COMPARISON OF ACS AND ASEC DATA ON GEOGRAPHIC MOBILITY: 2004

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INTRODUCTION

This report is one in a series that compares data from the American Community Survey (ACS) with data from the Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS). This report focuses on comparisons of national distributions of migration (where people resided 1 year ago) between the 2004 ACS and the 2004 ASEC. In this analysis, we compare the 2004 ACS and 2004 ASEC distributions, look for differences that are both statistically and substantively different, and for those found, offer possible explanations. The analysis is restricted to data for people living in housing units.

METHODOLOGY

The tables included in this report compare the most commonly tabulated data on migration from the ACS and ASEC at the national level. Comparisons consist primarily of percentage-point differences between the mobility rates. Tables display the ACS and ASEC estimates, the margins of error from which 90-percent confidence intervals of the estimates can be derived, and the difference between the two estimates. In the case of mobility rates, the difference is calculated as the percentage-point difference between the two estimates. An asterisk (*) denotes statistically significant differences.

At the national level, the ACS and ASEC variances were quite small, resulting in many statistically significant differences between the ACS and ASEC mobility rates. In this report, we generally consider statistically significant differences of 0.5 percentage points or less as not important. This yardstick was developed to help focus the analysis, though it can vary based on the relative size of the category. For example, for population groups constituting a relatively large percentage of the population (for example, people living in the same residence 1 year ago), a 0.5 percentage point difference in the estimates might be small, while for population groups constituting a smaller percentage of the population (for example, people living abroad 1 year ago), a 0.5 percentage point difference could be quite large. This decision is subjective, however, and users can apply their own standards to interpret the data presented in this report.

The remainder of this section examines differences in data collecting, data processing, sample, and estimation methodologies between the two surveys.

Sample Frame

The ACS derives its sample frame from a national Master Address File (MAF) that the Census Bureau maintains. The MAF is continuously updated using the U.S. Postal Service Delivery Sequence File (DSF), ACS non-response follow up, updates from special census operations, and the Community Address Updating System (CAUS). The ASEC sample uses the Decennial Census to produce its sample frame and updates it using the Building Permit Survey and area samples of new construction in places not covered by building permit offices in order to account for new housing units.

The 2004 ACS surveyed a national sample of housing units, both occupied and vacant. Data were collected in a total of 1,240 counties out of the 3,141 counties in the United States. The sample is designed to provide estimates of housing and socio-economic characteristics for the nation, all states, most areas with a population of 250,000 or more, and selected areas of 65,000 or more.

The 2004 ASEC surveyed a national sample of housing units in 1,211 counties. The sample is designed primarily to produce estimates of the labor force characteristics of the civilian noninstitutionalized population 16 years of age and older for the nation and all states.

One difference between the two survey universes is that the ASEC included a small number of individuals living at addresses that were housing units in 2000 but were later converted to noninstitutional group quarters (e.g. emergency and transitional shelters and group homes). For the purposes of this report, all individuals with household type of group quarters (H-TYPE = 09 or 10) were excluded from the ASEC estimates.

Sample Size and Mode of Data Collection

The 2004 ACS interviewed a total of 534,383 households. Data were collected continuously throughout the entire calendar year using a combination of mail-out/mail-back questionnaires, Computer-Assisted Telephone Interviewing (CATI), and Computer-

Assisted Personal Interviewing (CAPI). Each month a unique national sample of addresses received an ACS questionnaire. Addresses that did not respond were telephoned during the second month of collection if a phone number for the address was available, and personal visits were conducted during the third and last month of data collection for a subsample of the remaining nonresponding units. Interviewer language capabilities include English, Spanish, Portuguese, Chinese, Russian, French, Polish, Korean, Vietnamese, German, and Japanese. The 2004 ACS achieved an overall survey response rate, calculated as the initially weighted estimate of interviews divided by the initially weighted estimate of cases eligible to be interviewed, of 93.1 percent.[1]

The 2004 ASEC contained interviews from 77,657 households and 59 noninstitutional group quarters. The ASEC interviews were collected over a three-month period in February, March, and April 2004 as a supplement to the basic monthly CPS conducted during those months, with most of the data collected in March. All ASEC data are collected via CATI or CAPI, with interviews conducted only one week each month. CATI can be conducted in Spanish. The response rate for the 2004 ASEC was 91.8 percent. Response rates among eligible households were about 92 percent in February and April 2004 and 91 percent in March 2004.

[1] As a result of a reduction in funding in 2004, ACS dropped the telephone and personal visit followup operations for the January 2004 panel, thus only allowing mail respondents to contribute to the overall response for that panel. Dropping the nonresponse followup operations for that single panel month reduced the annual response rate by about four percentage points. If we exclude the January panel from the calculation, the annual response rate rises to 97.3% The Census Bureau revised the methodology for calculation of the response rate in 2004 and although a similar cost reduction measure was taken in 2002 the response rates provided for 2002 do not reflect this new method.

Both the ACS and ASEC employ experienced permanent interviewers for CATI and CAPI data collection.

The final weighted distribution by mode for the 2004 ACS was 55.1 percent mail responses, 12.7 percent CATI, and 32.2 percent CAPI. The weights for a portion of the CAPI cases were multiplied by 1.5 to account for the subsampling of unmailable cases. The weights were multiplied by 3 for the rest of the CAPI cases since only a subsample of the cases not obtained through CATI were selected during this phase of the data collection process.[2]

The percent of movers varied by mode of data collection. For the 2004 ACS, those who responded via CAPI were more likely to have moved than those who responded through the mail or CATI. Two possible reasons for the high CAPI values were recent movers and vacants. Both would be unlikely to respond during the mail out/mail back month. Recent movers may not have been settled into their new home and too busy to respond. For those recent movers who did not respond via mail, CATI would most likely have had outdated numbers listed and not been able to reach the sample address. Two months after the initial mailing, a subsample of these movers would be captured during the CAPI phase when households were personally visited. In the case of the vacant houses, by the CAPI month the recent movers could occupy some of them. So the three month

[2] A variable rate sampling plan was implemented with the 2005 ACS for the selection of the nonresponse CAPI sample.

collection period for ACS is expected to identify fewer vacant units than other surveys, and to increase the proportion of CAPI movers.[3]

For the final weighted ASEC estimates, the data collection mode was CAPI for 85.0 percent of the people 1 year and over and 15.0 percent for CATI. There was less of a difference in moving rates by collection mode in ASEC than in ACS. One reason there is not as much of a difference in mover rates between CATI and CAPI respondents for ASEC is that a large number of housing units in ASEC were surveyed in the basic monthly CPS during the prior months. A housing unit is in sample in the basic monthly CPS for four consecutive months, out of sample for the next eight months, and back in sample for another four months. CAPI is done for the first and the fifth month the housing unit is surveyed. For the other months, the interview is conducted using either CATI or CAPI. By the time ASEC is conducted, phone numbers associated with most of the housing units in sample will have been recently updated due to CAPI.

Residence Rules

The ACS and the ASEC employ different residence rules to determine which individuals in a household are eligible for interview; the ACS uses the concept of current residence, while the ASEC uses a version of usual residence. This difference may contribute to variations in the universes on which social characteristics depend.

[3] U.S. Census Bureau. Meeting 21st Century Demographic Data Needs-Implementing the American Community Survey, Report 10, Comparing Selected Physical and Financial Characteristics of Housing With the Census 2000, pages vii-viii.

The ACS interviews everyone in the housing unit on the day of interview who is living or staying there for more than two months, regardless of whether or not they maintain a usual residence elsewhere, or who does not have a usual residence elsewhere. If a person who usually lives in the housing unit is away for more than two months at the time of the survey contact, he or she is not considered to be a current resident of that unit. This rule recognizes that people can have more than one place where they live or stay over the course of a year, and these people can affect the estimates of the characteristics of the population for some areas.

The ASEC interviews everyone staying in the housing unit at the time of the interview who considers the housing unit as their usual residence or who has no usual residence elsewhere. In addition, the ASEC also includes temporarily absent individuals who consider the housing unit as their usual residence.

The different residence rules resulted in one notable difference in the universe of the two surveys. Because the 2004 ACS excluded group quarters from the sample frame and interviewed individuals at their current residence, college students living in dormitories were not included in the ACS universe. In contrast, the ASEC interviewers are instructed to include as household members any college students who are temporarily absent from the household, including those who are currently residing in college dormitories. The result being that the ASEC sample universe should include more college students than the ACS sample universe.

Question Wording and Reference Periods

The presentation and wording of questions between the ACS and the ASEC are very similar. The mobility status question on the 2004 ASEC asked the following:

> Did this person live in this house or apartment 1 year ago?
>
> - Person is under 1 year old
> - Yes, this house
> - No, outside the United States – Print name of foreign country, or Puerto Rico, Guam, etc., below
>
> _____
>
> - No, different house in the United States

For both surveys, people living in a different house in the U.S. were asked to specify the location where they lived one year ago. On the ASEC, they were asked:

> Where did (reference person's name/you) live one year ago?
> Name of city/town/post office
> Name of State
> Zip Code
> Did (reference person's name/you) live inside the city limits of (place name)?
> What (county/parish) is (place name) in?

The ACS questionnaire asked the following for previous residence:

> Where did this person live 1 year ago?
> Name of city, town, or post office
> Did this person live inside the limits of the city or town?
> Name of county
> Name of state
> Zip Code

Even though the wording was similar between the two surveys, there was a difference in the reference periods. Since the 2004 ACS estimates are based on data collected throughout the calendar year looking back on residence 1 year ago, the move from the previous residence could have taken place anytime between January 2003 and December

2004 (24 months). But the possible dates for a move to occur in the 2004 ASEC were limited to the period from February 2003 through April 2004 (15 months) because the collection period is only February through April.

In both surveys, the time of previous residence refers to exactly 1 year before the date the respondent completed the survey or was interviewed. Since the data collection period for ACS was three months compared to one week for ASEC, the mover status and previous residence of occupants in a housing unit may change in ACS but would not in ASEC. For instance, if a family who is about to move for the first time in several years receives the ACS survey in the mail and ignores it, by the time the unit is personally visited two months later, new occupants may have already moved into the house.

Since both surveys covered a 1-year period for previous residence, cyclical trends (for example, more moves within the year occurring during the summer months) should not have caused a difference between estimates. However, because the reference periods were somewhat different, noncyclical trends (for example, a spike in the real estate market or natural disasters) may have caused the estimates for the two surveys to differ.

Item Nonresponse

Item nonresponse is the failure of an individual to provide complete and usable information for a data item. Item allocation rates are often used as a measure of the level of item nonresponse. These rates are computed as the ratio of the number of eligible people or households for which a value was allocated during the editing process for a

specific item to the number of people or households eligible to have responded to that item.

For the 2004 ACS, the weighted allocation rate for mobility status was 2.1 percent. For residence 1 year ago, the allocation rate for migration state/foreign country was 3.9 percent, migration county was 4.8 percent, migration minor civil division was 4.9 percent, and migration place was 5.3 percent.

For the 2004 ASEC, the weighted allocation rate was 12.4 percent for mobility status, 13.6 percent for migration state/foreign country, and 14.5 percent each for migration county, migration minor civil division, and migration place.

Data Editing and Imputation Procedures

Both the ACS and ASEC edit and imputation rules are designed to ensure that the final edited data are as consistent and complete as possible. These rules are used to identify and account for missing, incomplete, and contradictory responses. In each case where a problem is detected, pre-established edit rules govern its resolution.

The ACS and the ASEC employ two principal imputation methods: relational imputation and hot deck allocation. Relational imputation assigns values for blank or inconsistent responses on the basis of other characteristics on the person's record or within the household. Hot deck allocation supplies responses for missing or inconsistent data from similar housing units or people in the sample that did provide complete information.

In general, both surveys' editing procedures check to see if there is a value assigned to everyone 1 year and over for the mobility status question. If this item indicates that a person had a different residence the previous year, then the editing procedures impute or allocate data to complete any missing migration information concerning the previous residence geography: country code for those who lived outside the U.S., or state, county, minor civil division, and place codes of previous residence for those who lived within the U.S.

Specifically, for the 2004 ACS edit procedure for missing mobility status, the program first checked to see if an unedited state/foreign country code for previous residence was reported. This happened only with mail returned surveys since the CATI/CAPI system has built in edits to resolve this issue during the interview. If there was an unedited state/foreign country code, the appropriate mobility status was assigned. If there was no state/foreign country code for previous residence reported, then the program looked at the year moved in to determine if it was within the previous year or not; and if it was, then the mobility status was set to different residence 1 year ago within the U.S.[4] If year moved in was not within the last year, the program then looked to see if there was a spouse with a valid mobility code that could have been assigned, unless the person was a son/daughter age 1 to 18 years old. In that case the program looked to see if there was a mother, and if not a father, with a valid mobility status code. If the mobility status code

[4] Beginning with the 2005 ACS, the edit will also use the variable month moved in to determine mobility status.

was still not assigned, then the code was allocated based upon race, age, armed forces status, education status, and metropolitan status of current residence.

The ASEC edit for mobility status involves fewer steps and variables. ASEC does not ask for year moved in and the CATI/CAPI system does not allow a respondent to report that they lived in the same house and also provide geographic information for previous residence. This leaves only household relationship to use when assigning a mobility status code. For the 2004 ASEC, the program first looked at whether there was a spouse with a valid code. If the person was a child of the householder, they were assigned either the code for the mother or father, if possible. Other children within the household who were under 15 years old were assigned the status code of their parent if the parent had a valid mobility status. If none of these was the case, then the code was allocated based on race, tenure, age, and armed forces status.

The surveys differ slightly in the way residence 1 year ago is edited. For those who reported a mobility status of living outside the U.S. but did not indicate a foreign country, Puerto Rico, or U.S. Island Area as their residence 1 year ago, the 2004 ACS first attempted to assign a code based upon the other household members responses. If that was not possible and if the place of birth was a foreign country, Puerto Rico, or U.S. Island area, then the place of birth code was assigned for previous residence. Otherwise, the previous residence was allocated using race/Hispanic origin, age, and armed forces status.

While the monthly CPS collects place of birth data, the ASEC does not. Therefore, the edit for ASEC must differ from ACS. For the cases missing a foreign country, Puerto Rico, or U.S. Island Area code of previous residence, the 2004 ASEC first attempted to assign a code based upon the other household members' responses, and if that was not possible, allocated the value using race/Hispanic origin and age.

In order to impute residence 1 year ago for those with a mobility status of living within the U.S. 1 year ago, the 2004 ACS first attempted to assign it based on other household members' responses and then allocated state, county, minor civil division, and place codes using the characteristics region of birth, race, age/armed forces, education, and metro status of current residence. ASEC used census division of current residence, race, tenure, and age/armed forces. When state of previous residence was reported, ACS used state of residence 1 year ago and metro status to allocate previous county, minor civil division, and place while ASEC used state of residence 1 year ago and age. When it came to allocating just minor civil division or place, both surveys used state and county of residence 1 year ago.

Another difference between the ACS and the ASEC is how the reported data are loaded into the allocation matrices. Since the sample size in ACS is much larger than in ASEC, the allocation matrices can be reloaded with data from respondents in the same state of residence. That means that donors and acceptors for allocations live in the same state. Since intrastate moves are more common than interstate movers, the allocated value for previous state of residence is more likely to be the same as state of residence.

For the ASEC migration edit, the matrices must be loaded with the entire national data set that has been sorted by the household sequence number. Therefore, the donor and acceptors are less likely to be from the same state and the allocated value for previous state of residence is less likely to be the same as state of residence.[5]

Controls and Weighting

There are notable differences in the selection of controls and the calculation of weights between the two surveys that may lead to differences in estimates. The ACS and ASEC were both weighted to account for the probability of selection and for housing unit nonresponse.

After the initial weighting, data from the ACS and ASEC are both controlled to be consistent with independent population estimates for the mid-point of the collection period. Data from the 2004 ACS are controlled, at the county level[6], to independent estimates of the population of individuals and housing units in July 2004. The 2004 ASEC is controlled to independent national and state estimates of the population of individuals in March 2004. In addition, the ACS presents the average responses over a 12-month period, while the ASEC shows the living arrangements of people for the February-April time period although the population is controlled to March estimates. Because the ACS controls to both the total population and the total number of housing units the ACS files contain both person weights and housing unit weights. The ASEC

[5] The data will be sorted based upon geography for all edits starting with the 2006 ASEC.
[6] For smaller counties, the 2004 ACS formed weighting areas with a minimum population of 250,000.

does not control to the total number of housing units and, thus, the ASEC files do not contain an independent housing unit weight but instead use the weight of the householder as the weight of the housing unit.

RESULTS

The CPS has been producing annual migration data since 1947 while the ACS started producing annual national migration data in 2000. Table 1 shows the ACS and ASEC estimated number and rate of nonmovers and movers for 2000 through 2004. The number of movers and the mobility rate were similar for the two surveys in 2000, but the ACS has consistently estimated more movers than ASEC and a higher mobility rate for the nation every year since. The difference in the overall mobility rate was largest for 2004 at 2.0 percentage-points. As discussed in the Methodology section, there are many differences between the surveys that may contribute to the differences in mobility rates: namely, sample frame, interview period, residence rules, reference period, unit nonresponse, imputation, and population controls.

Table 2 shows the differences between the 2004 ACS and ASEC estimates broken down by data collection mode. The mobility rate, or percent of people living in a different house 1 year ago, of those whose data was captured via CAPI (24.3 percent) was higher than for those who answered the mail-in questionnaire (12.9 percent) or via CATI (6.0 percent). The mobility rates for ASEC by mode were 10.5 percent for CATI and 14.3 percent for CAPI.

Table 3 displays the mobility rates for selected characteristics. Since the base population 1 year and over was significantly different between the two surveys, the mobility rate provides a way of comparing the difference in mobility estimates between the two surveys. The most striking result in Table 3 is that the percentage of those who moved within the same county was significantly higher in ACS than ASEC for almost every characteristic. Likewise, most characteristics for the percentage of those who lived abroad 1 year ago were also higher for ACS, but fewer differences were significant than those who moved within the same county. Conversely, ASEC had higher percentages of movers to a different state for many characteristics, but the differences were not significant as often as for those who lived abroad.

As expected given the overall difference in the 2004 mobility rate between the two surveys, the percentage of those who did not move was significantly higher in ASEC for most estimates. The only exceptions are those that are all remaining single races and all race combinations and those with an income of $65,000 to $74,999. In both cases, there was no significant difference between the ACS and ASEC estimates.

In addition to the general findings discussed above, a number of specific results are worth mentioning. For example, the 2004 ASEC was two percentage-points higher than the ACS for the percent of nonmovers. The percentage-point differences by age group were largest for those 18 to 19 years and 20 to 24 years. For 2004 ACS, 68.1 percent of those 18 to 24 years old lived in the same place and compared with 74.6 percent for 2004

ASEC. Part of this could be attributed to the different residence rules that were applied to college students, especially those temporarily absent from their household and living in college dormitories. They would be included in ASEC if they defined their usual residence as a housing unit where an interview took place, for example their parents' home. They were out of scope for ACS if they were away from home staying in the dormitories or not expected to be living at home for two months. Also, the population age 18 to 24 years old tends to be more mobile than the general population, thus any difference in the coverage of movers between the surveys might be magnified. The age groups 25 to 29 years and 30 to 34 years also had significantly larger percentage-point differences for those who lived in the same residence 1 year ago than the population in general.

The difference in percent of nonmovers age 15 years and over between the surveys was 2.3 percentage-points. Both the percent of those never married and those that had an income of $1 to $9,999 or loss both had significantly larger percentage-point differences between the surveys than population 15 years and over in general. These groups may contain a larger proportion of college students and they also tend to be more mobile than the population in general. Those separated also had a significantly larger percentage-point difference from all nonmovers 15 years and over.

As was the case among nonmovers, for movers within the same county there were larger significant differences for some specific age groups than for the total. For the percent of movers within the same county, the 2004 ACS was 1.8 percentage-points higher than the

2004 ASEC for the population age 1 year and over. The age groups 18 to 19 years, 20 to 24 years, and 25 to 29 years all had larger differences than the population 1 year and over. For all three groups together, the percentage-point difference was 3.9.

Likewise, the percentage-point differences for those never married and those with an income of $1 to $9,999 or loss were larger than the 1.9 percentage-point difference for those 15 years and over.[7] In addition, the percentage-point difference where a householder lived in renter-occupied housing was higher than the percentage-point difference for the population 1 year and over. Those in householder lived in renter-occupied housing units moved at a much greater rate than those in householder lived in owner-occupied housing units.

The 2004 ACS also had a larger percent of people age 1 year and over that moved to a different county within the same state. The percentage-point difference was 0.3. The age groups 20 to 24 years and 25 to 29 years had significantly larger percentage-point differences.

For those age 15 years and over, the percentage-point difference was 0.4[8] (ACS higher than ASEC) for movers from a different county within the same state. Those never married and with an income of $1 to $9,999 or loss had significantly larger differences than the group age 15 years and over as a whole.

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[7] The difference in percent of movers within the same county for the population age 1 year and over was not significantly different from the difference for those 15 years and over.

[8] The 0.4% difference for movers between counties in the same state age 15 years and over is not significantly different from the 0.3% difference for age 1 year and over or the 0.3% difference for those age 25 years and over.

For the percent moved to a different state, the 2004 ASEC was 0.2 percentage-points higher for those 1 year and over than the 2004 ACS. The only characteristics with significantly larger percentage-point differences were Black or African American alone and those in householder renter-occupied housing units.

The percentage-point difference for those age 1 year and over who moved from abroad was 0.2 with ACS having the higher rate. The characteristics with a difference significantly larger than this were those age 18 to 19 years, those who were all remaining single races and all race combinations, and those who were Hispanic or Latino. Those age 15 years and over also had a percentage-point difference of 0.2 between surveys and of those, the group with an income of $1 to $9,999 or loss had the only significantly larger difference.

SUMMARY

The 2004 ACS estimated 5.3 million more movers than the 2004 ASEC. This translated into a 2-percentage point difference in the overall mobility rate between the two surveys. This was the largest difference between the surveys since 2000 when ACS started producing estimates at the national level. Although the 2004 ACS has a higher overall mobility rate, the mobility rate for movers between states was higher for 2004 ASEC.

Even though the mobility questions for the surveys are worded similarly, there are many possible reasons for differences in the estimates. The two surveys have different residence rules and collection periods. Also, the process for updating the sample frame to account for new construction differs. During data collection, ACS collects data over three months using mail-in questionnaires along with CATI and CAPI instruments while ASEC has a much more condensed data collection phase that only uses the latter two. During the duration of data collection for ACS, vacant houses may become occupied or the people within the housing unit may change. And during processing, the edits vary in both assigning and allocating missing values. The difference in allocation rates can also affects the variation between the final estimates. These differences should be taken into account for any analysis of mobility data that is done with the surveys.

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