Domestic Migration Flows for States from the 2005 ACS

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Introduction

Since 2000, the American Community Survey (ACS) has been providing 1-year inmigration estimates for states; but outmigration, net migration and flow estimates have not been available since Census 2000. With the full implementation of the 2005 ACS, statistically reliable estimates can now be produced that provide a larger picture of internal migration within the United States and Puerto Rico. This paper will examine the reasonableness and variability of migration estimates between individual states, the District of Columbia, and Puerto Rico from the 2005 American Community Survey. Besides examining the migration for the population as a whole, the paper will also go into detail about the migration patterns for the subpopulations of the older population; the young, single, well educated; and the foreign born. These subpopulations have different migration patterns from one another and from the population as a whole.

The analysis will include comparisons with Census state Intercensal Population Estimates (IPE) and Census 2000 data. Comparisons between the Census 2000 and ACS data are limited to flow trends because the Census previous residence question covers a 5-year period while the ACS migration question covers a 1-year period.

Data

The ACS gathers data from every county in the United States in order to produce annual estimates of population and housing characteristics for places with a population of 65,000 or more. The initial sample size is about 3,000,000 addresses that are distributed across the 12 months of the sample year. The 2005 ACS only includes household data.

Full implementation of the ACS started with the 2005 survey year. The initial sample size for the 2004 ACS was about 838,000 addresses in 1,240 counties. With the larger sample size, the 2005 ACS estimates have smaller variability. In 2005, the sample included every county in the United States, thus making in- and out- migration estimates possible for states. Also for the first time in 2005, the data were collected for Puerto Rico. Migration data between Puerto Rico and the states are included in the tables, but for comparison purposes, those moving from Puerto Rico to the states are not considered domestic migrants.

The ACS household population totals are controlled by demographic characteristics at the county level to the annual IPE. The IPE are produced using a variety of administrative records including registered births and deaths, federal income tax returns, Medicare enrollees, and military movement.

The mobility section of the ACS survey asks persons 1 year and over whether they lived in their current residence 1 year ago. If they lived elsewhere, then the respondent is asked the location of their residence 1 year ago. The current state of residence and state of residence 1 year ago are used in the calculations in this paper. Census 2000 also asked for previous residence, but the questions referred to a 5-year rather than a 1-year time span.

Definitions

Domestic migration: For this paper, moves between the 50 states and the District of Columbia. For Puerto Rico, it is moves between Puerto Rico and the United States.

Inmigration: Migration into an area during a given period.

Outmigration: Migration out of an area during a given period.

Net migration: Inmigration minus outmigration.

Migration flow: Migration from one particular area to another.

Domestic migration rate per 1,000: The migration rate is calculated by dividing the net domestic migration by an approximated 2004 population. The result is then multiplied by 1,000. For the 2005 ACS, the approximated 2004 population is the sum of people who reported living in the area in 2004 and 2005 and those who reported living in the area in 2004 but lived elsewhere in the U.S. in 2005. For the 2005 IPE, the approximated 2004 population is the 2005 estimate minus total net migration and those under 1 year old.

Young, single, and college educated: The household population who were age 25 to 39; were never married, widowed, or divorced; and had at least a bachelor's degree in 2005.

Margin of error: The difference between an estimate and its upper or lower confidence bounds. The margins of error in this paper are based on a 90 percent confidence level.

Intercensal Population Estimates (IPE): Population estimates for state, county, and local governments that are produced annually by the Census Bureau between decennial censuses.

Inmigration, Outmigration, and Net Migration

The first step is to determine the reasonableness and reliability of the 2005 ACS estimates for migration from the rest of the U.S. to individual states (inmigration), from individual states to the rest of the U.S. (outmigration), and the difference (net migration). The domestic inmigration estimates are publicly available through detailed tables on the American FactFinder (AFF). They are reproduced in Table 1 along with estimates for domestic outmigration, net migration, and rates for all the 50 states and the District of Columbia. For Puerto Rico, the table includes the inmigration from the U.S., the outmigration to the U.S., net migration, and the migration rate.

A factor to consider when determining the usefulness of an estimate is whether it is statistically different than zero, or in other words, the margin of error is less than the

estimate. Also, the relative size of the margin of error compared to the estimate should be taken into account. At the state level, all inmigration estimates are statistically different than zero. The relative size of the margin of error ranges from 3 percent of the estimate for Florida inmigration to 16 percent for South Dakota inmigration.

The domestic outmigration estimates, which have not been published, are also all statistically different from zero. The relative size ranges from 3 percent of the estimate for California outmigration to 22 percent for Vermont outmigration.

Unlike inmigration or outmigration, net migration, being a derived measure from the difference between inmigration and outmigration, can be either positive or negative. Also, the margin of error is larger than either the margin of error for inmigration or outmigration. Despite that, twenty-seven of the state estimates as well as the District of Columbia and Puerto Rico estimate are statistically different from zero. Seventeen of the states had a positive net migration, or net inmigration, while ten others, the District of Columbia and Puerto Rico had a negative net migration, or net outmigration. The same is true for the rate per 1,000. Even some of the rates that are not statistically different from zero do not have much variation. For instance, the rate for Pennsylvania is 0.2 per 1,000 with a margin of error of 1.6 – a margin of error smaller than most other states.

The variations of the estimates are such that migration trends for states can be determined, but are the estimates themselves reasonable? To determine this, the ACS net migration rates are compared to the 2005 IPE. Chart 1 shows the net migration rates for the 2005 ACS compared to the 2005 ACS rates without controls and the rates derived from the 2005 population estimates. The chart includes the estimates without controls since the controls come directly from the 2005 IPE. As shown in the chart, the estimates with controls are similar to those without controls. This is not surprising since the effects of the controls are lessened because the rates are ratios.

The IPE are broken down by components of population change, so estimates for net internal and net international migration are calculated, but inmigration and outmigration are not calculated.[1] It should also be noted that since there is a lag of up to two years with most administrative record data, the 2005 population estimates will be revised with updated data in future releases.

Most of the net migration rates from the population estimates fall within the 90 percent confidence interval of the ACS estimates. However, thirteen states have estimates that are outside the interval. Some of the difference can be explained by differences between ACS and IPE. The IPE includes group quarters, but the 2005 ACS does not. Also, the IPE are for July 1 of the given year. The ACS estimates are averaged throughout the 12 months of the year. This makes a difference for states such as Louisiana, which was hit by Hurricane Katrina at the end of 2005, or Texas, which received several of the displaced residents from Louisiana. Also, the difference for places like Alaska, where the

[1] The methodology for the state intercensal population estimates can be found at http://www.census.gov/popest/topics/methodology/2005_st_co_meth.html

summer population can run as high has 18 percent above the annual population, can be explained by the difference in reference dates.[2]

State-to-State Flows

Since the inmigration, outmigration, and net migration estimates appear to be reasonable vis-à-vis the IPE; the next step is to determine if the state-to-state flows also seem reasonable. While we might expect some migration flows in 2005 to look different than in 2000, many of the patterns are likely to be the same. There are 2,652 different flows between the states, District of Columbia, and Puerto Rico. Not surprisingly, some of the flows are quite small. Table 2 gives a count for each state of how many inflows, outflows, and net flows are either different or not different statistically from zero. The inflows and outflows are the same except that the inflows are arranged by state of destination while the outflows are arranged by state of origin.

For either inflows or outflows, 63 percent are statistically different from zero. All the migration flows to Florida and out of California are statistically different from zero. On the other end of the spectrum, only 22 percent of the inflows and outflows for Delaware are statistically different from zero. Only 17 percent of all net flows, or 225 positive and 225 negative net flows, are statistically different from zero. Both California and Florida have 43 percent of their net flows being significant, while Montana, North Dakota, South Dakota, and Puerto Rico only have 2 percent each.

We can also compare the relative size of flows in the ACS and Census 2000. However, direct comparisons of the estimates themselves cannot be made since the Census 2000 collected data on residence in 1995 and ACS collected data on residence 1 year ago. Also, the relative size of the margin of errors for Census 2000 are smaller than ACS because the sample size was larger and the percent of the population who moves within a 5 year period is much larger than the percent who move within a 1 year period.

Table 3 shows the 20 largest estimated flows in the 2005 ACS and Census 2000.[3] The two largest flows are from New York to Florida and from California to Arizona. For Census 2000, the largest is from New York to Florida and second largest is from New York to New Jersey. However, California to Arizona is one of the five largest migration flows for Census 2000. Many of the same flows are on both lists. One notable exception is the flow from Louisiana to Texas. In 2005 ACS, it is one of the five largest, but it is not one of the twenty largest for Census 2000. It shows that the effects of Hurricane Katrina are showing up in the flows.

As stated above, many of the 2,652 different flows are not statistically different from one another. This makes it difficult to compare the ranking of flows for Census 2000 and 2005 ACS. To simplify matters, Table 4 lists the largest migration flows in and out of each state for the 2005 ACS. If a flow to a single state is significantly larger than the

[2] Williams. "Migration", page 6.
[3] Some flows not listed may not be significantly different from those listed. For all flows see Appendix A.

rest, only that flow is listed. Otherwise, if the two largest flows are not significantly different from one another, but significantly different from the rest, both are listed. The Census publication *State-to-State Migration Flows: 1995 to 2000* showed a similar table, except it only included the largest flow for each state. Where there is a largest flow for Census 2000 and a largest flow(s) for 2005 ACS, there are only 3 cases in which they differ. The largest outflow from Alabama is to Florida in the 2005 ACS and to Georgia in Census 2000, the largest outflow from California is to Arizona in the 2005 ACS and to Nevada in Census 2000, and the largest inflow to Vermont is from New Hampshire in the 2005 ACS and from New York in Census 2000.

Inmigration, Outmigration, and Net Migration by Characteristics

It has been established that the overall inflows, outflows, and net flows for the population appear reasonable for 2005 ACS, but what about for subpopulations? Table 5 shows the domestic inmigration, outmigration, and net migration for the population age 65 years and over. Table 6 is similar to Table 5, but it covers the foreign born population. Table 7 shows the same information for the young, single, college educated population. These groups were chosen because there is interest in their specific migration patterns across state boundaries from the "brain drain" of young professionals moving out of particular areas to the foreign born relocating out of gateway states to new retirees settling in retirement communities.

The rates of moving for the population age 65 years and over tend to be lower than younger population groups, but their migration patterns are of interest because of the potential effects on the economic, social, and demographic composition of local areas.[4] The relative size of the margin of errors varies more than the margin of errors for the migrant population as a whole. For inmigration, the margins of error ranges from 8 percent of the estimate for Florida to 69 percent for Rhode Island. For out migration, the margins of error ranges from 9 percent of the estimate for California, Florida, and New York to 55 percent for Delaware, North Dakota, and Rhode Island.

Chart 2 shows the 2005 ACS net migration rates for the population 65 years and over along with the 1995-2000 migration rates from Census 2000. The 90 percent confidence intervals for the 2005 ACS estimates are also shown. Even though the Census 2000 estimates are rates for a five year period and the 2005 ACS estimates are for a one year period, the direction of movement – net inmigration or net outmigration – can be compared.

Thirteen states have positive net migration rates significantly different from zero and fourteen states and the District of Columbia have negative net migration rates significantly different from zero in the 2005 ACS. None of those states had an opposite migration pattern for 1995-2000. However, there are some dramatic changes in the

[4] He and Schachter. *Internal Migration of the Older Population: 1995 to 2000.*

intensity of rates. For example, Nevada had a large positive net migration for 1995-2000, but the 2005 ACS rate is not statistically different from zero.[5]

The foreign born population is a rapidly growing segment of the population. Understanding their migration patterns helps to better understand changes in the overall migration patterns within the United States.[6] The margins of error for inmigration range from 9 percent of the estimate for Florida to 88 percent for Wyoming in Table 6. For outmigration, the range is from 9 percent for New York to 92 percent for Montana.

Chart 3 shows the migration rates for the foreign born population age 1 year and over for the 2005 ACS and Census 2000. Eleven states in the 2005 ACS have significant net inmigration rates and nine states and the District of Columbia have significant net outmigration rates. One of those states shows a reverse trend from 1995-2000. Montana went from having a net outmigration of the foreign born to having a net inmigration.[7]

While high net inmigration rates for places like Montana and Arkansas may be driven by relatively small foreign born populations, the rates for places such as Nevada and Arizona represent sizeable foreign born populations, and clearly reflect large net numeric inflows. Similarly, significant net outmigration rates in places like California and New York demonstrate the sizeable foreign born population leaving that state for other areas.

The young, single, college educated population is a much smaller population than the other two groups, but they are highly likely to relocate due to economic or lifestyle reasons.[8] Factors such as sizeable number of entry-level jobs or an excess of college graduates may be among the factors behind some of these patterns. Table 7 shows that the margins of error for inmigration range from 11 percent for California to 81 percent for Puerto Rico. The margins of error for outmigration range from 10 percent for California to 55 percent for Puerto Rico.

Chart 4 shows the migration rates for the young, single, college educated population for the 2005 ACS and Census 2000. Only four states and the District of Columbia have significant net inmigration rates and nine states have significant net outmigration rates for the 2005 ACS. Of those, two states had reverse migration rates when compared to Census 2000. South Carolina went from having a net outmigration rate for Census 2000 to a net inmigration rate for the 2005 ACS.[9]

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[5] The rates for the Oregon, Rhode Island, and Washington are statistically different than 0 for the 2005 ACS but not for Census 2000.

[6] Perry and Schachter. *Migration of Natives and the Foreign Born: 1995 to 2000.*

[7] There are net outmigration rates for Alaska, Massachusetts, and Rhode Island in the 2005 ACS, but the Census 2000 migration rates are not statistically different than 0. The Census 2000 rates are 17.8 per 1,000 for Alaska, 2.6 per 1,000 for Massachusetts, and 9.1 per 1,000 for Rhode Island.

[8] Franklin. *Migration of the Young, Single, and College Educated: 1995 to 2000.*

[9] There is a net outmigration for Alaska in the 2005 ACS, but the Census 2000 migration rate, 39.9 per 1,000, is not statistically different than 0. The rates for the District of Columbia and Massachusetts are statistically different than 0 for the 2005 ACS but not for Census 2000.

Summary

This analysis shows that the 2005 ACS inmigration and outmigration estimates are reasonable with good levels of variability. The rates are comparable to rates calculated using the Intercensal Population Estimates even when the controls based on the IPE are removed. The migration rates also reflect changes in seasonal population as well as major shifts in migration such as the displacement of people immediately after Hurricane Katrina.

Reliable data is also obtained through the inflows and outflows between states. Nearly two thirds of the flows are significantly different than zero. The largest flows for 2005 ACS are similar to those indicated by Census 2000 data. The results pertaining to net flows are less encouraging. Only about one-in-six of the net flows are significantly different than zero.

As expected, when examining inmigration, outmigration, and net migration for selected population groups, the level of variance increased. The margins of error for some states come close to being as large as the estimates themselves. For other states, the level of variance remained at good levels. Though not a full picture, the 2005 ACS reveals some migration trends. For example, the District of Columbia has a net outmigration of people age 65 years and over as well as the foreign born population, but a net inmigration of the young, single, and college educated population.

Overall, the 2005 ACS can provide numerous reliable estimates on inmigration, outmigration, net migration, and migration flows. With three-year and five-year estimates being produced in the future, not only is there a potential for state migration estimates with even less variance but also more reasonable and timely migration estimates for smaller pieces of geography.

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