

EVALUATING THE QUALITY OF INCOME DATA  
COLLECTED IN THE ANNUAL SUPPLEMENT  
TO THE MARCH CURRENT POPULATION  
SURVEY AND THE SURVEY OF INCOME  
AND PROGRAM PARTICIPATION

Working Paper

By: JOHN CODER  
LYDIA SCOON-ROGERS

HOUSING AND HOUSEHOLD ECONOMIC  
STATISTICS DIVISION

BUREAU OF THE CENSUS  
DEPARTMENT OF COMMERCE  
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NOTE TO READERS:

The draft below reflects late adjustments (following initial release as early draft or ASA paper) to several income survey estimates and subsequent changes to analysis. In addition, through refinements in statistical analysis, some modifications in results (i.e. magnitude of difference) appear. However, most previously expressed trends of improvement or deterioration of SIPP estimates relative to CPS estimates remain.

# EVALUATING THE QUALITY OF INCOME DATA COLLECTED IN THE ANNUAL SUPPLEMENT TO THE MARCH CURRENT POPULATION SURVEY AND THE SURVEY OF INCOME AND PROGRAM PARTICIPATION

## INTRODUCTION

The Bureau of the Census conducts two surveys that focus on measuring the economic resources of American households. These are the annual income supplement to the March Current Population Survey (CPS) and the Survey of Income and Program Participation (SIPP). A major focus of both of these surveys is collection of detailed information about the sources and amount of income received by the population. The annual supplement to the March CPS has been the "official" source of income and poverty estimates for the United States since 1947<sup>1</sup>, while SIPP emerged in 1984 as an alternative to the March CPS, offering the hope of more accurate and more comprehensive information concerning household income, labor market activity, and related topics.

The March CPS has been the mainstay of income measurement in the United States since its initiation in 1947. It has provided a time series of annual income estimates covering a span of 35 years. While the March CPS supplement data continue to be the official source of income and poverty estimates today, the survey has long been criticized for both the quality of its data and inherent limitations imposed by its ties with the CPS, whose main focus is measurement of monthly unemployment.

The SIPP was conceived as a survey that would overcome the shortcomings of the March CPS. It was designed to improve the quality of income data and to expand the amount of information collected so that complex issues related to government tax and transfer policy could be examined.

An assessment of the SIPP income data carried out by Vaughan (1989) has indicated that the quality of these data for 1984 was higher than the quality of the data collected in the March CPS for most, but not all, income sources<sup>2</sup>. His examination was based on

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<sup>1</sup> Poverty estimates from the CPS begin in 1959.

<sup>2</sup> SIPP has higher aggregate income estimates than the CPS for many of the individual sources. Yet, its overall standing relative to the CPS is that of a deficit, largely due to SIPP's lower estimate of wages and salary income-- the largest component of money income

comparisons at the aggregate level using calendar-year 1984 as the accounting period. The monthly amounts recorded in SIPP for each month of 1984 were summed to arrive at annual aggregate estimates that corresponded to the estimates available from the March CPS which asks questions about the amount of income received during the previous calendar year.

In addition to making comparisons of SIPP and March CPS income estimates, Vaughan compared both survey results to independent "benchmark" estimates derived from the National Income and Product Accounts (NIPA) and various other program and administrative sources. Comparisons of this nature provided an indication of how the surveys were performing relative to independently derived measures of "truth."

This paper presents a follow-up to Vaughan's work by comparing 1990 SIPP, CPS, and benchmark estimates of aggregate income and reciprocity, with attention given to refining the comparability between surveys and between surveys and independent estimates. This paper begins with a comparison of SIPP and March CPS data collection and processing procedures as a basis for comparability, highlighting main sources of nonsampling error. The next sections explain the derivations of survey and independent estimates of aggregate income used in the comparisons, with alternate SIPP estimates offered. The major part of the paper is devoted to presenting comparisons of SIPP, March CPS, and independent aggregate income estimates by source of income, including tabular comparisons of survey and independent estimates. The last appendix section contributed by Denton Vaughan provides a response to the paper presented here and suggests future research directions.

Our working definitions of quality in this analysis are indicated by one survey's relative standing to the other survey or to independent/administrative data regarding aggregate income, mean income and income reciprocity.

## **SIPP AND MARCH CPS DATA COLLECTION AND PROCESSING PROCEDURES**

Contrasting SIPP and March CPS data collection and processing methods provides much of the context for comparing estimates derived from these two surveys. While the surveys are radically different in many important aspects, they also share some important common ground.

### **Differences**

Perhaps the most important difference between the SIPP and the CPS lies in the surveys' focuses and subsequent data collection processes. The income data collection effort in the CPS is largely an "add-on" to a survey whose main purpose is measurement of

employment and unemployment. The need to produce monthly employment statistics within three weeks of the interview week places severe limits on the content and mode of collection for the income data. It is widely held that this environment, in which the collection of income data is secondary, has contributed significantly to the overall data quality problems observed over the years.

In contrast, the SIPP was conceived as a survey that would overcome the constraints inherent in the CPS. Limits on questionnaire content and mode of collection were removed in SIPP, so that more detailed income data could be obtained than in the CPS.

SIPP replaced the CPS's single annual interview and calendar-year accounting period for income (with retrospective questions covering the previous year) with multiple interviews occurring at 4-month intervals and a 4-month accounting period in an effort to reduce recall bias. The household-based questions covering unearned sources in the CPS were replaced by person-based questions. Reciprocity and amounts of income are recorded on a monthly basis within the 4-month reference period. Respondents' use of records to facilitate recall is given a higher priority. Questions attempt to place the receipt of income "in context" where applicable. Additional information is collected to aid the identification of misreported reciprocity. Interviewers are encouraged to follow up with respondents after the interview to obtain missing information. Self-response is encouraged and personal interviews are mandatory (partial telephone interviewing began with the 1990 SIPP panel).

### **Similarities**

Both the SIPP and the CPS share many basic characteristics related to general survey collection and processing procedures. The sample selection process and the sampling frame have been, for the most part, identical (for the 1990 SIPP panel, however, the sample was augmented by cases with "low income" characteristics from the curtailed 1989 SIPP panel). The general philosophy regarding consistency editing and imputing for missing data is the same. Adjustments for non-interviewed households (first stage weighting) follow the same model. Weighting to independent population controls utilizes the same methodology. However, additional controls for household type derived from the CPS are used in the SIPP. Income definitions, with the exception of self-employment income, are nearly identical and the surveys cover the same income sources. The order of questions follows much the same pattern, starting with the collection of basic demographic data, followed by work experience questions, then questions covering income sources and amounts (the SIPP postpones collection of amounts until all reciprocity is established while the CPS integrates reciprocity and amounts).

## SOURCES OF NONSAMPLING ERROR

The quality of the income data collected in these two surveys is influenced by many factors. Differences between SIPP and March CPS estimates and differences between survey and independent estimates shown in this report reflect the net effect of these factors and the interaction between them. Even though it is beyond the scope of this report to examine the separate components of nonsampling error, it is useful to enumerate the major sources of nonsampling error and to note their difference between these two surveys.

Most sources of survey error fall into one of the seven categories shown below. Of these, the first five are of most interest in the context of SIPP-CPS comparisons as survey undercoverage and errors in the sampling frame affect both surveys to nearly the same degree.

- 1) failure to contact sampled units (noninterviews)
- 2) item nonresponse and imputation error
- 3) response errors
- 4) time-in-sample effects
- 5) attrition bias
- 6) population undercoverage
- 7) errors in the sampling frame

**Failure to Contact.** Based on a measurement derived from the number of initial interviews (first contact), the SIPP suffers from a significantly higher noninterview rate than the CPS. The initial (first wave) noninterview rate was about 8 percent for the 1990 SIPP panel and rose to 13 percent by wave 4, compared to an overall noninterview rate for the March 1991 CPS survey of about 5 percent. Any errors associated with the noninterview adjustment process, therefore, contribute more to SIPP than to the CPS.

**Item Nonresponse and Imputation.** SIPP's data collection environment appears to reduce the level of item nonresponse relative to the CPS. For example, the nonresponse rate for wage and salary income amounts in the March 1991 CPS was about 18 percent (about half the nonresponse can be attributed to nonresponse to the entire income supplement). This compares with only about 12 percent for

the SIPP monthly amounts in the first interview. These rates are based on persons in interviewed households<sup>3</sup>. Nevertheless, SIPP has found some success in lowering item nonresponse, for example, with wages and salaries. It follows that errors caused by item nonresponse and subsequent imputation should affect the CPS to a greater degree than the SIPP.

Although imputation procedures for the CPS and SIPP are similar in approach--both use a "hot deck" to assign values to missing responses--the methods used in the March CPS are more complex and may provide better results. Since we have not validated either survey's imputation procedures, we cannot be sure that the CPS procedures, while more sophisticated, prove to be more accurate. In general, imputation systems tend to assign values that are, on average, below the true value.

**Response Error.** Response error defined in its simplest form is the difference between "truth" and what is reported in a survey. For income, response error may manifest itself in three basic ways. First, a respondent might neglect to report a source of income that was actually received. Second, a respondent might report the receipt of income but misidentify its source. Finally, a respondent might provide an incorrect amount received.

Much of the SIPP design reflects an attempt to lower response error by reducing the recall period and tailoring the questionnaire to promote good responses. While the improvements at the aggregate level noted by Vaughan are not solely due to lower response errors, it is likely that most of the reductions can be attributed to the effort to reduce them.

**Time-in-Sample Effects.** Persons' participation in a longitudinal sample may change their reporting behavior over successive interviews. Some changes may result in corrections to earlier mistakes. Some changes may reflect attempts to shorten interview time, or hide sensitive responses. Other changes may actually represent new behavior as a result of becoming informed by the survey, such as about program participation. The CPS also suffers from time-in-sample bias, but its effect on income has not been documented.

**Attrition.** While both the SIPP and CPS experience noninterviews, item nonresponse, and time-in-sample bias, SIPP alone is subject to attrition error in its annual income estimates<sup>4</sup>. Attrition may be defined as simply complete nonresponse due to

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<sup>3</sup> The true magnitude of missing data between the two surveys is somewhat smaller, since the SIPP has a household noninterview rate that is more than three percentage points higher than the CPS.

<sup>4</sup> Attrition in the March CPS sample does not affect calendar-year estimates of income. Attrition in the March CPS supplement occurs cross-sectionally between supplements.

non-interviews after one or more completed interviews. Levels of attrition in the 1990 panel were similar to those observed in earlier panels--attrition was highest after the first two interviews, totaling between 9 and 14 percent after both interviews.

Studies conducted on the 1984 panel have found that certain subgroups of the population are more likely than others to "attrit" from the sample, thus creating bias in the sample. Household noninterview rates after the first wave tended to be "higher for renters, households located in large metropolitan areas, and for households maintained by young adults. Individuals who did not complete all interview waves compared with those who did tended to include more residents of large metropolitan areas, renters, members of racial minorities, children and relatives of reference persons, people aged 15 to 24, movers, never-married people, and people with no savings accounts or assets<sup>5</sup>."

In the SIPP longitudinal file, attriters are essentially dropped from the sample, and weights are used to adjust for them. However, there is some evidence weights do not fully compensate for the attriting households.

It is often difficult to determine whether changes in estimates from a longitudinal study are due to attrition effects or time-in sample effects. It is also difficult to determine when earlier responses are more correct and when the later responses are.

## **DERIVATION OF SURVEY-BASED INCOME ESTIMATES**

The main focus of this assessment of data quality is on comparisons of aggregate income estimates. Estimates derived from the SIPP are compared to those from the CPS for calendar years 1984 and 1990 and to independent estimates derived using National Income and Product Accounts (NIPA) personal income that is provided by the U.S. Bureau of Economic Analysis (BEA). The SIPP and CPS estimates are also compared to data from various administrative sources.

The CPS income aggregates for 1984 and 1990 were derived directly from the March 1985 and 1991 CPS microdata files, respectively, that contain annual income amounts. The weights used to compute these aggregates reflect the population estimates as of March.

Developing aggregates for the SIPP, however, was much more complicated, since income amounts were recorded monthly. To

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<sup>5</sup> Citro and Kalton cite Jabine, King, and Petroni, 1990, in the The Future of the Survey of Income and Program Participation.



better evaluate differences between the SIPP and CPS data, annual aggregate estimates from the SIPP were derived using three alternative methods. Each of these methods, described below, sometimes generated different results. Some of these differences are easily explained while others are not clearly understood.

The first method, which we will call the "sum-of-waves method," was based on cross-sectional estimates and is comparable to the one used in the earlier work by Vaughan (1989). In this method, calendar-year income aggregates were derived by summing the products of monthly estimates of income recipients multiplied by mean amounts derived from the "wave" files<sup>6</sup>. The number of income recipients is estimated using monthly cross-sectional weights controlled to monthly population estimates. The incomes were the monthly amounts after edit and imputation. Since this method is based on the sum of monthly cross-sectional estimates, it does not provide an estimate of the number of income recipients "ever receiving income" during the calendar year.

The second method, the "longitudinal basis," utilized the SIPP longitudinal files. These files contain income and recipient data, month by month, over the length of the SIPP panel<sup>7</sup>. Annual income amounts for each sample person were created by summing the amounts received during each month of the calendar year. Next, the aggregate income estimates were derived by multiplying the annual amounts by the appropriate person weight (calendar-year weight) and summing these products across the entire population. A positive calendar-year weight was assigned to each sample person who began the calendar year as an interviewed person and either 1) was present in an interviewed household for all 12 months of the year, or 2) was present in an interviewed household continuously until death or exit from the noninstitutional population. Examples of exits from the noninstitutional population include 1) entry into a nursing home or prison, 2) entry into the armed forces, or 3) exit from the country for an extended period. The calendar year weights reflect population estimates for the noninstitutional population as of January 1984 and January 1990.

The third method for deriving annual aggregates from the SIPP incorporated the use of a special purpose file that was constructed as a CPS "look alike." This "March-based" file was developed by first fixing the 1990 SIPP panel household composition as it existed in March following the reference year (March 1985 and March 1991). Summary variables covering work experience and income for

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<sup>6</sup>Sample households in SIPP are subdivided into four smaller groups that rotate the month of interview in order to ease collection and processing burden. One cycle of four interviews covering the entire sample, using the same questionnaire, is called a wave. It takes data from four waves to provide calendar-year data for all households.

<sup>7</sup> The panel is the length of time over which sample households are interviewed. The 1984 and 1990 panels are two and one-half years long.

calendar years were created by summing monthly values across the year. Since some persons present in the SIPP March interviews were not interviewed in all months of the previous calendar year, a method was required to fill in information for these missing months. In order to arrive at annual totals for persons with missing interview months, a straight line extrapolation based on the observed months was employed.

Each of these methods for estimating income from the SIPP is conceptually different and is expected to yield slightly different aggregate income estimates. The method based on the March CPS "look alike" was expected to provide the smallest estimates of aggregate income since it excludes the income received by persons who died or entered the noninstitutional population during the period between January 1 of the reference year and the time of interview in March of the succeeding year (Note the March-based SIPP, like the March CPS, includes a small number of persons who spent the entire reference year in the institutionalized population or otherwise outside the survey universe but entered the household after the end of the reference year). The method based on the longitudinal file was expected to provide slightly higher estimates since its universe includes persons in the noninstitutional population as of January 1 who died or entered the institutional population from January 1 to December 31 (it should be noted that the longitudinal-based method excludes those persons entering the institutional population after January 1, 1990 as the weights reflect the institutional population as of that date). The method based on summing the cross-sectional monthly estimates was expected to provide the highest estimates since its universe includes the total noninstitutional population for each month of the year.

Table 8 gives us some indication of actual differences between aggregate income across SIPP methodologies. After the refined analysis we suspect fewer differences by source than earlier reported.

## **DERIVATION OF INDEPENDENT INCOME ESTIMATES**

### **Background**

Over the years evaluations of both the March CPS and SIPP income data have been undertaken by comparing the survey data to independent estimates. Most often, the independent estimates are derived from sources such as the NIPA, individual income tax returns, data from the Social Security Administration, caseload data from various transfer programs, etc.

Using independent estimates of aggregate income for purposes of assessing data quality are somewhat problematic since the data from independent sources are rarely comparable to the survey data and adjustment procedures to make them totally comparable are usually inadequate. In addition, periodic revisions to the independent data make it difficult to develop a time series of comparable

estimates.

Two main types of adjustment are required to make the independent estimates comparable to survey estimates. One type is needed to adjust the universe of income recipients to match the survey universe. This adjustment requires 1) removing income received by persons living in institutions (not in the sampling frame), 2) removing income received by persons who were alive during all or part of the survey reference period, but who died before the interview date, and 3) removing income received by persons living outside of the borders of the United States.

The second adjustment involves resolving differences between survey and independent definitions of income. The most significant components of this adjustment involve 1) removing "imputed" incomes included in NIPA personal income, but not received by households, 2) adjusting for different treatment of depreciation, capital consumption and inventories that apply mainly to self-employment income, and 3) removing income that is received as a lump sum (one-time payment).

Because complete comparability cannot be achieved between the independent sources and the survey estimates, a degree of uncertainty accompanies any analysis involving the two. In addition to problems in making the adjustments cited above, the independent estimates themselves are subject to various errors and omissions. For example, the estimates in the NIPA undergo periodic revisions that often substantially alter previous estimates. These revisions can greatly affect the initial reading of data quality. NIPA estimates are also often criticized because they do not reflect estimates of the underground economy.

Some of the details regarding development of the independent estimates used in this study are contained in Appendix A. Where it was deemed necessary, a description of the derivation process has been included for a particular source. There are also frequent references and clarifications concerning the strengths and weaknesses of the independent estimates in the discussions of data quality.

### **Considering Alternative Independent Estimates**

While the NIPA accounts have been most often referenced in the formulation of independent estimates of aggregate income to evaluate income data collected in the March CPS, alternatives to the NIPA for such evaluations should be considered. One alternative is to use Federal individual income tax returns as a source of the independent estimates for some types of income. The

NIPA is conceptually more "complete"<sup>8</sup>, but it may be unrealistic to judge the performance of an income survey solely based on NIPA figures.

Both the IRS and the surveys share in collecting data from households and are vulnerable to some of the same sources of human error/problems. Yet we often find aggregate income for some income sources collected by the IRS to be higher. Because data from the IRS may also be informative in assessing the accuracy of the surveys, we have computed independent estimates derived from tax return information for selected income types. These estimates are shown in Appendix A. References to these estimates are made where appropriate.

### **Notes on Independent Estimates**

The independent estimates shown in the text tables and used for the evaluations of data quality in this report were derived by making adjustments that pertain to the March CPS environment (and March-based SIPP environment). Independent estimates that apply directly to the longitudinal-based SIPP and the sum-of-months (wave) SIPP are also shown in Appendix A, along with those consistent with the March CPS. Estimates for the longitudinal and sum-of-months alternatives reflect smaller adjustments for deaths and for the institutionalized population since all or some of the income received by persons in these universes are included in the survey estimates.

We developed independent aggregate income estimates for most of the 22 sources of income examined in this study. The methodology used to develop the independent estimates for some income sources is somewhat different than those used in previous efforts related to the March CPS (used for income years 1983 and 1987). Changes were made in several areas in order to improve the comparability between the survey and independent figures. Income types most affected by these refinements were veterans' payments, workers' compensation, and private pensions. For veterans' payments, a much larger adjustment was made for benefits received by the institutionalized population. For workers' compensation and private pensions, adjustments for lump-sum benefits were developed and applied. Social Security, Supplemental Security Income, and interest income were affected somewhat by larger adjustments to account for deaths.

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<sup>8</sup> First, the NIPA estimates include the income of persons not required to file tax returns. Second, the NIPA estimates reflect both taxable and nontaxable income amounts. Third, the accounting methods used in the NIPA, such as the treatment of depreciation, differ from those used in the IRS. Fourth, the IRS is subject to relatively high levels of underreporting for some income types.

## COMPARISONS OF SIPP AND CPS INCOME ESTIMATES

In this section, we compare SIPP and CPS aggregate income estimates. Much of the focus is on the changes between 1984 and 1990. The comparisons center around aggregate income estimates, but also include references to estimates of recipients and mean amounts. Comparisons to independent estimates are shown for both 1984 and 1990, where possible.

Most of the data used to make comparisons can be found in Tables 1, 2, 3, and 4. Table 1 shows comparisons of the surveys' aggregate income estimates. Table 2 shifts the focus to comparisons of the survey aggregate amounts to independent estimates. Table 3 contains comparisons of survey estimates of numbers of income recipients by source of income. Finally, Table 4 shows survey estimates of the annual mean amount received for each income source. As mentioned previously, the SIPP estimates shown in these tables were derived from the March "look alike" file.

As a general observation, the data in Table 1 seem to indicate some significant shifts in the relationship between SIPP and CPS aggregate income estimates during the 1984-90 period. Curiously, corresponding shifts do not appear for many of the recipient estimates shown in Table 3. We have not undertaken a thorough investigation of these changes and the apparent inconsistencies between changes in aggregate amounts and changes in recipient counts. Rather, we have noted them and entered into discussions that present some hypotheses that help explain why such changes may have taken place.

We have little hard evidence to explain the changes observed for most income sources. For one change, the large increase in the SIPP to CPS ratio for "other income", we do have an explanation. This shift was caused by changes in the March CPS processing system (See Appendix B).

We can only speculate on causes for most other SIPP-CPS changes. Some may have resulted from subtle changes in SIPP questionnaire wording or from the mix of the 1990 SIPP panel sample which includes about 3,000 cases transferred from the 1989 panel whose probability of selection was related to "low-income" characteristics. Changes in the way income is received may also be a factor, especially in the area of pension income where the incidence of lump-sum disbursements has been increasing. Since the SIPP and the CPS have markedly different data collection methods, the interaction of these collection methods with changes in modes of income receipt may have resulted in changes in their relative performances over time.

For some income types a curious pattern emerges that shows the SIPP providing higher estimates of income recipients than the CPS but lower estimates of the total aggregate amount received. This pattern is apparent for both 1984 and 1990, yet more frequently

for 1990. The CPS, therefore, is providing significantly higher estimates of the mean amount received annually for many income types. While this relationship in the means is not unexpected, as the SIPP was designed to "pick up" more part-year recipients, we would not have anticipated lower SIPP aggregates. At present, no solid explanation for this relationship exists. However, the following thoughts may be relevant.

The SIPP was designed to improve the reporting of incomes that are typically received on an irregular or part-year basis. The SIPP's larger estimates of recipients indicate that the multiple interview scheme appears to be capturing short-term recipients (receiving small amounts) that are missed in the CPS. It would appear, however, that relative to the March CPS, the SIPP provides lower counts of higher income recipients.

But why does the SIPP seem to miss more high income recipients than the CPS? One may speculate on several causes. Differences in the recording of lump-sum payments may play a role. In the CPS the income definition excludes lump-sum payments and there is no mechanism to record them on the questionnaire. In the SIPP, income received as a lumpsum is collected, but labeled simply as "lump-sum income" (the specific source is not recorded). Even though the March CPS income definition excludes lump-sum payments, the possibility to erroneously report these payments exists. Large amounts will certainly be very salient to the March CPS respondent, and there is little or no probing during the interview that would help sort out the lump-sum payments from those received on a regular basis. On the other hand, in the SIPP, the monthly recording of income amounts presents a situation in which lump-sum amounts can be more easily identified and handled properly.

A second possibility is that it is not the SIPP but the CPS that has the problem. That problem would be the overreporting of amounts. While the lump-sum hypothesis mentioned above is a form of overreporting, some respondents could simply overreport the annual amount of periodic payments as well. This may be happening, but we have no hard evidence. It would certainly be easy for respondents to annualize monthly payments received at the time of the interview, thus incorrectly specifying the monthly amount received last year (if it had changed during the previous calendar year) or overstating the number of months in which payments were received. Further research seems clearly warranted.

## **Wage and Salary Income**

**SIPP vs. CPS.** Comparing the SIPP and CPS estimates of aggregate wage and salary income shows the SIPP to be about 5 percent lower than the CPS in 1990. The SIPP estimate was \$2,476 billion compared to \$2,614 billion for the CPS. This shortfall exists in the SIPP, even though SIPP provides an estimate of wage and salary recipients that exceeds the CPS estimate by about 2

percent (127.3 million recipients from the SIPP, versus 124.6 million from the CPS).

Comparisons for 1984 show approximately the same SIPP-CPS relationships. For that year, the SIPP aggregate estimate of \$1,663 billion was 7 percent below the CPS and the recipient estimate of 116.0 million was a little more than 1 percent higher than the CPS.

As reported in the earlier evaluation of the 1984 SIPP panel by Vaughan, the SIPP provides larger (improved) estimates of income recipients, but a lower estimate of the aggregate amount received when compared to the CPS. Since no definitive studies have been carried out, we have few specifics regarding the causes for the lower SIPP aggregate.

Several plausible explanations are worth noting. First, it seems likely that the SIPP data collection environment is more conducive to reporting "take-home" pay than the CPS since monthly amounts are recorded in the former. This would bias SIPP income estimates downward. Second, the CPS environment more easily facilitates the reporting of current amounts annualized, rather than the total amount received during the previous calendar year (for example, reporting current annual salary or current monthly salary x 12). This would tend to bias the CPS estimates upward. Third, in SIPP, "extra" paychecks received by persons paid in a weekly or biweekly manner may sometimes be missed. For workers paid weekly, current SIPP editing procedures attempt to identify months in which 5 paychecks are received and to correct the amount, if it appears that the fifth paycheck had been overlooked. There is no such edit for workers paid biweekly and this type of error would bias the SIPP estimates downward. Independent Estimate. The NIPA-derived independent estimate for wage and salary income for 1990 was about \$2,696 billion. The SIPP estimate is 92 percent of this amount and the CPS is 97 percent of this figure. Comparable ratios for 1984 were 91 percent for the SIPP and 97 percent for the CPS.

When compared to income reported on Federal individual tax returns, both 1990 survey estimates of wages and salaries are closer to the alternative benchmark, with the CPS estimate surpassing the tax aggregate (the tax return amount was \$2,576 billion). The NIPA-based independent estimate referenced above includes deferred amounts of wage and salary income, the wages of nonfilers, and estimates of unreported wages, while the amounts reported on tax returns excludes these components. In 1984, the CPS estimate was below the aggregate tax return wage and salary amount. The SIPP estimates were lower than the tax return amount for both 1984 and 1990.

### **Self-Employment Income**

SIPP vs. CPS. Direct comparisons of survey estimates from the SIPP and the CPS are invalidated by the fact that the self-

employment income concepts used in these surveys are quite different. In the CPS, the intended concept is consistent with the sole proprietor/partnerships income reported on tax returns. The IRS measure of self-employment income--gross revenues minus expenses--factors in changes in the value of inventory and allows for depreciation in the calculation of expenses. In the SIPP, the concept is "salary or draw" or any other money taken out of the business. Given these conceptual differences one might expect that the CPS estimate would be significantly lower than the SIPP estimate. This is, in fact, the case. In 1990, the SIPP self-employment income amounted to about \$268 billion compared to only \$228 billion from the CPS (note that these amounts exclude the earnings of the self-employed owners of incorporated businesses which are treated as wage and salary income in both surveys).

Whatever the comparability problems, it is important to note a marked shift in the relationship between the SIPP and CPS estimates of self-employment income between 1984 and 1990. The 1990 figures show that the SIPP estimate was about 18 percent above the CPS. In 1984, however, the SIPP aggregate was much higher, about 48 percent above the CPS amount.

Since the concept of self-employment as a labor force activity is the same in both surveys, it is possible to compare estimates of number of income recipients. This comparison shows the SIPP provided lower estimates than the CPS in both 1984 and 1990. In 1990, the CPS yielded an estimate of 14.3 million recipients compared to 12.9 million from the SIPP. In 1984, the gap between the SIPP and CPS was only 0.6 million, with the CPS estimate being 12.2 million compared with 11.6 million in the SIPP.

Independent Estimate. Of all of the income sources, self-employment income is perhaps the most difficult with regard to development of useful independent estimates. Starting with the NIPA as the base and using traditional adjustment methodologies to derive a survey-consistent independent estimate, we arrive at a figure of \$341.4 billion for 1990. Comparison of the surveys' estimates to this benchmark would indicate that both the SIPP and CPS have very serious downward biases in their estimates. In contrast, if we compare the survey estimates to the tax return data yardstick, we find that the SIPP and the CPS estimates are far in excess of the independent target.

The NIPA and tax return concepts differ in a number of significant ways, and these differences lead to this bizarre result. Based on the BEA reconciliation of the NIPA with tax returns, it appears that most of the gap between the two sources can be attributed to self-employment income that was not, but should have been, reported on tax returns. The survey estimates fall somewhere between the NIPA and IRS survey benchmarks.

Putting these inconsistencies aside and examining rates of change in these various aggregates and recipient counts between 1984 and 1990, we find both the SIPP and the CPS measure much slower growth than indicated by tax returns. The number of tax returns



reporting self-employment income rose by 29 percent during the period, and the aggregate amount of self-employment income on tax returns rose by 98 percent. The rates of change for the surveys were much smaller. For the aggregate amount, the surveys show an increase of 69 percent for the CPS and 35 percent for the SIPP. Recipient counts increased by about 14 percent for each the CPS and SIPP.

## **Social Security**

**SIPP vs. CPS.** The SIPP has maintained improvements relative to the CPS in the reporting of Social Security income, in spite of the fact that the reporting in the CPS has generally been very good. These improvements include both higher estimates of the aggregate amount received and higher numbers of recipients. In 1990, the SIPP estimate of the aggregate was about 6 percent higher than the CPS and the estimated number of recipients exceeded the CPS recipients by a similar rate, 4 percent. Roughly the same level of improvement was noted for 1984 where the SIPP aggregate is about 5 percent above that of the CPS and the number of recipients exceeded the CPS estimate again by about 4 percent<sup>9</sup>.

Independent Estimate. The NIPA-based independent estimate of aggregate Social Security income for 1990 was \$225.5. The SIPP estimate is only 2 percent below this amount, while the CPS estimate is 7 percent lower than the independent benchmark. Computation of the independent estimate for 1990 incorporated somewhat larger adjustments than applied in the past for the institutionalized and for persons living outside of the country. In deriving the benchmark, deductions of \$11.5 and \$5.2 billion were made for the institutionalized and civilians overseas, respectively.

Comparisons of survey aggregates to independent estimates indicate that both surveys' levels of under reporting remained constant over time. The SIPP was about 4 percent below the independent mark in 1984 while the CPS estimate was about 8-percent under reported.

## **Railroad Retirement**

**SIPP vs. CPS.** The SIPP maintained its relative advantage over the CPS regarding aggregate Railroad Retirement income in both 1984 and 1990. This is because both surveys maintained their 1984 aggregate income levels (about \$6 billion in the SIPP and \$4

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<sup>9</sup>The percent advantage SIPP had over the CPS in aggregates and recipients in both 1984 and 1990 was about 5 percent.

billion in the CPS), despite apparent differences. In both 1984 and 1990, the SIPP estimate exceeded the CPS figure by about 39 percent.<sup>10</sup>

Corresponding estimates of annual recipients indicate that there were no significant changes in 1984 levels for both surveys; SIPP recipient estimates remained higher.

**Independent Estimate.** The SIPP estimate of the aggregate amount of railroad retirement for 1990 was 96 percent of the \$6.9 billion independent estimate, compared to 67 percent for the CPS. A look at 1984 indicates that the SIPP and CPS performances to independent benchmarks remained unchanged over time.

### **Unemployment Compensation**

**SIPP vs CPS.** Early comparisons of the SIPP and CPS aggregate amounts of unemployment compensation for 1984 did not reflect anticipated gains over the March CPS (gains stemming from the SIPP design). This comparison of SIPP to CPS in 1984 showed the SIPP aggregate to be comparable to the CPS aggregate. In 1990, the findings are similar, with the SIPP aggregate of \$14.9 billion also being comparable to the corresponding CPS figure.

The lackluster performance of SIPP with regard to aggregate income is in contrast to SIPP's performance in terms of recipients. There, the SIPP has made some significant gains. For example, in 1990, the recipient count from the SIPP was 21 percent above the CPS, and in 1984 it was 12 percent higher.

Obviously the lack of gains registered in the SIPP aggregate relative to those noted for recipient counts indicate that the SIPP mean amounts are smaller than in the CPS by about 11 percent each time period. Certainly, one might expect higher means from the CPS because respondents are more likely to forget short spells of unemployment when they received small amounts. But for the SIPP to provide an aggregate that is comparable to the CPS with a recipient count that is 21 percent higher is a mystery. Could it be that the CPS respondents are over reporting their amounts? Or could it be that the SIPP misses persons who have longer spells of unemployment? Or perhaps the SIPP respondents are under reporting on amounts. We can only speculate.

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<sup>10</sup>The 1990 CPS aggregate Railroad Retirement income was not significantly different from the 1984 SIPP aggregate income level.

One possible cause of under reporting in SIPP might be that SIPP fails to "pick up" all payments in months where multiple payments are received. As noted for persons receiving wage and salary pay weekly, SIPP may be missing one of the paychecks received in months having 5 disbursements (paydays). SIPP's performance might improve if the number of checks received each month is asked before asking the check amounts. In fact, this practice might improve the performance for other income sources as well.

Independent Estimate. Both the SIPP and the CPS estimates for 1990 appear to be improved somewhat over 1984. The independent estimate for unemployment compensation is \$17.7 billion for 1990. The SIPP aggregate is about 84 percent of this amount, and the CPS estimate comes in at a comparable 80 percent of the target figure. In 1984, both the SIPP and CPS estimates reached about 75 percent of the benchmark figure<sup>11</sup>.

### **Workers' Compensation**

SIPP vs. CPS. SIPP moved from outperforming the CPS aggregate income in 1984 to yielding no advantage in 1990. Both the SIPP and CPS rose to about \$13 billion, up from \$8.0 billion for the SIPP and \$6.8 billion in the CPS. The rate of increase in the means was greater for the CPS, at a 75 percent increase from \$2,720 to \$4,759, and a 36 percent increase for the SIPP, from \$2,500 to \$3,405<sup>12</sup>.

Reciency amounts were higher for the SIPP both years. For 1990, the SIPP shows about 3.7 million persons receiving workers' compensation while the March CPS indicates only 2.8 million recipients. In 1984, the comparable figures were 3.2 million for the SIPP and 2.5 million for the CPS.

According to administrative records, workers' compensation benefits (including both periodic and lump-sum payments) rose by 74 percent, from \$13.3 billion in 1984 to about \$23.1 billion in 1990. The SIPP increased at a statistically comparable rate. The CPS increase was 93 percent.

We suspect that the shift in the positions of the SIPP and CPS aggregate amounts may be related to changes in the level of

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<sup>11</sup>The level of completeness (survey to benchmark ratio) for the 1990 CPS and the 1984 SIPP were not significantly different.

<sup>12</sup>The 1984 SIPP workers' compensation mean, \$2,720, is not statistically different from the 1990 CPS level, \$2,500.

lump-sum payments, workers' compensation payments and/or in the way in which the questionnaires handle them. We do not, however, have any hard evidence.

While both surveys intend to exclude lump-sum amounts, one could reasonably hypothesize that errors of inclusion are more likely to occur in the CPS where only annual totals are recorded.

**Independent Estimate.** Our independent estimate of aggregate workers' compensation was \$14.6 billion for 1990. Our latest efforts to develop independent estimates for worker's compensation in 1990 includes an adjustment for lump-sum payments. Adjustments for lump-sum payments have not been previously made in the derivation of the independent estimate for this income source. This adjustment is based on conversations with knowledgeable persons within the insurance industry and should be considered "rough".

The estimated lump-sum adjustment, \$8.2 billion in 1990, is more than one third of the total payments made in that year, \$23.1 billion (\$23.1 billion consists of the sum of periodic workers' compensation, \$14.6; lump-sum payments, \$8.2 billion; and Black Lung payments, \$0.3 billion).

In previous comparisons to benchmark estimates for 1984 (before the lump-sum adjustment), the CPS estimate was about half of the independent aggregate, and the SIPP estimate was a little over half the benchmark. In 1990, comparisons show the SIPP to be about 90 percent of the benchmark and the CPS to be at about a comparable level. Since some reporting of lump-sum payments occurs in the surveys, and since the lump-sum adjustment is considered a rough guess, the independent estimate may be understated relative to the survey concepts and thus the surveys' performances for 1990 may not be at such high levels. We believe, however, that the survey accuracy is much closer to the higher levels estimated for 1990 than those previously cited for earlier years.

Given that lump-sum payments make up such a large proportion of the total, any change in the data collection procedures or instructions that altered interviewer behavior regarding lump-sum payments could have had a significant effect. In addition, if lump-sum payments were more likely to occur in 1990 than in 1984, the effect of errors in recording these amounts may have been magnified.

### **Supplemental Security Income (combined Federally administered and State-administered benefits)**

SIPP vs. CPS. The SIPP held no significant advantage over the CPS in terms of aggregate Supplemental Security Income (SSI)

in both 1984 and 1990. The survey estimates rose from about \$8.6 million to about \$12.5 billion. Both surveys showed an increase in recipients during the 1984-90 period of about 15 percent.

Independent Estimate. In 1984, SIPP was at about 89 percent of the \$9.9 billion benchmark, comparable to the CPS level of 85 percent the benchmark. Estimates for 1990 show the SIPP to be at 95 percent of the independent estimate, not significantly different from the CPS estimate at about 89 percent<sup>13</sup>.

Some of the apparent improvement in the performance of both surveys may be related to changes that have taken place in the SSI program and the effect these changes have had on the data collection process. In 1989, the SSI program was expanded to include disabled children. Since neither survey includes income questions explicitly covering SSI received by children or their guardians, independent estimates exclude payments for them (about \$1.7 billion in 1990). However, since it is likely that some of the SSI payments for children were probably reported by parents and guardians, the adjustment to remove all child payments from the independent estimate may have been too large. The benchmark, therefore, may be conceptually correct, but fail to reflect the reality of survey data collection (it is somewhat similar to Social Security benefits received by minors, in which case both questionnaires do have explicit questions).

## **Public Assistance**

**SIPP vs. CPS.** Comparisons for public assistance (this income source includes Aid to Families with Dependent Children (AFDC), General Assistance, and "other welfare" collectively) show the surveys maintaining estimates comparable to one another in both 1984 and 1990; while not readily apparent, SIPP aggregate income estimates from all methodologies were comparable to one another and the CPS estimate both time periods (between \$13.2 and \$14.5 billion in 1984, and between \$16.1 and \$16.7 billion in 1990, summed from table 11).

AFDC aggregate income increased between 1984 and 1990, in both surveys. Both surveys' improvement in aggregate AFDC income was supported by bigger means in 1990 than in 1984 and additionally for the CPS, by an increase in AFDC recipients over time

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<sup>13</sup>SIPP's 1990 performance did not differ from its 1984 performance, nor the CPS' 1990 performance.

(Reciprocity levels of AFDC did not change over time for any SIPP methods<sup>14</sup>).

Aggregate "other welfare" income went unchanged. Reciprocity levels of "other welfare" income declined for the SIPP over time. Changes occurred in some SIPP and CPS methodologies concerning mean "other welfare" income. Yet, the net effect on aggregate "other welfare" income was inconsequential<sup>15</sup>.

Overall, SIPP estimates of total public assistance recipients showed deterioration relative to the CPS. In 1984, the combined count of recipients for AFDC and other public assistance was about 18 percent higher than the SIPP, using the March-based SIPP estimation. In 1990 this gap had closed to approximately 8 percent. Specifically, the SIPP total public assistance recipient count decreased, and the CPS count remained unchanged.<sup>16</sup>.

Independent Estimate. Our aggregate independent estimate of public assistance income (AFDC, General Assistance, and Emergency Assistance) is \$22.6 billion for 1990. Both the SIPP and CPS estimates are significantly below this level to a similar degree; the SIPP estimate of \$16.3 billion (March-based definition) is 72 percent of the benchmark. The \$16.6 billion CPS estimate is about 73 percent of the target, comparable to the SIPP level.

The quality of the survey estimates of total public assistance relative to the benchmark decreased from a level of about 85 percent the benchmark (for each survey) in 1984 to about 73 percent in 1990 (from summation of benchmarks in table 2).

Program sources indicate an increase of about 14 percent in the number of AFDC families between December 1984 and December 1990 (from 3.7 to 4.2 million). The CPS recipient estimate increased from 3.6 to 3.9 million persons, while the SIPP estimate remained at about 4.0 (using either the March-based or the longitudinally-based figures). All in all, both surveys hovered at or around the benchmark levels each year.

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<sup>14</sup>The 1990 AFDC reciprocity count from the CPS is not significantly different from counterpart SIPP estimates from the March SIPP and longitudinal SIPP methodologies.

<sup>15</sup>With later refinements in our analysis, we learned there were no significant differences in public assistance aggregate income levels across SIPP methodologies.

<sup>16</sup>Our estimates slightly over count total public assistance reciprocity, because we have simply summed the recipient counts of those receiving each source.

The SIPP estimate of other welfare recipients (i.e. General Assistance, etc) dropped significantly from 2.0 million to 1.5 million, but that of the CPS remained constant (about 1.4 million)<sup>17</sup>. Administrative sources show virtually no change in the average monthly number of general assistance recipients between 1984 and 1990.

## **Veterans' Payments**

**SIPP vs. CPS.** In terms of aggregate income, the SIPP estimate exceeds that of the CPS in 1984 but loses its advantage in 1990 as a result of gains in the CPS aggregate. The CPS aggregate increased by 29-percent, compared with SIPP maintaining its 1984 level. The SIPP aggregate for 1984 was about 37 percent above the CPS but comparable in 1990.

While the SIPP aggregate income position relative to the CPS deteriorated, the SIPP continues to provide significantly higher estimates of the number of recipients of veterans' benefits. In 1984, the SIPP estimate was 4.4 million persons compared to 2.9 million from the March CPS. By 1990, the SIPP estimate had declined to about 3.4 million while the CPS estimate had retreated by only 0.3 million to 2.6 million.

The decline in recipients contributed to the fall in the SIPP aggregate relative to the CPS. Higher mean levels for the CPS in 1990 also contributed to the CPS attaining a comparable aggregate income standing with the SIPP in 1990<sup>18</sup>.

How is it that SIPP provides an estimate of recipients that is about 31 percent above the March CPS for 1990, yet provides an aggregate that is only comparable? As has been noted for other sources of income, the 1990 CPS estimate of the mean amount received is larger than the SIPP estimate. Could it be that the March CPS recipients are over reporting their annual benefits? We have long suspected respondent confusion between these two sources of income. We have contended that veterans' payments are being reported as military retirement in the CPS, however, this would likely result in a lower, not higher estimate of mean military retirement amounts. This notion is based on the fact that the CPS aggregate income amount for military retirement is usually relatively near the independent estimate, when considering each of the public pensions.

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<sup>17</sup>AFDC reciprocity in the 1984 surveys were not significantly different from this 1984 benchmark. Also, the 1990 SIPP reciprocity and benchmark levels were not significantly different.

<sup>18</sup>The mean amounts received in the two surveys rose by similar rates between 1984 and 1990, despite appearances.

Independent Estimate. The 1990 SIPP and CPS surveys achieved about 81 percent the benchmark, \$13.8 billion, despite appearances. Relative to relationships in 1984, the SIPP maintained its 1984 level of completion, while the CPS estimate climbed from a 1984 level of about 60 percent of the benchmark.

We must note that calculation of the independent estimate in 1990 included a much larger adjustment for the institutionalized than used in benchmark computations in previous years. In 1990, 6.6 percent of veterans payments were attributed to the institutionalized population. In 1984, only 1.5 percent of the aggregate was counted as being received by this group. We believe that the earlier estimates of the benefits received by this group were too low. Additionally, the adjustments for payments abroad were slightly smaller in the later year.

The SIPP estimates of recipients compare more favorably to those derived from administrative sources. In 1984, the VA indicates about 4.1 million persons were receiving veterans compensation and pension benefits and about 570,000 veterans and dependents were receiving education benefits (monthly counts for December 1984). In 1990, the number of compensation and pension recipients declined to 3.8 million and those receiving educational assistance to about 360,000.

The estimated number of recipients (compensation, pensions, and educational assistance, excluding loans) declined for both surveys, with a 23-percent decline noted for SIPP and a 10-percent decline provided by the CPS.

Data from the Veterans Administration(VA) indicate a decline of about 7 percent in those persons receiving veterans compensation or pensions and 37 percent drop in the number of persons receiving educational assistance between 1984 and 1990<sup>19</sup>.

## **Pension Income**

**SIPP vs. CPS** When aggregate income estimates from SIPP and the CPS are compared for 1990, the SIPP gains indicated by Vaughan's evaluations of 1984 pension income are no longer apparent. In 1984, the SIPP estimate of aggregate total pensions received exceeded that of the CPS by about 13 percent( \$97 billion for SIPP and \$86 billion for the CPS). In 1990, however, the SIPP estimate of \$143 billion was comparable to the CPS estimate of \$150 billion. SIPP declines relative to the CPS aggregate were noted for private

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<sup>19</sup>Data from the VA are components of veterans' income and, thus, are not to be directly compared with the survey estimates which reflect veterans income reported collectively.



pensions, federal pensions, and state and local pensions. Specifically, for private or state and local pensions, the SIPP estimate, which was higher than the CPS in 1984, appeared to have actually become comparable to that of the CPS in 1990. For federal pensions, the CPS surpassed the SIPP estimate in 1990 while being comparable in 1984. The SIPP estimate for military pensions aggregate income was comparable to that of the CPS in both years. In fact, the surveys did not change levels over time.

It is not clear why the relationship for aggregate military pensions income remained constant for both surveys while SIPP showed declines relative to the CPS for the other three pension types. It may be related to the problem noted previously for veterans' payments. We have seen that the SIPP veterans' benefit estimates declined significantly relative to the CPS. Perhaps more veterans' payments were misreported as military retirement in 1990 than in 1984.

In terms of recipient counts, we find deterioration in SIPP relative to the CPS level for public pension estimates. Yet, SIPP maintains a superior standing of private pension recipients. For 1990, we see that the SIPP recipient estimates of both federal and state and local pensions are comparable to their respective CPS estimates. However, the 1984 SIPP estimates of each of these public pensions were higher than CPS estimates in 1984. With no increases in SIPP recipient estimates for federal pensions and state and local pension between 1984 and 1990, it allowed the CPS to catch up. Estimates for military pension beneficiaries appear to have remained static over time at about 1.5 million persons for both surveys.

The overall shift in the SIPP-CPS total pensions aggregate income relationship together with the lack of a shift in total pension recipient levels translate, in part, to larger mean pension amounts in the CPS in both 1984 and 1990. Of the four pension types, only private pensions mean income in 1984 and 1990 mirrored this trend. SIPP's mean amounts of each public pensions type were comparable to their CPS counterparts in both 1984 and 1990.

The CPS advantage in mean private pension income in SIPP may be related to major shifts toward payment of benefits as lump sums. It is clear that there have been large changes toward "defined contribution" pension plans during the 1980's and that these types of plans almost exclusively pay benefits in the form of lump sums. If the CPS is more likely to erroneously record lump-sum payments and lump sums became more common over the period, then the observed change in the CPS mean pension amount would seem to fit.

There is evidence, however, that clearly contradicts this hypothesis. If the CPS is more likely to "pickup" lump-sum payments and the proportion of lump-sum payments is increasing why does the SIPP-CPS relationship between recipients remain the same (SIPP having more in both 1984 and 1990)? This could only occur if recipients of lump-sum payments in the SIPP environment began receiving a regular income flow derived from the lump-sum amount following its receipt, and that the lump-sum amount was missed or

reported in the generic lump-sum income category. The aggregate amount of generic lump-sum income reported in the SIPP for 1990 was, however, only about \$9.3 billion, far short of the lump-sum retirement benefits estimated from independent sources for that year.

It is impossible to unravel this mystery without considerable effort. Regardless of the outcome of our continued investigation, it is apparent that the complexity surrounding the receipt of pension income overwhelms the current capabilities of both the SIPP and CPS questionnaires. A major revision to the manner in which we collect pension income questions needs to be adopted. This revision should permit the identification of lump-sum benefits, premature withdrawals, and disposition of the benefits (rolled over, saved, spent, etc).

**Independent Estimate.** A significant revision to our method for computing the independent estimates for private pensions requires that we discuss comparisons for this source separately from the comparisons for the public pension sources. These revisions, which apply only to the 1990 estimate, were made in an attempt to remove, for the first time, the lump-sum amounts that are becoming an increasingly important method of payment.

Our survey-comparable independent estimate for private pensions for 1990 is \$70.2 billion. In this derivation we have excluded a total of \$66.5 billion in estimated lump-sum benefits (actually benefits paid by defined contribution plans). Comparing the survey estimates to the independent estimate, we find that the survey estimates exceed the independent estimate by about 7 percent for the SIPP and a comparable 11 percent for the CPS. As it is rare that survey estimates exceed the independently-derived figures, it appears that our adjustment for lump-sum payments may have been too large. It is also possible that the survey estimates include a significant portion of the lump-sum payments that we have attempted to exclude. Indeed, the lump-sum income category in the SIPP captures only \$9.3 billion in these types of payments.

The independent estimate without an adjustment for lump-sum payments seems even more implausible than the \$70.2 billion cited above. If no adjustment had been made, the independent benchmark for private pensions would have been about \$141 billion. The survey estimates are only 53-55 percent of this figure. While regular private pension payments may be somewhat less salient and more complicated than Social Security payments, we can think of no good reason why the reporting of this income source should be so much worse than Social Security (the latter was reported at between 93 and 98 percent the independent estimate).

Independent estimates for public pensions were computed without adjustment for lump-sum payments as it was felt that these types of payments did not make up a significant part of the overall aggregate. In 1984 the SIPP estimates appear more complete than the CPS for the reporting of two of the three pension types--federal employee pensions (98 percent compared with 85 percent) and

state and local pensions (88 percent, compared with 72 percent). Military retirement completion levels were comparable (105 percent compared with 98 percent). It is important to note--while not apparent--that SIPP's level of reporting benchmarks were comparable for each public pension type.

In 1990 the SIPP edge vanishes, leaving the SIPP and CPS reporting comparable levels of the benchmarks (federal pensions, comparable at 73 and 83 percents; state and local pensions comparable at 75 and 80 percents; and military retirement comparable at 92 and 89 percents)<sup>20</sup>.

What specifically occurred for the individual public pensions was that between 1984 and 1990, the SIPP estimates fall relative to the independent estimates for two of the three sources, federal and state and local pensions, while the CPS estimates fall for one of the three, state and local pensions<sup>21</sup>.

The seemingly poorer data quality for public pensions for 1990 may be related to our inability to adjust the public pension benchmarks for increased levels of lump-sum payments. It may be related to other factors as well. Unlike for private pensions, we do not find the magnitude of increase in the SIPP recipient counts of public pensions that we would have expected. We recommend that a more thorough investigation be made in this area to try to determine the causes for the declines noted here. On the CPS side, we generally find increases in recipient counts (for federal pensions and state and local pensions) but still find a decline relative to the independent aggregates. These percent declines in CPS aggregates tend to be somewhat smaller than observed for the SIPP for the public pensions--except military pensions, for which the percentage change was comparable.

## **Interest Income**

**SIPP vs. CPS.** Comparisons of SIPP and CPS estimates of interest income are difficult to make because there is a major

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<sup>20</sup>The SIPP's level of completion for federal pensions in 1990 (73 percent) and state and local pensions (75 percent) were comparable. The CPS's level of completion for the federal pensions (83 percent) and state and local pensions (80 percent) were comparable. Additionally, the CPS's level of completion for federal pensions and military pensions were not significantly different (83 percent versus 89 percent). However, the CPS's completion level for military pensions was significantly different from its state and local income completion level (89 percent versus 80 percent).

<sup>21</sup>"Completion rates" for each public pension income source, for both years (as discussed in the prior three paragraphs) were tested for differences between one another in one all-encompassing test. We only mention results of the most obvious comparisons in the paragraphs and footnotes.

difference in the way that these two surveys impute for missing responses on the amount of interest received. The CPS procedures contain a post-imputation adjustment that attempts to correct for known downward biases in the imputation of missing amounts. In 1984, this adjustment added \$28.3 billion to the amount of imputed interest income in the CPS and raised the pre-adjustment aggregate by 26 percent. This procedure has not been integrated into the SIPP imputation process.

As the CPS interest income aggregate exceeded that of the SIPP by 15 percent in 1984 and a comparable 13 percent in 1990, it would appear that the SIPP just maintained its standing relative to the CPS in the collection of aggregate interest income (The CPS reflects the 26-percent adjustment noted above). However, some gains in interest income are evidenced by SIPP with larger estimates of interest income recipients than the CPS has. Here, the SIPP estimates in 1984 and 1990 exceed the CPS recipient counts by 26 and 22 percent, respectively.

Independent Estimate. Interest income is an income source for which alternative independent estimates may provide a better (more reasonable) picture of data quality than that derived from the NIPA. In examining previous comparisons of survey estimates with independent estimates derived from the NIPA, such as the study by Vaughan covering SIPP and the CPS for 1984, we find that the SIPP aggregate estimate was only 48 percent of the interest benchmark and the CPS was 57 percent of the NIPA benchmark (45 percent without the post-imputation adjustment)<sup>22</sup>.

It may be more appropriate, as Vaughan suggests, to use independent estimates derived from tax returns rather than the NIPA data for evaluating the survey data (similar alternative estimates have been incorporated in CPS evaluations for 1987). Several alternatives to the independent estimates based on the NIPA are considered in this discussion.

The first alternative is based on the NIPA, but excludes interest income received by fiduciaries on behalf of persons. Historically, income received by fiduciaries has consisted of such income sources as interest on IRA and KEOGH plans and on life insurance policies; the CPS presumes to include this interest in the survey's definition, however, it is likely that little is reported. The SIPP has always excluded these sources of interest income, mainly because it uses a 4-month reference period and reporting of this income on a sub-annual basis was deemed impossible by those designing the questionnaire. Exclusion of these sources of interest from the NIPA-based independent estimate reduces the aggregate for 1990 from \$355.2 billion to \$282.8 (see Appendix A). This is the

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<sup>22</sup>The 1984 SIPP aggregate interest income as a percent of the NIPA benchmark (48 percent) was not significantly different from the 1984 unadjusted CPS level (45 percent).

estimate shown in Table 2.

A second alternative is to simply use the amount of interest income reported on Federal individual income tax returns as the independent estimate. This is clearly somewhat of an underestimate because it excludes interest received by nonfilers, it excludes tax-exempt interest income, and it excludes unreported interest income. Using this source for 1990 yields an independent estimate of \$221.5 billion (the most important difference between the NIPA estimate of \$282.8 and this estimate appears to be tax-exempt interest of \$38.7 billion and \$15.3 billion in unreported interest income).

Based on these two alternative independent estimates for 1990, the SIPP estimate of \$150.8 billion would fall somewhere in the range of 53 to 68 percent of the specified independent figure (note this SIPP estimate has not been adjusted upward to reflect the difference in imputation procedures noted earlier). Had an adjustment reflecting the CPS post-imputation process been applied to the SIPP interest amount (increase of 26 percent), the new aggregate would be \$190.0 billion and the benchmark comparisons would show SIPP to be 67 percent of the NIPA estimate or 86 percent of the IRS-based estimate. The CPS estimate of \$172.8 billion is either 61 or 78 percent of the benchmark aggregate<sup>23</sup>.

Evaluating the accuracy of interest income is further complicated by the fact that survey respondents and tax payers may sometimes misclassify dividends as interest and visa versa. Statements from financial institutions often use the word "dividend" when, in fact, the income source should more properly be termed interest for tax and other accounting purposes.

Another type of confusion stems from the different definitions of income used by surveys and independent sources; Income received from mutual funds (money market funds and other mutual funds) are classified as interest in the national income accounts, but in the surveys, earnings from mutual funds are explicitly split among interest and dividends--earnings from "mutual funds" are collected as dividends and earnings from "money market funds" collected as interest. For tax purposes, returns on "mutual funds" are reported as dividends (in 1990, income from these funds totalled \$48.3 billion). We reconciled the NIPA and IRS benchmarks to reflect the definition of the surveys.

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<sup>23</sup>The original 1990 SIPP aggregate as a percent of the IRS benchmark (68 percent) and the adjusted SIPP aggregate as a percent of the NIPA benchmark (67 percent) are not significantly different.

In the BEA reconciliation of Federal tax return income with the NIPA, the gap between tax returns amounts and NIPA was only 8 percent for interest income, but 82 percent for dividends. Much of this discrepancy for these two income types would not exist had there been no definitional difference with regard to mutual funds.

During the 1984-90 period, both surveys appear to have improved relative to the independent benchmark for interest income. For the SIPP the ratio to benchmark controls increased from 48 percent to 53 percent. A similar rise was noted for the CPS.

Both surveys seem to track the changes in interest income evidenced by Federal individual income tax returns. The growth in aggregate interest income during the 1984-90 period was about 27 percent for the SIPP and 25 percent based on the CPS, comparable rates. The aggregate taxable interest income reported on tax returns rose by 29 percent.

Increases in recipients were 7 percent based on the SIPP and 10 percent based on the CPS. Tax returns with interest income reported in AGI increased at a faster rate during this period, about 14 percent, from 62.1 million to 70.7 million returns<sup>24</sup>.

## **Dividend Income**

**SIPP vs. CPS.** The SIPP seems to have maintained its advantage in the reporting of dividend income over the March CPS. In 1984, we see that the SIPP aggregate income estimate exceeds that of the CPS by 27 percent (\$39.1 billion vs. \$30.7 billion). In 1990, the SIPP estimate was 47 percent higher than the CPS, not a significantly higher percent differential than for 1984, despite appearances. Additionally, the 49-percent change in the SIPP estimate was not significantly different from the 29-percent change in the CPS.

**Independent Estimate.** While estimates derived from the NIPA and Federal tax returns provide different notions as to the quality of the dividend data, they both indicate levels of under reporting. For 1990, the independent estimate based on the NIPA data was \$126.3. Total dividends reported on tax returns for 1990 was \$78.6 billion. The main components of difference between these two sources are 1) dividends received by IRA and KEOGH plans and by nonprofits and other fiduciaries (these are included in the NIPA estimate but not in tax return AGI) and 2) dividends not reported on tax returns (both by filers who failed to report the dividends and by nonfilers).

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<sup>24</sup>Utilizing different units of observation in surveys and benchmarks--persons and filers/returns--prevent a precise comparison of the two.

Between 1984 and 1990, the NIPA, Federal tax return data and SIPP indicate aggregate income percent increases comparable to the SIPP despite appearances (49 percent for SIPP, compared with 65 percent for the IRS and 77 percent for the NIPA). A significant proportion of the rise in the NIPA aggregate can be attributed to increases in dividends received by IRA and KEOGH plans, nonprofits, etc.

Comparing the dividend estimates for 1990 from the surveys to the NIPA-based figure shows that the SIPP "picks up" 46 percent of the total and the CPS only 31 percent. Comparisons based on tax returns show the SIPP at 74 percent of the IRS-based estimate and the CPS at the 50-percent level<sup>25</sup>.

Comparisons of the independent estimates for 1984 generally show a much higher concordance between the surveys and independent sources. For the SIPP the reporting rate relative to the \$59.3 billion NIPA independent estimate was about 66 percent and 83 percent of the \$47.0 billion tax return figure. For the CPS, the comparable rates were 52 percent relative to the NIPA and 65 percent relative to tax returns<sup>26</sup>.

Both surveys, and especially the CPS, seem to understate the increase in reciprocity as measured using Federal tax returns. Based on tax returns, the number of recipients (returns with dividends) increased by about 22 percent between 1984 and 1990. The SIPP shows a recipient increase of 18 percent while the CPS shows a 13 percent rise.

Vaughan had suggested that a significant part of the gap between the independent estimates and the surveys might be attributed to the dividends reported as estates and trusts. BEA estimates that for 1990 only about \$1.0 billion of the \$3.8 billion in estates and trusts should be attributed to dividends. It does not appear, therefore, that the gap for 1990 could be affected significantly by dividends reported as estates or trusts.

### **Rent, Royalties, Estates and Trusts**

**SIPP vs. CPS.** We combine rents and royalties with estates and trusts to lessen the noise that CPS processing changes of these

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<sup>25</sup>The CPS level of completion of the IRS benchmark (50 percent) and SIPP's reporting of the NIPA benchmark (46 percent) were not statistically different.

<sup>26</sup>SIPP's level of reporting relative to the tax benchmark was not significantly different between 1984 (74 percent) and 1990 (83 percent) SIPP dividends reporting relative to the NIPA benchmark (65 percent) and CPS reporting relative to the IRS benchmark (66 percent) are not significantly different.

two income sources would have on the SIPP/CPS comparison<sup>27</sup>. Even with that, the SIPP and CPS estimates shown in this comparison are not entirely comparable since the SIPP rent and royalties amounts include "income from other financial investments", an income source that is not specified on the CPS. While "other financial investments" can be identified separately on the SIPP wave files, it was combined with rents and royalties on the longitudinal file and, therefore, unavailable for this examination which is based on that file. Vaughan estimated that income from financial assets amounted to about \$15 billion in 1984. We have no estimate for this source for 1990.

Since an estimate for income from financial investments for 1984 exists, we can remove it from the SIPP estimates for that year. Before adjusting for financial investments, the SIPP aggregate estimate of rent, royalties, estates and trusts was \$46.7 billion (Sum categories in Table 1). Following removal of financial investments, the 1984 SIPP estimate of rent, royalties, estates and trusts was about \$31.7 billion, compared to the CPS estimate of \$26.3 billion.

The comparison for 1990 seems to indicate a significant shift in the SIPP and CPS relationship. Before any adjustment for income from financial investments, the SIPP estimate was \$52.3 billion compared to the CPS estimate of \$45.8 billion. Since no estimate of the income from financial investments for 1990 exists, no precise adjustment to account for the conceptual difference may be made. It seems likely, however, that the amount attributable to this income source would be somewhat larger in 1990 and that any reasonable adjustment would result in a CPS aggregate that exceeded the SIPP estimate by a significant amount.

As has been the case for so many income sources, the SIPP estimate of recipients exceeds that of the CPS (there is minor double-counting of recipients in the CPS from the combining of rents and royalties with estates and trusts). In 1984, the SIPP counted 17.6 million persons receiving rents, royalties, and income from other financial investments while the CPS counted 12.5 million recipients. The SIPP count of recipients remained relatively constant between 1984 and 1990 (around 17.5 million), while the CPS count rose to 13.1 million.

Independent Estimate: Rents and Royalties. In our opinion, limited credence should be given to any evaluations of the quality of the survey estimates of rent/royalty income using independently derived estimates. One only need look at some of the differences between NIPA and Federal tax return amounts to come to a similar conclusion. In 1990, the NIPA estimate before reconciliation with

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<sup>27</sup> The 1984 estimate of "estates and trusts" in the CPS was processed to include both survivor's income and all other estates and trusts" The CPS processing for 1990 put "all other estates and trusts" together with rent and royalties, and had a separate category for survivor's income estates and trusts.



survey estimates was -\$12.3 billion, but the net amount reported on tax returns was \$4.8 billion. A third estimate, based on the Bureau of Economic Analysis's (BEA) annual reconciliation of the NIPA with AGI, indicates that their estimate of the amount that should have been reported on tax returns was \$37.6 billion. The CPS estimate for 1990 was \$38.7 billion, comparable to the BEA-reconciled tax return benchmark.

Tax data indicate that the number of returns with rent and royalty income was declining during the 1984-1990 period. For 1984, the count of returns with rent or royalty income was about 9.4 million. By 1990 this count had fallen to only 6.5 million.

**Independent Estimate: Estates and Trusts.** Because estates and trusts are not included as a separate income type in NIPA personal income, no independent estimate is available from that source. The BEA includes the underlying components of income (i.e. interest, dividends, rents, etc.) in the appropriate income categories. Data from tax returns also fail to provide a precise estimate of this income source, because the instructions for completing the individual income tax return request that the income received from estates and trusts be reported by component rather than specifically as estate and trust income on Schedule E. Thus, on tax returns, the amount of dividends is supposed to include dividends received by persons having estates or trusts.

To further complicate the issue, changes in the tax regulations eliminating the \$400 exclusion for dividends may have altered tax payer behavior, with regard to the manner in which they complied with the request to report income components separately.

In spite of these problems, the tax return information for estates and trusts still lends insight to the performance of survey data. In 1984, 1.0 million tax filers reported \$7.1 billion in estates and trusts. In 1990, this aggregate figure had dropped to only \$3.8 billion and the recipient count to about 0.5 million. Both the SIPP and the CPS indicate decreases in the number of persons receiving estates and trusts, but the decrease for the CPS was much larger (reflecting CPS processing changes to some degree). Both the SIPP and CPS show no increases in the aggregate, despite apparent differences.

## **Child Support**

**SIPP vs. CPS.** Child support payments were more complete in the SIPP than the CPS for both 1984 and 1990 in terms of the aggregate. Yet, solid growth occurred for both the CPS and SIPP between 1984 and 1990 (a 64-percent gain in CPS child support aggregate income, not significantly different from a 52-percent increase in the SIPP). The SIPP recipient count was 25 percent above the CPS count in 1984, and at a comparable advantage in 1990, 27 percent.

Independent Estimate. There are no independent estimates available for this income source.

### **Alimony**

**SIPP vs. CPS.** The SIPP and the CPS aggregate income estimates were comparable for the 1984 and 1990 periods, despite appearances. For both years, the SIPP indicated about 600,000 recipients of alimony, higher than CPS estimates of 300,000 in 1984 and 400,000 in 1990. The CPS excelled in mean amounts each period, compared to SIPP estimates.

The increase in recipients in the CPS could be related to changes in the processing system that occurred in the late 1980's, although this possibility has not been investigated thoroughly. Comparisons of CPS estimates for 1987 based on revised and unrevised processing methods showed that the revised system produced a 9.1 percent higher aggregate for combined alimony, child support, and "other cash income" not classified elsewhere (See Appendix B).

Independent Estimate. While no independent estimate for alimony was available in the past, some information can be derived from tax returns. These data indicate that 369,000 tax returns showed the receipt of alimony in 1984 and 467,000 in 1990. These data lack information on nonfilers, however, which are included in the CPS and SIPP. The aggregate amount of alimony reported on tax returns was \$2.7 billion in 1984 and \$3.8 billion in 1990.

### **Financial Assistance**

**SIPP vs. CPS.** Financial assistance is defined to be mainly money received from relatives or friends not living in the household. This definition is further refined in the context of the CPS to be "regular" financial assistance. As such, one might expect that the SIPP estimate should exceed that from the CPS on conceptual grounds alone, since the SIPP presumably encompasses any financial assistance (there is of course the ambiguity concerning the definition of "regular"). In any case, the apparent aggregate income advantage in SIPP was not statistically different from the CPS in 1984 and 1990. The SIPP captures a larger number of recipients, 2.6 million compared to 1.4 million for the CPS in 1984, and 2.7 million compared to 1.8 million in 1990 (SIPP levels were actually unchanged between 1984 and 1990. The CPS reported a larger mean estimate each period.

**Independent Estimate.** None available.

## **Other Income**

**SIPP vs. CPS.** Both the SIPP and the CPS include a "catch all" income source usually termed "other cash income". The purpose of this catch-all is to provide a last resort for persons to report income that does not seem to fit into any of the explicit sources covered during the interview. Changes in the CPS data processing system have destroyed the comparability of the data between 1984 and 1990.

In 1984, aggregate income from the CPS "other income" category was \$16.3 billion, about 3 times the \$5.3 billion estimate from SIPP. This large difference is due, in part, to differences in the incomes that have been defined as "other income". The CPS definition includes both cash educational benefits and "casual" earnings amounts, while the SIPP collects income amounts from these two sources explicitly. Since the surveys have significantly different approaches to collecting and classifying the various income sources and amounts, this difference does not seem particularly noteworthy. This is especially the case if one considers the \$16.5 billion in "income from other financial assets" identified in SIPP, but not classified in the CPS.

While the 1990 SIPP estimate of other income is comparable to 1984, the CPS estimate is not. Revisions to the CPS data processing system have made comparisons between 1984 and 1990 impossible. In these revisions, write-in entries describing the source of the other income were used to reallocate many amounts to more explicit categories. In addition, educational benefits were no longer lumped into "other income," but identified separately.

For 1990, we find a SIPP aggregate of \$10.2 billion, compared to a CPS estimate of \$4.6 billion.

**Independent Estimate.** None available.

**APPENDIX C:       Comments to the Paper by Denton Vaughan,  
                          U.S. Department of Health and Human Services,  
                          Social Security Administration**

**Selected Comments by D. Vaughan on the paper by John Coder and Lydia Scoon-Rogers "Evaluating the Quality of Income Data Collected in the Annual Supplement to the March Current Population Survey and the Survey of Income and Program Participation" that may be relevant to understanding SIPP/CPS poverty rate differences**

The most important finding of the Coder/Scoon-Rogers paper is that important parts of the "established" (e.g., by comparisons based on the 1979 ISDP and the 1984 SIPP panel) pattern of SIPP/CPS differences which likely derive from fundamental design differences continue to be evident for the 1990 panel, but in other respects the "expected" pattern of differences is either not present or is noticeably attenuated.

The paper also makes a number of useful methodological contributions, the most important being the careful consideration given to the development of improved benchmark estimates for separate income components, particularly with regard to interest income and private pensions. The development and comparison of mean income amounts by source for the two surveys is also novel and important in that it ought to simulate more interest in the likely strong distributional contrasts between the two surveys. The amount of detail provided on recipients and income aggregates by source is also useful in that it establishes baseline data for the primary level at which measurement occurs in both survey environments. The exploration of the effect of alternative procedures for deriving calendar year aggregates by source in the SIPP context on SIPP/CPS differences is also novel and a welcome addition to the statistical community's understanding of the SIPP measurement environment.

Earlier studies have documented a number of recurring differences between SIPP and March CPS income estimates (Vaughan[V] 1993, Vaughan, Whiteman and Lininger[V/W/L] 1984). At the most general, my enumeration of these differences would include:

1.       The SIPP generally provides a somewhat higher and thus likely more complete enumeration of income recipients. This characteristic is established both by head-to-head comparison of the survey estimates by type of income and comparison of the SIPP monthly estimates of recipients to appropriate independent estimates. With regard to some types of income, the differences have been striking (income from financial assets, public employee pensions, veterans payments and workers compensation). This general feature of SIPP/CPS differences is largely confirmed for calendar

year 1990 by the Coder/Scoon-Rogers study. For example, based on the data presented in the authors' table 3, on a source by source basis, the SIPP estimates averaged 25 percent higher than corresponding CPS estimates for calendar year 1984 and 19 percent higher for 1990.<sup>28</sup>

There is some evidence from the 1984 panel (principally with regard to food stamps and wage and salary earnings) that larger SIPP recipient estimates are associated with persons receiving the an income source for only part of the calendar year (V 1993, pp. 49, 58 & 59), a finding clearly consistent with the different measurement procedures characterizing the two surveys. It would be useful to reproduce such comparisons for calendar year 1990. Since the number of months of AFDC receipt during the calendar year is also now included in the CPS data set, a direct SIPP/CPS comparison could and should be made for AFDC, as well, particularly since the SIPP and CPS estimates are of essentially equivalent magnitude.

2. Although the pattern of SIPP/CPS differences for income aggregates by source based on earlier studies was not quite as pronounced as for numbers of recipients, there was a clear tendency for the SIPP estimates to be larger than the corresponding estimates from the CPS, especially for the broad category of transfer income<sup>29</sup> (the SIPP reduced the CPS aggregate shortfall for transfer income with respect to transfer benchmarks by 48 percent for the calendar year 1983 period [Vaughan 1993, p. 43]).<sup>30</sup> The Coder/Scoon-Rogers study does not support this precise comparison for calendar year 1983,<sup>31</sup> but review of source by source differences in survey aggregates for the two surveys strongly suggests a

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<sup>28</sup> Twenty-two income sources are presented in the table. My calculations of percentage differences in recipient counts between the two surveys in 1984 and 1990 is based on 21 of the 22 sources. Estimates for "other cash income" are excluded for both years because changes in the definition of that source in the CPS context argue against its inclusion.

<sup>29</sup> Defined here as including Social Security, railroad retirement, veterans payments, workers compensation and related income, unemployment compensation, SSI, AFDC and other forms of cash welfare, and employee pensions. These are sources for which annual independent estimates are currently available.

<sup>30</sup> And this characterization of the extent of the superiority of SIPP estimates is made of the basis of transfer benchmarks that do not include the sort of correction Coder/Scoon-Rogers introduce to the private pension control aggregate to account for lump-sum distributions. Consequently this characterization may be somewhat conservative.

<sup>31</sup> Based on data provided in their tables 1 & 2, the larger SIPP transfer aggregate for 1984 accounted for only about 35 percent of the gap between the CPS and the corresponding independent estimate. This rather large difference from my finding for 1983 is directly attributable to the fact that the Coder/Scoon Rogers

general and significant fall-off in the SIPP aggregates by source relative to those of the CPS between calendar years 1984 and 1990. (Based on the authors' table 3 the SIPP aggregates averaged 18 percent above their CPS counterparts in 1994 but only 6 percent higher in 1990). Some thoughts about of this apparent fall-off between 1984 and 1990 are presented below in (6).

3. The 1979 ISDP and the 1984 SIPP panel provided very strong evidence that wave based SIPP income estimates were very much less affected by item nonresponse than calendar year CPS estimates. This was especially true for reciprocity estimates and with regard to the regular money income aggregate for calendar year 1984,<sup>32</sup> the percent attributable to imputation in the CPS context (20.1) was nearly double that for the SIPP (11.4).

There are, of course, legitimate differences of view on how to interpret such a difference, and I suspect that John Coder and I see the issue somewhat differently. Calendar year estimates made on the basis of longitudinal person records are subject to attrition effects in the SIPP context that are not present in the CPS context.<sup>33</sup> In SIPP, attrition is compensated for by reweighting the nonattriting subset of the initial set of sample cases. Thus attrition represents an important source of "missingness" that affects SIPP income estimates that is not captured by a simple SIPP/CPS comparison of item nonresponse levels. While this point of view has considerable merit, I would argue that the overall pattern of missingness presented by the SIPP is likely to be less disruptive of important covariances than the missingness associated with strict item-nonresponse in the CPS context. Given the importance of the proper representation of covariances, particularly for program simulations<sup>34</sup> and other sorts of multi-variate analyses, I continue to advance the view that monitoring and comparing of the levels of item-nonresponse for income estimates in the usual way is relevant

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independent estimate for 1984 pension aggregate (\$123 billion), is about 20 percent larger than the corresponding independent estimate I employed for 1983 (largely derived from the one published by the Bureau). There are a number of reasons, for this difference, but much of it seems traceable to definitional problems and not true increase in the pension aggregate between 1983 and 1984. Thus, which view is more credible cannot be immediately resolved.

<sup>32</sup> Where the calendar year aggregate from the SIPP is based on summed cross-sectional wave estimates.

<sup>33</sup> Of course complete nonresponse to the income supplement, which I understand gives rise to much of the "item" nonresponse on income in the CPS context, would also appear to be something other item nonresponse in the strictest sense of the word,

<sup>34</sup> Which, in any case, are often implemented with only monthly data from one wave.

and provides a useful perspective on the differences between the quality of the income estimates provided by the two surveys. While John and I have not discussed this question for sometime and never in detail, it's my recollection that he does not share my interpretation on this point. Perhaps that is why a comparison of SIPP and CPS income item nonresponse rates is not presented.

4. The SIPP/CPS differences in estimates of wage and salary income shown for the 1990 panel are consistent with patterns evident from the 1979 ISDP and the 1984 panels, namely that the total count of recipients is slightly higher in the SIPP (1984 panel V 1993:58), but the SIPP aggregate is on the order of 3-6 percent below the corresponding CPS aggregate (1979 and 1984 panels [V/W/L 1984:113; V 1993:57,87). Some preliminary unpublished work of my own indicates that modestly lower SIPP wage and salary aggregate is associated with very important and unwelcome, from the SIPP perspective, differences in the upper half of the wage and salary size distributions of the two surveys.

Also, the modest, if not to say slight, difference in the total number of wage and salary recipients masks much more important differences in the portrayal of work experience of wage and salary workers, especially for minority groups (e.g. in the 1984 panel context the SIPP estimate for other than year-round/full-time workers for Black males was 25 percent above the corresponding CPS estimate (V 1993:58). I've presented evidence (V 1993:59) that about half of the difference is attributable to workers not identified by the CPS and the balance to classification of black wage and salary workers in the SIPP context as other than year-round/full-time who are apparently classified as year-round/full-time in the CPS. These sorts of findings strike me as rather significant and I would argue that they call out for a much larger investment by the Bureau in documenting and understanding the differences between the distributional characteristics of wage and salary estimates from the two surveys.

5. As was the case for the 1979 ISDP and/or the 1984 panel, 1990 panel SIPP estimates of property income recipients (interest, dividends, rents and royalties) substantially exceed corresponding estimates based on the CPS. The fact that SIPP aggregates do not consistently reflect the clear SIPP/CPS recipient estimate differences also continues an established pattern. The contrasting mean amounts by source, indicate that very considerable differences between the two surveys must exist in the size distributions for these income sources. To my knowledge this topic has not been addressed.

Incidentally, it is likely that a significant part of the short-fall in the SIPP interest aggregates relative to those of the CPS reflects the fact that the sorts of innovations introduced to the CPS interest imputation procedure in the mid 1980's have

not been incorporated in the SIPP.

6. Distributional issues and the poverty rate conundrum.--The one SIPP-based distributional estimate that has received a reasonable amount of attention (though not nearly enough, given its importance) is the poverty rate. Some unpublished work we have done here at SSA, which has relied heavily on mining estimates put out by the Bureau, reveals a regime of SIPP/CPS differences entailing significantly lower rates in the SIPP and that appears to have become accentuated with the introduction of the 1985 panel, particularly with regard to the aged. These differences continue unabated within the context of the 1990 panel despite the possibility of a modest decline in SIPP aggregates relative to the CPS. In addition, within the context of the 1990 panel, the steep age gradient in poverty rates for elderly women seen in the CPS is virtually nonexistent. Given that the magnitude of the differences in aged poverty rates between the two surveys is arguably on a par with the impact of incorporating the value of noncash benefits in the CPS context, this can only be seen as an issue of considerable importance.

In thinking about a possible explanation for the SIPP/CPS poverty rate differences, consideration of the information presented by Coder/Scoon-Rogers on recipient counts, aggregates and mean income amounts by type suggests to me that there must be notable differences in the distributional characteristics for an array of income types particularly below about where the lower quartile begins in the CPS context, especially for income types of particular importance for the aged, and most especially aged women. The combined effect of uncovering a bit more income for a number of sources in the region roughly corresponding to the lower quartile in the CPS could account for lower poverty rates in the face of frequently lower means that seem to result from higher reciprocity estimates on the one hand and income aggregates that roughly equivalent or bit smaller on the other. Based on the few distributional clues available and on the likely effect of the principal design differences between the surveys, the extra recipients in the SIPP would tend those who received the income for only part of the year and thus the most likely to be missed in the CPS. Such additional SIPP recipients would contribute disproportionately to the survey's estimates of recipients as opposed to income aggregates thus helping to explain some of the lower SIPP means. The combined effect of such a pattern over a number of income types might plausibly explain SIPP's lower poverty rates, especially for the aged.

7. Review of developments in transfer income measurement: 1984 -- 1990.--Based on a summarization of information provided in the authors' tables 1 & 2, the completeness of the CPS aggregates apparently increased between 1984 and 1990--from about 80 to about 90 percent of the independent estimates; the SIPP also increased, but less dramatically from 86 or 88 to 93 percent. During this period, CPS transfer income grew by about 50 percent while the actual income



aggregates for these transfers (as indicated by the benchmarks) grew by only about 30 percent. However the only broad grouping which for the CPS aggregate grew appreciably faster than its corresponding benchmark was employee pensions, and within that category only private pensions grew appreciably faster than its corresponding independent estimate. Indeed the CPS aggregates for cash public assistance, public employee pensions and social insurance payments other than social security and railroad retirement increased at a noticeably slower rate than the actual aggregates, indicating a decline in "completeness" over the period. In fact were it not for the disproportionate increase in the private pension aggregate, the CPS estimates of aggregate transfer income would be slightly less as a percentage of the control in 1990 than in 1984 (77 vs. 79 percent). Given the uncertainties about the nature of pension estimates, particularly private pension estimates, arising from the growth of lump sum distributions in recent years, it would be premature to conclude that "a catch-up" of the CPS transfer aggregate with respect to the SIPP since 1984 is indicative of an overall improvement in the CPS measures of transfer income over this period.

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Table 1. Comparisons of SIPP and March CPS Aggregate Income Estimates for 1984 and 1990  
(Income in billions of dollars)

Source of income	Standard error of the aggregate									
	1984		1990				1990		1984	
	SIPP	March CPS	SIPP as a percent of the CPS	SIPP	March CPS	SIPP as a percent of the CPS	SIPP	CPS	SIPP	CPS
Wage and salaries/1	\$1,663.3	\$1,770.7	93.9	\$2,475.7	\$2,614.0	94.7	\$19.5	\$12.4	\$15.1	\$9.1
Self-employment/2	198.5	135.3	146.7	267.7	228.1	117.4	6.3	5.8	5.4	3.6
Interest	118.3	138.7	85.3	150.8	172.8	87.3	6.1	2.3	5.2	2.0
Dividends	39.1	30.7	127.4	58.2	39.5	147.3	4.8	1.2	3.5	9.5
Rents and royalties/3	41.0	18.5	221.6	45.4	38.7	117.3	3.0	1.5	2.9	7.4
Estates and trusts/4	5.7	7.8	73.1	6.9	7.1	97.2	1.3	0.8	1.1	0.9
Social Security	154.4	147.5	104.7	221.6	209.8	105.6	2.7	1.7	2.2	1.3
Railroad Retirement	5.4	4.0	135.0	6.6	4.6	143.5	6.0	3.5	5.9	3.0
Supplemental Security Income	8.8	8.4	104.8	12.9	12.1	106.6	5.5	3.4	4.4	2.3
Aid to Families With Dependent Children/5	11.6	10.9	106.4	13.8	14.1	97.9	6.2	4.0	5.8	3.2
Other cash welfare/6	2.7	2.4	112.5	2.5	2.5	100.0	2.3	1.4	2.6	1.3
Unemployment compensation	12.4	12.2	101.6	14.9	14.2	104.9	5.5	5.3	5.1	3.0
Worker's compensation/7	8.0	6.8	117.6	12.6	13.8	91.3	8.4	6.4	6.1	4.2
Veterans' payments	11.4	8.3	137.3	11.6	10.7	108.4	7.9	4.8	8.1	3.7
Private pensions/8	41.6	37.3	111.5	75.2	77.8	96.7	2.4	1.7	1.6	9.2
Federal employee pensions	19.9	17.2	115.7	22.3	25.1	88.8	1.5	1.0	1.4	7.5
Military retirement	16.4	15.3	107.2	18.8	18.2	103.3	1.4	8.9	1.4	7.4
State and local employee pensions	19.3	15.7	122.9	27.1	28.9	93.8	1.5	1.0	1.2	5.9
Alimony	2.7	2.2	122.7	2.9	3.1	93.5	4.3	3.3	4.7	2.7
Child support	9.0	7.2	125.0	13.7	11.8	116.1	0.7	0.4	0.5	0.3
Financial assistance	5.8	4.8	120.8	8.2	8.5	96.5	0.6	0.5	0.5	0.3
Other cash income /9	5.3	16.3	32.5	10.2	4.6	221.7	1.4	0.3	0.8	1.0

Table 2. Ratio of SIPP and March CPS Aggregate Income Estimates to Independent Aggregate Income Estimates for 1984 and 1990

Source of income	Standard error of percent (ratio)									
	1984			1990			1990		1984	
	Independent estimate (billions)	SIPP (percent)	March CPS (percent)	Independent estimate (billions)	SIPP (percent)	March CPS (percent)	SIPP	CPS	SIPP	CPS
Wage and salaries /1	\$1,820.1	91.4	97.3	\$2,695.6	91.8	97.0	0.7	0.5	0.8	0.5
Self-employment /2	192.6	103.1	70.2	341.4	78.4	66.8	1.9	1.7	2.8	1.9
Interest	244.8	48.3	56.7	282.8	53.3	61.1	2.2	0.8	2.1	0.8
Dividends	59.3	65.9	51.8	126.3	46.1	31.3	3.8	0.9	5.9	1.5
Rents and royalties /3	19.4	211.3	95.4	44.1	102.9	87.8	6.8	3.4	5.0	3.6
Estates and trusts /4	N/A	N/A	N/A	N/A	N/A	N/A				
Social Security	160.5	96.2	91.9	225.5	98.3	93.0	1.2	0.8	1.4	0.8
Railroad Retirement	5.6	96.4	71.4	6.9	95.7	66.7	8.7	5.8	0.7	5.3
Supplemental Security Income	9.9	88.9	84.8	13.6	94.9	89.0	3.7	2.2	4.0	2.0
Aid to Families With Dependent Children /5	13.9	83.5	78.4	19.7	70.1	71.6	3.1	2.0	4.3	2.2
Other cash welfare /6	2.0	135.0	120.0	2.9	86.2	86.2	1.2	0.8	1.4	0.8
Unemployment compensation	16.3	76.1	74.8	17.7	84.2	80.2	2.8	2.3	3.1	1.9
Worker's compensation/7	14.1	56.7	48.2	14.6	86.3	94.5	5.5	4.8	4.3	2.9
Veterans' payments	13.9	82.0	59.7	13.8	84.1	77.5	5.8	3.6	5.8	2.8
Private pensions /8	65.2	63.8	57.2	70.2	107.1	110.8	3.4	2.4	2.5	1.4
Federal employee pensions	20.3	98.0	84.7	30.4	73.4	82.6	4.9	3.3	6.9	3.5
Military retirement	15.6	105.1	98.1	20.4	92.2	89.2	6.9	4.4	9.0	4.5
State and local employee pensions/9	21.9	88.1	71.7	36.1	75.1	80.1	2.8	5.5	2.7	
Alimony	2.7	100.0	81.5	2.5	116.0	124.0	6.0	2.0	8.5	1.1
Child support	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Financial assistance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other cash income/9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3. Comparisons of SIPP and March CPS Income Recipient Estimates for 1984 and 1990  
(Millions of persons.)

Source of income	1984		1990				Standard error of total			
			SIPP as a percent of the CPS				1984		1990	
	SIPP	March CPS	SIPP	March CPS	SIPP	March CPS	SIPP	March CPS	SIPP	March CPS
Wage and salaries/1	116.0	114.4	101.4	127.3	124.6	102.2	0.5	0.3	0.4	0.3
Self-employment/2	11.6	12.2	95.1	12.9	18.1	71.3	0.3	0.2	0.2	0.2
Interest	124.3	99.0	125.6	132.9	108.5	122.5	0.5	0.3	0.4	0.3
Dividends	26.9	20.6	130.6	31.8	23.3	136.5	0.4	0.2	0.4	0.2
Rents and royalties/3	17.6	12.5	140.8	17.4	13.5	128.9	0.3	0.2	0.3	0.2
Estates and trusts/4	0.7	1.5	46.7	0.5	0.5	100.0	0.1	0.1	0.0	0.0
Social Security	33.4	32.2	103.7	36.9	35.4	104.2	0.4	0.2	0.4	0.3
Railroad Retirement	0.8	0.6	133.3	0.9	0.6	150.0	0.1	0.0	0.1	0.0
Supplemental Security Income	3.9	3.6	108.3	4.6	4.0	115.0	0.2	0.1	0.1	0.1
Aid to Families With Dependent Children/5	4.0	3.6	111.1	4.0	3.9	102.6	0.2	0.1	0.1	0.1
Other cash welfare/6	2.0	1.4	142.9	1.5	1.3	115.4	0.1	0.1	0.1	0.1
Unemployment compensation	8.6	7.7	111.7	9.2	7.6	121.1	0.2	0.1	0.2	0.1
Worker's compensation /7	3.2	2.5	128.0	3.7	2.8	132.1	0.1	0.1	0.1	0.1
Veterans' payments	4.4	2.9	151.7	3.4	2.6	130.8	0.2	0.1	0.1	0.1
Private pensions/8	10.5	8.0	131.3	13.7	11.5	119.1	0.2	0.1	0.2	0.1
Federal employee pensions	2.0	1.6	125.0	1.8	1.9	94.7	0.1	0.1	0.1	0.1
Military retirement	1.6	1.5	106.7	1.6	1.4	114.3	0.1	0.1	0.1	0.1
State and local employee pensions	3.3	2.6	126.9	3.3	3.2	103.1	0.1	0.1	0.1	0.1
Alimony	0.6	0.3	200.0	0.6	0.4	150.0	0.1	0.0	0.1	0.0
Child support	4.0	3.2	125.0	5.2	4.1	126.8	0.2	0.1	0.2	0.1
Financial assistance	2.6	1.4	185.7	2.7	1.8	150.0	0.1	0.1	0.1	0.1
Other cash income /9	2.0	7.8	25.6	2.3	2.0	115.0	0.1	0.1	0.1	0.1

Table 4. Comparisons of SIPP and March CPS Mean Income Estimates for 1984 and 1990  
(Income in current dollars)

Source of income	1984		1990		Standard error of the mean					
					1984		1990			
	SIPP	March CPS	SIPP as a percent of the CPS	SIPP	March CPS	SIPP as a Percent of the CPS	SIPP	CPS	SIPP	CPS
Wage and salaries /1	\$14,339	\$15,478	93	\$19,448	\$20,979	93	\$114	\$67	\$141	\$85
Self-employment /2	17,112	11,090	154	20,752	15,951	130	268	258	296	348
Interest	952	1,401	68	1,135	1,593	71	42	20	46	21
Dividends	1,454	1,490	98	1,830	1,695	108	130	44	149	47
Rents and royalties /3	,330	1,480	157	2,609	2,856	91	162	56	166	102
Estates and trusts /4	8,143	5,200	157	13,800	13,170	105	1,413	557	2,181	1,318
Social Security	4,623	4,581	101	6,005	5,927	101	33	18	39	22
Railroad Retirement	6,750	6,667	101	7,333	8,069	91	439	318	434	361
Supplemental Security Income	2,256	2,333	97	2,804	2,981	94	69	38	78	46
Aid to Families With Dependent Children /5	2,950	3,028	97	3,450	3,590	96	93	52	98	57
Other cash welfare /6	1,350	1,714	79	1,667	2,095	80	103	66	116	76
Unemployment compensation	1,442	1,584	91	1,620	1,868	87	46	30	47	34
Worker's compensation /7	2,500	2,720	92	3,405	4,759	72	154	147	191	204
Veterans' payments	2,591	2,862	91	3,412	4,082	84	159	102	191	137
Private pensions /8	3,962	4,663	85	5,489	6,771	81	115	88	146	120
Federal employee pensions	9,950	10,750	93	12,389	12,966	96	460	265	522	299
Military retirement	10,250	10,200	100	11,750	12,522	94	546	319	570	368
State and local employee pensions	5,848	6,038	97	8,212	9,068	91	264	146	337	205
Alimony	4,500	7,333	61	4,833	6,566	74	601	650	588	546
Child support	2,250	2,250	100	2,635	2,850	92	95	59	102	71
Financial assistance	2,231	3,429	65	3,037	4,546	67	169	190	209	237
Other cash income /9	2,650	2,090	127	4,435	2,342	189	384	130	586	137

Table 5. Percent change in SIPP and March CPS Aggregate Income Estimates between 1984 and 1990  
(Income in billions of dollars)

Source of income	SIPP			March CPS			Standard error of percent change	
	1990	1984	Percent change	1990	1984	Percent change	SIPP	CPS
Wage and salaries /1	\$2,475.7	\$1,663.3	48.8	\$2,614.0	\$1,770.7	47.6	1.8	1.0
Self-employment /2	267.7	198.5	34.9	228.1	135.3	68.6	4.9	6.2
Interest	150.8	118.3	27.5	172.8	138.7	24.6	7.7	2.5
Dividends	58.2	39.1	48.8	39.5	30.7	28.7	18.2	5.5
Rents and royalties /3	45.4	41.0	10.7	38.7	18.5	109.2	10.8	11.5
Estates and trusts /4	6.9	5.7	21.1	7.1	7.8	-9.0	36.2	15.1
Social Security	221.6	154.4	43.5	209.8	147.5	42.2	2.7	1.7
Railroad Retirement	6.6	5.4	22.2	4.6	4.0	15.0	16.8	12.3
Supplemental Security Income	12.9	8.8	46.6	12.1	8.4	44.0	9.6	5.8
Aid to Families With Dependent Children /5	13.8	11.6	19.0	14.1	10.9	29.4	8.2	5.3
Other cash welfare /6	2.5	2.7	-7.4	2.5	2.4	4.2	12.4	8.1
Unemployment compensation	14.9	12.4	20.2	14.2	12.2	16.4	6.7	4.1
Worker's compensation/7	12.6	8.0	57.5	13.8	6.8	102.9	16.0	16.2
Veterans' payments	11.6	11.4	1.8	10.7	8.3	28.9	10.3	8.1
Private pensions /8	75.2	41.6	80.8	77.8	37.3	108.6	8.9	6.9
Federal employee pensions	22.3	19.9	12.1	25.1	17.2	45.9	11.0	8.8
Military retirement	18.8	16.4	14.6	18.2	15.3	19.0	12.6	8.2
State and local employee pensions/7.1	19.3	40.4		28.9	15.7	84.1	12.0	9.4
Alimony	2.9	2.7	7.4	3.1	2.2	40.9	22.6	22.7
Child support	13.7	9.0	52.2	11.8	7.2	63.9	11.5	8.2
Financial assistance	8.2	5.8	41.4	8.5	4.8	77.1	17.0	16.3
Other cash income /9	10.2	5.3	92.5	4.6	16.3	-71.8	40.6	2.7

\* Percent change not statistically different from zero at the 95% confidence level

Table 6. Percent Changes in SIPP and March CPS Mean Income Estimates Between 1984 and 1990  
(Income in current dollars)

Source of income	SIPP			CPS			Standard error of percent change	
	1990	1984	Percent change	1990	1984	Percent change	SIPP	CPS
Wage and salaries/1	\$19,448	\$14,339	35.6	\$20,979	\$15,478	35.5	1.5	0.8
Self-employment/2	20,752	17,112	21.3	15,951	11,090	43.8	5.1	2.5
Interest	1,135	952	19.2	1,593	1,401	13.7	7.1	2.2
Dividends	1,830	1,454	25.9	1,695	1,490	13.8	15.2	4.6
Rents and royalties/3	2,609	2,330	12.0	3,257	1,480	120.1	10.6	10.0
Estates and trusts/4	13,800	8,143	69.5	13,116	5,200	152.2	9.6	7.9
Social Security	6,005	4,623	29.9	5,927	4,581	29.4	1.3	0.7
Railroad Retirement	7,333	6,750	8.6	8,069	6,667	21.0	9.6	7.9
Supplemental Security Income	2,804	2,256	24.3	2,981	2,333	27.8	5.1	2.9
Aid to Families With Dependent Children/5	3,450	2,950	16.9	3,590	3,028	18.6	4.9	2.8
Other cash welfare	1,667	1,350	23.5	2,095	1,714	22.2	12.8	6.5
Unemployment compensation	1,620	1,442	12.4	1,868	1,584	17.9	4.8	3.1
Worker's compensation/7	3,405	2,500	36.2	4,775	2,720	75.6	11.3	3.2
Veterans' payments	3,412	2,591	31.7	4,082	2,862	42.6	10.9	6.9
Private pensions/8	5,489	3,962	38.5	6,771	4,663	45.2	5.5	3.8
Federal employee pensions	12,389	9,950	24.5	12,966	10,750	20.6	7.8	4.1
Military retirement	11,750	10,250	14.6	12,522	10,200	22.8	8.3	5.3
State and local employee pensions	8,212	5,848	40.4	9,068	6,038	50.2	8.6	6.1
Alimony	4,833	4,500	7.4	6,566	7,333	-10.5	19.3	10.9
Child support	2,635	2,250	17.1	2,850	2,250	26.7	6.7	4.6
Financial assistance	3,037	2,231	36.1	4,546	3,429	32.6	13.9	10.1
Other cash income/9	4,435	2,650	67.4	2,342	2,090	12.1	32.8	9.6

\* Percent change not statistically different from zero at the 95% confidence level



Table 7. Percent change in SIPP and March CPS Recipient Estimates between 1984 and 1990  
(Millions of persons)

Source of income	SIPP			March CPS			Standard error of percent change	
	1990	1984	Percent change	1990	1984	Percent change	SIPP	CPS
Wage and salaries/1	127.3	116.0	9.7	124.6	114.4	8.9	0.6	0.6
Self-employment/2	12.9	11.6	11.2	14.3	12.2	17.2	3.3	3.3
Interest	132.9	124.3	6.9	108.5	99.0	9.6	0.5	0.7
Dividends	31.8	26.9	18.2	23.3	20.6	13.1	2.1	2.4
Rents and royalties/3	17.4	17.6	1.1	13.1	12.5	4.8	2.4	3.0
Estates and trusts/4	0.5	0.7	28.6	0.5	1.5	66.7	9.8	3.9
Social Security	36.9	33.4	10.5	35.4	32.2	9.9	1.8	1.8
Railroad Retirement	0.9	0.8	12.5	0.6	0.6	0.0	12.9	13.6
Supplemental Security Income	4.6	3.9	17.9	4.0	3.6	11.1	6.0	6.0
Aid to Families With Dependent Children/5	4.0	3.9	2.6	3.9	3.6	8.3	5.4	5.9
Other cash welfare/6	1.5	2.0	25.0	1.3	1.4	7.1	6.0	8.4
Unemployment compensation	9.2	8.6	7.0	7.6	7.7	1.3	3.7	3.7
Worker's compensation/7	3.7	3.2	15.6	2.8	2.5	12.0	6.6	7.3
Veterans' payments	3.4	4.4	22.7	2.6	2.9	10.3	4.1	5.7
Private pensions/8	13.7	10.5	30.5	10.3	8.0	28.8	3.9	4.5
Federal employee pensions	1.8	2.0	10.0	1.9	1.6	18.8	6.8	9.5
Military retirement	1.6	1.6	0.0	1.4	1.5	6.7	8.1	8.1
State and local employee pensions <sup>3.3</sup>	3.3	0.0	3.2	2.6	23.1	5.8	7.7	
Alimony	0.6	0.6	0.0	0.4	0.3	33.3	13.6	24.2
Child support	5.2	4.0	30.0	4.1	3.2	28.1	6.4	7.1
Financial assistance	2.7	2.6	3.8	1.8	1.4	28.6	6.7	10.9
Other cash income/9	2.3	2.0	15.0	2.0	7.8	74.4	8.3	1.4

Table 8. Alternative SIPP Estimates of Income Aggregates, as a Percent of March-Based SIPP, By Source of Income: 1990

Source of income	Aggregate (billions of dollars)			Percent of March-based SIPP			Standard error of the aggregate		
	March Basis	Longi- tudinal Basis	Sum of Waves	March Basis	Longi- tudinal Basis	Sum of Waves	March Basis	Longi- tudinal Basis	Sum of Waves
Wages and salaries/1	\$2,475.7	\$2,472.5	\$2,337.5	100.0	99.9	94.4	\$19.5	\$21.3	\$18.4
Self-employment/2	267.7	275.0	283.0	100.0	102.7	105.7	6.3	7.0	6.0
Interest income	150.8	157.9	152.5	100.0	104.7	101.1	6.1	6.7	5.9
Dividend income	58.2	62.4	61.6	100.0	107.2	105.8	4.8	6.2	6.2
Rent/royalty income/3	45.4	48.7	43.0	100.0	107.3	94.7	3.0	3.3	2.9
Estates and Trusts/4	6.9	7.1	7.0	100.0	102.9	101.4	1.3	1.4	1.2
Social Security income	221.6	229.2	227.5	100.0	103.4	102.7	2.7	3.0	2.5
Railroad retirement	6.6	6.8	6.8	100.0	103.0	103.0	6.0	6.9	5.9
Supplemental Security income	12.9	13.2	12.9	100.0	102.3	100.0	5.5	6.1	5.1
Aid to Families with Dependent Children/5	13.6	13.8	14.3	100.0	101.5	105.1	6.2	6.7	5.9
Other cash welfare/6	2.5	2.4	2.4	100.0	96.0	96.0	2.3	2.4	2.1
Unemployment compensation	14.9	14.3	14.7	100.0	96.0	98.7	5.5	5.8	5.1
Worker's compensation/7	12.6	12.4	12.8	100.0	98.4	101.6	8.4	9.1	8.0
Veteran's payments	11.6	11.9	12.1	100.0	102.6	104.3	7.9	8.8	7.8
Private pensions/8	75.2	77.0	75.6	100.0	102.4	100.5	2.4	2.7	2.3
Federal employee pensions	22.3	23.6	23.6	100.0	105.8	105.8	1.5	1.6	1.4
Military retirement	18.8	19.3	18.9	100.0	102.7	100.5	1.4	1.5	1.3
State and local employee pensions/9	28.9	28.8		100.0	106.6	106.3	1.5	1.7	1.5
Alimony	2.9	2.9	2.9	100.0	100.0	100.0	4.3	4.5	4.0
Child support	13.7	13.8	13.5	100.0	100.7	98.5	0.7	0.7	0.6
Financial assistance	8.2	7.7	8.6	100.0	93.9	104.9	0.6	0.7	0.6
Other cash income/9	10.2	10.3	9.3	100.0	101.0	91.2	1.4	1.6	1.4

Table 9. Alternative Independent Aggregate Income Estimates: 1990  
(Income in billions of dollars)

Source of income	CPS and March-based SIPP adjusted estimates			Longitudinal-based SIPP adjusted estimates		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
Wages and salary	\$2,695.6	\$2,688.6	\$2,576.0	\$2,706.6	\$2,702.7	\$2,589.7
Self-employment	341.4	328.8	136.3	343.5	330.6	136.9
Interest	282.8	239.0	221.5	285.6	240.0	222.4
Dividends	103.0	143.4	78.6	105.0	145.4	79.7
Rents and royalties	44.1	38.0	4.8	44.7	37.6	4.7
Estates and trusts	N/A	N/A	N/A	N/A	N/A	N/A
Social security	225.5	24.9	19.9	233.9	24.9	19.9
Railroad retirement	6.9	N/A	N/A	7.0	N/A	N/A
Supplemental Security Income	13.6	N/A	N/A	14.2	N/A	N/A
Aid to Families with Dependent Children	19.7	N/A	N/A	19.7	N/A	N/A
Other cash welfare	2.9	N/A	N/A	2.9	N/A	N/A
Unemployment compensation	17.7	17.8	15.1	17.8	18.0	15.3
Workers' compensation	14.6	N/A	N/A	14.6	N/A	N/A
Veterans payments	13.8	N/A	N/A	13.7	N/A	N/A
Private pensions	70.2	N/A	N/A	71.0	N/A	N/A
Federal employee pensions	30.4	N/A	N/A	30.7	N/A	N/A
Military retirement	20.4	N/A	N/A	20.6	N/A	N/A
State and local employee pensions	36.1	N/A	N/A	36.4	N/A	N/A
Alimony	N/A	N/A	N/A	N/A	N/A	N/A
Child support	N/A	N/A	N/A	N/A	N/A	N/A
Financial assistance	N/A	N/A	N/A	N/A	N/A	N/A
Other cash income	N/A	N/A	N/A	N/A	N/A	N/A

Table 10. Alternative SIPP Estimates of Income Aggregates, as a Percent of March CPS, By Source of Income: 1990

Source of income	Aggregate (billions of dollars)				Percent of March CPS			Standard error of the aggregate				
	SIPP				SIPP			SIPP				
	March Basis	Longi- tudinal Basis	Sum of Waves	March CPS	March Basis	Longi- tudinal Basis	Sum of Waves	March Basis	Longi- tudinal Basis	Sum of Waves	March CPS	
Wages and salaries/1	\$2,475.7	\$2,472.5	\$2,337.5	\$2,614.0	94.7	94.6	89.4	\$19.5	\$21.3	\$18.4	\$12.4	
Self-employment/2	267.7	275.0	283.0	228.1	117.4	120.6	124.1	6.3	7.0	6.0	5.8	
Interest income	150.8	157.9	152.5	172.8	87.3	91.4	88.3	6.1	6.7	5.9	2.3	
Dividend income	58.2	62.4	61.6	39.5	147.3	158.0	155.9	4.8	6.2	6.2	1.2	
Rent/royalty income/3	45.4	48.7	43.0	38.7	117.3	125.8	111.1	3.0	3.3	2.9	1.5	
Estates and Trusts/4	6.9	7.1	7.0	7.1	97.2	100.0	98.6	1.3	1.4	1.2	0.8	
Social Security income	221.6	229.2	227.5	209.8	105.6	109.2	108.4	2.7	3.0	2.5	1.7	
Railroad retirement	6.6	6.8	6.8	4.6	143.5	147.8	147.8	6.0	6.9	5.9	3.5	
Supplemental Security income	12.9	13.2	12.9	12.1	106.6	109.1	106.6	5.5	6.1	5.1	3.4	
Aid to Families with Dependent Children/5	13.6	13.8	14.3	14.1	96.5	97.9	101.4	6.2	6.7	5.9	4.0	
Other cash welfare/6	2.5	2.4	2.4	2.5	100.0	96.0	96.0	2.3	2.4	2.1	1.4	
Unemployment compensation	14.9	14.3	14.7	14.2	104.9	100.7	103.5	5.5	5.8	5.1	5.3	
Worker's compensation/7	12.6	12.4	12.8	13.8	91.3	89.9	92.8	8.4	9.1	8.0	6.4	
Veteran's payments	11.6	11.9	12.1	10.7	108.4	111.2	113.1	7.9	8.8	7.8	4.8	
Private pensions and annuities /8	75.2	77.0	75.6	77.8	96.7	99.0	97.2	2.4	2.7	2.3	1.7	
Federal employee pensions	22.3	23.6	23.6	25.1	88.8	94.0	94.0	1.5	1.6	1.4	1.0	
Military retirement	18.8	19.3	18.9	18.2	103.3	106.0	103.8	1.4	1.5	1.3	8.9	
State and local employee pensions	27.1	28.9	28.8	28.9	93.8	100.0	99.7	1.5	1.7	1.5	1.0	
Alimony	2.9	2.9	2.9	3.1	93.5	93.5	93.5	4.3	4.5	4	3.3	
Child support	13.7	13.8	13.5	11.8	116.1	116.9	114.4	0.7	0.7	0.6	0.4	
Financial assistance	8.2	7.7	8.6	8.5	96.5	90.6	101.2	0.6	0.7	0.6	0.5	
Other cash income /9	10.2	10.3	9.3	4.6	221.7	223.9	202.2	1.4	1.6	1.4	0.3	

Table 11. Alternate Survey Estimates of Public Assistance: 1984 and 1990  
(Billions of dollars. Millions of persons.)

	Aggregate				Recipients			
	Estimates		Standard error		Estimates		Standard error	
	1984	1990	1984	1990	1984	1990	1984	1990
CPS								
Public assistance	\$13.3	\$16.5	\$0.4	\$0.4	4.8	5.1	0.3	0.3
Aid to Families with Dependent Children	10.9	14.0	0.4	0.3	3.6	3.8	0.2	0.2
Other cash welfare	2.4	2.5	0.1	0.1	1.4	1.3	0.1	0.1
Longitudinal SIPP								
Public assistance	14.4	16.2	1.0	0.7	N/A	N/A	N/A	N/A
Aid to Families with Dependent Children	11.6	13.8	0.7	0.7	4.0	4.0	0.5	0.4
Other cash welfare	2.8	2.4	0.2	0.4	2.0	1.5	0.3	0.3
March-based SIPP/5								
Public assistance	13.2	16.1	0.8	0.8	N/A	N/A	N/A	N/A
Aid to Families with Dependent Children	10.5	13.6	0.6	0.6	3.9	4.0	0.4	0.4
Other cash welfare	2.7	2.5	0.2	0.4	2.0	1.5	0.3	0.2
Wave-based SIPP								
Public assistance	14.5	16.7	0.8	0.8	N/A	N/A	N/A	N/A
Aid to Families with Dependent Children	11.7	14.3	0.6	0.7	N/A	N/A	0.4	0.4
Other cash welfare	2.8	2.4	0.2	0.6	N/A	N/A	0.3	0.2

## Footnotes for Tables 1 through 10

N/A is not applicable.

- /1 SIPP and CPS wage and salary estimates include earnings from the self-employed that are incorporated.
- /2 SIPP and CPS self-employment estimates exclude earnings from the self-employed that are incorporated.
- /3 The 1990 SIPP files available for this report included "other financial investments," with "rents and royalties". The 1990 CPS rent and royalties estimate corrects the estimate printed in the P60, No. 174 report.
- /4 The CPS estimate of estates and trusts for 1990 refers solely to survivor estates and trusts. The CPS estimate for 1984 includes all estates and trusts (i.e. both survivor and other sources of estates and trusts).
- /5 The CPS estimate of Aid to Families with Dependent Children for 1990 includes the entire sum of public assistance when respondent indicated receipt of both types of public assistance (0.6 billion dollars in AFDC and other cash welfare).
- /6 The CPS estimate of "other cash welfare" for 1990 excludes "other cash welfare" when respondent indicated she received both other cash welfare and Aid to Families with dependent Children.
- /7 The CPS estimate of worker's compensation includes (beyond P-60 series published, line item definition) black lung payments, accident insurance, and temporary insurance.
- /8 SIPP estimate of private pensions includes pensions nowhere else classified. It excludes lump-sum payments. CPS private pensions include (beyond P-60 series published, components) survivor's annuities, other unspecified survivor benefits and unspecified disability benefits.
- /9 Some cash income sources are excluded from "other cash income" and from all income sources identified above. "Other cash income" as shown is definitionally incomparable over time and across surveys.

### Note:

Most survey estimates from the Survey of Income and Program Participation (SIPP) are based on the population existing in March following the income year, mirroring the universe found in the Current Population Survey (CPS). The exception is the SIPP Aid to Families with Dependent Children estimate which is based on the longitudinal universe, except in Table 11.

Benchmarks from the National Income and Product Accounts (NIPA) identify before-tax income as is collected in Census Bureau surveys.

Adjusted gross income benchmarks derived by the Bureau of Economic Analysis (BEA-AGI) and the Internal Revenue Service (IRS-AGI) identify adjusted gross income collected on IRS tax returns from individuals.

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## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in millions of dollars)

	CPS and March based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
<b>A. Wages and Salary</b>						
wages and salary...(NIPA Basis) /6	2,742,801	2,728,335	2,615,307	2,742,801	2,728,335	2,615,307
LESS:						
In sample universe but left /5	10,880	10,823	10,374	N/A	N/A	N/A
Decedents /1	2,536	2,523	2,418	N/A	N/A	N/A
Institutionalized /2	2,283	2,271	2,177	N/A	N/A	N/A
Civilian overseas /2	1,000	995	954	N/A	N/A	N/A
Military on post of overseas /2	5,061	5,0340	4,8260	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	28,939	28,939	28,939	28,832	28,832	28,832
Institutionalized /3	2,000	2,000	2,000	1,893	1,893	1,893
Decedents /3	750	750	750	643	643	643
Survivors /3	1,250	1,250	1,250	1,250	1,250	1,250
Civilian overseas /4	3,245	3,245	3,245	3,245	3,245	3,245
Military on post and overseas /4	23,694	23,694	23,694	23,694	23,694	23,694
Lump sum payments	0	0	0	0	0	0
Imputed food and lodging /6	12,399	N/A	N/A	12,399	N/A	N/A
PLUS:						
Director's fees /7	2,860	N/A	N/A	2,860	N/A	N/A
Judicial and marriage fees /7	1,549	N/A	N/A	1,549	N/A	N/A
Wages of migratory workers /8	634	N/A	N/A	634	N/A	N/A
control.....	2,695,626	2,688,573	2,575,994	2,706,748	2,702,748	2,589,720

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in millions of dollars)

	CPS and March based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
B. Nonfarm self-employment income /6 (NIPA basis)						
nonfarm self employment income	325,244	297,171	138,576	325,244	297,171	138,576
LESS:						
In sample universe but left /5	1,328	1,213	566	N/A	N/A	N/A
Decedents /1	618	565	263	N/A	N/A	N/A
Institutionalized /2	329	301	140	N/A	N/A	N/A
Civilian overseas /2	325	297	138	N/A	N/A	N/A
Military on post or overseas /2	56	51	24	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	850	850	850	843	843	843
Institutionalized /3	150	150	150	143	143	143
Decedents /3	50	50	50	43	43	43
Survivors /3	100	100	100	100	100	100
Civilian overseas /3	500	500	500	500	500	500
Military on post and overseas /3	200	200	200	200	200	200
Lump sum payments	0	0	0	0	0	0
Patronage refunds of farm cooperatives (to section C) /7	1,900	N/A	N/A	1,900	N/A	N/A
Proprietorship and partnership income paid to fiduciaries /7	1,000	N/A	N/A	1,000	N/A	N/A
Defaulter's gain/Bad debt expense /7	4,506	N/A	N/A	4,506	N/A	N/A
Construction adjustment /7	3,900	N/A	N/A	3,900	N/A	N/A
Rural telephone cooperatives /7	200	N/A	N/A	200	N/A	N/A
Rural electric cooperatives /7	800	N/A	N/A	800	N/A	N/A
Inventory valuation adjustment /6 and /8	(805)	N/A	N/A	(805)	N/A	N/A
Control consumption adjustment /6 and /8	16,027	N/A	N/A	16,027	N/A	N/A
control.....	295,538	295,108	137,160	296,873	296,328	137,733

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
D. Money interest income (NIPA basis) /6						
money interest income	694,502	240,623	222,994	694,502	240,623	222,994
LESS:						
In sample universe but left /5	2,772	960	890	N/A	N/A	N/A
Decendents /1	1,676	581	538	N/A	N/A	N/A
Institutionalized /2	884	306	284	N/A	N/A	N/A
Civilian overseas /2	150	52	48	N/A	N/A	N/A
Military on post or overseas /2	62	21	20	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	666	642	641	637	637	637
Institutionalized /3	500	500	500	471	471	471
Decendents /3	200	200	200	171	171	171
Survivors /3	300	300	300	300	300	300
Civilian overseas /4	36	12	11	36	36	36
Military on post and overseas /3	130	130	130	130	130	130
Lump sum payments	0	0	0	0	0	0
Interest received by nonprofits /6	18,824	N/A	N/A	N/A	N/A	N/A
Monetary interest retained by						
Fiduciaries /6	12,419	N/A	N/A	12,419	N/A	N/A
Taxable distributions by regulated						
Investment co. (Excludes earnings from						
Money market mutual funds) (to section E) /7	23,100	N/A	N/A	23,100	N/A	N/A
Imputed interest income /8	300,338	N/A	N/A	300,338	N/A	N/A
IRA-Keogh /6	30,481	N/A	N/A	30,481	N/A	N/A
control.....	282,802	239,020	221,463	285,603	239,986	222,357

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
C. Farm self-employment (NIPA basis) /6						
farm self-employment	41,675	34,362	(814)	41,675	34,362	(814)
LESS:						
In sample universe but left /5	721	594	(14)	N/A	N/A	N/A
Decedents /1	307	253	(6)	N/A	N/A	N/A
Institutionalized /2	192	158	(4)	N/A	N/A	N/A
Civilian overseas /2	189	156	(4)	N/A	N/A	N/A
Military on post or overseas /2	33	27	(1)	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	37	42	42	42	42	42
Institutionalized /3	35	35	35	35	35	35
Decedents /3	10	10	10	9	9	9
Survivors /3	25	25	25	25	25	25
Civilian overseas /4	0	0	0	0	0	0
Military on post and overseas /3	2	2	2	2	2	2
Lump sum payments	0	0	0	0	0	0
Net rent received by farm,	18,824	N/A	N/A	N/A	N/A	N/A
Operator landlords (to section F) /9	140	N/A	N/A	140	N/A	N/A
Imputed farm income net of expense /9	1,476	N/A	N/A	1,476	N/A	N/A
Capitol Consumption adjustment	(7,800)	N/A	N/A	(7,800)	N/A	N/A
Change in business inventory /7	3,100	N/A	N/A	(3,100)	N/A	N/A
Defaulter's gain/bad debt /7						
PLUS						
Patronage refunds of farm						
Cooperatives (from section b) /7	1,900	N/A	N/A	1,900	N/A	N/A
control.....	45,901	33,731	(837)	46,623	34,326	(850)

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
D. Money interest income (NIPA basis) /6						
money interest income	694,502	240,623	222,994	694,502	240,623	222,994
LESS:						
In sample universe but left /5	2,772	960	890	N/A	N/A	N/A
Decedents /1	1,676	581	538	N/A	N/A	N/A
Institutionalized /2	884	306	284	N/A	N/A	N/A
Civilian overseas /2	150	52	48	N/A	N/A	N/A
Military on post or overseas /2	62	21	20	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	666	642	641	637	637	637
Institutionalized /3	500	500	500	471	471	471
Decedents /3	200	200	200	171	171	171
Survivors /3	300	300	300	300	300	300
Civilian overseas /4	36	12	11	36	36	36
Military on post and overseas /3	130	130	130	130	130	130
Lump sum payments	0	0	0	0	0	0
Interest received by nonprofits /6	18,824	N/A	N/A	18,824	N/A	N/A
Monetary interest retained by Fiduciaries /6	12,419	N/A	N/A	12,419	N/A	N/A
Taxable distributions paid by regulated Investment co. (Exclude earnings from Money market mutual funds) (to section E)	23,100	N/A	N/A	23,100	N/A	N/A
Imputed interest income /8	300,338	N/A	N/A	300,338	N/A	N/A
IR-Keogh /6	30,481	N/A	N/A	30,481	N/A	N/A
control.....	282,802	239,020	221,463	285,603	239,986	222,357

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
E. Dividend income (NIPA basis) /6						
Dividend income.....	140,333	145,745	80,119	140,333	145,745	80,119
LESS:						
In sample universe but left /5	1,889	1,962	1,078	N/A	N/A	N/A
Decedents /1	1,711	1,777	977	N/A	N/A	N/A
Institutionalized /2	135	140	77	N/A	N/A	N/A
Civilian overseas /2	27	28	15	N/A	N/A	N/A
Military on post or overseas /2	16	17	9	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	729	729	729	672	672	672
Institutionalized /3	700	700	700	643	643	643
Decedents /3	400	400	400	343	343	343
Survivors /3	300	300	300	300	300	300
Civilian overseas /4	17	17	17	17	17	17
Military on post and overseas /3	12	12	12	12	12	12
Lump sum payments	0	0	0	0	0	0
Dividends received by nonprofits /6	5,672	N/A	N/A	5,672	N/A	N/A
Dividends retained by fiduciaries /6	5,245	N/A	N/A	5,245	N/A	N/A
IRA Keogh /6	15,772	N/A	N/A	15,772	N/A	N/A
Small business corporation income /6	8,175	N/A	N/A	8,175	N/A	N/A
PLUS						
Taxable distributions paid by regulated Investment co. (Excludes earnings from Money market mutual funds) (from sec D)	23,100	N/A	N/A	23,100	N/A	N/A
control.....	126,251	143,354	78,612	128,197	145,373	79,747

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
F. Money rental income						
Money rental income. W/CCAdj.	(12,261)	37,642	4,759	(12,261)	37,642	4,759
In sample universe but left /5	131	(402)	(51)	N/A	N/A	N/A
Decedents /1	76	(233)	(29)	N/A	N/A	N/A
Institutionalized /2	25	(77)	(10)	N/A	N/A	N/A
Civilian overseas /2	25	(77)	(10)	N/A	N/A	N/A
Military on post or overseas /2	5	(15)	(2)	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	17	17	17	17	17	17
Institutionalized /3	5	5	5	5	5	5
Decedents /3	2	2	2	2	2	2
Survivors /3	3	3	3	3	3	3
Civilian overseas /4	4	4	4	4	4	4
Military on post and overseas /3	8	8	8	8	8	8
Lump sum payments	0	0	0	0	0	0
Net rental income retained by fiduciaries /6	2,226	N/A	N/A	2,226	N/A	N/A
Imputed rent of owner-occupied dwellings includes ccadj /7	(2,644)	N/A	N/A	(2,644)	N/A	N/A
Capital consumption adjustment /7	(56,900)	N/A	N/A	(56,900)	N/A	N/A
Income from royalties, inclusive Of depletion (to action G) /7	7,802	N/A	N/A	7,802	N/A	N/A
PLUS						
Net rent received by farm Operator landlords (from section F) /9	140	N/A	N/A	140	N/A	N/A
control.....	37,247	38,027	4,793	37,378	37,625	4,742



## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
G. Income from royalties						
Income from royalties, inclusive						
Of depletion (NIPA basis)						
(from section B) /6	7,802	N/A	N/A	7,802	N/A	N/A
LESS:						
In sample universe but left /5	82	0	0	N/A	N/A	N/A
Decedents /1	28	0	0	N/A	N/A	N/A
Institutionalized /2	25	0	0	N/A	N/A	N/A
Civilian overseas /2	24	0	0	N/A	N/A	N/A
Military on post or overseas /2	5	0	0	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	63	17	17	17	17	17
Institutionalized /3	25	5	5	5	5	5
Decedents /3	10	2	2	2	2	2
Survivors /3	15	3	3	3	3	3
Civilian overseas /4	20	4	4	4	4	4
Military on post and overseas /3	18	8	8	8	8	8
Lump sum payments	22	0	0	0	0	0
Royalties retained by fuduciaries /7	747	N/A	N/A	463	N/A	N/A
control.....	6,888	N/A	N/A	7,322	N/A	(17)

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
H. Social Security						
Social Security and Railroad Retirement Board Income (NIPA basis)						
Social Security benefits /10	247,816	24,874	19,949	247,816	24,874	19,949
LESS						
In sample universe but left	8,412	N/A	N/A	N/A	N/A	N/A
Decedents /1	5,320	N/A	N/A	N/A	N/A	N/A
Institutionalized /2	3,042	N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	70	N/A	N/A	N/A	N/A	N/A
Military on post or overseas	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe /11	13,688	N/A	N/A	13,688	N/A	N/A
Institutionalized /11	8,458	N/A	N/A	8,458	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A3	N/A		N/A	N/A
Civilian overseas /11	5,230	N/A	N/A	5,210	N/A	N/A
Military on post and overseas	0	N/A	N/A	0	N/A	N/A
Lump sum payments /11	202	N/A	N/A	202	N/A	N/A
control.....	225,494	24,874	19,949	233,926	24,874	19,949

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
<b>I. Unemployment Compensation</b>						
Unemployment compensation (NIPA basis) /7	18,117	18,275	15,569	18,117	18,275	15,569
Government unemployment compensation	18,056	18,275	15,569	18,056	18,275	15,569
Supplemental unemployment benefits /4	0	N/A	N/A	0	N/A	N/A
Railroad unemployment insurance /7	61	N/A	N/A	61	N/A	N/A
Special unemployment benefits /7	0	N/A	N/A	0	N/A	N/A
LESS:						
Civilian overseas /5	71	72	61	N/A	N/A	N/A
Decedents /12		0	0	N/A	N/A	N/A
Institutionalized /12		0	0	N/A	N/A	N/A
Civilian overseas /2	35	35	30	N/A	N/A	N/A
Military on post or overseas /2	36	360	31	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	13	13	11	19	19	16
Institutionalized /12	0	0	6	6	5	
Decedents /12		0	0	0	0	0
Survivors /12		0	0	6	6	5
Civilian overseas /4	10	10	9	10	10	9
Military on post and overseas /3	3	3	3	3	3	3
Lump sum payments	0	0	0	0	0	0
Death or institutionalization /11	362	362	362	271	271	271
control.....	17,671	17,828	15,135	17,827	17,985	15,282

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
J. Aid to Families with Dependent						
Aid to Families with Dependent Children /7	19,800	0	0	19,800	0	0
LESS:						
In sample universe but left	49	N/A	N/A	N/A	N/A	N/A
Decedents /12		N/A	N/A	N/A	N/A	N/A
Institutionalized /12		N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	49	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe	85	N/A	N/A	85	N/A	N/A
Institutionalized /12		N/A	N/A		N/A	N/A
Decedents /12		N/A	N/A		N/A	N/A
Survivors /12		N/A	N/A		N/A	N/A
Civilian overseas /3	85	N/A	N/A	85	N/A	N/A
Military on post and overseas /3	0	N/A	N/A	0	N/A	N/A
Lump sum payments	0	N/A	N/A	0	0	N/A
Death or institutionalization /11	396	N/A	N/A	297	N/A	N/A
control.....	19,666	N/A	N/A	19,715	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
K. Federally-Administered Supplemental Security Income						
Federally-Administered Supplemental Security Income /10	16,133	0	0	16,133	0	0
LESS:						
In sample universe but left	571	N/A	N/A	N/A	N/A	N/A
Decedents /11	555	N/A	N/A	N/A	N/A	N/A
Institutionalized /11	0	N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	11	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	6	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe	703	N/A	N/A	703	N/A	N/A
Institutionalized /11	669	N/A	N/A	669	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas /3	22	N/A	N/A	22	N/A	N/A
Military on post and overseas /3	12	N/A	N/A	12	N/A	N/A
Child payments /11	1,723			1,723		
Lump sum payments	0	N/A	N/A	0	0	N/A
control.....	13,136	N/A	N/A	13,707	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
L. State-Administered Supplemental Security Income						
State Administered Supplemental Security Income /10	466	N/A	N/A	466	N/A	N/A
LESS:						
In sample universe but left	16	N/A	N/A	N/A	N/A	N/A
Decedents /11	16	N/A	N/A	N/A	N/A	N/A
Institutionalized /2	0	N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	0	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe	19	N/A	N/A	19	N/A	N/A
Institutionalized /11	19	N/A	N/A	19	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas	0	N/A	N/A	0	N/A	N/A
Military on post and overseas	0	N/A	N/A	0	N/A	N/A
Lump sum payments	0	N/A	N/A	0	N/A	N/A
Child support /11	0			0		
control.....	431	N/A	N/A	447	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
M. Other Public Assistance						
Other public assistance	2,900	N/A	N/A	2,900	N/A	N/A
General Assistance	2,900	N/A	N/A	2,900	N/A	N/A
LESS:						
In sample universe (as of Jan 90) but left	27	N/A	N/A	N/A	N/A	N/A
Decedents /1	6	N/A	N/A	N/A	N/A	N/A
Institutionalized /2	14	N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	7	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe	16	N/A	N/A	16	N/A	N/A
Institutionalized /3	6	N/A	N/A	6	N/A	N/A
Decedents	0	N/A	N/A	0	N/A	N/A
Survivors	6	N/A	N/A	6	N/A	N/A
Civilian overseas /3	10	N/A	N/A	10	N/A	N/A
Lump sum payments	0	N/A	N/A	0	0	N/A
control.....	2,857	N/A	N/A	2,884	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
N. Federal Civilian Retirement						
Federal Civilian Retirement	31,800	N/A	N/A	31,800	N/A	N/A
LESS:						
In sample universe but left	327	0	0	N/A	N/A	N/A
Decedents /11	323	0	0	N/A	N/A	N/A
Institutionalized /13		0	0	N/A	N/A	N/A
Civilian overseas /2	3	0	3	N/A	N/A	N/A
Military on post or overseas /2	1	0	0	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	1,021	1,041	1,041	1,041	1,041	1,041
Institutionalized /11	699	699	699	699	699	699
Decedents						
Survivors						
Civilian overseas /11	322	322	322	322	322	322
Military on post and overseas	0	20	20	20	20	20
Lump sum payments /11	75	75	75	75	75	75
control.....	30,377	N/A	N/A	30,684	N/A	N/A



## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
O. Veteran Benefits	15,800	N/A	N/A	15,800	N/A	N/A
Disability and Pension /10	15,500	N/A	N/A	15,500	N/A	N/A
Readjustment and Education /10	300	N/A	N/A	300	N/A	N/A
LESS:						
In sample universe but left	532	N/A	N/A	N/A	N/A	N/A
Decedents /1	500	N/A	N/A	N/A	N/A	N/A
Institutionalized /13		N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	3	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	29	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe	1,330	N/A	N/A	2,000	N/A	N/A
Institutionalized /14	1,200	N/A	N/A	1,200	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas /3	100	N/A	N/A	100	N/A	N/A
Military on post and overseas /3	30	N/A	N/A	30	N/A	N/A
Lump sum payments /3	100	N/A	N/A	100	N/A	N/A
control.....	13,838	N/A	N/A	13,700	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
P. Military Retirement						
Military retirement /8	22,100	N/A	N/A	22,100	N/A	N/A
LESS:						
In sample universe but left	216	0	0	N/A	N/A	N/A
Decedents /11	215	0	0	N/A	N/A	N/A
Institutionalized /13		0	0	N/A	N/A	N/A
Civilian overseas /15		0	0	N/A	N/A	N/A
Military on post or overseas /4	1	0	0	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe	682	685	685	685	685	685
Institutionalized /11	466	466	466	466	466	466
Decedents						
Survivors						
Civilian overseas /11	216	216	216	216	216	216
Military on post and overseas	0	3	3	3	3	3
Lump sum payments /11	818	818	818	818	818	818
control.....	20,384	N/A	N/A	20,597	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
Q. State and Local pensions						
State and Local pensions /8	40,100	N/A	N/A	40,100	N/A	N/A
LESS:						
In sample universe but left	386	0	0	N/A	N/A	N/A
Decedents /11	386	0	0	N/A	N/A	N/A
Institutionalized /13		0	0	N/A	N/A	N/A
Civilian overseas /15		0	0	N/A	N/A	N/A
Military on post or overseas /16		0	0	N/A	N/A	N/A
Other leaving survey universe	0	0	0	N/A	N/A	N/A
Not in sample universe						
Institutionalized /11	1,231	1,231	1,231	1,231	1,231	1,231
Decedents	836	836	836	836	836	836
Survivors						
Civilian overseas /11	385	385	385	385	385	385
Military on post and overseas /13	10	10	10	10	10	10
Lump sum payments /11	2,430	2,430	2,430	2,430	2,430	2,430
control.....	36,053	N/A	N/A	36,489	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
R. Railroad Retirement						
Railroad retirement (NIPA BASIS) /8	7,200	N/A	N/A	7,200	N/A	N/A
LESS:						
In sample universe but left	72	N/A	N/A	N/A	N/A	N/A
Decedents /11	72	N/A	N/A	N/A	N/A	N/A
Institutionalized /13		N/A	N/A	N/A	N/A	N/A
Civilian overseas /2	0	N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe Institutionalized	239	N/A	N/A	239	N/A	N/A
Institutionalized /11	167	N/A	N/A	167	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas /11	72	N/A	N/A	72	N/A	N/A
Military on post and overseas /13	0	N/A	N/A	0	N/A	N/A
Lump sum payments /3	3	N/A	N/A	3	N/A	N/A
control.....	6,886	N/A	N/A	6,958	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
S. Workers' Compensation						
Workers' compensation /11	23,100	N/A	N/A	23,100	N/A	N/A
Includes black lung						
LESS:						
Decedents in 1987						
In sample universe but left		N/A	N/A	N/A	N/A	N/A
Decedents		N/A	N/A	N/A	N/A	N/A
Institutionalized		N/A	N/A	N/A	N/A	N/A
Civilian overseas		N/A	N/A	N/A	N/A	N/A
Military on post or overseas		N/A	N/A	N/A	N/A	N/A
Other leaving survey universe		N/A	N/A	N/A	N/A	N/A
Not in sample universe						
Institutionalized		N/A	N/A		N/A	N/A
Institutionalized		N/A	N/A		N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas		N/A	N/A		N/A	N/A
Military on post and overseas		N/A	N/A		N/A	N/A
Lump sum payments /11	8,197	N/A	N/A	8,197	N/A	N/A
Universe adjustment /11	298	N/A	N/A	298	N/A	N/A
control.....	14,605	N/A	N/A	14,605	N/A	N/A

## APPENDIX A Detailed Derivations of Independent Benchmarks

Table. Detailed Derivations of Independent Aggregate Income: 1990  
(Income in million of dollars)

	CPS and March-based SIPP			Longitudinal based SIPP		
	NIPA	BEA-AGI	IRS-AGI	NIPA	BEA-AGI	IRS-AGI
T. Private Pensions and Annuities						
Private pensions and annuities /11	140,700	N/A	N/A	140,700	134,539	N/A
LESS:						
In sample universe but left	777	N/A	N/A	N/A	N/A	N/A
Decedents /1	777	N/A	N/A	N/A	N/A	N/A
Institutionalized /13		N/A	N/A	N/A	N/A	N/A
Civilian overseas /15		N/A	N/A	N/A	N/A	N/A
Military on post or overseas /2	0	N/A	N/A	N/A	N/A	N/A
Other leaving survey universe	0	N/A	N/A	N/A	N/A	N/A
Not in sample universe						
Institutionalized	3,243	N/A	N/A	3,243	N/A	N/A
Institutionalized /11	1,680	N/A	N/A	1,680	N/A	N/A
Decedents		N/A	N/A		N/A	N/A
Survivors		N/A	N/A		N/A	N/A
Civilian overseas /11	1,548	N/A	N/A	1,548	N/A	N/A
Military on post and overseas /13	15	N/A	N/A	15	N/A	N/A
Lump sum payments /3	66,500	N/A	N/A	66,500	N/A	N/A
control.....	70,180	N/A	N/A	70,957	N/A	N/A