

# INVESTIGATING TIME IN SAMPLE EFFECT FOR THE SURVEY OF INCOME AND PROGRAM PARTICIPATION

Maryann K. McCormick, Derrick M. Butler, and Rajendra P. Singh, U.S. Census Bureau  
Maryann K. McCormick, U.S. Census Bureau, Washington, D.C. 20233

## I. Introduction and Background

In this paper, we'll present the results of a study conducted to evaluate what, if any, effect a respondent's repeated exposure to the same line of questions has on data estimates. Specifically, we'll look for its effect on estimates from the Survey of Income and Program Participation (SIPP). Over the long term, if a respondent's answers are affected, the overall quality of our estimates is affected. In addition to any learning effect, increasing nonresponse as a panel progresses may also impact data quality. We refer to this change in quality of data for panel surveys as a time-in-sample (TIS) effect.

Various survey organizations have done a substantial amount of research concerning the effect prolonged exposure to a survey's questions has on a respondent's answers. Kemsley (1961) and Turner (1961) found that respondents reported higher expenditures in the first interview than in later interviews. In the California health surveys, Mooney (1962) found that the level of illness reported was much higher in initial reports than that reported in later interviews of the panel. In a survey of residential alterations and repairs, Waksberg and Neter (1965) also found the effect of time-in-sample. They observed that the number of alterations and repairs reported at the second interview were higher than those reported at the third interview.

Bailar (1975) found that persons in housing units interviewed for the first time estimated the number of unemployed 20% higher than the average of all persons in the sample (rotation groups). The estimate based on the persons living in housing units interviewed for the last time was lower than the average of all rotation groups.

Silberstein and Jacobs (1989) reported that in the Consumer Expenditure Interview Survey, the time-in-sample effect seemed to discourage the reporting of certain types of expenditures but seemed to improve reporting for certain other types. For example, from the second to the fifth interviews, reports of expenditures for household furnishings and apparel decreased but increased for vehicles, public transportation and some utilities.

Woltman and Bushery (1975) studied the time-in-sample effect in the National Crime Survey (NCS). In general, their research showed a decline in the rates of reported victimization as the number of interviews increased. The highest victimization rate was shown as of the first interview followed by the second and third interviews, respectively.

Kahn (1984) evaluated the time-in-sample (TIS) effect for the 1979 Income Survey Development Program (ISDP) data. Since ISDP was a large scale experiment panel for the SIPP, she performed this research to get an indirect source of information about the SIPP. Due to sample size and the effect of seasonality constraints, her research was done only to determine the existence of extremely large TIS effects on ISDP data. The results of her study did not indicate any obvious time-in-sample effect.

Since Kahn's study, other studies to evaluate the effect of TIS on SIPP data have been completed. Chakrabarty (1988) used the SIPP 1984 panel data and compared estimates from consecutive interviews. He found evidence of a TIS effect for some labor force activity items. But, monthly estimates of income and benefits reciprocity for persons and households were not affected.

A respondent in the SIPP is in sample for 2½ years. Given that he/she is interviewed every four months, a respondent is subject to the same line of questioning as many as eight times. The important question to ask is, does this repeated exposure have an effect on a respondent's answers? Before we answer that question, we will provide an overview of the design and content of the SIPP in section II. We'll discuss some of the background on the TIS issue and what implications its existence has for the SIPP in section III. In section IV, we'll discuss our methodology. Finally, in section V, we'll discuss what we've found.

## II. Design and Content of the SIPP

The SIPP is a nationally representative survey program of the U.S. Bureau of the Census. It obtains information about the financial situation of persons, families, and households in the noninstitutionalized population of the United States. The information we gather includes data on: earnings, labor force status, poverty, and eligibility and participation in various government transfer programs (SSI, AFDC, Food Stamps).

The SIPP is a continuing survey with a new national probability sample (panel) of households introduced each year. For most panels, sample households are interviewed every four months for about 2½ years (eight interviews). Each panel is divided into four approximately equal subsamples, called rotation groups. One rotation group is interviewed per month. Thus, one cycle, or wave of interviewing (using the same questionnaire) usually takes four consecutive months to complete.

The first SIPP panel was the 1984 panel. It was introduced in October, 1983. In every year since 1985, a new panel has been introduced each February. All the panels have varied somewhat in size due to budget constraints.

At each interview, respondents are asked a core set of questions about their income, labor force activity and program participation during the previous four month period. At waves 2 and beyond, respondents are also asked a set of supplemental (topical module) questions which vary by wave. Finally, since the SIPP has an overlapping panel design, there are sometimes two or three panels in the field at the same time. Thus, two panels provide estimates for the same period of time. A detailed description of the SIPP is given in Nelson, et. al. (1985).

## III. Why Study the Time-in-Sample Effect?

In general, the goal of our research was to determine if a respondent's answers were affected by the repeated exposure to the same questions over the life of a panel. Over time, what would cause a respondent to give a different answer to the same question? If it is the result of repeated exposure, we can't lay blame on any one specific cause. Perhaps, the respondent has a better understanding of the question over time; allowing him/her to provide more accurate information. Or maybe, the respondent becomes so familiar with how the questions are asked that he/she knows how to shorten the interview by giving one response over another.

\*\* This paper reports the general results of research undertaken by Census Bureau staff. The views expressed are attributable to the authors and do not necessarily reflect those of the Census Bureau.

There are many things that could contribute to the TIS problem: learning, nonresponse, nonsampling error, recall, and bounded versus unbounded interviews. Although we are interested in what causes the TIS effect, we need to decide if, first and foremost, it is a problem for the SIPP. So, for our study, all of the above factors are combined. We are more interested in an overall effect and not in determining how it is introduced. For that reason, we have not tried to distinguish or focus on or between any individual source.

It's also important to mention why we've decided to refer to our work as a study of the time-in-sample effect. In other studies, the subject has usually been referred to as a time-in-sample bias. However, we feel it's important to emphasize the word effect rather than bias. Bias tends to make people think in negative terms but, from what our research has shown, the estimates are not necessarily deteriorating as the panel progresses.

So, back to our question, why are we looking for a time-in-sample effect? The existence or nonexistence of any substantial TIS effect impacts any future decisions made about the SIPP design. If there is no overwhelming evidence of a TIS effect, it allows more flexibility when deciding if we could go to an alternative design.

#### IV. Methodology

Our interest is in whether a TIS effect exists. If it exists, is there a pattern to how the estimates differ? Is the effect constant from quarter to quarter or is it positive in one quarter and negative in the next? Are persons/households with certain characteristics more susceptible to the effect of time-in-sample?

Using the SIPP generalized variance parameters, we calculated variances and standard errors on the estimates for the comparisons we made. We have focused on two types of comparisons, each being a comparison of two estimates:

##### 1. Administrative Data Comparisons

Using various sources, we have collected administrative data comparable to several of the estimates we have an interest in. We assume the administrative estimate is the true value. Using the data, we have taken a simple difference of a SIPP quarterly estimate and an administrative data estimate. For example,  $(X_{i,j,k} - A_{i,j})$  where  $X_{i,j,k}$  is the SIPP quarterly estimate from the  $i$ th quarter of the  $j$ th year from the  $k$ th panel and  $A_{i,j}$  is the administrative data estimate from the  $i$ th quarter of the  $j$ th year.

We hoped to show that a significant difference occurring between a SIPP quarterly estimate and an administrative estimate pointed to the existence of a TIS effect. By making this direct comparison with administrative data (where available) and looking at the differences over several quarters, we could see if a change was occurring. At the same time, we could tell if the change was an improvement. To do this, we looked at the direction of change in relation to the administrative estimate. If the estimates moved closer, the implication was that the SIPP estimate was improving. Of course, if the estimate moved further apart, it implied that the SIPP estimate had deteriorated.

##### 2. SIPP Quarterly Estimate Comparisons Across Panels

Having four panels worth of data available and due to the overlapping panel design of the SIPP, we compared quarterly estimates for the same calendar year from two different panels. For example,  $(Y_{i,j,k} - Y_{i,j,k+1})$  where  $Y_{i,j,k}$  is the SIPP quarterly estimate for the  $i$ th quarter of the  $j$ th year from the  $k$ th panel and  $Y_{i,j,k+1}$  is the SIPP quarterly estimate for the  $i$ th quarter for the  $j$ th year from the  $k+1$ th panel.

If we see a significant difference in this type of comparison, it also indicates the existence of a TIS effect. By looking for patterns in the way the estimates are different, we can tell if the TIS effect is changing. However, with this approach, we can't

tell whether the change is good or bad unless we have an administrative estimate to use as a benchmark.

#### V. Results

We concentrated our efforts on comparisons of quarterly estimates across panels. Where possible, we compared the SIPP estimate to an administrative data estimate. Because of the small sample size and resulting large variances, it is possible that we won't detect any time-in-sample effect. Therefore, in addition to comparing differences in estimates for the same time periods from different panels, we looked for trends associated with the aging of a panel.

Provided are a number of tables which present estimates from the 1984-1987 panels for specified characteristics. For several of the characteristics, corresponding administrative data estimates are provided as well.

The first four tables present our general findings when comparing one SIPP quarterly panel estimate to another SIPP quarterly panel estimate. Estimates are provided from the 1984-1987 panels for the 1985-1987 calendar years. Each line of a table illustrates a comparison. Each line designates a quarter and the two SIPP estimates, each from different panels, that represent that quarter. Shown is the difference between the two panel estimates and finally, an "X" in the final column gives indication of a significant difference.

The layout of the tables lends itself easily to examination of what happens to estimates as a panel ages. As mentioned before, each line presents two SIPP estimates. Since the two panels are at different stages in the interview cycle, the first estimate is always from the more aged panel. The second is from the younger panel. The distance between the two estimates is shown in the next to last column. If the difference is statistically significant, a time-in-sample effect is indicated. Over time, we can use the gaps between the panel estimates to tell us if the time-in-sample effect is increasing, decreasing or remaining constant.

Tables 6 through 8 present SIPP quarterly estimates as compared to administrative data estimates. Each line in a table represents a quarter and gives an administrative data estimate and two SIPP quarterly estimates, each from different panels. If a SIPP panel estimate is significantly different from the administrative data estimate, an asterisk will follow the SIPP quarterly estimate. The final column in the table indicates when the two SIPP quarterly estimates are significantly different from each other.

We researched a great number of estimates. We studied characteristics related to:

- household earnings
- personal earnings
- labor force activity
- poverty
- program participation.

Each characteristic was examined by race, sex, age, marital status change, mover status, and metro/non-metro status.

We looked at where significant differences between the estimates occurred. We looked for patterns where all the differences were positive/negative. This indicating that one panel's estimates were consistently higher/lower than another's. We looked at the differences by calendar year; was one calendar year showing significant differences with a higher frequency than any other? We looked for patterns across calendar years; were significant differences occurring with any pattern across the same quarters in different calendar years?

Although we studied a great many estimates for a number of characteristics, in general, our results were the same. We

found little or negligible time-in-sample effect. We did, however, notice the following situations:

#### 1. The Wave 1 Phenomenon

As a general observation, we saw significant differences occurring across panels when comparing quarter one estimates. What's important about this is that a quarter one estimate includes wave 1 responses from the "younger" panel.

With the introduction of the 1985 panel came a new design. A new design means a significant number of new field representatives are conducting interviews for the first time. When the 1985 panel went into the field there were about 300 new field representatives. We added 100 more with the introduction of the 1986 panel. Given the magnitude of the SIPP questionnaire, it is understandable that one wouldn't be entirely familiar with the questionnaire at the first interview. We believe that the lack of experience on the part of the new SIPP field representatives may cause differences in our estimates.

A wave 1 interview is an unbounded interview, meaning, the respondent's have an open ended time frame from which to recall their answers. All other waves are bounded by the previous wave's interview. Table 1 shows estimates for persons 16+ with personal earnings experiencing a marital status change. In each instance where wave 1 data is involved we have a significant difference between the two panel estimates. But, it is not always true that the estimate including the wave 1 responses is consistently higher or lower than the estimate from the "older" panel.

Regardless of the cause, quarter one comparisons appeared significant in a number of cases in a number of our areas of interest but, it was in no way consistent from one variable to the next. Furthermore, there was no pattern within a variable across different calendar years.

#### 2. State Unemployment Compensation

Shown in the table presented for State Unemployment Compensation (table 2), we see a number of significant differences within Black males. But, although the differences are occurring within calendar year 1986 and calendar year 1987 estimates, you can see from looking at the differences between the panel estimates that there is no direction/pattern.

It's also important to keep in mind that previous research has shown that SIPP estimates for State Unemployment Compensation are not good. There are several hypotheses about the inadequacies of our estimates but we have no definite answer to this problem. This may be a contributing factor to the differences we are seeing.

#### 3. Seasonality

We feel there is also a seasonal effect. In many cases, the quarter one estimate is higher than that of the other quarters of the year. This is illustrated in Table 3 for households receiving food stamps. This situation is seen regardless of the age of the panel. However, even this isn't consistent. For households receiving SSI (table 6), we see the quarter one estimate is lower than that of all the other quarters.

#### 4. The Calendar Year 1985 Phenomenon

When looking at the estimates of Poverty, Some Labor Force Activity, and Other Labor Force Activity, we noticed another oddity in the estimates. For each of these, virtually all of the calendar year 1985 quarterly estimates were significantly different between the 1984 panel and 1985 panel. This occurred for the following subset of tables within each variable:

- a. Number of persons in households in universe.
- b. Universe (This is number of households in poverty and number of persons for the labor force variables.)
- c. Nonblack males

d. Nonblack females (The differences did not occur for poverty.)

e. Hispanics (The differences did not occur for poverty.)

f. Metro

g. Nonmetro (The differences did not occur for poverty.)

This occurred for various age groups, etc. within each of these variables as well. However, there didn't appear to be any pattern. Again, there were sporadic cases of significant differences occurring for the other calendar years and panels we looked at but none with the frequency as seen in the 1985 calendar year.

At this time, we are not able to provide a full explanation for why the differences existed so frequently for the 1985 calendar year estimates. Again, it may be due to the large number of new SIPP interviews for the 1985 panel.

#### 5. The Administrative Data Estimates

Our administrative data comparisons showed a variety of things. For persons 16+ receiving State Unemployment Compensation (table 5), the SIPP estimates are in line with the administrative data estimates. In some cases the SIPP estimate was higher than the administrative data estimate, in some lower. In general, the SIPP estimates followed the same path as the administrative data estimate.

As part of the administrative data collection process, we adjusted the administrative estimates to compensate for differences between the administrative universe and the SIPP universe. For households receiving SSI (table 6) and households receiving AFDC (table 8), all the SIPP estimates are significantly lower than the administrative estimates. However, the SIPP estimate, although lower, follows the same general pattern as the administrative estimates. It is possible that our adjustments did not completely compensate for the differing universes.

Finally, we'll look at the number of persons in households receiving food stamps. Again, the SIPP estimates are following the general pattern as the administrative estimates. We do note that the 1984 and 1985 panel estimates are generally lower while the 1986 and 1987 panel estimates are generally higher than the administrative data estimates.

#### VI. Future Plans

For the future, we will continue looking at our results as presented here. We will extend our analysis using 1988 panel data. With the 1988 panel, we can see if the current results held.

There has been some mention of the existence of a TIS effect in health insurance coverage estimates. We will evaluate the health insurance data in future analysis.

Upon completion of these studies, we will need to investigate the implications of our results on the SIPP design. How and where the TIS effect exists impacts the policy evaluation and socio-economic research. We'll also investigate if we can improve data quality using a simple estimation technique.

#### VII. Conclusion

The goal of our research has been to determine whether the length of time in sample has any effect on SIPP data quality. For our purposes, we defined the time-in-sample effect as any change in data quality. We didn't focus on any individual cause. Instead, we saw learning, nonresponse, nonsampling error, recall, attrition, etc. all as contributing factors.

Throughout our study, we saw instances where significant differences existed when comparing SIPP quarterly estimates across panels. In some cases, we saw a slight pattern to the occurrences, as in the wave 1 situation. But, even that didn't occur with much regularity. We saw where significant differences occurred in a pattern for only one calendar year, as

with Some Labor Force Activity, etc. However, the reasons we feel explain this imply the differences should show up for every pair of estimates we look at in that calendar year; but, detailed investigation showed this was not the case. Finally, we've seen cases where there are significant differences across panel estimates. But, there seems to be no pattern or frequency to the occurrences for any of the characteristics we studied.

There are two possible explanations for the nonexistence of much of a TIS effect.

#### 1. Dependency of Interviews

The SIPP has dependent interviews. This may reduce the TIS effect. Studies have been done that show dependency reduces changes. It's also the case with the SIPP that follow-up questions are asked based on earlier responses.

#### 2. Independent Controls

The SIPP makes a weighting adjustment by using iterative raking procedures. The marginal controls used in the raking are chosen such that they are highly correlated with the characteristics of most interest. Thus, significantly reducing, if not completely eliminating, the TIS effect.

Even though we didn't find evidence of a time-in-sample effect, it is still possible that it exists but is too small to detect. Such a small effect may change some of our borderline conclusions in the data analysis.

#### VIII. References

Bailar, B., (1975), "The Effects of Rotation Group Bias on Estimates from Panel Surveys." *Journal of the American Statistical Association*, March 1975, Volume 70, Number 349.

Chakrabarty, R., (1988), "The Effects of Time-in-Sample Bias on SIPP Estimates. A Preliminary Report.", Internal Census Bureau memorandum.

Kahn, J., (1985), "SIPP: Research on Month in Sample (MIS) Effect.", Internal Census Bureau memorandum for Shapiro from Singh dated January 4, 1985.

Kemsley, W.F.F., (1961), "The Household Expenditure Enquiry of the Ministry of Labor," *Applied Statistics*, 10, No. 3, 117-35.

Lepkowski, J., S. Pennell, (1992), "Panel Conditioning Effects in the Survey of Income and Program Participation." Prepared for presentation at the Annual Meeting of the American Statistical Association, 1992.

Mooney, H., (1962), "Methodology in Two California Health Surveys, Public Health Monograph No. 70, U.S. Public Health Services, Washington, D.C.

Nelson, D., D. McMillen, and D. Kasprzyk, (1985), "An Overview of the SIPP: Update 1," SIPP Working Paper Series No. 8401, U.S. Bureau of the Census.

Silberstein, A.R. and C.A. Jacobs (1989), "Symptoms of Repeated Interview Effects in the Consumer Expenditure Interview Survey," *Panel Surveys*, Edited by Kasprzyk, Duncan, Kalton, and Singh; Wiley, pp. 289-303.

Turner, R., (1961), "Inter-Week Variations in Expenditure Recorded During a Two-Week Survey of Family Expenditure," *Applied Statistics*, 10, No. 3, 136-46.

U.S. Department of Commerce, Bureau of the Census, (1991). "SIPP 1985+: Specifications for Producing Estimates to Study the Time-in-Sample Effect." Memorandum from Waite to Courtland, May 14, 1991.

Waksberg, J. and J. Neter, (1965), "Response Errors in Collection of Expenditures Data by Household Interviews: An Experimental Study," Technical Paper No. 11, U.S. Bureau of the Census, Washington, D.C.

Woltman, H.F., and J.M. Bushery (1975), "A Panel Bias Study in the National Crime Survey," *Proceedings of the Survey Research Methods Section of the American Statistical Association*.

#### Acknowledgements

The authors are grateful to Kathy Kreilick and Sandra Carnegie for their clerical support and to all the peer reviewers for their useful comments.

Table 1. SIPP 1984-1987 Panel Estimates of Persons 16+ with Personal Earnings who Experienced a Change in Marital Status

Quarter	1984 Panel		1985 Panel		1986 Panel		1987 Panel		Difference Between Panels	Significant Difference
	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>		
1st 1985	212159	0.6580	146652	0.3420					135487	X
2nd 1985	183905	0.5533	307409	0.4447					76496	X
3rd 1985	339274	0.5873	346658	0.4935					10616	
4th 1985	301073	0.4874	316488	0.3126					-15613	
1st 1986			210457	0.8396	23579	0.1604			226878	X
2nd 1986			346337	0.3531	279394	0.4449			66943	
3rd 1986			371730	0.4972	355915	0.5028			-1463	
4th 1986			296942	0.5225	273353	0.4773			23607	
1st 1987					282932	0.3462	334294	0.6538	-251362	X
2nd 1987					331065	0.3272	296655	0.4728	34210	
3rd 1987					335958	0.3136	322810	0.4864	17988	
4th 1987					247016	0.3463	221881	0.4531	45193	

The standardized estimate is calculated as follows: Let  $X_{1,85}$  represent the 1st quarter 1985 estimate from the 1984 panel. Let  $Y_{1,85}$  represent the 1st quarter 1985 estimate from the 1985 panel. The standardized estimate for the 1st quarter of 1985 from the 1984 panel is calculated as:

$$\bar{X}_{1,85} = \frac{X_{1,85}}{X_{1,85} + Y_{1,85}}. \text{ The standardized estimate for the 1st quarter of 1985 from the 1985 panel is calculated as: } \bar{Y}_{1,85} = \frac{Y_{1,85}}{X_{1,85} + Y_{1,85}}.$$

The same pattern holds for other quarters.

Table 2. SIPP 1984-1987 Panel Estimates of Households Receiving Food Stamps

Quarter	1984 Panel		1985 Panel		1986 Panel		1987 Panel		Difference Between Panels	Significant Difference
	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>		
1st 1985	6236073	0.5071	6035802	0.4929					174273	
2nd 1985	3934632	0.3032	5876008	0.4967					78624	
3rd 1985	3883283	0.5094	3649346	0.4906					216441	
4th 1985	5839407	0.5010	5724182	0.4930					113385	
1st 1986			5853796	0.4688	6636157	0.5312			-780361	X
2nd 1986			3668123	0.4629	6576754	0.5371			-908629	X
3rd 1986			5631618	0.4752	6218375	0.5248			-566737	X
4th 1986			3692792	0.4761	6264684	0.5239			-571892	X
1st 1987					6396064	0.5045	6281987	0.4955	114077	
2nd 1987					6273814	0.5036	6184424	0.4964	89390	
3rd 1987					5945528	0.5006	5930333	0.4994	15295	
4th 1987					5628851	0.4968	5903389	0.5032	-74538	

The standardized estimate is calculated as follows: Let  $X_{1,85}$  represent the 1st quarter 1985 estimate from the 1984 panel. Let  $Y_{1,85}$  represent the 1st quarter 1985 estimate from the 1985 panel. The standardized estimate for the 1st quarter of 1985 from the 1984 panel is calculated as:

$$\bar{X}_{1,85} = \frac{X_{1,85}}{X_{1,85} + Y_{1,85}}. \text{ The standardized estimate for the 1st quarter of 1985 from the 1985 panel is calculated as: } \bar{Y}_{1,85} = \frac{Y_{1,85}}{X_{1,85} + Y_{1,85}}.$$

The same pattern holds for other quarters.

Table 3. SIPP 1984-1987 Panel Estimates of Black Males 16+ Receiving State Unemployment Compensation

Quarter	1984 Panel		1985 Panel		1986 Panel		1987 Panel		Difference Between Panels	Significant Difference
	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>		
1st 1985	258346	0.3212	237303	0.4788					21041	
2nd 1985	144917	0.4268	194642	0.3732					-49725	
3rd 1985	130660	0.5875	91733	0.4123					38927	
4th 1985	184988	0.3290	164676	0.4710					20304	
1st 1986			265530	0.6401	160381	0.3599			124989	X
2nd 1986			197621	0.3766	143933	0.4214			53688	
3rd 1986			192457	0.6000	127383	0.3992			64572	X
4th 1986			160407	0.6712	78586	0.3288			81821	X
1st 1987					44559	0.1567	339764	0.8433	-193203	X
2nd 1987					66989	0.2739	177589	0.7261	-110600	X
3rd 1987					74362	0.3057	169354	0.6943	-94992	X
4th 1987					73964	0.3706	125611	0.6294	-51647	X

The standardized estimate is calculated as follows: Let  $X_{1,85}$  represent the 1st quarter 1985 estimate from the 1984 panel. Let  $Y_{1,85}$  represent the 1st quarter 1985 estimate from the 1985 panel. The standardized estimate for the 1st quarter of 1985 from the 1984 panel is calculated as:

$$\bar{X}_{1,85} = \frac{X_{1,85}}{X_{1,85} + Y_{1,85}}. \text{ The standardized estimate for the 1st quarter of 1985 from the 1985 panel is calculated as: } \bar{Y}_{1,85} = \frac{Y_{1,85}}{X_{1,85} + Y_{1,85}}.$$

The same pattern holds for other quarters.

Table 4. SIPP 1984-1987 Panel Estimates of Persons 16+ with Some Labor Force Activity

Quarter	1984 Panel		1985 Panel		1986 Panel		1987 Panel		Difference Between Panels	Significant Difference
	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>	Estimate	Standardized Estimate <sup>1</sup>		
1st 1985	112717619	0.4919	117468781	0.5081					-3751082	X
2nd 1985	115086366	0.4970	118822236	0.5030					-3735890	X
3rd 1985	115483321	0.4917	119361109	0.5083					-3877788	X
4th 1985	114641000	0.4922	118214371	0.5078					-3643371	X
1st 1986			118985306	0.4994	119280482	0.5006			-285176	
2nd 1986			121173871	0.5004	120985870	0.4996			18801	
3rd 1986			122384276	0.5013	121757372	0.4987			626904	
4th 1986			120917406	0.5008	120549160	0.4992			368248	
1st 1987					120147752	0.4995	120499319	0.5005	-261567	
2nd 1987					121549595	0.5000	121569189	0.5000	-19394	
3rd 1987					122606718	0.5013	121965001	0.4987	641717	
4th 1987					121572929	0.5004	121383771	0.4996	189318	

The standardized estimate is calculated as follows: Let  $X_{1,85}$  represent the 1st quarter 1985 estimate from the 1984 panel. Let  $Y_{1,85}$  represent the 1st quarter 1985 estimate from the 1985 panel. The standardized estimate for the 1st quarter of 1985 from the 1984 panel is calculated as:

$$\bar{X}_{1,85} = \frac{X_{1,85}}{X_{1,85} + Y_{1,85}}. \text{ The standardized estimate for the 1st quarter of 1985 from the 1985 panel is calculated as: } \bar{Y}_{1,85} = \frac{Y_{1,85}}{X_{1,85} + Y_{1,85}}.$$

The same pattern holds for other quarters.

Table 3. SIPP Panel Estimates Versus Administrative Data Estimates for Persons 16+ Receiving State Unemployment Compensation

Quarter	Administrative Data Estimate <sup>1</sup>	1984 Panel Estimate	1985 Panel Estimate	1986 Panel Estimate	Significant Difference Between SIPP Estimates
1st 1985	2864000	3170344	3130906		
2nd 1985	2280333	2197104	2393583		
3rd 1985	2042667	1872037	1985375		
4th 1985	2216000	1936237	2202393		
1st 1986	2906000		2800449	2690534	
2nd 1986	2391000		2231118	2173227	
3rd 1986	2391000		2156768	2192141	
4th 1986	2391000		2332982	2096630	

<sup>1</sup> An asterisk after a panel estimate denotes a statistically significant difference between it and the corresponding administrative data estimate.

<sup>1</sup> The administrative data estimates for State Unemployment Compensation were found in the "Social Security Bulletin" published through the Social Security Administration, U.S. Department of Health and Human Services.

Table 6. SIPP Panel Estimates Versus Administrative Data Estimates for Households Receiving SSI (Supplemental Security Income).

Quarter	Administrative Data Estimate <sup>1</sup>	1984 Panel Estimate	1985 Panel Estimate	1986 Panel Estimate	Significant Difference Between SIPP Estimates
1st 1985	3663581	3009389*	2963773*		
2nd 1985	3691981	3080577*	3017191*		
3rd 1985	3701303	3036297*	3182249*		
4th 1985	3729721	3069443*	3188742*		
1st 1986	3732438		3101493*	3091399*	
2nd 1986	3854907		3155667*	3258021*	
3rd 1986	3854907		3179517*	3285923*	
4th 1986	3854907		3164481*	3271384*	

<sup>1</sup> An asterisk after a panel estimate denotes a statistically significant difference between it and the corresponding administrative data estimate.

<sup>1</sup> The administrative data estimates for SSI were found in the "Social Security Bulletin" published through the Social Security Administration, U.S. Department of Health and Human Services.

559

Table 7. SIPP Panel Estimates Versus Administrative Data Estimates for Persons in Households Receiving Food Stamps

Quarter	Administrative Data Estimate <sup>1</sup>	1984 Panel Estimate	1985 Panel Estimate	1986 Panel Estimate	1987 Panel Estimate	Significant Difference Between SIPP Estimates
1st 1985	20241120	19928168	19114901*			
2nd 1985	19907303	18636398*	18666671*			
3rd 1985	19160901	18562377	17983439*			
4th 1985	19214760	18494598	18041836*			
1st 1986	19395194		18646932	21004122*		X
2nd 1986	19437776		18151630*	21020205*		X
3rd 1986	18966378		17748148*	19813955		X
4th 1986	19039931		18081514	20128963		X
1st 1987	19371360			20672261	20522368	
2nd 1987	19153365			20013689	20167793	
3rd 1987	18444349			19237334	19103968	
4th 1987	18999234			18149648	18653237	

<sup>1</sup> An asterisk after a panel estimate denotes a statistically significant difference between it and the corresponding administrative data estimate.

<sup>1</sup> The administrative data estimates for Food Stamps were found in the "Food Stamp Program Information" compiled by the U.S. D. A. Food and Nutrition Service.

Table 8. SIPP Panel Estimates Versus Administrative Data Estimates for Households Receiving AFDC (Aid to Families with Dependent Children)

Quarter	Administrative Data Estimate <sup>1</sup>	1984 Panel Estimate	1985 Panel Estimate	1986 Panel Estimate	Significant Difference Between SIPP Estimates
1st 1985	3644219	2851314*	2636645*		
2nd 1985	3650911	2737873*	2670114*		
3rd 1985	3626050	2797781*	2612240*		
4th 1985	3646810	2813768*	2600893*		
1st 1986	3699364		2610912*	2732124*	
2nd 1986	3714462		2589261*	2637339*	
3rd 1986	3689767		2593992*	2668934*	
4th 1986	3701398		2622068*	2723943*	

<sup>1</sup> An asterisk after a panel estimate denotes a statistically significant difference between it and the corresponding administrative data estimate.

<sup>1</sup> The administrative data estimates for AFDC were found in the "Quarterly Public Assistance Statistics" compiled by the U.S. Department of Health and Human Services.