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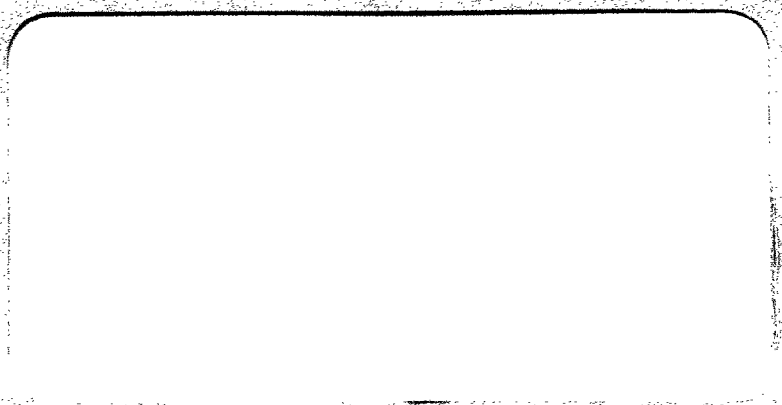

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IMPROVING THE INCOME ALLOCATION PROCEDURES IN MATH

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PREFACE

This report uses data from the Survey of Income and Program Participation 1985 and 1986 Full Panel Research Files, which were released by the Census Bureau for research to enhance understanding and analysis of SIPP data. The data on these files are preliminary and should be analyzed and interpreted with caution. At the time the files were created, the Census Bureau was still exploring certain unresolved technical and methodological issues associated with the creation of these data sets. The Census Bureau does not approve or endorse the use of these data for official estimates.

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EXECUTIVE SUMMARY

The eligibility and benefit criteria of the Food Stamp Program are subject to periodic review and revision by the legislative and executive branches of the government. To estimate the impact of proposed program changes on the federal budget and the program caseload, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture relies on microsimulation techniques--models constructed from household survey and case-record survey data to simulate the provisions of the major tax and needs-tested transfer programs. One model often used is the Microanalysis of Transfers to Households (MATH™) model, The simulations derived from the MATH model are routinely based on data from the March Current Population Survey, which provides measures of annual income and labor-force participation.

The MATH model is reviewed periodically to ensure its accuracy and validity. Because the Food Stamp Program operates according to a monthly accounting period, the annual-based income and employment measures in the March CPS must be converted into monthly amounts to enable the MATH model to simulate the Food Stamp Program on a monthly basis. The purpose of this report is to assess the "performance" of the MATH model at allocating annual income to monthly based income in order to support reliable and accurate simulations.

EVALUATION METHODOLOGY

We pose three specific questions in this study:

- ***How well do the MATH income allocation procedures determine intra-year*** poverty ***status?*** That is, how well do the procedures simulate income eligibility for the Food Stamp Program at a fixed point in time.

- Are the assumptions underlying the MATH procedures correct? That is, have the patterns of intra-year income receipt that were observed in the 1979 Income Survey Development Program Research Test Panel and on which the current model is based changed since 1979?

- Are the MATH procedures biased because they do not model correlation in the patterns of unearned income receipt by husbands and wives? That is, is the estimate of monthly household income biased because the model does not explicitly coordinate the imputed periods of unearned income receipt by husbands and wives?

To address these questions, we compared the results of the MATH income allocation procedures with data derived from the Survey of Income and Program Participation--a national data set that provides extant data on the monthly income and employment status of a sample of U.S. households. We used SIPP longitudinal data for January 1986 through 1987 derived from the 1985 and 1986 full-panel files to construct an analysis file that resembled the March 1987 CPS. We then applied the MATH income allocation procedures to the constructed annual data to simulate monthly income, and then compared the results with the actual monthly income data derived from SIPP.

EVALUATION RESULTS

The MATH income allocation procedures perform well at simulating the number of households below 130 percent of poverty at a fixed point in time, although the number of households below poverty is about 7 percent higher than observed in SIPP. Moreover, the model is producing too many very-low-income households with a relatively even pattern of income receipt, and too few households whose pattern is marked by peaks and valleys.

Most of the assumptions underlying the MATH procedures are still appropriate. The model performs well at determining employment status, at allocating earnings, and at capturing correlation in the work patterns of husbands and wives. The model also produces better estimates of the low-income population and average monthly unearned income than does an alternative, naive model of intra-year income flows in which all unearned income is assumed to be received evenly throughout the year.

The assumptions underlying the model must be revised in two cases: the allocation of unemployment compensation and other unearned nonasset income. The simulated duration of the receipt of unearned income other than asset income and the simulated duration of the receipt of unemployment compensation deviate somewhat from the observed durations in SIPP. The allocation procedure also produces too many outliers (that is, situations in which the imputed duration of receipt is unrealistically low given the amount of reported annual income). The procedures for allocating unemployment compensation yields periods of receipt that are too short on average and monthly benefits that are too high on average. The apparent bias in the simulated duration is due primarily to inconsistencies in SIPP between reported labor-force participation and unemployment compensation receipt. An analysis of SIPP data reveals that only 28 percent of unemployment compensation recipients receive benefits solely during the period of unemployment. On the other hand, 19 percent were employed throughout the period of receipt, most of whom full-time.

The MATH procedures are not biased because the model does not explicitly capture the correlation in periods of the receipt of other income by husbands and wives. The current procedure captures most of the observed correlation.

RECOMMENDATIONS

Recognizing the model performs well at simulating food stamp eligibility at a fixed point in time, we do not recommend major modifications to the model. However, we do recommend two minor enhancements. Fiit, we should revise the procedure for allocating unemployment compensation. Experimentation with alternative methods for modeling the duration of the receipt of this income source reveals that the optimum procedure is one that ignores the relationship between labor-force participation and the receipt of benefits. Thus, we recommend adopting a procedure that relies on administrative data on average weekly benefits to estimate the duration of receipt. Second, we should update the probabilities that govern estimating the duration of the receipt of unearned income other than assets and unemployment compensation, and introduce a control for outliers in the process.

We incorporated the recommended changes into ALLOY and found that the simulation of income eligibility at a fixed point in time remained quite good Nor were there any adverse effects in the intra-year poverty and income eligibility estimates.

In conclusion, we note that, by design, the model does not capture the full variation in poverty within the year, and that further research is required to change the system. The design changes that must be made to address this issue are the addition of a component that captures seasonality in employment patterns and the addition of a component to model intra-year fluctuations in household composition. We observed that the lack of a model of fluctuation in household composition is largely responsible for the finding that ALLOY produces too many very-low-income households with a relatively even pattern of income receipt, and too few households whose pattern is marked by peaks and valleys.

I. INTRODUCTION

Eligibility and benefits under the Food Stamp Program (FSP) are based on a very intricate program design legislated by Congress. The regulations implementing this design reflect the complexities of an assistance program that serves a broad cross-section of the population. Although the basic structure of the FSP has not changed in more than a decade, many refinements have been considered and implemented in that time period. But before such reforms can be legislated, Congress must have information on their estimated impact on the federal budget and on program participants. In order to estimate the impact of reforms to the Food Stamp Program, the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture uses the MicroAnalysis of Transfers to Households (MATH)® model. This model is a microsimulation system that operates with household- and person-level data extracted from the March Current Population Survey (CPS). The CPS provides information on the annual income, labor-force participation, and demographic characteristics of a large sample of the civilian noninstitutionalized population in the United States and is the best available data source for simulating the impact of program reforms.

The MATH model is reviewed periodically to ensure its validity and accuracy. In the most recent review, Doyle and Trippe (1989) focused on the outcomes of the simulation of the FSP to identify weaknesses with the model and their possible causes. This study continues the efforts to validate the MATH model, by evaluating the procedures used to compensate for the annual accounting period of the CPS. Annual retrospective income measured by the CPS is not consistent with the monthly income measures that are used to determine FSP eligibility. Hence, the MATH model incorporates a modeling procedure to allocate the CPS annual income to monthly amounts. The following questions are addressed in this study:

- How well do the MATH procedures determine intra-year poverty status and thus income eligiility for food stamps?

- Do the assumptions underlying the MATH procedures reflect current patterns, or have the patterns of intra-year income receipt changed since 1979, the year of the data on which supporting research was conducted?
- Are the MATH procedures biased because they do not model the correlation in patterns of unearned income receipt among household members?

Based on an evaluation of the MATH procedures, we recommend several enhancements to correct weaknesses with the model. (These recommendations are presented in Chapter V.) In the remainder of this introductory chapter, we provide an overview of the simulation of the FSP within the MATH system, an overview of the evaluation methodology, and an overview of the report.

A. SIMULATION OF THE FOOD STAMP PROGRAM IN MATH

The MATH model uses a two-step procedure to simulate the FSP under current legislation. It first applies eligibility criteria to households on the CPS as if they had entered the welfare office to apply for benefits. Then, since not all eligible households choose to participate, MATH invokes a behavioral model to simulate participation among the households that are determined to be eligible (Doyle, 1990). The model simulates proposed changes to the FSP by incorporating modifications to the eligibility criteria and repeating the eligibility and participation simulation. The simulated current-law and proposed program are compared at the household level to determine gainers and losers under the reform, and are compared at the macro level to determine the net impact of the reform on program costs and caseload.

The MATH model attempts to overcome several drawbacks with the CPS to support analyzing the impacts of the Food Stamp Program. The CPS uses an annual accounting period for income and labor-force participation, while the Food Stamp Program determines eligibility and benefits on the basis of monthly income. The survey is retrospective and does not necessarily reflect the economic and demographic conditions expected to exist at a future point in time when a proposed or legislated reform would be implemented. The survey also lacks information on countable assets and deductible child care, shelter, and medical costs, and underreports information on participation in cash assistance

programs.[1] Finally, the CPS uses two different reference periods for measuring demographic data and economic data.

To overcome these weaknesses, the MATH model executes a number of preparatory steps to set up the data base for Food Stamp Program simulations. The CPS is aged to the year in which FNS expects the program changes to be implemented, to capture the impact of projected changes in the unemployment rate, expected growth in the population, and projected changes in income and prices. In order to compensate for the underreporting of cash welfare and to support simulating the impact of reforms to the cash welfare programs on the Food Stamp Program, MATH simulates eligibility, participation, and potential benefits under the Aid to Families with Dependent Children (AFDC), Supplemental *Security* Income (SSI), and General Assistance (GA) programs. As noted, the model first simulates monthly income from annual income in the process of determining food stamp eligibility. The monthly income simulation relies on reported weeks of work and unemployment from the CPS, as well as on patterns of intra-year income flows from the 1979 Income Survey Development Program Research Test Panel, to assign reported annual income to calendar months within the year. Finally, the MATH model imputes missing asset balances and deductible expenses.

B. EVALUATION METHODOLOGY

We investigated the questions to be addressed in our validation study by applying the MATH income allocation model, ALLOY, to a data set for which the outcome was known and by comparing simulated with actual outcomes. We then used the outcome of the comparisons to infer the strengths and weaknesses of the ALLOY procedures. Finally, we developed alternative model specifications and used the same data set to evaluate their strengths and weaknesses. The known, or observed, data underlying the analysis were derived from the Survey of Income and Program Participation. Thus, the evaluation of ALLOY and alternate procedures are based on the success with which the model

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[1] See, for example, *Current Population Reports,* P-60 no. *163* to illustrate the underreporting problem.

replicates the original monthly data in SIPP, given an extract of the SIPP data which resembles the CPS.

SIPP is a longitudinal survey of the civilian noninstitutionalized population which captures monthly income, labor-force participation, demographic characteristics, and household composition. Thus, SIPP provides the desired monthly accounting period absent from the CPS. The longitudinal component of SIPP also provides sufficient information to replicate the annual economic data and the March demographic data available in the CPS. For this analysis, we constructed a CPS-type file from the SIPP data for 1986, executed the standard ALLOY modeling procedures and several variants of the ALLOY procedures, and compared the results with the original monthly information in SIPP.

Due to differences in their survey design, the outcomes of a CPS-type file that can be constructed from SIPP differ from the outcomes of an actual CPS survey. More importantly, the CPS sample size is more than twice the size of the SIPP sample, the questions pertaining to similar topics are phrased differently in the two surveys, and the recall period for economic data is much longer in the CPS (up to 15 months) than in SIPP (up to 4 months). However, the design of this study focuses on the replication of monthly data given an annual measure as input and does not require actually replicating all CPS concepts. There are some limitations with using SIPP to mimic the CPS, but they are not substantial and do not affect this study's outcome.

C. OVERVIEW OF THE REPORT

Chapters II and III provide additional background material for the evaluation. Chapter II focuses on the literature on intra-year fluctuations in income, and Chapter III focuses on the evaluation methodology and its limitations. Chapter III also includes a more detailed description of the CPS and SIPP. Chapter IV presents the outcome of the evaluation, and Chapter V concludes with recommendations for further research and model enhancements.

II. A REVIEW OF THE RESEARCH ON INTRA-YEAR INCOME FLOWS

The Food Stamp Program, and other means-tested programs, use monthly income data to determine eligibility, whereas most household surveys provide annual income data. This chapter reviews three areas of research that address the problem of converting annual income into monthly amounts. The first section discusses studies that compare annual and monthly poverty measures, thus illustrating the importance of estimating subannual income amounts. The second section reviews research on developing and evaluating the current approach used in the MATH model. Finally, the third section discusses research on modeling the coincidence of work among family members who work part year.

A. ANNUAL VERSUS MONTHLY POVERTY MEASURES

Much of the research on intra-year income flows comprises studies of the incidence and duration of poverty. Until recently, however, researchers have had to rely on annual income data to measure poverty. For example, the Bureau of the Census computes the official poverty statistics on the percentage of persons in poverty each year by comparing annual cash income as reported in the cross-sectional Current Population Survey with poverty thresholds (U.S. Department of Commerce, 1989a). Furthermore, the longitudinal Panel Study of Income Dynamics (PSID) has allowed researchers to study changes in poverty over time, but only on a year-to-year basis, because the data are annual. The studies based on the PSID data show that the poverty population is not static over time, and the characteristics of the long-term poor differ significantly from those who are counted as poor according to annual income as measured in the CPS (see, for example, Levy 1977; Coe, 1978; Hill, 1981; Duncan et al., 1984; and Bane and Ellwood, 1986).[1]

[1] For example, Levy (1977) found that only about 40 percent of those poor at a point in time will remain poor for at least five years, and Bane and Ellwood (1986) found that only about 52 percent of the nonelderly poverty population are in the midst of a spell of poverty that lasts more than nine years.

The problem with using annual income data when measuring poverty is that annual income data do not capture temporary spells of poverty due to short-term setbacks, such as job loss, the death or disability of a family member, or divorce or separation. Capturing these subannual income fluctuations is particularly important when estimating eligibility for means-tested programs such as the FSP, because eligibility is based on monthly income (as a percentage of the poverty threshold). Due to variations in household income, a household may be eligible for food stamps in one month but ineligible the next.

Only since the advent of the Survey of Income and Program Participation (SIPP) in 1984, and its predecessor -- the 1979 Income Survey Development Program Research Test Panel (ISDP) -- have researchers been able to track subannual changes in poverty, thus allowing them to compare annual and subannual measures. SIPP is a longitudinal panel survey that collects information on income, family composition, and other characteristics for each month rather than for an entire year, and the data collection occurs every four months rather than annually.

Patricia Ruggles and Roberton Williams have conducted much of the research on subannual measures of poverty using the monthly-income-based SIPP.[2] For example, Williams (1987) used the monthly SIPP data to calculate a variety of poverty rates according to alternative accounting periods. Williams calculated an annual poverty rate of 11 percent based on income over the ***entire year,*** a "continuous poverty" rate of 5.9 percent based on the proportion who were poor in every ***month*** during the year, an "occasional poverty" rate of 26.2 percent based on income below one-twelfth of the annual threshold for at ***least*** one ***month*** during the year, and an average rate of 13.7 percent based on an ***average*** of the monthly poverty rates calculated for each month during calendar-year 1984.[3]

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[2]See, for example, Ruggles (1990), Ruggles (1988), Williams (1987), and Ruggles and Williams (1986).

[3]The 11 percent annual poverty rate is based on variable family composition. Williams calculated variable family composition by comparing, for each person, the sum of family incomes for each of the 12 months of 1984 with the sum of monthly poverty thresholds over the same period.

The substantial divergence in the poverty rates implies large amounts of intra-year fluctuation in the monthly income of low-income families. In particular, the percentage of persons who are occasionally poor (poor in at least one month during the year) is greater than the percentage who are poor on the basis of their annual incomes (26 percent, compared with 11 percent). The difference in these two rates implies that the monthly income of many low-income families drops below the poverty threshold in at least one month during the year, even though they are not poor according to their annual income. This monthly variation in family income would not be captured if it equaled annual income divided by 12. Furthermore, the continuously poor (those poor in every month of the year) is smaller than the percentage who are poor on the basis of their annual income (6 percent, compared with 11 percent). This difference implies that almost half of families whose annual income is below the poverty threshold have at least one month during the year in which their income rises above the poverty threshold.

Hence, using annual income divided by 12 as a measure of monthly income to estimate the number of FSP-eligible households would inaccurately assume that a household received its income evenly throughout the year. This process would yield an inaccurate measure of household income and generate a biased number of households eligible for the FSP. The purpose of the MATH income allocation procedures is to capture as much of this monthly income fluctuation as possible.

B. DEVELOPING THE CURRENT MATH APPROACH

The current approach for allocating annual income to monthly amounts in the MATH model is based on an analysis of intra-year income flows for a cross-section of the population derived from the 1979 ISDP (Doyle, 1984a).[4] Doyle tested existing assumptions about allocating annual income to

[4] The 1978 and 1979 ISDP surveys were the prototypes of the new, continuing SIPP household survey used in this analysis.

monthly amounts and developed alternative methodologies when necessary.' Doyle measured three sources of income variability: (1) the coincidence of labor-force participation among family members; (2) the distribution of unearned income across periods of work and nonwork for part-year workers; and (3) the variation in individual amounts of unearned income across months. The results showed that:

- The work periods of husbands and wives tend to be concurrent rather than compensating (as descrii more fully in Section C).
- The distribution of unearned income across periods of work and nonwork varies by type of income: worker's compensation is received during periods of work and nonwork, but in no clear pattern; unemployment compensation is generally received during periods of nonwork; but its receipt during periods of work occurs during transitions between nonwork and work
- The distribution of other unearned income (excluding asset income) varies between elderly and nonelderly persons: elderly receive other income continuously throughout the year; nonelderly receive other income in patterns that vary according to whether they receive their income regularly (social security, railroad retirement, veterans' benefits, and other disability payments) or irregularly (all other nonasset, unearned income).
- More than half of persons who report receiving asset income receive it for the entire year, but the survey design precluded analyzing intra-year fluctuations for the other persons who report receipt.
- Variations in individual amounts of income differ by type of income: average unemployment compensation benefits are much higher during periods of nonwork than during periods of work; asset income does not fluctuate between work and nonwork periods; and other unearned income is higher during periods of work than nonwork (for the elderly, the amount does not vary; for the nonelderly, other income is higher during periods of work than nonwork).

Doyle incorporated these findings into the current MATH income allocation approach (ALLOY), as documented in Doyle (1984b) and summarized in the following chapter. The changes in the allocation procedure increased the number of FSP-eligibles. Specifically, the number of

[5]The then-existing assumptions about the patterns of income receipt tested by Doyle were as follows: (1) in couples that consisted of part-year workers, the period of work by the head and spouse tended to be compensating rather than concurrent; (2) unemployment compensation was received over the period of unemployment (inclusive of spells of part-time work); and (3) other unearned income was received evenly throughout the year.

households simulated to be eligiile for food stamps increased by 13 percent, with a corresponding reduction in the participation rate from 60 percent to 54 percent. Lubitz (1986) analyzed the outcome and concluded that the current procedure generated a more accurate cross-section of monthly income distribution relative to the monthly income distriiution measured in SIPP.

A more recent examination of the outcome of the annual to monthly allocation process indicated once again that, on the whole, the process performs well relative to monthly data in SIPP (Doyle and Trippe, 1989).[6] The process performs poorly only at estimating the number of recipients and the amount of unemployment compensation. The study concludes that the problem lies with the reported CPS data, rather than with the methodology.

Whereas the MATH model allocates labor-force participation during the year according to intra-year income flows observed in the 1979 ISDP, other microsimulation models use different procedures. The Transfer Income (TRIM2) model, for example, allocates labor-force participation and earnings by assigning intra-year patterns of work and unemployment to individuals based on the seasonal variation in the unemployment rate published by the Bureau of Labor Statistics (BLS).[7] Unemployment and workers' compensation are then allocated on the basis of assigned intra-year patterns of weeks not worked. Other unearned income is allocated evenly throughout the year. The Household Income and Tax Simulation Model (HITSM) uses the reported information on the number of jobs and the number of spells of unemployment to estimate a variable pattern of labor-force participation, employment, and unemployment on an individual basis. To some extent, the HITSM model also takes into account the seasonal variation in the employment patterns of students.

[6]Doyle and Trippe compare the aggregate results of the monthly income allocation process (total recipients, average income, and total income for six major components of monthly income based on CPS data) both with SIPP monthly estimates and with independent benchmark estimates.

'For a description of TRIM2, see Webb et al. (1986).

C. RESEARCH ON MODELING THE COINCIDENCE OF WORK AMONG PART-YEAR WORKERS

A key to developing an accurate measure of monthly household earnings for households that contain part-year workers lies in modeling the decision about whether family members who work part-year tend to work concurrently or at different times. CPS files do not contain information on fluctuations in the level of monthly earnings within the work period, and they do not support identifying when employment begins and when it ends within the year.

For most families (81 percent of those whose head and spouse work), the assumption about the months in which the head or spouse works is irrelevant, because one or both spouses work all 12 months. However, for the 19 percent of the working families in which both the head and the spouse work part year, the assumption about the months in which they work can make a large difference in their monthly income, and thus in their eligibility and benefit levels. In general, if part-year work periods tend to be concurrent (simultaneous), household income will *vary* more within the year than if work periods tend to be compensating (sequential). Doyle (1984a) used the 1979 ISDP to examine the coincidence of the part-year work periods of heads and spouses.

The results show that, in general, the work periods of heads and spouses are more likely to overlap than not to overlap at least one month. In 74 percent of the families, the head and spouse work concurrently in at least one month. The work periods of the head and spouse in only about 15 percent of families do not overlap. On the other hand, the head and spouse work completely concurrently only in 11 percent of the families.

Doyle conducted four experiments using different assumptions about the coincidence of labor-force participation in the annual CPS data, and compared the results with the actual distribution of the coincidence of work in the ISDP. The results showed that the assumption that the work periods of spouses overlap with the work periods of heads by at least one month generates work patterns in the CPS that are most similar to the patterns seen in the ISDP data. Hence, the current model

assumes that the work periods of heads and spouses tend to be concurrent rather than compensating--that is, their work periods overlap by at least one month.

These results coincide with an intuitive understanding of the work patterns of husbands and wives, and relates to empirical work on the behavioral patterns of husbands and wives. One would expect that the work and nonwork periods of husbands and wives would overlap at least to some extent. Since husbands and wives tend to live in the same place, have similar educational backgrounds, and work in related fields (see, for example, Becker, 1973), it seems reasonable that their periods of work and nonwork would overlap. Furthermore, when families move to a new location, both spouses will tend to leave their old jobs and start new ones together rather than separately. In the event of lay-of& or plant closings, or plant openings, spouses are more likely to be affected similarly than differently.

This report tests whether the income allocation procedures that are based on the results in Doyle (1984a) are still valid with the SIPP data. The next chapter describes how we used SIPP to evaluate the procedures.

III. PROCEDURES FOR EVALUATING THE MATH APPROACH

SIPP measures monthly income directly and captures variations in intra-year income flows attributed both to changes in income and employment patterns and to changes in household composition. This chapter outlines how we used SIPP to evaluate the MATH income allocation procedures and lists some related concerns due to differences between SIPP and the CPS. We begin the discussion with an overview of SIPP and the CPS and a description of the analysis file created for this study. We then describe the evaluation methodology. We conclude this chapter with a summary of the limitations in the methodology.

A. DATA

1. The Survey of Income and Program Participation

SIPP is a nationally representative longitudinal survey of adults in the United States that is conducted by the Census Bureau to provide detailed monthly information on income, program participation, and wealth. It is a multipanel survey to which replacement panels are added each year. This study relies on information collected in the 1985 and 1986 panels, for which the reference periods included January 1986 through March 1987.

Each panel consists of persons in a primary sample who were followed for a period of more than two years. The primary sample was defined as adults age 15 and older who resided at approximately 12,000 addresses (dwelling units) in the United States, forming a cross-se&ion sample of U.S. dwelling units. The primary sample members were interviewed in the beginning of a panel year, and then, along with other individuals with whom they resided, they were interviewed at subsequent four-month intervals over a two-year period. In each round of interviewing (or wave), a core questionnaire collected information on each of the four months preceding the interview date. In most waves, the monthly core questions were supplemented with questions on a variety of topical issues that varied

from interview to interview. Because the interviewing process was staggered, the reference period covered in any given wave was not the same for all sample members.

The Census Bureau issues a series of data products from each panel of SIPP, the most important of which for this study was a full-panel longitudinal file. This file contains one record for every adult or child who was ever in the SIPP sample over the course of the panel and reflects a majority of the core data collected in each wave. Each person is classified according to the length of time that he or she remained in the sample, yielding three different longitudinal samples:

- ***A full-panel longitudinal sample,*** consisting of persons who were in the sample for the full reference period, and persons who were in the sample in the first month and remained in the sample for as long as they remained in the SIPP universe.
- ***Two calendar-year samples,*** each consisting of persons who were in the sample during all 12 months of the calendar year and persons who were in the sample in January of the calendar year and remained in the sample for as long as they remained in the SIPP universe during the calendar year.

The Census Bureau assigns three different longitudinal weights to each longitudinal sample member in accordance with the three different samples.[1]

2. The **March Current Population Survey**

The March CPS is a nationally representative survey of approximately 60,090 households in the United States that is conducted annually by the Census Bureau. It contains demographic and labor-force information for March of the interview year and annual retrospective income and employment information for the preceding calendar year. For example, the March 1987 CPS includes demographic and basic labor-force participation for March 1987 and annual income and weeks of labor-force participation for calendar year 1986. The survey measures the earnings, program participation, unearned income, weeks worked, and weeks spent looking for work among all adults

[1]For more information on SIPP and the full panel longitudinal files, see U.S. Department of Commerce (1989b and 1990).

in the sample households; the Census Bureau then enhances these data by constructing family and household income, composition, and poverty status indicators.

3. Analysis Files for the Evaluation

Both limitations with the CPS data and constraints on the size and organization of the MATH data base governed the design of the MATH income allocation procedure, ALLOY. Thus, in order to use SIPP to evaluate the allocation procedure, we created an analysis file from SIPP which mimics the design of the CPS.[2] This analysis file represents a cross-section sample of the population in March of 1987 and describes retrospective annual income, weeks worked, and weeks spent looking for work during 1986. We also created a second analysis file from SIPP that contains monthly income data for the same cross-sectional sample. Both files were created from the 1985 and 1986 full-panel longitudinal SIPP data files according to the following sample selection and data recoding process.

a. Sample Selection

In order to generate annual retrospective data for a cross-section sample of the population (a primary feature of the CPS sample design), we selected a subset of persons present in each SIPP sample in March 1987. Selected cases consisted of all persons (including children) who as of March 1987 resided in households that met the following condition: all of the adults in the household were present in the SIPP sample for all of calendar-year 1986. In other words, if an individual who was present in March was absent from the sample for at least one month in 1986, he and all persons with whom he resided in March were excluded from the analysis. The resulting analysis sample was a subset of the 1986 calendar-year samples included in the 1985 and 1986 full-panel longitudinal files. The selection process used in this study ensured that complete information on annual income, weeks worked, and weeks unemployed could be constructed for all of the observations in the analysis sample and for all persons with whom they resided in March.

[2] We note for clarity that SIPP does not yield the same responses as the CPS due to different modes of data collection. However, that feature does not affect the outcome of this study.

The sample selection process was not random, because, as discussed subsequently, sample attrition in SIPP is not random. Therefore, we assigned weights to the analysis sample to compensate for the nonrandom selection process. We used a two-stage procedure to develop the weights. Within each panel, we extracted the calendar-year weight for 1986 and adjusted this weight to compensate for persons in the SIPP calendar-year sample who were dropped from the analysis sample either because they were not present in the SIPP sample in March 1987 or because some adult with whom they resided in March of 1987 had incomplete information for calendar year 1986. For each panel, the weight adjustment factors were multiplicative and were derived from the ratio of all persons in the calendar-year 1986 SIPP sample to those in the analysis sample. Separate adjustment factors were computed for each age, sex, race/ethnicity, and household headship classification. The adjustment factors are presented in Appendix A.

Once we drew the analysis samples from each panel, we combined them to form one sample. We adjusted the weights at this stage as follows: weights for observations extracted from the 1985 Panel were multiplied by .51, and weights for observations extracted from the 1986 panel were multiplied by .49.[3]

b . Data Recoding

We constructed two analysis files for the final analysis sample, one resembling a March CPS-type file (referred to as the "CPS-type file") and one containing recoded monthly data extracted directly from SIPP (referred to as the "SIPP analysis tile"). The CPS-type file contained one record for each person in the analysis sample and included demographic information as of March 1987, total weeks with a job but not on layoff during 1986, total weeks spent looking for work or on layoff, annual income from 12 aggregate sources for 1986, and total annual household income. The demographic data included personal characteristics (age, race, etc.), family relationships, and household composition. The 12 aggregate income sources constructed from the sum of income amounts over

[3]These factors were derived by the Census Bureau (U.S. Department of Commerce, 1990).

the 12 months of the year were earnings, social security, unemployment compensation, cash welfare, private pensions, government pensions, worker's compensation, veterans' benefits, interest income, dividends, other asset income, and other unearned income.[4] Total household income reflected the sum of total annual income in 1986 for persons in the household as of March.

The SIPP analysis file contains one record for each person in the analysis sample and includes monthly data on demographic characteristics, labor-force participation, person-level income, household sire, household composition, and two measures of total household income for each month in 1986 and March 1987. To compute the first measure of total monthly household income, we used person-level income and household composition as reported for each month of the year.[5] To compute the second measure of monthly household income, we used demographic information from March 1987 together with person-level monthly income during 1986.

B. EVALUATION METHODOLOGY

We simulated monthly income and labor-force participation for the CPS-type file, compared the outcome with reported monthly income and labor-force participation in the SIPP analysis file, and used the results to infer the strengths and weaknesses of the ALLOY model. We compared reported and simulated outcomes at the macro level because ALLOY is not designed to predict monthly income accurately for each person and household, but only average monthly person and household

[4]The income sources were chosen to match those used in the MATH system that were governed by the design of the March CPS through 1988. With the release of the March 1989 CPS, more detailed income sources can be accessed by the model. Prior to the March 1989 CPS, the public-use file identified the following income sources: wages and salaries, self-employment (farm and nonfarm), social security or railroad retirement, SSI, public assistance, interest, rent, dividends, pensions, and other. Subsequent files include wages and salaries, self-employment (farm and nonfarm), interest, rents, dividends and other unearned income disaggregated into 30 different sources.

[5]We constructed the first household income measure and monthly household size prior to selecting the analysis sample. Hence, in each month, they reflect the characteristics of all-persons with whom members of the analysis sample resided, regardless of whether or not these other individuals were in the analysis sample.

income. The income allocation procedure is described in Section B.1, followed by a discussion of the evaluation.

1. MATH Income Allocation Procedure

The MATH income allocation procedure, ALLOY, determines monthly income for each adult in the CPS sample and then aggregates the results to the household and family levels based on reported composition in March. The design of ALLOY emphasizes supporting the simulation of the Food Stamp Program in a "typical" month during the year. While the MATH model supports simulating food stamp benefits for all months of a year, the option is not often used because the CPS does not support models of intra-year changes in household composition. The procedures for determining person-level monthly income are described in detail in Doyle (1984b) and are summarized as follows.

a. Employment and Unemployment

The modeling procedure allocates weeks of employment and unemployment on the CPS to calendar months within the year. The ALLOY procedure does not consider seasonality in employment and unemployment. Instead, for each individual, it determines months of employment from weeks of employment (if reported), and then chooses a start month at random. It assigns months of employment to the start month and to each subsequent month until they are exhausted. In the event that the number of months of employment exceeds the number of months between the start month and the end of the year, ALLOY assigns the balance of the months of employment to the beginning of the year. It constructs months of unemployment from weeks of unemployment and assigns them randomly within the period of nonwork.

In the event that the model encounters a married couple who held jobs only for part of the year, the modeling procedure alters the outcome of one spouse (the person who is not the family head). ALLOY redetermines the start month and reassigns months of employment so that at least one

month of work for the spouse coincides with a month in which the family head worked. Months of unemployment are then reassigned within the revised period of nonwork.

b. Earnings and Unemployment Compensation

ALLOY computes monthly earnings as annual earnings divided by the number of weeks worked and multiplied by the average number of weeks in a month (4.333). It then assigns average monthly earnings to months of employment. The model computes monthly unemployment compensation in an analogous manner, based on an estimated number of weeks of benefit receipt. The estimated weeks of receipt are a function of reported weeks spent looking for work or working part time, maximum weekly benefits (computed from weekly earnings), and legislated maximum allowable weeks of benefit receipt.

c. Cash Welfare

ALLOY has an option either to ignore cash welfare (in the event that cash welfare is simulated with monthly data) or to allocate simulated annual benefits to monthly amounts. The allocation of cash welfare was not invoked for this study for two reasons. First, future applications of ALLOY will ignore cash welfare as the model will be invoked prior to the simulation of public assistance benefits. Thus its performance at allocating annual public assistance is not relevant. Second, the design of the analysis file precludes applying the ALLOY procedure directly.[6]

d. Other Unearned Income

ALLOY allocates asset income evenly over the calendar year, but gives the user the option to use a more sophisticated, three-step method for allocating other unearned income:

- The modeling procedure first imputes the duration of receipt on the basis of user-supplied probabilities.

[6]The only way to make the analysis file suitable for replicating the ALLOY procedure would be to use the MATH approach to simulate public assistance benefits. This simulation process is beyond the scope of this task.

- It then randomly selects a start month and assigns months of receipt until they are exhausted, allowing months of receipt to wrap around to the beginning of the year, as it does with months of employment.
- Finally, the modeling procedure allocates reported annual amounts evenly to the assigned months of receipt.

The user-supplied probabilities are arrayed in two dimensions: elderly versus nonelderly and regularly received income versus other types of nonasset income. Regularly received income is defined as social security, railroad retirement, veterans' benefits, and other disability payments.

For this evaluation, the primary ALLOY simulation procedure uses the default duration probabilities developed from the 1979 ISDP, as discussed in Chapter II and listed in Doyle (1984b). However, for comparison purposes, we also invoked an alternative ALLOY simulation with a different set of probabilities. The alternate ALLOY simulation (as it is referred. to in the next chapter) assumes that unearned income is allocated evenly during the year.

2. The Evaluation

We evaluate ALLOY according to its effectiveness at replicating the original monthly data in SIPP, given the CPS-type file as input. ALLOY computes average monthly income for each adult in the sample and then aggregates the amounts to the household level based on composition in March. Hence, fluctuation in monthly household income is simulated partially but not completely. The major missing components are (1) changes in household composition and (2) seasonality in employment. ALLOY captures three fluctuations in monthly income at the person-level that determine fluctuations in household income and thus poverty status and eligibility:

- Part-year workers have earnings in some months but not others.
- Persons with unemployment compensation have that income in some months but not others.
- Recipients of unearned income other than unemployment compensation, cash welfare, and asset income may have this income source in some months but not others.

We address the following questions: How much of the actual variation in household income does the ALLOY procedure capture? And does ALLOY capture as much variation as possible within the constraints of the CPS data?

Our analysis consists of three components. First, we determine the effectiveness of ALLOY at replicating monthly household income. Developing a good measure of monthly household income is the key to simulating food stamp eligibility successfully; hence, the quality of the simulated outcome is the determining factor behind decisions to modify the system. Our analysis of household income entails comparing the distribution of adults by poverty status across the ALLOY simulation, the alternate ALLOY simulation, and the two household income measures in the original SIPP data.

The second component of the analysis entails modeling intra-year fluctuations in employment status, earnings, and unemployment compensation. Ma-year fluctuations in earnings and unemployment compensation are influenced directly by the allocation of employment status. Thus, errors in the latter would cause errors in the former, thereby creating an incorrect model of fluctuations in monthly household income. In evaluating employment status, we first examine how the model replicates monthly unemployment and labor-force participation rates. This replication process is not an explicit objective of the model, yet its outcome affects fluctuations in program eligibility when the user chooses to simulate food stamps for a full year. We then examine the effectiveness of the modeling procedure at capturing the correlation in the work patterns of husbands and wives, which has a direct influence on the intra-year fluctuation in household income. In evaluating earnings and unemployment compensation, we consider the size and distribution of monthly benefits among the total and low-income populations, and use those measures to infer the effectiveness of ALLOY at estimating the duration of receipt (the underlying force behind a successful allocation of income amounts).'

'The low-income population consists of persons in households whose income is below 250 percent of the monthly federal DHHS poverty guidelines.

The third component of the analysis focuses on unearned income other than unemployment compensation, assets, and cash welfare. As with earnings and unemployment compensation, we consider the size and distriiution of monthly benefits among the total and low-income populations, and use those measures to infer the effectiveness of ALLOY at estimating the duration of receipt. We also consider whether the model captures the correlation in patterns of unearned income receipt among husbands and wives. Because the ALLOY procedure does not model that correlation explicitly, household monthly income could be biased if the model does not capture it effectively.

C. LIMITATIONS OF THE METHODOLOGY

Although we used SIPP data to generate both the simulated and actual monthly income and labor-force participation estimates, we could not apply the actual ALLOY procedures directly in some circumstances. Furthermore, some aspects of the SIPP survey design prohibited a direct comparison between the simulated and the observed results. In Sections C.1 and C.2, we discuss how we adapted the ALLOY model to operate with SIPP and how aspects of the SIPP design affect the evaluation of ALLOY.

1. Adapting ALLOY to SIPP

Adapting the ALLOY modeling procedure to operate with the SIPP-based CPS-type file required modifying the process. Fiit, due to the lack of information on the full panel SIPP files, we used self-employment draw rather than net self-employment earnings.[8] Second, we required an assumption about how the responses to the SIPP labor-force questions might translate into responses to the CPS labor-force questions (we discuss this assumption in subsection 1.a). Third, we constructed a measure of spells of unemployment during the year (we discuss this measure in subsection 1.b). Finally, as stated earlier, we did not invoke the option to allocate annual cash assistance to monthly amounts. However, to construct annual household income poverty measures

[8] Sel-emp byment draw refers to regular salary or other income received from the business.

we required a measure of cash assistance. Hence, on the CPS-like file, we divided annual cash assistance by 12 to compute total income.[9]

a. Assumptions about Labor-Force Participation

The CPS and SIPP use different questions to determine weeks of work and weeks of unemployment. In order to adapt ALLOY to operate with the SIPP-based file, we required an assumption about how these different questions would be interpreted. The two surveys differentially treat persons who have a job but are absent without pay due to layoff, illness, labor disputes, vacation, or inclement weather. In ascertaining periods of work, the CPS does not include periods in which the respondent is absent without pay. In ascertaining periods of unemployment, the CPS does include periods in which the respondent is absent without pay due to layoff. Conversely, SIPP counts weeks absent as weeks with a job, but then identifies them separately, and, if weeks absent were spent on layoff, counts them as weeks spent looking for work To mimic the CPS questions with the SIPP-based file, we excluded weeks absent without pay from weeks of employment, and counted weeks on layoff as unemployment.

b. Constructing Spells of Unemployment

To construct a measure of spells of unemployment, we assigned at least two spells of unemployment to an individual if he or she experienced a month of looking for work but not working, followed by a month of working but not looking, followed some time later by the reverse transition. We assigned one spell of unemployment to all other persons who reported looking for work during the year. This measure does not provide a true measure of the number of spells unemployed, because it misses short spells of looking for work that begin in one month and end in the next. However, we used spells of unemployment only to determine whether an individual had two or more spells of unemployment compensation. The model imposes a maximum of 26 weeks spent receiving

[9]For comparison purposes, we also used average monthly cash welfare in determining the second measure of household monthly income, i.e., the measure based on fixed household composition.

unemployment compensation on persons with one spell of unemployment, and 39 weeks spent receiving unemployment compensation on persons with two spells of unemployment.

2. Comparability

Three aspects of the SIPP design affect using the comparisons in this study to infer the strengths and weaknesses of the ALLOY procedure when it is applied to the CPS: the definition of employment status, the definition of poverty status, and the recall period in SIPP.

a. Employment Status

First, determining whether someone is employed or unemployed in a month is not straightforward when the available information is in essence weekly. In this study, we actually defined employment status differently on the CPS-type file than on the SIPP analysis file, and this difference affects the evaluation. The differences in the procedure are discussed below.

In the SIPP analysis file, we determined monthly employment status as follows: if weeks worked was greater than zero and not less than weeks spent looking for work, we assigned an employment status of employed; if weeks spent looking for work was greater than zero and greater than weeks worked, we assigned an employment status of unemployed, if none of these conditions was met, we assigned a status of not in the labor force.

The impact of the employment definitions on the evaluation can best be described by example. Consider two persons with 49 weeks of employment and 3 weeks spent looking for work, The first person experiences one 3-week spell of unemployment in June, and the second experiences two spells--one week in the beginning of January and two weeks at the end of July and the beginning of August. In the SIPP file, the first person is employed in every month except June, during which he or she is unemployed and the second is employed in all months, because he or she worked the majority of each calendar month However, in the CPS-type file, both persons are assigned a status of employed for 11 months and unemployed for 1 month, because 49 weeks of work divided by 4.333

rounds to 11 months. For observations in which weeks of unemployment are greater than weeks of work, the reverse situation can occur.

b. Poverty Status

The second aspect of the SIPP design that affects direct comparisons across the SIPP analysis file and the CPS-type file pertains to the statistics that are used to define poverty status. To replicate the CPS, we determined monthly poverty status on the CPS-type file according to the income of the persons present in the household in March 1987.[10] However, in the SIPP file, we determined monthly poverty status according to the income of all persons who resided together in a particular month, regardless of whether or not they were included in the analysis sample. Hence, in the poverty statistics presented in Chapter IV, we capture differences attributed not only to the income allocation procedure, but also to changes in household composition. To illustrate the impact of the latter, our analyses incorporate statistics on annual poverty rates that are not influenced by the income allocation procedure. Our SIPP file also includes an alternative poverty measure that determines income and size according to composition of the household in March and that uses average rather than actual monthly cash welfare.

c. Recall Period

The final comparability issue stems from the different recall periods used by SIPP and the CPS. For example, SIPP data yield a much higher count of persons who are unemployed during the year than do the CPS data (Ryscavage and Martini, 1990; Ryscavage and Feldman-Ha&ins, 1988, and Vaughan, 1989).[11] While Ryscavage and Martini attriiute some of the difference to the fact that SIPP counts many more persons with short spells of unemployment, they conclude that the major

[10] As stated earlier, we also used average monthly cash assistance to determine poverty status on the CPS-type file.

[11] Based on 1985 SIPP data, 29.7 million persons experienced some unemployment in 1985 -- 8.7 million (42 percent) more than is recorded in the CPS (Ryscavage and Martini, 1990).

reason for the difference is the shorter recall period in SIPP. However, they conclude that estimates of the extent of unemployment in SIPP are not necessarily superior to those in the CPS, due to biases in the SIPP data (when used longitudinally) that are not present with the CPS data.

As a result of the shorter recall period used in SIPP, to obtain annual estimates the analyst must use several interviews and exclude respondents with missing interviews from the sample. The exclusion of persons who attrite from the sample yields estimates that are subject to "selection bias," because the selected demographic and economic characteristics of individuals interviewed in all of the waves differ from those of individuals who drop out of one or more interview.[12] The sample weight adjustments compensate for some, but not all, of the differences between those who stay in the sample and those who drop out.

[12]See, for example, Ernst and Gillman (1988), Short and McArthur (1986), McArthur (1988) for a discussion of the differences between attriters and persons who remain in the sample.

IV. EVALUATION OF THE MONTHLY INCOME ALLOCATION PROCEDURE

The ultimate objective of the MATH model is to simulate food stamp eligibility and participation and the distributional impact of program reforms accurately. Because the income allocation procedure has a direct bearing on how income eligiility is determined under the program, the most crucial test of the procedure is the effectiveness with which it captures income eligiility. The Food Stamp Program requires that the gross monthly income of households that do not contain an elderly or disabled person be below 130 percent of the federal poverty guidelines, and that the income net of allowable expenses of all households be below 100 percent of poverty. Hence, our initial discussion in this chapter focuses on the monthly poverty status of adults in the analysis sample. We then consider the two primary components of ALLOY separately: the allocation of labor-force patterns and the allocation of unearned income.

A. MONTHLY POVERTY ESTIMATES

The MATH food stamp model, as it is most commonly used, simulates FSP eligibility and participation during one month of the year--typically April. In so doing, it relies on simulated income in April, and the outcome is influenced directly by the quality of the estimated monthly income in that month. The food stamp model also has an option to simulate FSP eligibility and participation during a full calendar year. As such, the outcome is influenced by the quality of the simulation of intra-year fluctuations in household income.

In this section we explore the quality of simulated monthly household income, both for April and for the entire year. We then compare the results of the ALLOY modeling procedure with those of an alternate ALLOY simulation, which is based on the naive assumption that unearned income is allocated evenly throughout the year. As discussed in Chapter III, ALLOY captures fluctuations in household income that are attributable to fluctuations in person-level earnings, unemployment compensation, and unearned income other than cash welfare and asset income. The alternate

ALLOY simulation captures only fluctuations in person-level earnings and unemployment compensation.

1. April Poverty Status

Table IV.1 presents the distribution of adults by household poverty status in April as simulated by ALLOY and the alternate ALLOY model, and compares those two sets of outcomes with the outcomes observed in SIPP. The ALLOY results compare favorably with those of SIPP among all poverty classes except less than 100 percent," where the ALLOY results are higher by 7 percent. The ALLOY estimates of the number of adults in households below 131 percent of poverty and between 131 and 185 percent of poverty are virtually the same as the SIPP estimates.

The alternate ALLOY simulation yields a more accurate estimate of the proportion of adults in poverty in April than does ALLOY, but fares less well at capturing the number of adults in households below 131 percent of poverty.

Hence, ALLOY effectively replicates the pool of income-eligible adults under the Food Stamp Program at a fixed point in time. However, the distribution of eligible adults by food stamp benefit levels is likely to be skewed toward higher benefits given the overestimate of the number of persons in poor households. ALLOY performs better than the alternate, naive model of intra-year income flows at estimating the potentially eligible pool of adults (that is, those in the "less than 131 percent of poverty" category), but performs less well at simulating adults in poverty in April.

2. Intra-Year Variation in Poverty Status

Table IV.2 examines the distribution of adults based on three different definitions of poverty and three different measures of potential income eligibility. The outcome of a standard ALLOY simulation and a naive model of intra-year income flows are each compared with an adjusted SIPP outcome based on household composition in March and the observed outcome in SIPP. The three definitions of poverty are:

TABLE IV.1

DISTRIBUTION OF ADULTS BY POVERTY STATUS IN APRIL,
AND A COMPARISON OF SIMULATED AND OBSERVED OUTCOMES

ALLOY Version Poverty Status	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Original ALLOY			
Less than 131%	14.91%	15.00%	**-.60%**
Less than 100%	10.49	9.84	6.61
101-130%	4.42	5.16	-14.34
Less than 251%	37.59	38.07	-1.26
131-185%	10.24	10.14	**.99**
186-250%	12.44	12.93	-3.79
Over 250%	62.41	61.93	**.78**
Total	100.08	100.00	0.00
Alternate ALLOY			
Less than 131%	14.42	15.00	-3.87
Less than 100%	9.85	9.84	**.10**
101-130%	4.57	5.16	-11.43
Less than 251%	37.07	38.07	-2.63
131-185%	10.25	10.14	1.08
186250%	12.40	12.93	-4.10
Over 250%	62.93	61.93	1.61
Total	100.00	100.00	0.00

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal **files,** consisting of 34,840 adults (189 **million** adults **weighted)** present in the combined samples in 1986 and March 1987.

TABLE IV.2

DISTRIBUTION OF ADULTS BY POVERTY STATUS AND POTENTIAL INCOME ELIGIBILITY UNDER THREE ALTERNATIVE DEFINITIONS, AND A COMPARISON OF SIMULATED AND OBSERVED OUTCOMES

ALLOY Version Poverty or Eligibility Status	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	Adjusted SIPP Outcome[1]	Difference as a Percent of Adjusted
Original ALLOY					
Percent Poor on Annual Basis	9.08%	8.11%	11.96%	9.09%	-.11%
Percent Poor in All Months (Continuous Poverty)	6.56	4.56	43.86	5.28	24.24
Percent Poor at Least one Month (Occasional Poverty)	16.78	19.23	-12.74	19.68	-14.74
Percent Income-Eligible on Annual Basis	13.87	12.88	7.69	13.90	-.22
Percent Income-Eligible in All Months (Continuous Eligibility)	10.41	7.8	33.46	8.74	19.11
Percent Income-Eligible in at Least One Month (Occasional Eligibility)	22.00	26.27	-16.25	26.74	- 17.73
Alternate ALLOY					
Percent Poor on Annual Basis	9.08	8.11	11.96	9.09	-.11
Percent Poor in All Months (Continuous Poverty)	7.75	4.56	69.96	5.28	46.78
Percent Poor at Least one Month (Occasional Poverty)	15.34	19.23	-20.23	19.68	-22.05
Percent Income-Eligible on Annual Basis	13.86	12.88	7.61	13.90	-.29
Percent Income-Eligible in All Months (Continuous Eligibility)	11.33	7.80	45.26	8.74	29.63
Percent Income-Eligible in at Least One Month (Occasional Eligibility)	20.78	26.27	-20.90	26.74	-22.29

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

[1]The Adjusted SIPP outcome is based on fixed household composition and an even allocation of cash welfare.

- Annual ***Poverty Status.*** The poverty ratio is the sum of monthly household income over the year divided by the sum of monthly poverty thresholds. We used the food stamp net income screens in effect for July 1985 through June 1986 for the first six months of 1986 and the net income screens in effect for July 1986 through June 1987 for the last six months of **1986.**

- ***Continuous*** Poverty. Persons are continuously poor if their household income falls below poverty in all months.

- Occasional Poverty. Persons are occasionally poor if their household income falls below the poverty threshold in at least one month.

The three different definitions of income eligibility (annual income eligibility, continuous income eligibility, and occasional income eligibility), are defined in an analogous manner, except that persons are considered to be "income eligible" if their household income falls below 131 percent of poverty.

The first estimate presented in Table **IV.2--annual** poverty--is included to illustrate the impact of the absence of variation in household composition on the estimated number of adults in poor households. The ALLOY measure is based on household annual income divided by the annual poverty measure appropriate for household size and state of residence (continental U.S. versus Alaska and Hawaii) in March. Household annual income is the sum of person-level annual income summed over the persons who share the same dwelling unit in March. The first SIPP measure (observed outcome) is based on the sum of monthly household income over 12 months divided by the sum of 12 monthly poverty measures, each computed on the basis of household size in the relevant month. Household income in each month is the sum of person-level income for that month summed over persons sharing the same dwelling unit in that month, inclusive of persons who may have been excluded from the analysis sample. The second **SIPP** measure (adjusted outcome) is analogous to the ALLOY measure in that it is based on the annual income of persons present in March (aggregated to the household level) divided by the annual poverty measure appropriate for household size and state of residence in March. As expected, the ALLOY outcome (9 percent poor on an annual basis) is identical to the adjusted **SIPP** measure but exceeds the observed **SIPP** measure (8

percent poor on an annual basis) by 12 percent. The 12 percent difference is attributed entirely to changes in household composition that are not captured by ALLOY.

The second and third poverty measures reflect the number of persons in households that are poor throughout the year (that is, they are continuously poor) and the number of persons in households that are poor at least one month during the year (that is, they are occasionally poor). When compared with the adjusted SIPP outcome, ALLOY overestimates the size of the continuously poor group by 24 percent and underestimates the size of the occasionally poor group by 15 percent. Relative to the observed outcome in SIPP the differences are 44 and 13 percent, respectively. Thus, it appears that the model is assigning income to the full year more frequently than it should, at least for the very low-income population. However, it does perform better than the alternate model, which yields 47 percent too many continuously poor adults and 22 percent too few occasionally poor adults relative to the adjusted SIPP outcome poverty rates.

A comparison of the annual income eligibility estimates (a simulated 14 percent income-eligible versus the corresponding SIPP estimates of 13 and 14 percent, respectively) shows that ALLOY results exceed the observed SIPP target by 8 percent solely due to the absence of information on changes in household composition that are not captured in the CPS. As is true for estimates of the poverty population, the ALLOY simulation yields too many income-eligible households in all months and too few in at least one month. When compared to the adjusted SIPP outcome, ALLOY overestimates the size of the continuously income-eligible group by 19 percent and underestimates the size of the occasionally income-eligiile group by 18 percent. (Relative to the observed SIPP outcome the discrepancies are 33 and 16 percent, respectively.) Again the alternate ALLOY simulation is worse.

These estimates indicate that the ALLOY model and, by inference, the MATH food stamp model yield too few potentially income-eligiile adults on an annual basis because simulated income fluctuates too little within the year.

3. Conclusions

At a fixed point in time, ALLOY performs well at replicating the size of the potentially income-eligible pool of adults. However, the assignment of income among very-low-income households in ALLOY can be improved. Moreover, if FNS anticipates requiring simulations of the Food Stamp Program caseload on an annual basis, it would be wise to examine the intra-year fluctuation in household income more closely than we have here. Clearly, the model is producing too many very-low-income households with a relatively even pattern of income receipts, and too few households with peaks and valleys in the pattern.

The estimates presented here suggest that the unearned income allocation procedure is performing better than a naive model of intra-year income flows. However, they do not reveal any specific areas in which the model can be improved, or even whether it is feasible to come any closer to the SIPP estimates than has the current model. We address the components of the model more directly in the next two sections.

B. THE ALLOCATION OF EMPLOYMENT, EARNINGS, UNEMPLOYMENT, AND UNEMPLOYMENT COMPENSATION

With two exceptions, the CPS provides very little information for estimating monthly income flows from annual data. The two exceptions are the reported weeks of work and the reported weeks of unemployment. Weeks of work is a very strong indicator of the number of months during which earnings are received, and weeks of unemployment or part-time work are correlated with the number of months spent receiving unemployment compensation. Therefore, ALLOY relies heavily on this information to allocate earnings and unemployment compensation within the year. The remainder of this section examines the effectiveness of ALLOY at replicating the intra-year flows of these two income sources. We consider three measures in this evaluation--unemployment and labor-force participation rates, the correlation of patterns of work among husbands and wives, and monthly income receipt.

1. Unemployment and Labor-Force Participation Rates

As discussed previously, our measures of employment status across the ALLOY output and the original SIPP data are inconsistent because SIPP uses a weekly accounting period for work and unemployment. We illustrated that ALLOY could yield more or less months of employment than SIPP given the same input data. As shown in Table IV.3, ALLOY yields lower unemployment and labor-force participation rates on average than does SIPP. The ALLOY unemployment rate of 6.39 is about 6 percent below that of SIPP, while the labor-force participation rate of 63.23 is only about 2 percent below that of SIPP.

The estimates of unemployment rates in SIPP vary considerably during the year, beginning the year with a high of 7.31, declining fairly steadily to 6.07 in November, and then rising again to 6.47 in December. As noted previously, ALLOY is not designed to capture such variation, and in fact picks up very little of it. While the rates generated by ALLOY are at a maximum in January, they do not behave in the same monotonic pattern as the SIPP estimates, nor do they achieve the same range. The estimates of labor-force participation rates in SIPP vary from a low of 63.3 in February to a high of 65.27 in June, while the ALLOY estimates vary only slightly (from a minimum rate of 63.1 in November to a maximum rate of 63.40 in March).

2. Correlation Between the Work Patterns of Husbands and Wives

Variation in household income within the year depends on the coincidence of the income receipt of household members. ALLOY attempts to capture the coincidence of earnings receipt among husbands and wives by conditionally allocating work periods for the family spouse on the basis of the allocation of the work of the family head. The remainder of this section examines the extent to which the ALLOY procedure successfully captures the correlation in the work patterns of husbands and wives in the total and low-income populations. Before proceeding, some definitions are required:

TABLE IV.3

EMPLOYMENT AND LABOR-FORCE PARTICIPATION RATES,
AND A COMPARISON OF SIMULATED AND OBSERVED OUTCOMES

Employment Status	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Unemployment Rates by Month			
January	6.70%	7.31%	-8.34%
February	6.57	7.15	-8.11
March	6.56	7.18	-8.64
April	6.28	6.93	-9.38
May	6.03	6.76	-10.80
June	6.26	6.95	-9.93
July	6.31	6.98	-9.60
August	6.35	6.70	-5.22
September	6.19	6.40	-3.28
October	6.34	6.37	-.47
November	6.58	6.07	8.40
December	6.46	6.47	-.15
Average	6.39	6.77	-5.71
Labor-Force Participation Rates by Month			
January	63.21	63.76	-.86
February	63.16	63.30	-.22
March	63.40	63.47	-.11
April	63.29	63.91	-.97
May	63.25	64.17	-1.43
June	63.31	65.27	-3.00
July	63.30	65.24	-2.97
August	63.26	64.78	-2.35
September	63.24	64.62	-2.14
October	63.10	64.43	-2.06
November	63.11	63.94	-1.30
December	63.14	64.26	-1.74
Average	63.23	64.26	-1.61

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,848 adults (189 million adults weighted). present in the combined samples in 1986 and March 1987.

- *Head and **Spouse** Compensating with Overlap. The* family head works at least one month when the spouse does not, the spouse works at least one month when the head does not, and they work concurrently in at least one month.

- ***Concurrent.*** Whenever the family head works, the spouse does as well, and vice versa.

- ***Partial Overlap.*** The family head works at least one month when the spouse does not and at least one month when the spouse does, but the spouse does not work when the head does not.

- ***Completely** Compensating. The* family head works when the spouse does not, the spouse works when the head does not, and they do not work concurrently.

- *Spouse Compensating with Overlap. The* family spouse works when the head does not and at least one month when the head does, but the head does not work when the spouse does not.

Table IV.4 first considers couples in which both spouses worked at least one month during the year. The SIPP and ALLOY results are close but not perfectly correlated. However, the differences are largely an artifact of the different measures of employment status discussed earlier. SIPP yields an estimate of 31.3 million couples in this universe, 57 percent of whom were two-earner couples for the entire year. ALLOY yields an estimate of 31.7 million couples, in 55 percent of which both spouses worked the entire year. The difference in the total number of couples in the universe (365,000) reflects situations in which at least one spouse worked one or two weeks in the year, qualifying that person as employed according to the **SIPP** definition, but not employed according to the ALLOY definition. The difference in the total number of couples in which both spouses worked concurrently for 12 months (465,000) reflects situations in which at least one spouse worked 48 or 49 weeks and was not in the labor force during the remaining weeks, qualifying that person as employed for 12 months according to SIPP but 11 months according to ALLOY.

Setting aside the differences attriiutable to measurement problems, ALLOY appears to replicate the distribution of couples by work patterns quite closely, both for the total population and for couples in households below 250 percent of poverty. Among the total population, ALLOY yields 55 percent of couples with concurrent work patterns, compared with the SIPP estimate of 58 percent,

TABLE IV.4

DISTRIBUTION OF WORKING COUPLES BY THE CORRELATION BETWEEN THE WORK PATTERNS OF HUSBANDS AND WIVES, AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES

	All Dual Earner Couples in the Sample		Dual Earner Couples in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	ALLOY Outcome	Observed SIPP Outcome	Adjusted SIPP Outcome[1]
Number of Couples (1,000)	31,689	31324	6,815	6,634	6,817
Distribution by Correlation and by Months Working					
Head and Spouse compensating with overlap:	4.38%	3.33%	9.86%	8.53%	8.39%
1 - 6	.14	.04	.34	.23	.22
7 - 11	1.36	1.17	3.78	4.99	4.06
12	288	212	5.74	4.21	4.10
Concurrent:	5532	57.87	28.92	3241	32.02
1 - 6	.06	.15	.21	.48	.47
7 - 11	.05	.39	.07	.65	.71
12	55.21	57.33	28.64	31.28	30.83
Partial Overlap:	2832	27.88	38.81	38.92	39.32
1 - 6	.07	.18	.32	.64	.62
7 - 11	1.47	1.61	3.90	4.16	4.14
12	26.78	26.09	34.59	34.12	34.54
Completely compensating:	.63	.57	2.16	217	2.20
1 - 6	.12	.12	.39	.50	.48
7 - 11	.49	31	1.67	1.31	1.28
12	.02	.14	.10	.36	.43
Spouse compensating with overlap:	1136	10.25	20.25	17.89	18.05
1 - 6	.24	.07	1.03	.29	.28
7 - 11	1.05	.82	3.03	223	222
1 2	10.07	936	16.19	15.37	1554
Total:	100.01	99.90	100.0	99.92	99.92
1 - 6	.63	.56	229	214	207
7 - 11	4.42	4.30	12.45	12.44	1241
12	94.96	95.04	85.26	85.34	85.44

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

[1]The adjusted SIPP outcome is based on fixed household wmposition.

and yields somewhat more couples that are either "partial overlap" or "spouse compensating with overlap." Most of the difference is associated with couples with 12 months in the labor force, and thus reflect the measurement problem discussed earlier. Very few couples (less than one percent) fall in the "completely compensating" category with either data source, while ALLOY yields somewhat more couples in the "head and spouse compensating with overlap" category (4 percent) than does SIPP (3 percent). Overall, the distributions of couples by the number of months in which either of them worked are quite close.

Among the low-income population, the distributions are almost as close regardless of whether the universe for the SIPP estimates is based on the income of all members of the household in each month or on the income of members present in March. ALLOY yields fewer couples with concurrent work patterns (29 versus 32 percent) and more couples in the "spouse compensating with overlap" category (20 versus 18 percent). The model also generates more couples in the "head and spouse compensating with overlap" category (10 percent versus 9 percent observed or 8 percent adjusted). Overall, the distributions of low-income couples by the number of months in which either of them worked are nearly identical.

3. Earnings

ALLOY averages earnings and assigns earnings to simulated months of employment, as shown relative to SIPP data in Table IV.5. On average, ALLOY captures the earnings that are reported in SIPP but does not capture the variation across months or within months. Moreover, ALLOY tends to simulate employment evenly throughout the year, while the number of earners in SIPP varies somewhat more. Average monthly earnings and the average of total monthly earned income simulated by ALLOY come to within 1 percent of the SIPP estimates among both the total and low-income populations. However, the number of earners in each month varies less in the ALLOY results than in the original SIPP data. Among the low-income population, the number of earners

TABLE IV.5

MONTHLY EARNED INCOME AND A
COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES

	All Adults in the Sample			Adults in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
April Earnings						
Mean	$1,583	$1,612	-1.86%	$858	$863	-.58%
Median	1,299	1,287	.93	783	782	.13
Minimum	1	1	.00	1	2	-50.00
Maximum	16,397	46,000	-64.35	3,833	5,087	-24.65
Number of Earners by Month (1,000)						
January	110,638	108,444	2.92%	27,886	26,846	7.96
February	110,718	187,855	2.65	28,023	25,726	8.93
March	111,122	108,566	2.35	28,238	25,903	9.01
April	111,243	109,415	1.67	28,205	26,255	7.43
May	111,467	109,925	1.40	28,286	26,164	8.11
June	111,287	111,577	-.26	28,255	26,725	5.72
July	111,164	110,841	.29	28,262	26,789	5.50
August	111,064	110,821	.22	28,135	26,727	5.27
September	111,210	110,285	.84	28,291	26,687	6.01
October	110,830	110,772	.os	28,112	27,034	3.99
November	110,551	110,871	-.29	27,928	27,060	3.21
December	110,731	110,865	-.12	28,003	27,132	3.21
Average	111,002	110,028	.89	28,135	26,521	6.09
Average Earnings by Month						
January	$1,588.62	$1,677.78	-5.31%	$864.15	$918.06	-5.87
February	1,585.60	1528.47	3.74	858.41	819.99	4.69
March	1,585.29	1,538.55	3.04	861.77	821.48	4.90
April	1,582.59	1,612.42	-1.85	857.77	863.04	-0.61
May	1582.70	1,594.38	-.73	856.88	874.68	-2.12
June	1,583.28	1,530.76	3.43	851.48	826.73	299
July	1,586.72	1,630.25	-267	855.83	890.17	-3.86
August	1,585.82	1583.70	.13	859.78	869.48	-1.11
September	1,584.57	1,569.94	.93	861.85	845.14	1.98
October	1,588.93	1,722.09	-7.73	864.50	937.34	-7.77
November	1592.47	1,561.45	1.99	863.69	848.76	1.76
December	1589.75	1,657.04	-4.06	868.64	890.47	-3.35
Average	1,586.36	1,600.57	-.89	869.66	867.10	-.74

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,848 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

simulated by ALLOY exceeds the number of earners observed in SIPP by 6 percent on average, even though average earnings remain quite close. The differences in the number of low-income earners is an artifact of the sample selection process.' In Appendix B we illustrate that if we define the low-income population in SIPP based on fixed composition in March, the number of low-income earners simulated by ALLOY comes to within one percent of the SIPP estimate.

Average earnings simulated by ALLOY for April fall about 2 percent below the SIPP mean, while the median of simulated earnings exceeds the SIPP estimate by less than 1 percent. Among the low-income population, the simulated mean and median are less than one percent lower than the actual mean and median. SIPP-observed per-capita earnings in April range from $1 to $46,000 among the total population, while ALLOY simulates a maximum of $16,397.

4. **Unemployment Compensation**

ALLOY uses a multistep procedure to allocate unemployment compensation benefits. Fiit, the procedure estimates weeks of benefit receipt as a function of weeks of unemployment and of weekly benefits implied by weekly earnings subject to legislated limits on the duration of participation. Second, ALLOY computes average weekly benefits as annual benefits divided by estimated weeks of benefit receipt and then computes the monthly equivalent. Finally, the procedure assigns months of receipt randomly within periods spent looking for work allowing periods of receipt to overlap with periods of work

As Table IV.6 illustrates, the model does not perform well relative to the SIPP data. In each month, the ALLOY procedure yields 26 percent to 48 percent fewer recipients of this income source among the total population, and the simulated average monthly benefits exceed the observed amounts

[1]The determination of the low income population on the CPS-type file is based on fixed composition and annual income whereas the determination of that population subgroup in the SIPP analysis file is based on monthly composition and income. Hence these two groups are different and reflect a different number of earners.

TABLE IV.6

UNEMPLOYMENT COMPENSATION BENEFITS AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES

	All Adults in the Sample			Adults in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
April Benefits						
Mean	$684	$439	55.81%	$566	$425	33.18%
Median	694	410	69.27	506	404	25.25
Minimum	55	3	1,733.33	55	30	83.33
Maximum	3,983	1,600	148.94	3,859	1,432	169.48
Unemployment Compensation Recipients by Month (1,000)						
January	1,498	2,878	-47.95%	802	1,367	-41.33%
February	1,538	2,767	44.42	842	1,344	-37.35
March	1,524	2,612	-41.65	869	1,298	-33.05
April	1,462	2,214	-33.94	813	1,164	-30.15
May	1,395	2,142	-34.87	823	1,061	-2243
June	1,528	2,060	-25.83	886	1,031	-14.06
July	1,578	2,196	-28.14	828	1,137	-27.18
August	1,530	2,242	-31.76	790	1,130	-30.09
September	1,474	1,980	-25.56	745	995	-25.13
		2,006	-26.92	750	971	-22.76
November	1,466	2,129	-3255	776	1,016	-23.62
December	1,412	2,438	-42.08	823	1,063	-22.58
Average	1,487	2,305	-35.50	812	1,132	-28.27
Average Unemployment Compensation Benefits by Month						
January	$682.24	$447.19	52.56%	$601.13	$422.68	4222%
February	658.65	458.98	43.50	592.23	409.15	44.75
March	682.41	434.15	57.18	699.07	411.86	47.88
April	683.99	439.22	55.73	565.79	425.38	33.01
May	645.16	450.05	43.35	570.60	442.42	28.97
June	632.85	443.90	4257	543.30	444.20	22.31
July	640.05	429.87	48.89	539.11	417.94	29.27
August	627.45	449.15	39.70	533.02	430.65	23.77
September	639.76	44293	44.44	568.53	418.38	35.89
October	693.04	453.64	52.77	559.16	427.58	30.77
November	655.29	428.84	52.81	574.61	390.56	47.13
December	629.68	448.73	40.31	582.38	410.86	4202
Average	655.88	443.89	47.76	569.91	420.83	35.21

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

by 40 to 57 percent. Similarly, among the low-income population, simulated recipients are 14 to 41 percent too low, and simulated average benefits are 22 to 48 percent too high. The outcome is not much different if the SIPP low-income group is redefined according to fixed household composition. Appendix B illustrates that recipients still run 15 to 44 percent too low, and that average benefits are 23 to 48 percent too high. Thus, in total, the simulated periods of receipt are too short. This is true despite the fact that, as illustrated earlier, intra-year fluctuations in employment and unemployment status are well modeled.

Another problem with the ALLOY results is that of the $12.3 million of unemployment compensation reported in SIPP for all months of 1986 (not shown) ALLOY captures only $11.7 million, a difference of 5 percent.[2] Finally, the original SIPP data show that the number of recipients varies considerably across months, while the simulated number of recipients fluctuates relatively little. The monotonic pattern in the SIPP data and the lack of it in the ALLOY results resemble the pattern in unemployment rates discussed earlier.

In April, the results are not very promising. Average simulated benefits exceed average reported benefits by 55 percent among the total population and 32 percent among the low-income population. Furthermore, simulated maximum and minimum benefits exceed observed maximum and minimum benefits by well over 100 percent. Interestingly enough, ALLOY has introduced fewer outliers, as evidenced by the relationship between the mean and median figures across the two sources.

The problem with the allocation of unemployment compensation arises from two modeling issues. Fiit, the model does not replicate total annual income in all instances. Second, the procedure for calculating the number of weeks of unemployment compensation receipt produces biased results.

[2]It should be noted that the SIPP data contain an inconsistency that contributes to but does not explain the discrepancy in the total amount of unemployment compensation: six unweighted cases report unemployment compensation but no periods of work or unemployment; the six cases are simulated not to have monthly unemployment benefits and account for approximately $60,000 in such benefits that are not retained by the model. The balance of the discrepancy occurs for persons simulated to be receiving Unemployment Compensation for one or two weeks. Because the conversion to months treats these as zero months, no monthly Unemployment Compensation is recorded.

Given the good results for employment and unemployment, the weaknesses in the ALLOY model are concentrated in two areas. First, in SIPP, the reported receipt of unemployment compensation and reported periods of unemployment are inconsistent. To the extent that these inconsistencies exist in the CPS, the model must be redesigned to address them. Second, the procedure that is used to predict weeks of benefit receipt as a function of weeks of unemployment, the level of reported unemployment compensation, weekly earnings, and legislated limits on duration and maximum weekly benefits yields biased results relative to observed periods of receipt in SIPP. We explore these two issues further below.

Table IV.7 illustrates that unemployment compensation receipt and weekly labor-force participation reported in the original SIPP data are inconsistent. Only 28 percent of recipients fall into the expected classification of receiving benefits while unemployed. On the other hand, 19 percent were employed throughout the period of receipt, most of whom were employed full time, an unlikely pattern of labor-force participation for unemployment compensation recipients. Over 40 percent of the recipients were both working and unemployed, which is not unexpected for transitions from work to unemployment. However, one-fourth of these recipients (10 percent of the total recipient population) were not experiencing transitions. About one-tenth of the recipients received benefits while not in the labor force, nearly half of whom did not experience any unemployment during periods of receipt.[3]

Given that the current algorithm produces biased results due to the manner in which it simulates the duration of benefit receipt, we decided to experiment with alternative methods for computing duration. We considered an adjustment to the current procedure that allows for an inconsistency between reported periods of labor-force participation and allows periods of part-time work to be considered periods of unemployment. We also considered an approach adopted by TRIM2 (Citro

[3]This refers to the three groups of recipients who experienced some period of receipt while not in the labor force.

TABLE IV.7

DISTRIBUTION OF UNEMPLOYMENT COMPENSATION (UI) RECIPIENTS BY LABOR-FORCE PARTICIPATION

Labor Force Participation	Number (1,000)	Percent of total	Within-Group Percentage Distribution
Unemployed Throughout Period of UI Receipt	2,370	28.1	
Activity during periods of nonreceipt:			100.0
Employed only	502	5.9	21.2
Working and unemployed	1,154	13.7	48.7
All three	319	3.8	13.5
Other[a]	395	4.7	16.6
Employed Throughout Period of UI Receipt	1,632	19.3	
Activity during periods of nonreceipt:			100.0
Working	1,187	14.1	72.7
Working and unemployed	311	3.7	19.1
Other	134	1.6	8.2
Level of work activity:			100.0
Full-time	1,254	14.8	76.9
Part-time	378	45	23.1
Not in Labor Force during Periods of UI Receipt	314	3.7	
Employed and Unemployed during Periods of UI receipt	3,476	41.2	
Number of months of receipt:			100.0
1 or 2	1,334	15.8	38.4
Leas than 2	2,142	25.4	61.6
Activity During Periods of Nonreceipt:			100.0
Working	1,848	21.9	53.2
Working and unemployed	1335	15.8	38.4
Other[a]	293	3.5	8.4
Level of work activity:			100.0
Fuh-time	2,572	39.5	74.0
Part-time	903	10.7	26.0
Period of work:			100.0
Transition month(s)[b]	2,644	313	76.1
Other	832	9.9	23.9
Unemployed and Not In Labor Force While Receiving UI	287	3.4	
Employed and Not in Labor Force While Receiving UI	105	1.2	
Unemployed, Employed, and Not in Labor Force While Receiving UI	262	3.1	
Total UI recipients	8,445	100.00	

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,846 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

'Includes persons receiving UI for the entire year.

[b]Periods of work and UI receipt are defined as transitions months if they comprised only 1 or 2 months within the year. 390,008 individuals had 1 month of UI receipt while working; the remaining 23 million individuals had 2 weeks of UI receipt while working.

and Ross, 1991). Finally, we considered two approaches which ignore the relationship between the duration of receipt of unemployment compensation receipt and labor force participation.

Table IV.8 illustrates the outcome of the five variants for computing the duration of benefit receipt:

- The current approach as adapted to SIPP *(original procedure)*
- *The original* procedure adjusted to account for an inconsistency between weeks of unemployment compensation receipt and periods in the labor force *(adjusted original procedure).* This option also counts periods of part-time work as periods of unemployment,
- The allocation of unemployment compensation to periods of nonwork *(nonwork procedure).*
- *The* allocation of unemployment compensation based on simulated duration computed directly from reported annual benefits and published statistics on average weekly benefits by state in 1986 from the *Green Book, 1987* Edition *(administrative procedure).*
- *The* allocation of unemployment compensation based on simulated duration computed directly from reported annual benefits and published statistics on average weekly benefits by state in 1986 adjusted for underreporting in SIPP (20 percent according to *Current Population Reports,* p. *70,* no. 5) *(adjusted administrative procedure).*

As shown in the table, each of the procedures that relies on reported labor-force participation produces biased results. As noted earlier, the original procedure allocates periods of receipt that are too short on average, yielding counts of recipients that are 36 percent too low and average benefits that are 48 percent too high. The outcome for April is similar to the average outcome. The adjusted original procedure represents an improvement, but still allocates periods of receipt that are too short on average, yielding counts of average monthly recipients that are 31 percent too low and average monthly benefits that are 36 percent too high. The nonwork procedure is by far the worst, yielding counts of recipients that are 84 percent too high and benefits that are 46 percent too low on average.

The two procedures that ignore the relationship between unemployment compensation receipt and periods of unemployment represent a vast improvement. The administrative procedure yields

TABLE IV.8

ALTERNATE PROCEDURES FOR COMPUTING
THE DURATION OF UNEMPLOYMENT COMPENSATION RECEIPT

Alternate Procedures	Number of Recipients			Average Monthly Benefits		
	Simulated Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	Simulated Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Original Procedure						
April Mean	$1,462	$2,214	-33.94	$684	$439	55.81
Overall Mean	1,487	2305	-35.49	656	444	47.75
Minimum	1,395	1,980	n/a	627	429	n/a
Maximum	1,578	2,878	n/a	693	459	n/a
Adjusted Original Procedure						
April Mean	1,680	2,214	-24.12	588	439	33.94
Overall Mean	1,681	2,305	-30.54	602	444	35.59
Minimum	1,372	1,980	n/a	574	429	n/a
Maximum	1,728	2,878	n/a	670	459	n/a
Nonwork Procedure						
April Mean	4,218	2,214	90.60	241	439	-45.11
Overall Mean	4,252	2,305	84.44	240	444	-45.94
Minimum	4,126	1,980	n/a	227	429	d a
Maximum	4,309	2,878	n/a	250	459	n/a
Administrative Procedure						
April Mean	1,760	2,214	-20.47	576	439	31.17
Overall Mean	1,687	2,305	-26.83	578	444	39.21
Minimum	1,480	1,980	n/a	573	429	n/a
Maximum	1,802	2,878	n/a	585	459	n/a
Adjusted Administrative Procedure						
April Mean	2,149	2,214	-2.89	465	439	5.84
Overall Mean	2,066	2,305	-10.38	465	444	4.75
Minimum	1,864	1,980	n/a	463	429	n/a
Maximum	2,199	2,878	n/a	468	459	n/a

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,848 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

average monthly recipients that are 27 percent too low and average benefits that are 30 percent too high. Finally, the adjusted administrative procedure, which accounts for the underreporting of unemployment compensation, allocates periods of receipt that are still too short. However, on average, the procedure yields counts of monthly recipients that are within 10 percent of the original SIPP data and average monthly benefits that are within 5 percent. April statistics are equally good: simulated recipients are 3 percent below target, and simulated benefits are 6 percent above target.

Based on the results in Table IV.8, it would seem advisable that the ALLOY procedure for computing the duration of unemployment compensation receipt be converted to the adjusted administrative procedure. However, there would be one drawback to doing so. This method requires information on average weekly benefits that are not directly available in most applications of the MATH model, since the data are aged to a future year.[4] We could project the data forward in time, but the error in such an estimate would be unknown

5. Conclusions

The allocation of employment status seems to work well given the insufficient information in the CPS to simulate variation within the year. The overall unemployment and labor-force participation rates differ, but they are attributed to differences in measurement. The model also performs well at simulating average monthly earnings both among the total population and among the low-income population. Again, the model does not capture variations within the year, but the CPS contains very little information to support doing so.

ALLOY performs poorly at simulating monthly unemployment compensation, and this area requires attention. The current approach appears to suffer from two problems: it does not replicate total reported benefits in all cases, and the method used to calculate the duration of receipt is weak. In fact, inconsistencies between periods of unemployment compensation receipt and periods of

[4]The monthly income allocation procedure in MATH is implemented after the data have been aged to a future time period The MATH data base is aged in order to simulate the impact of program reforms in the year in which they would be implemented.

unemployment reported in the original SIPP data inhibit the performance of any model of duration conditional on periods of unemployment.

The most promising method for calculating the duration of unemployment compensation receipt in SIPP is to compute the number of weeks of receipt according to reported average weekly benefits from administrative data adjusted for underreporting. However, this method has disadvantages when applied to the MATH model, because the administrative data would usually have to be aged thus introducing an unknown amount of error. The MATH aging processes adjusts unemployment compensation benefits through multiplicative adjustment factors reflecting the change in annual wages between the survey year and the projection year (adjusted to account for changes in earners that result from population growth and changes in the unemployment rate). To adapt the adjusted administrative procedure to the aged unemployment benefits in MATH, we would need to use administrative data for the survey year and apply the same multiplicative factors. This is **not** necessarily the best method of projecting average weekly UI benefits. However, this approach minimizes the potential error in the overall model by retaining as much consistency between the administrative and survey data as possible.

C. THE ALLOCATION OF OTHER INCOME

ALLOY uses a naive model to assign income from assets (monthly income equals annual income divided by 12) but attempts to capture some variation in other unearned income by estimating the duration of receipt. In this section, we address the appropriateness of the asset income assignment and the success of the allocation of unearned income other than assets in total and among husbands and wives.

1. Intra-Year Fluctuations in Asset Income

The assumption that asset income is normally received 12 months of the year originates from the lack of information on the pattern of intra-year asset income receipt. Doyle (1984a) attempted to

ascertain this pattern based on data from the ISDP, but the results were biased due to the method used to collect asset-income data,

An analysis of SIPP data confirms that this assumption is reasonable among elderly persons in low-income households, in which only 23 percent have asset income for less than 12 months (Table IV.9). However, 64 percent of nonelderly persons in low-income households have asset income for less than 12 months.

While at first glance this discrepancy suggests that asset income should not be divided evenly throughout the entire year for all persons, an analysis of the probability of having this source for less than 12 months by the level of annual income reveals that persons who report receipt for short periods tend to be persons who report small amounts of annual asset income. Only 15 percent of nonelderly persons whose annual asset income exceeds $1,000 report receipt for less than one year, and this probability increases steadily as annual income drops. As expected given the design of SIPP, persons whose income is less than $12 are, by definition, asset-income recipients for less than 12 months.[5]

If, based on these findings, we choose to allocate asset income evenly throughout the year, what is the expected level of error in determining the total monthly income of households? Comparing observed average monthly income with average annual income divided by 12 reveals that the error is small among those who are potentially eligible for food stamps. Under an assumed 6.5 percent rate of return on investment, nonelderly persons with $130 or less in asset income would have $2,000 or less in asset balances, the eligibility cutoff for nonelderly households. Among these persons, the evenly allocated amount would be only $1.52 less than the observed monthly amount on average. By definition, the even allocation method assigns asset amounts to months of nonreceipt, but the assigned amount is small as well, ranging from $.08 for persons with $1 in annual asset income to $10.83 for persons with $130 in annual income.

[5]SIPP data are recorded by month in whole-dollar amounts. Thus, if the total amount for the year is less than $12, fewer than 12 months of receipt are recorded.

TABLE IV.9

PROBABILITY OF RECEIVING ASSET INCOME
AMONG ADULTS IN HOUSEHOLDS BELOW 250 PERCENT
OF POVERTY, BY ASSET INCOME CLASS

Age/ Annual Asset Income	Total Number of Recipients (1,000)	Less Than 12 Months of Assets: Number of Recipients (1,000)	Less Than 12 Months of Assets: Percent of Total Recipients	Observed Average Monthly Income	Average Annual Income Divided BY 12
Total	**34,368**	16,456	47.88%	$63.08	**$48.28**
Nonelderly					
Total	21,062	13,447	63.84	33.47	22.62
Asset Income **$1000+**	**1,350**	**203**	15.05	244.95	231.83
Asset Income **$500-999**	1,104	271	24.55	63.10	58.26
Asset Income **$195-499**	1,955	466	23.86	28.37	2634
Asset Income $130-194	**1,003**	342	34.07	14.95	13.24
Asset Income **$100-129**	**787**	283	**35.96**	10.75	937
Asset Income **$50-99**	**2,127**	863	40.58	6.75	5.82
Asset Income $13-49	**5,311**	3,617	68.09	276	2.13
Asset Income $2-12	6,313	6,290	99.63	1.23	0.49
Asset Income $1	1,112	1,112	100.00	1.00	0.08
Subtotal < $130	15,650	**12,164**	77.73	3.71	219
Elderly					
Total	**13,306**	**3,009**	**22.62**	**97.96**	88.91
Asset Income **$1000+**	**4,587**	284	6.18	214.35	210.41
Asset Income $500-999	**2,174**	276	12.70	6272	**60.29**
Asset Income **$195-499**	**2,286**	373	16.33	29.25	27.83
Asset Income **$130-194**	**770**	200	26.02	14.73	13.35
Asset Income $100-129	**446**	89	20.06	10.05	9.44
Asset Income **$50-99**	**836**	285	34.11	6.82	5.86
Asset Income **$13-49**	**1,334**	658	49.30	3.04	251
Asset Income $2-12	**791**	762	**96.26**	1.23	057
Asset Income $1	**82,000**	**82**	100.00	1.00	0.08
Subtotal < $194	**4,259**	**2,077**	48.75	7.01	5.45

SOURCE: An extract of the Smvey of Income and Program Participation derived from the 1985 and 1986 **full-panel** longitudinal **files,** consisting of 34,840 **adults** (189 **million** adults weighted) present in **the** combined samples in 1986 and **March** 1987.

2. The Allocation of Unearned Income Other Than Assets, Cash Welfare, and Unemployment Compensation

ALLOY assigns the number of months of other unearned income receipt randomly on the basis of age and type of income. The months of receipt are then assigned randomly within the year. Table IV.10 illustrates that ALLOY assigns about the correct number of persons as full-year recipients among the total population and about **5** percent fewer low-income persons as full-year recipients. However, ALLOY assigns too few persons as other income recipients for one month, too many for **3** months or less, and too many for **4 to 6** months. These differences partially reflect differences in the design of the **ISDP** and SIPP. **The** ISDP had a three-month recall period, and estimates of duration were biased toward multiples of three months. Conversely, **SIPP** has a four-month recall period, and estimates of duration are biased toward multiples of four months.

The ALLOY model uses relatively little information to predict the duration of other unearned income receipt, and the lack of detail in the model might yield unrealistic results. Univariate statistics for April confirm that ALLOY is introducing outliers among the total and low-income populations, **and** that these outliers are generating mean values that greatly exceed reported mean values. However, the medians are quite close, indicating that the results would be quite close if the outlier problem could be resolved.

For illustrative purposes, we compare the results of ALLOY with the alternate ALLOY which evenly allocates unearned income over the year. As expected, the alternate model produces fewer outliers and lower mean values. However, the simulated means and medians are well below actual medians, suggesting that a naive model would yield too many eligible households. However, as we discussed earlier, the naive model does not yield too many of such households, because, while the average income is lower under the alternate model, more individuals have the income at a given point **in time.**

The outcome of Table IV.10 suggests that ALLOY could be enhanced if the probabilities that govern the allocation were replaced with estimates derived directly from SIPP. Appendix B lists the

TABLE IV.10

DISTRIBUTION OF UNEARNED NON-ASSET-INCOME RECIPIENTS BY NUMBER OF MONTHS OF RECEIPT AND INCOME LEVELS, AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES

	All Adults in the Sample			Adults in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Number of Months of Receipt:						
ALLOY Simulation						
1	7.20%	9.26%	-22.25%	6.90%	6.54%	-5.50%
2	7.41	4.13	79.42	6.83	3.42	99.71
3	7.14	3.38	111.24	6.25	2.73	128.94
4	1.33	3.92	-66.07	1.41	3.66	-61.48
5	1.53	2.17	-29.49	1.26	1.96	-35.71
6	1.45	1.74	-16.67	1.31	1.58	-17.09
7	1.36	1.35	.74	1.39	1.19	16.81
8	1.51	1.73	-12.72	1.56	1.56	0.00
9	1.43	1.35	5.93	1.39	1.38	.72
10	1.45	1.40	3.57	1.25	1.43	-12.59
11	1.58	1.66	-4.82	1.35	1.83	-26.23
12	66.60	67.91	-1.93	69.10	72.71	-4.96
Subtotal 1 to 3	21.75	16.77	29.70	19.98	12.69	57.45
Subtotal 1 to 4	23.08	20.69	11.55	21.39	16.35	30.83
Subtotal 4 to 6	4.31	7.83	44.96	3.98	7.20	-44.22
Subtotal 5 to 8	5.85	6.99	-16.31	5.52	6.29	-12.24
April Income: ALLOY Simulation						
Mean	$849	$624	36.06%	$602	$444	35.59%
Median	472	471	.21	412	408	.98
Minimum	1	1	.00	1	1	.00
Maximum	66,000	25,500	158.82	14,898	4,000	272.45
April Income: Alternate Simulation						
Mean	$499	$624	-20.03%	$368	$444	-17.12%
Median	360	471	-23.57	332	408	-18.63
Minimum	1	1	.00	1	1	.00
Maximum	13,583	25,500	-46.73	2,273	4,000	-43.18

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

updated probabilities for nonelderly persons and the outcome'of a simulation that is based on these new estimates.[6] Because we used the duration of other-unearned income receipt among the low-income population to generate the new probabilities, we focus on the outcome for that group.

Overall, the SIPP-derived estimates improve the simulated distribution of low-income persons by the number of months of other-income receipt. The ALLOY model with the new probabilities generates about the correct number of low-income persons with 12 months of unearned income receipt, and the distribution of those with fewer than 12 months by the number of months of receipt roughly follows the pattern in the SIPP data. The simulated mean under this ALLOY model ($555) is closer to the SIPP mean than is the original ALLOY model, although the simulated median ($398) is somewhat lower.

In an attempt to deal with the problem of outliers in the ALLOY outcome, we conducted an experiment. Before discussing the experiment, it is important that we clarify the definition of outliers in this context. An outlier occurs when income received for 12 months is assigned to a period of 1 month, and it need not reflect a large sum of money. For example, if an individual who lives alone receives $400 a month in social security benefits for 12 months (with no other income), he or she is eligible for food stamps for 12 months. On the other hand, if the same person is simulated to receive all of the income ($4,800) in one month and none of the income in other months, he or she would be eligible for food stamps only for the 11 months of nonreceipt.

In our experiment, we attempted to avoid this assignment scenario by imposing a maximum monthly amount on regular income amounts equal to the maximum allowable social security payment in 1986 ($1,750 in 1986, according to the Green *Book,* 1987 edition, Table 15). In other words, the minimum number of months that a person could be simulated to receive regular other income was his or her annual income divided by this maximum amount (unless, of course, this calculation yielded

[6]Ninety-five percent of low-income elderly persons with unearned income report receipt for 12 months. Hence, we continued to allocate unearned income evenly for these persons.

an estimate that exceeded 12). The results of this experiment are also described in Appendix B. Note that the probabilities that govern the allocation of other unearned income are those derived from SIPP. As expected, the simulated duration of receipt deviates more from the original data for the low-income population than does the previous ALLOY run. However, the simulated mean is closer to the original mean, suggesting that it performs somewhat more effectively at controlling outliers.

3. Correlation in Patterns of Unearned Income Receipt among Husbands and Wives

We conclude the evaluation of the ALLOY results by analyzing the patterns of unearned-income receipt among husbands and wives. Here, we exclude unemployment compensation, asset income, and cash welfare. Because ALLOY does not model the correlation of unearned-income receipt among couples, the question is, should it? Table IV.11 indicates that, of the 10 million couples who report unearned income of this type, 78 percent comprise couples in which both spouses receive income concurrently throughout the year, 8 percent comprise couples in which the head receives income for the full year and the spouse receives income for a portion of the year, and 4 percent comprise couples in which the reverse situation occurs. Among the low-income population, even more households would be unaffected by an attempt to coordinate intra-year income receipt among couples (among 83 percent of couples, both spouses receive income for the entire year; among 9 percent, one spouse receives income the entire year). These percentages illustrate that the incidence of couples who receive income for less than the entire year is relatively rare (10 percent of the couples with two unearned-income recipients among the total and 8 percent of such couples among the low-income population), and thus it is difficult to model well.

ALLOY tends to underestimate the number of couples who receive income for less than the entire year, yielding 7 percent of these couples in the total and low-income populations, compared with 9 and 8 percent, respectively, among the two groups observed in SIPP. Among the total population, the model overestimates the number of couples who concurrently receive unearned

TABLE IV.11

DISTRIBUTION OF COUPLES WITH UNEARNED INCOME BY THE CORRELATION IN THE PATTERNS OF UNEARNED INCOME RECEIPT BY HUSBANDS AND WIVES, AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES

	All Couples in Which Both Spouses Receive Unearned Income in the Sample		Couples in Which Both Spouses Receive Unearned Income in Households with Income Below 250% of Poverty		
	ALLOY Simulation	Observed SIPP Outcome	ALLOY Simulation	Observed SIPP Outcome	Adjusted SIPP Outcome[1]
Number of Couples (l,ooo)	9,821	9,669	4,214	4,148	4,159
Distribution by Correlation and Months of Receipt					
Head and spouse compensating with overlap:	5.23%	1.07%	4.84%	1.12%	1.10%
1-6	2.38	.48	2.11	.34	.33
7-11	1.75	.37	1.50	.61	.60
12	1.10	.22	1.23	.17	.16
Concurrent:	83.03	88.35	83.63	83.47	83.62
1-6	.oo	1.83	.00	.79	.78
7-11	.00	.37	.oo	.00	.11
12	83.03	78.15	83.63	82.68	82.72
Partial overlap:	5.26	10.91	4.72	9.26	9.15
1-6	.00	1.35	.00	1.61	1.59
7-11	.00	1.27	.00	1.21	1.20
12	5.26	8.29	4.72	6.44	6.35
Completely compensating:	279	2.66	3.41	2.26	2.25
l-6	266	2.16	3.2	1.47	1.46
7-11	.13	.44	.21	.79	.79
12	.00	.06	.oo	.00	.oo
Spouse compensating with overlap:	3.68	5.00	3.40	3.88	3.85
l-6	.oo	.73	.00	.33	.34
7-11	.34	.39	.33	.77	.76
1 2	3.34	3.88	3.07	2.78	275
Total:	99.99	99.99	100.00	99.99	99.94
1-6	5.94	6.55	5.31	4.54	4.50
7-11	2.22	2.84	2.04	3.38	3.46
12	92.73	90.60	92.65	92.07	91.98

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,848 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

[1]The adjusted SIPP outcome is based an fixed household composition.

income for the full year by nearly 6 percent (83 percent simulated, versus 78 percent observed), and underestimates the number of the couples that comprise one full-year recipient and one part-year recipient (9 percent simulated, versus 13 percent observed). The results are close among the low-income population: 84 percent simulated, versus 83 percent observed, are couples that comprise 2 full-year recipients; 8 percent simulated, versus 9 percent observed, are couples that comprise one full-year recipient. The comparisons are virtually unaffected by the SIPP estimate chosen (household poverty status determined as a function of all persons who reside in the household in each month, versus household poverty status determined as a function of composition in March).

Appendix B describes the correlation in patterns of receipt yielded by the two new ALLOY runs discussed earlier (one with updated duration probabilities, and one with updated duration probabilities and a control for outliers). While improving the simulated duration of receipt and mean amounts, these two simulations do not improve the simulated correlation of patterns of receipt among husbands and wives. In fact the results are worse. In both simulations, too many low-income couples are simulated to receive income for the entire year (95 percent from both models, versus 92 percent observed). This difference is driven largely by the discrepancy in the number of couples in which both spouses are simulated to receive income concurrently for 12 months (88 percent simulated in both models, versus 83 percent observed).

4. Conclusions

The results of ALLOY are superior to a naive model of intra-year income flows at replicating median income, the number of recipients of unearned income, and the variation in average benefits within the year. However, there is room for improvement. At a minimum, we should update the probabilities that govern the simulation of the duration of receipt of unearned income. Second, a more sophisticated model of the duration of other-unearned income receipt conditional on income levels is warranted. This model should incorporate a control for the occurrence of outliers, particularly since updated duration probabilities yield more persons who are simulated to have one

month of unearned income receipt. The analysis of intra-year fluctuations in asset income suggests that the even allocation of asset income is sufficient, and thus no change in this procedure is recommended.

V. RECOMMENDATIONS FOR MODEL DEVELOPMENT AND FUTURE RESEARCH

Overall, the current model performs well at replicating accurately the number of potentially income-eligible households at a fixed point in time. However, it yields a distribution of adults in households by poverty class at a fixed point in time that is skewed more towards those below poverty than is true with the original SIPP data. Furthermore, the current model yields less variation in intra-year fluctuations in household income than is desirable based on the SIPP estimates. Thus, there are several areas in which additional research and model development might improve the ALLOY results.

A. THE ALLOCATION OF UNEMPLOYMENT COMPENSATION

It is clear that reported labor-force participation is inconsistent with reported unemployment compensation receipt. Thus, relying on reported labor-force participation to estimate the duration of unemployment compensation receipt yields periods of receipt that are too short on average. Therefore, we recommend that the ALLOY procedure be changed -- specifically, that the adjusted administrative procedure be adopted. Although this procedure (in which estimates of the weeks of benefit receipt are based on administrative data on average weekly benefits adjusted for underreporting in unemployment compensation benefits in SIPP) still yields estimates of duration which are too short, the bias in the estimate is reduced considerably. We acknowledge our prior reservation about the need to age the administrative data on unemployment benefits in order to carry out this procedure and consider it to be less error prone than the other methods studied here.

B. ASSET INCOME

While we observe that the intra-year fluctuation in asset income is considerable, the tendency to have asset income is highly correlated with the amount of asset income received, persons who report small amounts are more likely to report income for less than one year. An even allocation introduces very little bias in total monthly income, because the amount of money allocated

erroneously is small in absolute terms. Thus, we recommend that the current procedure of allocating asset income evenly remain the same.

C. OTHERINCOME

We found that the original ALLOY model performed reasonably well at allocating unearned income, such as social security payments, within the year and at capturing the correlation in patterns of receipt among husbands and wives. Thus, we decided to concentrate on updating the probabilities that govern the allocation based on 1986 SIPP data. Interestingly enough, using updated probabilities improved the estimates of the duration of receipt and mean monthly income amounts, but did not improve the estimated correlation in patterns of receipt among husbands and wives. In fact, the outcome of the updated procedure was somewhat worse than the outcome of the procedure based on 1979 data.

In addition to updating the probabilities, we experimented with a procedure for minimizing outliers in the estimates of the duration of receipt. While the resulting simulated duration deviated somewhat more from the target than did the updated procedure discussed earlier, we did improve simulated mean monthly amounts, indicating a reduction in the number of outliers. Therefore, we recommend adopting the updated procedure for correcting for outliers.

D. RECOMMENDATIONS FOR FUTURE RESEARCH

We incorporated the preceding recommendations into ALLOY and simulated monthly income on the CPS-type file. As shown in Tables V.l and V.2, the overall measures of monthly poverty and income eligibility did not change substantially. The revised procedures still produced about the correct number of households below 131 percent of poverty in April, but too many income-eligible households in all months and too few income-eligible households in at least one month.

TABLE V.l

DISTRIBUTION OF ADULTS BY POVERTY STATUS IN APRIL,
AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES
ACCORDING TO THE REVISED ALLOY MODEL

Povertv Status	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Less than 131%	14.66%	15.00%	-227
Less than 100%	10.32	9.84	4.88
101-130%	4.34	5.16	-15.89
Less than 251%	37.28	38.07	-2.08
131-185%	10.07	10.14	.69
186250%	12.55	12.93	-294
Over 250%	62.72	61.93	1.28
Total	100.00	100.00	0.00

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE V.2

DISTRIBUTION OF ADULTS BY POVERTY STATUS AND POTENTIAL INCOME ELIGIBILITY UNDER THREE ALTERNATIVE DEFINITIONS, AND A COMPARISON OF SIMULATED WITH OBSERVED OUTCOMES ACCORDING TO THE REVISED ALLOY PROCEDURE

Poverty or Eligibility Status	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	Adjusted SIPP Outcome[1]	Difference as a Percent of Adjusted
Percent Poor on Annual Basis	9.11%	8.11%	12.33%	9.09%	-.22%
Percent Poor in All Months (Continuous Poverty)	6.79	4.56	48.90	5.28	28.60
Percent Poor at Least One Month (Occasional Poverty)	16.40	19.23	- 14.72	19.68	-16.67
Percent Income-Eligible on Annual Basis	13.90	12.88	7.92	13.90	0.00
Percent Income-Eligible in All Months (Continuous Eligibility)	10.53	7.8	35.00	8.74	20.48
Percent Income-Eligible in at Least One Month (Occasional Eligibility)	21.93	26.27	-16.52	26.74	-17.99

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

'The adjusted outcome is based on fixed household composition.

Considering the current application of the model -- that is, simulating the Food Stamp Program at a fixed point in time (usually April) -- the current ALLOY model and the recommended revised ALLOY model perform well at capturing the number of eligible households, although the distriiution by poverty class is somewhat skewed toward households with low incomes and high benefits. However, neither model is well suited to the less frequent applications that require simulating annual ever-eligible households, because total household income does not fluctuate sufficiently within the year.

If future applications of the full-year model are anticipated, further research must be undertaken to improve the intra-year fluctuations in household income. The two areas of investigation should be the two principal omissions in the current ALLOY model: seasonality in labor-force participation, and changes in household composition.

The affect of the absence of intra-year fluctuations in household composition is evident in Table V.2, in which poverty and income eligibility estimates are derived from SIPP according to both actual composition each month and composition fixed as of March.' Restricting the poverty and income eligibility estimates to composition in March raises the number of continuously poor adults and the number of continuously income-eligible adults by less than one percent, and has virtually no affect on the number of occasionally poor and occasionally income-eligible. Nonetheless, half of the deviation of simulated continuously poor and continuously income-eligible adults from the target is explained by the absence of measures of changes in household composition in the CPS.

[1]The adjusted SIPP outcome in Table V.2 also reflects an even allocation of cash welfare. However, the impact on the poverty rates is small (less than one-tenth of one percentage point).

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APPENDIX A

SAMPLE WEIGHT ADJUSTMENT FACTORS FOR 1985 AND 1986 FULL PANEL SIPP EXTRACTS

SAMPLE WEIGHT ADJUSTMENT FACTORS FOR SIPP 1985 PANEL

	A62 CATEGORIES											
	TOTAL	W - 6 2	03 - 04	05 - 06	0 7 - W	09 - 10	11 - 12	13 - 14	15 - 15	16 • 17	18 - 19	26 - 21
TOTAL PERSONS	1.14	1.14	1.17	1.15	1.13	1.13	1.15	1.15	1.15	1.19	1.26	1.29
MALE	1.14	1.12	1.16	1.13	1.11	1.13	1.13	1.16	1.15	1.16	1.23	1.26
BLACK	1.22	1.27	1.43	1.15	1.17	1.20	1.19	1.32	1.24	1.42	1.23	1.62
HISPANIC	1.14	1.31	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OTHER	1.09	1.31	0.60	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00
NON-HISPANIC	1.22	1.27	1.40	1.16	1.18	1.21	1.20	1.33	1.26	1.43	1.24	1.02
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
OTHER	1.24	1.27	1.40	1.16	1.18	1.21	1.26	1.22	1.26	1.43	1.24	1.03
OTHER	1.13	1.10	1.22	1.13	1.10	1.12	1.12	1.14	1.13	1.12	1.23	1.31
HISPANIC	1.26	1.14	1.26	1.27	1.26	1.34	1.17	1.42	1.29	1.16	1.29	1.1
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
OTHER	1.26	1.14	1.29	1.27	1.20	1.34	1.17	1.42	1.29	1.16	1.31	1.12
NON-HISPANIC	1.13	1.09	1.11	1.11	1.09	1.10	1.11	1.11	1.12	1.11	1.22	1.33
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	1.29
OTHER	1.16	1.09	1.11	1.11	1.09	1.10	1.11	1.11	1.12	1.11	1.23	1.22
FEMALE	1.15	1.16	1.18	1.17	1.14	1.13	1.17	1.14	1.14	1.23	1.29	1.39
BLACK	1.26	1.36	1.26	1.22	1.47	1.26	1.36	1.15	1.49	1.32	1.47	1.23
HISPANIC	1.17	1.66	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.20	0.00	6.W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OTHER	1.13	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
NON-HISPANIC	1.27	1.41	1.27	1.34	1.47	1.26	1.38	1.16	1.46	1.29	1.44	1.23
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.29
OTHER	1.34	1.42	1.27	1.34	1.47	1.28	1.29	1.16	1.46	1.1	1.49	1.17
OTHER	1.13	1.13	1.17	1.14	1.10	1.11	1.14	1.14	1.09	1.21	1.26	1.22
HISPANIC	1.24	1.20	1.22	1.61	1.10	1.15	1.29	1.44	1.12	1.81	1.14	1.14
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.20	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	1.00	1.24
OTHER	1.29	1.26	1.22	1.81	1.10	1.15	1.29	1.44	1.12	1.81	1.18	1.w
NON-HISPANIC	1.12	1.12	1.15	1.10	1.10	1.11	1.12	1.11	1.09	1.17	1.28	1.34
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.10	0.00	0.00	0.00	0.00	6.W	0.00	0.00	0.00	1.00	1.14	1.26
OTHER	1.18	1.12	1.15	1.10	1.26	1.11	1.12	1.11	1.09	1.17	1.36	1.41

SAMPLE WEIGHTA DJUSTMENT FACTORS FOR SIPP 1995 PANEL

	AGE CATEGORIES										
	22-24	26-29	30 - 34	35 - 39	46.44	46-49	50 - 54	55 - 59	W-64	65 - 69	70 PLUS
TOTAL PERSONS	1.27	1.17	1.12	1.11	1.11	1.11	1.12	1.10	1.09	1.08	1.13
MALE	1.27	1.19	1.12	1.11	1.11	1.09	1.12	1.09	1.10	1.09	1.14
BLACK	1.26	1.20	1.16	1.20	1.23	1.10	1.11	1.13	1.19	1.15	1.34
HISPANIC	2.95	1.00	I.W	1.00	1.00	1.00	1.62	1.00	1.00	1.74	1.33
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.00	0.09	1.00	1.00	1.00	1.00	1.62	1.00	1.00	1.74	1.52
OTHER	0.00	1.00	0.99	1.00	0.00	0.00	1.62	0.00	1.00	0.00	1.00
NON-HISPANIC	1.22	1.21	1.19	1.21	1.24	1.10	1.09	1.13	1.21	1.13	1.35
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.61	1.17	1.17	1.26	1.26	1.13	1.10	1.16	I.22	1.13	1.34
OTHER	1.12	1.29	1.13	1.29	1.14	1.00	1.00	1.00	1.00	1.13	1.34
OTHER	1.28	1.19	1.11	1.09	1.10	1.09	1.12	1.09	1.09	1.1	1.12
HISPANIC	1.26	1.21	1.11	1.22	1.13	1.13	1.11	1.11	1.27	1.70	1.05
HOUSEHOLD REFERENCE											
PERSON OR SPWSE	1.07	1.17	1.09	1.16	1.13	1.13	1.09	1.11	1.22	1.70	1.66
OTHER	1.49	1.33	1.27	1.60	0.00	1.00	1.22	1.00	0.00	0.00	1.00
NON-HISPANIC	1.29	1.19	1.12	1.08	1.09	1.09	1.12	1.09	1.08	1.07	1.12
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.23	1.15	1.09	1.08	1.09	1.09	1.13	1.08	1.08	1.07	1.12
OTHER	1.22	1.32	1.29	1.14	1.17	1.07	1.00	1.26	1.23	1.00	1.27
FEMALE	1.27	1.15	1.13	1.11	1.12	1.13	1.11	1.10	1.08	1.08	1.13
BLACK	1.18	1.20	1.29	1.25	1.32	1.07	1.42	1.24	1.16	1.09	1.22
HISPANIC	1.18	1.20	1.69	1.00	1.29	1.00	1.00	1.00	1.16	1.34	1.00
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.00	1.20	1.92	1.00	1.29	1.00	1.00	1.00	1.16	1.34	1.00
OTHER	1.22	1.20	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.00
NON-HISPANIC	1.18	1.18	1.29	1.29	1.32	1.1	1.44	1.1	1.16	1.1	1.23
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.22	1.10	1.29	1.27	1.30	1.07	1.46	1.27	1.16	1.07	1.17
OTHER	1.15	1.59	1.29	1.00	1.67	I.27	1.00	1.00	1.16	1.16	1.46
OTHER	1.22	1.15	1.10	1.10	1.09	1.11	1.1	1.09	I.w	1.08	1.12
HISPANIC	1.40	1.22	1.32	1.19	1.09	1.26	1.24	1.24	1.21	1.16	1.09
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.48	1.21	1.32	1.19	1.10	1.23	1.21	1.24	1.24	1.11	1.1
OTHER	1.27	1.26	1.12	1.19	1.00	1.61	1.59	1.24	1.00	1.33	1.29
NON-HISPANIC	1.27	1.14	1.99	1.09	1.09	1.12	1.07	1.08	1.07	1.08	1.12
HOUSEHOLD REFERENCE											
PERSON OR SPOUSE	1.20	1.11	1.07	1.09	1.09	1.12	1.06	1.08	1.07	1.08	1.10
OTHER	1.42	1.31	1.22	1.09	1.34	1.23	1.49	1.1	1.11	1.05	I.24

SAMPLE WEIGHT ADJUSTMENT FACTORS
FOR SIPP 1986 PANEL

	AGE CATEGORIES											
	TOTAL	W-92	OS-04	05-06	07-08	09-10	11-12	13-14	15-I	16-17	18-19	20-21
TOTAL PERSONS	1.18	1.17	1.14	1.17	1.18	1.14	1.19	1.20	1.14	1.27	1.38	1.39
MALE	1.18	1.17	1.13	1.17	1.17	1.13	1.18	1.20	1.11	1.27	1.39	1.29
BLACK	1.25	1.24	1.25	1.20	1.21	1.22	1.31	1.22	1.24	1.48	1.79	1.47
HISPANIC	1.28	1.11	1.52	1.00	1.00	1.35	1.33	1.68	1.00	1.42	2.53	3.29
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OTHER	1.35	1.11	1.52	1.00	1.00	1.35	1.23	1.68	1.00	1.42	2.53	3.29
NON-HISPANIC	1.25	1.26	1.24	1.22	1.22	1.29	1.31	1.18	1.25	1.49	1.64	1.39
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56
OTHER	1.29	1.26	1.24	1.22	1.23	1.29	1.11	1.18	1.25	1.49	1.64	1.37
OTHER	1.17	1.16	1.12	1.17	1.16	1.11	1.16	1.19	1.08	1.23	1.35	1.38
HISPANIC	1.31	1.26	1.30	1.36	1.38	1.22	1.27	1.32	1.25	1.55	1.72	1.49
HOUSEHOLD REFERENCE PERSON OR SPWSE	1.21	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76
OTHER	1.41	1.26	1.30	1.36	1.28	1.22	1.27	1.32	1.25	1.55	1.72	1.11
NON-HISPANIC	1.16	1.15	1.09	1.15	1.14	1.10	1.15	1.18	1.07	1.21	1.33	1.38
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	1.47	1.38
OTHER	1.29	1.15	1.09	1.15	1.14	1.10	1.15	1.18	1.07	1.20	1.31	1.29
FEMALE	1.17	1.16	1.16	1.16	1.18	1.16	1.20	1.20	1.18	1.27	1.36	1.38
BLACK	1.23	1.15	1.23	1.37	1.32	1.16	1.34	1.21	1.18	1.31	1.42	1.29
HISPANIC	1.29	1.29	1.00	2.02	1.61	1.24	1.25	1.18	1.00	1.33	1.50	1.19
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
OTHER	1.27	1.20	1.00	2.02	1.61	1.24	1.25	1.18	1.00	1.33	1.50	1.23
NON-HISPANIC	1.23	1.14	1.25	1.34	1.29	1.15	1.35	1.21	1.22	1.30	1.42	1.1
HOUSEHOLD REFERENCE PERSON OR SPWSE	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	1.84
OTHER	1.24	1.14	1.25	1.34	1.29	1.15	1.35	1.21	1.22	1.27	1.41	1.19
OTHER	1.17	1.17	1.15	1.12	1.16	1.16	1.18	1.20	1.18	1.27	1.35	1.49
HISPANIC	1.29	1.27	1.16	1.29	1.30	1.20	1.48	1.55	1.30	1.28	1.48	1.64
HOUSEHOLD REFERENCE PERSON OR SPWSE	1.23	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	1.00	2.42	2.22
OTHER	1.28	1.27	1.16	1.29	1.30	1.20	1.48	1.55	1.24	1.29	1.43	1.44
NON-HISPANIC	1.16	1.15	1.14	1.11	1.15	1.16	1.15	1.17	1.17	1.27	1.24	1.29
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	1.54	1.1
OTHER	1.22	1.15	1.14	1.11	1.15	1.16	1.15	1.17	1.17	1.26	1.31	1.41

SAMPLE WEIGHT ADJUSTMENT FACTORS FOR SIPP1986PANEL

	AGE CATEGORIES										
	22 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 PLUS
TOTAL PERSONS	1.32	1.26	1.13	1.12	1.14	1.16	1.15	1.11	1.11	1.11	1.17
MALE	1.37	1.22	1.14	1.12	1.12	1.16	1.14	1.13	1.14	1.13	1.15
BLACK	1.27	1.37	1.14	1.16	1.10	1.17	1.09	1.24	1.31	1.36	1.24
HISPANIC	1.00	1.00	1.43	1.00	1.53	1.82	1.06	1.23	1.96	1.00	1.00
HOUSEHOLD REFERENCE PERSON OR SPOUSE	0.00	1.00	1.43	1.00	1.00	1.82	1.06	1.29	1.00	1.00	1.60
OTHER	1.09	1.09	0.00	1.00	0.06	0.00	0.99	1.00	0.00	0.60	0.66
NON-HISPANIC	1.28	1.40	1.13	1.17	1.07	1.15	1.65	1.24	1.32	1.31	1.25
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.37	1.43	1.06	1.17	1.1	1.19	1.10	1.24	1.13	1.34	1.0
OTHER	1.25	1.36	1.25	1.24	1.13	1.60	1.06	0.66	0.60	1.00	1.60
OTHER	1.36	1.29	1.14	1.11	1.12	1.15	1.15	1.12	1.0	1.12	1.17
HISPANIC	1.47	1.39	1.39	1.22	1.11	1.20	1.33	1.14	1.19	1.20	1.13
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.25	1.19	1.32	1.13	1.13	1.29	1.26	1.14	1.19	1.23	1.14
OTHER	1.69	2.49	1.1	2.17	1.00	0.60	0.06	0.00	0.00	1.60	1.00
NON-HISPANIC	1.27	1.18	1.12	1.10	1.12	1.15	1.14	1.12	1.13	1.12	1.15
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.32	1.13	1.11	1.09	1.12	1.15	1.12	1.12	1.12	1.12	1.16
OTHER	1.41	1.34	1.15	1.22	1.22	1.26	1.44	1.13	1.27	1.09	1.71
FEMALE	1.28	1.19	1.13	1.13	1.16	1.17	1.16	1.12	1.09	1.09	1.17
BLACK	1.16	1.29	1.20	1.16	1.39	1.23	1.19	1.24	1.16	1.11	1.22
HISPANIC	2.46	1.00	1.00	1.23	1.57	3.99	1.14	1.95	1.60	1.1	1.57
PERSON OR SPOUSE	0.66	1.06	1.60	1.23	1.78	3.99	1.14	1.%	1.00	1.1	1.57
OTHER	1.06	1.00	1.00	0.00	1.06	0.00	0.06	0.00	0.00	0.00	0.00
NON-HISPANIC	1.13	1.33	1.21	1.15	1.29	1.17	1.20	1.19	1.17	1.65	1.20
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.12	1.33	1.20	1.16	1.31	1.11	1.21	1.20	1.15	1.07	1.15
OTHER	1.15	1.33	1.23	1.60	1.12	1.64	1.00	1.00	1.00	1.1	1.47
OTHER	1.29	1.18	1.12	1.12	1.14	1.17	1.16	1.11	1.%	1.09	1.16
HISPANIC	1.24	1.36	1.17	1.15	1.19	1.27	1.19	1.42	1.41	1.24	1.34
HOUSEHOLD REFERENCE PERSON a SPOUSE	1.33	1.20	1.15	1.14	1.21	1.26	1.20	1.26	1.33	1.27	1.12
OTHER	1.56	1.%	1.42	1.19	1.00	1.40	1.00	1.75	1.73	1.00	1.95
NON-HISPANIC	1.29	1.16	1.11	1.12	1.14	1.16	1.15	1.10	1.07	1.09	1.16
HOUSEHOLD REFERENCE PERSON OR SPOUSE	1.21	1.13	1.10	1.12	1.14	1.16	1.15	1.10	1.1	1.09	1.13
OTHER	1.42	1.40	1.29	1.26	1.18	1.1	1.16	1.09	1.38	1.69	1.39

APPENDIX B

SUPPLEMENTAL TABLES

TABLE B.1

MONTHLY EARNED INCOME FOR PERSONS IN HOUSEHOLDS BELOW 250 PERCENT OF POVERTY BASED ON COMPOSITION FIXED AS OF MARCH

Month	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Recipients (in thousands)			
January	27,886	27,394	1.80%
February	28,023	27,082	3.47
March	28,238	27,262	3.58
April	28,205	27,561	2.34
May	28,286	27,511	2.82
June	28,255	28,106	0.53
July	28,262	28,191	0.25
August	28,135	28,203	-0.24
September	28,291	28,119	0.61
October	28,112	28,512	-1.40
November	27,928	28,508	-2.03
December	28,003	28,568	-1.98
Average	28,135	27,918	0.78
Average Benefits			
January	$864.15	$911.19	-5.16
February	858.41	817.16	5.05
March	861.77	823.17	4.69
April	857.77	865.24	-0.86
May	856.08	873.11	-1.95
June	851.48	827.35	292
July	855.83	890.35	-3.88
August	859.78	870.32	-1.21
September	861.85	845.66	1.92
October	864.50	938.97	-7.93
November	863.69	849.91	1.62
December	860.64	892.63	-3.58
Average	859.66	867.09	-0.86

SOURCE An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.2

MONTHLY UNEMPLOYMENT COMPENSATION
FOR PERSONS IN HOUSEHOLDS BELOW 250 PERCENT OF POVERTY
BASED ON COMPOSITION FIXED AS OF MARCH

Month	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Recipients (in thousands)			
January	802	1,439	-44.27
February	842	1,410	-40.28
March	869	1,346	-35.44
April	813	1,203	-32.42
May	823	1,087	-24.29
June	886	1,843	-15.05
July	82.8	1,135	-27.05
August	790	1,125	-29.78
September	745	1,020	-26.96
October	750	989	-24.17
November	776	1,032	-24.81
December	823	1,090	-24.50
Average	812	1,168	-30.00
Average Benefits			
January	$681.13	$426.69	40.88
February	592.23	412.27	43.65
March	609.07	416.46	46.25
April	565.79	423.83	33.50
May	570.60	439.87	29.72
June	543.30	442.03	22.91
July	539.11	416.27	29.51
August	533.02	430.63	23.78
September	568.53	414.24	37.25
October	559.16	424.46	31.73
November	574.61	388.59	47.87
December	582.38	409.66	42.16
Average	569.91	420.42	35.56

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.3

DISTRIBUTION OF NONELDERLY PERSONS IN HOUSEHOLDS BELOW 250 PERCENT OF POVERTY BY NUMBER OF MONTHS IN WHICH OTHER INCOME WAS INDICATED

	Regular		Irregular		Total	
	Number (1,000)	Percent	Number (1,000)	Percent	Number (1,000)	Percent
Number of Months Receiving Other Income						
1	432	9.8	1,405	19.7	1,837	15.9
2	227	5.1	732	10.3	958	8.3
3	171	3.9	560	7.9	731	6.3
	252	5.7	748	10.5	1,000	a7
3	86	1.9	417	5.9	503	4.3
6	110	2.5	304	4.3	415	3.6
7	90	20	207	2.9	297	26
8	72	1.6	273	3.8	345	3.0
9	84	1.9	246	3.4	330	2.9
10	126	28	214	3.0	340	29
11	85	1.9	318	4.5	402	3.5
12	2,696	60.9	1,704	23.9	4,400	38.1
Total	4,430	100.0	7,128	100.0	11557	100.0

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.4

DISTRIBUTION OF UNEARNED NONASSET INCOME RECIPIENTS BY NUMBER OF MONTHS OF RECEIPT AND INCOME LEVELS, AND A COMPARISON OF SIMULATED WITH ACTUAL OUTCOMES: ALLOY SIMULATION USING UPDATED PROBABILITIES

	All Adults in the Sample			Adults in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Number of Months Receiving						
1	7.08%	9.26%	-23.54%	6.84%	6.54%	4.59%
2	3.80	4.13	-7.99	3.24	3.42	-5.26
3	2.96	338	-1243	2.85	273	4.40
4	4.09	3.92	434	3.64	3.66	-.55
5	1.83	2.17	-15.67	1.56	1.%	-20.41
6	1.45	1.74	-16.67	134	1.58	-15.19
7	1.03	135	-23.70	1.02	1.19	-14.29
8	1.18	1.73	-31.79	1.18	1.56	-24.36
9	1.23	1.35	-8.89	1.02	1.38	-26.09
10	1.18	1.40	-15.71	1.21	1.43	-15.38
11	1.41	1.66	-15.06	1.44	1.83	-2131
12	72.76	67.91	7.14	74.68	7271	271
Subtotal 1 to 3	13.84	16.77	-17.47	1293	12.69	1.89
Subtotal 1 to 4	17.93	20.69	-1334	16.57	16.35	1.35
Subtotal 4 to 6	7.37	7.83	-5.87	6.54	7.20	-9.17
Subtotal 5 to 8	5.49	6.99	-21.46	5.10	6.29	-18.92
April Income						
Mean	$782	$623	25.52%	$555	$444	25.00%
Median	444	475	-6.53	398	409	-2.69
Minimum	1	1	.00	1	1	.00
Maximum	66,000	25,500	158.82	14,898	4,000	272.45

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.5

DISTRIBUTION OF COUPLES WITH UNEARNED INCOME BY THE CORRELATION IN PATTERNS OF UNEARNED INCOME RECEIPT BY HUSBANDS AND WIVES, AND A COMPARISON OF, SIMULATED WITH ACTUAL OUTCOMES: ALLOY SIMULATION WITH UPDATED PROBABILITIES

	All Couples in Which Both Receive Unearned Income in the Sample		Couples in Which Both Receive Unearned Income in Households below 250% of Poverty	
	ALLOY Simulation	Observed SIPP Outcome	ALLOY Simulation	Observed SIPP Outcome
Number of couples (l,ooo)	9,821	9,669	4,214	4,149
Distribution by Correlation and Months Receiving				
Head and spouse compensating with overlap:	3.17%	1.07%	2.60%	1.12%
1-6	1.40	.48	1.22	.34
7-11	1.43	.37	1.27	.61
12	.33	.22	.11	.17
Concurrent:	86.89	80.35	87.52	83.47
1-6	.00	1.83	.00	.79
7-11	.00	.37	.00	.00
12	86.89	78.15	87.52	82.68
Partial overlap:	4.47	10.91	4.33	9.26
1-6	.00	1.35	.00	1.61
7-11	.00	1.27	.00	1.21
12	4.47	8.29	4.33	6.44
Completely compensating:	2.79	2.66	2.94	2.26
1-6	1.98	2.16	2.71	1.47
7-11	.26	.44	.12	.79
12	.05	.06	.11	.00
Spouse compensating with overlap:	3.18	5.00	2.61	3.88
1-6	.11	.73	.00	.33
7-11	.00	.39	.00	.77
12	3.08	3.88	2.61	278
Total:	100.00	99.99	100.00	99.99
1-6	3.49	6.55	3.93	4.54
7-11	1.69	2.84	1.39	3.38
12	94.82	90.60	94.68	92.07

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.6

DISTRIBUTION OF UNEARNED NONASSET-INCOME RECIPIENTS BY NUMBER OF MONTHS OF RECEIPT AND INCOME LEVELS, AND A COMPARISON OF SIMULATED WITH ACTUAL OUTCOMES: ALLOY SIMULATION USING UPDATED PROBABILITIES AND CONTROL FOR OUTLIERS

	All Adults in the Sample			Adults in Households Below 250% of Poverty		
	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed	ALLOY Outcome	Observed SIPP Outcome	Difference as a Percent of Observed
Number of Months Receiving						
1	6.89%	9.26%	-34.23%	5.89%	6.54%	-9.94%
2	3.78	4.13	-8.47	3.38	3.42	-1.17
3	3.03	3.38	-1036	3.03	273	10.99
4	4.06	3.92	3.57	3.73	3.66	1.91
5	2.03	2.17	-6.45	1.74	1.96	-11.22
6	1.63	1.74	-6.32	1.53	1.58	-3.16
7	1.13	1.35	-16.30	1.10	1.19	-7.56
8	1.26	1.73	-27.17	1.19	1.56	-23.72
9	1.27	1.35	-5.93	1.03	1.38	-25.36
10	1.26	1.40	-10.00	1.25	1.43	-1259
11	1.42	1.66	-14.46	1.44	1.83	-21.31
12	73.03	67.91	7.54	74.69	7271	272
Subtotal 1 to 3	12.98	16.77	-23.08	12.30	12.69	-3.07
Subtotal 1 to 4	16.96	20.69	-18.03	16.03	16.35	-1.96
Subtotal 4 to 6	7.72	7.83	-1.40	7.00	7.20	-278
Subtotal 5 to 8	6.05	6.99	-13.45	5.56	6.29	-11.61
April Income						
Mean	$693	$623	11.24%	$509	$444	14.64%
Median	444	475	-6.53	398	409	-269
Minimum	1	1	.oo	1	1	.00
Maximum	66,000	25,500	158.82	13,598	4,000	239.75

SOURCE: An extract of the Survey of Income and Program Participation derived from the 1985 and 1986 full-panel longitudinal files, consisting of 34,848 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

TABLE B.7

DISTRIBUTION OF COUPLES WITH UNEARNED INCOME BY THE CORRELATION IN PATTERNS OF UNEARNED INCOME RECEIPT OF HUSBANDS AND WIVES, AND A COMPARISON OF SIMULATED AND ACTUAL OUTCOMES ALLOY SIMULATION WITH UPDATED PROBABILITIES AND CONTROL FOR OUTLIERS

	All Couples in Which Both Receive Unearned Income in the Sample		Couples in Which Both Receive Unearned Income in Low-Income Households	
	ALLOY Simulation	Observed Data in SIPP	ALLOY Simulation	Observed Data in SIPP
Number of Couples (l,ooo)	9,821	9,669	4,214	4,140
Distribution by Correlation and Months Receiving				
Head and spouse compensating with overlap	3.23%	1.07%	3.03%	1.12%
1-6	1.37	.48	1.54	.34
7-11	1.53	.37	1.38	.61
12	.33	.22	.11	.17
Concurrent	87.06	80.35	87.52	83.47
1-6	.00	1.83	.00	.79
7-11	.00	.37	.00	.00
12	87.06	78.15	87.52	82.68
Partial overlap	4.53	10.91	4.47	9.26
1-6	.00	1.35	.00	1.61
7-11	.00	127	.00	1.21
12	4.53	8.29	4.47	6.44
Completely compensating	1.96	2.66	2.27	226
1-6	1.60	2.16	1.93	1.47
7-11	.31	.44	.23	.79
12	.05	.06	.11	.00
Spouse compensating with overlap	3.22	5.00	2.71	3.88
1-6	.22	.73	.10	.33
7-11	.00	.39	.00	.77
12	3.00	3.88	2.61	2.78
Total	100.00	99.99	100.00	99.99
1-6	3.19	6.55	3.57	4.54
7-11	1.84	2.84	1.61	3.38
12	94.97	90.60	94.82	92.07

SOURCE: An extract of the Survey of Income and Program Participation, derived from 1985 and 1986 full-panel longitudinal files consisting of 34,840 adults (189 million adults weighted) present in the combined samples in 1986 and March 1987.

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