SEAM EFFECT, RECALL BIAS, AND THE ESTIMATION OF LABOR FORCE TRANSITION RATES FROM SIPP

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1. INTRODUCTION

The Survey of Income and Program Participation (SIPP) represents the only nationally representative household survey, except for the Current Population Survey (CPS), with enough sub-annual information to provide measures of month-to-month change in labor force status. The purpose of this paper is to illustrate the potential, as well as the shortcomings, of SIPP for the purpose of estimating labor force gross flows. The plan of the paper is the following. Section 1.1 provides the motivation for the analysis of gross flows and reviews some applications. Section 1.2 illustrates the features of the SIPP and CPS design relevant to the measurement of month-to-month change. Section 2.1 illustrates the criteria adopted to classify sample persons as employed or unemployed using SIPP monthly variables. Section 2.2 presents SIPP-based estimates of the major labor force aggregates for calendar years 1984 and 1985, and compares them to the corresponding measures obtained from the CPS. Section 3 presents SIPP-based estimates of the average gross flows between employment, unemployment, and non-participation. The problems raised by the design of SIPP for the estimation of gross flows are discussed in detail.

1.1 Uses of labor force gross flows

A common view of the U.S. labor market is that it is very "dynamic", a view which is based mainly on data from the Current Population Survey. These data show large flows of people entering and leaving each labor market state, and in particular unemployment. The net difference in the number of persons unemployed between one month and the next is usually in the order of the hundreds of thousands, while several million people are reported every month entering and leaving unemployment. In 1984, a year of rapidly decreasing unemployment[1], the average month-to-month (absolute) difference in the number unemployed was 283,000, while the average number of persons reported leaving unemployment every month was approximately 3.7 million (2 million to employment and 1.7 to non-participation), and 3.5 million were reported entering it (1.7 from employment and 1.8 from non-participation).

The size of the flows in and out of unemployment has important welfare implications. Holding constant the size of the unemployed pool, larger flows imply that the unemployment burden is shared among a larger number of persons, while smaller flows imply a higher concentration and longer duration of unemployment (Clark and Summers, 1979). The relative size of the two flows out of unemployment (to employment and to non-participation) also has important implications: if those leaving unemployment to non-participation contribute to a short average duration of unemployment, the latter measure is not necessarily an indication of an "healthy" labor market.

Gross flows are rarely analyzed in raw form, i.e., as absolute numbers. They are most commonly transformed into transition matrices, where the entry ij represents the proportion of individuals in state i in month t-1 who are in state j in month t. These transition matrices provide a simple descriptive measure of the amount of turnover in the labor market. An important illustration of the use of labor force transition matrices is in the work by Marston (1976) and Blau and Robbins (1986). Marston utilizes transition matrices in his analysis of the unemployment differential between demographic groups. He is able to "decompose" such differential into flow-specific components. His major finding is that the higher unemployment rates of non-whites and teenagers are due mostly to a higher probability of leaving employment, rather than to a lower probability of finding employment. Blau and Robbins use a similar methodology to analyze the differential in employment rates between welfare and non-welfare recipients. Their main finding is that the lower employment rate of welfare recipients is due to a slower entry into employment.

Despite their potential usefulness for the analysis of labor market dynamics, a very limited use of gross flows has been made. For a long time, the only potential source of monthly gross flows data has been the CPS, but severe statistical problems have so far prevented a reliable estimation of gross flows from this survey (Hogue, 1984). The next section discusses some of these problems.

1.2 Features of SIPP and CPS critical for gross flows estimation

Perhaps the most relevant difference between the SIPP and the CPS is that the SIPP has been specifically designed as a longitudinal survey. In SIPP the initial sample members are followed for a period of two and a half years and interviewed every four months. The CPS is essentially a cross-sectional survey with a longitudinal dimension, given by its rotation group structure: each rotation group is interviewed for four consecutive months, dropped eight months and reinterviewed for another four months. Month-to-month gross flows are obtained from the 6 rotation groups common to both months. However, the so-called "non-identicals", i.e., persons who missed one of the two interviews, are also excluded from the computation of the flows. The weights used to obtain population estimates do not compensate for the non-identicals, since CPS weights are purely cross-sectional. The consequence is the inconsistency between the flows and the levels computed for the initial and the subsequent month. The biases induced by excluding non-identicals have been for many years the center of the attention of those studying CPS-based gross flows (Hogue, 1984).

More recently, the problem of response error has received increased attention. Errors in reporting one's labor force state either in the initial or subsequent month result in spurious transitions being added to the true transitions. Under fairly plausible conditions[2], this tends to increase the size of the off-diagonal elements of the transition (or gross flows) matrix. The prevalence of response error in reporting labor force status in the monthly CPS seems to be very high, as suggested by data from the CPS Reinterview Survey.

Some of the features of the SIPP survey design might obviate the problems encountered in computing CPS-based gross flows. 1) Rather than a sample of addresses, like the CPS, the SIPP is a sample of individuals followed over time. Movers are followed

to the new address whenever possible. However, the problem of the "non-identicals" remains in SIPP because of attrition from the survey; 2) most SIPP interviews are obtained in-person, while the CPS relies heavily on telephone interviews; 3) the use of proxies is less frequent in SIPP; 4) record matching across interviews is not an issue in SIPP, because exact identifiers are used for each person in the household, whereas the CPS relies on the demographic characteristics of each household member (age, race and sex) in order to statistically match records from two subsequent interviews. This increases the incidence of spurious transitions (when false positive matches occur) and the number of non-identicals (when false negative matches occur).

The features of SIPP just reviewed have the potential for reducing errors in classifying respondents' labor force status. On the other hand, other important characteristics of the SIPP design may create problems not encountered in the CPS. In particular, SIPP collects information on labor force behavior retrospectively for every week in the reference period, i.e., the previous 17 or 18 weeks. The monthly CPS asks about the week immediately preceding the week of the interview. This feature of the design of SIPP has three major implications for classifying labor force status and for estimating gross flows: 1) SIPP enables the analyst to construct summary measures of labor force status for each month using information from every week in the month, while the monthly labor force status in the CPS is constructed based on information from just one week in the month. 2) The long recall period may potentially induce biases in the reported labor force behavior, in particular in the earlier months of the reference period. For example, if short spells of unemployment tend to be forgotten as time goes by, one might expect a lower overall level of unemployment in the earlier months of the reference period than in the later months. 3) Three-fourths of the month-to-month transitions in SIPP are based solely on retrospective data, while the remaining fourth is constructed from information collected during two separate interviews. This asymmetry contributes to a phenomenon widely observed in SIPP, the so-called "seam effect", i.e., the heaping of most of the observed transitions at the seam between two waves of interviews. This phenomenon has been observed for labor force behavior as well as for income and program participation (Burkhead and Coder, 1985, Marquis and Moore, 1989).

The next two sections address these issues in more detail and present relevant empirical estimates of labor force stock and flows from SIPP.

2. ESTIMATING LEVELS OF EMPLOYMENT AND UNEMPLOYMENT FROM SIPP DATA

Section 2.1 briefly describes the conventions adopted to classify individuals as employed, unemployed, or non-participant, using the monthly measures on the SIPP 32-month Longitudinal Research File produced by the Census Bureau.[3] In section 2.2 we present estimates of labor force aggregates for calendar years 1984 and 1985 based on the adopted classification.

2.1 Defining monthly labor force status with SIPP

SIPP collects information on labor force status for each week in the four month reference period. The Census Bureau recodes this information into four separate monthly variables. If one is trying to compute measures of spell duration, the direct use of the weekly data is important to avoid loss of information. This is not necessarily the case however if one is constructing discrete-time monthly measures. The monthly recoded variables provide sufficient detail for a variety of classifications of labor force status.

We adopt a classification scheme based essentially on the number of weeks the person is employed or looking for work in the month. The sample member is classified as employed if: a) s/he reports having a job the entire month, even if s/he misses some weeks of work (for reasons other than being laid off); or b) s/he reports having a job the entire month, is laid off part of the month but works at least TWO weeks; or c) s/he reports as having a job only part of the month but works at least TWO weeks. The person is classified as unemployed if: a) s/he reports having a job the entire month, but is laid off part of the month and works less than TWO weeks; or b) s/he reports having a job part of the month, but works less than TWO weeks and looks for work in some other week; or c) s/he does not report having a job at any point during the month, but she reports looking for work at least TWO weeks. The person is residually classified as a non-participant if s/he does not meet any of the above criteria.

This method of classification differs from that adopted by Ryscavage and Feldman-Harkins (1988). The two authors attempts to "mimic" the sequence of observations collected by the CPS using SIPP weekly data, by utilizing employment information only from the week containing the 12th day of the month and job search information from the preceding 4 weeks. Estimates of labor force stocks and flows for 1984 obtained with this method are partially reproduced below for comparison.

2.2 Stock measures for 1984 and 1985

The estimates of labor force stocks presented in table 1 are based on the 32-month Longitudinal Research File of SIPP. This file contains longitudinal weights, which are positive only for the sample members continuously present in the survey for a calendar year, i.e., who did not miss any interview during the year.[4] We obtained the estimates for 1984 and 1985 using the subsamples with positive longitudinal weights for each year. Based on the classification specified in section 2.1 we estimated annual averages of the number of persons employed and unemployed. In table 1 these estimates are presented in the first column.

The second column of table 1 reports the corresponding measures obtained from the CPS. In the third column we report the estimates obtained by Ryscavage and Feldman-Harkins (RFH, 1988), based on the SIPP weekly data from the cross-sectional files. The numbers in parentheses represents, respectively, the employment-population ratio and the unemployment rate. The classification scheme proposed in this paper (first column) yields estimates which are closer to the CPS measures than the SIPP estimates obtained by RFH. Our method underestimates the number unemployed by about 630,000 individuals in 1984 (7.3% below the CPS estimate), while the method of RFH overestimates it by 1.5 million (17.7% above the CPS estimate). Part of the discrepancy between our estimates and the CPS's is due to the different size of the two populations. When the estimates are normalized by the size of the population, for example considering the unemployment rate rather than the number unemployed, the discrepancy is reduced: our unemployment rate for 1984 is 6.4%

lower than the CPS estimate. Despite the many differences between the CPS and SIPP survey designs, interview methods, length of recall, and wording of the labor force questions, the estimates based on the classification proposed in this paper can be considered quite successful in replicating the CPS measures.

TABLE 1 Alternative estimates of employment and unemployment among the non-institutional population 16 and older (thousands of persons)

Month in the Reference Period	data source and estimation method: SIPP method proposed in the paper	CPS not seasonally adjusted	SIPP reported by Ryscavage (1988)
	1984		
	EMPLOYMENT		
All months	105,822	106,702	105,612
	(61.17)	(59.91)	(57.85)
Month 1	105,356	-	-
Month 2	106,072	-	-
Month 3	105,968	-	-
Month 4	105,906	-	-
	UNEMPLOYMENT		
All months	7,908	8,539	10,054
	(6.95)	(7.40)	(8.69)
Month 1	8,033	-	-
Month 2	7,852	-	-
Month 3	7,979	-	-
Month 4	7,766	-	-
Total population	173,003[a]	178,080	177,354
	1985		
	EMPLOYMENT		
All months	108,536	108,856	-
	(61.87)	(60.50)	-
Month 1	107,999	-	-
Month 2	108,679	-	-
Month 3	108,831	-	-
Month 4	108,631	-	-
	UNEMPLOYMENT		
All months	7,355	8,312	-
	(6.35)	(7.09)	-
Month 1	7,362	-	-
Month 2	7,346	-	-
Month 3	7,376	-	-
Month 4	7,335	-	-
Total population	175,435[a]	179,912	-

[a] Excluding persons who were in sample in January but died or were institutionalized before December of the same year.

Table 1 presents in the first column an additional set of estimates. These are annual averages for the two labor force aggregates estimated separately for each month in the reference period.[5] The purpose is to investigate the effect of the length of the recall period on the reported labor force status.[6] The figures reported in the table clearly show that the length of the recall period does not have any systematic effect: there is no recognizable trend, and the differences are not statistically significant (10% level).

3. ESTIMATING CHANGES IN LABOR FORCE STATUS FROM SIPP DATA

Table 2 presents annual averages of the month-to-month gross flows between employment (E), unemployment (U) and non-participation (N) for 1984 and 1985. Sample members are classified in the three labor force states according to the method described above. Each column of table 2 contains the six off-diagonal entries of a gross flows matrix. The first column in the table shows the "seam" gross flows, i.e., the number of transitions reported between month 4 of one reference period and month 1 of the next period (the "seam" between two waves of SIPP data). The second, third, and fourth columns contain the "non-seam" flows, i.e., the number of transitions reported between two consecutive months of the same reference period. The last column contains the annual averages for all flows, computed without regard to the position of the two months with respect to the reference period.

TABLE 2 Estimates of labor force gross flows from the SIPP Longitudinal Research File for the non-institutional population 16 and older (thousands of persons)

	Seam gross flows	Non-seam gross flows			Average gross flows
Months Involved	4-->1	1-->2	2-->3	3-->4	
Labor Force States			1984		
EU	1,749	583	790	814	984
EN	3,261	655	1,068	1,181	1,541
UE	1,808	990	1,067	1,168	1,258
UN	1,812	215	334	405	692
NE	2,967	1,132	1,001	1,019	1,530
NU	1,949	387	474	380	797
			1985		
EU	1,535	621	800	744	925
EN	3,319	768	972	1,186	1,561
UE	1,700	896	991	990	1,144
UN	1,756	175	275	287	623
NE	2,712	1,116	993	914	1,434
NU	1,846	325	411	388	743

Key: E = employment; U = unemployment; N = non-participation

Table 3 has the same structure as table 2, but it contains transition rates rather than gross flows.[7] The so-called "seam effect" or "seam bias" is immediately evident in examining tables 2 and 3. The flows at the seam are several times larger than those not at the seam. For example, 3.2 million individuals leave employment to enter non-participation when the seam transitions are considered (table 2, first column, 1984). This figure decreases to 655,000 individuals when transitions are reported between month 1 and month 2 of the reference period (table 2, second column). When observed at the seam, almost half of the persons unemployed in an month are no longer classified as unemployed the following month, 23.27 percent by finding employment and 23.34 percent by leaving the labor force (table 3, first column, 1984). These percentages drop dramatically when the non-seam transitions are

considered, in particular the unemployment - non-participation transition.

Three other findings emerge from table 3. First, comparing the three non-seam transitions one notices, with few exceptions, a clear decrease in turnover from right to left, i.e., from the most recent transition to the least recent one. Second, the extent to which the seam effect occurs varies significantly according to the labor force states involved in the specific transitions. The seam effect is particularly strong for the transitions between unemployment and non-participation.

TABLE 3 Estimates of labor force transition rates from the SIPP Longitudinal Research File for the non-institutional population 16 and older (percentages)

	Seam trans. rates	Non-seam transitions rates			Average trans. rates
Months Involved	4-->1	1-->2	2-->3	3-->4	
Labor Force States			1984		
EU	1.65	0.55	0.74	0.77	0.93
EN	3.08	0.62	1.01	1.11	1.46
UE	23.27	12.32	13.58	14.63	15.91
UN	23.34	2.68	4.26	5.08	8.75
NE	5.00	1.90	1.69	1.72	2.58
NU	3.28	0.65	0.80	0.64	1.35
			1985		
EU	1.41	0.58	0.74	0.68	0.85
EN	3.06	0.71	0.89	1.09	1.44
UE	23.18	12.17	13.49	13.42	15.56
UN	23.94	2.38	3.74	3.89	8.47
NE	4.56	1.86	1.67	1.54	2.41
NU	3.10	0.54	0.69	0.66	1.25

Moreover, no decrease in turnover within the reference period takes place for the transitions originating from non-participation. Third, there are no significant differences between 1984 and 1985, although 1984 had a higher average unemployment rate and a sharper decrease in unemployment during the year.

3.1 Interpretation of the results

One possible way of dealing with the seam effect in computing SIPP gross flows is that of averaging across all observed transitions[8], ignoring whether they took place at the seam or off the seam. This is the approach used by Ryscavage and Feldman-Harkins (1988). This approach gives unbiased estimates under very strong assumptions. In this section we attempt to clarify what these assumptions are, and how they can be relaxed.

There is obviously no structural reason why the propensity to change one's labor force status should depend on the month interviewed. Therefore, both the observed seam effect and the decrease in turnover must be caused by measurement error. In order to understand the measurement error process(es) causing these effects, it is useful to think in terms of the underlying labor force spells, rather than in terms of the "discrete-time" monthly recodes on which gross flows are based. When the respondent is interviewed in SIPP, s/he is (implicitly) asked to recall all the labor force spells that took place during the preceding four months. Some respondents are able to recall and to report without error all spells and all the information needed to classify them correctly. Others report their labor force experience incorrectly. We distinguish three types of error (although in practice they might not be separately identifiable):

1) failure to report some spells;
2) error in reporting the start and end dates of some spells;
3) error in reporting some relevant facts, so that some spells are classified in the wrong labor force state.

We discuss each type of error separately, focussing on whether it causes the seam effect or the decrease in turnover or both, and to what extent the "averaging" method can correct the problem giving unbiased estimates.

Omitted spells. Some spells are not reported or simply forgotten. The prevalence of these omissions is likely to increase with the length of the recall period and to decrease with the duration of the spell. The labor force state of the spell might also affect the probability of omission. For example, periods of unemployment might be more easily go unreported than equally long and equally recent spells of employment. However, the data presented in the first columns of table 1 (discussed in section 2.2) suggest that the omission of spells, if present, is not causing any systematic difference in the estimated levels between earlier months and more recent months in the reference period.

Even if it is not affecting the levels, the omission of spells affects the amount of observed turnover during the reference period. For each omitted spell two transitions are suppressed. If the tendency to forget spells increases with the duration of recall, we would expect to see a decrease in turnover as we move away from the time of the interview. This is what we observe, with the exception of the transitions originating from non-participation, in table 3.

The downward bias on the estimated gross flows induced by the omission of spells is not corrected by the averaging method. However, this bias is probably less important with the classification of labor force adopted in this paper. With this classification, very short spells are irrelevant in determining one's labor force status for the month. For example, one-week spells of employment are ignored, and two-week spells of job search are ignored if in the remaining weeks of the month the respondent is employed. As seen above, the classification chosen in this paper gives estimates of levels which are consistent with the CPS levels. At the same time it produces measures of change that are not too sensitive to the omission of short spells.

Error on the start and end dates of spells. Some spells are reported by the respondent but their duration is not reported correctly. In most cases this type of error does not cause seam effect and does not reduce the amount of turnover. However,

when the error consists of "pushing back" the onset of a spell to the beginning of the wave, it does cause seam effect. Moreover, if the spell in question is in progress at the end of the wave, this generates what has been called the "constant wave effect". If one looks at the frequency distribution of labor force spell durations from SIPP, very pronounced spikes are noticeable at values multiple of the reference period (Martini, 1988): a disproportionate amount of spells have a duration of 17, 35 and 52 weeks. As long as no suppression of spells occurs, these errors on timing can be corrected by the averaging method, since they do not reduce the amount of turnover.

Error in classifying spells. This occurs when the respondent provides erroneous information that leads to misclassifying a spell. For example, a spell of job search classified as non-participation; a spell of layoff reported as a period of unpaid vacation. For each misreported spell a pair of transitions is misclassified. We need to distinguish two cases: 1) the misreported spell is completely "within" the reference period. In this case no seam effect occurs; the misclassified transitions tend to cancel out in the same way that classification errors tend to cancel out when labor force levels are estimated; 2) the misreported spell spans two (or more) reference periods, but only the portion in one reference period is misreported (i.e., the reporting errors are not perfectly correlated). In this case the classification error contributes to the seam effect, but also artificially increases the amount of turnover, since spurious transitions are created. The averaging method cannot correct this problem. Classification errors are expected to affect, in particular, the reported transitions between unemployment and non-participation, given the problems in distinguishing these two labor force states (Clark and Summers, 1979).

The preceding discussion can be summarized as follows: omission of spells reduces turnover within the reference period, and this bias cannot be corrected by averaging. The tendency to "push back" the onset of spells to the beginning of the reference period does not reduce (or increase) total turnover but causes a seam effect: this bias can be corrected by averaging. Finally, misclassification of portions of spells spanning more than one wave causes a seam effect and creates spurious transitions. This bias cannot be corrected by averaging. Therefore, averaging gives unbiased estimates under the assumption that the only type of error is the erroneous reporting of the timing of the transitions. If some transitions are suppressed and/or other created by misclassification of spells, average flows are not necessarily unbiased.

3.2 Establishing upper and lower bounds on the estimates

The preceding considerations imply that unbiased estimates of labor force gross flows are not likely to be obtained on the basis of the information available in SIPP. The question remains whether there is enough information to estimate upper and lower bounds for each flow and transition rate and whether these bounds are reasonably close to yield a useful picture of turnover in the labor market.

If the reduction in turnover caused by omission of spells dominates the increase in turnover caused by classification errors, then even the average flows are a downward biased estimate of the true flows. This seems implausible, however, in particular with the classification scheme adopted in this paper. Conversely, if the turnover-increasing effect of the classification errors dominates that of the omission of spells, the average flows can be considered an upward biased measure, and be used as upper bounds.

The candidates for lower bounds are to be found among the non-seam transitions. These flows are unambiguously downward biased for at least two reasons: 1) the error on the timing of the transitions tends to move turnover toward the seam, proportionally reducing it within the reference period; 2) the omission of spells unambiguously reduces turnover within the reference period. The highest among the non-seam transitions can therefore be used as a plausible lower bound of the estimate of the true flows.

TABLE 4 Comparison of lower and upper bound estimates for SIPP transition rates with CPS based transition rates

	SIPP estimates			CPS estimates	
Labor Force States	Lower bound	Upper bound	Ryscavage (1988)	BLS	Adjusted Poterba and Summers (1988)
			1984		
EU	0.77	0.93	1.4	1.7	1.1
EN	1.11	1.46	1.8	3.1	0.6
UE	14.63	15.91	17.4	22.8	17.3
UN	5.08	8.75	8.8	19.4	9.5
NE	1.90	2.58	2.8	4.5	0.3
NU	0.80	1.35	1.7	2.9	1.5
			1985		
EU	0.74	0.85	-	1.7	-
EN	1.09	1.44	-	3.1	-
UE	13.49	15.56	-	25.4	-
UN	3.89	8.47	-	21.0	-
NE	1.86	2.41	-	4.6	-
NU	0.69	1.25	-	2.8	-

The first two columns of table 4 show the upper and lower bounds for the transition rates, selected on the basis of the foregoing discussion. The other three columns of table 4 contain, for purpose of comparison, the transition rates computed by BLS from the CPS, the same transition rates corrected for response error with the method proposed by Poterba and Summers (1986)[9], and the transition rates computed by Ryscavage and Feldman-Harkins (1988) with SIPP.

The BLS-CPS estimates are always well above the upper bound of the SIPP estimates. In the case of the transitions between unemployment and non-participation, the CPS estimates are more than twice as large as the SIPP upper bound. When corrected for response error, the CPS estimates are either above the SIPP upper bound or below the lower bound.

However, in the latter case (EN and NE transitions), the extent of the correction seems unreasonably large.[10]

The gap between upper and lower bounds estimates is still substantial. In only one case (UE transitions in 1984) the percentage difference[11] is less than 10%. For all the EU and UE transitions, it is 20% or below, but when non-participation is involved in the transition, it goes up as much as 117% (UN transitions in 1985).

IV. CONCLUSIONS

The objective of this paper has been to illustrate the potential of SIPP for estimating gross flows, as well as the methodological problems associated with it. We showed that SIPP is able to produce estimates of the major labor force aggregates reasonably close to those obtained from the CPS. We then computed estimates of the labor force gross flows (and transition rates) from SIPP. The salient feature of these estimates is that they change according to whether the transition is observed at the seam between two waves of SIPP or within a wave. The transitions at the seam show a dramatically higher prevalence of month-to-month change than the transitions reported within a wave (seam effect). The paper explored alternative explanations for this problem and it discussed the assumptions that need to be made in order to obtain unbiased estimates of the "true" flows, or at least plausible upper and lower bound estimates. The upper bound estimates of the SIPP flows, although quite apart from the lower bound estimates, are still substantially lower than the estimates based on the CPS. These SIPP estimates imply a labor market much less "dynamic" than it is commonly thought on the basis of CPS data.

NOTES

1. The level of unemployment in December 1983 was 8.99 million (age 16 and over, both sexes), and by December 1984 had dropped to 7.97 million.
2. If the elements on the main diagonal of the "true" transition matrix are larger than the off-diagonal elements, random measurement error tends to inflate the off-diagonal elements. This is likely to be the case with month-to-month labor force transitions. Another requirement is that the errors are not perfectly correlated (i.e., the same error is not made in both months), which seems plausible.
3. The 32-month Longitudinal Research File of the Survey of Income and Program Participation, which is released by the Census Bureau for research to improve understanding and analysis of SIPP data. The data on the file are preliminary and should be analyzed and interpreted with caution. At the time the file was created, the Census Bureau was still exploring certain unresolved technical and methodological issues associated with the creation of this data set. The Census Bureau does not endorse the use of these data for official estimates.
4. The Census Bureau assigns positive longitudinal weights also to persons who are interviewed at the start of the year but are known to have died or have been institutionalized before the end of the year. In order to maintain consistency between labor force levels and flows, we excluded these persons from the analysis. This represents a small group, 1.9% of the longitudinal sample in 1984 and 1.5% in 1985. Because of this exclusion, our population estimates are representative of the individuals who remained part of the non-institutional population from January until December of a given year.
5. It needs to be emphasized that the annual average for each month in the reference period is an average of 12 months of data. This is made possible by the SIPP staggered interview design. For example, January 1984 is a "month 4" for rotation group 1 (interviewed in February), "month 3" for rotation group 2 (interviewed in March), and so on.
6. This issue has been examined in the context of the CPS by comparing data collected monthly with the retrospective work experience data collected in the March CPS. The results show that periods of unemployment are underreported when they are more distant from the interview (Horvath, 1982). The recall period in the March CPS is as long as 15 months, in the SIPP it is a maximum of 4 months.
7. The entries in table 3 are derived by dividing the entries of table 2 by the "initial" month totals presented in table 1.
8. By "average flows" we specifically indicate averages across the different types of transitions (seam and non-seam). However, both seam and non-seam flows are themselves annual averages.
9. We estimated the corrected flows using the 1984 CPS flows and the "misclassification probabilities" estimated by Poterba and Summers for 1981.
10. One would think that the transitions between employment and non-participation are less subject to response error than those between unemployment and non-participation, which receive a "less severe" treatment by the Poterba and Summers method.
11. Computed as (upper - lower bound)/(lower bound).

REFERENCES

Blau, David, and Phil Robins, "Labor Supply Response to Welfare Programs: A Dynamic Analysis", Journal of Labor Economics, vol. 4, no. 1, 1986.

Burkhead, Dan and John Coder, "Gross Change in Income Recipiency from the SIPP", Proceedings of the Social Statistics Section, American Statistical Association, pp. 351-356, 1985

Clark, Kim and Lawrence Summers, "Unemployment and Labor Market Dynamics: a Reconsideration", Brookings Papers on Economic Activity, no. 1, 1979.

Hogue, Carma, "History of the Problems Encountered Estimating Gross Flows", Proceedings of the Conference on Gross Flows in Labor Force Statistics, Washington, DC, July 19-20, 1984.

Horvath, Francis, "Forgotten Unemployment: Recall Bias in Retrospective Data", Monthly Labor Review, Vol. 105, no. 3, 1982.

Marquis, Kent, and Jeffrey Moore, "Response Errors in SIPP: Preliminary Results", paper presented at the Census Fifth Annual Research Conference, Arlington, March 19-21, 1989.

Marston, Stephen, "Employment Instability and High Unemployment Rates", Brookings Papers on Economic Activity, no. 1, 1976.

Martini, Alberto, "The Discouraged Worker Effect: A Reappraisal Using Spell Duration Data", U.S. Bureau of the Census Working Paper No. 8810, 1988.

Poterba, James, and Lawrence Summers, "Reporting Errors and Labor Market Dynamics", Econometrica, vol. 54, no. 6, 1986.

Ryscavage, Paul, and Angela Feldman-Harkins, "A Comparison of Gross Changes in Labor Force Status from SIPP and CPS", presented at the SSRC Conference on Individuals and Families in Transition, Annapolis, March 16-18, 1988.