ATTRITION BIAS IN PANEL ESTIMATES OF THE CHARACTERISTICS OF PROGRAM BENEFICIARIES

John L. Czajka
James Mabli
Karen Cunnyngham

Mathematica Policy Research, Inc.
600 Maryland Ave., SW, Suite 550
Washington, DC 20024
jczajka@mathematica-mpr.com
jmabli@mathematica-mpr.com
kcunnyngham@mathematica-mpr.com

1.0 Introduction

Attrition is a fact of life in panel surveys, but attrition presents a more serious problem in some panel surveys than others. The Census Bureau's inability to reduce attrition to an acceptable level was cited as the leading factor in the agency's decision to phase out the Survey of Income and Program Participation (SIPP) and replace it with a new data collection system (U.S. Census Bureau 2006). While the Census Bureau subsequently reversed its decision to collect no additional SIPP data after September 2006, lower attrition rates have been defined as a means of achieving the goal of improved accuracy in the reengineering of SIPP (Johnson 2007).

With each successive interview, fewer members of an initial SIPP panel respond. Excluding those who have left the SIPP universe, this attrition of panel members may make the sample less representative of the survivors of the population from which the initial sample was selected. There is ample evidence from numerous studies over the years that people who attrite from panel surveys—including the SIPP—are different from people who continue to respond. However, SIPP sample weights—both cross-sectional and longitudinal—incorporate rather substantial adjustments designed to reduce the bias that may result from attrition. This study looks at the effectiveness of the adjustments that are included in the Census Bureau's weights and whether any refinement of these adjustments could be beneficial to applications of SIPP panel data by the Social Security Administration (SSA).

2.0 Attrition in the SIPP

We can measure the magnitude of attrition over the full length of a SIPP panel in different ways, depending on whether our perspective is longitudinal or cross-sectional. We focus on the longitudinal weights—specifically, the full panel weight that is assigned to panel members who responded to all interviews for which they remained in the survey universe. To qualify for a full panel weight, a sample member must be present in the common month of the first wave (January 2001 for the 2001 panel) and have data for all subsequent months through the final reference month of the last wave unless the sample member left the survey universe. Sample members who leave the SIPP universe can qualify for full panel weights if they have data for all months for which they remained in the survey universe. (In effect, the absence of reported information for a sample member who is no longer in the survey universe is still "data.") Sample members can complete the final interview of a SIPP panel without qualifying for full panel weights, owing to missed interviews along the way. By completing the final interview, or any given interview, they qualify for cross-sectional weights for the reference period covered by that interview. The proportion of SIPP panel members qualifying for cross-sectional weights for both the initial wave and final wave is considerably higher than the proportion qualifying for full panel weights.

Table 1 presents unweighted sample counts and unweighted proportions of wave 1 sample members retained through the end of the 1996 and 2001 SIPP panels, as well as the weighted estimates, based on alternative definitions of retention. The weighted proportions differ little from the unweighted proportions, so we focus on the unweighted estimates.

For the 9-wave 2001 panel, 64.4 percent of the wave 1 respondents present in January 2001 qualified for full panel weights, implying an attrition rate of 35.6 percent. For the 12-wave 1996 panel, 58.3 percent of the wave 1 respondents qualified for a

full panel weight. For comparability, we applied a 9-wave panel definition to the 1996 panel and found that 63.7 percent would appear to have qualified for a 9-wave full panel weight. This is not a perfect proxy for retention in a 9-wave panel because the Census Bureau does not assign a full panel weight to everyone who would appear to qualify, so we applied the same definition to the 2001 panel and found that 64.8 percent satisfied these marginally broader criteria. By this measure, sample retention was somewhat higher (attrition was somewhat lower) in the 2001 panel than the 1996 panel.

By a less restrictive measure of sample retention, 72.5 percent of the 1996 panel and 78.5 percent of the 2001 panel was interviewed in both the first and ninth waves, implying attrition rates of 27.5 versus 21.5 percent. The markedly lower attrition in the 2001 panel is due to a survey operational change initiated with the 2001 panel. Previously, interviews were not attempted with sample members who missed two consecutive waves (or three, depending on the reason). Beginning with the 2001 panel, sample members were no longer dropped from the active sample if they missed consecutive interviews. While this change in practice had no impact on the proportion qualifying for full panel weights, it had a pronounced impact on the proportion of the original sample that was interviewed in the final (ninth) wave. If we include sample members who missed the wave 9 interview but responded to the wave 8 interview—and, therefore, would not have been counted as attriters even in the 1996 panel—the retention rate rises (and the attrition rate declines) by two percentage points in each panel.

3.0 Attrition among Social Security Beneficiaries

Attrition rates for social security beneficiaries other than SSI recipients are markedly lower than those for the total population. This is due primarily to their older age distribution. Only 24.4 percent of the social security retired workers in the wave 1 sample of the 2001 SIPP panel failed to qualify for full panel weights, and only 14.3 percent did not complete wave 9 (Table 2).[1] If we were to impute the bounded missing waves for those who completed waves 1 and 9 but failed to qualify for full panel weights, we would reduce the proportion who failed to qualify for full panel weights to 17.7 percent.[2] Attrition rates are somewhat higher for disabled workers (ranging from 18.4 percent to 27.9 percent) and all other social security beneficiaries (16.8 percent to 27.3 percent). For SSI recipients, the attrition rates range from 20.9 percent to 33.7 percent, which is very close to the total population. Among persons who were 65 and older in January 2001, however, there is little difference across the beneficiary subpopulations and the total population—especially after imputation of missing waves.

Elderly sample members were less likely to qualify for full panel weights in the 1996 panel than the 2001 panel (Table 2). Therefore, attrition rates based on the assignment of full panel weights were a few percentage points higher for social security beneficiaries in the 1996 panel than the 2001 panel. For example, 28.8 percent of retired workers failed to qualify for full panel weights in the 1996 panel compared to 24.4 percent in the 2001 panel. The difference between the two panels is even more pronounced when we compare the proportions of wave 1 respondents who did not respond to wave 9. By this measure the attrition rate among retired workers in the 1996 panel was 22.4 percent versus 14.3 percent in the 2001 panel. For disabled workers these rates were 23.4 percent (1996) and 18.4 percent (2001), and for all other social security beneficiaries they were 23.3 percent (1996) and 16.8 percent (2001). For SSI recipients, with their broader age range, the comparable figures were 23.3 percent (1996) and 20.9 percent (2001).

Because of the aforementioned change in operational procedures, the proportion of sample members failing to complete the ninth interview is clearly less of a problem in the 2001 panel than the 1996 panel, and this is true across the board. In fact, by this measure the 2001 panel is more similar to the 1993 panel than to the 1996 panel. The 21.3 percent attrition rate for the full 2001 sample compares to a 19.2 percent attrition rate for the 1993 panel versus 27.5 percent for the 1996 panel. For all social security or SSI beneficiaries, the 16.0 percent attrition rate in the 2001 panel compares to a 13.5 percent attrition rate in the 1993 panel versus 23.0 percent in the 1996 panel.

---

[1] These estimates are weighted. Compare to Table 1.

[2] With the 1996 panel the Census Bureau ceased production of a longitudinal file and discontinued the imputation of missing waves, which had been initiated with the 1991 panel. MPR has produced its own missing wave imputations for the 1996 and 2001 panel. Our estimates of who would fail to qualify as full panel members with the imputation of missing waves are based on the results of this work. For 1993, the percentages who would not qualify as full panel members with or without imputation of missing waves are based on the Census Bureau's missing wave imputations.

4.0 Bias in Full Panel Estimates of Earnings

Vaughan and Scheuren (2002) and Hall et al. (2004) added to the literature on differences between attriters and continuers with extensive analyses using SIPP and Survey of Program Dynamics (SPD) data linked to summary earnings record (SER) data.[3] Our focus in this report is different. We acknowledge that there are important differences between attriters and continuers, but the question of interest to us is whether differences exist between the full panel (continuers) and the full cross-sectional sample (continuers plus attriters) after the application of non-interview adjustments and demographic calibration designed to reduce or eliminate specific types of differences between the full panel and the cross-sectional sample.

A limitation of the analysis of the 2001 SIPP panel arises from the fact that SSNs were not requested until the second and later interviews. Because of this, there are no matched data for persons who attrited immediately after the first wave. This means that when we compare the matched full panel sample with the matched wave 1 cross-sectional sample, the sample members who attrited after wave 1 are excluded from both groups. This removes about a quarter of the total attrition from the evaluation with administrative records.

Using SIPP data matched to the SER, we compared distributions of earnings between the full panel sample and the wave 1 respondents who also responded to wave 2 (and were asked for their SSNs). The wave 1/wave 2 sample serves as a proxy for the wave 1 cross-sectional sample. To correct in a simple way for match bias, both samples were calibrated to the population totals that the Census Bureau used to calibrate the January 2001 cross-sectional sample and the full panel.

The upper panel of Table 3a reports the wave 1/wave 2 estimates of the proportion of persons with positive SER earnings, by age, for each of the years 1999 through 2003. An advantage of using administrative records in evaluating attrition bias is that we are not limited to the survey period (although SSA's analytical use of SIPP full panel data linked to administrative records would be limited to the time frame of the survey). The lower panel of the table reports the difference between the full panel and wave 1/wave 2 estimate of each proportion, with indicators of statistical significance. For persons 18 to 24, the full panel estimates are about a percentage point lower than the cross-sectional sample estimates across all years, and the largest of these differences (in 2000 and 2001) are statistically significant at the 0.05 level or better. Outside of this age group, the differences are negligible, and none is significant at the 0.05 level or better.

Tables 3b and 3c report the wave 1/wave 2 estimates of points in the distribution of earnings among those with positive earnings, by age, in each of the five years, as well as differences between the full panel and wave 1/wave 2 estimates, with indicators of statistical significance. Except for one age group (65+) in one year (2002), mean positive earnings among panel members 45 and older are consistently lower than the estimates from the wave 1/wave 2 sample, and half of the differences in mean earnings among workers 55 and older are large enough to be statistically significant at the 0.10 level or better. *Median* earnings are also lower, generally, for panel members 45 and older, but the difference is not statistically significant in any age group and year. It is evident from Table 3c that the differences in means are driven by the upper part of the earnings distribution. Panel estimates of the 75th percentile are consistently lower than the wave 1/wave 2 estimates among workers 35 to 64, The differences are statistically significant among workers 55 to 64 in three of the five years.

It is surprising that where we find differences in positive earnings, the panel sample (after the Census Bureau's attrition adjustment) has a lower incidence of high earnings than the cross-sectional sample. This runs counter to research findings that attrition probabilities are highest among those with very low income. Together these findings suggest that the Census Bureau's adjustments generally compensate for attrition bias with respect to income. Among older workers, the adjustments appear to over-correct for attrition bias by producing more high-income workers than were lost to attrition .

Lastly, Table 4 compares the matched wave 1/wave 2 and full panel samples with respect to the gross change in annual earnings between 2001 and 2003. The upper part of the table reports the (weighted) proportion of persons in the wave 1/wave 2 sample with a positive change, no change, or negative change in earnings between the two years. Persons with zero earnings in either year are excluded . Among all persons 18 and older, 60.9 percent experienced an increase in earnings and 39.1 percent incurred a reduction in earnings. Positive changes peak in the youngest age group and decline with increasing

[3] The SER contains the annual earnings (from both wage and salary and self-employment) on which Social Security taxes were paid and which are used to calculate social security benefit entitlements.

age. Table 5 presents a frequency distribution of the magnitudes of the changes whose signs are measured in Table 4. Most of the individuals who experience a positive change in earnings between 2001 and 2003 incur more than a 25 percent change in earnings. Similarly, most of the individuals who experience a negative change in earnings across years have their earnings decrease by more than 25 percent.

The lower portion of Tables 4 and 5 reports the difference between the matched full panel and wave 1/wave 2 samples. Among persons 18 and older, full panel members were significantly more likely than cross-sectional sample members to experience an increase in earnings, but the difference was less than a percentage point. Differences are very slightly larger and still significant among persons 25 to 34, but there are no significant differences at ages 35 and older. Where Vaughan and Scheuren found that attriters experienced greater increases in earnings than nonattriters, we find that when the sample weights are adjusted for attrition bias, it's the full panel sample—the non-attriters—who are somewhat more likely to experience an increase in earnings over the duration of the panel, suggesting that, if anything, the Census Bureau's weighting adjustments for attrition bias may overcompensate for the bias arising from attrition. When we compare the magnitudes of the change in earnings, we find that full panel members 18 to 64 were significantly less likely to have experienced a large decline in earnings but were no more likely than cross-sectional sample members to have experienced a large increase in earnings—or any change beyond a large decline. In short, by this measure of gross change in earnings, full panel members as a whole were quite similar to cross-sectional sample members.

5.0 Bias in Full Panel Estimates of Social Security Beneficiaries

To assess the bias in full panel estimates of Social Security beneficiaries, we compared the full panel and wave 1/wave 2 samples with respect to characteristics obtained from the Social Security Master Beneficiary Record enhanced with payment data from the Payment History Update System (MBR-PHUS).

The full panel and wave 1/wave 2 samples produce nearly identical estimates of the number of Social Security beneficiaries in January 2001 and their distribution by type of beneficiary and age (Table 6). For example, on an estimate of 28 million retired workers, the two samples differ by only 56,000. And on an estimate of 5 million disabled workers, the two samples differ by only 23,000. Larger differences occur for the smaller aged non-widow and all other beneficiary populations, but only the difference of 99,000 for an estimate of 2 million aged non-widows is statistically significant—and only at the 0.10 level.

Larger differences emerge by the end of the panel (September 2003), but even here only one category has differences that are statistically significant. Out of 30 million retired worker beneficiaries the two samples differ by about one-third of a million (Table 6). For all beneficiaries, the full panel is 405,000 or less than 1 percent below the wave 1/wave 2 estimate of 45.5 million, a difference that is statistically significant at the 0.01 level.

Since SIPP is a longitudinal survey, how well it captures important life transitions is of great interest to users. Transitions into and out of each beneficiary status category, as well as the differences in these transitions between the full panel and the wave 1/wave 2 sample, are estimated in Table 7. The first and fourth columns are the January 2001 and September 2003 category totals from Table 6. The second and third columns contain estimates of the number of individuals who enter into or exit from each beneficiary category between January 2001 and September 2003. The full panel and wave 1 / wave 2 samples produce nearly identical estimates of these transitions. The only transition for which there is a statistically significant difference (at the 0.05 level) involves retired workers who receive a benefit in January 2001 but no longer receive a retirement benefit in September 2003. In this case, the full panel estimate is approximately 7 percent greater than the wave 1 / wave 2 estimate. Additionally, the number of entrants into all beneficiary categories is 249,000 lower in the full panel than in the cross-sectional sample. While the difference is statistically significant at the 0.01 level, it is less than 3 percent of the wave 1 / wave 2 entrant total of 8.5 million.

Table 8 reports the mean amounts of several administrative variables that are related to the primary insurance amount among disabled and retired workers, based on the matched wave 1/wave 2 observations, as well as the differences in means between the full panel and the wave 1/wave 2 sample. For disabled workers, these differences are negligible, and none is statistically significant at the 0.10 level. For retired workers, there are only negligible differences between the two samples although five of them, ranging from $5 to $6, are statistically significant at the 0.10 level.

6.0 Bias in Full Panel Estimates of SSI Recipients

To assess the bias in full panel estimates of SSI recipients, we compared the full panel and wave 1/wave 2 samples with respect to characteristics obtained from the Supplemental Security Record (SSR).

Estimates of the number, type (age, blind, or disabled), and age distribution of SSI recipients also differ little between the full panel and the wave 1/wave 2 cross-section (Table 9). In both January 2001 and September 2003 the full panel finds more disabled beneficiaries age 25 to 49 than the wave 1/wave 2 sample; the difference is about 100,000 out of 2 million, or a little less than 5 percent, but it is not statistically significant. This difference grows to 143,000 in September 2003 but still falls short of statistical significance. In other age groups the differences are proportionally similar except among persons 65 and older, where the difference in both years is much smaller. Differences between the two samples are not statistically significant for any age group and eligibility category pair, although it should be noted that the sample of blind recipients is too small to support statistically significant differences.

Table 10a contains estimates of the means of federal and state payment variables as well as two determinants of the payment variables, earned and unearned income. Differences in the mean amounts between the two samples are generally small, only a few are statistically significant, and they form no obvious pattern. The mean of the federal SSI benefit over all age groups is about 4 percent greater in the full panel sample than in the cross-sectional sample in January 2001. For 25-49 year old beneficiaries, the mean federal SSI benefit is about 7 percent greater in the full panel sample than in the cross-sectional sample in January 2001. Both differences are statistically significant at the 0.10 level. Estimates from the two samples are even closer in September 2003 than in January 2001.

The two samples are also quite similar with respect to the gross change in a number of the payment variables recorded on the SSR (see Table 10b). For all recipients and elderly recipients, the largest differences lie in the 1 to 2 percentage point range. None of the differences for elderly recipients is statistically significant. Differences for recipients under age 65 are somewhat larger than this for three of the four variables, and differences for earned income and the federal benefit amount are statistically significant. When the age groups are combined we find statistically significant differences for these same two variables. Overall, though, the small magnitudes of the differences between the two samples and the absence of a strong pattern in these differences are more compelling. We note, for example, that the largest differences run in opposite directions for the nonelderly and elderly beneficiaries.

Table 11 presents estimates of the distribution of SSI payments as a percentage of personal income in January 2001 for all SSI recipients and for subgroups defined by selected demographic characteristics. In both the numerator and denominator of this percentage, the benefit amount reported in the SIPP has been replaced by the amount recorded in the SSR. Differences between the full panel and wave 1/wave 2 samples are reported in the right hand side of the table. The two samples are nearly identical for all SSI recipients, with no statistically significant differences For several demographic groups, there are statistically significant differences between the samples, but the differences are scattered, suggesting no particular pattern, and they rarely exceed 3 percentage points.

7.0 Conclusion and Recommendations

When measured in terms of the proportion of wave 1 respondents who could not be assigned full panel weights, attrition got no worse between the 1996 and 2001 panels. Among older social security beneficiaries and older persons generally, attrition of this type was actually lower in the 2001 panel than the 1996 panel. Furthermore, because of an operational change, the proportion of the wave 1 sample failing to complete the wave 9 interview declined markedly between the 1996 and 2001 panels, to the point where the 2001 panel resembled the 1993 panel more closely than it resembled the 1996 panel in this alternative measure of attrition. These developments suggest that the upturn in attrition between the 1993 and 1996 panels did not continue through the 2001 panel. If growing attrition is a concern, there is actually less reason to hesitate in using the 2001 panel than the 1996 panel.

An analysis of earnings data from SER records matched to SIPP records suggests that the attrition adjustments that the Census Bureau applies to its panel and post-wave 1 cross-sectional weights are effective in correcting for attrition bias with respect to income. The limited number of significant differences that we observed between the panel sample and the wave 1 sample members who provided SSNs in wave 2 were in the opposite direction as the attrition bias documented elsewhere. Among persons 50 to 61, the panel sample tended to underestimate the frequency of high earnings, but there were no

consistent differences elsewhere and no consistent differences in the proportion of persons who had positive earnings. Estimates of gross changes in earnings also differ little between the full panel and wave 1/wave 2 cross-sectional samples.

Estimates of the number and selected characteristics of Social Security and SSI beneficiaries show only small differences between the full panel and wave 1/wave 2 samples. This is particularly striking for estimates of transitions into and out of Social Security beneficiary categories, estimates of payment amounts for retired and disabled workers, and estimates of the proportion of SSI beneficiaries' personal income that is provided by their SSI benefits.

In all, these findings based on data from three administrative data sources suggest that for the population of Social Security and SSI beneficiaries, the full panel could readily substitute for the wave 1/wave 2 sample.

References

Hall, David, Smanchai Sae-Ung, and Jan Tin. "Earned Income and Longitudinal Attrition in the SIPP and SPD." *Proceedings of the Survey Research Methods Section.* Alexandria, VA: American Statistical Association, 2004.

Johnson, David. "Reengineering the SIPP: The Evolution of a Phoenix." Presentation at the Joint Statistical Meetings, Salt Lake City, UT, August 2007.

U.S. Census Bureau. "The Phase-Out of the Survey of Income and Program Participation (SIPP) and the Launch of the Program of Income, Wealth, and Health Insurance Measurement." Washington, DC, February 3, 2006.

Vaughan, Denton R. and Fritz Scheuren. "Longitudinal Attrition in the SIPP and SPD." *Proceedings of the Survey Research Methods Section.* Alexandria, VA: American Statistical Association, 2002.

TABLE 1

SIPP PANEL RETENTION BY ALTERNATIVE DEFINITIONS, UNWEIGHTED AND WEIGHTED ESTIMATES: 1996 AND 2001 SIPP PANELS

	Sample Counts		Retention Rate		Attrition Rate	
Definition of Retention	1996	2001	1996	2001	1996	2001
Persons in wave 1 common month	95,141	77,269	100.0	100.0	0.0	0.0
Number of these with:						
Full panel weight	55,484	49,749	58.3	64.4	41.7	35.6
Pseudo 9-wave panel eligibility	60,641	50,099	63.7	64.8	36.3	35.2
Wave 9 data or full panel weight	68,992	60,620	72.5	78.5	27.5	21.5
Wave 8 or wave 9 data or full panel weight	70,549	62,184	74.2	80.5	25.8	19.5

	Weighted Estimates (1,000s)		Retention Rate		Attrition Rate	
Definition of Retention	1996	2001	1996	2001	1996	2001
Persons in wave 1 common month	264,254	279,185	100.0	100.0	0.0	0.0
Number of these with:						
Full panel weight	154,264	180,352	58.4	64.6	41.6	35.4
Pseudo 9-wave panel eligibility	168,594	181,704	63.8	65.1	36.2	34.9
Wave 9 data or full panel weight	191,472	219,611	72.5	78.7	27.5	21.3
Wave 8 or wave 9 data or full panel weight	195,790	224,615	74.1	80.5	25.9	19.5

Source: Mathematica Policy Research, from the 1996 and 2001 SIPP panels.

Note: The 1996 panel included 12 waves; the 2001 panel included only 9 waves. The weighted estimates for 2001 are based on the full January 2001 cross-sectional weight, adjusted for a one-third sample cut after wave 1.

TABLE 2

WEIGHTED ATTRITION RATE (PERCENT) AFTER WAVE 1 AMONG ALL PERSONS AND SOCIAL SECURITY OR SSI BENEFICIARIES BY AGE, WITH OR WITHOUT MISSING WAVE IMPUTATIONS OR COMPLETE WAVE 9 DATA

	2001 Panel (Age in January 2001)			1996 Panel (Age in March 1996)[a]			1993 Panel (Age in January 1993)		
Population	Total	Subtotal Under 65	Subtotal 65+	Total	Subtotal Under 65	Subtotal 65+	Total	Subtotal Under 65	Subtotal 65+
	Percentage Not Qualifying as Full Panel Members with No Missing Wave Imputations								
Total Population	35.4	36.9	24.5	36.6	37.6	28.7	28.4	29.8	18.3
Unduplicated Total Beneficiaries	26.5	31.5	24.2	29.9	32.9	28.5	20.5	27.2	17.8
Retired Workers	24.4	27.2	24.0	28.8	30.3	28.6	18.5	23.9	17.8
Disabled Workers	27.9	29.8	21.9	29.7	31.3	25.3	24.6	25.3	22.7
All Other Social Security Beneficiaries	27.3	32.1	24.2	31.1	34.1	29.2	19.8	26.2	17.6
SSI Beneficiaries	33.7	35.9	26.2	30.7	34.1	22.3	25.9	31.1	16.6
	Percentage Not Qualifying as Full Panel Members with Imputation of Missing Waves								
Total Population	27.4	28.7	18.1	32.9	33.9	25.8	23.6	25.0	13.4
Unduplicated Total Beneficiaries	19.8	23.9	17.9	27.1	29.8	25.8	15.9	22.9	13.0
Retired Workers	17.7	18.9	17.6	26.0	25.3	26.0	13.6	18.9	12.9
Disabled Workers	22.5	23.9	17.9	28.2	29.0	26.0	20.1	20.8	18.2
All Other Social Security Beneficiaries	20.9	24.5	18.6	27.5	30.5	25.7	15.0	21.8	12.8
SSI Beneficiaries	26.0	27.9	19.5	30.0	33.1	22.3	23.3	28.0	14.8
	Percentage Not Qualifying as Full Panel Members or with Data for All Four Months of Wave 9								
Total Population	21.3	22.2	14.7	27.5	28.3	22.3	19.2	20.1	11.8
Unduplicated Total Beneficiaries	16.0	19.2	14.5	23.0	24.7	22.3	13.5	18.6	11.5
Retired Workers	14.3	14.4	14.3	22.4	22.2	22.5	11.8	15.3	11.4
Disabled Workers	18.4	19.4	15.3	23.4	24.6	20.0	16.8	16.9	16.5
All Other Social Security Beneficiaries	16.8	19.6	15.0	23.3	25.0	22.3	12.8	17.5	11.2
SSI Beneficiaries	20.9	22.8	14.6	23.3	25.9	16.6	19.5	23.5	12.2

Source: Mathematica Policy Research, from the 1993, 1996 and 2001 SIPP panels.

Note: Attrition rates are weighted by the January 2001, March 1996, and January 1993 cross-sectional weights for the 2001, 1996, and 1993 estimates, respectively.

[a] All 1996 estimates are based on a simulated 9-wave panel. See text for details.

TABLE 3A

PROPORTION OF PERSONS WITH POSITIVE EARNINGS IN THE SER
BY AGE AND CALENDAR YEAR

Age in January	1999	2000	2001	2002	2003
	Wave 1 Sample with Wave 2 and Matched Data				
18+	70.6	70.8	69.9	68.2	67.1
18-24	85.8	87.6	87.1	85.3	83.8
25-34	85.7	86.5	86.0	84.1	84.0
35-44	83.2	83.8	83.5	81.8	81.2
45-54	78.6	79.6	79.2	78.4	77.8
55-64	60.5	60.8	60.8	61.1	61.0
65+	16.1	16.2	15.4	15.3	14.6
	Difference between Full Panel Sample with Matche Data and Wave 1 Sample with Wave 2 and Matched Data				
18+	-0.3 *	-0.3	-0.2	0.0	0.0
18-24	-0.8	-1.1 **	-1.4 ***	-0.7	-0.9 *
25-34	0.1	-0.1	-0.2	0.0	0.2
35-44	-0.5 *	-0.2	-0.3	0.0	-0.2
45-54	-0.3	-0.2	0.4	0.3	0.3
55-64	-0.2	0.1	0.1	0.6	0.5
65+	0.1	0.2	0.1	-0.1	0.0

Source: Mathematica Policy Research, from linked 2001 SIPP-SER records.

Note: All earnings have been adjusted for inflation and are in 2001 dollars.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 3B

MEAN AND MEDIAN ANNUAL EARNINGS OF WORKERS WITH POSITIVE EARNINGS IN THE SER, BY AGE AND CALENDAR YEAR

Age in January	1999	2000	2001	2002	2003
			Mean Earnings		
			Wave 1 Sample with Wave 2 and Matched Data		
18+	27,756	28,131	28,308	28,637	28,628
18-24	12,952	13,282	12,989	12,846	12,421
25-34	27,355	28,268	28,557	28,707	28,279
35-44	32,662	33,027	33,185	33,662	33,821
45-54	35,057	35,077	35,289	35,790	36,165
55-64	29,139	29,132	29,914	30,766	30,855
65+	13,610	13,955	14,669	14,611	14,799
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data				
18+	-64	-84	-93	-57	-17
18-24	105	108	-161	-201	-174
25-34	-153	-34	66	194	370
35-44	8	-217	-110	-165	46
45-54	-104	-181	-329	-227	-216
55-64	-558 **	-196	-471	-480 *	-598 **
65+	-697 *	-796 **	-397	43	-142
			Median Earnings		
			Wave 1 Sample with Wave 2 and Matched Data		
18+	22,986	23,308	23,400	23,457	23,415
18-24	10,382	10,588	9,987	10,182	9,722
25-34	24,088	24,827	25,150	25,287	24,962
35-44	29,220	29,225	29,005	29,112	29,284
45-54	30,983	30,817	31,231	31,453	31,835
55-64	23,436	23,368	24,215	24,473	24,218
65+	7,083	7,341	8,366	7,877	8,355
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data				
18+	62	72	27	74	154
18-24	324	184	-173	-247	-458
25-34	-66	60	48	468	255
35-44	88	-190	-81	-375	166
45-54	19	-103	-478	-229	-128
55-64	-495	367	-217	-213	-210
65+	-14	-54	-124	13	65

Source: Mathematica Policy Research, from linkded 2001 SIPP-SER records.

Note: All earnings have been adjusted for inflation and are in 2001 dollars.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 3C

25TH AND 75TH PERCENTILES OF ANNUAL EARNINGS OF WORKERS WITH POSITIVE EARNINGS IN THE SER, BY AGE AND CALENDAR YEAR

Age in January	1999	2000	2001	2002	2003
			25th Percentile of Earnings		
			Wave 1 Sample with Wave 2 and Matched Data		
18+	10,361	10,565	10,339	10,328	10,090
18-24	4,375	4,331	4,360	4,024	3,623
25-34	12,490	13,068	13,169	13,110	12,687
35-44	14,937	14,941	14,875	14,661	14,807
45-54	16,805	17,004	17,024	17,412	17,362
55-64	10,022	10,257	10,493	10,616	10,736
65+	2,231	2,166	2,403	2,569	2,737
			Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data		
18+	189	154	71	144	137
18-24	140	106	-319 **	-121	-166
25-34	-14	120	173	232	532 *
35-44	356	428	125	114	333
45-54	234	153	-337	13	121
55-64	155	320	210	59	-43
65+	-20	-12	-3	170	-249
			75th Percentile of Earnings		
			Wave 1 Sample with Wave 2 and Matched Data		
18+	39,545	40,129	40,403	40,805	40,730
18-24	18,626	19,312	18,956	18,787	18,190
25-34	37,311	38,863	39,193	39,465	38,338
35-44	46,252	46,799	46,640	47,574	48,248
45-54	50,057	50,199	50,106	50,194	51,083
55-64	42,427	41,678	43,440	45,096	45,164
65+	15,445	16,941	16,929	17,685	18,022
			Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data		
18+	-233	-333 *	-387	-268	-222
18-24	204	163	-24	-229	-74
25-34	-312	-588	-168	69	336
35-44	0	-628	-598	-542	-820
45-54	-298	-646	-382	-443	-759
55-64	-1,205 *	-749	-1,844 **	-1,233	-1,552 **
65+	-616	-923	-285	202	392

Source: Mathematica Policy Research, from linked 2001 SIPP-SER records.

Note: All earnings have been adjusted for inflation and are in 2001 dollars.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 4

PROPORTION OF PERSONS WITH A CHANGE IN SER ANNUAL EARNINGS, BY DIRECTION, 2001 TO 2003: PERSONS WITH POSITIVE EARNINGS IN BOTH YEARS

Age in January 2001	Positive Change	No Change	Negative Change
	Wave 1 Sample with Wave 2 and Matched Data		
18+	60.9	0.0	39.1
18-24	67.2	0.0	32.8
25-34	62.9	0.0	37.1
35-44	62.2	0.0	37.8
45-54	59.8	0.0	40.2
55-64	50.8	0.0	49.2
65+	39.2	0.0	60.8
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data		
18+	0.7 ***	0.0 [a]	-0.7 ***
18-24	1.1	0.0 [a]	-1.1
25-34	1.3 **	0.0 [a]	-1.3 **
35-44	0.5	0.0 [a]	-0.5
45-54	0.1	0.0 [a]	-0.1
55-64	0.4	0.0 [a]	-0.4
65+	0.3	0.0 [a]	-0.3

Source: Mathematica Policy Research, from linked 2001 SIPP-SER records.

Note: All earnings have been adjusted for inflation and are in 2001 dollars.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 5

FREQUENCY DISTRIBUTION OF GROSS CHANGE IN SER ANNUAL EARNINGS, 2001 TO 2003, BY AGE: PERSONS WITH POSITIVE EARNINGS BOTH YEARS
(Thousands of Persons)

Percentage Change in Earnings	Age in January 2001		
	18+	18 to 64	65+
	Wave 1 Sample with Wave 2 and Matched Data		
(More than -25.0%)	23,442	22,182	1,260
(-10.1% to -25.0%)	10,556	10,096	460
(-5.1% to -10.0%)	6,408	6,225	183
(-2.1% to -5.0%)	6,219	5,954	265
(-0.1% to -2.0%)	4,397	4,252	145
0	0	0	0
(0.1% to 2.0%)	5,001	4,922	79
(2.1% to 5.0%)	14,487	14,194	293
(5.1% to 10.0%)	11,063	10,889	174
(10.1% to 25.0%)	18,030	17,763	267
(More than 25.0%)	30,949	30,269	680
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data		
(More than -25.0%)	-1,153 ***	-1,137 ***	-15
(-10.1% to -25.0%)	-220	-221	1
(-5.1% to -10.0%)	145	138	7
(-2.1% to -5.0%)	225	233 *	-8
(-0.1% to -2.0%)	33	21	12
0	0 [a]	0 [a]	0 [a]
(0.1% to 2.0%)	188	192	-4
(2.1% to 5.0%)	130	131	-1
(5.1% to 10.0%)	530 ***	523 ***	6
(10.1% to 25.0%)	235	227	8
(More than 25.0%)	-393	-401	8

Source: Mathematica Policy Research, from linked 2001 SIPP-SER records.

Note: All earnings have been adjusted for inflation and are in 2001 dollars.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

*** Statistically significant at 0.01 level

** Statistically significant at 0.05 level

TABLE 6

DISTRIBUTION OF SOCIAL SECURITY BENEFICIARY STATUS IDENTIFIED IN THE MBR, BY AGE: JANUARY 2001 AND SEPTEMBER 2003
(Thousands of Persons)

Age	Disabled Worker	Retired Worker	Aged Non-widow	Aged Widow	All Other Beneficiaries	Total
			Wave 1 Sample with Wave 2 and Matched Data			
January 2001:						
Under 65	5,000	2,620	240	334	3,986	12,180
65 and older	0	25,435	1,720	3,107	21	30,283
Total	5,000	28,055	1,960	3,441	4,007	42,462
September 2003:						
Under 65	5,895	2,861	117	416	4,145	13,434
65 and older	0	27,190	1,681	3,181	24	32,077
Total	5,895	30,051	1,799	3,597	4,169	45,511
			Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data			
January 2001:						
Under 65	23	29	-18	23	137	193
65 and older	0 [a]	-84	-80	23	0	-141 *
Total	23	-56	-99 *	46	138	52
September 2003:						
Under 65	-65	-48	-18	18	61	-51
65 and older	0 [a]	-284 *	-58	-12	0	-354 **
Total	-65	-332 **	-75	6	61	-405 *

Source: Mathematica Policy Research, from linked 2001 SIPP-MBR-PHUS records.

Note: The category "all other beneficiaries" includes spouses caring for minor children, widow(er)s caring for minor children, disabled widow(er)s, adults disabled in childhood, student children, minor children, and other individuals who have a current payment status and who are not elsewhere classified.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 7

ENTRIES INTO AND EXITS FROM SOCIAL SECURITY BENEFICIARY CATEGORIES
BETWEEN JANUARY 2001 AND SEPTEMBER 2003
(Thousands of Persons)

Beneficiary Category	January 2001	Entries into Category	Exits from Category	September 2003
	Wave 1 Sample with Wave 2 and Matched Data			
Disabled worker	5,000	1,835	939	5,895
Retired worker	28,055	4,559	2,563	30,051
Aged non-widow	1,960	194	355	1,799
Aged widow	3,441	599	443	3,597
All other beneficiaries	4,007	1,330	1,168	4,169
Total	42,462	8,517	5,468	45,511
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data			
Disabled worker	23	-35	52	-65
Retired worker	-56	-86	190 **	-332 **
Aged non-widow	-99 *	-11	-34	-75
Aged widow	46	-13	27	6
All other beneficiaries	138	-104	-27	61
Total	52	-249 *	208	-405 *

Source: Mathematica Policy Research, from 2001 linked SIPP-MBR-PHUS records.

Note: The category "all other beneficiaries" includes spouses caring for minor children, widow(er)s caring for minor children, disabled widow(er)s, adults disabled in childhood, student children, minor children, and other individuals who have a current payment status and who are not elsewhere classified.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 8

MEAN DOLLAR VALUES OF SELECTED PAYMENT VARIABLES AMONG RETIRED AND DISABLED WORKERS WHO ARE CURRENT BENEFICIARIES, JANUARY 2001 AND SEPTEMBER 2003

	January 2001				September 2003			
	Retired Workers				Retired Workers			
Payment Variable	Under 65	65+	Total	Disabled Workers	Under 65	65+	Total	Disabled Workers
	Wave 1 Sample with Wave 2 and Matched Data							
Family Maximum Benefit	1,628	1,467	1,482	1,116	1,703	1,481	1,502	1,158
Indexed Monthly Earnings	2,069	1,099	1,190	1,178	2,192	1,224	1,316	1,340
Monthly Benefit Amount	809	858	854	768	810	867	862	800
Monthly Benefit Payable	806	813	812	745	806	817	816	777
Medicare Part B Premium	1	45	41	22	2	49	45	23
Monthly Benefit Paid	732	810	802	717	755	813	807	816
Primary Insurance Amount	953	856	865	775	991	863	876	806
Social Security Income	733	855	843	739	757	862	852	838
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data							
Family Maximum Benefit	-1	-7	-6	-1	7	-10	-8	-9
Indexed Monthly Earnings	-11	-13	-12	-8	12	-14	-12	-13
Monthly Benefit Amount	-1	-4	-3	0	-2	-6 *	-5 *	-5
Monthly Benefit Payable	-1	-3	-3	0	-2	-6 *	-5 *	-5
Medicare Part B Premium	0	0	0	0	0	0	0	0
Monthly Benefit Paid	-5	-3	-3	17	-1	-6 *	-5 *	-4
Primary Insurance Amount	-1	-5	-4	0	4	-6 *	-5 *	-5
Social Security Income	-5	-3	-4	17	-1	-6 *	-6 *	-4

Source: Mathematica Policy Research, from 2001 linked SIPP-MBR-PHUS records.

* Statistically significant at 0.10 level

TABLE 9

SSI RECIPIENTS IDENTIFIED IN THE SSR BY AGE AND ELIGIBILITY CATEGORY: JANUARY 2001 AND SEPTEMBER 2003

Month and Eligibility Category	Age in Month						Total
	Under 18	18-24	25-49	50-61	62-65	65+	
	Wave 1 Sample with Wave 2 and Matched Data						
January 2001:							
Aged	0	0	0	0	4,783	1,095,341	1,100,124
Blind	9,896	14,608	22,902	27,112	4,275	10,236	89,030
Disabled	770,905	479,866	2,322,438	1,154,721	220,356	589,781	5,538,066
September 2003:							
Aged	0	0	0	0	0	1,123,836	1,123,836
Blind	9,896	0	43,487	27,112	0	9,616	90,111
Disabled	881,737	490,619	2,189,979	1,164,071	312,618	642,591	5,681,615
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data						
January 2001:							
Aged	0 [a]	0 [a]	0 [a]	0 [a]	1,136	101,561	102,698
Blind	6,460	8,456	-8,495	-2,108	-4,275	3,573	3,612
Disabled	-63,302	47,503	102,339	73,048	801	-19,904	140,486
September 2003:							
Aged	0 [a]	0 [a]	0 [a]	0 [a]	0 [a]	135,306	135,306
Blind	6,460	0 [a]	-17,295	-2,108	0 [a]	-2,715	-15,659
Disabled	-76,053	-33,565	142,597	55,695	19,087	-5,821	101,941

Source: Mathematica Policy Research, from linked 2001 SIPP-SSR records.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

TABLE 10A

MEAN DOLLAR VALUES OF SELECTED PAYMENT VARIABLES ON THE SSR FOR SSI RECIPIENTS BY AGE, JANUARY 2001 AND SEPTEMBER 2003

Month and Payment Variable	Age in Month: Under 18	18-24	25-49	50-61	62-65	65+	Total
	Wave 1 Sample with Wave 2 and Matched Data						
January 2001							
Earned Income	2	28	11	6	2	7	9
Unearned Income	79	66	116	133	169	245	145
Federal Money Amount Payment	417	391	364	488	320	258	367
State Support Amount	14	30	31	33	34	58	36
September 2003							
Earned Income	0	23	8	2	0	3	6
Unearned Income	63	40	140	135	224	240	151
Federal Money Amount Payment	469	465	382	361	280	256	359
State Support Amount	25	23	45	46	39	76	48
	Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data						
January 2001							
Earned Income	1	0	3	2 ***	-2	0	2
Unearned Income	-7	-3	-14 *	5	23	-4	-4
Federal Money Amount Payment	6	27	25 *	31	-20	-2	15 *
State Support Amount	2	2	-2	-1	1	1	0
September 2003							
Earned Income	0	11	2	0	0 [a]	2	2 *
Unearned Income	-2	2	-13	5	-5	2	0
Federal Money Amount Payment	2	-11	9	-4	0	-2	-2
State Support Amount	3	-3	-1	-2	4	7 *	2

Source: Mathematica Policy Research, from linked 2001 SIPP-SSR records.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 10B

GROSS CHANGE IN PAYMENT VARIABLES ON THE SSR FILE, JANUARY 2001 THROUGH SEPTEMBER 2003, FOR SSI RECIPIENTS BY AGE

Payment Variable and Gross Change	Wave 1 Sample with Wave 2 and Matched Data			Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data		
	Age in January 2001			Age in January 2001		
	Under 65	65+	Total	Under 65	65+	Total
Earned Income						
Positive Change	2.8	0.8	2.3	1.0 **	0.4	0.9 **
Negative Change	3.6	3.2	3.5	0.3	0.1	0.2
No Change	93.6	96.0	94.2	-1.3 *	-0.5	-1.1 *
Unearned Income						
Positive Change	11.9	6.1	10.5	-1.1	0.4	-0.7
Negative Change	32.3	61.0	39.2	-1.2	1.6	-0.3
No Change	55.8	32.9	50.3	2.2	-1.9	1.0
Federal Payment						
Positive Change	19.7	9.3	17.2	-2.7 **	1.5	-1.7 *
Negative Change	77.2	85.7	79.3	3.8 ***	-2.1	2.4 **
No Change	3.1	5.0	3.5	-1.2 *	0.6	-0.7
State Support Amount						
Positive Change	13.0	28.3	16.7	0.6	2.2	1.1
Negative Change	19.9	17.0	19.2	0.2	0.0	0.1
No Change	67.1	54.6	64.1	-0.8	-2.1	-1.2

Source: Mathematica Policy Research, from linked 2001 SIPP-SSR records.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level

TABLE 11

DISTRIBUTION OF SSI PAYMENTS AS A PERCENTAGE OF PERSONAL INCOME AMONG PERSONS WITH POSITIVE SSI AND POSITIVE TOTAL INCOME BY SELECTED PERSONAL CHARACTERISTICS

	Wave 1 Sample with Wave 2 and Matched Data					Difference between Full Panel Sample with Matched Data and Wave 1 Sample with Wave 2 and Matched Data				
	SSI Payment as a Percentage of Total Personal Income					SSI Payment as a Percentage of Total Personal Income				
Characteristic	0-24%	25-49%	50-74%	75-99%	100%	0-24%	25-49%	50-74%	75-99%	100%
All Recipients	21.8	18.9	11.3	8.9	39.1	-1.1	0.8	-1.2	-0.1	1.6
Sex										
Male	19.0	13.9	9.2	10.4	47.5	-2.5 *	0.9	-2.5 **	1.3	2.8
Female	23.5	22.2	12.6	7.9	33.7	0.0	1.1	-0.1	-1.2	0.2
Age										
15-17	0.0	0.0	4.4	20.2	75.5	0.0 [a]	0.0 [a]	0.9	-1.5	0.6
18-64	17.4	15.9	11.6	9.6	45.5	-0.7	0.3	-0.9	0.8	0.5
65+	33.2	27.2	10.9	6.4	22.2	-2.0	2.4	-2.0	-2.2	3.7 **
Race										
White	23.4	20.0	10.0	8.8	37.9	-2.4 **	1.3	-1.3	0.1	2.4 *
Black	20.0	18.1	12.1	8.7	41.0	2.3 *	0.0	-2.1	-0.3	0.1
American Indian, Alaska Native	25.9	10.0	14.2	8.7	41.2	0.1	3.5	3.2	-1.2	-5.6
Asian, Pacific Islander	12.5	16.6	18.6	11.0	41.3	-4.6	-0.1	1.8	-0.8	3.7
Ethnicity										
Hispanic	21.1	18.8	9.5	8.9	41.7	-2.4	3.9 ***	-1.0	1.5	-2.0
Non-Hispanic	21.9	19.0	11.8	8.9	38.4	-0.8	0.0	-1.2	-0.6	2.5 **
Marital Status										
Married	17.5	20.0	12.7	12.9	37.0	-1.4	-0.4	-0.3	-0.3	2.4
Widowed	35.1	22.3	11.0	5.7	25.9	2.5	0.4	0.4	-4.0 **	0.7
Divorced or separated	25.1	19.3	10.8	8.5	36.2	-1.1	1.9	-1.4	-0.9	1.5
Never married	15.3	16.5	11.0	8.7	48.5	-2.0 *	1.1	-2.2 *	2.0 *	1.1

Source: Mathematica Policy Research, from linked 2001 SIPP-SSR records.

[a] Since the cross-sectional sample estimate is zero, the full panel estimate is zero as well.

*** Statistically significant at 0.01 level
** Statistically significant at 0.05 level
* Statistically significant at 0.10 level