5. NONRESPONSE ERROR

Three kinds of nonresponse occur in SIPP: household (unit) nonresponse, person (within unit) nonresponse, and item nonresponse. Survey procedures are designed to minimize all three kinds of nonresponse, and weighting and imputation procedures have been developed to try to minimize errors resulting from differences between units and persons that do respond and those that do not. Section 5.1 describes the steps taken in SIPP to maximize response rates. Sections 5.2 through 5.4 present data on levels and trends for each kind of nonresponse and on the characteristics of respondents and nonrespondents. Nonresponse indicators for SIPP and other surveys are compared. Finally, Section 5.5 describes the results of experiments with procedures designed to improve response rates in SIPP. The weighting and imputation procedures designed to minimize the effects of nonresponse are covered in Chapter 8.

5.1 Steps to maximize response rates

Wave 1 response

Several steps are taken to encourage response to the first wave interview:

- An advance letter from the Director of the Census Bureau explains the authority for and purposes of the survey and urges participation.
- Field representatives (FRs) carry cards and portfolios identifying them as Census Bureau employees.
- If no one is home at the time of the first visit, interviewers try to determine the best time for a callback, either by asking neighbors or by telephoning.
- Supervising field representatives and supervisors may be called in to convert refusals.
- More flexibility has been introduced into the interviewing schedule for later panels to allow more time to follow up on refusals.
- FRs are provided with talking points to explain SIPP and how it is used in policy decisions. The talking points target different segments of the population including: the elderly, the poor, the wealthy, and the middle-income groups.

Wave 2 and beyond

Keeping response rates high in longitudinal surveys is especially difficult, because units and persons who respond initially can be lost in later waves for various reasons. Steps taken in SIPP to minimize attrition after the initial wave include:

- A letter from the Census Director is sent to responding households in advance of each wave thanking them for their support and urging continued participation.
- Respondents are given a brochure containing some interesting results from the survey.

- Interviewers are instructed to call respondents and schedule interviews at times that are convenient for them.

- To assist in locating households that move, contact persons who would be likely to know the new locations are identified at the time of the first interview. Interviewers are instructed on how to trace movers by contacting new occupants of the housing unit, the Post Office, and other likely sources of information.

Success in completing interviews is an important factor in evaluating interviewer performance. The standards that have been established for household response rates, calculated on an annual basis, are shown in Section 4.4. The Census Bureau has continued to review these standards to ensure that they truly reflect the FRs' efforts in completing interviews with both movers and nonmovers.

5.2 Household nonresponse

Household or unit nonresponse occurs at the initial wave when all members of an eligible household refuse to participate in the survey or when no one can be contacted after repeated attempts. Except in the 1985 panel, there have been no attempts to contact wave 1 noninterview households in subsequent waves. When this was tried in the second wave of the 1985 panel, relatively few households were brought back into the sample and the processing of these households turned out to be difficult and resulted in delays in releasing data products, so the practice was discontinued (Jean and McArthur, 1987).

After wave 1, sampled households comprise those households that contain original sample persons. Household nonresponse from these households can occur for the same reasons as in wave 1. In addition, these households may be temporarily unavailable because a sample person has moved, and the household cannot be located, or because the household is located more than 100 miles from a SIPP sample PSU and cannot be interviewed by telephone. Whenever possible, a household that is not interviewed in the second or a subsequent wave is visited once more in the next wave to attempt an interview. If that attempt fails, there are no further attempts to interview the household in later waves.

Nonresponse rates

The calculation of response (or nonresponse) rates is complicated by the fact that the exact number of eligible households after the first wave is not known. Households interviewed in wave 1 may split up to form additional eligible households, or may leave the survey population entirely. When all members of an interviewed household move and cannot be located, they may account for zero, one, or two or more eligible households in subsequent waves. If all members of the household leave the survey population, there will be no eligible households. If they split up and move to different housing units, there can be two or more households.

The accuracy of reported response rates can also be affected by interviewer misclassification of noninterviews. If a noninterview household is incorrectly classified as not eligible for interview, it will be incorrectly excluded from both the numerator and denominator of the calculated nonresponse rate, and vice versa. Reinterview results for the years 1984 to 1987 show that only 3.5 percent of noninterviews were incorrectly classified, so the effect of such errors on reported response rates is minimal (Pennie, 1988).

Type A and Type D nonresponse

Table 5.1 shows household noninterview rates by panel and wave for the 1984-1993 SIPP panels for Type A and Type D noninterviews. Type A noninterviews occur when interviews are not obtained for known eligible households. Type D noninterviews occur when some or all members of a household leave and cannot be traced or move more than 100 miles from a SIPP PSU and cannot be interviewed by telephone. The rates shown are cumulative. The sample loss rates after wave 1 include an adjustment for unobserved growth resulting from splits of households that were Type A noninterviews in the first wave and later waves. Details of the calculation of the rates shown in Table 5.1 are given by Nelson et al. (1987). Total sample loss is highest at the first and second interviews, and most of the early losses are due to Type A nonresponse. The number of additional Type A noninterviews is quite small after the first four waves. Most households that have participated up to that point stick it out to the end. Losses due to moves (Type D noninterviews) continue at a fairly constant rate throughout the duration of each panel.

Rates from 1984-1993

Table 5.1 shows a consistent pattern in the wave nonresponse rates for SIPP panels (see Citro and Kalton, 1993, pp. 100-102). Between 1984 and 1990, the rate of loss is about 5-8 percent of eligible households at wave 1, an additional 4-6 percent of eligible households at wave 2, another 2-3 percent in each of waves 3-5, and less than 1 percent in each subsequent wave thereafter. For these panels, by wave 6 (after 2 years of interviewing), cumulative sample loss from SIPP is 18-20 percent of eligible households; by wave 8 it is 21-22 percent (Citro and Kalton, 1993). The 1992 and 1993 panels experienced higher household nonresponse. The loss rates were around 9 percent at wave 1, 22 percent at wave 6, and 25 percent at wave 8.

The causes for the increase in household nonresponse in recent panels is unknown. One suggestion from the FRs is that maximum telephone interviewing has an adverse effect on Type A noninterview rates. Investigations by King (1995) and James (1994) found no evidence to support this suggestion. However, Type D nonresponse rate was found to be high when telephone interviewing was used heavily.

It is relevant to note here that several other major demographic household surveys conducted by the Census Bureau also experienced an increase in Type A noninterview rates and refusal rates in the period 1990-1995 (Davey, 1996). The surveys investigated include: the CPS, the National Crime and Victimization Survey, National Health Interview Survey (NHIS), Consumer Expenditure (CE) Quarterly, and Consumer Expenditure (CE) Diary. Comparisons of the annual average Type A noninterview rate between 1990 and 1995 showed increases ranging from 1.4 percent for the NHIS to almost 13 percent for the CE Diary. The increases in the annual average refusal rates ranged from 1.4 percent to 4.1 percent.

Rates relative to other surveys

Because of important differences in survey content and design features, it is difficult and may possibly be misleading to compare the SIPP response experience with that of other longitudinal surveys, let alone cross-sectional surveys. Nelson et al. (1987) made a careful comparison of sample losses in SIPP, the Income Survey Development Program (ISDP), the National Longitudinal Surveys (NLS), the National Medical Care Utilization and Expenditure Survey, and the Panel Study of Income Dynamics (PSID). They concluded that: "In summary, SIPP sample losses appear to be comparable to those experienced by other longitudinal surveys. We see the same pattern repeated in all these surveys; that is, a heavy initial loss which increases at a much slower rate throughout the subsequent interviews until it levels off." (Nelson et al., 1987, p.636). Further information on nonresponse and other nonsampling errors in longitudinal surveys can be found in Kasprzyk et al. (1989).

Table 5.1 Household noninterview[1] and sample loss[2] rates: 1984-1993 panels[3]

	1984 Panel[3]			1985 Panel			1986 Panel			1987 Panel			1988 Panel		
Wave	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss
1	4.9	--	4.9	6.7	--	6.7	7.3	--	7.3	6.7	--	6.7	7.5	--	7.5
2	8.3	1.0	9.4	8.5	2.1	10.8	10.8	1.5	13.4	11.1	1.5	12.6	11.4	1.5	13.1
3	10.2	1.9	12.3	10.2	2.7	13.2	12.6	2.3	15.2	11.5	2.6	14.2	12.0	2.3	14.7
4	12.1	2.9	15.4	12.4	3.4	16.3	13.8	3.0	17.1	12.3	3.3	15.9	13.0	3.0	16.5
5	13.4	3.5	17.4	14.0	4.1	18.8	15.2	3.7	19.3	13.7	4.1	18.1	13.9	3.3	17.8
6	14.9	4.1	19.4	14.2	4.8	19.7	15.2	4.3	20.0	13.6	4.9	18.9	13.6	4.0	18.3
7	15.6	4.9	21.0	14.4	5.2	20.5	15.3	4.8	20.7	13.6	4.9	19.0			
8	15.8	5.7	22.0	14.4	5.5	20.8									
9	15.8	5.7	22.3												

	1989 Panel			1990 Panel			1991 Panel			1992 Panel			1993 Panel		
Wave	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss	Type A	Type D	Loss
1	7.6	--	7.6	7.3	--	7.3	8.4	--	8.4	9.3	--	9.3	8.9	--	8.9
2	11.0	1.4	12.5	10.9	1.5	12.6	12.3	1.5	13.9	12.8	1.7	14.6	12.3	1.7	14.2
3	11.2	2.3	13.8	11.5	2.6	14.4	13.1	2.7	16.1	13.1	2.8	16.4	12.9	2.8	16.0
4				12.5	3.4	16.5	13.6	3.6	17.7	13.8	3.6	18.0	13.9	3.5	17.9
5				13.6	4.6	18.8	14.5	4.2	19.3	14.9	4.7	20.3	14.9	4.4	19.9
6				14.1	5.3	20.2	14.4	5.1	20.3	15.3	5.4	21.6	15.9	5.5	22.2
7				14.3	5.9	21.1	14.7	5.6	21.0	16.0	5.9	23.0	17.1	6.2	24.0
8				14.4	5.9	21.3	14.5	5.9	21.4	16.9	6.7	24.7	17.5	6.9	25.1
9										17.7	7.3	26.2	18.1	7.5	26.5
10										17.5	7.6	26.7			

[1]Type A noninterviews consist of households occupied by persons eligible for interview and for whom a questionnaire would have been completed if an interview had been obtained. Reasons for Type A noninterview include: no one at home in spite of repeated visits, temporarily absent during the entire interview period, refusal, and unable to locate a sample unit. Type D noninterviews consist of households of original sample persons who are living at an unknown new address or at an address located more than 100 miles from a SIPP PSU, provided a telephone interview is not conducted.

[2]The sample loss rate consists of cumulative noninterview rates adjusted for unobserved growth in the Type A noninterview units (created by splits).

[3]Differences in rates for the 1984 panel compared to subsequent panels may be due in part to differences in the panel designs.

Source: Data for the 1984-1988 panels came from Kasprzyk (1988) and Bowie (1990).

Refusal

Most Type A noninterviews are the result of refusals. Refusals accounted for between 70 and 76 percent of wave noninterviews in the first four panels (Bowie, 1988b, p.8). Some data on reasons for refusals in the first six waves of the 1984 panel are given by Nelson et al. (1987). Only one reason for refusing was coded for each household even though multiple reasons may have been given. For wave 1, the most frequently cited reasons were:

Reason given	Percent of households that refused
Not interested in participating	18.7
No time, too busy	14.7
Invasion of privacy	9.9
Voluntary survey	9.3
Offended by income questions, too personal	9.1
Didn't believe information was confidential	3.4

Of those who refused in the second wave, 6.2 percent said they had not understood that the interviewer would be returning for another interview. In the third and later waves, about one-fourth of the refusers said that they did not want to answer any more questions.

Characteristics of nonresponding households

For obvious reasons, relatively little information is available about the characteristics of sample households that are not interviewed in wave 1 of a panel. It is possible, however, to compare the characteristics of households that are interviewed in the first wave and drop out later with the characteristics of households that continue to participate. The Census Bureau's SIPP Nonresponse Workgroup (1988) compared distributions based on first-wave characteristics of household reference persons for sample households interviewed in all of the first five waves of the 1984 panel and sample households interviewed in the first wave but not in the fifth wave (households in the second group may or may not have been interviewed in waves 2 to 4). Types of households more likely to be noninterviews in the fifth wave included those that were: occupied by renters, located in Standard Metropolitan Statistical Areas (SMSAs) with a population of 500,000 or more, or had reference persons in the age group 15 to 24. No statistically significant differences were observed for distributions of households by household monthly income, sex of the reference person, or receipt/nonreceipt of cash or noncash benefits.

Mack and Waite (1995) proposed a nonresponse follow-up study to obtain more information about wave 1 noninterviews. The plan was to mail a short questionnaire to all wave 1 nonrespondents to obtain basic information about household membership, income, and program participation. The objective is to use the information to refine the noninterview adjustments to the sampling weight. This proposal was implemented for the 1996 panel and results are forthcoming.

5.3 Person nonresponse

Person nonresponse occurs when a member of an interviewed household refuses to participate or is unavailable for interview and a proxy interview is not obtained. Original sample persons can miss any number of waves and still reenter the sample as long as their households have not missed two or more consecutive interviews in the interim. Most analyses of person nonresponse subsequent to wave 1 include all persons not interviewed in each wave, whether or not other members of their household were interviewed in that wave.

As discussed at length in Section 8, the presence of person nonresponse in interviewed households makes it difficult to decide what combinations of imputation and estimation procedures are best suited for undertaking various kinds of longitudinal analyses with SIPP data.

Nonresponse pattern

Table 5.2 (from Lepkowski et al., 1989) shows the person response patterns for the eight interviews in the 1984 panel. Panel members are original sample persons who responded for all eight interviews for which they were eligible (i.e., for which they were in the SIPP universe). Nonpanel members are original sample persons who failed to respond to one or more interviews when they were eligible. Total nonrespondents are those who did not respond to any of the eight interviews. Table 5.2 shows that 70.4 percent of the SIPP sample were interviewed in all interviews in which they were eligible. Persons who were interviewed for one or more consecutive interviews and then dropped out for all of the remaining interviews, known as attrition cases, accounted for 14 percent. Persons with other response patterns, who might be called “in and outers,” accounted for 7.2 percent.

Table 5.3 shows the nonresponse patterns for panel and nonpanel members from waves 1 through 7 of the 1985, 1986, 1987, and the 1991 panels. This table does not include an estimate for total nonrespondents. Therefore, the percentages are not directly comparable to Table 5.2. Table 5.3 shows that about 76 to 80 percent of the SIPP sample who responded in wave 1 continued to respond to all seven waves in which they are eligible. Persons who were interviewed for wave 1, or more consecutive interviews, and then attrite from all remaining interviews accounted for about 13-16 percent. Persons with other nonattrition patterns accounted for about 6-7 percent. About half of the persons who were Type Z nonrespondents at wave 1 failed to respond at any of the seven waves. Type Z nonrespondents are members of otherwise cooperating households for whom no information is obtained, either in person or by proxy.

Movers

Not surprisingly, person nonresponse is higher for persons who move than for those who are residents of the same housing unit for the duration of the panel. Table 5.4 compares person nonresponse for movers and nonmovers in waves 1 to 5 of the 1984 panel, for rotation groups 1, 2, and 3. About one-fifth of the original sample persons moved at least once between waves 1 and 5. One or more interviews were missed for about one-third of the movers, as compared with less than one-fifth of the nonmovers (Jean and McArthur, 1987). For the 1991 panel, Mack et al., 1995 also found that that at wave 8, the nonresponse rate for movers was 22.5 percent, a rate that doubled the rate of 10.3 percent for nonmovers.

Table 5.2 Person response (1) or nonresponse (0) patterns for the eight interviews in the 1984 SIPP panel research file

Person response pattern	Percent
Panel members	**70.4**
Responded to all 8 interviews	67.0
Responded to all Interviews prior to death	1.5
Responded to all Interviews except when:	
in an institution	0.7
in the Armed Forces	0.4
abroad	0.6
Other panel members	0.2
Nonpanel members	**24.8**
Attrition nonresponse patterns:	14.0
11111110	1.4
11111100	1.2
11111000	1.5
11110000	2.0
11100000	2.2
11000000	2.6
10000000	3.1
In and Outers:	7.2
Other patterns with only one missing interview	4.3
Other patterns with two or more missing interviews	2.9
Nonpanel members with missing interviews who were known to have died, become institutionalized, entered the Armed Forces, or moved abroad	0.3
Nonpanel members with missing interviews who left for other reasons	3.3
Total nonrespondents[1]	**4.9**
Total	**100.0**
Total number of sample persons	35,027

[1]Estimated -- the number of total nonrespondents is not known; all that is available is the number of total nonresponding households, from which the number of persons has been crudely estimated by multiplying the average number of sample persons in responding households by the number of nonresponding households.

Source: Lepkowski et al. (1989).

Table 5.3 Nonresponse patterns for panel and nonpanel members in waves 1-7 of the 1985-87 and 1991 panels

Pattern group	1985 Panel Percent	1986 Panel Percent	1987 Panel Percent	1991 Panel Percent
Panel members	**76.1**	**77.5**	**79.5**	**77.0**
A. Responded on all 7 waves	73.7	74.7	76.9	73.8
B. Ineligible on some waves:	2.4	2.8	2.6	3.2
Died	*1.0*	*1.1*	*1.2*	*1.4*
Entered institution	*0.5*	*0.6*	*0.5*	*0.8*
Entered Armed Forces barracks	*0.3*	*0.3*	*02*	*0.2*
Moved abroad	*0.6*	*0.7*	*0.7*	*0.8*
Reason ineligible not listed	*0.0*	*0.0*	*0.0*	*0.0*
Nonpanel members	**23.9**	**22.5**	**20.5**	**23.0**
C. Eligibility for all 7 waves	23.6	22.3	20.3	22.7
1. Attrition nonresponse only at :	15.8	14.4	12.6	13.3
Wave 2	*5.1*	*5.0*	*4.7*	*4.6*
Wave 3	*3.4*	*2.9*	*2.3*	*2.5*
Wave 4	*2.8*	*2.1*	*1.9*	*1.8*
Wave 5	*1.8*	*2.0*	*1.6*	*1.4*
Wave 6	*1.3*	*1.1*	*1.1*	*1.2*
Wave 7	*1.4*	*1.3*	*1.1*	*1.8*
2. Nonattrition nonresponse only:	5.7	5.7	5.6	6.8
1 wave	*4.5*	*4.6*	*4.3*	*5.2*
2 waves	*0.9*	*0.9*	*1.0*	*1.1*
3-5 waves	*0.3*	*0.2*	*0.3*	*0.5*
3. Nonattrition and attrition nonresponse:	1.3	1.3	1.2	1.4
At least one wave of each	*1.3*	*1.3*	*1.2*	*1.4*
4. Type Z noninterview at wave 1:	0.8	0.8	0.9	1.2
Noninterview all waves	*0.4*	*0.4*	*0.4*	*0.6*
Interviewed at least one wave	*0.4*	*0.4*	*0.4*	*0.6*
D. Some ineligibility	0.3	0.3	0.2	0.3
Total	**100.0**	**100.0**	**100.0**	**100.0**
Number of sample members	30,605	23,157	30,769	28,184

Table 5.4 Response status for movers and nonmovers in waves 1 to 5: 1984 panel[1]

Response status	Total		Movers		Nonmovers	
	Number	Percent	Number	Percent	Number	Percent
Five interviews	19,878	79.1	3,485	68.8	16,393	81.7
Missing at least interview 5	4,222	16.8	1,148	22.6	3,074	15.3
All other	1,038	4.1	436	8.6	602	3.0
Total	25,138	100.0	5,069	100.0	20,069	100.0

[1]Persons 15+ in rotation Groups 1, 2, and 3.

Source: Jean and McArthur (1987).

The higher nonresponse rates among movers is a concern because the SIPP sample shows relatively high mobility. Waite (1995a) reported that over 25 percent of households with three or more persons would have at least one person moving out of their households in a 4-month period. On average, 41 percent of the new noninterview cases reported in each wave of the 1992 panel are unlocated movers. Furthermore, in wave 8 of the 1991 panel, the noninterview rate for movers in poverty was twice the rate for persons not in poverty. In contrast, nonresponse due to refusals was higher for persons not in poverty than for persons in poverty.

Characteristics of nonrespondents

A study by McArthur (1987), based on all 9 waves of the 1984 panel, compared the characteristics of persons for whom all interviews were completed with the characteristics of persons for whom there were one or more noninterviews. Table 5.5 shows selected results from this study, and corresponding data from the waves 1-7 of the 1992 panel. The characteristics of persons with higher than average person nonresponse are similar in both panels. They are: residence in rented housing units, members of racial minorities, children and other relatives of the reference person, aged 15 to 24, never married, and had no savings account or other assets. Higher nonresponse rate are also common among residence in large SMSAs.

5.4 Item nonresponse

Item nonresponse occurs when a respondent refuses or is unable to answer a question. It can also occur when a FR fails to ask a question that should have been asked or asks the question but fails to record the answer. Missing data for an item can also be the result of a data entry clerk failing to key the answer to a question, or an answer being deleted in editing because it is inconsistent with answers to other items.

Table 5.5 Selected characteristics of original sample persons by their interview experience for the full 1984 panel and for the first 7 waves of the 1992 panel

Characteristics of persons in wave 1	1984 Interview experience (% distribution)				1992 Interview experience (% distribution)			
	Completed all	Missed last 2	Other[1]		Completed all	Missed last 2	Other[1]	
			Missed 1	Missed 2+			Missed 1	Missed 2+
Relationship:								
Ref. persons	37.3	33.1	33.9	30.7	36.3	31.3	30.5	31.2
Primary ind.	12.7	14.7	13.4	12.0	13.9	18.0	15.4	17.9
Spouse	31.3	23.9	25.4	23.9	29.4	21.3	22.4	21.0
Child	13.9	17.9	18.4	24.1	14.2	14.4	17.8	14.8
All other	4.8	10.3	9.0	9.4	6.3	15.0	13.9	15.1
Age:								
15-24	18.2	24.2	25.3	29.5	16.3	23.4	25.5	23.8
25-34	22.1	21.4	22.6	22.9	21.1	23.3	25.3	23.4
35-44	17.3	14.4	17.0	14.9	21.1	16.2	16.4	16.1
45-64	27.0	23.2	21.5	23.2	26.0	19.9	18.0	19.8
65+	15.4	16.8	13.6	9.5	15.4	17.2	14.9	16.9
Race:								
White	88.5	83.8	82.9	78.2	87.0	80.9	78.9	80.8
Black	9.2	12.9	13.9	17.6	9.6	14.5	15.6	14.6
Other	2.3	3.3	3.2	4.2	3.5	4.6	5.6	4.6
Living quarters:								
Owned	72.7	62.9	65.6	59.8	71.9	55.6	57.8	55.2
Rented	24.8	35.1	32.1	37.3	25.9	41.6	39.1	42.1
Rent free	2.4	2.0	2.3	2.8	2.3	2.8	3.1	2.8
Marital status:								
Never married	20.8	28.8	28.3	33.6	23.4	33.0	32.8	33.5
Married	63.5	52.2	53.3	50.4	59.9	46.9	47.9	46.6
Other	15.8	18.9	18.5	15.9	16.7	20.0	19.3	19.9
Savings account:								
Yes	59.9	51.1	51.9	51.0	55.0	42.8	43.3	42.5
No	40.1	48.9	48.1	49.0	45.0	57.1	56.7	57.5

[1]Interview experience categories are mutually exclusive. At least one of the last two interviews was completed for persons in the other category.

Source: Data for the 1984 panel was adapted from McArthur (1987).

Item nonresponse can be analyzed either on a cross-sectional or a longitudinal basis. Cross-sectional item nonresponse refers to missing data items for persons interviewed in a single wave. Longitudinal item refers to data items common to two or more waves of interviewing: there is said to be longitudinal item nonresponse for such an item if the person was interviewed in all the relevant waves and data are missing for one or more of those waves. This section examines the extent of item nonresponse in SIPP and how it compares with other surveys. The methods used to compensate for cross-sectional and longitudinal item nonresponse are discussed in Chapter 8.

Core items

Table 5.6 shows the item nonresponse rates for selected core items in three categories: labor force activity; income recipiency or asset ownership; and income amounts for five panels between 1984 and 1993. The rates for the first two categories are quite low and do not show much change over the panels. Nonresponse rates for income amounts, especially self-employment income, and interest and dividends, are substantially higher, indicating that respondents who report income recipiency or asset ownership are not always able or willing to report amounts. For interest, as shown by the rates in parentheses for the 1984-1986 panels, the majority of respondents who did not report amounts of interest were willing to report the balances in their interest-bearing accounts, thus providing a reasonable basis for imputation of the amounts of interest. For dividends, separate questions are asked for dividends paid directly to shareholders and those credited to reinvestment or margin accounts (shown in parenthesis). Nonresponse rates are considerably higher for the latter category.

Table 5.7 shows longitudinal nonresponse rates for selected income amounts based on 12 months and 32 months of data from the 1984 panels. For income types appearing in both Tables 5.6 and 5.7 the overall nonresponse rates are lower in Table 5.6. For example, Food Stamps had an average cross-sectional nonresponse rate of 3.6 percent in the 1984 panel as compared with a longitudinal nonresponse rate of 8.1 percent for the first 12 months of that panel, and 7.2 percent for all 32 months of the panel. The 32-month estimate appears lower because it included only panel members who completed all 8 waves of the survey. Table 5.7 also shows that only 1.9 percent of Food Stamp recipients had no Food Stamps amounts reported for any of the 12 months, and 3.0 percent had no amounts reported for any of 32 months. Thus, for many Food Stamp recipients with some missing values for Food Stamp benefit amounts, it would be possible to impute these values based on data for other months.

Items on asset amounts

The highest item nonresponse rates experienced in SIPP have been for questions on asset amounts. Table 5.8 shows nonresponse rates for selected asset amounts collected in waves 3 and 4 of the 1984 SIPP panel, wave 4 of the 1986 panel and, for comparative purposes, from the Income Survey Development Program (ISDP). SIPP nonresponse rates for these items range from 13 to 42 percent, lower than the corresponding rates in the ISDP, but still much higher than rates for most other types of questions. Curtin, et al., 1989 have compared item nonresponse for questions on asset ownership and amounts in SIPP (data for waves 3 and 4 of the 1984 panel), the Panel Study of Income Dynamics (1984 Wealth Supplement), and the 1983 Survey of Consumer Finances (SCF). Nonresponse on the ownership questions is low for all types of assets in all three surveys. For the asset categories included in all three surveys, item nonresponse rates for questions on amounts were, without exception, higher for SIPP than for either of the other two surveys.

Table 5.6 Nonresponse rates for selected SIPP core items by panel

Question	1984	1985	1986	1992[3]	1993[3]
Labor force activity:					
Identification of weeks absent without pay (item 4)	0.1	(Z)	0.1	0.3	0.2
Identification of weeks with a job or business (item 6a)	2.2	2.0	2.5	0.2	0.1
Presence of weeks looking or on layoff (item 7a)	1.0	1.3	2.0	0.1	0.1
Identification of weeks looking or on layoff (item 7b)	3.2	2.4	2.9	0.2	0.1
Income recipiency or asset ownership:					
Social Security	0.6	0.6	1.0	0.1	0.1
Unemployment compensation	0.1	0.1	0.2	0.2	0.1
Food Stamps	0.3	0.4	0.5	0.6	0.6
Savings accounts	1.0	0.9	0.9	0.8	1.0
Shares of stock	1.3	1.4	1.5	1.3	1.5
Income amounts:					
Hourly wage rate	9.5	10.4	10.8	7.2	7.7
Monthly wage and salary	6.2	7.2	8.4	4.0	4.2
Self-employment salary or draw	14.0	16.9	14.6	12.4	13.5
Social Security	8.8	9.5	10.0	14.0	14.7
Unemployment compensation	9.1	9.7	9.9	9.2	10.7
Food Stamps	3.6	4.1	4.4	6.4	5.4
Interest[1]	34.6(24.2)	29.8(28.9)	30.8(30.2)	10.3	10.2
Dividends[2]	9.4(30.7)	10.5(30.5)	9.4(29.1)	7.5	7.6

Z = Less than .05 percent.

[1]Figure in parentheses is the nonresponse rate on balance in the account. This question was asked on the 34.6 percent that did not provide an estimate of the amount of interest received.

[2]The figure in parentheses is the nonresponse rate for dividends credited to accounts.

[3]The rates shown for labor force activity items in 1992 and 1993 refer to wave 1 only.

Source: Rates for panel 1984-86 adapted from Bowie (1986).

Table 5.7 Longitudinal item nonresponse rates for amounts of selected income types: 1984 SIPP panel 12-month summary[1] and 32-month average[2]

Income type	All amounts reported	One or more amounts not reported	One or more but not all amounts not reported	No amounts reported
12 months				
Hourly wage rate	83.0	17.0	9.0	8.0
Social Security	82.8	17.2	13.1	4.1
Private pension	78.8	21.8	13.6	8.2
AFDC	91.0	9.0	5.6	3.4
Food Stamps	91.9	8.1	6.2	1.9
Unemployment compensation	87.9	12.1	4.0	8.0
Federal SSI	88.0	12.0	7.6	4.4
32 months				
Social Security	87.7	12.4	8.6	3.8
AFDC	92.1	7.9	4.8	3.1
Food Stamps	92.7	7.2	4.2	3.0
Unemployment compensation	86.6	13.4	4.5	8.9
Federal SSI	90.2	9.8	4.3	5.5

[1]These rates are based on the total number of persons with recipiency in one or more of the 12 months. Also these rates do not reflect imputations made to type Z person noninterviews.

[2]These rates are rates of missing data based on panel members included in the 1984 SIPP longitudinal file. The rates include imputations due to item nonresponse only. Type Z imputations are not included. Data is adapted from Pennell (1993), Table 4.3).

Source: Data for the 12-month summary was adapted from Kasprzyk and Herriot (1986) and data for the 32-month summary was adapted from Pennell (1993), Table 4-3.

Table 5.8 Item nonresponse rates for asset amounts in SIPP and the ISDP

Asset type	Percent nonresponse		
	SIPP		ISDP
	1984 waves 3 and 4	1986 wave 4	
Amount in savings accounts	16.8	22.8	24.9
Amount in checking accounts	13.3	21.2	23.1
Amount in bonds and government securities	25.9	23.1	32.2
Market value of stocks and mutual fund shares	41.5	36.9	65.8
Debt on stocks and mutual fund shares	41.1	38.6	87.3
Face value of U.S. Savings Bonds	24.9	24.9	35.8
Value of rental property	33.5	31.3	39.9
Value on own business	37.9	41.8	55.3
Debt on own business	28.8	31.5	50.4

Sources: Data from ISDP and SIPP 1984 Panel from U.S. Bureau of the Census (1986c).
Data from SIPP 1986 Panel from unpublished tabulations.

Topical modules

Turning to item nonresponse for the topical modules, we note first that there are some interviewed persons who do not provide any data, either directly or through a proxy respondent, for a topical module for which they are eligible. As shown in Table 5.9 for the 1984-1993 panels, complete nonresponse to topical modules ranges from about 3.0 to 9.0 percent. There is a tendency for this to increase moderately over the life of a panel. Topics covered in later waves of a panel are doubly disadvantaged: a smaller proportion of households and persons are interviewed, and of those who are interviewed, a slightly higher proportion are nonrespondents to the topical modules. By wave 8 of the 1993 panel, the topical module nonresponse rate for the school enrollment and financing module is 9.3 percent.

Item nonresponse rate in SIPP compares favorably to CPS

A question of considerable interest to users of SIPP income data is how the quality of those data compare with the quality of income data from the annual Current Population Survey (CPS) March Income Supplement. This is not an easy question to answer. A full analysis requires consideration of all sources of error that affect SIPP and CPS estimates, as well as differences in coverage and definitions between the two surveys.

Table 5.9 Person nonresponse rates for topical modules

Panel	Wave	Percent of persons with no topical module data	Type of module	
1984	4	3.3	Fixed:	Assets and liabilities
			Variable:	Retirement and pensions, housing, energy
	5	3.1	Variable:	Child care and support, welfare history, working, reservation wage
	6	4.2	Fixed:	Annual income, taxes, employee benefits, education
			Variable:	Training (ETA)
	8	4.5	Fixed:	Marital, fertility and migration history
			Variable:	Household relationships, work expense, support of persons not in household
	9	5.0	Fixed:	Annual income, taxes, IRAs, education
1985	3	2.8	Fixed:	Assets and liabilities
1990	2	5.0	Fixed:	Education and work training history
	5	6.6	Fixed:	Education financing
1991	2	5.0	Fixed:	Education and training history
	5	6.0	Fixed:	Education financing
	6	4.0	Variable:	Extended measure of well-being
	8	6.5	Fixed:	School enrollment and financing
1992	2	4.0	Fixed:	Education and work
1993	8	9.3	Fixed:	School enrollment and financing

Source: Bowie (1986, 1988a).

Looking only at item nonresponse rates for income amounts, SIPP has a clear advantage, as shown in Tables 5.10 and 5.11. Moreover, the SIPP sample persons who do not respond to particular income items are not necessarily the same ones in each quarter (see Table 5.7), so in many instances of item nonresponse, part-year data will be available for use in imputing missing values. In the March 1985 CPS, 5.2 percent of eligible households were not interviewed. In the interviewed households, data for the income supplement either were not obtained or could not be tabulated because of matching failures for 9.4 percent of the eligible persons. Combining these two rates indicates that the item nonresponse rates shown in Tables 5.10 and 5.11 for CPS apply to an interviewed population already subject to a 14.1 percent overall person nonresponse rate.

Table 5.10 Item nonresponse rates[1] for income amounts in the 1984 SIPP panel and March 1985 CPS, for selected income types

Income type	SIPP 1st quarter 1984 monthly average	SIPP 2nd quarter 1984 monthly average	SIPP 3rd quarter 1984 monthly average	SIPP 4th quarter 1984 monthly average	CPS March 1985
Wage and salary	7.2	7.5	7.5	7.6	18.9
Self-employment income	16.8	16.2	16.0	16.1	26.5
Supplemental security income (Federal)	7.6	8.4	8.1	8.4	19.9
Social Security	10.8	11.6	11.7	12.3	21.9
AFDC	6.1	6.9	6.5	5.5	16.0
Unemployment compensation	10.1	13.6	10.4	12.7	21.8
Company or union pension	13.9	14.0	12.8	14.7	24.0
Food Stamp allotment	5.2	6.3	6.7	6.6	13.7
Veteran's compensation or pension	11.3	11.2	11.9	13.5	18.3

[1]Noninterviews or complete failure to obtain cooperation from any household member have not been considered in this examination of nonresponse rates.

Source: U.S. Bureau of the Census (1985), Report Numbers 3,4,5, and 6, Appendix D.

Comparable rates for SIPP are more difficult to determine. They increase somewhat each quarter because of additional sample loss at each successive wave. Table 5.1 discussed in Section 5.2 shows that 4.9 percent of eligible households were not interviewed in wave 1 of the 1984 panel. McArthur (1987) shows that of sample persons 15 and over who were interviewed in wave 1, the percents not interviewed in the next 3 waves were:

Wave 2	5.6 percent
Wave 3	10.3 percent
Wave 4	14.1 percent

Overall, the comparison favors SIPP, but the advantage of SIPP over the CPS March income supplement in terms of total nonresponse would be considerably smaller in the second calendar year covered by a panel.

5.5 Methodological research and experimentation

This section describes Census Bureau research and experimentation aimed at reducing nonresponse in SIPP and using supplemental data collection procedures to enhance survey content and to compensate for missing data in regular interviews.

5.5.1 The gift experiment

The purpose of the gift experiment was to determine whether giving an inexpensive gift to households at their first interview would reduce household nonresponse. All households in rotation group 4 of the 1987 panel were given an inexpensive solar-powered calculator immediately following the interviewer's introductory statement in the first interview, conducted in April 1987. No obligation to participate, either in the initial interview or subsequent ones, was associated with the gift.

The other three rotation groups of the 1987 panel did not receive gifts and served as the control group for the experiment. In the analysis it was necessary to consider possible seasonal effects on the outcome measures; the experimental rotation group had its first interviews in April and the three rotation groups used as the control had their first interviews in February, March, and May.

The main analysis of the experiment compared cumulative Type A noninterview rates (defined earlier in this section) for the experimental and control groups. The results for the first three waves of the 1987 panel were inconclusive. Cumulative noninterview rates were significantly lower (significance level = .10) in the experimental group at each wave, but comparisons with the 1985 and 1986 panels indicated that the differences might have been at least partly due to seasonal trends in response rates.

Table 5.11 Item nonresponse rates[1] for income amounts in the 1985 SIPP panel and March 1985 CPS, for selected income types

Income type	SIPP 1st quarter 1985 monthly average	SIPP 2nd quarter 1985 monthly average	SIPP 3rd quarter 1985 monthly average	SIPP 4th quarter 1985 monthly average	CPS March 1986
Wage and salary	7.8	6.7	8.5	8.3	16.5
Self-employment income	17.0	9.3	19.4	17.6	21.9
Supplemental security income (Federal)	8.5	8.7	8.0	8.5	16.5
Social Security	13.0	12.5	12.7	13.2	19.3
AFDC	8.9	8.1	8.5	8.5	14.4
Unemployment compensation	15.0	15.6	14.9	16.0	18.6
Company or union pension	17.0	16.1	16.2	16.5	21.0
Food Stamp allotment	7.1	5.9	6.3	6.6	11.1
Veteran's compensation or pension	13.1	13.4	13.2	16.2	18.8

[1]Noninterviews or complete failure to obtain cooperation from any household member have not been considered in this examination of nonresponse rates.

Because the effectiveness of a procedure can depend in part on interviewers reactions to it, interviewers in the experimental group were asked to complete a self-administered evaluation form after the interview in which the gift was given. Their reactions were mixed: although about one-third of them thought that giving a gift to participating households was a good idea, only 12 percent believed that giving it helped to gain cooperation. Some interviewers felt that they were "buying the interviews" and that the survey was becoming "too commercial."

Further details on the experimental procedures and results of the gift experiment are given by the Gift Experiment Workgroup, 1988, Petroni et al. (1989), and Butler (1991). The outcome is that the gift of a calculator resulted in a 2 percent increase in final response rates compared to the control (no gift group). Since this gain is small, the idea of a gift was not adopted.

Mack and Waite (1995) reviewed a number of recent incentive studies which found that incentives increased response rates and reduced the number of callbacks to contact sample persons. Mack and Waite discussed plans to conduct a new incentive test during wave 1 of the 1996 panel to test three treatment conditions: a control group that received no incentive, and two treatment groups receiving cash gifts of $10 or $20. This incentive study was used on the 1996 panel, the results of which are forthcoming.

5.5.2 A missing wave module

In a longitudinal survey like SIPP, if a sample person is not interviewed in one or more waves, it is possible to try to collect the missing information in subsequent waves. This possibility was tested in the 1984, 1985 and 1986 panels. Starting with wave 4 of the 1984 panel, a missing wave module was added to the questionnaire and was administered, following the core and topical module sections, to persons who had missed the preceding wave but had been interviewed in the wave prior to that one. The missing wave module contained an abbreviated set of questions on labor force status, receipt of income and assets, and program participation for the reference period covered by the preceding wave.

A study of the missing wave data collected in wave 9 of the 1984 panel was undertaken to evaluate the potential utility of the data for imputation and noninterview adjustment. The main criteria selected for evaluation were item nonresponse rates, completion rates, and reporting of transitions. A transition was defined as a change in recipiency status that occurred during the reference period covered by the missing wave questions.

It was found that interviewers succeeded in collecting at least some missing wave information for 94 percent of eligible persons. However, the number of transitions reported was much smaller than predicted and it was concluded that the additional information obtained did not justify the respondent burden and cost of collection, because other methods of compensating for the missing data, such as imputation by direct substitution, are likely to be equally effective. Consequently, the missing wave module was dropped from the SIPP questionnaire midway through the 1986 panel. Additional information on the evaluation study is provided by Huggins (1987); Kasprzyk (1988); and Petroni et al. (1989).

5.5.3 The employer-provided benefits study

For some kinds of data about sample persons, the person may not be the best source of information. In several household surveys, information collected directly from respondents has been supplemented by data obtained, with respondents' permission, from record sources such as health care providers, utility companies, and government agencies. In SIPP, it was felt that information on the economic well-being of employed sample persons might

be enhanced by contacting their employers to obtain information on employee and employer contributions to their health insurance, pension, and life insurance plans.

Procedures for obtaining such information from employers were tested for a probability sample of 500 households taken from one rotation group of the 1985 panel. At the time of the final interview for this rotation group, in August 1987, employed persons in the sample household were shown the questionnaire that would be sent to their employers and, if they gave permission, were asked to provide employer addresses and names of contact persons at their places of employment. When permission was given, the authorized questionnaires were sent to the employers.

For SIPP interviews conducted by telephone or with a proxy respondent, the interviewer mailed or left the employer questionnaire/authorization form, along with a letter of explanation and an envelope to mail the form to the Census Bureau. There was no follow-up when these forms were not returned. Follow-up on the forms that were sent to employers was conducted first by letter and subsequently by telephone.

This procedure carried the possibility of two new kinds of nonresponse, beyond those normally encountered in SIPP. First, sample persons might decline to authorize the Census Bureau to obtain information about them from their employers. Second, employers might fail to complete and return the questionnaires. Somewhat unexpectedly, the first of these sources accounted for most of the total nonresponse. Authorizations were obtained from 596 (44.1 percent) of the 1,352 employed persons in the study sample. Of the 596 forms mailed to employers, 549 (92.1 percent) were mailed back. Thus, the overall response rate for eligible persons was 40.6 percent. Overall response rates for self-respondents to personal interviews were moderately higher than they were for sample persons interviewed by telephone or through a proxy respondent.

The high response rate by employers was encouraging and it is believed that with some additional effort the rate of authorization by eligible sample persons to contact their employers can be increased. Additional information about the employer-provided benefits study is given by Kasprzyk (1988), Singh (1988b), Petroni et al. (1989), and Haber (1989). This research, however, was discontinued in the 1990s.

5.5.4 Recent nonresponse research

Mack and Waite (1995) summarize the recent nonresponse research plans for the SIPP. Research on SIPP nonresponse has become increasingly important because the changes to the 1996 panel are likely to give rise to higher nonresponse rates by the end of the panel. Beginning with the 1996 panel, SIPP is extending the panel length to a total of 12 waves. The Census Bureau has conducted several studies to reduce nonresponse, measure nonresponse bias, and to improve nonresponse adjustment methodology. This section discusses studies aimed at improving the data collection efforts. Chapter 8 discusses the methods for nonresponse adjustments.

Suggestions from FRs

One project was to gather information from field representatives (FRs) and supervisory field representatives (SFRs) about effective methods for obtaining interviews, finding movers, and converting refusals. FRs and SFRs who maintained high response rates were asked to report methods they used to find movers and convert refusals (see Allen, 1994 for a discussion of the Mover Questionnaire). The Census Bureau used the results of these studies to provide insights on how to improve training materials and data collection procedures. The improvements were included in the interviewer training for the 1996 panel.

Informing respondents about SIPP

Another project was conducted to assess the procedures used to inform respondents and interviewers about the importance of the survey. The regional offices have suggested the need to publicize the value of the SIPP to the Nation and local communities. The purpose is to motivate respondents and FRs by informing them of the importance of the SIPP. This project examined the current practices of publicizing the SIPP and that of other surveys conducted by the Census Bureau. A document has been prepared with talking points about the SIPP aimed at informing sample households about why it is important that they respond.