.

Two limitations should be mentioned. First, the method will include a considerable amount of imputation of missing information. For example, for several categories of admission, a significant number of records are missing the year of arrival for those who adjusted status. Second, the type of immigrants included in this method will not match those included in the ROYA-based estimates. Specifically, while the universe of the ROYA-based estimates is assumed to include immigrants of all legal statuses, the administrative estimates are restricted to immigrants who either become LPRs based on admission records or who can be expected to become LPRs based on their characteristics and past experience. The LPR-based immigration estimates do not include temporary residents who depart the country or die before obtaining legal permanent residence, permanent foreign-born residents who would never receive immigrant visas, or unauthorized migrants who would never appear in immigrant data as legal permanent residents. While the LPR-based estimates provide flow-based information on immigration, they do not provide information on emigration.

The LPR-based immigration series will serve as a basis for comparison with our estimates of foreign-born immigration and will provide insight into the size and characteristics of legal migration flows into the United States. This alternative series is important for DA 2010 because it is almost entirely independent of the survey-based series, making comparisons with the ROYA-based immigration estimates informative and meaningful, once the discrepancies in the universe are considered.

#### *Stock Estimate of the Foreign-Born Population*

We are developing a method to obtain a stock estimate of the foreign born as an alternative to the survey-based estimates from the ACS. It will be based primarily on

vital statistics data, which serve as the foundation of DA estimates and are generally believed to be of high quality. We will start with the DA 2000 estimate of the native population. This estimate is based primarily on birth and death data, with relatively small components of net native migration from other data sources. We will then incorporate estimates of births, deaths to natives, and native migration during the 2000 to 2010 period to develop a stock estimate of natives in 2010. We will use birth data from vital statistics records since all children born in the United States are native born. We are evaluating methods to estimate deaths to natives. Two methods under consideration are 1) applying survival rates to the DA 2000 stock estimate of natives and 2) using death certificate information on country of birth to develop separate estimates of native and foreign-born deaths. Estimates of native immigration and emigration will come from our prior research on this topic as described above. There is very little information on native migration, therefore we will include several estimates of native migration to examine the sensitivity of our stock estimate to alternative native migration assumptions.

After developing a stock estimate of the native population, we will apply the ratio of the native to foreign-born population in the ACS in each estimate year to obtain a stock estimate of the foreign-born population. Table 3 shows the population by nativity in each year of the ACS, and the ratio of the native to foreign-born population. In 2000, there were approximately eight natives for every foreign-born person. This ratio decreased from 2000 to 2007, then increased slightly in 2008. In 2008 the native-to-foreign-born ratio was 7.01.

Our plan is to use this method to develop foreign-born stock estimates for several estimate years using ratios developed from ACS data at different stages of weighting. We will assess the results by comparing the time series of foreign-born stock estimates to estimates of the foreign-born population in the ACS. We will also examine the method's sensitivity to different migration assumptions. The resulting stock estimates of the foreign born will be used to make an additional comparison to the NIM estimates.

## Demographic Characteristics and Geographic Distribution of the Components of NIM

### *Current Method*

We will produce flow estimates of net international migration by single years of age, sex, race, and Hispanic origin. In the Census Bureau's postcensal population estimates, we use information from Census 2000 and the three-year ACS 2005-2007 to distribute component estimates of NIM by age, sex, race, and Hispanic origin. The ideal universe for assigning characteristics to a migration flow is normally either a) a near representation of the flow in the receiving population or b) the population at risk of migrating in the sending population. We define proxy population universes in Census 2000 and ACS 2005-2007 that appear to best represent these two criteria for immigrants and emigrants, respectively. The age, sex, race, and Hispanic origin of these proxy universes are then applied to our estimates. The following paragraphs describe the proxy universes that are used to distribute each component of NIM by demographic characteristics in the estimates program. For DA 2010, we plan to evaluate the proxy universes and determine whether they can be refined.

The estimate of net international migration of the foreign born is distributed in two components, immigration and emigration. Foreign-born immigrants are given the age, sex, race, and Hispanic origin distribution of the foreign-born population who entered the United States within five years of the Census/survey year. Age is adjusted for foreign-born immigrants to represent age at arrival to the United States. Estimates of foreign-born emigration are distributed by two period of entry groups representing the appropriate populations at risk of emigrating. The age, sex, race, and Hispanic origin distribution of the foreign born who entered the United States within ten years of the Census/survey year is applied to the estimate of emigrants who entered the United States within ten years of the estimate year. The age, sex, race, and Hispanic origin of the foreign born who entered the United States more than ten years before the Census/survey

year is applied to the estimate of emigrants who entered the United States more than ten years before the estimate year.

The estimate of movement between the United States and Puerto Rico is distributed by demographic characteristics as a net using information from Census 2000 on the population born in Puerto Rico who entered the United States in 1995 or later and information from ACS 2005-2007 on the population born in Puerto Rico who entered the United States within 10 years of the survey year.

For net native international migration we apply the age, sex, race, and Hispanic origin distribution of natives residing in the United States. Information on age, sex, race, and Hispanic origin for the estimate of net Armed Forces movement is obtained from the Defense Manpower Data Center and Census 2000.

#### *Evaluation of Assumptions in Current Method*

The methodology used in the production of the population estimates assumes that the proxy universe for each component accurately reflects the demographic characteristics of recent immigrants and emigrants. For our DA 2010 estimates, we plan to evaluate the use of alternative proxy universes for distributing component estimates of NIM by single years of age, sex, race, and Hispanic origin. For example, our proxy universe for foreign-born immigration is the foreign-born population who entered the United States within five years of the survey year. For Demographic Analysis we will examine whether the ACS provides sufficient information at the national level to narrow this proxy universe. Then, we will examine the magnitude of impact that alternative proxy universes have on the overall distribution of NIM and use this information to inform our decision on the best proxy universe for each NIM component.

#### **Summary**

The ROYA method will be used to develop the DA 2010 estimates of NIM between 2000 and 2010. Additionally, we will produce multiple versions of many of the components of



net international migration and evaluate them for possible inclusion as alternative estimates. The main focus will be on estimates of foreign-born immigration, the main contributor to our overall NIM estimates, and on emigration, a component that suffers from a lack of sufficient data. We will develop these alternative estimates to help us gain a better understanding of the variation in our NIM estimates and the impact of using alternative estimates of NIM on the total DA estimates.

## **Tables and Figures**

Table 1. Vintage 2009 Annual Estimates of Net International Migration: 2000 – 2009.

Table 2. Foreign-Born Emigration Estimates: 2000 – 2009.

Table 3. Resident Population by Nativity and Native to Foreign-Born Ratio: 2000 - 2008.

Figure 1. Foreign-Born Immigration (Residence One Year Ago Abroad) With 90-Percent Confidence Bounds: ACS 2000 – 2008.

Figure 2. Foreign-Born Immigration Using Residence One Year Ago and Year Of Entry With 90-Percent Confidence Bounds: ACS 2000 – 2008.

## References

- Bhaskar, R., S. Rastogi, and A. Kennedy-Puthoff. 2008. "Foreign-Born Emigration: Estimates and Rates," Poster presented at the Population Association of America Annual Meeting, April 17-19, New Orleans, LA.
- Christenson, M. 2002. "Evaluating Components of International Migration: Migration Between Puerto Rico and the United States," Population Division Working Paper No. 64. U.S. Census Bureau.
- Costanzo, J., C.J. Davis, C. Irazi, D.M. Goodkind, and R.R. Ramirez. 2002. "Evaluating Components of International Migration: The Residual Foreign Born," Population Division Working Paper No. 61. U.S. Census Bureau.
- De La Cruz, P. and C. Logan, 2009. "August 2008 CPS Migration Supplement: A Preliminary Look at the Citizenship and Year of Entry Sections," Poster presented at the Southern Demographic Association Annual Meeting, October 22-24, Galveston, TX.
- Gibbs, J., G. Harper, M. Rubin, and H. Shin. 2003. "Evaluating Components of International Migration: Native-Born Emigrants," Population Division Working Paper No. 63. U.S. Census Bureau.
- Harris, P., R. Bhaskar, C. Shook-Finucane, and L. Ericson. 2007. *Evaluation Report Covering Place of Birth, U.S. Citizenship Status, and Year of Arrival*, 2006 American Community Survey Content Test Report P.1. U.S. Census Bureau.
- Kennedy-Puthoff, A., R. Bhaskar, and S. Rastogi. 2008. "Estimating Annual International Migration Flows To and From the United States: 2000 to 2006," Poster presented at the Population Association of America Annual Meeting, April 17-19, New Orleans, LA.
- Robinson, J.G., A. Adlakha, and K.K. West. 2002. "Coverage of Population in Census 2000: Results from Demographic Analysis," Paper presented at the Population Association of America Annual Meeting, May 8-11, Atlanta, GA.
- Schachter, J. 2008. "Estimating Native Emigration from the United States," Memorandum dated December 24, delivered to the U.S. Census Bureau.
- U.S. Census Bureau. 2009. *Design and Methodology*, American Community Survey, U.S. Government Printing Office, Washington, DC.
- 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), 361-82.

**Table 1. Vintage 2009 Annual Estimates of Net International Migration: 2000 - 2009**

Estimate period	Net International Migration <sup>1</sup>
Total: April 1, 2000 - June 30, 2009	8,944,170
April 1, 2000 to June 30, 2000	319,226
July 1, 2000 to June 30, 2001	1,200,535
July 1, 2001 to June 30, 2002	1,078,014
July 1, 2002 to June 30, 2003	822,079
July 1, 2003 to June 30, 2004	985,807
July 1, 2004 to June 30, 2005	947,844
July 1, 2005 to June 30, 2006	1,006,408
July 1, 2006 to June 30, 2007	866,397
July 1, 2007 to June 30, 2008	862,955
July 1, 2008 to June 30, 2009	854,905

<sup>1</sup>Net International Migration is calculated as foreign-born immigration - foreign-born emigration + net migration between the United States and Puerto Rico + net native migration + net migration of the Armed Forces population.

Source: U.S. Census Bureau.

**Table 2. Vintage 2009 Foreign-Born Emigration Estimates: 2000 - 2009**

Estimate Period	Foreign-Born Emigration		
	Total	Entered within the last 10 years	Entered more than 10 years ago
Total: April 1, 2000 - June 30, 2009	2,098,784	1,632,885	465,899
April 1, 2000 to June 30, 2000	52,255	41,849	10,406
July 1, 2000 to June 30, 2001	209,020	167,397	41,623
July 1, 2001 to June 30, 2002	209,713	167,040	42,673
July 1, 2002 to June 30, 2003	214,147	169,476	44,671
July 1, 2003 to June 30, 2004	219,780	172,685	47,095
July 1, 2004 to June 30, 2005	227,242	176,734	50,508
July 1, 2005 to June 30, 2006	237,474	185,113	52,361
July 1, 2006 to June 30, 2007	244,188	189,556	54,632
July 1, 2007 to June 30, 2008	243,961	187,626	56,335
July 1, 2008 to June 30, 2009	241,004	175,409	65,595

Source: U.S. Census Bureau.

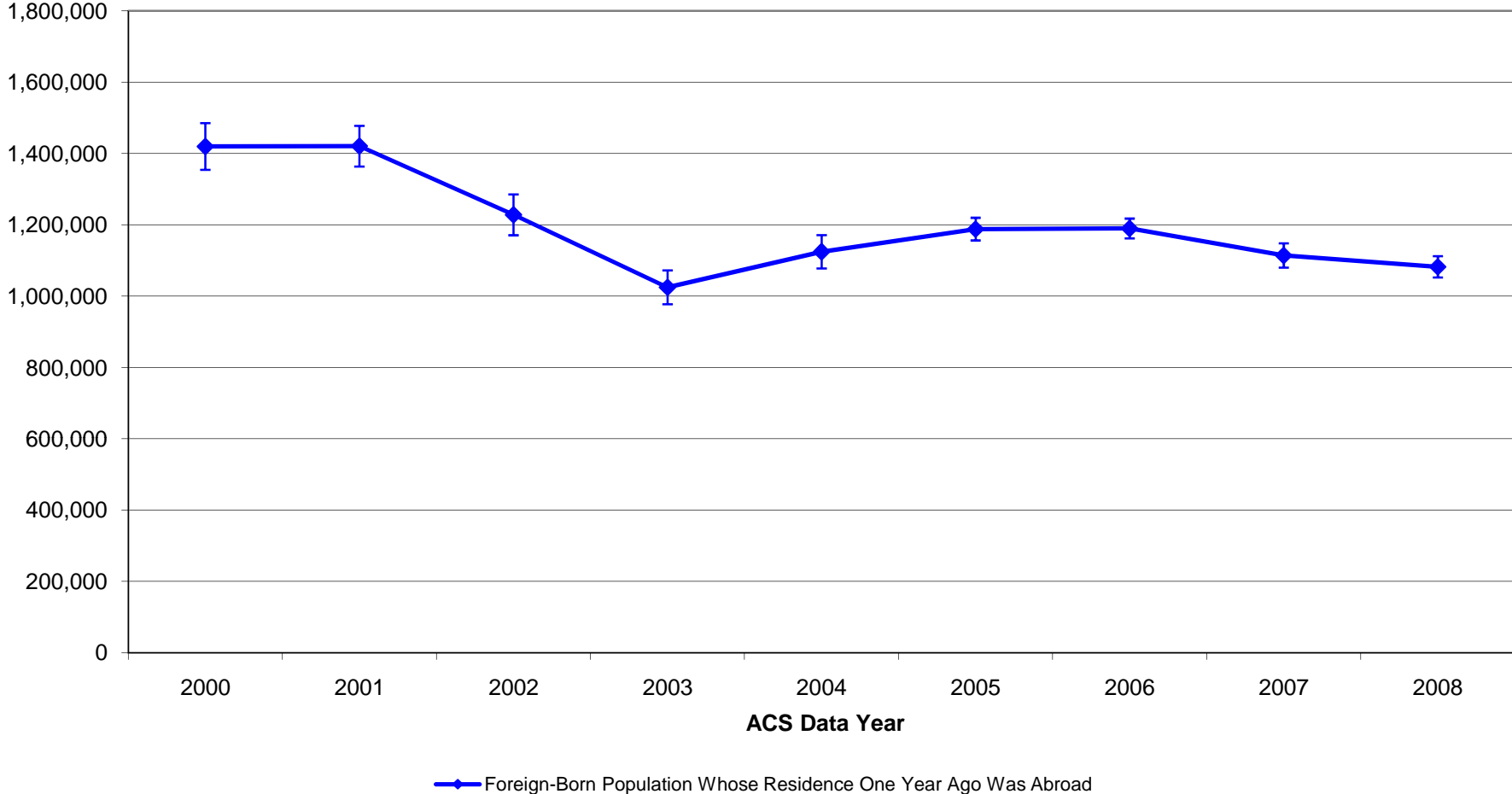
**Table 3. Resident Population by Nativity and Native to Foreign-Born Ratio: 2000 - 2008**

ACS Data Year	Native	Foreign Born	Native to Foreign-Born Ratio
2000 <sup>1</sup>	243,369,613	30,273,660	8.04
2001 <sup>1</sup>	245,535,342	31,482,280	7.80
2002 <sup>1</sup>	247,491,481	33,048,849	7.49
2003 <sup>1</sup>	249,375,940	33,533,945	7.44
2004 <sup>1</sup>	251,411,745	34,279,756	7.33
2005 <sup>1</sup>	252,688,295	35,689,842	7.08
2006	261,850,696	37,547,789	6.97
2007	263,561,465	38,059,694	6.92
2008	266,098,793	37,960,935	7.01

<sup>1</sup>Data for 2000 through 2005 are for the household population only (i.e., exclude the group quarters population).

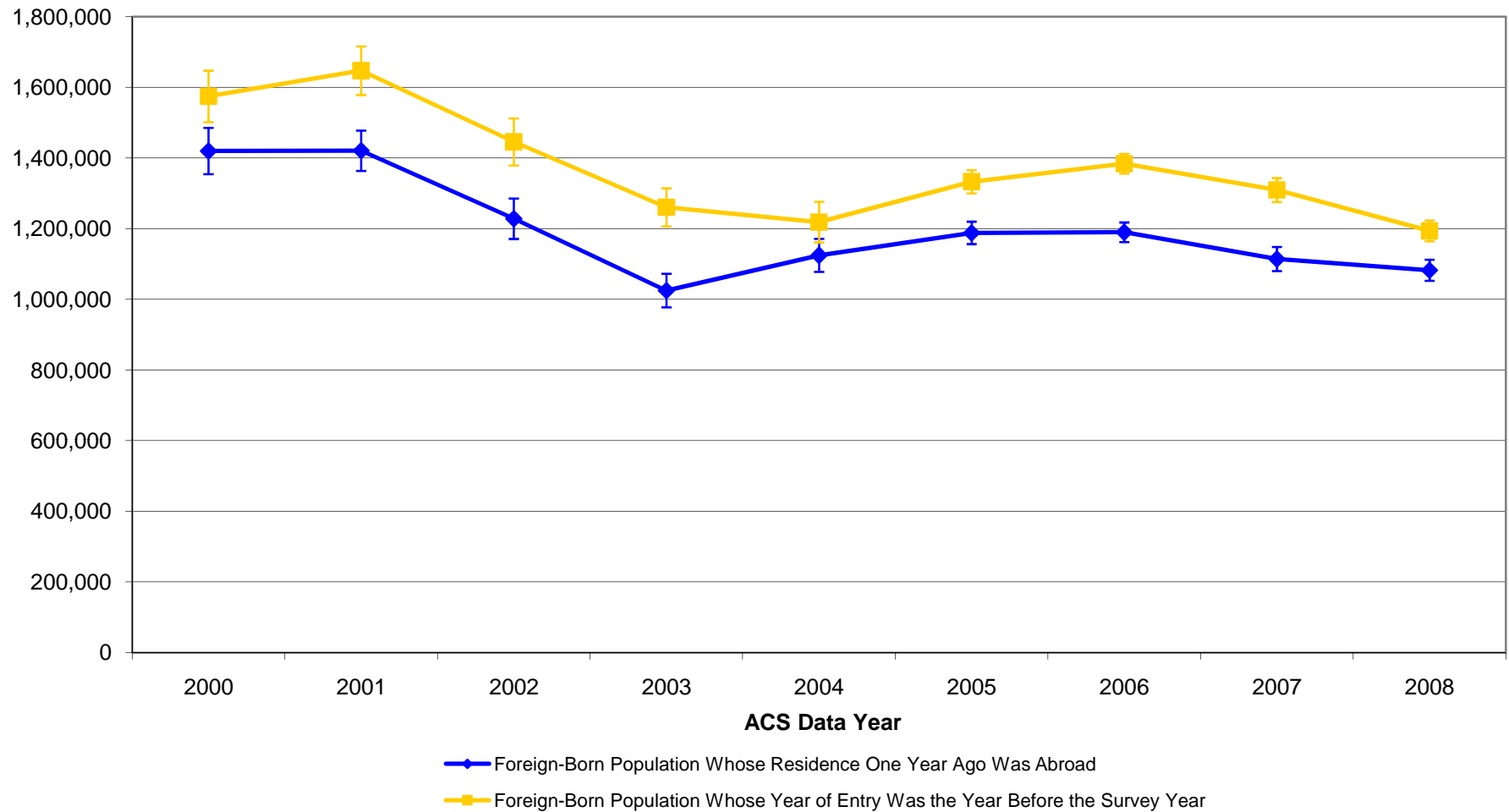
Source: U.S. Census Bureau. American Community Survey: 2000 - 2008.

**Figure 1. Foreign-Born Immigration (Residence One Year Ago Abroad)  
With 90-Percent Confidence Bounds: ACS 2000 - 2008**



Source: U.S. Census Bureau.

**Figure 2. Foreign-Born Immigration Using Residence One Year Ago and Year of Entry With 90-Percent Confidence Bounds: ACS 2000 - 2008**



Source: U.S. Census Bureau.