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CENTER FOR ADMINISTRATIVE RECORDS REASEARCH AND APPLICATIONS MEMORANDUM SERIES # 2016-08

MEMORANDUM FOR ACS Research and Evaluation Advisory Group

From: Amy O'Hara *(signed Amy O'Hara)*
Chief, Center for Administrative Records Research and Applications (CARRA)

Subject: Preliminary Research for Replacing or Supplementing the Residence One Year Ago Question on the American Community Survey with Administrative Records

Attached is the Center for Administrative Records Research and Applications (CARRA) Research and Evaluation report, "Preliminary Research for Replacing or Supplementing the Residence One Year Ago Question on the American Community Survey with Administrative Records." We conducted this evaluation to assess the potential for using Internal Revenue Service (IRS) data to replace or supplement the Residence One Year Ago question on the American Community Survey. If you have any questions about this report, please contact Amy O'Hara at 301-763-5757 or Dave Sheppard at 301-763-9291.

Attachment

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Preliminary Research for Replacing or Supplementing the Residence One Year Ago Question on the American Community Survey with Administrative Records

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EXECUTIVE SUMMARY

As detailed in the report, "Agility in Action: A Snapshot of Enhancements to the American Community Survey" (Census Bureau, 2015), the Census Bureau is investigating ways to reduce the difficulty and length of the American Community Survey (ACS) using administrative records to address concerns about the burden survey participation places on respondents. We are investigating the Residence One Year Ago (ROYA) question in this report. This research will begin the determination of whether there are administrative record sources with data of sufficient coverage and quality that would allow the question on the ACS to be removed. Alternatively, we may find administrative record sources sufficient only to supplement data provided by respondents by filling in missing responses or improving editing routines. A Census Bureau team will use this report and conduct additional research to make recommendations on whether this question is a good candidate for removal or supplementation with the use of external data sources in its place.

The ROYA question on the ACS has two parts; the first part asks if a respondent has moved in the past year and the second part asks for detailed address information on that move. This report explored whether information from the Internal Revenue Service (IRS) tax returns provides information on mobility status, or if a respondent has moved in the past year as reported in unweighted ACS data. This report is focused on simulating how IRS data compares to actual respondent data without making any inference on effects on ACS estimates. Protected Identification Keys (PIKs) were assigned to 95.0 percent of ACS householders in 2012. For ACS responses to the ROYA question where PIKs were assigned, 76.6 percent of the time householders on the ACS can be linked to people in IRS data. The IRS data agreed with the ACS data on whether a householder moved 84.5 percent of the time, and when they agreed, it was usually when a householder had not moved in the past year (95.5 percent). For the linked sample of householders (the person in whose name the housing unit is rented or owned), IRS data indicate a move in the previous year for 14.0 percent of ACS respondents, which is higher than the 9.1 percent in ACS unedited data. This report does not look into matching and supplementing prior year address information.

The primary mandated use of the ROYA question is by the Population Division at the Census Bureau. The ROYA question provides information on persons who move into the United States from other countries that is needed to construct estimates of international migration. No administrative records sources have been identified to replace this component of the question. Lack of international migration detail is a major challenge to using the IRS data to replace the ROYA question for the ACS.

I. Background

Stemming from concerns about the burden that the American Community Survey (ACS) participation places on respondents, the Census Bureau is looking for ways to reduce the difficulty and length of the survey by leveraging administrative records. We have identified sources of both federal and third-party data that may potentially alleviate the need to ask certain questions altogether or for a subset of the ACS sample. Work is underway to acquire new sources and assess their linkage to the ACS sample, the presence of comparable data to ACS questions, and their agreement with ACS self-reported and imputed responses by subpopulation and housing characteristics. Data from other Federal agencies are under review as potentially replacements for ACS content, including income data from the Internal Revenue Service (IRS) and pension and disability data from the Social Security Administration (SSA). The American Community Survey Office (ACSO) is consulting with stakeholders, including Congress, regarding the appropriateness of direct substitution.

Recently, the ACSO contracted with the National Opinion Research Center (NORC) to report on the availability of data sources, as well as the potential issues with those sources, as candidates for replacing or supplementing data currently collected by the ACS. Using this report (Ruggles, 2015) as well as their experience, the Center for Administrative Records Research and Applications (CARRA) identified several topics for further study based on the availability of data and likelihood of successful matching and analysis. These topics include:

- Year built
- Part of condominium
- Tenure
- Property value
- Real estate taxes
- Have mortgage/mortgage amount
- Second mortgage/HELOC and payment
- Income in the past 12 months
- Residence one year ago
- Number of rooms/bedrooms
- Facilities
- Fuel type
- Acreage
- Telephone service
- Self-employment income in the past 12 months
- Sale of agricultural products
- Social security income and supplemental security income in the past 12 months

For each topic, CARRA will acquire and match the administrative records to survey data, provide a report describing the linkage, presence, and agreement of the data source with the ACS self-reported and imputed responses by subpopulation and housing characteristics as applicable.

This research is intended to be a first look at the various topics to document the linkage of federal and third-party data sources to the ACS sample, presence of comparable data to ACS

questions, and their agreement with ACS self-reported and imputed responses for potential ACS integration. This research will enable ACS to evaluate the potential of the replacement data sources, identify challenges, and provide direction for further research. It is an exploratory investigation of the feasibility of replacing ACS data with administrative records.

Next, the ACSO will create teams for each ACS topic identified as a potential candidate for records usage based on the results from the first phase of research. Each team will include statistical researchers, subject matter experts, and data processors that together can identify and research issues related to records usage.

The teams will make recommendations on whether each question is a good candidate for removal from the survey questionnaire with the use of federal or third-party data sources in its place. This recommendation will be based on an assessment of the implications of implementing such a change, considering overall data quality, break in series, and the limitations of the data source affecting the suitability for use. The team will document and evaluate various options for integrating the records. For instance, for some topics, records may be better suited in assisting with imputation whereas for other topics the records may be used for direct substitution of a survey question (for all or a subset of the ACS respondent pool).

Moreover, the ACSO will gauge reactions to our intention to use federal and third-party data sources from data users, stakeholders, and the public. They will review current ACS mail materials to ensure proper transparency, as well as publicly share our vision in forums such as the ACS Data Users Conference, meetings of the Association of Public Data Users (APDU), the Population Association of America (PAA), the Joint Statistical Meetings (JSM), the American Association for Public Opinion Research (AAPOR), and other public venues.

This report focuses on the ACS Residence One Year Ago (ROYA) question. ACS data are widely used to study geographic mobility, along with other annual mobility data from Census Bureau Population Estimates, Internal Revenue Service (IRS) Migration Data, and the Annual Social and Economic Supplement to the Current Population Survey (ASEC) – which is the Census Bureau's longest continuous measure of one-year geographic mobility. The Census Flows Mapper (an interactive, mapping application that shows county-to-county migration flows) and numerous mobility reports rely on data from the ACS ROYA question. The data from this question are the primary source for measuring migration from abroad.

II. Literature Review

The report, "Review of Administrative Data Sources Relevant to the American Community Survey (Ruggles, 2015)," provided a review of data sources that could be used to replace or improve specific questions on the ACS. Its purpose was to support the work of the ACS Content Review (Chappell and Obenski, 2014) by providing additional input on potential data sources

that might be used to improve the survey and its content or reduce the burden associated with its collection.

CARRA uses the Person Identification Validation System (PVS) to assign Protected Identification Keys (PIKs) to records. PIKs are unique, anonymous person identifiers assigned to facilitate linking across files while protecting individuals' privacy. Personally identifiable information is then removed from the records to anonymize the data and preserve confidentiality so it can be used for statistical purposes and research (Wagner and Layne, 2014). Not all records are able to receive a PIK and the ability to assign PIKs to records is not random. One study used probit models to explore the biases in linking data to the 2009 and 2010 ACS using PVS (Bond et al, 2014). The results suggest that certain types of respondents are less likely to be assigned a PIK. Recent movers and immigrants, as well as young children, minorities, residents of group quarters, low-income individuals, and non-employed individuals are less likely to receive a PIK. In another study, PVS false match rates were developed by analyzing the observed false matches in truth data, and then using the Belin and Rubin methodology to model the false match rate using the truth data (Layne et al., 2014). This truth data was generated by extracting the verified records from the PVS verification module, which provides a direct match to the Census Social Security Numeric Identification File (NUMIDENT) based on Social Security Number, and then confirms agreement of the name and date of birth data. The results showed that, due to the non-normality of the distributions of the Box-Cox power transformed weights for both the true and false match rates, this method is not a good approach for PVS error research, and the authors indicate that future research using alternative methods of measuring false match rates is needed. Another report discusses the utility of the National Change of Address (NCOA) database in providing supplemental geographic specificity to the self-reported movers in the ACS (Benetsky et al., 2015). In the analysis, migration flow pairs (moves between residence origins and destinations) were constructed for records in both sets of data and then individuals were matched through the PVS. The report concluded that using the NCOA to supplement missing geographic information for matched movers during normal ACS processing would not be feasible at this time.

The IRS presented a report on the use of IRS data in migration studies to the American Statistical Association in 2005 (Gross, 2005). This report discussed how the IRS and the Census Bureau worked together to create area-to-area migration data from the Individual Master File (IMF) that can be used both in the Census Population Estimates Program and the Treasury Department's Office of Tax Analysis. Using IRS data has the advantage of being based on a very large dataset, but the dataset is not comprehensive as some segments of the population are underrepresented in IRS data, such as the poor and the elderly. Because the dataset reflects only returns filed before late September, late filers are not included. Most late filers are high-income, which introduces an additional bias. Secondary filers are also not included in the dataset. This becomes problematic as it means the file will miss cases when a filer changes from secondary to primary

status between the two tax years. Many of the data limitations described in this report continue to exist in current IRS data.

As of the 2011-2012 data year, the IRS took over the creation of the Area-to-Area Migration Data. The IRS made a number of changes that they detailed in a Statistics of Income Bulletin, (Pierce, 2015). The current migration file reflects an entire year of data and includes late-filers. They have also altered the way they match records to include primary, secondary, and dependent filers. These changes made the file representative of a larger swath of the population filing a tax return.

The Census Bureau uses data from the ACS ROYA question in preparing both the annual intercensal estimates as well as in Demographic Analysis (DA) performed once a decade. Intercensal estimates serve as the official estimate of the population for the nation, states, counties, and subcounty areas; they are the population controls for surveys, and they are used to distribute billions in federal funds. Migration estimates are an important part of total population estimates. In order to estimate domestic migration for the population under 65 years of age, the Census Bureau Population Estimates Program (PEP) uses person-level data from the IRS. Similar to the methodology used in this analysis (described in the Data and Methods section), PEP matches two years of IRS tax returns with age data from the NUMIDENT. PEP then compares the addresses between the two years of IRS data to identify the number of exemptions that moved from one county to another between tax filings. Because IRS coverage rates for the population aged 65 and over are not as high as they are for the younger population, the Census Bureau relies on changes in Medicare enrollment data from the Centers for Medicare and Medicaid (CMS) to measure migration for the older population (U.S. Census Bureau, 2015).

DA is used to develop national estimates of the population in order to assess the decennial census counts. Net international migration is a key component in developing population estimates for DA. One report describes the data and methods used to calculate international migration flows for the 2010 DA release (Bhaskar et al. 2013). ACS data is a critical component in developing the foreign-born migration DA component.

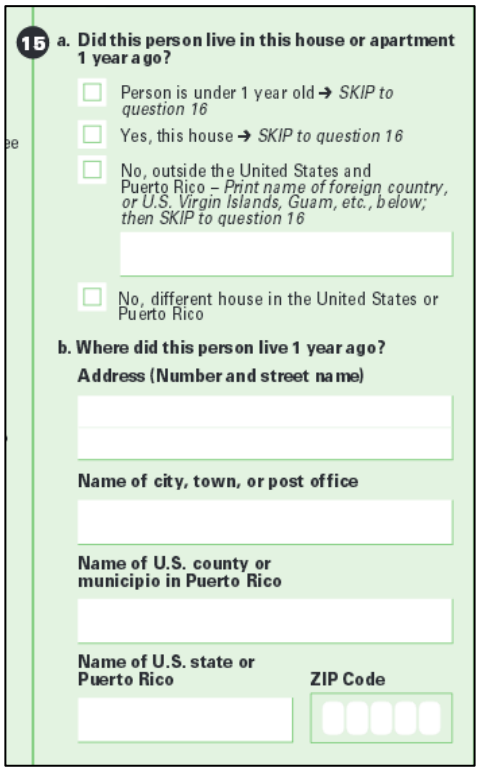
To estimate the number of immigrants who entered the country in the last year, two questions from the ACS were used for both DA and the population estimates — the ROYA and the Year of Entry (YOE) questions. Before the ACS was implemented, this information was gathered from Immigration and Naturalization Service (INS) administrative records for legal immigrants and estimation of temporary migrants and the residual foreign-born (Robinson et al. 2011). This method is considered insufficient because of uncertainty surrounding the estimates of temporary migrants and the residual foreign-born. The ACS ROYA method is preferred because it includes all foreign-born respondents regardless of legal status and is thus not dependent on estimation (Bhaskar et al., 2011).

III. ACS Background

The person section of the ACS asks a question concerning the residence of the respondent one year ago, seeking to capture information twelve months prior to the interview date. This report compares the ACS respondent-provided data from 2012 to two years of linked IRS data to determine whether IRS data could replace the ROYA question on the ACS. There were three modes of data collection for the ACS in 2012 (paper, Computer Assisted Telephone Interview (CATI), and Computer Assisted Personal Interview (CAPI)), and there are slight differences for this question in each mode, as reflected in our analysis. The internet mode of response was added to the ACS in 2013 and is not included in mode descriptions for this report. Migration status – determining whether a person was a mover or non-mover – is captured by varying formats across the modes.

A. ACS Response Mode: Paper

Question 15 part a. of the 2012 paper questionnaire reads, "Did this person live in this house or apartment 1 year ago?" The question is asked of everyone, capturing whether the person lived in the same house, outside the US and Puerto Rico, or in a different house in the US or Puerto Rico. Part b. reads, "Where did this person live 1 year ago?" and asks for specific address information. See Appendix I for information provided in the Instruction Guide for these questions.


15 a. Did this person live in this house or apartment 1 year ago?

- Person is under 1 year old → *SKIP to question 16*
- Yes, this house → *SKIP to question 16*
- No, outside the United States and Puerto Rico – *Print name of foreign country, or U.S. Virgin Islands, Guam, etc., below; then SKIP to question 16*
- No, different house in the United States or Puerto Rico

b. Where did this person live 1 year ago?

Address (Number and street name)

Name of city, town, or post office

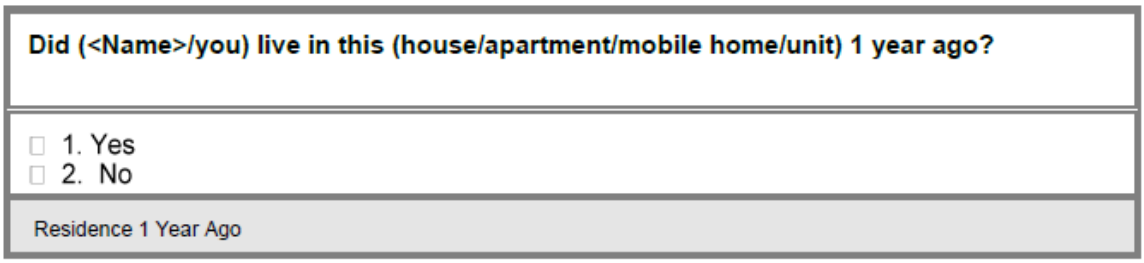
Name of U.S. county or municipio in Puerto Rico

Name of U.S. state or Puerto Rico

ZIP Code

B. ACS Response Mode: Computer Assisted Telephone Interview (CATI) or Computer Assisted Personal Interview (CAPI)

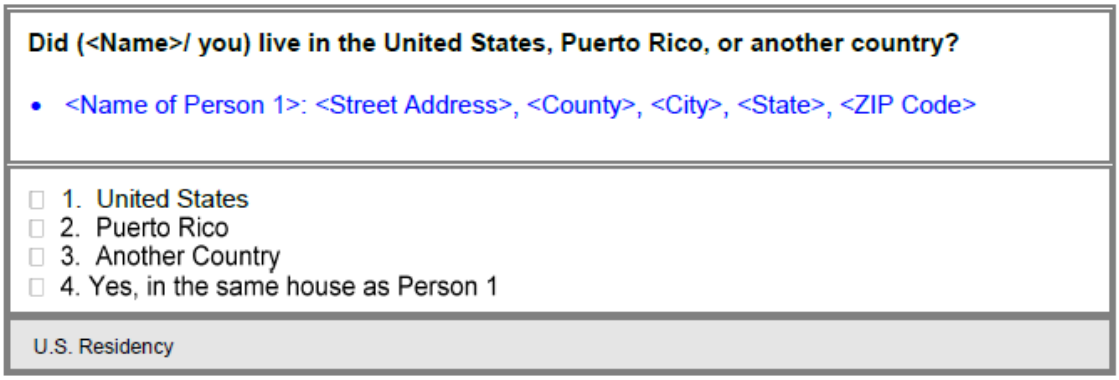
In the CATI and CAPI response modes, the interviewer reads the following question: regarding each roster member, "Did (<Name>/you) live in this (house/apartment/mobile home/unit) 1 year ago?" Answers yes or no are captured for this screener question.


Did (<Name>/you) live in this (house/apartment/mobile home/unit) 1 year ago?

1. Yes
2. No

Residence 1 Year Ago

The next question asks, “Did (<name>/you) live in the United States, Puerto Rico, or another country?” There are four response categories, “1. United States,” “2. Puerto Rico,” “3. Another Country,” and “4. Yes, in the same house as Person 1.”



If the interviewer enters 1 or 2, the instrument will proceed to part b of the ROYA question, prompting collection of the street address, city, county, state, and ZIP code where person 1 lived 1 year ago. An entry of 3, “Another Country,” prompts collection of the name of the foreign country where the householder lived 1 year ago. Code 4 is a possible selection only if the first person listed on the roster answered “no” to if they lived in this housing unit 1 year ago If the first person on the roster does not give a previous address of U.S. residence, then the migration information must be collected for all applicable people on the roster.

IV. Research Questions

We attempted to address these three questions:

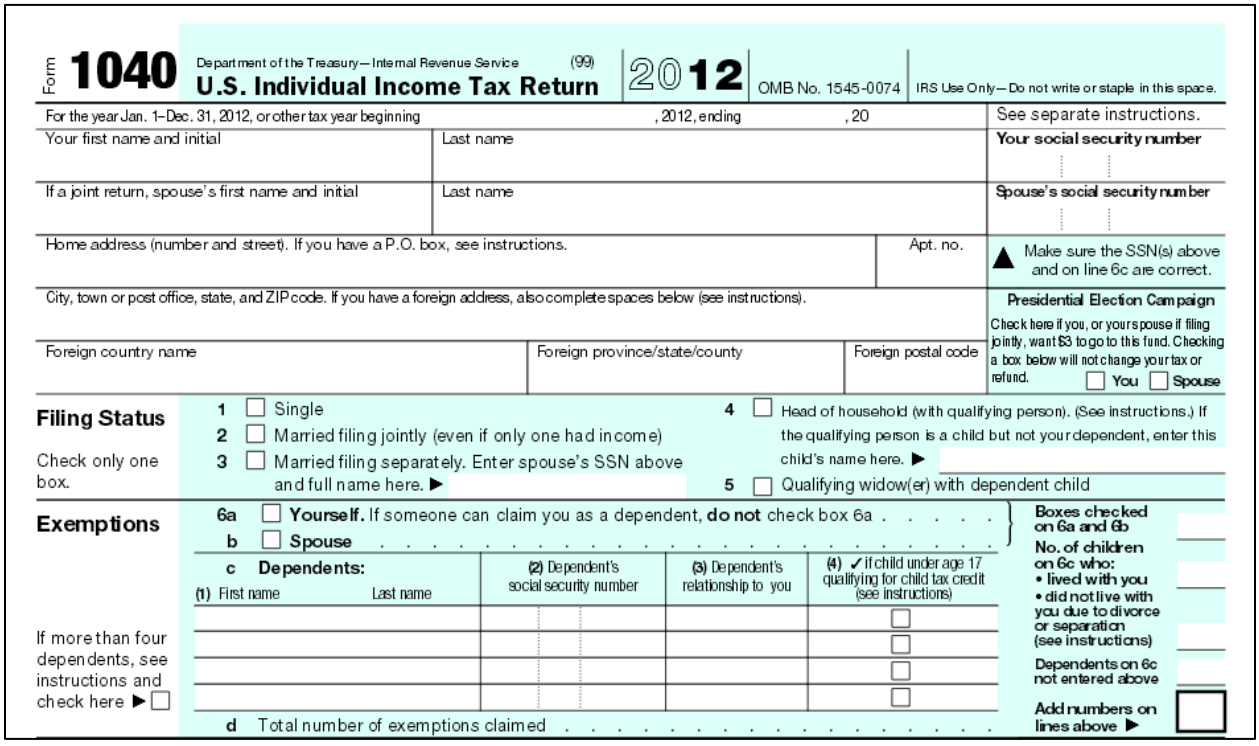
- To what extent is the construct measured by the federal or third-party data source(s) identical or close enough to the construct as measured by the ACS question(s)?
- How often does this federal or third-party data source(s) contain data that can be used to replace the respondent provided response?
- How often do the data from the federal or third-party data source(s) agree with the reported response from ACS respondents by major subpopulation and housing characteristics?
- How current are the federal or third-party data source(s), that is, can we get current year data for the ACS cycle?

V. Data and Methods

Data

Individual income tax return data from Form 1040 from 2011 and 2012 are used in this analysis. More than 140 million tax returns are filed each year, providing substantial coverage of U.S. households (Internal Revenue Service, 2013). The tax forms collect the names and social security numbers of the people in the household and the address from which they filed their tax

return. This could be their home address, though filers may list other locations such as business addresses, accountant address, or post office boxes. Tax returns can include tax dependents at an address where they do not reside (for instance, college students living in dormitories rather than at a parent's address). ACS group quarters residents are not included in this study. To remain compliant with the IRS filing deadline of April 15 of the subsequent year, most households file returns in February, March, and April. Some individuals request extensions and file on or before October 15, and a small number of filers submit late or amended returns throughout the year.[1]



Form **1040** Department of the Treasury—Internal Revenue Service (99) **U.S. Individual Income Tax Return** **2012** OMB No. 1545-0074 IRS Use Only—Do not write or staple in this space.

For the year Jan. 1–Dec. 31, 2012, or other tax year beginning , 2012, ending , 20 See separate instructions.

Your first name and initial | Last name | Your social security number

If a joint return, spouse's first name and initial | Last name | Spouse's social security number

Home address (number and street). If you have a P.O. box, see instructions. | Apt. no. | Make sure the SSN(s) above and on line 6c are correct.

City, town or post office, state, and ZIP code. If you have a foreign address, also complete spaces below (see instructions). | Presidential Election Campaign

Check here if you, or your spouse if filing jointly, want $3 to go to this fund. Checking a box below will not change your tax or refund. ☐ You ☐ Spouse

Foreign country name | Foreign province/state/county | Foreign postal code

Filing Status Check only one box.

1 ☐ Single
2 ☐ Married filing jointly (even if only one had income)
3 ☐ Married filing separately. Enter spouse's SSN above and full name here. ▶
4 ☐ Head of household (with qualifying person). (See instructions.) If the qualifying person is a child but not your dependent, enter this child's name here. ▶
5 ☐ Qualifying widow(er) with dependent child

Exemptions

6a ☐ **Yourself.** If someone can claim you as a dependent, **do not** check box 6a
b ☐ **Spouse**

c **Dependents:** (1) First name Last name	(2) Dependent's social security number	(3) Dependent's relationship to you	(4) ✓ if child under age 17 qualifying for child tax credit (see instructions)
			☐
			☐
			☐
			☐

If more than four dependents, see instructions and check here ▶ ☐

d Total number of exemptions claimed

Boxes checked on 6a and 6b
No. of children on 6c who:
• lived with you
• did not live with you due to divorce or separation (see instructions)
Dependents on 6c not entered above
Add numbers on lines above ▶

The ACS ROYA question is asked for all persons and collects residence one year prior to the interview date. The IRS data do not capture home address during all months of the year, but only the address at which a person has filed their return. Linking persons between two years of tax return data (2011 and 2012), allows us to observe whether their address has or has not changed. This addresses domestic migration for the ACS question, provided the person files taxes in both years. IRS data fail to capture international migrants who were not in the U.S. in the previous year, unless they were required to file a tax return from their address abroad. This is a major drawback of IRS data for replacing the ROYA question. Although the Population Estimates Program has used Legal Permanent Resident records and refugee data for benchmarking, no other administrative data sources have been identified to fully address the migration-from-abroad gap.

[1] For more information on filing patterns, see http://www.irs.gov/uac/Filing-Season-Statistics produced by the Statistics of Income Division of the IRS.

Methods

To address question 15A, we start with person records for ACS respondents that have been processed through the Person Identification Validation System (PVS). PIKs are unique, anonymous person identifiers assigned through the PVS to facilitate linking across files while protecting individuals' privacy. For more information on the assignment of PIKs by PVS, please see "The Person Identification Validation System (PVS): Applying the Center for Administrative Records Research and Applications' (CARRA) Record Linkage Software". Unedited and unweighted ACS reported responses were compared directly to data submitted to IRS.

To determine whether the administrative records provide information on mover or non-mover migration status, we link IRS data from tax years 2011 and 2012 to persons who responded to the 2012 ACS. If the tax return address is the same between two years of IRS data, we flag the people in the unit as non-movers. If the address is different, we infer that a move has occurred. After this report, an ACSO working group will evaluate if the administrative records meet the following criteria: the records should cover the ACS universe, provide complete and accurate information, represent the appropriate timeframe, and measure the right concept.

VI. Limitations

The primary mandated use of the ROYA question is by the Population Division at the Census Bureau. The ROYA question provides information on persons who move into the United States, which is needed to construct annual estimates of international migration. Federal and third-party sources were not addressed for question 15b. This is a major drawback of IRS data for replacing the ROYA question. Although the Population Estimates Program has used Legal Permanent Resident records and refugee data for benchmarking, no other administrative data sources have been identified to fully address the migration-from-abroad gap. The modest linkage, presence, and agreement between data sources described in this report indicate the need for further research on the topic.

Other limitations concern the universe alignment and timing of tax returns. Not all U.S. residents are required to file tax returns. Furthermore, not all tax returns list a residential address: 4.5 percent of returns have a P.O. Box, and filers may list their business or accountant's address instead of their home address. Regarding the timeliness of the data, tax returns are filed for income earned in the previous year. For example, income earned in calendar year 2011 appeared on individual income tax returns that were due by April 15, 2012. Addresses from tax returns are most useful for persons who have lived in the U.S. for at least two years and who have reportable income. As mentioned above, the IRS data and administrative records approach fails for persons who were not in the U.S. or did not have to report income to the IRS in the 1-2 years before the survey.

The timing of tax returns is also problematic given the ACS monthly data collection. Respondents are supposed to answer about their residence one year prior to the interview date.

Most tax returns are filed between February and April each year, meaning that ROYA responses for summer, fall, and winter ACS respondents may misalign with tax return residence information. Multiple moves within a year may also explain misalignment between the ACS and IRS data. See Figure 3 in Appendix IV for examples of potential timing misalignment between tax filing and ACS responses.

There are additional timing issues surrounding when the 1040 data is available for Census use. The full universe of IRS tax returns is not available to Census until up to two years after the tax year. For example, while Census did not receive the majority of 1040s for tax year 2012 until after they were filed in the Spring of 2013, Census did not receive the last late returns filed with the IRS until February 2014. This has implications for data processing.

VII. Results

Table 1 presents information about unweighted ACS response; Table 2 presents information about linkage rates, and Tables 3 through 6 present information about rates of agreement. These tables are located in Appendix III. Table 1 presents unedited responses to the ACS question. 95.6 percent of 2012 ACS respondents provided an answer to the ROYA question. The majority of these responses, 83.4 percent, indicated that the respondent did not move in the past year. Table 1 also shows ACS PIK assignment rates for the ACS sample living in housing units by their response to the ROYA question. The 2012 ACS sample had a very high overall PIK rate, at 94.0 percent. Table 1A in Appendix III shows ACS PIK assignment rates for householders by their response to the ROYA question. The PIK rate for householders was 95.0 percent.

Table 2 in Appendix III compares the ACS responses assigned a PIK to the ROYA question by IRS records to see if we could link to the respondent in the IRS data. This table does not show agreement between the IRS data and the ACS data over ROYA response, but solely if we could or could not link to an ACS respondent in the IRS data. Of the 4,972,562 people who were assigned a PIK and present in the 2012 ACS data, we could link to 3,892,028 (78.3 percent) in a 2011 or 2012 tax year 1040 individual income tax return. The response categories with the highest match rates to IRS were people who lived at the same house one year ago (79.8 percent). In addition, 70.9 percent of missing ACS responses could be linked to an IRS record. Table 2A performs the same comparison for householders with similar results.

Table 3 in Appendix III collapses the ROYA response categories from the ACS for the householder into two categories: respondent lived at the same address one year ago (non-movers) and respondent lived at a different address one year ago (movers), based on their ACS response. It then crosses these categories by demographic and geographic variables. In the 2012 ACS sample, householders under age 25 and people who rent moved at higher rates than people over age 25 and homeowners. Nevada and the District of Columbia also have a higher percentage of movers than other states in the 2012 ACS sample. These results are for ACS person records population older than 1, prior to PIK assignment.

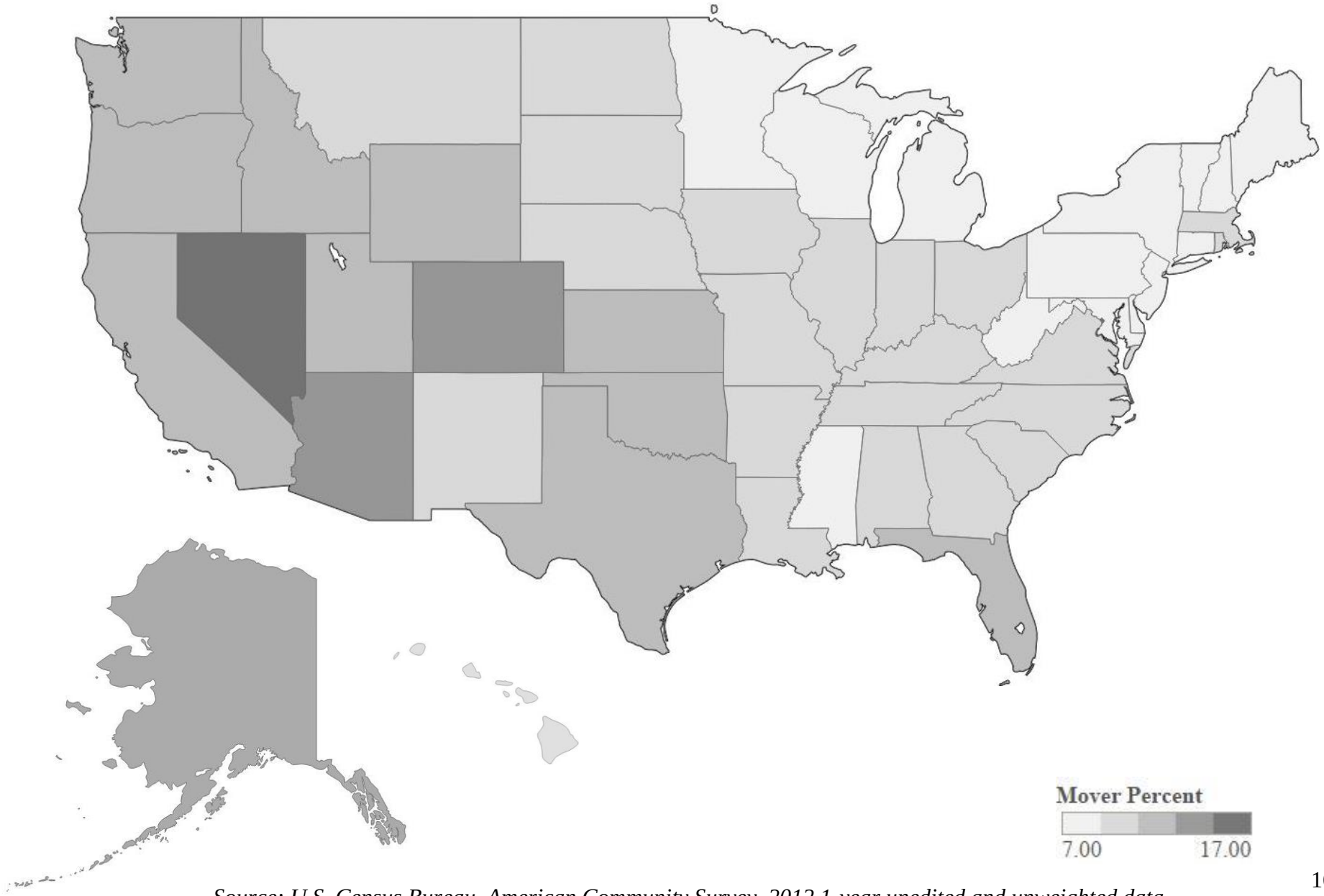
Table 4 in Appendix III presents the distribution of the ACS ROYA response alongside the IRS moving concept for ACS householders who were PIK-linked to IRS data. Note that only records assigned a PIK were eligible for linking. Similar to Table 3, the ROYA response categories from the ACS were collapsed into mover and non-mover categories, and then Table 4 crosses these categories by demographic and geographic variables. In the 2012 ACS sample, householders under age 25 and people who rent moved at higher rates than people over age 25 and homeowners. Nevada and the District of Columbia also had a higher percentage of movers than other states. See Figure 1 below for a map representing the state distribution of the percent of the population who were movers in the past year. These results are for all ACS householders prior to PIK assignment.

The last set of columns in Table 4 present the mobility concept as captured by IRS data for ACS householders who were PIK-linked to IRS data. The IRS data includes more movers who were female filers, filers under age 40, and renters, compared to males, people over 40, and homeowners. In the linked sample, Alaska, the District of Columbia, Oklahoma, and West Virginia also have a higher percentage of movers than other states. While the move status is derived from the IRS data for these columns, the demographic and geographic variables (state and MSA) are based on the ACS response rather than the IRS data. ACS householders were matched to all IRS PIKs, regardless of if they were primary, secondary, or dependent matches. See Table 4A for more information on filing status.

Overall, there are more movers in the IRS data, 14.0 percent compared with the 9.1 percent found in the ACS data. There are more movers in the IRS data when compared with the ACS data in most demographic characteristics, including sex, race, ethnic origin, and tenure. However, there are fewer movers in the IRS data when compared with the ACS data in the age demographic categories (67.4 percent of movers under age 20, compared with 45.0 percent of movers in that age group in the IRS data). After age 25, the IRS data again shows more movers than the ACS data. The pattern of higher percentage of moves in IRS data continues when you look at the tables geographically. The largest differences occur in the District of Columbia, Nevada, and West Virginia.

Table 5 in Appendix III compares householders linked between the ACS and IRS data files to see if the two sources agreed that a respondent had moved. The IRS agreed with ACS data on whether or not a householder moved 84.5 percent of the time and disagreed with ACS data in 15.5 percent of cases. IRS and ACS data agree more often as householders get older, for male householders, for white householders, and for homeowners. Geographically, the highest levels of disagreement are in Alaska, the District of Columbia, Nevada, Oklahoma, and West Virginia.

Figure 1: ACS Residence One Year Ago: Percent of Population that were Movers



Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data

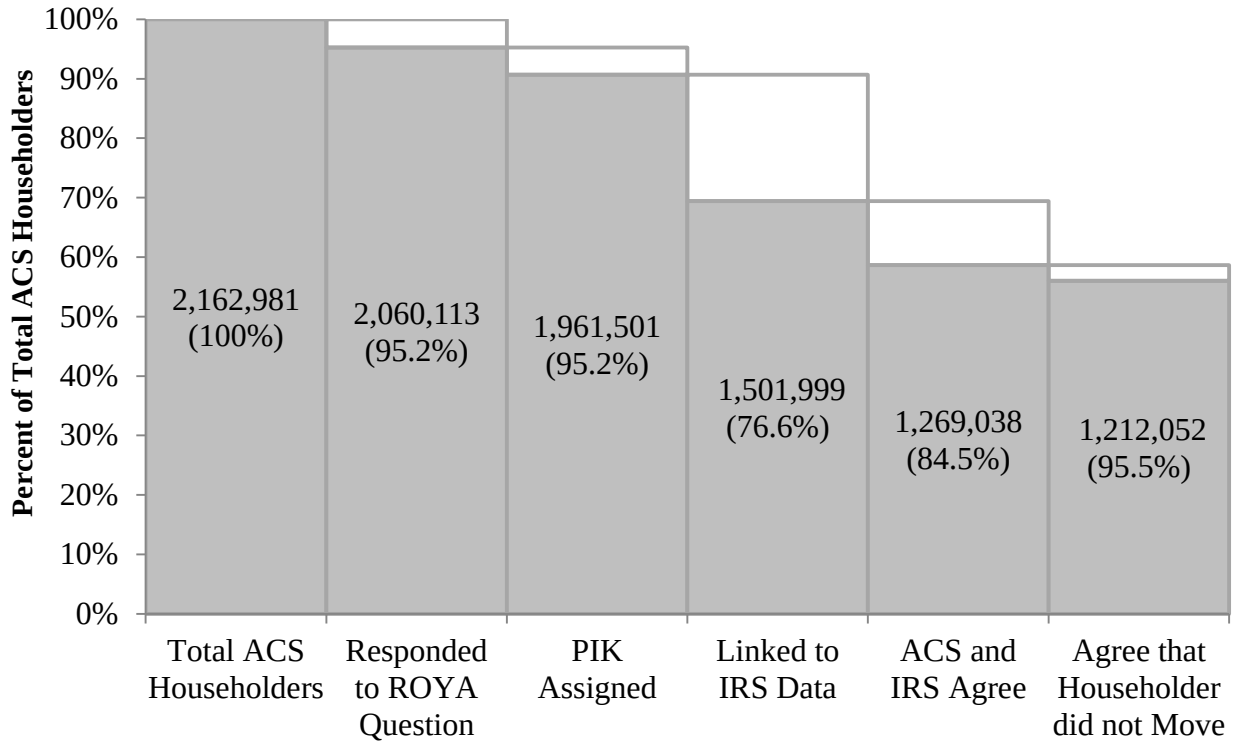
Table 6 in Appendix III describes the 84.5 percent of cases where the ACS and the IRS agree on householder moves in the past year in more detail by ACS demographic and geographic characteristics, as initially described in Table 5. When the ACS and IRS agree, 95.5 percent of the time the householder was a non-mover. The two sources agree that younger people and renters from the 2012 ACS sample were more likely to move than other groups. Table 6A shows the ACS month interviewed for the householders in Table 6.

Table 7 in Appendix III describes the 15.5 percent of cases where the ACS and the IRS disagree on householder moves in the past year in more detail by ACS demographic and geographic characteristics, as initially described in Table 5. A majority of the time, the two data sources disagree when the IRS says the householder moved, but the ACS (65.5 percent) does not capture that move. The older the householder in the 2012 ACS sample, the more likely the move is reported by IRS data and not the ACS data. Table 7A shows the ACS month interviewed for the householders in Table 7.

VIII. Conclusions and Future Research

The ROYA question on the ACS has two parts; the first part asks if a respondent has moved in the past year and the second part asks for detailed address information on that move. This report explored whether information from the IRS tax returns provides adequate information on if a respondent has moved in the past year as reported in unweighted ACS data.

Figure 2: 2012 ACS Householders Linkage and Agreement with 2011 and 2012 Tax Year IRS Data



Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns

Consider the overall linkage and agreement of 2012 ACS householders (one year of age and over) with the 2011 and 2012 IRS individual income tax returns, as shown in Figure 2:

- Item response for householders to the ROYA question was high at 95.2 percent.
- For ACS responses to the ROYA question, PIKs were assigned to householders at 95.2 percent.
- For ACS responses to the ROYA question where PIKs were assigned, 76.6 percent of the time householders on the ACS can be linked to people in IRS data.
- Finally, for ACS responses to the ROYA question where PIKs were assigned and the ACS data was linked to IRS data, there was agreement on whether a householder moved 84.5 percent of the time, and when they agreed, it was usually when a householder had not moved in the past year (95.5 percent).

However, IRS data fall short for international migration. IRS data lack complete information on migration from abroad. Migration data is critical for the Census Bureau's Population Estimates Program.

Additional research should explore whether federal and third-party data sources could be used to:

- Enhance edit and imputation techniques for domestic migration;
- Explore how mode differences (paper, CATI, CAPI, and internet) affect the capture of migration status – including migration from abroad;
- Use federal and third-party data sources to address the ROYA content in question 15B; and
- Further, explore the effect of the time frame misalignment between the two data sources.

Future research can also assess similarities and differences with the migration data released by the IRS. We expect that future research would include edited and imputed data as well as explore non-linking bias.

Other data sources may extend this research on domestic migration in the future. Addresses from IRS information returns could be used with or instead of individual income tax returns, but they mostly include adults. Personal income tax returns are used because they include spouses and dependents, providing information that is closer to the person questions on the ACS. Data from the NCOA file could reflect movers, but not all movers complete NCOA requests. In addition, the NCOA data also show people who have their mail forwarded, not necessarily moves.

IX. References

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Appendix I: Instruction Guide and Help Screen Text

The ACS Instruction Guide provides the following information for the ROYA question (U.S. Census Bureau, 2012):

> **15a.** If the person did not live in the United States or Puerto Rico one year ago, mark the **"No, outside the United States and Puerto Rico**" box and print the name of the foreign country, or U.S. Virgin Islands, Guam, etc., where the person lived. Be specific when printing the name of the foreign country, for example, specify Czech Republic or Slovakia, not Czechoslovakia; North or South Korea, not Korea. Specify the particular country, not region. For example, specify Jamaica, not West Indies; Kenya, not East Africa. Then SKIP to question 16.
>
> If the person lived somewhere else in the United States or Puerto Rico one year ago, mark the **"No, different house in the United States or Puerto Rico"** box.
>
> **15b**. Include the house or structure number; street name; street type (for example, St., Road, Ave.); and the street direction (if a direction such as "North" is part of the address). For example, print 1239 N. Main St. or 1239 Main St., N.W., not just 1239 Main. If the person lived in Puerto Rico, the address should also include the name of the development or condominium.
>
> *If the only known address* is a post office box, give a description of the residence location. For example, print the name of the building where the person lived, the nearest intersection, the name of a military base or installation, or the nearest street where the residence was located, etc. DO NOT GIVE A POST OFFICE BOX NUMBER.
>
> Print the name of the U.S. county or the name of the municipio in Puerto Rico. If the person lived in Louisiana, print the parish name in the **"Name of U.S. county or municipio in Puerto Rico**" space. If the person lived in Alaska, print the borough or census area name, if known. If the person lived in New York City and the county name is not known, print the borough name. If the person lived in an independent city (not in any county) or in Washington, D.C., leave the **"Name of U.S. county or municipio in Puerto Rico"** space blank.

For CATI and CAPI, the interviewer instructions for the ROYA question states:

> "Ask this question of all persons 1 year old and older. If the person lived at the sample unit 1 year ago, enter **1**; the instrument will proceed to [next question]. If the person did not live at the sample unit 1 year ago, enter **2**; the instrument will proceed to [detailed residence one year ago question]."

Appendix II: ACS Data Editing

While data in this report are unedited, future research into this topic may look into using administrative records in the editing process, or how administrative records usage would affect edited data. The two parts of the migration question are edited separately. Mobility status, indicating if the person is a mover or non-mover, is edited first. Before editing, the response for mobility status and state or foreign country are compared for consistency. If they do not agree, then mobility status is changed to agree with the reported state or foreign country of ROYA. Likewise, if mobility status is not reported but state or foreign country of ROYA is, then mobility status is updated.

Missing values of mobility status for householder, spouse, or children age one year to 18 months are assigned to mover if year and month moved in are within one year.[2] If mobility status is still missing, then mobility status of another family member is used if reported. Any remaining missing values are imputed using a matrix based upon with race, age, Armed Forces status, educational attainment, and Metro status of current residence.

Once all persons age one year and over have a mobility status, then the ROYA variables are edited. Missing ROYA responses are edited similarly to mobility status variables using family member responses and imputation matrices. ROYA state or foreign, county, minor civil division (MCD), and place (municipality or Census designated place) are geocoded and edited in that order, except for editing missing counties within New York City. The most significant form of editing is imputation, where missing values are substituted with data from other respondents, or data donors. Only respondents who report all four variables are accepted as donors, and a single donor is used to impute all missing ROYA variables for an individual record. If a recipient has a partial ROYA response, only donors whose ROYA matches the partial response are used.

If possible, donors for householder, spouse, and children age 1 to 18 are chosen from within the same household. If ROYA is still missing for any person, and they reported that they lived in either an unspecified U.S. Island Area or foreign country, then place of birth is used within those constraints. Otherwise, missing cases are imputed from one of nine matrices, based upon mobility status and the ROYA variables reported. The characteristics used within the matrices vary, but include race, Hispanic origin, age, Armed Forces status, educational attainment, region of birth, Metro status, ROYA state, ROYA county, and ROYA MCD.

[2] Housing section question 3 reads, "When did PERSON 1 move into this house, apartment, or mobile home?"

Appendix III

Selected Tables

Table 1: 2012 ACS Residence One Year Ago (unedited, unweighted) for the ACS Sample Living in Housing Units

Selected Characteristic	Total		Respondents without a PIK		Respondents with a PIK	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Persons	**5,291,907**	**100.0**	**319,345**	**6.0**	**4,972,562**	**94.0**
Response to ROYA Question	5,056,558	95.6	285,224	5.6	4,771,334	94.4
Same house 1 year ago	4,414,887	83.4	234,079	5.3	4,180,808	94.7
Moved from abroad	27,144	0.5	6,025	22.2	21,119	77.8
Moved from different house in U.S. or P.R.	459,961	8.7	31,869	6.9	428,092	93.1
Person under 1 years old	89,907	1.7	4,139	4.6	84,958	95.4
Other[3]	65,469	1.2	9,112	13.9	56,357	86.1
Nonresponse	235,349	4.4	34,121	14.5	201,228	85.5

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data.
Note: Percentages may not sum to 100 due to rounding.

[3] The "Other" category includes the CATI/CAPI only categories of "Same as Person 1" and "Moved, not specified." These categories are handled by the edit process before data is released, but this report looks at unedited data. The CATI/CAPI selections of same as person 1 and different house unspecified do not get the residence 1 year ago question. (The edit populates residence 1 year ago for those who specify same as person 1).

Table 1A: 2012 ACS Residence One Year Ago (unedited, unweighted) for Sampled Householders

Selected Characteristic	Total		Respondents without at PIK		Respondents with a PIK	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Householders	**2,162,981**	**100.0**	**107,449**	**5.0**	**2,055,532**	**95.0**
Responded to Question (1 years old and over)	2,060,113	95.2	98,612	4.8	1,961,501	95.2
Same house 1 year ago	1,852,587	85.6	85,857	4.6	1,766,730	95.4
Moved from abroad	9,140	0.4	1,218	13.3	7,922	86.7
Moved from different house in U.S. or P.R.	195,002	9.0	10,925	5.6	184,077	94.4
Other[4]	3,384	0.2	612	18.1	2,772	81.9
Person under 1 years old[5]	15,269	0.7	446	2.9	14,823	97.1
Nonresponse	87,599	4.0	8,391	9.6	79,208	90.4

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data.
Note: Percentages may not sum to 100 due to rounding.

[4] The "Other" category includes the CATI/CAPI only categories of "Same as Person 1" and "Moved, not specified." These categories are handled by the edit process before data is released, but this report looks at unedited data. The CATI/CAPI selections of same as person 1 and different house unspecified do not get the residence 1 year ago question. (The edit populates residence 1 year ago for those who specify same as person 1).

[5] The "Person under 1 years old" category was removed from the "Responded to Question" subtotal because it is not a valid response for householders and is only here because the report looks at unedited data. By definition, householders are at least 15 years old. This type of reporting error is taken care of in the data editing process.

Table 1: 2012 ACS Residence One Year Ago (unedited, unweighted) by Presence in IRS Data for the ACS Sample Assigned a PIK Living in Housing Units

	Total		Not In IRS Data		In IRS Data	
Selected Characteristic	Count	Column Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Persons	**4,972,562**	**100.0**	**1,080,534**	**21.7**	**3,892,028**	**78.3**
Responded to Question	4,771,334	96.0	1,021,946	21.4	3,749,388	78.6
Same house 1 year ago	4,180,808	84.1	845,781	20.2	3,335,027	79.8
Moved from abroad	21,119	0.4	7,870	37.3	13,249	62.7
Moved from different house in U.S. or P.R.	428,092	8.6	120,650	28.2	307,442	71.8
Person under 1 years old	84,958	1.7	32,565	38.3	52,393	61.7
Other[6]	56,357	1.1	15,080	26.8	41,277	73.2
Nonresponse	201,228	4.0	58,588	29.1	142,640	70.9

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

[6] The "Other" category includes the CATI/CAPI only categories of "Same as Person 1" and "Moved, not specified." These categories are handled by the edit process before data is released, but this report looks at unedited data. The CATI/CAPI selections of same as person 1 and different house unspecified do not get the residence 1 year ago question. (The edit populates residence 1 year ago for those who specify same as person 1).

Table 2A: 2012 ACS Residence One Year Ago (unedited, unweighted) by IRS Data for Householders

Selected Characteristic	Total		Not In IRS Data		In IRS Data	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Householders	**2,055,532**	**100.0**	**492,769**	**24.0**	**1,562,763**	**76.0**
Responded to Question (1 years old and over)	1,961,501	95.4	459,502	23.4	1,501,999	76.6
Same house 1 year ago	1,766,730	86.0	402,006	22.8	1,364,724	77.2
Moved from abroad	7,922	0.4	2,941	37.1	4,981	62.9
Moved from different house in U.S. or P.R.	184,077	9.0	53,749	29.2	130,328	70.8
Other[7]	2,772	0.1	806	29.1	1,966	70.9
Person under 1 years old[8]	14,823	0.7	4,974	33.6	9,849	66.4
Nonresponse	79,208	3.9	28,293	35.7	50,915	64.3

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.

Note: Percentages may not sum to 100 due to rounding.

[7] The "Other" category includes the CATI/CAPI only categories of "Same as Person 1" and "Moved, not specified." These categories are handled by the edit process before data is released, but this report looks at unedited data. The CATI/CAPI selections of same as person 1 and different house unspecified do not get the residence 1 year ago question. (The edit populates residence 1 year ago for those who specify same as person 1).

[8] The "Person under 1 years old" category was removed from the "Responded to Question" subtotal because it is not a valid response for householders and is only here because the report looks at unedited data. By definition, householders are at least 15 years old. This type of reporting error is taken care of in the data editing process.

Table 3: 2012 ACS Residence One Year Ago (unedited, nonresponses removed) for Householder Demographic Characteristics

Selected Characteristic	Total		Non-mover		Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Total	**2,060,113**	**100.0**	**1,852,587**	**89.9**	**207,526**	**10.1**
Sex						
Male	1,108,700	53.8	1,006,781	90.8	101,919	9.2
Female	951,413	46.2	845,806	88.9	105,607	11.1
Age						
15-19 Years	5,212	0.3	1,834	35.2	3,378	64.8
20-24 Years	62,071	3.0	30,496	49.1	31,575	50.9
25-29 Years	118,773	5.8	82,827	69.7	35,946	30.3
30-34 Years	145,963	7.1	117,850	80.7	28,113	19.3
35-39 Years	149,597	7.3	129,311	86.4	20,286	13.6
40-44 Years	175,997	8.5	157,749	89.6	18,248	10.4
45-49 Years	197,463	9.6	181,840	92.1	15,623	7.9
50-54 Years	225,207	10.9	210,563	93.5	14,644	6.5
55-59 Years	223,672	10.9	211,488	94.6	12,184	5.4
60-64 Years	207,516	10.1	197,818	95.3	9,698	4.7
65-69 Years	171,234	8.3	164,657	96.2	6,577	3.8
70 Years or Older	377,408	18.3	366,154	97.0	11,254	3.0
Race						
White alone	1,680,601	81.6	1,522,131	90.6	158,470	9.4
Black or African American alone	196,773	9.6	173,159	88.0	23,614	12.0
American Indian and Alaska Native alone	23,016	1.1	20,610	89.5	2,406	10.5
Asian alone	74,710	3.6	64,296	86.1	10,414	13.9
Native Hawaiian and Other Pacific Islander alone	2,206	0.1	1,877	85.1	329	14.9
Some Other Race alone	47,844	2.3	41,079	85.9	6,765	14.1
Two or More Races	34,963	1.7	29,435	84.2	5,528	15.8

Selected Characteristic	Total		Non-mover		Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Ethnicity						
Not Hispanic or Latino	1,872,254	90.9	1,689,012	90.2	183,242	9.8
Hispanic or Latino	187,859	9.1	163,575	87.1	24,284	12.9
Place of birth						
Native	1,827,097	88.7	1,646,559	90.1	180,538	9.9
Foreign-born	233,016	11.3	206,028	88.4	26,988	11.6
Tenure						
Householder lived in owner-occupied housing units	1,463,537	71.0	1,408,924	96.3	54,613	3.7
Householder lived in renter-occupied housing units	596,576	29.0	443,663	74.4	152,913	25.6
MSA						
Living in Metro Area	1,569,165	76.2	1,400,815	89.3	168,350	10.7
Living in Micro Area	260,125	12.6	237,600	91.3	22,525	8.7
Living Outside Core Based Statistical Area (CBSA)	230,823	11.2	214,172	92.8	16,651	7.2
State, District, or Territory						
Alabama	33,308	1.6	30,237	90.8	3,071	9.2
Alaska	7,093	0.3	6,171	87.0	922	13.0
Arizona	36,840	1.8	31,778	86.3	5,062	13.7
Arkansas	20,208	1.0	18,053	89.3	2,155	10.7
California	197,983	9.6	175,567	88.7	22,416	11.3
Colorado	33,533	1.6	29,045	86.6	4,488	13.4
Connecticut	21,864	1.1	20,103	91.9	1,761	8.1
Delaware	6,211	0.3	5,666	91.2	545	8.8
District of Columbia	4,109	0.2	3,476	84.6	633	15.4
Florida	101,212	4.9	89,393	88.3	11,819	11.7
Georgia	49,602	2.4	44,165	89.0	5,437	11.0
Hawaii	8,633	0.4	7,722	89.4	911	10.6

Selected Characteristic	Total		Non-mover		Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Idaho	10,031	0.5	8,902	88.7	1,129	11.3
Illinois	89,482	4.3	81,064	90.6	8,418	9.4
Indiana	44,463	2.2	39,915	89.8	4,548	10.2
Iowa	31,804	1.5	28,938	91.0	2,866	9.0
Kansas	24,800	1.2	22,066	89.0	2,734	11.0
Kentucky	31,400	1.5	28,378	90.4	3,022	9.6
Louisiana	27,965	1.4	25,206	90.1	2,759	9.9
Maine	13,621	0.7	12,546	92.1	1,075	7.9
Maryland	35,485	1.7	32,369	91.2	3,116	8.8
Massachusetts	39,427	1.9	35,764	90.7	3,663	9.3
Michigan	87,129	4.2	79,377	91.1	7,752	8.9
Minnesota	64,134	3.1	58,890	91.8	5,244	8.2
Mississippi	16,756	0.8	15,259	91.1	1,497	8.9
Missouri	45,290	2.2	40,378	89.2	4,912	10.8
Montana	9,810	0.5	8,896	90.7	914	9.3
Nebraska	19,287	0.9	17,360	90.0	1,927	10.0
Nevada	15,539	0.8	13,008	83.7	2,531	16.3
New Hampshire	9,627	0.5	8,762	91.0	865	9.0
New Jersey	51,491	2.5	47,870	93.0	3,621	7.0
New Mexico	13,658	0.7	12,406	90.8	1,252	9.2
New York	123,306	6.0	113,774	92.3	9,532	7.7
North Carolina	60,239	2.9	53,941	89.5	6,298	10.5
North Dakota	8,473	0.4	7,649	90.3	824	9.7
Ohio	82,254	4.0	74,261	90.3	7,993	9.7
Oklahoma	38,879	1.9	34,300	88.2	4,579	11.8
Oregon	24,386	1.2	21,432	87.9	2,954	12.1

Selected Characteristic	Total		Non-mover		Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Pennsylvania	107,050	5.2	99,036	92.5	8,014	7.5
Rhode Island	6,153	0.3	5,562	90.4	591	9.6
South Carolina	28,394	1.4	25,552	90.0	2,842	10.0
South Dakota	8,881	0.4	7,984	89.9	897	10.1
Tennessee	39,592	1.9	35,574	89.9	4,018	10.1
Texas	131,224	6.4	115,057	87.7	16,167	12.3
Utah	16,714	0.8	14,669	87.8	2,045	12.2
Vermont	7,634	0.4	7,069	92.6	565	7.4
Virginia	49,711	2.4	44,415	89.3	5,296	10.7
Washington	42,940	2.1	37,888	88.2	5,052	11.8
West Virginia	13,712	0.7	12,690	92.5	1,022	7.5
Wisconsin	64,791	3.1	59,494	91.8	5,297	8.2
Wyoming	3,985	0.2	3,510	88.1	475	11.9

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data.
Note: Percentages may not sum to 100 due to rounding.

Table 4: 2012 ACS and 2011 IRS Residence One Year Ago (unedited, unweighted, nonresponses removed) by ACS Householder Demographic and Geographic Characteristics

Selected Characteristic	Total		ACS Non-mover		ACS Mover		IRS Non-mover		IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Householders	**1,501,999**	**100**	**1,364,724**	**90.9**	**137,275**	**9.1**	**1,292,341**	**86.0**	**209,658**	**14.0**
Sex										
Male	842,754	56.1	774,997	92.0	67,757	8.0	741,061	87.9	101,693	12.1
Female	659,245	43.9	589,727	89.5	69,518	10.5	551,280	83.6	107,965	16.4
Age										
15-19 Years	3,434	0.2	1,120	32.6	2,314	67.4	1,887	55.0	1,547	45.0
20-24 Years	45,375	3.0	22,163	48.8	23,212	51.2	25,590	56.4	19,785	43.6
25-29 Years	90,661	6.0	64,801	71.5	25,860	28.5	61,241	67.5	29,420	32.5
30-34 Years	113,209	7.5	93,548	82.6	19,661	17.4	86,301	76.2	26,908	23.8
35-39 Years	116,002	7.7	102,472	88.3	13,530	11.7	95,195	82.1	20,807	17.9
40-44 Years	136,164	9.1	124,439	91.4	11,725	8.6	116,952	85.9	19,212	14.1
45-49 Years	151,715	10.1	142,096	93.7	9,619	6.3	134,499	88.7	17,216	11.3
50-54 Years	170,783	11.4	161,952	94.8	8,831	5.2	153,758	90.0	17,025	10.0
55-59 Years	169,060	11.3	161,775	95.7	7,285	4.3	153,966	91.1	15,094	8.9
60-64 Years	154,161	10.3	148,491	96.3	5,670	3.7	141,384	91.7	12,777	8.3
65-69	121,250	8.1	117,524	96.9	3,726	3.1	111,949	92.3	9,301	7.7
70 Years or Older	230,185	15.3	224,343	97.5	5,842	2.5	209,619	91.1	20,566	8.9
Race										
White alone	1,260,319	83.9	1,151,730	91.4	108,589	8.6	1,096,521	87.0	163,798	13.0
Black or African American alone	118,364	7.9	105,331	89.0	13,033	11.0	95,759	80.9	22,605	19.1
American Indian and Alaska Native alone	12,431	0.8	11,191	90.0	1,240	10.0	9,928	79.9	2,503	20.1
Asian alone	56,660	3.8	49,679	87.7	6,981	12.3	47,720	84.2	8,940	15.8

Selected Characteristic	Total		ACS Non-mover		ACS Mover		IRS Non-mover		IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent
Native Hawaiian and Other Pacific Islander alone	1,299	0.1	1,111	85.5	188	14.5	996	76.7	303	23.3
Some Other Race alone	30,344	2.0	26,429	87.1	3,915	12.9	23,383	77.1	6,961	22.9
Two or More Races	22,582	1.5	19,253	85.3	3,329	14.7	18,034	79.9	4,548	20.1
Ethnicity										
Not Hispanic or Latino	1,376,816	91.7	1,254,310	91.1	122,506	8.9	1,192,129	86.6	184,687	13.4
Hispanic or Latino	125,183	8.3	110,414	88.2	14,769	11.8	100,212	80.1	24,971	19.9
Place of birth										
Native	1,340,513	89.2	1,219,448	91.0	121,065	9.0	1,158,656	86.4	181,857	13.6
Foreign-born	161,486	10.8	145,276	90.0	16,210	10.0	133,685	82.8	27,801	17.2
Tenure										
Householder lived in owner-occupied housing units	1,149,311	76.5	1,106,681	96.3	42,630	3.7	1,057,739	92.0	91,572	8.0
Householder lived in renter-occupied housing units	352,688	23.5	258,043	73.2	94,645	26.8	234,602	66.5	118,086	33.5
MSA										
Living in Metro Area	1,169,493	77.9	1,056,439	90.3	113,054	9.7	1,004,835	85.9	164,658	14.1
Living in Micro Area	181,322	12.1	166,962	92.1	14,360	7.9	157,366	86.8	23,956	13.2
Living Outside Core Based Statistical Area (CBSA)	151,184	10.1	141,323	93.5	9,861	6.5	130,140	86.1	21,044	13.9
State, District, or Territory										
Alabama	22,746	1.5	20,823	91.5	1,923	8.5	19,544	85.9	3,202	14.1
Alaska	3,995	0.3	3,521	88.1	474	11.9	3,155	79.0	840	21.0
Arizona	26,279	1.7	22,880	87.1	3,399	12.9	21,485	81.8	4,794	18.2
Arkansas	13,322	0.9	11,966	89.8	1,356	10.2	11,189	84.0	2,133	16.0
California	147,763	9.8	132,548	89.7	15,215	10.3	124,883	84.5	22,880	15.5
Colorado	24,768	1.6	21,766	87.9	3,002	12.1	20,772	83.9	3,996	16.1

Selected Characteristic	Total		ACS Non-mover		ACS Mover		IRS Non-mover		IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent
Connecticut	16,509	1.1	15,384	93.2	1,125	6.8	14,823	89.8	1,686	10.2
Delaware	4,750	0.3	4,371	92.0	379	8.0	4,234	89.1	516	10.9
District of Columbia	2,934	0.2	2,501	85.2	433	14.8	2,339	79.7	595	20.3
Florida	72,858	4.9	65,048	89.3	7,810	10.7	60,543	83.1	12,315	16.9
Georgia	34,598	2.3	31,164	90.1	3,434	9.9	28,913	83.6	5,685	16.4
Hawaii	4,368	0.3	3,946	90.3	422	9.7	3,695	84.6	673	15.4
Idaho	7,164	0.5	6,437	89.9	727	10.1	5,973	83.4	1,191	16.6
Illinois	67,580	4.5	61,886	91.6	5,694	8.4	58,184	86.1	9,396	13.9
Indiana	33,636	2.2	30,608	91.0	3,028	9.0	29,214	86.9	4,422	13.1
Iowa	23,181	1.5	21,189	91.4	1,992	8.6	20,401	88.0	2,780	12.0
Kansas	18,944	1.3	17,017	89.8	1,927	10.2	16,302	86.1	2,642	13.9
Kentucky	21,594	1.4	19,688	91.2	1,906	8.8	18,639	86.3	2,955	13.7
Louisiana	18,715	1.2	16,986	90.8	1,729	9.2	15,849	84.7	2,866	15.3
Maine	9,703	0.6	9,005	92.8	698	7.2	8,511	87.7	1,192	12.3
Maryland	27,796	1.9	25,592	92.1	2,204	7.9	24,554	88.3	3,242	11.7
Massachusetts	28,661	1.9	26,358	92.0	2,303	8.0	25,373	88.5	3,288	11.5
Michigan	67,556	4.5	62,153	92.0	5,403	8.0	59,856	88.6	7,700	11.4
Minnesota	52,156	3.5	48,270	92.5	3,886	7.5	46,551	89.3	5,605	10.7
Mississippi	10,828	0.7	9,903	91.5	925	8.5	9,149	84.5	1,679	15.5
Missouri	33,089	2.2	29,915	90.4	3,174	9.6	28,217	85.3	4,872	14.7
Montana	6,745	0.4	6,175	91.5	570	8.5	5,771	85.6	974	14.4
Nebraska	14,781	1.0	13,420	90.8	1,361	9.2	12,629	85.4	2,152	14.6
Nevada	11,145	0.7	9,580	86.0	1,565	14.0	9,068	81.4	2,077	18.6
New Hampshire	7,234	0.5	6,668	92.2	566	7.8	6,408	88.6	826	11.4
New Jersey	38,894	2.6	36,516	93.9	2,378	6.1	34,788	89.4	4,106	10.6
New Mexico	8,948	0.6	8,185	91.5	763	8.5	7,419	82.9	1,529	17.1
New York	81,083	5.4	75,487	93.1	5,596	6.9	71,280	87.9	9,803	12.1
North Carolina	42,882	2.9	38,779	90.4	4,103	9.6	36,557	85.3	6,325	14.7
North Dakota	6,331	0.4	5,759	91.0	572	9.0	5,451	86.1	880	13.9
Ohio	61,302	4.1	56,029	91.4	5,273	8.6	53,792	87.7	7,510	12.3

Selected Characteristic	Total		ACS Non-mover		ACS Mover		IRS Non-mover		IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent	Count	Row Percent
Oklahoma	25,583	1.7	22,796	89.1	2,787	10.9	20,098	78.6	5,485	21.4
Oregon	17,400	1.2	15,506	89.1	1,894	10.9	14,872	85.5	2,528	14.5
Pennsylvania	82,996	5.5	77,504	93.4	5,492	6.6	74,253	89.5	8,743	10.5
Rhode Island	4,426	0.3	4,065	91.8	361	8.2	3,954	89.3	472	10.7
South Carolina	19,897	1.3	18,051	90.7	1,846	9.3	17,129	86.1	2,768	13.9
South Dakota	6,600	0.4	5,975	90.5	625	9.5	5,639	85.4	961	14.6
Tennessee	28,150	1.9	25,485	90.5	2,665	9.5	24,262	86.2	3,888	13.8
Texas	95,081	6.3	84,349	88.7	10,732	11.3	79,045	83.1	16,036	16.9
Utah	12,751	0.8	11,301	88.6	1,450	11.4	10,835	85.0	1,916	15.0
Vermont	5,621	0.4	5,250	93.4	371	6.6	5,023	89.4	598	10.6
Virginia	38,166	2.5	34,387	90.1	3,779	9.9	32,998	86.5	5,168	13.5
Washington	31,437	2.1	28,096	89.4	3,341	10.6	26,947	85.7	4,490	14.3
West Virginia	8,776	0.6	8,171	93.1	605	6.9	6,968	79.4	1,808	20.6
Wisconsin	47,794	3.2	44,068	92.2	3,726	7.8	42,692	89.3	5,102	10.7
Wyoming	2,483	0.2	2,197	88.5	286	11.5	2,115	85.2	368	14.8

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data.
Note: Percentages may not sum to 100 due to rounding.

Table 4A: 2011 and 2012 IRS PIK matched to 2012 ACS PIK (unedited, unweighted, nonresponses removed)

ACS Sampled Householders	2011 IRS PIK		2012 IRS PIK	
	Count	Percent	Count	Percent
Total	**1,501,999**	**100.0**	**1,501,999**	**100.0**
Primary Filer	1,222,261	81.4	1,226,630	81.7
Secondary Filer	259,984	17.3	257,100	17.1
Dependents	19,754	1.3	18,269	1.2

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 5: Data Agreement between 2012 ACS ROYA (unedited, unweighted, nonresponses removed) and IRS Movers by ACS Demographic and Geographic Characteristics for Householders

Selected Characteristic	Total		Agreement		Disagreement	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
ACS Sampled Householders	**1,501,999**	**100.0**	**1,269,038**	**84.5**	**232,961**	**15.5**
Sex						
Male	842,754	56.1	726,890	86.3	115,864	13.7
Female	659,245	43.9	542,148	82.2	117,097	17.8
Age						
15-19 Years	3,434	0.2	1,825	53.1	1,609	46.9
20-24 Years	45,375	3.0	26,100	57.5	19,275	42.5
25-29 Years	90,661	6.0	59,873	66.0	30,788	34.0
30-34 Years	113,209	7.5	83,542	73.8	29,667	26.2
35-39 Years	116,002	7.7	92,569	79.8	23,433	20.2
40-44 Years	136,164	9.1	114,351	84.0	21,813	16.0
45-49 Years	151,715	10.1	131,932	87.0	19,783	13.0
50-54 Years	170,783	11.4	151,115	88.5	19,668	11.5
55-59 Years	169,060	11.3	151,327	89.5	17,733	10.5
60-64 Years	154,161	10.3	139,092	90.2	15,069	9.8
65-69 Years	121,250	8.1	110,205	90.9	11,045	9.1
70 Years or Older	230,185	15.3	207,107	90.0	23,078	10.0
Race						
White alone	1,260,319	83.9	1,075,368	85.3	184,951	14.7
Black or African American alone	118,364	7.9	95,424	80.6	22,940	19.4
American Indian and Alaska Native alone	12,431	0.8	9,708	78.1	2,723	21.9
Asian alone	56,660	3.8	46,253	81.6	10,407	18.4
Native Hawaiian and Other Pacific Islander alone	1,299	0.1	1,018	78.4	281	21.6
Some Other Race alone	30,344	2.0	23,480	77.4	6,864	22.6
Two or More Races	22,582	1.5	17,787	78.8	4,795	21.2
Ethnicity						
Not Hispanic or Latino	1,376,816	91.7	1,169,381	84.9	207,435	15.1

Selected Characteristic	Total		Agreement		Disagreement	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Hispanic or Latino	125,183	8.3	99,657	79.6	25,526	20.4
Place of birth						
Native	1,340,513	89.2	1,137,495	84.9	203,018	15.1
Foreign-born	161,486	10.8	131,543	81.5	29,943	18.5
Tenure						
Householder lived in owner-occupied housing units	1,149,311	76.5	1,035,037	90.1	114,274	9.9
Householder lived in renter-occupied housing units	352,688	23.5	234,001	66.3	118,687	33.7
MSA						
Living in Metro Area	1,169,493	77.9	985,799	84.3	183,694	15.7
Living in Micro Area	181,322	12.1	154,900	85.4	26,422	14.6
Living Outside Core Based Statistical Area (CBSA)	151,184	10.1	128,339	84.9	22,845	15.1
State, District, or Territory						
Alabama	22,746	1.5	19,305	84.9	3,441	15.1
Alaska	3,995	0.3	3,089	77.3	906	22.7
Arizona	26,279	1.7	21,074	80.2	5,205	19.8
Arkansas	13,322	0.9	11,073	83.1	2,249	16.9
California	147,763	9.8	121,864	82.5	25,899	17.5
Colorado	24,768	1.6	20,364	82.2	4,404	17.8
Connecticut	16,509	1.1	14,516	87.9	1,993	12.1
Delaware	4,750	0.3	4,129	86.9	621	13.1
District of Columbia	2,934	0.2	2,286	77.9	648	22.1
Florida	72,858	4.9	59,287	81.4	13,571	18.6
Georgia	34,598	2.3	28,597	82.7	6,001	17.3
Hawaii	4,368	0.3	3,597	82.3	771	17.7
Idaho	7,164	0.5	5,934	82.8	1,230	17.2
Illinois	67,580	4.5	57,214	84.7	10,366	15.3
Indiana	33,636	2.2	28,834	85.7	4,802	14.3
Iowa	23,181	1.5	19,959	86.1	3,222	13.9
Kansas	18,944	1.3	15,973	84.3	2,971	15.7
Kentucky	21,594	1.4	18,411	85.3	3,183	14.7

Selected Characteristic	Total		Agreement		Disagreement	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Louisiana	18,715	1.2	15,684	83.8	3,031	16.2
Maine	9,703	0.6	8,377	86.3	1,326	13.7
Maryland	27,796	1.9	24,024	86.4	3,772	13.6
Massachusetts	28,661	1.9	24,830	86.6	3,831	13.4
Michigan	67,556	4.5	58,619	86.8	8,937	13.2
Minnesota	52,156	3.5	45,561	87.4	6,595	12.6
Mississippi	10,828	0.7	9,062	83.7	1,766	16.3
Missouri	33,089	2.2	27,775	83.9	5,314	16.1
Montana	6,745	0.4	5,675	84.1	1,070	15.9
Nebraska	14,781	1.0	12,404	83.9	2,377	16.1
Nevada	11,145	0.7	8,811	79.1	2,334	20.9
New Hampshire	7,234	0.5	6,286	86.9	948	13.1
New Jersey	38,894	2.6	34,194	87.9	4,700	12.1
New Mexico	8,948	0.6	7,306	81.6	1,642	18.4
New York	81,083	5.4	69,872	86.2	11,211	13.8
North Carolina	42,882	2.9	36,192	84.4	6,690	15.6
North Dakota	6,331	0.4	5,295	83.6	1,036	16.4
Ohio	61,302	4.1	52,801	86.1	8,501	13.9
Oklahoma	25,583	1.7	20,043	78.3	5,540	21.7
Oregon	17,400	1.2	14,558	83.7	2,842	16.3
Pennsylvania	82,996	5.5	72,715	87.6	10,281	12.4
Rhode Island	4,426	0.3	3,875	87.6	551	12.4
South Carolina	19,897	1.3	16,891	84.9	3,006	15.1
South Dakota	6,600	0.4	5,538	83.9	1,062	16.1
Tennessee	28,150	1.9	23,905	84.9	4,245	15.1
Texas	95,081	6.3	78,161	82.2	16,920	17.8
Utah	12,751	0.8	10,605	83.2	2,146	16.8
Vermont	5,621	0.4	4,934	87.8	687	12.2
Virginia	38,166	2.5	32,229	84.4	5,937	15.6

Selected Characteristic	Total		Agreement		Disagreement	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Washington	31,437	2.1	26,418	84.0	5,019	16.0
West Virginia	8,776	0.6	6,915	78.8	1,861	21.2
Wisconsin	47,794	3.2	41,926	87.7	5,868	12.3
Wyoming	2,483	0.2	2,051	82.6	432	17.4

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 6: Detailed Data Agreement between ACS ROYA (unedited, unweighted, nonresponses removed) and IRS Movers by ACS Demographic and Geographic Characteristics for Householders

Selected Characteristic	Agreement Total		ACS Non-mover and IRS Non-mover		ACS Mover and IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Total ACS Householders	1,269,038	100.0	1,212,052	95.5	56,986	4.5
Sex						
Male	726,890	57.3	700,097	96.3	26,793	3.7
Female	542,148	42.7	511,955	94.4	30,193	5.6
Age						
15-19 Years	1,825	0.1	699	38.3	1,126	61.7
20-24 Years	26,100	2.1	14,239	54.6	11,861	45.4
25-29 Years	59,873	4.7	47,627	79.5	12,246	20.5
30-34 Years	83,542	6.6	75,091	89.9	8,451	10.1
35-39 Years	92,569	7.3	87,117	94.1	5,452	5.9
40-44 Years	114,351	9.0	109,789	96.0	4,562	4.0
45-49 Years	131,932	10.4	128,406	97.3	3,526	2.7
50-54 Years	151,115	11.9	148,021	98.0	3,094	2.0
55-59 Years	151,327	11.9	149,004	98.5	2,323	1.5
60-64 Years	139,092	11.0	137,403	98.8	1,689	1.2
65-69 Years	110,205	8.7	109,214	99.1	991	0.9
70 Years or Older	207,107	16.3	205,442	99.2	1,665	0.8
Race						
White alone	1,075,368	84.7	1,031,650	95.9	43,718	4.1
Black or African American alone	95,424	7.5	89,075	93.3	6,349	6.7
American Indian and Alaska Native alone	9,708	0.8	9,198	94.7	510	5.3
Asian alone	46,253	3.6	43,496	94.0	2,757	6.0
Native Hawaiian and Other Pacific Islander alone	1,018	0.1	913	89.7	105	10.3
Some Other Race alone	23,480	1.9	21,474	91.5	2,006	8.5
Two or More Races	17,787	1.4	16,246	91.3	1,541	8.7
Ethnicity						

Selected Characteristic	Agreement Total		ACS Non-mover and IRS Non-mover		ACS Mover and IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Not Hispanic or Latino	1,169,381	92.1	1,119,502	95.7	49,879	4.3
Hispanic or Latino	99,657	7.9	92,550	92.9	7,107	7.1
Place of birth						
Native	1,137,495	89.6	1,087,543	95.6	49,952	4.4
Foreign-born	131,543	10.4	124,509	94.7	7,034	5.3
Tenure						
Householder lived in owner-occupied housing units	1,035,037	81.6	1,025,073	99.0	9,964	1.0
Householder lived in renter-occupied housing units	234,001	18.4	186,979	79.9	47,022	20.1
MSA						
Living in Metro Area	985,799	77.7	938,790	95.2	47,009	4.8
Living in Micro Area	154,900	12.2	148,953	96.2	5,947	3.8
Living Outside Core Based Statistical Area (CBSA)	128,339	10.1	124,309	96.9	4,030	3.1
State, District, or Territory						
Alabama	19,305	1.5	18,463	95.6	842	4.4
Alaska	3,089	0.2	2,885	93.4	204	6.6
Arizona	21,074	1.7	19,580	92.9	1,494	7.1
Arkansas	11,073	0.9	10,453	94.4	620	5.6
California	121,864	9.6	115,766	95.0	6,098	5.0
Colorado	20,364	1.6	19,067	93.6	1,297	6.4
Connecticut	14,516	1.1	14,107	97.2	409	2.8
Delaware	4,129	0.3	3,992	96.7	137	3.3
District of Columbia	2,286	0.2	2,096	91.7	190	8.3
Florida	59,287	4.7	56,010	94.5	3,277	5.5
Georgia	28,597	2.3	27,038	94.5	1,559	5.5
Hawaii	3,597	0.3	3,435	95.5	162	4.5
Idaho	5,934	0.5	5,590	94.2	344	5.8
Illinois	57,214	4.5	54,852	95.9	2,362	4.1
Indiana	28,834	2.3	27,510	95.4	1,324	4.6
Iowa	19,959	1.6	19,184	96.1	775	3.9

Selected Characteristic	Agreement Total		ACS Non-mover and IRS Non-mover		ACS Mover and IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Kansas	15,973	1.3	15,174	95.0	799	5.0
Kentucky	18,411	1.5	17,572	95.4	839	4.6
Louisiana	15,684	1.2	14,902	95.0	782	5.0
Maine	8,377	0.7	8,095	96.6	282	3.4
Maryland	24,024	1.9	23,187	96.5	837	3.5
Massachusetts	24,830	2.0	23,950	96.5	880	3.5
Michigan	58,619	4.6	56,536	96.4	2,083	3.6
Minnesota	45,561	3.6	44,113	96.8	1,448	3.2
Mississippi	9,062	0.7	8,643	95.4	419	4.6
Missouri	27,775	2.2	26,409	95.1	1,366	4.9
Montana	5,675	0.4	5,438	95.8	237	4.2
Nebraska	12,404	1.0	11,836	95.4	568	4.6
Nevada	8,811	0.7	8,157	92.6	654	7.4
New Hampshire	6,286	0.5	6,064	96.5	222	3.5
New Jersey	34,194	2.7	33,302	97.4	892	2.6
New Mexico	7,306	0.6	6,981	95.6	325	4.4
New York	69,872	5.5	67,778	97.0	2,094	3.0
North Carolina	36,192	2.9	34,323	94.8	1,869	5.2
North Dakota	5,295	0.4	5,087	96.1	208	3.9
Ohio	52,801	4.2	50,660	95.9	2,141	4.1
Oklahoma	20,043	1.6	18,677	93.2	1,366	6.8
Oregon	14,558	1.1	13,768	94.6	790	5.4
Pennsylvania	72,715	5.7	70,738	97.3	1,977	2.7
Rhode Island	3,875	0.3	3,734	96.4	141	3.6
South Carolina	16,891	1.3	16,087	95.2	804	4.8
South Dakota	5,538	0.4	5,276	95.3	262	4.7
Tennessee	23,905	1.9	22,751	95.2	1,154	4.8
Texas	78,161	6.2	73,237	93.7	4,924	6.3
Utah	10,605	0.8	9,995	94.2	610	5.8

Selected Characteristic	Agreement Total		ACS Non-mover and IRS Non-mover		ACS Mover and IRS Mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Vermont	4,934	0.4	4,793	97.1	141	2.9
Virginia	32,229	2.5	30,724	95.3	1,505	4.7
Washington	26,418	2.1	25,012	94.7	1,406	5.3
West Virginia	6,915	0.5	6,639	96.0	276	4.0
Wisconsin	41,926	3.3	40,446	96.5	1,480	3.5
Wyoming	2,051	0.2	1,940	94.6	111	5.4

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 6A: 2012 ACS ROYA Sample Panel (unedited, unweighted, nonresponses removed) by IRS Data for Householder Where There is Data Agreement Between ACS ROYA and IRS Movers

Sample Panel	Agreement Total		ACS Non-mover and IRS Non-mover		ACS Mover and IRS Mover	
	Count	Column Percent	Count	Percent	Count	Percent
Total	**1,269,038**	**100.0**	**1,212,052**	**95.5**	**56,986**	**4.5**
January	167,815	13.2	161,354	96.1	6,461	3.9
February	69,859	5.5	66,341	95.0	3,518	5.0
March	124,745	9.8	119,646	95.9	5,099	4.1
April	119,245	9.4	114,265	95.8	4,980	4.2
May	72,144	5.7	68,534	95.0	3,610	5.0
June	123,910	9.8	119,032	96.1	4,878	3.9
July	123,040	9.7	118,159	96.0	4,881	4.0
August	85,955	6.8	82,002	95.4	3,953	4.6
September	111,496	8.8	106,462	95.5	5,034	4.5
October	79,945	6.3	75,701	94.7	4,244	5.3
November	114,028	9.0	108,105	94.8	5,923	5.2
December	76,856	6.1	72,451	94.3	4,405	5.7

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 7: Detailed Data Disagreement between ACS ROYA (unedited, unweighted, nonresponses removed) and IRS Movers by Demographic and Geographic Characteristics for Householders

Selected Characteristic	Disagreement Total		ACS Non-mover and IRS Mover		ACS Mover and IRS Non-mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Total ACS Householders	232,961	100.0	152,672	65.5	80,289	34.5
Sex						
Male	115,864	49.7	74,900	64.6	40,964	35.4
Female	117,097	50.3	77,772	66.4	39,325	33.6
Age						
15-19 Years	1,609	0.7	421	26.2	1,188	73.8
20-24 Years	19,275	8.3	7,924	41.1	11,351	58.9
25-29 Years	30,788	13.2	17,174	55.8	13,614	44.2
30-34 Years	29,667	12.7	18,457	62.2	11,210	37.8
35-39 Years	23,433	10.1	15,355	65.5	8,078	34.5
40-44 Years	21,813	9.4	14,650	67.2	7,163	32.8
45-49 Years	19,783	8.5	13,690	69.2	6,093	30.8
50-54 Years	19,668	8.4	13,931	70.8	5,737	29.2
55-59 Years	17,733	7.6	12,771	72.0	4,962	28.0
60-64 Years	15,069	6.5	11,088	73.6	3,981	26.4
65-69 Years	11,045	4.7	8,310	75.2	2,735	24.8
70 Years or Older	23,078	9.9	18,901	81.9	4,177	18.1
Race						
White alone	184,951	79.4	120,080	64.9	64,871	35.1
Black or African American alone	22,940	9.8	16,256	70.9	6,684	29.1
American Indian and Alaska Native alone	2,723	1.2	1,993	73.2	730	26.8
Asian alone	10,407	4.5	6,183	59.4	4,224	40.6
Native Hawaiian and Other Pacific Islander alone	281	0.1	198	70.5	83	29.5
Some Other Race alone	6,864	2.9	4,955	72.2	1,909	27.8
Two or More Races	4,795	2.1	3,007	62.7	1,788	37.3
Ethnicity						

Selected Characteristic	Disagreement Total		ACS Non-mover and IRS Mover		ACS Mover and IRS Non-mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Not Hispanic or Latino	207,435	89.0	134,808	65.0	72,627	35.0
Hispanic or Latino	25,526	11.0	17,864	70.0	7,662	30.0
Place of birth						
Native	203,018	87.1	131,905	65.0	71,113	35.0
Foreign-born	29,943	12.9	20,767	69.4	9,176	30.6
Tenure						
Householder lived in owner-occupied housing units	114,274	49.1	81,608	71.4	32,666	28.6
Householder lived in renter-occupied housing units	118,687	50.9	71,064	59.9	47,623	40.1
MSA						
Living in Metro Area	183,694	78.9	117,649	64.0	66,045	36.0
Living in Micro Area	26,422	11.3	18,009	68.2	8,413	31.8
Living Outside Core Based Statistical Area (CBSA)	22,845	9.8	17,014	74.5	5,831	25.5
State, District, or Territory						
Alabama	3,441	1.5	2,360	68.6	1,081	31.4
Alaska	906	0.4	636	70.2	270	29.8
Arizona	5,205	2.2	3,300	63.4	1,905	36.6
Arkansas	2,249	1.0	1,513	67.3	736	32.7
California	25,899	11.1	16,782	64.8	9,117	35.2
Colorado	4,404	1.9	2,699	61.3	1,705	38.7
Connecticut	1,993	0.9	1,277	64.1	716	35.9
Delaware	621	0.3	379	61.0	242	39.0
District of Columbia	648	0.3	405	62.5	243	37.5
Florida	13,571	5.8	9,038	66.6	4,533	33.4
Georgia	6,001	2.6	4,126	68.8	1,875	31.2
Hawaii	771	0.3	511	66.3	260	33.7
Idaho	1,230	0.5	847	68.9	383	31.1
Illinois	10,366	4.4	7,034	67.9	3,332	32.1
Indiana	4,802	2.1	3,098	64.5	1,704	35.5
Iowa	3,222	1.4	2,005	62.2	1,217	37.8

Selected Characteristic	Disagreement Total		ACS Non-mover and IRS Mover		ACS Mover and IRS Non-mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Kansas	2,971	1.3	1,843	62.0	1,128	38.0
Kentucky	3,183	1.4	2,116	66.5	1,067	33.5
Louisiana	3,031	1.3	2,084	68.8	947	31.2
Maine	1,326	0.6	910	68.6	416	31.4
Maryland	3,772	1.6	2,405	63.8	1,367	36.2
Massachusetts	3,831	1.6	2,408	62.9	1,423	37.1
Michigan	8,937	3.8	5,617	62.9	3,320	37.1
Minnesota	6,595	2.8	4,157	63.0	2,438	37.0
Mississippi	1,766	0.8	1,260	71.3	506	28.7
Missouri	5,314	2.3	3,506	66.0	1,808	34.0
Montana	1,070	0.5	737	68.9	333	31.1
Nebraska	2,377	1.0	1,584	66.6	793	33.4
Nevada	2,334	1.0	1,423	61.0	911	39.0
New Hampshire	948	0.4	604	63.7	344	36.3
New Jersey	4,700	2.0	3,214	68.4	1,486	31.6
New Mexico	1,642	0.7	1,204	73.3	438	26.7
New York	11,211	4.8	7,709	68.8	3,502	31.2
North Carolina	6,690	2.9	4,456	66.6	2,234	33.4
North Dakota	1,036	0.4	672	64.9	364	35.1
Ohio	8,501	3.6	5,369	63.2	3,132	36.8
Oklahoma	5,540	2.4	4,119	74.4	1,421	25.6
Oregon	2,842	1.2	1,738	61.2	1,104	38.8
Pennsylvania	10,281	4.4	6,766	65.8	3,515	34.2
Rhode Island	551	0.2	331	60.1	220	39.9
South Carolina	3,006	1.3	1,964	65.3	1,042	34.7
South Dakota	1,062	0.5	699	65.8	363	34.2
Tennessee	4,245	1.8	2,734	64.4	1,511	35.6
Texas	16,920	7.3	11,112	65.7	5,808	34.3
Utah	2,146	0.9	1,306	60.9	840	39.1

Selected Characteristic	Disagreement Total		ACS Non-mover and IRS Mover		ACS Mover and IRS Non-mover	
	Count	Column Percent	Count	Row Percent	Count	Row Percent
Vermont	687	0.3	457	66.5	230	33.5
Virginia	5,937	2.5	3,663	61.7	2,274	38.3
Washington	5,019	2.2	3,084	61.4	1,935	38.6
West Virginia	1,861	0.8	1,532	82.3	329	17.7
Wisconsin	5,868	2.5	3,622	61.7	2,246	38.3
Wyoming	432	0.2	257	59.5	175	40.5

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 7A: 2012 ACS ROYA Sample Panel (unedited, unweighted, nonresponses removed) by IRS Data for Householder Where There is Data Disagreement Between ACS ROYA and IRS Movers

Sample Panel	Disagreement Total		ACS Non-mover and IRS Mover		ACS Mover and IRS Non-mover	
	Count	Column Percent	Count	Percent	Count	Percent
Total	**232,961**	**100.0**	**152,672**	**65.5**	**80,289**	**34.5**
January	34,062	14.6	21,855	64.2	12,207	35.8
February	18,273	7.8	12,635	69.1	5,638	30.9
March	26,062	11.2	17,696	67.9	8,366	32.1
April	24,987	10.7	16,840	67.4	8,147	32.6
May	16,805	7.2	11,725	69.8	5,080	30.2
June	21,802	9.4	14,199	65.1	7,603	34.9
July	19,880	8.5	12,595	63.4	7,285	36.6
August	14,770	6.3	9,342	63.2	5,428	36.8
September	17,254	7.4	10,808	62.6	6,446	37.4
October	12,736	5.5	8,123	63.8	4,613	36.2
November	15,539	6.7	9,795	63.0	5,744	37.0
December	10,791	4.6	7,059	65.4	3,732	34.6

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Table 8: 2011 IRS Reported State, District, or Territory for 2012 ACS ROYA Respondent Who Reported Moved from Abroad (unedited, unweighted)

State, District, or Territory	Count	Percent
Total	**27,144**	**100.0**
Alabama	175	0.6
Alaska	39	0.1
Arizona	293	1.1
Arkansas	112	0.4
California	1,978	7.3
Colorado	326	1.2
Connecticut	164	0.6
Delaware	58	0.2
District of Columbia	58	0.2
Florida	1,045	3.9
Georgia	368	1.4
Hawaii	115	0.4
Idaho	65	0.2
Illinois	628	2.3
Indiana	237	0.9
Iowa	162	0.6
Kansas	167	0.6
Kentucky	185	0.7
Louisiana	163	0.6
Maine	62	0.2
Maryland	349	1.3
Massachusetts	333	1.2
Michigan	481	1.8

State, District, or Territory	Count	Percent
Minnesota	404	1.5
Mississippi	78	0.3
Missouri	249	0.9
Montana	32	0.1
Nebraska	103	0.4
Nevada	171	0.6
New Hampshire	71	0.3
New Jersey	494	1.8
New Mexico	87	0.3
New York	844	3.1
North Carolina	445	1.6
North Dakota	64	0.2
Ohio	467	1.7
Oklahoma	166	0.6
Oregon	168	0.6
Pennsylvania	569	2.1
Rhode Island	37	0.1
South Carolina	189	0.7
South Dakota	49	0.2
Tennessee	241	0.9
Texas	1,249	4.6
Utah	190	0.7
Vermont	29	0.1
Virginia	512	1.9
Washington	382	1.4
West Virginia	45	0.2
Wisconsin	319	1.2

State, District, or Territory	Count	Percent
Wyoming	23	0.1
Puerto Rico	14	0.1
Not matched	11,890	43.8

Source: U.S. Census Bureau, American Community Survey, 2012 1-year unedited and unweighted data and tax year 2011 and 2012 IRS 1040 Returns.
Note: Percentages may not sum to 100 due to rounding.

Appendix IV

Figure 3: Tax Return Timing Issues

Scenario 1: ***Individual moves in May 2011, receives ACS in April 2012, filed taxes in June 2012 (for Tax Year 2011) and March 2013 (for Tax Year 2012).***
Did the individual experience a move? ACS = Yes, IRS = No

	January	February	March	April	May	June	July	August	September	October	November	December
2011					MOVED							
2012				Filled out ACS		Filed (Late) Tax Return for 2011						
2013			Filed Tax Return for 2012									

Scenario 2: ***Individual moves in May 2011, receives ACS in June 2012, filed taxes in March 2012 (for Tax Year 2011) and March 2013 (for Tax Year 2012).***
Did the individual experience a move? ACS = No, IRS = No

	January	February	March	April	May	June	July	August	September	October	November	December
2011					MOVED							
2012			Filed Tax Return for 2011			Filled out ACS						
2013			Filed Tax Return for 2012									

Overlap between ACS reference period and time period between tax year 2011 and tax year 2012 filing dates.

ACS reference period.

Time period between tax year 2011 and tax year 2012 filing dates.

Scenario 3: ***Individual moves in February 2012, receives ACS in April 2012, filed taxes in January 2012 (for Tax Year 2011) and February 2013 (for Tax Year 2***
Did the individual experience a move? ACS = Yes, IRS = Yes

	January	February	March	April	May	June	July	August	September	October	November	December
2011												
2012	Filed Tax Return for 2011	MOVED		Filled out ACS								
2013		Filed Tax Return for 2012										

Scenario 4: ***Individual moves in June 2012, receives ACS in April 2012, filed taxes in January 2012 (for Tax Year 2011) and February 2013 (for Tax Year 2012)***
Did the individual experience a move? ACS = No, IRS = Yes

	January	February	March	April	May	June	July	August	September	October	November	December
2011												
2012	Filed Tax Return for 2011			Filled out ACS		MOVED						
2013		Filed Tax Return for 2012										

Overlap between ACS reference period and time period between tax year 2011 and tax year 2012 filing dates.

ACS reference period.

Time period between tax year 2011 and tax year 2012 filing dates.