

# Income in the ACS: Comparisons to the 1990 Census

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## Adjusting 1996 ACS Income Data and Comparing Estimates to the 1990 Census

The long-term goal of the American Community Survey (ACS) is to produce more timely local area estimates. Currently, the only sources of Census Bureau local area income estimates are the decennial census (data only once every ten years) and the Small Area Income and Poverty Estimates (SAIPE) program (biennial county and state estimates of median household income). We designed the battery of income questions as well as the edit and allocation specifications for the ACS to be as similar as possible to that of the Census in order to evaluate the ACS's performance. There are, of course, some differences inherent with the ACS that forced us to make some changes. The most notable change between the Census and the ACS is the reference period, "past 12 months" versus "last calendar year." Other differences include a slight change in the questionnaire and some changes in the edit and allocation process. The purpose of this paper is to explain these differences and provide a preliminary overview of the ACS results.

In the 1990 Census, a battery of eight detailed income questions and a total income question were posed to all persons 15 years old and over. The eight detailed income questions included (1) wages and salary, (2) non-farm self-employment income, (3) farm self-employment income, (4) interest, dividend, and net royalty income, (5) social security, (6) Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance income, (7) retirement, survivor, or disability income, and (8) any other sources of income received on a regular basis. These eight income questions were placed at the end of each set of person questions on the long form (sample) questionnaire so that response levels to the other less sensitive sample questions would not be adversely impacted. A "total income" question was first asked in the 1980 Census to aid in the resolution of income entry problems in the detailed questions. Test results indicated that a sizable number of all income recipients furnished responses to the total income question, but failed to provide answers to some or all parts of the detailed type of income questions, proving the total income item very important.

We used the same battery of income questions including the total income item in the ACS with a few exceptions (see Table 1.) First of all, we combined the non-farm self-employment income item with the farm self-employment income item. We did this mainly because the number of respondents reporting farm self-employment income was small. This should not hinder analysts from identifying farm income recipients because we can still determine this number from other labor force related questions such as "occupation of longest job." We used this combined self-employment format in the 1998 Dress Rehearsal and we are planning to use it in the 2000 census as well.

Table 1: Comparison of 1990 Census and 1996 American Community Survey Income Questions

1990 Census	1996 American Community Survey
<p>In 1989, did this person receive-</p> <ul style="list-style-type: none"> <li>a. Wages or salary?</li> <li>b. Self-employment income from own nonfarm business, including proprietorship and partnership?</li> <li>c. Farm self-employment income?</li> <li>d. Interest, dividends, net rental income or royalty income, or income from estates and trusts?</li> <li>e. Social Security or Railroad Retirement?</li> <li>f. Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments?</li> <li>g. Retirement survivor, or disability pensions?</li> <li>h. Any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony?</li> </ul> <p>What was this person's total income in 1989?</p>	<p>In the PAST 12 MONTHS, did this person receive-</p> <ul style="list-style-type: none"> <li>a. Wage or salary?</li> <li>b. Self-employment income from own business (farm or non-farm) including proprietorship and partnership?</li> <li>c. Interest, dividends, net rental income, royalty income, or income from estates and trusts?</li> <li>d. Social Security or Railroad Retirement?</li> <li>e. Retirement, survivor, or disability pensions?</li> <li>f. Supplemental Security Income (SSI), Aid to Families with Dependent Children (AFDC), or other public assistance or public welfare payments?</li> <li>g. Other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support or alimony, etc.?</li> </ul> <p>What was this person's total income during the PAST 12 MONTHS?</p>

Again, the biggest difference between collection methods in the ACS and the Census is the income reference period. The ACS collects data





Because the ACS data are collected on a monthly basis, at the time of imputation we will have access to a much smaller sample than we did during the census (about 3 million housing units for a full year of data for the ACS compared to around 17 million during the Census). Therefore, we found it necessary to borrow some matching schemes from the Current Population Survey processing system that does not rely on the nearest geographic neighbor as a donor. That is, we used different "keys" when attempting to match to an information donor.

We started the process by looking for donors in fairly detailed matrices hoping to match as closely as possible to another person's characteristics. If we fail to locate a match, we dropped back to a more general and less detailed matrix or a second "key" in order to find a match.

Sometimes respondents will indicate they received a particular type of income but will not report how much they received. Another difference between the ACS and the Census is that the ACS treats respondents who report income reciprocity with no amount differently than those respondents who left an income question completely blank. That is, we allocate missing amounts from different matrices depending on whether the respondent marked the "yes" box for that item. In other words, we first try to establish a pattern of reciprocity and then go from there.

**Test Site Results:** Median and mean household income estimates for all four 1996 ACS sites were lower than the 1990 Census figures after they were adjusted for inflation. In all four areas the differences were statistically significant. (See Table 3 for the median household income figures).

	Brevard Co. Florida		Fulton Co. Pennsylvania		Multnomah Co. Oregon		Rockland Co. New York	
ACS Adjusted to 1996 dollars	\$32,728		\$28,058		\$32,732		\$60,163	
1990 Census Adjusted to 1996 dollars	\$38,635		\$30,034		\$34,073		\$66,722	
Difference	-\$5,907	*	-\$1,976	*	-\$1,341	*	-\$6,559	*

Source: 1990 Census of Population and the 1996 American Community Survey  
 \* Indicates statistically significant difference at 90-percent confidence level.

We looked into several possible explanations for this. For example, the counties could have failed to keep up with inflation. The lower median household incomes could be because of the changing demographic makeup of the counties during the past seven years. The difference could also be the result of other census / ACS differences including survey design and mode of interviewing.

Another possible explanation for the lower figures for the "PAST 12 MONTHS" reference period is that a respondent read the instructions and "keyed in" on the word "Month" and reported "monthly" amounts in the income fields. The income edits are designed to catch monthly amounts and would have caught many of these types of mistakes but some of the higher monthly amounts indicated by respondents could have remained unchanged thus lowering the median and mean income. As a precautionary measure and to help prevent this situation for future respondents, we are changing the instructions slightly on the questionnaire to emphasize annual amounts. The instructions will be changed to read "Mark (X) the "Yes" box for each type of income this person received, and give your best estimate of the TOTAL AMOUNT during the PAST 12 MONTHS. (NOTE: The "past 12 months" is the period from today's date one year ago up through today.)"

Still another possible explanation for the lower medians could be the fact that we are applying national (and sometimes regional) CPI factors to adjust local area estimates from the 1990 Census and trying to compare the result to our ACS estimates. These factors may not entirely reflect what is actually happening in the local areas. Also, a recession occurred between 1989 (Census) and 1996 (ACS); not all localities fully recovered.

It should also be noted that we published "true medians" for household and family incomes from the ACS. The medians from the 1990 Census were calculated from grouped data using linear interpolation. We compared the "true" 1996 ACS median household income estimates to (1) adjusted 1990 Census figures, (2) county estimates of household income from the Census Bureau's Small Area Income and Poverty Estimates (SAIPE) program adjusted to 1996 dollars, and (3) ACS medians calculated from grouped data using linear interpolation. As shown in Table 4, in most cases, the 1996 ACS "true" median household incomes matched up much more closely with the more recent SAIPE estimates than the older adjusted census figures.

	1989	1993	1996	1996
Site:	Census Adjusted Medians	SAIPE Adjusted Medians	True ACS Medians	ACS Medians (Grouped Data)
Brevard Co., Florida	\$38,635	\$36,140	\$32,728	\$32,735
Multnomah Co., Oregon	\$34,073	\$32,313	\$32,732	\$32,777
Rockland Co., New York	\$66,722	\$57,253	\$60,163	\$60,155
Fulton Co., Pennsylvania	\$30,034	\$30,811	\$28,058	\$27,996

Source: 1990 Census of Population, 1996 American Community Survey, and 1993 SAIPE Program Estimates

When looking at response rates (the percentage of respondents who answered "yes," "no," or "loss") by the different sources of income, the questionnaire with the "past 12 months" reference period produced slightly higher response rates for every income source although only one income item, public assistance, was statistically significant over the two reference periods. (See Table 5.)

Table 5 - Response Rates for All Sources of Income - Split Panel Test

Income	Period	Percent Reporting Income	Difference	
Wage/Salary	Past 12 months	73.93%		
	Calendar year 1996	72.84%	+1.09	
Self-Employment	Past 12 months	73.72%		
	Calendar year 1996	72.68%	+1.04	
Interest, etc.	Past 12 months	72.07%		
	Calendar year 1996	71.05%	+1.02	
Social Security	Past 12 months	75.78%		
	Calendar year 1996	74.65%	+1.13	
Retirement	Past 12 months	75.36%		
	Calendar year 1996	73.96%	+1.40	
Public Assistance	Past 12 months	77.12%		
	Calendar year 1996	75.38%	+1.74	*
Other Income	Past 12 months	76.40%		
	Calendar year 1996	75.23%	+1.17	
Total Income	Past 12 months	83.67%		
	Calendar year 1996	83.09%	+0.58	

Source: 1996 American Community Survey

\* Indicates statistical significant difference at 90-percent confidence level.

Finally, because response rates were slightly better and to assure that the income questions would be as consistent as possible with the other, more current information collected on the ACS (disability and labor force status, for example), we decided to keep the 12-month reference period. But, as mentioned earlier, we are changing the wording of the instructions slightly to emphasize the fact that we are looking for "Total amounts" for the previous 12 months and not simply a monthly amount.

It is also worth mentioning that when making comparisons between the 1990 Census income figures and those of the ACS, it is also important to keep in mind the different modes of data collection. That is, when gathering information from households who failed to respond via mail, the ACS used computer-assisted telephone interviewing (CATI) and computer-assisted personal interviewing (CAPI) where the 1990 Census did not.