Table of Contents

Authors: Nancy R. Burstein
Mary G. Visher

FOOD STAMP ANALYTIC STUDIES

THE DYNAMICS OF FOOD STAMP PROGRAM PARTICIPATION

March 1989

Prepared for:

U.S. Department of Agriculture
Food and Nutrition Service
3101 Park Center Drive
Alexandria, VA 22302

Prepared by:

Abt Associates Inc.
55 Wheeler Street
Cambridge, Massachusetts 02138

ACKNOWLEDGMENTS

The authors gratefully acknowledge the incisive direction of Jean Wood, and the thoughtful insights of William Hamilton. The report also benefited greatly from discussions on econometric methods with Trond Petersen (Berkeley), George Jakubson (Cornell), and Stephen Kennedy (Abt Associates). Helpful comments were provided at all stages of the process by Food and Nutrition Service staff, especially Steve Cole, Steven Carlson, and Christy Schmidt.

The PSID analysis files used in Chapter Four were constructed by Nancy Williamson and Cheri Minton of Harvard, and Roberta Branagan of Abt Associates.

TABLE OF CONTENTS

Table of Contents

TABLE OF CONTENTS
(continued)

Table of Contents

TABLE OF CONTENTS
(continued)

Table of Contents

LIST OF TABLES AND FIGURES

LIST OF TABLES AND FIGURES
(continued)

Table of Contents

LIST OF TABLES AND FIGURES
(continued)

Table of Contents

LIST OF APPENDICES

EXECUTIVE SUMMARY

The evolution of welfare policy in recent years has increasingly cast assistance programs in a short-term, remedial role. Certain events--such as family breakups, loss of employment, and perhaps intergenerational poverty --leave people in positions of severe economic need. For people in these situations, assistance programs are intended primarily to provide help until the family can become financially independent, with incentives and services tailored to make the transition to independence occur as quickly and permanently as possible. For others, however, the need for assistance may have been triggered by the sudden onset of a disability, or by lack of sufficient savings at time of retirement. For the permanently disabled and the elderly, long-term assistance may be required.

In forming policies to help people become independent, it is essential to understand the dynamics of participation in assistance programs. What events actually precipitate the need to apply for help? How long do people usually receive assistance? What events take them off the assistance rolls? Do they stay off, or do they quickly return?

Recent studies have revealed much useful information about the dynamics of participation in the Aid to Families with Dependent Children (AFDC) program. Similar information about the Food Stamp program has been lacking. Because the Food Stamp Program serves a much broader population than AFDC, it cannot be assumed that the two programs have similar participation dynamics.

This report presents information on the dynamics of the food stamp caseload through the analysis of two data bases. Short-run dynamics are examined with administrative data originally collected to evaluate the effects of the Omnibus Budget Reconciliation Act of 1981 (OBRA). Monthly data were collected over a three-year period (October 1980 through December 1983). Long-run dynamics of food stamp receipt are examined over an eleven-year period (1973-1984) using annual data from the Panel Study of Income Dynamics (PSID).

Table of Contents

assistance for only a few months, less intensive work requirements, such as job search, may be most appropriate. For households that require long-term assistance but are elderly or disabled, employment and training programs are moot. It is therefore of interest to determine the duration of food stamp receipt, both for the population as a whole and for particular subgroups.

A key result of these analyses therefore is that more than half of all continuous episodes of food stamp receipt end within 7 months. Because some households receive food stamps continuously for several years, however, the average length of participation is 18 months. For some types of households, i.e. AFDC recipients and the elderly, participation tends to last considerably longer than for the caseload as a whole: half of all episodes for AFDC recipients go on for 14 months or more, and half of all episodes for elderly recipients, for 19 months or more. For other types of food stamp recipients, i.e. work registrants, earned income cases, and singles, program stays are shorter; half of all episodes in these categories last six months or less.

Intermittent contact with the Food Stamp Program lasts longer. Two-thirds of spells in the PSID--defined as sets of consecutive calendar years in which a household received food stamps in one or more months--last only one or two years. The average length was 4.6 years; it was greater for households receiving AFDC and households with elderly heads, and less for households with earners and single individuals.

These numbers are in striking contrast with corresponding statistics for the AFDC program, which tend to show substantially longer periods of recipient dependency. Working with data from the Survey of Income and Program Participation, Ruggles (1988) found that half of all continuous episodes of AFDC receipt end within 11 months, compared with the 7 month median reported here for the Food Stamp Program. Likewise, Bane and Ellwood (1983) found from the PSID that less than half of AFDC recipients ended intermittent contact with the AFDC program within two years. As noted above, over two-thirds of food stamp recipients did so with regard to the Food Stamp Program. Thus, long-term dependency is less prevalent in the Food Stamp Program than in the AFDC Program.

What factors affect patterns of participation?

If agency staff could predict the future dependency of food stamp cases based on their characteristics at the time they first appear in the food stamp office, they might be able to tailor their case management services. We therefore examined case closings and reopenings in a multivariate context. Among specific factors considered were recipients' demographic characteristics, presence of earned income, participation in other income support programs, geographic and macroeconomic factors, and program attributes. Strong relationships emerged with respect to each of these sets of variables, which are in general consistent between the short-run and long-run analyses.

Among demographic characteristics, we find that continuous time on the program is greater for households with more children, fewer adults, older heads, and black heads. The effects of these variables on periods of intermittent contact with the program are similar, with the exception of the effect of the age of the head of household. This exception presumably reflects the fact that households with younger heads, although quicker to get off the food stamp rolls, are then more likely to reopen within a few months than households with older heads.

Sources of household income are important predictors of the length of time on the program. Presence of earners in the household at the start of an episode reduces both length of continuous participation and length of intermittent participation for most household types. Conversely, participation in other income support programs--AFDC, Social Security, or GA--increases length of both continuous and intermittent participation.

Among geographic and macroeconomic factors, there are no consistent regional effects. The local unemployment rate at the time of an episode beginning, however, had strong effects on both continuous and intermittent receipt for childless households: participation tended to last longer in areas with higher unemployment rates.

Finally, both the short-run and long-run models contained pre-post indicators of important program attributes, namely, the implementation of the OBRA changes and the elimination of the purchase requirement (EPR), respectively. While these indicators may be capturing other secular changes, it is at least suggestive that households that began to receive food stamps post-EPR had substantially lower annual rates of leaving the Food Stamp Program.

Are multiple episodes more typical than single episodes?

Policies aimed at moving people out of welfare dependency intend not only to end the spell of assistance receipt, but also to leave the individual in a position of continuing independence. It is important therefore to consider patterns of recidivism among former food stamp recipients.

The data suggest that while the majority of food stamp recipients participate for only a single continuous period, multiple spells are by no means rare. Elderly Social Security and SSI recipients and young childless couples are least likely to reopen (14 to 19 percent within six months of closure). Reopening is most common for intact families with case heads over 40 and for single-parent GA cases without earnings (35 to 42 percent within six months of closure). From the alternative perspective of time elapsed since the beginning of participation, one-third of all cases begin a second spell within two years.

Taking into account the length of the original episode and the likelihood of returning to the program, one can estimate how many months of food stamps a case would be expected to receive in the five years after it begins a spell. The groups with the greatest food stamp participation over this period are elderly individuals and couples who also get Social Security or SSI, and AFDC recipients (28 to 37 months of food stamps). Those that participate least are individuals and young childless couples who do not participate in any other income maintenance programs (12 to 14 months).

These findings indicate that the success of policies promoting self-sufficiency cannot be judged simply in terms of the length of a single spell of public assistance. Recidivism, even though it appears to exist for a minority of cases, is important. Policies designed to reduce the incidence of multiple episodes--such as education and training programs that increase the earnings potential of recipients who already have a work history and would thus be expected to leave the rolls quickly--might be cost-effective in the long run.

What are the circumstances surrounding leaving the program?

The likely success of alternative policies designed to reduce welfare dependency may be inferred from examination of the changes that households experience concurrent with leaving the Food Stamp Program. The PSID data show that marriage of the head of the household occurs in the same year in 5 percent of all cases (10 percent for households which leave the AFDC program at the same time). An additional 53 percent of such households experience an increase in earnings or other taxable income in the year of leaving the program or in the following year, while 4 percent of the households cease to exist due to the death of the last sample member. The corresponding values for households that continue to receive food stamps are 2 percent, 34 percent, and 0 percent.

Thus by far the most important route out of food stamp dependency is recipients' increased earnings--in contrast to the AFDC program, where more than half of all exits are associated with marriage or loss of categorical eligibility.

Conclusion

The analyses summarized above provide much evidence on the variety of food stamp recipients. While some segments are as economically dependent as the AFDC population, and for the same reasons, other segments, which are unburdened with young children or which contain multiple able-bodied adults, are much less so. Still other groups of recipients, in particular the elderly, are even less likely to achieve economic independence than AFDC recipients. Thus, the Food Stamp Program, which is the sole income maintenance program available to all poor people regardless of age, family structure, or other characteristics, fills a variety of needs for a diverse population.

Table of Contents

CHAPTER ONE

INTRODUCTION

The purpose of this report is to present analyses pertaining to the dynamics of food stamp receipt. The analyses cover many different dimensions of this topic, including short-run versus long-run behavior; rates of closings and reopenings; reasons for openings and closings; and behavior of both households and individuals.

The analyses address the following questions:

1. What are the circumstances that lead to food stamp recipiency?

2. How long do people tend to receive food stamps?

3. Are patterns of participation affected by:

   - recipients' demographic characteristics;
   - presence of earned income;
   - participation in other income support programs;
   - geographic or macroeconomic factors; and
   - program attributes?

4. Are multiple episodes more typical than single episodes?

5. What are the circumstances surrounding leaving the program?

The central decision that directed the technical approach to this task was to use two data bases to answer these questions: an administrative set that had originally been collected for the purpose of evaluating impacts of the Omnibus Budget Reconciliation Act of 1981 (OBRA), and the Panel Study of Income Dynamics (PSID). Although these data sets differ in several important ways, perhaps the most striking difference is that OBRA data were collected monthly over a period of three years, while PSID data on food stamp receipt were collected annually over a period of 11 years. By conducting parallel analyses on the two data bases, we are able to estimate both long-run and short-run effects.

An additional advantage of using both data bases is that not all of the research questions listed above can be addressed by either one taken separately. Table 1.1 shows the appropriateness of the two data bases for answering each of the research questions. The primary limitation of the PSID in the context of the research questions is that receipt of food stamps is known only for the year as a whole, so that multiple episodes cannot be explored. The primary limitation of OBRA is that households are only observed when they are actually receiving food stamps, so that reasons for opening and reasons for closing cannot be determined. In addition, some particular demographic and geographic variables are present in only one or the other of the two data bases. With regard to program attributes, we have for each data base chosen a single major event that occurred during the observation period, and divided the period into "pre" and "post" segments. For the OBRA data base, that event was the implementation of the OBRA changes, in October 1981. For the PSID, the event was the elimination of the purchase requirement (EPR), which occurred in 1979.

All analysis of food stamp participation to date has focused on the household as the unit of analysis. When using administrative data sets like OBRA, there is no alternative. The PSID offers the opportunity, however, to examine participation behavior of individuals. As explained in Chapter 4, we feel that the concept of a spell of receipt for a family over a number of years is ambiguous, and we have therefore performed our descriptive analyses of length of receipt for individuals as well as for families.

In the chapters that follow, we first present a review of the literature on the dynamics of food stamp receipt. We then discuss our findings on short-run dynamics, based on the OBRA data, followed by our findings on long-run dynamics, based on the PSID.

Table 1.1

APPROPRIATENESS OF PSID AND OBRA DATA BASES FOR ANSWERING RESEARCH QUESTIONS

Research Questions	PSID	OBRA
1. What are the circumstances that lead to food stamp recipiency?	Yes	No
2. How long do people tend to receive food stamps?	Yes (intermittent)	Yes (continuous)
3. Are patterns of participation affected by:	Yes	Yes
• recipients' demographic characteristic;		
• presence of earned income;		
• participation in other income support programs;		
• geographic or macroeconomic factors; and		
• program attributes?		
4. Are multiple episodes more typical than single episodes?	No	Yes
5. What are the circumstances surrounding leaving the program?	Yes	No

CHAPTER TWO

REVIEW OF THE LITERATURE ON PARTICIPATION IN THE FOOD STAMP PROGRAM

A small but growing body of literature exists which examines the dynamics of participation in welfare programs. While most of these studies deal with the Aid to Families with Dependent Children Program (AFDC), some focus on the Food Stamp Program, or on a combination of programs which includes food stamps.

The purpose of this chapter is to summarize methodological issues and substantive findings concerning the length of participation in the Food Stamp Program, recidivism, and reasons why people begin to receive or stop receiving food stamps. Subgroup variation for each of these topics is also discussed. While we concentrate on studies examining food stamp participation, we also refer to selected works on AFDC dependency which have made important methodological contributions to the dynamics literature.

2.1 Methodological Issues in the Study of the Dynamics of Welfare Receipt

Long (1985)[1] provides an assessment of studies on food stamp and AFDC participation in the context of important methodological issues. She further organizes her review into descriptive and multivariate analyses.

Four fundamental problems related to the adequacy of available data plague descriptive studies of welfare dependency:

1. Due to the problem of left and right censoring (the problem of truncated observation periods), meaningful estimates of spell duration cannot be achieved by simple averaging of observed completed spells.

2. Households rarely remain completely intact over time, making it difficult to decide whose participation in the program to track. Analyses that select only those households that do not change are biased, and all rules defining longitudinal families are at some level arbitrary.

[1] A list of references appears at the end of the report.

3. Annual data which are the most readily available tend to yield overestimates of spell duration and underestimates of turnover, because they ignore breaks in recipiency of less than a full calendar year.

4. The two types of data available for analyses of welfare dependency tend to be longitudinal data sets rich in socioeconomic variables but having only annual observations (e.g., the Panel Study of Income Dynamics), or administrative data measured at shorter time intervals but lacking important analytic variables and covering a much shorter period of time (e.g., the OBRA data).[1]

The present analysis addresses the above four issues in a variety of ways. With respect to the problem of censoring and how to estimate spell duration, hazard rate analysis is employed in both a descriptive and a multivariate context. Also, the PSID data covers a period of 11 years (from 1973 through 1983) and the OBRA data base (with monthly observations) covers 39 months, long enough to capture all but a small fraction of spells.

With regard to the problem of the appropriate unit of observation--the household or the individual--our approach is to analyze lengths of spells both for individuals within families and for families themselves using the PSID data. Further, we have developed a method to track families over time which allows changes to occur without disregarding the basic continuity of a family unit. The OBRA data are based on the food stamp household as the unit of observation.

While PSID data come from an annual survey, the OBRA data are taken from monthly administrative records. The analyses of these two nationally representative data bases are therefore complementary, with each providing information on issues which the other cannot address.

In addition to these basic challenges, multivariate analyses of welfare dependency face another set of unsolved or poorly solved methodological problems according to Long. These are:

---

[1]Recently data from the Survey of Income and Program Participation have also become available. While these data combine the advantages of a rich set of variables and monthly observations, like administrative data they cover only a short period of time (about 2 1/2 years), and in addition they cover only a relatively small number of food stamp households (around 1,300).

1. Little work has been done on developing a theoretical model underlying the decision to participate in welfare programs. (The exception for AFDC research, according to Long, is Hutchens (1981); Fraker and Moffitt (1988) have done the same for the Food Stamp Program.) Consensus on the appropriate exogenous variables to include in equations to be estimated is lacking.

2. No solution has yet been found to the problem of left censoring of data, although hazard rate analysis--used increasingly in the field--corrects adequately for right censoring.

3. No solution has yet been found to the problem of unmeasured heterogeneity, other than attempts to include normally unmeasured characteristics such as psychosocial traits, or the inclusion of a random disturbance term (Tuma (1982)).

4. No solution has yet been found to separate duration dependence from unmeasured heterogeneity (Tuma (1982); Flinn and Heckman (1982)).

Long identifies and critically discusses the approaches used by a set of studies of AFDC and food stamp recipiency, giving particular attention to the ways in which the authors have dealt with the issues outlined above. The summary matrices from her report are reproduced in Appendix A.

2.2 Findings on Food Stamp Program Participation

In this section, we review findings from selected studies with regard to four of the research questions addressed by the present project. The questions are as follows:

- What are the circumstances that lead to food stamp recipiency?
- How long do people tend to receive food stamps?
- Are multiple episodes more typical than single episodes?
- What are the circumstances surrounding leaving the program?

The findings of the previous studies are summarized in Table A.3 in Appendix A.

2.2.1 Circumstances Leading to Food Stamp Recipiency

Most food stamp studies have examined household characteristics or characteristics of the head of the household at the time of beginning a food stamp spell to determine why people participate in the program. A consistent finding in these studies is that participation in other welfare programs, especially AFDC, tends to be a strong predictor of beginning a food stamp spell (Coe (1979); Kirlin and Merrill (1985); Carr, Doyle and Lubitz (1984); Merck (1980)). In addition, the household's earnings and employment status of the household head at the onset of a spell have been found to be significant factors. In particular, the likelihood of food stamp participation increases when there are no earnings in the household or when the household head is unemployed (Coe (1979); Kirlin and Merrill (1985)). Other demographic characteristics such as age, sex and race of household head have inconclusive impacts, according to a study by Carr, Doyle and Lubitz (1984). A study that focused exclusively on the participation decision by the eligible elderly, however, found that sex, age, and education of the household head, as well as stigma and distance to the food stamp office had a significant impact on the probability of beginning a spell of food stamps (Hollonbeck and Ohls (1984)).

Work by Bane and Ellwood (1983, 1985) examined the effect of "trigger events" on the probability of beginning a spell of AFDC. Several studies of food stamp participation have likewise attempted a dynamic approach to explaining why people begin to receive food stamps (Coe (1979); Lubitz and Carr, (1985)). Instead of analyzing static characteristics of households, these researchers examined events that occurred around the time of entry into the program that could have precipitated the decision to seek assistance. Such events typically affect a household's eligibility to receive food stamps or signal a new financial hardship. Changes in income or labor force status of earners in the household were found by Lubitz and Carr (1985) to be better predictors of entry than a change in household composition. Coe (1979), on the other hand, found a positive impact on entry of an increase in family size.[1]

[1]For an interesting study of why eligible households choose not to participate in the Food Stamp Program, see Coe (1983a). On the same topic but with a focus on nonparticipation among the elderly see Hollonbeck and Ohls (1984).

The current study relies on the trigger event approach to help explain why people enter the Food Stamp Program.

2.2.2 Duration of Receipt

The topic that has received most attention from researchers of the dynamics of food stamp behavior has been that of estimating how long people tend to receive food stamps, once they start. As noted above, Long (1985) explained the methodological pitfalls of calculating duration of food stamp spells, the most important of which is the problem of right censoring or truncated observation periods. Researchers have used a variety of measures of spell duration including average length of stay, turnover rates, survival rates, and percentage of spells that end after one month, two months, one year, two years, and so on.

Studies of the length of time people receive food stamps are widely disparate in their methods, data and findings, making comparisons difficult or impossible. In general, however, studies concur that households move in and out of the program at a brisk rate, and that any given stay in the program tends to be short, under a year or two. This general insight into the dynamics of food stamp receipt is consistent with analogous findings in studies of AFDC dependency (see, for example, Bane and Ellwood (1983, 1985).

Coe (1979), in a study of determinants of turnover in the food stamp population, used the PSID data to examine food stamp participation behavior of households which did not use food stamps in 1973 in the years that followed. The percentage of households which received food stamps in any one year varied between 7.1 and 8.5 percent. However, only 2.8 percent of the households used food stamps in every one of the four years, while 14.8 percent used food stamps in at least one of the four years. Of all households that did receive food stamps in 1973, 50 percent had stopped receiving benefits by 1977. In a later article (Coe (1981)), he found that 21.7 percent of the sample had received benefits at least one year within the periods 1968-1971 and 1972-1978.

Kirlin (1982) used administrative data from the Massachusetts NPA caseload (covering a period of 13 months), and Kirlin and Merrill (1985) examined administrative data from a Chicago welfare office (covering 23 months). Both studies found a very high rate of departure from the program in

only the second or third month after the spell began. For example, in the Illinois data 22.5 percent of all food stamp households that did not close in the first month of receipt closed in the second month. For the remaining months the monthly departure rate never exceeded 8 percent. The median spell length in the Chicago office was 9 months; the average estimated spell length was 18.9 months.

In two studies of turnover using the Income Survey Development Program (ISDP) data (Carr, Doyle and Lubitz (1984) and Lubitz and Carr (1985)), the turnover rate has also been found to be quite high. For example, in Carr, et al. (1984), the ratio of annual to monthly participation was estimated at 1.7, indicating that the number of households who participate in the program over the course of a year is about 70 percent greater than the number who benefit in a given month. Earlier studies using data from the Seattle and Denver Income Maintenance Studies estimated annual to monthly participation ratios ranging from 1.4 to 1.7 (Springs (1977) and Merck (1980)).

In a study by Wolf (1985), using the same OBRA data analyzed in this report, the estimated spell duration for food stamp receipt in the post-OBRA period ranges between a low of 5.4 months for non-AFDC households with earnings to a high of 15.2 months for AFDC households without earnings.

2.2.3 Patterns of Recidivism

Few researchers have looked at the incidence and causes of recidivism, that is, the return of a household to the program for another spell of food stamps. This is primarily a function of short observation periods in most data sources. Furthermore, it is almost always impossible to tell if the first spell observed in the data is the first spell ever for that individual or family. Some argue, however, that repeat spells of welfare merit separate analysis: their duration as well as reasons for beginning and ending are different from those of first spells.

Kirlin and Merrill (1985) found evidence suggesting the existence of two kinds of food stamp cases. The first case type tends to have long spells that, once closed, tend not to reopen. Stayers tend to be AFDC or SSI recipients, large households whose heads have little education, are nonwhite and are unemployed. The second type tends to have short and/or frequent

spells (movers). Carr, Doyle and Lubitz (1984) found that the incidence of multiple spells, even within a relatively short period of time, is relatively high: 11% of their sample of ISDP household heads either reopened or reclosed a food stamp spell within one year. Although no study of the effect of having had a past spell on the probability of opening a new spell has been done for food stamps, Plotnick (1981) and Hutchens (1983) found that previous receipt of AFDC had a significantly positive effect on the likelihood of repeated experience with that program.

2.2.4 Circumstances Surrounding Leaving the Program

The determinants of exits from the Food Stamp Program have attracted some attention by researchers, although the findings here too are somewhat meager. Several circumstances and characteristics have been found to have an impact on the probability of ending a spell of food stamp receipt. The most important of these is receipt or the termination of receipt of some other form of public assistance, particularly AFDC. Although a family's eligibility for food stamps does not necessarily end when its eligibility for AFDC ends, the concurrence of these two events is frequently observed (Coe, 1979; Kirlin (1982); Carr, Doyle and Lubitz, (1984)). Other factors include an increase in earnings (Lubitz and Carr (1985)) and administrative actions such as recertifications (Kirlin (1982); Kirlin and Merrill (1985)). The host of additional characteristics that have been tested for their effects on the probability of closure include marital status, age, disability, family size, female headship, and length of spell to date. Lubitz and Carr (1985), who focused on the role of trigger events in leading to closures, isolated an increase in the number of earners in a household, an increase in income, marriage, and beginning receipt of unemployment insurance as events that trigger the ending of a spell.[1]

[1]For some early analysis of the effect of macroeconomic variables, particularly the unemployment rate, on aggregate participation rates in the Food Stamp Program, see Seagrave (1975) and MacDonald (1977).

CHAPTER THREE

SHORT RUN DYNAMICS

The purpose of this chapter is to explain the short-run dynamics of food stamp receipt, based on analysis of the OBRA data. The following research questions are addressed:

- How long do people tend to receive food stamps?
- Are patterns of participation affected by:
  - -- recipients' demographic characteristics;
  - -- presence of earned income;
  - -- participation in other income support programs;
  - -- geographic or macroeconomic factors; and
  - -- program attributes?
- Are multiple episodes more typical than single episodes?

The first two sections that follow present a description of the data used, and a discussion of methodological issues encountered and their resolution. Findings are then presented with respect to average length of continuous receipt, effects of various factors on length of receipt, and multiple episodes. Conclusions are presented in the final section.

3.1 Description of the OBRA Data

The OBRA data base, so called because it was initially collected for the purpose of analyzing impacts on the Food Stamp Program of the Omnibus Budget Reconciliation Act (OBRA) of 1981, contains information abstracted from case records of 6,621 food stamp households located in sixty sites throughout the nation. The selected sites were distributed throughout 29 States, covering all seven food stamp regions. The data cover a period of 39 months, from October 1980 through December 1983.[1]

[1] A list of the sites appears in Appendix B. For a discussion of the data abstraction and file construction, see two Urban Institute memoranda: Barnes and Nightingale (1985), and Bergsman (1986). (A list of references appears at the end of this report.)

The OBRA data have several special strengths for explaining caseload dynamics. First, they are monthly, the preferable time unit for analyzing food stamp receipt. Second, they are administrative data, and therefore are not subject to recall error. Third, they describe the experience of a nationally representative sample of food stamp recipients over a period of three years, which gives them some generality.

Several drawbacks of the OBRA data should also be noted, however. First, because they are administrative data, they do not provide any information on non-recipients. Therefore, they cannot shed any light on the decision to participate. Second, they do not contain detailed information on individuals. For example, while they indicate the presence of two adults in a household, they do not indicate the relationship of the adults to the children or to each other, nor the age of the adult who was not the food stamp applicant. Third, they represent a one-time data collection effort which ended five years ago. In addition, the period they covered was not necessarily typical of recent food stamp experience, as it spanned an economic recession and some important changes in food stamp policy. Fourth, although the data are not subject to recall error, they are subject to errors of abstraction and transcription. Finally, because of two idiosyncrasies of data collection, sample reductions are required before caseload dynamics can be analyzed. The more serious one of these is that the date at which the current spell of food stamp receipt began is known only for cases whose current spells began during the abstraction period. Dropping the left-censored spells--i.e., those which began an unknown length of time before the onset of data abstraction--reduces the sample size by about one third.[1] In addition, it appears that closures are not recorded reliably in the last month of abstraction (December 1983).[2] This may be because an important indicator of closure, namely the failure of cases to receive benefits in the following month, was not available at this point. For the current analysis the data have, therefore, been truncated in November 1983.

---

[1]Issues of left- and right-censoring are discussed in Section 3.2 below.

[2]The number of closures recorded per month in the last year of the OBRA data ranges from 154 to 212, with the exception of December 1983, in which only 58 closures were recorded.

The variables that are available for analysis in the OBRA data base are as follows:

- Indicators of the calendar month, the spell duration, and left and right censoring of the data;
- Reason for closure;
- Information on prorating of benefits;
- A monthly reporting indicator;
- Household size and counts of persons in the household aged 3 and under, 6 and under, 17 and under, 18 to 64, and 65 and over;
- Age, race, sex, marital status, citizenship, and boarder status of applicant;
- Count of food stamp eligibles in the household and of persons for whom food stamp eligibility is unknown;
- Count of work registrants in the household and persons for whom work registration status is unknown;
- Values of liquid assets, real property, licensed vehicles, and total assets and resources;
- Components of the calculation of the food stamp allotment, namely gross monthly income, earnings deduction, standard deduction, allowable medical expenses, dependent care costs, shelter costs, shelter deduction, and adjusted net monthly income;
- Number of known earners, amount of monthly earnings, indicator of additional unknown amount of earnings, and indicator of possible additional earned income; and
- For each of the following sources of unearned income, the monthly amount and indicators of additional unknown amounts and of possible additional income from that source: Social Security, veterans' benefits, railroad retirement income, unemployment compensation, SSI, other disability benefits, AFDC, GA, alimony and child support, education grants, loans and scholarships, contributions, interest and other.

In addition, several site-level variables were linked with the analysis file, namely:

- a rural/urban indicator;
- the FNS geographic region[1]; and
- the local (county level) unemployment rate.

The OBRA data were initially assembled to analyze the impacts of the OBRA legislation on food stamp payments and caseload. While the OBRA changes are clearly not the focus of our report, we have included a pre/post OBRA indicator in all of our multivariate models to allow us to observe any marked variations in dynamic behavior after October 1, 1981.[2]

In comparing these two periods, it is helpful to keep in mind the state of the general economy. Unemployment rates were on average lower in the pre-OBRA than in the post-OBRA period, both in the nation as a whole and in the 60 selected sites. Between October 1980 and September 1981, the national unemployment rate was quite stable, fluctuating only between 7.2 and 7.6

[1]Geographic regions have been consolidated from seven to three, namely the Northeast, the South, and the West. In our analyses, the Northeast region contains the 11 sampled States in the FNS Northeast, Middle Atlantic, and Midwest regions, namely, Connecticut, Massachusetts, New York, New Jersey, Pennsylvania, Virginia, West Virginia, Illinois, Michigan, Ohio, and Wisconsin. The South consists of the nine sampled States in the FNS Southeast and Southwest regions: Alabama, Florida, Kentucky, North Carolina, South Carolina, Arkansas, Louisiana, Oklahoma, and Texas. Finally, the West consists of the nine sampled States in the FNS Mountain Plains and West regions: Colorado, Iowa, Missouri, Montana, North Dakota, South Dakota, California, Nevada, and Washington.

[2]We also attempted to develop an indicator of monthly reporting status, but this was not successful. The monthly reporting flag contained in the OBRA data base did not appear to be coded reliably, and it was strongly negatively related to closure behavior. Since we believe that cases on monthly reporting are more likely to close than other cases, both because it is the more volatile cases that become monthly reporters and because the additional procedural requirement itself leads to some terminations, we could not put much credibility in this variable. While we were able to determine with a fair degree of detail the monthly reporting requirements of the 29 sampled States in the early 1980's, it became clear that implementation dates could not be defined. For all but a handful of the States, monthly reporting was not fully implemented until virtually the end of the observation period; in most States, it was implemented gradually for different types of cases and different counties throughout the period in a way that defied our ability to code it after the fact. We therefore have not included a monthly reporting indicator in our models.

percent. From October 1981 on, however, unemployment climbed steadily for over a year, reaching a peak of 10.8 percent in December 1982. During the remaining year of the observation period, it fell just as steadily, reaching 8.2 percent by December 1983. This qualitative pattern was essentially replicated in the 60 sites. Thus the pre-OBRA period was a time of approximately constant unemployment while the post-OBRA period exhibited first an increase and then a decline in the unemployment rate.

3.2 Methodological Issues

A number of methodological issues arose in the course of these analyses. In this section we discuss: (1) handling of left- and right-censored spells; (2) choice between discrete and continuous-time models; (3) choice between current and baseline characteristics to estimate the models; (4) functional forms; and (5) disaggregation of the data into "household types."

3.2.1 Left- and Right-Censored Spells

The ideal data set for analyzing caseload dynamics would take a cohort of cases beginning at a particular time and follow all cases until the last one closed. The distribution of spell lengths for the cohort would then correspond to the probability that a randomly chosen spell would last one month, two months, and so on; and the arithmetic mean of spell lengths for the cohort would be an estimate of mean or expected spell length.

The OBRA data differ from this ideal in that they contain many spells which are left-censored--that is, which commenced an unknown length of time before data abstraction began--and many others which are right-censored--that is, which were still ongoing at the end of the abstraction period. There is no generally accepted method for analyzing left-censored spells. We have therefore dropped them from the analysis. When right-censored spells are present, on the other hand, the standard approach is to use hazard rate analysis to calculate distributions and means of completed spell lengths. In this approach, the focus is shifted from the length of a spell to the hazard rate, or the probability that a spell is terminated after t months conditional on it having run for at least $t - 1$ months. The hazard rate for the fifth month of a spell, for example, is calculated as:

$$\frac{\text{the number of spells exactly 5 months long}}{\text{the number of spells 5 or more months long.}}$$

If a spell is right censored, then it is only used in the hazard rate calculations up to the last month in which it is actually observed. For example, if a case is in its fifth month of receipt in the last month of observation, and does not close in that month, then it is counted in the denominators of the hazard rates for durations of 1 through 5 months.

Once the hazard rates have been calculated, the distribution of lengths of spells is calculated iteratively, as follows. Let h(t) be the hazard rate for a spell of length t; f(t) be the probability that a spell lasts exactly t months; and F(t) be the probability that a spell lasts more than t months. Then it can be seen that

$$h(t) = f(t)/F(t-1).$$

Also, $f(t) = F(t-1) - F(t)$. Finally, we know that $F(0) = 1$, so that $f(1) = h(1)$. We can then calculate F(1) as F(0) - f(1), calculate f(2) as h(2) x F(1), and so on, up to f(38) and F(38) (because we have 38 months of data).

The final element calculated, F(38), is the probability that a completed spell lasts more than 38 months. The distribution of lengths of spells longer than 38 months cannot be observed. It is desirable, however, to calculate a single summary statistic representing the mean length of spell. This can only be done by making some assumptions about closure rates for spell lengths beyond 38 months. One such assumption is that monthly hazard rates beyond month 38 are constant for these long spell lengths, and equal to the hazard rate for the longest spells observed. That is, if two percent of all spells of length 38 months or longer close after exactly 38 months (which is to say that two percent of those spells that opened in month 1 and were still open in month 38 closed in month 38), then we will assume that in each cohort, two percent of the spells that are still open after t months close in the next month for all t greater than 38.

A feature that emerges from the descriptive analyses below is the marked concentration of closures at such points as six, twelve, eighteen, twenty-four, and thirty-six months after opening. These patterns presumably represent the effects of expired certification periods. This pattern is likely to persist into later years as well; that is, cases will be relatively

more likely to close on their anniversaries of opening. Over time, this effect may get diluted, however, if some cases' recertifications are delayed or additional recertifications are scheduled.

Given this pattern, it would be unreliable to project the closure rate from a single month ad infinitum when calculating mean lengths of spells. If we used an anniversary month for our benchmark, the closure rate would be too high; if we did not use an anniversary month, the closure rate would be too low. Our approach for projecting closures in the descriptive analyses has therefore been to use the actual hazard rates through month 24, and then to use the weighted average of the hazard rates for months 24 through 35 as representing long-term behavior. Thus the cycle of a full year is captured in the extrapolation.[1]

The mean length of spell is then estimated as follows. Suppose that the long-run hazard rate is estimated as 3 percent. In other words, the probability of a spell lasting exactly t months given that it had already lasted $t - 1$ months would be 3 percent, for t greater than 24. It can then be shown that the expected value of the length of a spell conditional on it being more than 24 months long is 24 + 1/.03, or 57 months.[2] The expected value, or

---

[1]The hazard rate for the anniversary month is taken from the twenty-fourth rather than the thirty-sixth month because the sample size is substantially larger for the former, hence it is considered a more reliable estimate. Since the yearly cycle begins in the month after the anniversary, however, the weights used are the number of cases at risk of closing in months 25 through 36, rather than 24 through 35.

[2]The probability that a spell lasts exactly $24 + x$ months conditional on it lasting at least 24 months is equal to

$$.03 \times .97^{x-1}.$$

The conditional expected value of the length of spell is therefore

$$24 + (1 \times .03 + 2 \times .03 \times .97 + 3 \times .03 \times .97^2 \ldots)$$

Let the term in parentheses be M. Then,

$$.97\ M = (1 \times .03 \times .97 + 2 \times .03 \times .97^2 \ldots)$$

Subtracting this from M yields

$$.03\ M = .03 + .03 \times .97 + .03 \times .97^2 \ldots,$$

i.e., $M = 1 + .97 + .97^2 \ldots = 1/.03$, as claimed.

mean length of all spells would then be calculated as the probability that a spell lasted 24 or fewer months times the mean length of such spells, plus the (small) probability that a spell lasted over 24 months times 57.

Our confidence in this estimate is greater the higher the percentage of spells that are actually completed in the observation period. For populations in which a substantial proportion of spells lasted longer than the observation period, the mean is not a very reliable or meaningful statistic. The hazard rates for very long spells may be based on only a handful of observations, and therefore be quite unstable; this instability is transmitted to the estimated mean. The median length of stay, in contrast, can always be estimated reliably with the data available to us.

Multiple active and inactive spells are recorded for many cases. We have included all non-left-censored spells in the analyses. Our rationale for this decision is presented in Appendix C. In principle, we are seeking to analyze the distribution of length of spell for a spell chosen at random, rather than for a case chosen at random. Over the observation period, some cases will experience several shorter spells while other cases will experience only one longer spell. By including all non-left-censored spells, we ensure that we do not undersample the shorter spells.

3.2.2 Discrete versus Continuous-Time Models

In modelling the dynamics of a socioeconomic process, we analyze a variable X--in this case, a household's food stamp activity status--which varies over time. We may think of elapsed time as being either discrete or continuous in nature. In the former case, we measure X at specified intervals--a week, a month, or a year--and develop a model to explain the observed series of evenly spaced values of X(t). In the latter case, we record the specific dates at which X(t) changes from one value to another, and develop a model to explain the amount of time between such changes.

Although different quantitative methods would be implemented, one would not expect the results of an analysis to differ substantially depending on whether one viewed time as discrete or continuous. We have in this case chosen to estimate discrete multivariate models, for several reasons. First, receipt of food stamps thought of as a dynamic process has an underlying periodicity of a month, in that a case either does or does not receive food

stamps each month. (Other dynamic processes, such as employment or family formation, are not in themselves periodic; a person could gain and lose employment several times during the course of a month, complicating the interpretation of a discrete time model.) Using a discrete-time approach, we can take advantage of the monthly nature of the OBRA data, which corresponds exactly to the phenomenon we are studying.

In addition, discrete-time models are more readily interpretable. Coefficients can be directly interpreted as the impact of a variable on the monthly closure rate measured in percentage points, an easily understood concept.

Finally, discrete-time models allow full flexibility for analyzing the impact of elapsed time. It is clear that closure rates vary systematically with the length of the spell, declining generally over time but with sharp peaks in months corresponding to the ends of certification periods. This pattern, which is of policy interest, can only be expressed in a discrete-time model.

It is sometimes claimed that multivariate logistic estimation of a discrete-time hazard rate model produces estimates of the standard errors which are biased downward, because of the inclusion of multiple observations from the same spell.[1] In fact, however, the standard errors are estimated based on the number of spells, not the total number of case months or years. This issue is discussed in detail in Appendix D.

3.2.3 Current versus Baseline Characteristics

The effects of case characteristics on case closure and reopening behavior can be examined from two points of view. For expository purposes, let us consider the effects of the presence of earnings. On the one hand, we could ask how much more likely a case which has earnings in a given month is to close in that month than an otherwise similar case which does not have earnings. This analysis would show the effects of current case characteristics on closures. On the other hand, we could ask how much more likely a case which had earnings at the time its spell began is to close in a given

[1] See, for example, Bane and Ellwood (1983), pp. 80-81.

month than an otherwise similar case which did not have earnings when its spell began. This latter analysis would show the effects of initial case characteristics on closures, and would further enable us to calculate the number of additional months of food stamp receipt associated with a given characteristic.

It is clear that the two analyses could yield different results. While both address interesting questions, we have chosen to focus on the latter, as being of greater policy interest. That is, we predict food stamp dependency of a case over time as a function of its characteristics when we first observe it receiving food stamps.

3.2.4 Functional Forms

Our focus on transition rates implies that our dependent variables are dichotomous. Hence ordinary least squares is not the most appropriate quantitative technique; it is inefficient, and standard errors are biased.

A standard technique to use in such situations is a logistic regression. This is therefore our estimation method. Because logistic coefficients cannot be directly interpreted, we have converted them to percentage point impacts at the mean. This was done by multiplying them by $\bar{p} * (1-\bar{p})$, where $\bar{p}$ is the mean probability of a transition in the sample. While this formula is only an approximation, it is suitable for small effects. The resulting impact measures, which represent the change in the probability of closure with respect to a one-unit change in the corresponding independent variable, are analogous in interpretation to least squares coefficients in a linear probability model.[1]

---

[1] The derivation is as follows. The logistic form may be written as:

$$p = \frac{e^{Xb}}{1 + e^{Xb}}$$

Then

$$\frac{\partial p}{\partial X_j} = \frac{e^{Xb} * b_j * (1+e^{Xb}) - e^{Xb} * b_j * e^{Xb}}{(1 + e^{Xb})^2}$$

$$= b_j * \frac{e^{Xb}}{1 + e^{Xb}} * \left(\frac{1 + e^{Xb} - e^{Xb}}{1 + e^{Xb}}\right)$$

$$= b_j * p * (1-p), \text{ as claimed.}$$

Although most of the variables in the models could be expressed in continuous form (e.g., amount of earnings, number of children, etc.), we have in many cases used dichotomous or categorical forms because of an unwillingness to assume that the effects are linear. The particular categories used were chosen based on exploratory work on the models. For example, we have

feel more confident that cases headed by an elderly individual are different from other households than that each additional year of age of the household head has the same effect.

3.2.5 Household Types

We anticipate that different models of behavior are appropriate for different types of food stamp cases. For example, number of children and receipt of AFDC income, which are important explanatory variables for one-adult households with children, are irrelevant as explanatory variables for households which consist of one or two adults only. Similarly, whether the head of household is elderly is important to know for childless households, but probably irrelevant (because of its unlikeliness) for single-adult households with children.

Rather than estimate a single model for all households which includes numerous interaction terms, we have chosen to estimate four separate models for households according to their family structure: one adult with children, multiple adults with children, one adult only, and multiple adults only. Within each of these household types, we can give reasonable interpretations to the effects of particular characteristics.

one month, for two months, for three months, and so on. That is, we seek to determine the distribution of the lengths of completed spells. This information has direct implications for the costs of the program relative to the flow of new applicants.

An alternative interpretation is to ask of those cases that are active this month, how many are in their first month of an active spell, how many are in their second month, and so on. This question, which is analogous to the question asked of unemployed persons in Department of Labor surveys regarding how many months they have been unemployed so far, provides descriptive information about the composition of the caseload at a point in time. This interpretation thus pertains to the distribution of the lengths of ongoing spells.

In principle, the average completed spell could be either longer or shorter than the average ongoing spell. If all spells lasted exactly 12 months, for example, then the average length of completed spells would be 12, while the average length of ongoing spells would be only 6½.[1] That is, because ongoing spells are observed, on average, halfway through their course, observed completed spells would tend to be about twice as long as observed ongoing spells.

This phenomenon may be countered, however, by the fact that a longer spell is more heavily weighted than a shorter one in analyzing ongoing spells, although they are equally weighted when analyzing completed spells. Suppose, for example, that there are 100 three-month and 10 24-month spells that begin each month. Then the average length of a completed spell is 4.9 months. The average length of an ongoing spell may be calculated by noting that of the short spells, we will observe at any time 100 which have just begun, 100 in their second month, and 100 in their third month; while of the longer spells, we will observe 10 each in their ith month, for $i = 1$ to 24. Averaging these values yields a mean value of 6.7 months--which is greater than the mean length of completed spells. It should be noted, however, that only the

[1]That is, the average of 1, 2, 3, . . . , 12. This assumes that new spells begin at a constant rate each month.

presence of some very large spells can lead to the mean ongoing episode exceeding the mean completed episode in length--i.e., spells that are substantially more than twice as long as the mean completed episode.

The distribution of lengths of completed spells is of more general interest than the distribution of lengths of ongoing spells. We have therefore focused our discussion on the former, relegating the latter to Appendix E.

Results have been obtained for the food stamp population as a whole, and for five subgroups of special policy interest, namely:

- cases which also receive AFDC;
- cases which contain one or more work registrants;
- cases which contain one or more earners;
- cases in households which contain one or more persons aged 65 or older;[1] and
- cases consisting of one person only.

The characteristics of each of these subsets are defined as of the first month of receipt of food stamps in the spell, with the exception of AFDC receipt. This characteristic is defined as of the first two months of receipt of food stamps, to allow for the possibility that households which applied for both AFDC and food stamps did not begin to receive AFDC until a month later. It should be noted that these five subgroups are not mutually exclusive, nor are they exhaustive of the food stamp population.

The distributions of lengths of completed spells are shown in Table 3.1. The first column shows the proportions of all completed spells that are one month long, two months long, etc., and the estimated mean length of completed spells.

[1]It would have been preferable to define a subset of cases, rather than households, which contained one or more elderly individuals, and to identify the elderly as those over age 59, rather than those over age 64. The OBRA data only permit the identification of elderly individuals as indicated here, however.

Figure 3.1 presents the same information in graphic form for all cases. This figure shows clear periodic peaks that undoubtedly correspond to the ends of certification periods.

The second column of Table 3.1 shows the cumulative frequency of closure by month--that is, the proportion of all episodes that ended within one month of opening, within two months of opening, and so on.

The remaining columns show corresponding statistics for the five previously mentioned subsets of the food stamp population. The frequency distributions of completed spells for these subgroups are illustrated graphically in Appendix F.

With regard to the food stamp population as a whole, Figure 3.1 shows that completed spell lengths are somewhat concentrated at six and twelve months, no doubt indicating the impact of the regular six- and twelve- month recertifications. It can furthermore be seen from the second column of Table 3.1 that almost half of all spells (48.5 percent) end within six months. The median spell length--the amount of time after which at least 50 percent of spells have closed--is therefore 7 months. Small concentrations of completed spells occur at twenty-four and thirty-six months (see Figure 3.1). About 20 percent of all spells last more than two years, and about 14 percent of all spells last more than three years. The mean length of a spell is about 18 months.

It is interesting to compare these numbers with corresponding figures in Kirlin and Merrill (1984), based on a sample of all food stamp recipients in the Southeast District Office (SEDO) in Chicago. Kirlin and Merrill found a median spell length of 9 months (vs. 7 months in Table 2.1) and estimated the average spell length as 19 months (vs. 18 months in Table 2.1). Their results are thus similar to these, especially in the relationship between the median and the estimated mean spell lengths.

Patricia Ruggles (1988) examined the length of AFDC spells using the 1984 Survey of Income and Program Participation. She found a median spell length of 11 months, substantially longer than the 7 month median in the Food Stamp Program. This suggests that the Food Stamp Program serves segments of the population that become economically independent more quickly than do AFDC recipients.

Figure 3.1

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: ALL CASES

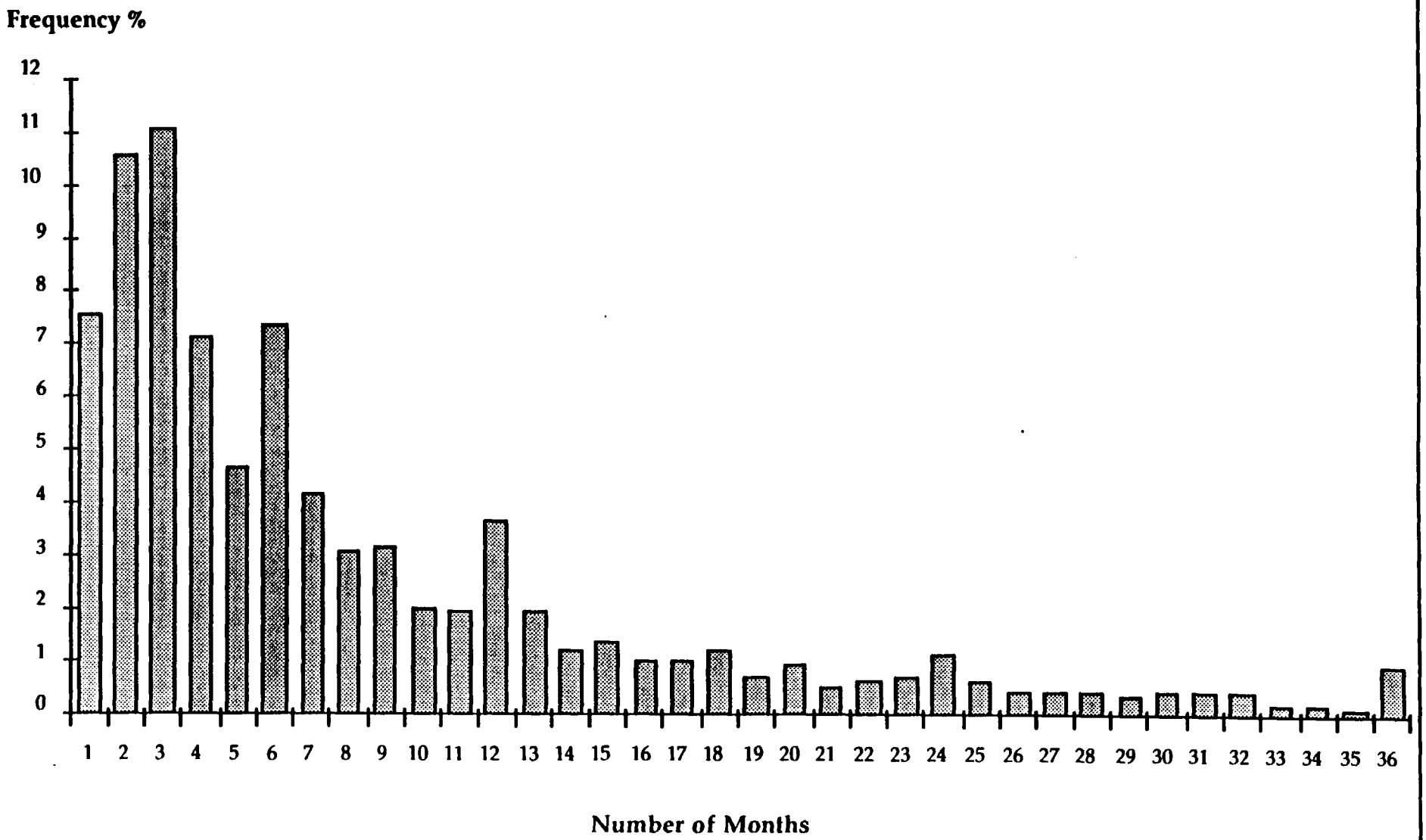


Table of Contents

Table 3.1

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: FREQUENCIES AND CUMULATIVE FREQUENCIES

Number of Months	All Cases		AFDC Recipients		Work Registrants		Earned Income		Elderly		Singles	
	freq.	cum. freq.	freq.	cum. freq.	freq.	cum. freq.	freq.	cum. freq.	freq.	cum. freq.	freq.	cum. freq.
1	7.6%	7.6%	2.4%	2.4%	7.9%	7.9%	8.6%	8.6%	3.2%	3.2%	8.9%	8.9%
2	10.6	18.1	3.8	6.2	13.0	21.0	9.4	18.0	3.9	7.1	13.4	22.3
3	11.1	29.2	6.3	12.5	14.4	35.3	14.2	32.2	3.8	11.0	11.7	34.0
4	7.2	36.4	4.3	16.8	7.7	43.0	10.1	42.3	3.7	14.6	7.6	41.6
5	4.7	41.0	4.5	21.3	4.7	47.7	5.1	47.4	2.0	16.6	4.1	45.7
6	7.4	48.5	7.7	29.0	8.1	55.9	9.2	56.6	6.8	23.4	6.2	51.9
7	4.2	52.7	4.8	33.8	4.2	60.0	4.3	60.9	1.6	25.0	3.5	55.4
8	3.1	55.8	2.6	36.4	2.4	62.4	2.5	63.4	1.9	26.8	3.1	58.5
9	3.2	59.0	2.1	38.5	3.7	66.2	3.7	67.1	2.2	29.0	3.3	61.8
10	2.1	61.1	2.2	40.7	2.9	69.1	2.6	69.7	2.0	31.0	1.8	63.6
11	2.0	63.1	2.2	42.9	2.3	71.4	2.4	72.1	1.2	32.1	1.5	65.1
12	3.7	66.8	4.2	47.0	2.8	74.2	2.5	74.6	8.2	40.4	4.1	69.2
13	2.0	68.8	2.2	49.3	1.7	75.8	1.3	75.9	2.4	42.8	2.1	71.3
14	1.3	70.0	1.8	51.0	1.3	77.1	1.6	77.5	1.3	44.0	1.2	72.4
15	1.4	71.4	2.0	53.1	1.2	78.4	1.6	79.1	1.3	45.3	1.2	73.7
16	1.1	72.6	2.1	55.2	1.3	79.6	1.1	80.2	1.3	46.7	0.5	74.1
17	1.1	73.7	1.8	57.0	1.0	80.6	1.2	81.4	1.0	47.7	0.7	74.9
18	1.3	74.9	2.3	59.3	0.9	81.5	1.2	82.6	1.1	48.8	0.8	75.7
19	0.8	75.8	0.9	60.2	0.8	82.3	1.0	83.6	1.6	50.3	0.9	76.6
20	1.0	76.8	1.9	62.1	0.8	83.1	0.7	84.2	1.6	52.0	1.0	77.6
21	0.6	77.4	1.0	63.0	0.5	83.6	1.3	85.5	0.0	52.0	0.4	78.0
22	0.7	78.1	0.8	63.9	0.4	84.0	0.8	86.3	2.3	54.2	0.7	78.7
23	0.8	79.0	1.3	65.2	0.8	84.8	0.9	87.2	0.9	55.2	0.9	79.6
24	1.2	80.1	0.9	66.1	0.4	85.2	0.8	88.0	3.8	58.9	1.7	81.3
25	0.7	80.8	1.0	67.1	0.4	85.5	0.6	88.6	0.0	58.9	0.6	82.0
26	0.5	81.3	0.9	68.0	0.3	85.8	0.2	88.8	0.5	59.5	0.5	82.4
27	0.5	81.7	1.0	69.0	0.3	86.1	0.4	89.1	0.6	60.0	0.5	82.9
28	0.5	82.2	0.2	69.2	0.4	86.5	0.2	89.4	1.2	61.2	0.5	83.4
29	0.4	82.7	0.5	69.7	0.3	86.9	0.0	89.4	0.7	61.9	0.7	84.2
30	0.5	83.2	0.3	69.9	0.4	87.2	0.9	90.3	0.8	62.7	0.5	84.7
31	0.5	83.6	0.6	70.5	0.4	87.6	0.0	90.3	0.9	63.6	0.9	85.6
32	0.5	84.2	0.3	70.8	0.4	88.1	1.3	91.6	0.0	63.6	0.9	86.5
33	0.3	84.5	1.1	71.9	0.2	88.3	0.4	92.0	0.0	63.6	0.0	86.5
34	0.3	84.8	0.0	71.9	0.5	88.8	0.9	92.9	0.0	63.6	0.3	86.7
35	0.2	85.1	0.5	72.4	0.3	89.1	0.0	92.9	1.7	65.3	0.0	86.7
36	1.0	86.1	0.7	73.2	0.8	90.0	0.9	93.8	6.3	71.6	1.4	88.2
37+	13.9	100.0	26.8	100.0	10.0	100.0	6.2	100.0	28.4	100.0	11.8	100.0
Mean Length:	17.6		30.8		14.5		11.8		42.1		15.4	

Another summary measure of spell length that may be calculated is the turnover rate: the ratio of the number of households receiving benefits during the course of a year to the average number receiving benefits in a given month. For the last year of the OBRA data, this statistic was equal to 1.5. This may be compared to the rate of 1.7 found by Carr, Doyle, and Lubitz in their analysis of the ISDP data, cited above in Chapter 2. Thus, somewhat more continuity of receipt is apparent in the OBRA data of 1983 than in the ISDP data of 1979.

We now turn to the distribution of completed spell lengths of subgroups of food stamp recipients.

AFDC Recipients. Almost half (47 percent) of all spells end within 12 months; approximately one third last over two years. Case closures are somewhat concentrated at three, six, twelve, and eighteen months after opening. The mean episode length is 31 months. AFDC recipients thus appear to receive food stamps for substantially longer periods than other food stamp recipients. They may of course continue to receive food stamps after leaving the AFDC program.

Kirlin and Merrill found that 43 percent of AFDC-food stamp cases in Chicago closed within 12 months, and they estimated the mean episode length to be 37 months--somewhat greater than the estimate shown here.

Work Registrants. More than half of all spells for cases containing a work registrant end within five months. Only 14 percent last more than two years. Closures are concentrated at three and six months, and to a lesser extent at nine and twelve months. The estimated mean episode length is 15 months.

Earned Income Cases. Like cases containing work registrants, cases with one or more earners present have almost a 50 percent chance of closing within six months, and are especially likely to close at three, six, nine, and twelve months. Only 11 percent of spells last over two years; the estimated mean episode length is 12 months.

Elderly. Around half of all episodes for households which contain one or more elderly members close within 18 months; a quarter continue for three years or more. A relatively high proportion of cases close at six, twelve, and twenty-four months. The mean estimated episode length is 42 months.

Kirlin and Merrill estimated completed spell lengths for SSI/food stamp recipients in Chicago, who may be similar to this group. They found that half of all episodes ended within 13 months, and they estimated the mean spell length as 33 months.

Singles. More than half of all one-member food stamp cases close within six months of opening. Less than 20 percent are open for more than two years, and only 12 percent for more than three years. Closures are concentrated at six, twelve, and twenty-four months. The estimated mean length of spell is 15 months.

Appendix tables F.1 and F.2 show the distribution of lengths of completed spells for singles disaggregated by age, race, and sex. The number of spells in most of these subgroups is too small to allow for reliable calculation of mean lengths of spell. The median spell lengths are shown in Table 3.2. It appears that length of spell tends to increase across the three age groups for each race and sex division. Furthermore, in every age-race subdivision, males have spells at least as long as females. The effects of race are mixed; no common pattern emerges across the age groups for either sex.

Similar analyses of lengths of ongoing spells are presented in Appendix E.

3.4 Multivariate Models of Closures

The descriptive analyses above were limited to comparing lengths of spell among the five particular subgroups and the population as a whole. The reported results therefore pertained to average rather than marginal effects of particular characteristics. For example, in comparing the AFDC population with the entire food stamp recipient population, we could see only how the average AFDC/food stamp recipient differed from the overall average food stamp recipient. Thus we could not know if the observed differences were due to receipt of AFDC per se, or to the presence of children, the age of the household head, and so on. In this section, we therefore analyze case closure behavior in a multivariate context, deriving marginal effects of case characteristics.

Table of Contents

Table 3.2

MEDIAN LENGTH OF COMPLETED SPELLS FOR ONE-PERSON CASES

	Male				Female			
Age	White	Black	Hispanic	Total	White	Black	Hispanic	Total
18 - 24	3 (202)	6 (149)	2 (32)	4 (383)	5 (176)	6 (94)	8 (26)	6 (296)
25 - 64	4 (494)	6 (303)	5 (61)	5 (858)	7 (246)	12 (122)	11 (57)	9 (425)
65+	24 (34)	12 (17)	12 (10)	17 (61)	24 (96)	22 (53)	37 (25)	24 (174)
Total	4 (730)	6 (469)	4 (103)		8 (518)	11 (269)	14 (108)	

Note: Sample sizes in parentheses.

The dependent variable in the closure models is an indicator of whether or not a case closed in a given month. The explanatory variables that are used fall into the following categories:

- Household composition: number of adults, number of children, presence of preschoolers (aged 6 and under), and presence of children aged 3 and under;
- Demographics of applicant: age, race, and sex;
- Sources of income: earnings, AFDC, GA, Social Security, SSI, unemployment compensation; and
- Site characteristics: urban/rural classification, geographic region, county unemployment rate.

All of these are measured at the beginning of the spell of receipt. In addition, the number of months a case has been active is used as a measure of duration dependence, and an indicator that the spell began after October 1, 1981 is used as a measure of the net effect of OBRA legislation.

The expected directions of impact of the included variables are based on our understanding of case volatility. In general, we would expect households with more potential earners to be more volatile, and hence more likely to close in a given month, while households with more dependent children would be less likely to close. The applicant's demographics will be related to probability of finding employment or remarrying. Receipt of public assistance is expected to reduce the probability of closure, as indicating a greater level of dependency.

Although it seems to be obvious that earned income cases are more volatile than other cases, we have learned in other work (Hamilton, et. al., 1988) that this is not an unqualified truism. For the typical food stamp recipient who is also receiving some form of public assistance such as AFDC or GA, the presence of earnings at the beginning of a spell of receipt does indeed indicate an increased potential for leaving the rolls. The most volatile cases of all, however, are those that currently have no income--neither earned nor unearned. These cases are clearly in transition, and can be expected to find some other means of support shortly, either through employment or through receipt of some form of public assistance. It follows that in a subpopulation that is largely NPA, the presence of earnings in the initial month of food stamp receipt need not be strongly positively associated

with the closure rate over the course of the spell, and may even be negatively associated with it. The usual positive relationship between earnings and closure could be anticipated to appear more strongly if the model were based on current rather than initial characteristics.

With regard to site characteristics, our exploratory analyses indicated that closure rates tended on average to be higher in the West, and lower in the Northeast, than in the South. Part of this is no doubt due to differences in unemployment rates, also included in the models, which in this time period were lowest in the West and highest in the Northeast. Higher closure rates are naturally expected in sites with lower unemployment rates.

Model specifications were developed using ordinary least squares (OLS). Our general criterion for including variables was that the estimated coefficient exceed the estimated standard error, except that the post-OBRA indicator was explicitly kept in every model.

Because of the large resource cost of the logistic regressions, we did not run alternative forms with and without variables which came close to meeting this condition. We have previously found, however, that significance levels, as well as impacts at the sample mean, are fairly stable when moving between OLS and logistic regression. We therefore felt confident in running the single preferred OLS version as a logistic. In some cases we included some marginal variables in the logistic models, on the ground that a loss of power through including too many variables was preferable to a risk of excluded variable bias. The implication of this approach is that variables which were far from being statistically significant in the OLS versions of the equations do not appear at all in the logistic models presented below.

3.4.1 Single Parent Households

Table 3.3 shows the logistic regression model for single-adult households with children. The mean closure rate per month for such households is 6.1 percent. (That is, on average, about 6 percent of single-parent households close each month.) This rate varies significantly, however, with many of the characteristics of the household and the site.

Cases with more children are less likely to close in a given month, although the impact is not large. Other things equal, an additional child

Table of Contents

Table 3.3

LOGISTIC MODEL OF CLOSURES:
ONE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-2.2679	0.1619	-0.1306
Number of children under 18	-0.0614*	0.0321	-0.0035
Presence of Children			
Under 7	-0.2724***	0.0973	-0.0157
Under 4	0.1642*	0.0853	0.0095
Demographics of applicant:			
Under age 30	0.2071**	0.0838	0.0119
Over age 39	-0.2134*	0.1177	-0.0123
Male	0.2939***	0.1092	0.0169
Black	-0.4391***	0.0727	-0.0253
Hispanic	-0.2634**	0.1063	-0.0152
Receipt of other programmatic income:			
AFDC	-0.7202***	0.0748	-0.0415
GA	-0.4251***	0.1282	-0.0245
Unemployment Compensation	0.1995	0.1388	0.0115
Social Security	-0.4346**	0.1702	-0.0250
Earned income present	0.1540**	0.0740	0.0089
Site characteristics:			
Urban	0.3601***	0.0919	0.0207
Unemployment rate	-1.2645	0.9159	-0.0728
Northeast	-0.6915***	0.0921	-0.0398
West	-0.0819	0.0857	-0.0047
Duration of spell:			
2 months	0.3397***	0.1113	0.0196
3 months	0.7012***	0.1059	0.0404
4 months	0.3093**	0.1255	0.0178
5 months	0.2313*	0.1360	0.0133
6 months	0.8522***	0.1177	0.0491
7 to 11 months	0.2686***	0.0912	0.0155
12 months	0.7257***	0.1598	0.0418
18 months	0.6046***	0.2263	0.0348
Spell started post-OBRA	0.0709	0.0673	0.0041

Sample size (case months): 19,100
Mean monthly closing rate: 0.0614
Fraction of concordant pairs: 0.6570

R^2: 0.0562

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

will reduce the closure probability by about 0.4 percentage points. Holding constant the number of children, presence of children under age 7 reduces the closure rate by 1.6 percentage points, while presence of even younger children (under age 4) slightly increases the closure probability.

The age, race, and sex of the head of household also have important influences. A case with a household head under age 30 is 1.2 percentage points more likely, and a case with a household head over age 39 is 1.2 percentage points less likely to close in a given month than a similar household with a head aged 30 to 39 (the excluded category in the equation). The head being male rather than female increases the closure rate by 1.7 percentage points, while cases headed by blacks and Hispanics are 2.5 and 1.5 percentage points less likely, respectively, to close than otherwise similar cases headed by whites.

Receipt of other programmatic income--in particular, AFDC and GA--significantly lowers the probability of food stamp closure. Cases that were receiving benefits from these two programs in their first month of food stamp receipt are, respectively, 4.2 and 2.5 percentage points less likely to close than similar cases that were not receiving such benefits. Presence of earnings, on the other hand, increases the monthly probability of closure by 0.9 percentage points.

Characteristics of the sites as well as characteristics of the individuals are significantly related to closure rates. Being in an urban area increases the probability of closure, by 2.1 percentage points. There is also significant variation among the regions of the country; relative to the excluded region, the South, cases in the Northeast are 4.0 percentage points less likely to close.

Finally, time elapsed since opening is an important predictor of closure. Looking at the impact column, it can be seen that closures are especially likely in months 3, 6, 12, and 18--common times of recertification. (The excluded category was month 1; closure rates in months 13 through 17, and 19 and beyond, did not differ significantly from the rate in the first month, and thus do not appear as separate indicators). Closure rates also tend to be higher in the first year in general relative to later years.

Two summary statistics presented in Table 3.3 should also be explained. The R^2 value, a measure of goodness of fit, is analogous to the square of the multiple correlation coefficient in a linear regression. It is calculated as:

(model chi-square - 2p)/(-2 * L(0)),

where p is the number of variables in the model, excluding the intercept, and L(0) is the log likelihood of a model which only included an intercept. Ignoring the 2p correction, R^2 would equal 0 if the model was of no value; 1, if it predicted perfectly; and an intermediate value corresponding to the proportion of the log likelihood explained by the model, in all other cases.

The fraction of concordant pairs is a measure of predictive power of the model. It is constructed by pairing each case month in which a closure occurred with each month in which a closure did not occur, and determining for each of these pairs whether the model predicts a greater probability value for the member of the pair in which the closure occurred. If so, that pair of observations is a concordant pair. If the fraction of concordant pairs is 1, that means the model discriminates perfectly: all case months in which a closure occurred had higher predicted probability values than all case months in which a closure did not occur.[1]

3.4.2 Intact Families

Table 3.4 shows the logistic model of closures for multiple-adult households with children. For this household type, the mean monthly closure rate is 9.0 percent. It is significantly reduced by the presence of additional children aged 6 or under (1.0 percentage point per child).

Table 3.4

LOGISTIC MODEL OF CLOSURES: MULTIPLE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-2.2260	0.1355	-0.1828
Number of children			
Under 18	-0.0420	0.0267	-0.0034
Under 7	-0.1251***	0.0383	-0.0103
Demographics of applicant:			
Under age 30	0.0988	0.0775	0.0081
Over age 39	-0.2937***	0.0798	-0.0241
Black	-0.3568***	0.0770	-0.0293
Receipt of other programmatic income:			
AFDC	-0.4572***	0.0783	-0.0375
GA	-0.7862***	0.1452	-0.0646
Unemployment Compensation	0.1167	0.0817	0.0096
Social Security	-0.1989	0.1218	-0.0163
Site characteristics:			
Urban	0.1207*	0.0671	0.0099
Northeast	-0.2080***	0.0795	-0.0171
West	0.1702**	0.0745	0.0140
Duration of spell:			
2 months	0.5368***	0.1130	0.0441
3 months	0.8763***	0.1109	0.0720
4 months	0.6225***	0.1224	0.0511
5 months	0.3559***	0.1366	0.0292
6 months	1.0539***	0.1225	0.0865
7 to 11 months	0.2286**	0.1076	0.0188
12 months	0.4338**	0.1886	0.0356
13 or more months	-0.2736**	0.1224	0.0225
Spell started post-OBRA	0.0081	0.0651	0.0007

Sample size (case months): 15,287
Mean monthly closing rate: 0.0903
Fraction of concordant pairs: 0.6370
R^2: 0.0420

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

ively. Presence of earnings, receipt of unemployment compensation and the unemployment rate itself were not significant predictors. Cases of this type have relatively lower closure rates in the Northeast and relatively higher closure rates in the West than in the excluded region, the South.

The pattern of the impact of months elapsed since case opening is similar to that for one-parent households: large impacts at 3, 6, and 12 months (and also at 9 months) and generally higher rates in the first year than in later years. Since the excluded category is the first month, the significant negative coefficient in the last group, 13 or more months, reflects the difference between the first month and the second and subsequent years.

3.4.3 Single Individuals

As seen in Table 3.5, single individuals have a mean closure rate of 8.7 percent per month. This rate is 2 percentage points higher for recipients under age 30 and 3.1 percentage points lower for elderly recipients than for recipients aged 30 to 59 (the excluded category). Significant differences are also seen by sex and race: the closure rate is 2.8 percentage points higher for males than for females, and 2.7 percentage points lower for blacks than for whites.

Receipt of GA, Social Security, or SSI reduces the monthly probability of closure by 3.4 to 7.5 percentage points, while receipt of earnings does not have a statistically significant effect. Urban/rural classification and the local unemployment rate also do not have any significant effects. Closure rates are higher, other things equal, in the West, and lower in the Northeast.

The spell duration indicators show very high impacts not only for the third, sixth and twelfth months, but also for the twenty-fourth and thirty-sixth months. This is undoubtedly associated with the fact that some important subgroups of single recipients (e.g., Social Security and SSI recipients) typically have 12-month certification periods. As for other types of cases, closure rates are generally high in the first year.

Table 3.5

LOGISTIC MODEL OF CLOSURES: ONE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-2.3613	0.1309	-0.1865
Demographics of applicant:			
Under age 30	0.2815***	0.0584	0.0222
Over age 59	-0.3894***	0.1112	-0.0308
Male	0.3583***	0.0572	0.0283
Black	-0.3464***	0.0617	-0.0274
Hispanic	-0.1771*	0.1027	-0.0140
Receipt of other programmatic income:			
GA	-0.4407***	0.0838	-0.0348
Social Security	-0.7127***	0.1126	-0.0563
SSI	-0.9526***	0.1180	-0.0752
Earned income present	0.1113	0.0737	0.0088
Earnings over $600 per month	0.6645	0.5183	0.0525
Site characteristics:			
Unemployment rate	-1.4049*	0.8275	-0.1110
Northeast	-0.4423***	0.0839	-0.0349
West	0.2813***	0.0807	0.0222
Duration of spell:			
2 months	0.8056***	0.0854	0.0636
3 months	0.9611***	0.0889	0.0759
4 months	0.7332***	0.1018	0.0579
5 months	0.2123*	0.1277	0.0168
6 months	0.8057***	0.1130	0.0636
7 to 11 months	0.2694***	0.0868	0.0213
12 months	1.0344***	0.1456	0.0817
24 or 36 months	0.8130***	0.2582	0.0642
Spell started post-OBRA	-0.0719	0.0601	-0.0057

Sample size (case months): 18,806
Mean monthly closing rate: 0.0865
Fraction of concordant pairs: 0.7160

R^2: 0.0924

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

3.4.4 Multiple Adult Households Without Children

Table 3.6 shows the closure rate model for multiple-adult childless households. These cases have a mean monthly closure rate of 8.7 percent. As with the other types, cases with younger heads are more likely to close and cases with older heads are less likely to close. Hispanics as well as blacks have significantly lower closure rates than whites for this type of case. Closures were significantly less likely in the Northeast than in the South.

For this type of household, the presence of earnings has an ambiguous effect: cases with earnings are less likely to close than other cases, while cases with substantial earnings are more likely to close than other cases. This latter effect, however, is not statistically significant; only 3 percent of case months come from spells in which earnings exceed $600 in the first month of food stamp receipt.

To interpret these coefficients, we note that just over half of all case months for this household type are NPA--that is, do not receive GA, Social Security, or SSI. The greater volatility of nonearners among the NPA cases more than counterbalances the greater volatility of earners among the PA cases.

This can be seen explicitly by examining some univariate statistics for this subgroup. For all cases, the closure rate for earners exceeds that for nonearners by 1.8 percentage points (10.9 versus 8.1). Only 7 percent of cases receive GA, Social Security, or SSI, and have earnings as well, and their closure rate does not differ significantly from nonearners receiving GA, Social Security, or SSI. Among NPA cases, on the other hand, the closure rate is 2.3 percentage points higher for nonearners (13.7 versus 11.4), indicating that cases with no income at the time of initial receipt have the highest closure rate of all.

High closure rates are seen in the second, third, sixth, and twelfth months for this type of case. Although the point estimate of the differential rate for the twenty-fourth and thirty-sixth months is also high, there were too few instances to achieve statistical significance. As with the others, closure rates are relatively higher in the first year of recipiency.

Table 3.6

LOGISTIC MODEL OF CLOSURES: MULTIPLE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-2.2464	0.1802	-0.1774
Demographics of applicant:			
Under age 30	0.4688***	0.1200	0.0370
Over age 59	-0.5378***	0.1754	-0.0425
Black	-0.3912***	0.1325	-0.0309
Hispanic	-0.4422*	0.2317	-0.0349
Receipt of other programmatic income:			
GA	-0.2817	0.2521	-0.0223
Social Security	-0.4781***	0.1724	-0.0378
SSI	-0.5155***	0.1705	-0.0407
Earned income present	-0.2127*	0.1218	-0.0168
Earnings over $600 per month	0.3851	0.2797	0.0304
Site characteristics:			
Urban	0.1116	0.1205	0.0088
Northeast	-0.6235***	0.1269	-0.0492
Duration of spell:			
2 months	0.5908***	0.1774	0.0467
3 months	0.9831***	0.1734	0.0777
4 months	0.7362***	0.1972	0.0581
5 months	0.2715	0.2426	0.0214
6 months	0.9696***	0.2086	0.0766
7 to 11 months	0.3705**	0.1677	0.0293
12 months	1.1717***	0.2759	0.0925
24 or 36 months	0.7576	0.5395	0.0598
Spell started post-OBRA	-0.0778	0.1176	-0.0061

Sample size (case months): 4,927
Mean monthly closing rate: 0.0865
Fraction of concordant pairs: 0.6890

R^2: 0.0645

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

3.4.5 Summary of Models

The results of the closure models are summarized in Table 3.7. Although the coefficient values vary among the four types of households and also, to some extent, the presence and statistical significance of various factors, there are a number of common themes running through the four closure models. These are:

- Cases headed by younger applicants are more prone to close than cases headed by older applicants. Those headed by applicants under age 30 are several percentage points more likely to close per month, and those headed by the elderly are several percentage points less likely to close per month, than those headed by applicants aged 40 to 59.

- Cases headed by blacks are less prone to close than cases headed by whites, by about 3 percentage points.

- Cases receiving other forms of programmatic income in addition to food stamps are substantially less likely to close in a given month. This income source may be AFDC for households with children, or social security or SSI for households without children.

- Cases are substantially more likely to close in months corresponding to certification period lengths--e.g., 3, 6, and 12 months after opening--and in the first 12 months of activity in general.

Some notable variations among the four household types are:

- On average, closure rates are lowest for one-parent households with children (6.1% percent per month) and about equal for the other three types (8.7 to 9.0 percent per month).

- For those households with children, having more children is associated with a lower probability of closure.

- The presence of earnings has a small positive effect for single-parent households, a small negative effect for multiple adult household without children, and no statistically significant effect for the other two types.

It may appear surprising at first that the economic variables--presence of earnings and the unemployment rate--have such weak effects. With regard to the counterintuitive finding of a small negative effect of earnings

Table of Contents

Table 3.7

SIGNIFICANT DETERMINANTS OF CLOSURES

	One Adult with Children	Multiple Adults with Children	One Adult Only	Multiple Adults Only
Number of children/ young children	-	-		
Earned income present	+			-
Head of household:				
Younger	+		+	
Older	-	-	-	-
Male	+		+	
Black	-		-	-
Hispanic	-		-	-
AFDC	-	-		
GA	-	-	-	
Social Security	-		-	-
SSI			-	-
Urban	+	+		
Unemployment rate			-	
Mean monthly rate	6.1%	9.0%	8.7%	8.7%

on closures for childless couples, it must be recalled that the model for that group also included an indicator of earnings over $600 per month, which had a positive but statistically insignificant effect. Combining the two earnings variables in this model, we do not find a significantly lower closure rate for those couples with earnings relative to those couples without earnings.

More generally, while there is little doubt that earnings are an important reason for closure, and even that cases with earnings at a given point in time are more likely to close the next month than cases without earnings, it does not follow that cases with earnings at the time of a spell beginning are likely to close substantially sooner on average than other cases. Many cases apply for food stamps due to a recent job loss; hence employment status at the beginning of a spell is not necessarily a reliable measure of potential for employment. The significant positive effect of earnings at entry for single parents may reflect the special barrier to employment, i.e. need for child care, that is faced by this group. Those few individuals who have already dealt with this issue when the food stamp spell begins are indeed likely to have shorter spells than other single parents.

Similarly, the fact that the unemployment rate is measured at the beginning of the spell may help explain its lack of importance in all the models except that for single adults. As discussed above, these models could alternatively have been estimated as functions of current rather than initial circumstances. While that approach would no doubt have led to stronger relationships between closures and economic variables, it would have been useless for predicting spell lengths at time of entry in the Food Stamp Program.

These multivariate results are in qualitative agreement with those of the preceding section. Recall that the descriptive analyses found substantially longer active spells for AFDC recipients and the elderly than for the population as a whole, and substantially shorter spells for cases with earned income. This conforms with the current findings on the effects of programmatic income, age, and earnings. Furthermore, the descriptive analysis of single individual cases found that length of spell tended to increase across the three age groups for each race and sex division, and that in every age-race subdivision, males had spells at least as long as females--suggesting the findings on age and sex effects for single individuals in Table 3.5.

3.4.6 Estimates of Spell Length Based on Multivariate Models

The models presented in the preceding sections can be used to infer the impact of various initial characteristics on the expected length of an active spell. For purposes of this analysis, we have used a set of 17 subgroups identified by household type, sources of income, and in some cases age of household head. These subgroups are mutually exclusive, and account for over 90 percent of food stamp spells of receipt. The first column of Table 3.8 shows the proportion of the total spells accounted for by each subgroup.[1]

Within each subgroup, there can of course be substantial variation among the variables that are not held constant. We have preserved this variation by using the actual population in the sample from each subgroup as the basis for the analyses. For example, to estimate the expected length of spell for one-parent households with GA income and no earnings, we have calculated this statistic for <u>each</u> one-parent household with GA income and no earnings using the model presented in Table 3.4, and conditioning on the characteristics of the individual cases, then taken the average. Thus the result represents the expected value for a "typical" one-parent GA/food stamp case. This approach was preferable to using the sample means because of the nonlinearity of the models.

To determine the expected length of an active spell for a case with given characteristics, the conditional probability of closure, or hazard rate, was first calculated by month elapsed since opening, based on the models in Tables 3.3 through 3.6. This conditional probability eventually becomes a constant value--after 18 months for Type 1 cases, for example.[2] Given these

---

[1]This differs from the proportion of the food stamp caseload accounted for by each subgroup by not taking into account the average length of spell. Thus, this column shows that AFDC cases comprise only 18 percent of spells; but as these spells tend to be long ones, AFDC recipients in fact comprise over 40 percent of cases at any point in time.

[2]For Type 3 and 4 cases, the long run hazard rates were calculated as appropriately weighted averages of the hazard rates for "anniversary" months (e.g. 24 and 36), and other months beyond the first year of receipt. (This is the same approach as was used in calculating mean lengths of spells in Section 3.2 above.)

Table 3.8

EXPECTED LENGTH OF SPELL FOR SELECTED SUBGROUPS

	Proportion of all Spells	Expected length of Spell (months)
Type 1: Single-Parent Households		
AFDC, no earnings	11.7%	33.4
AFDC with earnings	1.4	26.9
GA, no earnings	1.5	18.3
NPA, no earnings	8.2	12.1
NPA with earnings	5.3	10.5
All spells	28.2	21.6
Type 2: Intact Families		
AFDC, case head under 40	3.9%	19.9
AFDC, case head over 40	1.7	27.9
NPA, case head under 40	14.3	9.6
NPA, case head over 40	5.1	14.6
All spells	28.7	14.4
Type 3: Single Individuals		
SSI and/or Social Security, elderly	5.5%	52.2
GA, under age 30	2.7	16.8
GA, age 30-59	2.0	21.9
NPA, under age 30	11.9	7.2
NPA, age 30-59	10.1	8.9
All spells	34.0	17.7
Type 4: Childless Couples		
Social Security, elderly	1.0%	29.1
NPA, under 30	2.6	6.2
NPA, age 30-59	3.6	10.3
All spells	9.1	15.1

hazard rates, it is straightforward to calculate the unconditional closure probabilities--i.e., the proportions of a cohort that close after 1 month, 2 months, etc. To calculate the mean length of spell, we then sum the infinite series:

$$\text{prob (spell length = j)} \times j.$$

The first part of the sum, from j=1 to j=18, is calculated arithmitically. The tail of the sum--from j=19 to infinity--is calculated algebraically.

The results of these calculations are shown in column 2 of Table 3.8. Among one-parent households, this value varies from 11 and 12 months, respectively, for NPA cases with and without earnings at opening, to 33 months for AFDC cases without earnings at opening.[1] AFDC cases with earnings and GA cases without earnings fall in between.

Among two-parent households, the expected length of spell varies from 10 months for NPA cases with a young head of household to 28 months for AFDC/food stamp cases with an older head.

The greatest expected spell length--52 months--is seen for a subgroup of single individuals, namely elderly people receiving SSI or Social Security income. Among non-elderly single individuals, expected spell lengths are 21 months for GA recipients and 9 to 17 months for NPA cases.

Finally, among childless couples, expected spell lengths are 29 months for elderly on Social Security, and 6 to 10 months for NPA cases.

3.5 Recidivism

The final research question we address pertains to households' rate of return to the Food Stamp Program after a spell of receipt has ended. We first examine the relative frequency of single versus multiple spells and the occurrence of administrative churning, and then perform multivariate analyses of reopening rates. The multivariate models are then used to calculate probability of reopening within six months and food stamp activity rates over a five-year period.

---

[1] Mean spell length for all cases containing an elderly member was estimated as 42 months in Section 3.2.

3.5.1 Multiple Spells

In order to perform a meaningful comparison of the number of active spells experienced by a set of cases, it is necessary that the comparison span the same number of months for each case. Multiple spells would have a different interpretation for a case which appeared in Month 1 of the observation period than for a case which first appeared in Month 24.

The total number of months in the observations period is 38. A trade-off must be made in this analysis between number of months over which spells are counted and number of cases included in the analysis. For example, we could look at the occurrence of multiple spells over a three-year period, at the cost of basing our analysis on only the handful of cases that entered the sample in the first two months.

We have chosen to examine the occurrence of multiple spells over a two-year period. This enables us to include over 40 percent of the analysis sample (those that began a spell in the first 14 months of the abstraction period). For each such case, we have counted only those spells that began within two years of its first appearance. For example, if a case first appeared in Month 1, we did not count any spells that began in or after Month 25.

The results are presented in Table 3.9. We see that for 69 percent of all cases beginning a spell, no further spell is begun within the next two years. About a quarter of cases start a second but not a third spell, and about 7 percent of cases start three or more spells.

Some variation in this pattern is seen among the five subgroups of interest. Cases containing work registrants or earners at the time of commencing their first spell are more prone to experience multiple spells. On the other hand, AFDC recipients, singles, and especially the elderly are less prone than other cases to experience multiple spells within a two-year period.

3.5.2 Administrative Churning

Administrative churning refers to the phenomenon of circumstantially eligible cases being closed for a brief period of time due to failure to meet some procedural requirement, such as filing a monthly report or appearing for

Table of Contents

Table 3.9

MULTIPLE SPELLS OVER TWO YEARS

Number of Spells	All Cases	AFDC Recipients	Work Registrants	Earned Income Cases	Elderly	Singles
1	68.0%	74.0%	62.6%	64.1%	82.3%	72.1%
2	23.7	21.1	26.4	26.5	17.1	20.5
3	5.9	4.3	9.1	7.4	0.6	5.4
4	1.3	0.6	1.6	1.8	0.0	1.9
5	0.1	0.0	0.0	0.2	0.0	0
6	0.05	0.0	0.2	0.0	0.0	0.1
TOTAL	100%	100%	100%	100%	100%	100%
n	2139	534	384	551	175	755

a recertification. It could be argued that "true" closure rates are overstated, and "true" spell lengths are underestimated, if churning is treated the same as other closures and reopenings. Some researchers (e.g. Ruggles (1988)) have dealt with this problem by ignoring apparent closures of one month's duration.

In the analyses presented here, we have treated all closures identically, for several reasons. First, we feel that it is of primary importance to analyze the data as reported. Second, administrative churning cannot be reliably distinguished from other types of closures and reopenings. While it is possible that cases not receiving food stamps benefits for a single month were circumstantially eligible during that month, it is not a certainty; and the situation is even less clear for cases closed for two months. Third, cases subject to administrative churning may have their benefits restored retroactively, so that they would not show up in these data as having been closed. Finally, we take account of recidivism in our calculations of total time on food stamps.

Table 3.10 shows the proportion of cases of various types reopening after one and two month closures. These statistics are based on all spells that ended in or before August 1983, so that it is known for all these cases whether a reopening occurred within that amount of time. For the caseload as a whole, less than 1 percent of closures were followed by reopenings after one month; this proportion is lower for AFDC recipients and cases with elderly members, and higher for single individuals. Somewhat more cases reopened after two months of being closed: 2 percent for the caseload as a whole, and 2.4 percent for cases with earnings at the time of the initial spell beginning. These are the maximum estimates of the degree of administrative churning with loss of benefits--that is, 1 to 2 percent of closures. These are presumably overestimates, in that at least some of these cases were circumstantially ineligible when they were closed. It is, if course, possible that many more cases were closed and reopened without loss of benefits, but on that point the data are mute.

3.5.3 Multivariate Models of Reopenings

It is to be expected that many of the same factors that influence the probability of a case closing influence in the opposite direction the

Table 3.10

PROPORTION OF CASES REOPENING AFTER ONE AND TWO MONTH CLOSURES

	One Month	Two Months
All cases	0.8%	2.0%
AFDC recipients	0.4	1.2
Work registrants	0.7	2.2
Earned income cases	0.9	2.4
Elderly	0.4	0.4
Single individuals	1.2	2.2

NOTE: Based on 4,107 spells that began during the abstraction period and closed in or before August 1983.

probability of it reopening, as these factors measure the degree of dependence on the Food Stamp Program. The relationships could be attenuated, however, because with the passage of time, characteristics in the first month of receipt of the preceding spell become less and less accurate descriptors of the current circumstances. The reopening models have nonetheless been estimated based on these measures to enable us to predict long term activity rates conditional on the characteristics of a case when it is first observed beginning a spell of food stamp receipt.

Time duration differs from other explanatory variables in that it plays a very different role in the closure and reopening models. While cases are especially prone to close on the anniversary of their opening because of certification period lengths, they are not especially prone to reopen on the anniversary of their closing. In fact, the most salient feature of the time dependence of inactive spells is the strong tendency of cases to reopen quickly.

One Parent Households

The mean monthly probability of reopening for one-adult households with children, as shown in Table 3.11, is 3.6 percent. This probability is significantly higher for cases that received GA at the beginning of their prior food stamp spells, and for cases headed by applicants either under 30 or over 39. Reopenings are less likely in urban than in rural areas, and more likely in areas of high unemployment. Reopening rates are substantially higher in the first six months after closure than thereafter.

Two Parent Households

Table 3.12 shows that the mean monthly reopening rate for multiple-adult households with children is somewhat higher, at 4.0 percent. The coefficients for numbers of children indicate that the presence of an

Table 3.11

LOGISTIC MODEL OF REOPENINGS:
ONE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-3.7007	0.2518	-0.1267
Number of children			
Under 18	0.1263**	0.0576	0.0043
Under 7	-0.1381	0.1098	-0.0047
Presence of children			
Under 7	0.3583*	0.1972	0.0123
Demographics of applicant:			
Under age 30	0.2953**	0.1456	0.0101
Over age 39	0.4448**	0.1921	0.0152
Receipt of other programmatic income:			
GA	0.5398***	0.1747	0.0185
Earned income present	0.1481	0.1209	0.0051
Earnings over $600 per month	-0.3143	0.2185	-0.0108
Site characteristics:			
Urban	-0.3057**	0.1315	-0.0105
Unemployment rate	2.3131*	1.2704	0.0792
Time elapsed since closure:			
1 month	0.9218***	0.1327	0.0316
2 months	0.3646**	0.1590	0.0125
7 to 11 months	-0.6713***	0.1496	-0.0230
13 or more months	-1.2340***	0.1760	-0.0423

Sample size (case months): 11,968
Mean monthly reopening rate: 0.0355
Fraction of concordant pairs: 0.6540

R^2: 0.0600

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

Table of Contents

Table 3.12

LOGISTIC MODEL OF REOPENINGS:
MULTIPLE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-3.3705	0.2063	-0.1279
Number of children			
Under 18	0.1465***	0.0423	0.0056
Under 7	-0.2242***	0.0808	-0.0085
Presence of children			
Under 4	0.1516	0.1383	0.0058
Demographics of applicant:			
Under age 30	0.3055**	0.1291	0.0116
Over age 39	0.2656**	0.1263	0.0101
Black	-0.2108	0.1300	-0.0080
Hispanic	0.2597*	0.1410	0.0099
Receipt of other programmatic income:			
AFDC	0.2521**	0.1209	0.0096
GA	0.4707**	0.2111	0.0179
Earnings over $600 per month	-0.2236*	0.1183	-0.0085
Site characteristics:			
Unemployment rate	2.5572**	1.0172	0.0970
Northeast	-0.4408***	0.1169	-0.0167
West	-0.2699**	0.1155	-0.0102
Time elapsed since closure:			
1 month	0.9205***	0.1322	0.0349
2 months	0.3236**	0.1564	0.0123
3 months	0.2402	0.1656	0.0091
7 to 11 months	-0.4531***	0.1429	-0.0172
13 or more months	-1.4322***	0.1882	-0.0543
Spell started post-OBRA	-0.1844*	0.1006	-0.0070

Sample size (case months): 13,115
Mean monthly reopening rate: 0.0395
Fraction of concordant pairs: 0.6720
R^2: 0.0640

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

to reopen, as well as cases in areas of high unemployment. Reopening rates are higher in early months after closure, dropping off gradually for 9 months. Closures of spells that started post-OBRA are somewhat less likely to be followed by reopenings.

Single Individuals

The mean monthly reopening rate for this type of household, as shown in Table 3.13, is 2.7 percent. Hispanic individuals tend to have lower reopening rates than whites, and elderly a lower rate than nonelderly. There is a higher probability of reopening in the early months after closure, and lower probability for spells that began post-OBRA.

Childless Couples

Finally, as shown in Table 3.14, multiple-adult households without children have a monthly reopening rate of 3.4 percent, significantly lower for the elderly and higher for recipients of GA and SSI. Reopenings are heavily concentrated in the first month after closure. Again, reopening rates are lower for spells that started post-OBRA

Summary

Several interesting findings emerge from these reopenings models, which are summarized in Table 3.15.

- Reopenings are significantly less likely for childless households headed by elderly individuals. Although these households have very low closure rates, such closures are likely to be permanent, possibly because they are more likely to be associated with death or institutionalization.

- For two of the household types, reopenings are significantly more likely in areas with high unemployment rates.

- Reopenings are markedly concentrated in the early months after closure. If a case does not reopen within a few months, it is much less likely to reopen at all.

- For three of the four household types, reopening rates were significantly lower for spells that began after the OBRA legislation went into effect. This could reflect changes in the eligibility limit for receipt of benefits or the concurrent economic recovery in the final year of the observation period. While explora-

Table of Contents

Table 3.13

LOGISTIC MODEL OF REOPENINGS:
ONE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-3.1992	0.1987	-0.0838
Demographics of applicant:			
Over age 59	-0.3685**	0.1742	-0.0097
Black	0.1273	0.1029	0.0033
Hispanic	-0.7004***	0.2225	-0.0183
Site characteristics:			
Unemployment rate	1.2539	1.2757	0.0328
Northeast	-0.2255	0.1374	-0.0059
West	-0.1670	0.1340	-0.0044
Time elapsed since closure:			
1 month	1.0413***	0.1403	0.0273
2 months	0.4819***	0.1631	0.0126
3 months	0.4107**	0.1714	0.0108
7-12 months	-0.3684**	0.1454	-0.0096
13 or more months	-1.3513***	0.1759	-0.0354
Spell started post-OBRA	-0.3750***	0.0996	-0.0098

Sample size (case months): 18,203
Mean monthly reopening rate: 0.0269
Fraction of concordant pairs: 0.6490
R^2: 0.0576

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

Table 3.14

LOGISTIC MODEL OF REOPENINGS: MULTIPLE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	Standard Error	Impact
Intercept	-2.9121	0.2185	-0.0961
Demographics of applicant:			
Under age 30	-0.2561	0.1913	-0.0085
Over age 59	-1.0072***	0.3019	-0.0332
Black	-0.2360	0.2290	-0.0078
Receipt of other programmatic income:			
GA	0.8508**	0.3570	0.0281
Unemployment Compensation	0.3043	0.2755	0.0100
Social Security	0.3553	0.2727	0.0117
SSI	0.7621***	0.2716	0.0252
Site characteristics:			
Urban	-0.2325	0.1850	-0.0077
West	-0.2193	0.1880	-0.0072
Time elapsed since closure:			
1 month	0.9843***	0.2119	0.0325
13 or more months	-0.4255*	0.2347	-0.0140
Spell started post-OBRA	-0.2977*	0.1768	-0.0098

Sample size (case months): 4,360
Mean monthly reopening rate: 0.0342
Fraction of concordant pairs: 0.5880
R^2: 0.0282

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

Table of Contents

Table 3.15

SIGNIFICANT DETERMINANTS OF REOPENINGS

	One Adult with Children	Multiple Adults with Children	One Adult Only	Multiple Adults Only
Number of children	+	+		
Earned income present		-		
Head of household:				
Under age 30	+	+		
Over age 39	+	+		
Over age 59			-	-
Hispanic			-	
AFDC		+		
GA	+	+		+
SSI				+
Urban	-			
Unemployment rate	+	+		
Spell started post OBRA		-	-	-
Mean monthly rate	0.0355	0.0395	0.0269	0.0342

tion of the implementation process of OBRA is beyond the scope of this project, it is suggestive that such a marked change in recidivism was seen after October 1981.

3.5.4 Probability of Reopening Within Six Months

Table 3.16 shows the expected proportion of cases of various types that would reopen within six months after closing. This probability was calculated for each case in each subgroup based on the models presented in Tables 3.11 through 3.14.[1] The findings were:

- Among single-parent households, 42 percent of GA/food stamp cases are expected to reopen within six months, but only 28 to 31 percent in AFDC and GA cases;
- Among two-parent households, 28 percent of NPA cases with a head under age 40 would reopen within six months, compared with 33 to 38 percent of AFDC cases and NPA cases with an older head;
- Among single individuals, 23 to 24 percent of non-elderly GA and NPA cases would reopen within six months, while only 19 percent of elderly SSI or Social Security recipients would do so; and
- Among childless couples, 14 percent of the elderly receiving Social Security and 18 to 23 percent of non-elderly NPA cases would reopen within six months.

Thus, among all the subgroups the highest reopening rates are seen among single-parent households that are GA recipients and dual parent households with older heads that are receiving AFDC. The low reopening rates of elderly SSI and Social Security recipients are also interesting. This phenomenon may occur because their case closures are often associated with death or institutionalization, and are hence likely to be permanent. Unfortunately the OBRA data do not provide usable information on reasons for closure.

---

[1] If p_i is the probability that a case reopens in month i conditional on having been closed through month $i-1$, then the probability of reopenings during and of the first six months can be calculated as:

$$1 - (1-p_i) * (1-p_2) \ldots * (1-p_6).$$

Table 3.16

PROBABILITY OF REOPENING WITHIN SIX MONTHS
FOR SELECTED SUBGROUPS

	Proportion of Caseload	Probability of Reopening within 6 Months
Type 1: Single-Parent Households		
AFDC, no earnings	11.7%	28.4%
AFDC with earnings	1.4	31.3
GA, no earnings	1.5	41.9
NPA, no earnings	8.2	28.2
NPA with earnings	5.3	29.6
Type 2: Intact Families		
AFDC, case head under 40	3.9%	33.1%
AFDC, case head over 40	1.7	38.4
NPA, case head under 40	14.3	28.3
NPA, case head over 40	5.1	34.9
Type 3: Single Individuals		
SSI and/or Social Security, elderly	5.5%	18.5%
GA, under age 30	2.7	22.9
GA, age 30-59	2.0	23.7
NPA, under age 30	11.9	23.2
NPA, age 30-59	10.1	22.9
Type 4: Childless Couples		
Social Security, elderly	1.0%	13.5%
NPA, under 30	2.6	17.8
NPA, age 30-59	3.6	22.9

3.5.5 Proportion of Time Receiving Food Stamps

Combining the closure and reopening models, we have calculated the proportion of time over a five-year period during which cases with various characteristics could be expected to receive food stamps. This was done using a Monte Carlo approach, as follows. For each case in each subgroup, two arrays of probabilities were calculated based on the case characteristics: the probability of such a case closing given that it had been active for j months, and the probability of such a case reopening given that it had been inactive for j months, for j=1 to 60. (In most of the the closure and reopening models presented above, these probabilities became constant numbers for j greater than 12 or 18 months.) A hypothetical history of the case was then created for a 60-month period beginning with a case opening, by generating a new random number from a uniform distribution every month. If the case was currently active and the random number for the month was less than the probability of closure, then the case was determined to have closed. Conversely, if the case was currently inactive and the random number for the month was less than the probability of reopening, then the case was determined to have reopened. A count was kept of the number of months in which the case was active. This procedure was repeated for each case a sufficient number of times to yield 5,000 realizations of the five-year period in each of the 18 subgroups. The number of months active was then averaged over the 5,000 realizations for each subgroup.

Table 3.17 shows the results of these simulations. Each entry in the table thus represents the average experience of 5,000 cases of a particular type, with representative variations in other characteristics. The findings are as follows:

- The highest food stamp activity rates are seen among single parent AFDC cases without earnings (58 percent), dual-parent AFDC cases with older head (58 percent) and single elderly receiving SSI or Social Security (62 percent).

- Other groups with high activity rates are single parent AFDC cases with earnings, single parent GA cases, and elderly childless couples receiving Social Security (all 50 to 55 percent).

Table 3.17

ACTIVITY RATE OVER FIVE YEARS
FOR SELECTED SUBGROUPS

	Proportion of Spells	Activity Rate Over 5 Years
Type 1: Single-Parent Households		
AFDC, no earnings	11.7%	57.7%
AFDC with earnings	1.4	54.7
GA, no earnings	1.5	51.2
NPA, no earnings	8.2	33.3
NPA with earnings	5.3	32.8
Type 2: Intact Families		
AFDC, case head under 40	3.9%	47.0%
AFDC, case head over 40	1.7	58.3
NPA, case head under 40	14.3	27.6
NPA, case head over 40	5.1	41.7
Type 3: Single Individuals		
SSI and/or Social Security, elderly	5.5%	61.6%
GA, under age 30	2.7	38.2
GA, age 30-59	2.0	44.3
NPA, under age 30	11.9	20.6
NPA, age 30-59	10.1	23.9
Type 4: Childless Couples		
Social Security, elderly	1.0%	50.2%
NPA, under 30	2.6	19.9
NPA, age 30-59	3.6	32.6

- The groups with the lowest activity rates are several NPA case types: single parent, dual parent with a younger case head, single non-elderly individuals, and non-elderly childless couples (all 20 to 33 percent).

- The remaining groups have intermediate activity rates: dual-parent AFDC cases with a younger case head, dual-parent NPA cases with an older case head, and single GA recipients (all 38 to 47 percent).

It is clear that overall activity rates can reflect the effect of factors working in opposite directions; for example, among intact families, NPA cases with an older case head have a somewhat greater expected activity rate than AFDC cases with a younger case head. Likewise, single-parent AFDC cases with earnings have a higher expected activity rate than elderly couples receiving Social Security because of their higher reopening rate, despite the fact that the latter group have longer spells on average.

3.6 Conclusions

This chapter has presented descriptive and multivariate analyses of the OBRA data base pertaining to short-run caseload dynamics. Some of the main findings were:

- While nearly half of all episodes of food stamp receipt end within six months, the mean completed episode of receipt is about 18 months in length.

- Subgroups of the food stamp population which tend to receive benefits for a shorter period of time include cases which contain work registrants, earners, or only one person.

- Subgroups which tend to receive benefits for a longer period of time include cases which contain AFDC recipients or elderly individuals.

- Nearly one third of all cases experience multiple spells of receipt within a two-year period. Work registrant and earned income cases are more prone to do so, while cases containing elderly individuals are less prone to do so.

Although both quantitative and qualitative variations were seen among the various models, certain relationships appeared with striking consistency:

- Greater food stamp dependency--as measured by high mean length of spell, low probability of closure, high probability of reopening, or the summary activity rate measure--was associated with increased age of the recipient, the recipient being black, receipt of other forms of programmatic income, and a high unemployment rate, at the time the spell began.

- For families with children, additional children increased food stamp dependency, while the presence of earnings decreased dependency.

- Reopening rates apparently fell significantly, although closure rates did not increase, in the post-OBRA period.

CHAPTER FOUR

THE LONG-RUN DYNAMICS OF FOOD STAMP RECEIPT

The purpose of this chapter is to describe the findings of the analysis of long-term participation in the Food Stamp Program, with regard to the following research questions:

- What are the circumstances that lead to food stamp recipiency?
- What are the circumstances surrounding leaving the program?
- How long do people tend to receive food stamps?
- Are patterns of participation affected by:
  - -- recipients' demographic characteristics;
  - -- presence of earned income;
  - -- participation in other income support programs;
  - -- geographic or macroeconomic factors; and
  - -- program attributes?

The analysis of the OBRA data in the previous chapter focused on the short-run dynamics of food stamp receipt, using administrative data covering a period of 39 months. This analysis, in contrast, focuses on the long-run dynamics of food stamp receipt using data collected by the Panel Study of Income Dynamics (PSID) covering an eleven-year period from 1973 to 1983.

This chapter is organized as follows. Following a description of the data, we discuss a number of methodological issues that are peculiar to the analysis of the PSID data. Sections 4.3 and 4.4 present findings pertaining to circumstances surrounding beginnings and endings of food stamp spells, respectively. In Section 4.5, the distributions of lengths of food stamp spells are calculated for both households and individuals, and the results are compared. Multivariate models of closures are then presented in Section 4.6, along with their implications for expected spell duration.

4.1 Description of the Data

The PSID is a nationally representative, longitudinal survey of households conducted by the Survey Research Center at the University of

Michigan. The original 1968 PSID sample of 5,000 American families was made up of approximately 2,000 low-income families drawn from the Census Bureau's Survey of Economic Opportunity (1966-67) and a fresh probability sample of approximately 3,000 additional households taken from the Survey Research Center's national sampling frame. The PSID is especially well suited to analyses of welfare dynamics due to the oversampling of families in poverty, the extraordinarily long period of time of observation (currently seventeen waves of data are available), and the rich amount of information on income, socioeconomic status, family composition, and welfare recipiency.

The findings in this chapter are based on an extract from the PSID database, consisting of 11 waves of data for the entire sample of 5,130 families in 1973, expanded to 6,647 families by 1983. The records were organized with the goal of conducting event history analysis, where each record pertains to one year for each of the years the family or individual is followed. Records are maintained for households even though they may have failed to respond in one or more years.[1] We analyze the years 1973 to 1983. Food stamp spells already in progress in 1973 are not analyzed because they are left-censored, so that in essence we analyze food stamp behavior starting in 1974. This is appropriate, because the program was not implemented nationwide until 1974.

Although thousands of variables are available for use as covariates in the PSID data, not all variables were collected consistently across all years of the panel. We have selected our covariates from variables that were available for all 11 years, including:

- Indicators of the year, food stamp spell duration, and left and right censoring of the data;
- Household composition variables, including number of adults and children, marital status, family type, and presence of elderly;

[1]Until recently, the records for such households and individuals were purged from the data, resulting in an unknown degree of response bias for certain research questions. Only within the past year has it been possible to integrate information on death and other causes of non-response with the rest of the PSID.

- Age, race, sex, education, and other demographic information about the head of household;
- Sources and amounts of all income, earned and unearned; and
- County unemployment rate, and area of residence.

4.2 Methodological Issues

Section 3.2 in the previous chapter described the general methodological approach used in the analyses of both short-run and long-run dynamics of participation in the Food Stamp Program, including the treatment of left- and right-censored spells, the choice between discrete and continuous-time models, the decision between estimating the effects of current or baseline characteristics, functional forms, and the development of a typology of households. In this section we discuss some new issues that are peculiar to analyzing the PSID data: problems with annual observations; interpretation of a "spell" of food stamp receipt; choice of a unit of analysis; longitudinal definition of a family; definition of trigger events for spell beginnings and endings; and use of family and individual weights.

4.2.1 Interpreting Annual Observations

While the annual nature of the data lend themselves to dynamic analyses, in most cases we do not know the month in which particular events, such as the beginning of a food stamp spell, occurred. This feature of the data implies a substantial degree of uncertainty with respect to the timing of events within the year, and therefore with respect to paths of causation. For example, we may observe that in year t a family reports receiving food stamps. We can also observe that in the beginning of year t the family was intact, with a head and spouse. At the end of the year, the couple has divorced. Identifying the divorce as the reason why the family began to receive food stamps depends on whether the divorce--or perhaps a separation followed by a divorce--occurred before or after the first month of the food stamp spell. This information is simply unavailable.

Another important feature of the data is that variables are measured at different points in time during the year. Some variables, such as household composition, marital status, and demographic characteristics, are

observed the day of the interview. Other variables, such as education and race, are recorded once or sporadically through the individual's stay in the study. (Race was observed in 1972 and never again.) Finally, all income and most employment variables pertain to the entire calendar year.

Suppose, for example, that a family is interviewed in March 1981 and again in March 1982. The record for that family for the year 1981 consists of information about household composition and demographics as of March 1981 plus information on earned and unearned income for the following 12 months. This combination of time frames suggests that interpretations of subgroup variations or the effect of earned or unearned income on food stamp dependency must be made with caution. For example, a single woman living alone may have been interviewed in March 1981. Six months later she has an out-of-wedlock baby and goes on AFDC. The record for this year shows an apparent paradox: a single woman with no children receiving AFDC. The sheer length of time, 12 months, between the observation of some characteristics and others introduces problems of interpretation.

4.2.2 Defining a Spell of Food Stamp Receipt

Having only a point-in-time observation of whether or not a household is receiving food stamps in a given year raises the question of our temporal unit of analysis. Throughout this analysis we seek to explain "spells of food stamp receipt", that is, sets of years in which a family participates in the Food Stamp Program for all or part of the time. The use of the word "spell" to denote such periods of time, however, can be misleading, given the common application of this term in social science literature using event history analysis. Traditionally, "spell" means a period of time in which a state or condition is experienced continuously. For example, one analyzes spells of unemployment, spells of marriage, spells of schooling. In this analysis, as explained above, the data do not permit knowledge of whether or not food stamps were received every week or month of the year in which a family reports having received them. Thus although we use the word "spell" to indicate periods of food stamp receipt, the reader must keep in mind that a spell does not necessarily imply continuous receipt.

Despite this drawback, modeling the dynamic process underlying food stamp receipt is more than warranted using these data, given the exceptional features of this database described above.

4.2.3 Choice of Unit of Analysis

One of the controversies in the literature on welfare dynamics is whether the household or the individual is the proper unit of observation.[1] The choice between the individual and the household has important implications for measuring the length of time spent receiving food stamps, frequency of use and so on. We have chosen to analyze length of food stamp participation at the descriptive level for both households and individuals. By comparing the findings for households and individuals, we hope to shed light on the methodologically important issue of the choice of the unit of observation.

Administrative data sources, such as OBRA, do not offer the opportunity of analyzing length of food stamp receipt by individuals--or even families, to be exact. Instead, they follow food stamp cases, as defined by policy and regulations. If a family moves to another State, or perhaps even to another county, it is assigned a new case ID, and information on the continuity of its receipt of benefits is lost. Furthermore, if the head of household changes, due to death, divorce, or marriage, a new case ID may be assigned to the remaining members. The PSID data give us a valuable opportunity to follow receipt of benefits by families through such changes.

As will be seen below, however, any longitudinal definition of a family is essentially arbitrary. The concept of how long a "family" receives food stamps becomes less solid the more it is considered. A family could in principle continue to exist indefinitely, if it contained several generations and the birth of new children replaced losses through deaths and split-offs.

either family. The problem here is that a family is an ever-changing set of individuals--each of whom may or may not have received benefits in a given year in whatever household they resided.

These problems, while existing in principle even over the course of a few months, are more serious for a data set covering a great number of years, such as the PSID, than for one covering only a few years, such as OBRA. In fact, only 13 percent of the original PSID families interviewed in 1968 had undergone no compositional change by 1982. It is because of the inherent ambiguity of the concept of receipt of food stamps by a family that we have analyzed spells of receipt by individuals as well.

4.2.4 Defining a Longitudinal Family

While tracking an individual over time is relatively straightforward, tracking a family over time is fraught with difficulties. The essential problem is determining appropriate rules to govern the definition of a successor family, that is the portion of a family that is the "same family" as the one before a change, such as a divorce, occurred. Suppose, for example, that a family exists in 1973, consisting of a married couple and three children. In 1974, the family has split into two groups, where one group contains the mother and two children, and the other group contains the father and one child. Which group, if either, should be considered the old family? Such changes in family composition are quite common, as noted above.

The designation of a successor family after a change matters a great deal for the analysis of participation in the Food Stamp Program. If one fraction of the family continues to receive food stamps, and the other does not, determination of the length of the food stamp spell will depend on the set of rules identifying the successor family. If one were to use the PSID definition, then whichever group stays with the head (who is by definition male) would be the successor family. Thus, in our example above, the father with the one child would be the same family, while the mother and the two children would be a new family. We rejected this definition because of its sex bias and arbitrariness. Instead, we developed a definition of a longitudinal family based on following the majority of members. Our primary rule is thus that the group containing the majority of family members after a split is the successor family.

In cases of an even split, additional rules are necessary. A compositional change that occurs which leaves the head and spouse relationship intact is nonproblematic: the head and spouse unit constitutes the successor family. For example, an adult child splitting off to form his/her own household is a new family, and the parent is the old family. In other situations that occur occasionally, we have used the following additional rules:

- The group containing the majority of children is designated the successor family.
- If an equal number of children are in each group after the split, the group with the majority of adults is the successor family.
- In the case of an equal split of adults and children the successor family is chosen at random.
- Similarly, if a childless couple splits through divorce or separation, a coin toss determines the successor family. (An exception to this rule is if one spouse is a sample member and the other spouse is not a sample member. In this case, the sample member is considered the successor family and is followed.) If a head or spouse in a childless couple dies or is institutionalized then the surviving spouse is the successor family.

Although we believe that the above definition is the most appropriate for this analysis because it captures family compositional change while taking account of legitimate compositional continuity, we wish to emphasize that any definition of a longitudinal family is necessarily arbitrary. One can only create rules and decide when it is necessary to toss a coin. Taking the basic starting point of our approach--to follow the majority of family members--and then tidying up the loose ends is about the best one can do.

4.2.5 Trigger Events

Bane and Ellwood (1983) used the PSID data to analyze the dynamics of AFDC recipiency through analysis of trigger events preceding case openings and closings. They identify the following potential trigger events for case openings:

- wife becoming a female head;
- single, divorced, widowed, or separated woman without a child becoming a female head with a child;
- decrease in female head's earnings;
- decrease in other adult's earnings;
- decrease in other income;
- increase in family size; and
- moving.

Because of the indeterminacy of the relative timing of events, a change in household composition was considered to have triggered the beginning of an AFDC spell if it occurred either during the year that the AFDC spell began or during the preceding year. Under this broad definition, a divorce in the beginning of one year could be interpreted as triggering the start of an AFDC spell as much as 23 months later; and a divorce at the end of a year could be interpreted as triggering the start of an AFDC spell that occurred as much as 11 months earlier. Changes in earnings were considered substantive if they exceeded $500 in 1978 dollars.

Bane and Ellwood defined the events hierarchically, i.e., a decrease in the earnings of a female head would be considered the trigger event for an AFDC spell beginning only if neither of the first two trigger events had occurred. They found that 45 percent of spell beginnings could be attributed to a wife becoming a female head, another 30 percent to an unmarried woman without a child becoming a female head with a child, and another 12 percent to a fall in a female head's earnings.

The authors similarly defined trigger events for case closings, namely:

- female head becoming wife;
- female head losing child;
- female head's earnings increasing;
- earnings of others increasing;
- other income increasing;

- decrease in family size; and
- moving.

They found that 32 percent of closings occurred after a female head became a wife, 14 percent after a female head lost a child (e.g. the child turned 18), and 32 percent after a female head's earnings increased.

The role of trigger events in food stamp spells beginnings and endings was examined by Lubitz and Carr (1985), using the 1979 ISDP panel. They considered such events as a decrease in the number of earners, a decline in income, a break-up of the household, and exhaustion of UI benefits as potential triggers for entering the Food Stamp Program. Analogously, an increase in income, an increase in the number of earners, receipt of UI benefits, and marriage were considered to be potential triggers for leaving the Food Stamp Program. Their analysis differs from this primarily in that they were using monthly rather than annual data.

In adapting Bane and Ellwood's methodology to our analysis of the Food Stamp Program, we have made two changes. First, as did Lubitz and Carr, we have redefined the trigger events to be more appropriate for the Food Stamp Program. Bane and Ellwood were looking at female-headed AFDC households only; the composition of a food stamp household, in contrast, is unrestricted. We have therefore replaced the trigger events which pertain to women becoming heads or marrying with more general events which pertain to a change in the identity or marital status of the head--including death of head or spouse, and divorce and marriage for either a male or a female head. Likewise, we examine changes in the combined earnings of the household rather than focussing on the earnings of one member.

The second major change that we have made is to calculate the relative frequency of trigger events for households that did <u>not</u> experience openings or closures. For example, Bane and Ellwood found that 45 percent of women who began an AFDC spell recently became female heads. Before concluding that becoming a female head leads to AFDC recipiency, one would want to know what percentage of women who did <u>not</u> begin an AFDC spell recently became female heads. Similarly, we wish to know how many households that continued to receive benefits experienced a trigger event such as marriage or an increase in earnings.

4.2.6 Weighting

As described above, the PSID data consist of two subsamples drawn in 1968, one of which was representative of the population and another which oversampled poor families. We have employed the weights provided by PSID in all descriptive analyses. (For a more detailed description of how these weights are calculated and then adjusted for nonresponse and death through the years, see Procedures and Tape Codes, 1984 Wave XV11 pp. 66-71.)

4.3 Circumstances Surrounding Food Stamp Spell Beginnings

We have used a dynamic approach to the question of why people begin a food stamp spell. That is, instead of simply reporting the static characteristics of households who begin a spell of food stamps, such as size, age groups, and type of family composition, we look for trigger events that have occurred directly before the food stamp spell that are likely to have caused the household to seek assistance in covering their food expenses. Our approach is modeled closely after Bane and Ellwood's hierarchical approach, in that the following events are hypothesized to trigger a food stamp spell:

- A decrease in the number of adults in the household which alters the identity or marital status of the head of household. This may occur through divorce, separation, or death. Note that the loss of a wife is treated symmetrically with the loss of a husband.
- Formation of a new (split-off) household.
- A decrease in the number of adults, other than the head and spouse.
- A drop in the combined taxable income of a household of $500 or more (1978 dollars).
- An increase in family size, through births or through children or adults moving into the household.

Following Bane and Ellwood, changes in household composition are considered potential trigger events if they occur either in the year that food stamp receipt began or in the year preceding. Income changes are measured by comparing income for the year in which food stamp receipt began with income for the preceding year. The events are made to be mutually exclusive by

defining them hierarchically; that is, only if the identity and marital status of the head of household is unchanged do we look for net losses of other adult members, and only if the number of adults is the same do we look for decreases in taxable (non-welfare) income.

Table 4.1 shows the analysis of reasons for opening a spell of food stamps. Food stamp spells are broken down into three categories: those that begin at the same time an AFDC spell begins; those that begin at the same time a spell of other welfare or Social Security begins; and those that begin with no other beginning of welfare or Social Security. The remaining columns show the proportions of non-recipient family years in which these potential trigger events occurred, both for the population as a whole and for households with income less than 400 percent of poverty. To interpret this cut-off, we note that nearly 80 percent of households that start receiving food stamps in a given year were below 400 percent of the poverty line in the preceding year. (Of households that do not start food stamp spells on a five year, 34.4 percent were below 400 percent of the poverty line in the preceding years.)

We see that 80 percent of all food stamp spells begin without a synchronous beginning of a spell of AFDC or other unearned income. About 12 percent of spells begin with an AFDC spell and about 8 percent with a spell of other welfare or Social Security.

One-sixth of all food stamp spells are preceded by the spouse or head dying or otherwise departing from the household. Nearly as many spells are preceded by the new formation of a household.[1] With the addition of the trigger event of the departure of an adult who is not the head or spouse, 40 percent of all spell beginnings are accounted for. A decrease in taxable income among households that do not experience such changes in composition occurs in another 31 percent of households beginning spells, and a further 9 percent experience an increase in household size.

[1]If a household split into two parts and each one then began to receive food stamps, the "successor family" would appear as having its spell triggered by a change in identity or marital status of the head, while the "split off family" would appear as having its spell triggered by new family formation.

Table of Contents

Table 4.1

DISTRIBUTION OF TRIGGER EVENTS ASSOCIATED WITH HOUSEHOLDS BEGINNING A FOOD STAMP SPELL

	Households Beginning a Food Stamp Spell				Households not Beginning a Food Stamp Spell	
	All	Synchronous with AFDC Spells Beginning	Synchronous with Other Welfare or Social Security Spells Beginning	Not Synchronous with Welfare or Social Security Spells Beginning	All	Under 400% of Poverty
Type of Trigger Event						
Change in identity or marital status of head: divorce, death	16.4%	36.8%	16.8%	13.4%	6.0%	6.2%
Newly formed household	15.4	6.4	3.3	17.9	3.4	4.2
Other net decrease in number of adults present	7.9	7.8	7.6	8.0	9.0	7.3
Decrease in taxable income	30.9	33.2	46.1	29.1	30.1	19.5
Other net increase in household size	8.6	4.0	7.1	9.4	6.9	7.3
None of the above	20.8	11.9	19.2	22.3	44.6	55.5
Percent of total spells beginning	100.0	100.0	100.0	100.0	100.0	100.0
Unweighted number of spells	2573	271	228	2074	--	--
Weighted proportion	100.0%	11.8%	7.9%	80.3%	100.0%	34.4%

The second through fourth columns show that there are significant variations in the distribution of trigger events by type of food stamp spell beginning. For openings that are synchronous with AFDC spell beginnings, we see many more changes in identity or marital status of head: this event occurs in 37 percent of AFDC/food stamp openings, compared with only 16 percent of food stamp openings in general. Although split-offs and other net decreases in number of adults present are relatively less common among AFDC/food stamp openings than among other food stamp openings, we still find that changes in the adult composition of the household of all types occur in over half of AFDC/food stamp openings.

Food stamp openings that are synchronous with beginnings of spells of other welfare or Social Security are in contrast relatively more likely to be triggered by a decrease in taxable income. Changes in the adult composition of the household occur in just over a quarter of these openings.

Finally, since the bulk of food stamp openings are not synchronous with either a welfare or Social Security spell beginning, it is not surprising that the distribution of trigger events for openings of that type is very similar to the distribution for all food stamp openings.

The final two columns show that these events are far less common among households that do not begin food stamp spells. The main difference that is seen between these last two columns is that substantive decreases in earnings are less common among the poorer third of the non-recipient population than among the non-recipient population as a whole. We see that less than a fifth of the poorer non-recipient households experienced a change in adult composition in the current or preceding year (compared with 40 percent of households beginning a food stamp spell and 51 percent of households beginning both an AFDC and a food stamps spell). Similarly, less than a fifth experienced a substantive decrease in earnings (compared with 31 percent of households beginning a food stamp spell and 42 percent of households beginning with both another unearned income and a food stamp spell). Thus, some 80 percent of all households beginning a spell of food stamps, but only 45 percent of poorer households not beginning a spell of food stamps, experienced one of the five trigger events.

4.4 Circumstances Surrounding Food Stamp Spell Endings

The analysis of the reasons why a spell ends proceeds analogously to the analysis of the reasons why a spell begins. That is, we identify trigger events that could potentially cause a food stamp spell to end, and report their distribution for spells ending with an ending of an AFDC spell, for spells ending with the ending of a spell of other unearned income, and for all other spell endings. The trigger events for closures are defined symmetrically with the trigger events for openings. We check first for death or institutionalization of the last family member. We then look for a change in the identity or marital status of the head of household due to a marriage or reconciliation, and then for addition of other adults. Next, we look for an increase in household earnings. Finally, if none of the above events occurred, we look for a decrease in family size that might account for the family no longer needing food stamps. We eliminate right censored spells from the analysis, because the year following the last year of a spell must be observed in order to identify trigger events.

The time frames in which trigger events for closings may occur are defined inversely to those for openings--that is, a change in household composition may be thought to trigger a food stamp closure only if it occurs in the last year of food stamp receipt, while a change in income may be a trigger if it occurs either in the last year of food stamp receipt or the following year. Suppose, for example, that a person loses his job, goes on food stamps for several months, finds a new job, and leaves the food stamp rolls, all within a single year. Then the increase in the person's earnings that triggered leaving food stamps would be seen as a higher level of earnings in the year after receipt of food stamps than in the year during which food stamps were received. On the other hand, a person may have been receiving food stamps continuously for several years, and had no earnings at all until the year in which he becomes employed and leaves the food stamp rolls. In this instance, the increase in earnings that triggered leaving food stamps would be seen by comparing the level of earnings in the last year of receipt with the level in the preceding year.

The results of this analysis are shown in Table 4.2. We see that about a fifth of all spell endings are synchronous with spells of AFDC, other welfare, or Social Security, ending as well.

Table of Contents

Table 4.2

DISTRIBUTION OF TRIGGER EVENTS ASSOCIATED WITH HOUSEHOLDS ENDING A FOOD STAMP SPELL

	Spells Ending				
	All	Synchronous with AFDC Spells Ending	Synchronous with Other Welfare or Social Security Spells Ending	Not Synchronous with Welfare or Social Security Spells Ending	Ongoing Spells
Type of Trigger Event					
Change in identity or marital status of head of household: marriage, reconciliation, new cohabitation	4.6%	9.7%	2.7%	3.9%	2.1%
Other net increase in number of adults present	5.9	5.8	6.3	5.9	7.5
Increase in taxable income	53.1	64.6	47.0	51.8	33.5
Death of only/all sample member(s)	4.1	1.1	2.7	4.7	0.0
Other net decrease in size of household	5.8	6.3	4.6	5.8	7.8
None of the above	26.6	12.4	36.6	27.8	49.2
	100.0%	100.0%	100.0%	100.0%	100.0%
Percent of total spells ending	100.0%	12.7%	8.3%	79.0%	--
Unweighted number of spells	2341	321	199	1821	--

Only a small number of food stamp spell endings--4.6 percent--can be associated with marriage of the head of household. This percentage is more than doubled, however, for those households which leave AFDC at the same time they leave food stamps. That is, nearly one out of ten households that simultaneously end AFDC and food stamp spell experience a marriage in the last year of AFDC and food stamp receipt.[1] We see furthermore that the marriage rate among households that continue to participate in the Food Stamp Program is only 2.1 percent--less that half the rate for households that close. We conclude that marriage is an important trigger event, especially for AFDC recipients.

Other net increases in the number of adults present actually occur in more households which continue to receive food stamps (7.5 percent) than in households which stop receiving food stamps (5.9 percent). It is therefore unlikely that this is an important trigger event.

Taxable income increased without a concommitant increase in the number of adults present for over half of households that ended a food stamp spell--and for nearly two-thirds of households that simultaneously ended an AFDC and a food stamp spell--compared with only a third of households that did not end a food stamp spell. Another 4 percent of food stamp closures are attributable to death of the only household member(s)--an event which of course cannot occur to a household that continues to receive food stamps. Other net decreases in the size of the household were, however, somewhat less common among households that stopped receiving food stamps (5.8 percent) than among households that continued to receive benefits (7.8 percent).

To summarize, nearly three-quarters of households ending a food stamp spell experienced one or more of the five potential trigger events, compared with half of households that did not end a food stamp spell. For both ending and ongoing recipient households, increases in income were much

[1]This number is subtantially lower than the fraction of AFDC spell closings that Bane and Ellwood (op. cit.) found to be associated with a marriage of the head--32.4 percent. It is not clear from reading Bane and Ellwood whether they include in their count former AFDC recipients who got married the year after they left the AFDC rolls. If so, that could account for part of the differences. In addition, some AFDC recipients who marry and stop receiving AFDC may continue to receive food stamps.

more common than changes in household composition. The events that were substantially more frequent among closing cases than among ongoing cases were marriage (especially for AFDC cases); increases in earnings; and death of the last household member.

4.5 Length of Spells

The next question to be addressed is, how long do recipients tend to continue receiving food stamps, once they start? We proceed using the same hazard rate methodology as in the analysis of the OBRA data (described in Section 3.2) for both households and individuals, and then compare the results. It should be recalled that a spell, as measured here, represents receipt in one or more months of consecutive calendar years rather than necessarily continuous receipt.

4.5.1 Distribution of Lengths of Spells for Households

Table 4.3 shows the distribution of lengths of food stamp spells for all households and for four subgroups: families receiving AFDC; families containing one or more earners; families whose head is over the age of 59; and households containing only one person.[1] Characteristics are always measured during the first year of the spell. The first column shows the weighted proportions of spells that last one year, two years and so on up to eleven or more years. This is the probability density function, or equivalently, the estimated probability per year that an exit from the Food Stamp Program occurs during that year. The second column shows the weighted cumulative proportion of spells that ended after one year, two years, etc. This is known as the "survivor function".

The mean number of years food stamp spells lasted is shown for all cases and for three of the four subgroups. This statistic is calculated based on the assumption that the hazard rate of ending a spell each year after the tenth year is equal to the average rate for spells lasting 8, 9 and 10

[1]Households containing one or more work registrants, the other subgroup of interest, cannot be identified in the PSID.

Table of Contents

Table 4.3

DISTRIBUTION OF LENGTHS OF SPELLS OF FOOD STAMP RECEIPT FOR HOUSEHOLDS: FREQUENCIES AND CUMULATIVE FREQUENCIES

Number of Years	All Households		Households Receiving AFDC		Households with Earners		Households with Elderly Head		Single-Person Households	
	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.
1	41.8%	41.8%	25.9%	25.9%	46.4%	46.4%	34.5%	34.5%	39.4%	39.4%
2	19.5	61.3	19.6	45.5	18.5	64.9	22.0	56.5	22.4	61.7
3	9.9	71.2	10.4	55.9	9.9	74.8	10.7	67.2	11.1	72.8
4	6.6	77.8	10.4	66.3	6.7	81.5	6.5	73.6	5.4	78.2
5	2.8	80.6	2.0	68.3	2.4	83.9	3.7	77.3	2.7	80.9
6	1.7	82.3	2.8	71.1	1.0	84.9	2.6	79.9	3.1	84.0
7	2.0	84.3	0.6	71.7	2.6	87.5	0.0	79.9	0.2	84.2
8	1.2	85.5	3.3	75.0	0.7	88.2	0.0	79.9	0.1	84.3
9	1.1	86.6	0.0	75.0	1.4	89.6	0.0	79.9	3.6	87.9
10	1.7	88.3	0.0	75.0	2.0	91.6	0.0	79.9	3.5	91.4
11+	11.7	100.0	25.0	100.0	8.4	100.0	20.1	100.0	8.6	100.0
Mean length in years:	4.56		10.38		3.69		N.A.		3.79	
Unweighted number of spells:	2,981		759		2,322		349		553	

years. The unweighted number of spells upon which the mean is based is shown in the last row of the table.[1]

For the caseload as a whole, two-fifths of all spells end the same year they began, and an additional one-fifth last no more than two years. After the fourth year, spells end at a steady, slow rate, with approximately 11 percent of all spells still ongoing after ten years. The mean length of a spell is estimated as 4.6 years. Although this statistic does not measure the length of time families continuously receive food stamps, it does indicate the length of time families have at least occasional contact with the program. Thus, while the average length of continuous food stamp spells was estimated to be about one and a half years in Chapter 3, the total length of time a family is sporadically dependent on the program may be much longer.[2]

The remaining columns in Table 4.3 show the distribution of spell lengths for the four subgroups described above. The highlights of these calculations include the following:

- Not surprisingly, families receiving AFDC during the first year they receive food stamps tend to have much longer spells than average, with a mean length of 10.4 years. Only one in four spells ends after the first

- **Families with earned income** have the shortest mean spell length of the subgroups since they receive stamps for an average of only 3.7 years. Close to half (46%) of households with an earner leave the program after only one year, and over 90% leave by the tenth year.

- **Families in which the head is elderly** have relatively long spells with only about one-third leaving the program after one year. About 20 percent of the spells last more than ten years, which is a greater percentage than for all subgroups except households receiving AFDC.

- **Single-person households** receive stamps for an average of 3.8 years, and end spells at a rate that is about average for the entire population.

Comparing these findings with the analogous results in Bane and Ellwood (1983) reveals both an important substantive insight and an important methodological insight. First, the distribution of lengths of spells for food stamp households that also receive AFDC is very similar to that found by Bane and Ellwood for all AFDC households, reinforcing the notion that AFDC recipients are more dependent on welfare than food stamp recipients in general. Second, despite the very close similarity in the estimated frequencies, the mean length of spell presented here for AFDC/food stamp cases (10.4 years) is more than twice as great as that calculated by Bane and Ellwood for AFDC recipients (4.7 years). The reason is the extreme sensitivity of the calculation to hazard rates beyond, say, the first five or six years of receipt, which are estimated based on very small samples. Table 4.3 shows, for example, that only 3.3 percent of AFDC/food stamp spells ended during the eighth, ninth and tenth years combined--implying a hazard rate of only 3.9 percent per year.[1] This leads to extremely long estimated spell lengths for that substantial portion of the caseload that remained active for more than 10 years. In these circumstances, the mean length of spell may be of limited use as a summary statistic.

Table 4.4 takes a closer look at the spells of single person households. The small number of observations precludes examination of racial

[1]This is calculated as $\frac{.033}{.283 + .283 + .283}$, since 28.3 percent of spells lasted up through their seventh year.

Table of Contents

Table 4.4

DISTRIBUTION OF LENGTHS OF SPELLS OF FOOD STAMP RECEIPT
FOR SINGLE-PERSON HOUSEHOLDS ONLY:
FREQUENCIES AND CUMULATIVE FREQUENCIES

Number of Years	Race[a]				Age in Years						Sex			
	White		Black		< 26		26-59		> 59		Male		Female	
	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.
1	42.1%	42.1%	35.5%	35.5%	44.0%	44.0%	42.3%	42.3%	30.4%	30.4%	50.3%	50.3%	32.9%	32.9%
2	22.4	64.5	17.5	53.0	26.3	70.3	22.8	65.1	17.2	47.6	26.6	76.9	20.3	53.2
3	13.3	77.8	5.6	58.6	11.4	81.7	11.6	76.7	10.2	57.8	7.1	84.0	13.4	66.6
4	6.3	84.2	1.7	60.4	2.3	84.0	5.3	82.1	9.3	67.1	2.7	86.7	6.9	73.4
5	3.5	86.7	3.3	63.7	0.5	84.5	4.8	86.9	3.3	70.4	1.4	88.1	3.4	76.8
6	3.7	90.4	0.0	63.7	3.6	88.1	0.0	86.9	5.1	75.6	0.0	88.1	4.2	81.0
7	0.0	90.4	1.3	64.9	0.0	88.1	0.6	87.5	0.0	75.6	1.3	89.3	0.0	81.0
8	0.0	90.4	1.4	66.3	0.0	88.1	0.4	87.9	0.0	75.6	0.0	89.3	0.1	81.1
9+	9.6	100.0	33.7	100.0	11.9	100.0	12.1	100.0	24.6	100.0	11.7	100.0	18.9	100.0
Unweighted number of spells:	183		348		186		230		137		235		318	

[a]Other races excluded due to small number of observations.

groups other than blacks and whites, simultaneous analysis of race, age, and sex, and calculation of mean spell lengths for subgroups. Nonetheless, we can see some important subgroup differences among singles. In particular:

- Blacks have longer spells than whites, leaving the program at a much slower rate.
- Singles who are elderly (over 59 years) at the beginning of a spell have longer spells than younger singles.
- Female singles tend to have longer spells than male singles.

These descriptive analyses of the survival rate of food stamp recipients give strong indication of the need to include duration dependence in our multivariate models of closures. The exit rate from the program does not follow a neat linear pattern. Instead, most cases close after the first year or two, accounting for the steep drop in the beginning.

4.5.2 Distribution of Lengths of Spells for Individuals

In analyzing spells for individuals, each person is followed over time, regardless of changes in household composition. An individual is considered to be a food stamp recipient if he or she resides in a household that receives food stamps.

Approximately 65,000 observations--or family-years--were included in the family-level analysis reported in the previous section. In the individual-level analysis, we have approximately 175,000 observations, or individual-years. Similarly, while the families experienced 2,981 non-left-censored spells, individuals report 8,627 non left-censored spells.

Table 4.5 shows the rate at which individuals leave the Food Stamp Program, and the estimated mean length of stay, for all individuals, for individuals living in AFDC households, for individuals living in households with earned income, for individuals living in households headed by an elderly

Table of Contents

Table 4.5

DISTRIBUTION OF LENGTHS OF SPELLS OF FOOD STAMP RECEIPT FOR INDIVIDUALS: FREQUENCIES AND CUMULATIVE FREQUENCIES

Number of Years	All Individuals		Individuals Living in Households: Receiving AFDC		With Earners		With an Elderly Head		Consisting of One Person	
	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.	Freq.	Cum.
1	43.0%	43.0%	21.5%	21.5%	46.5%	46.5%	30.0%	30.0%	41.3%	41.3%
2	21.8	64.8	22.0	43.5	20.9	67.4	31.2	61.2	25.0	66.3
3	9.0	73.8	9.3	52.8	8.2	75.6	10.1	71.3	11.6	77.9
4	7.0	80.8	10.3	63.1	7.4	83.0	6.3	77.6	5.1	83.0
5	4.2	85.0	6.2	69.3	4.2	87.2	3.7	81.3	4.3	87.3
6	1.8	86.8	1.6	70.9	1.6	88.8	2.0	83.3	1.8	89.0
7	1.8	88.5	2.6	73.5	1.7	90.5	2.6	85.9	0.0	89.0
8	1.6	90.1	3.3	76.8	1.8	92.3	0.6	86.5	0.0	89.0
9	2.4	92.5	3.9	80.7	2.7	95.0	0.1	86.6	0.0	89.0
10	2.0	94.5	2.2	82.9	1.5	96.5	7.1	93.7	7.2	96.2
11+	5.5	100.0	17.4	100.0	3.5	100.0	6.3	100.0	3.8	100.0
Mean length in years:	3.22		5.79		2.87		3.69		3.07	
Unweighted number of spells:	8,627		2,130		7,215		773		401	

person, and for individuals living alone. As before, all characteristics are measured in the year a spell began.[1]

The highlights of Table 4.5 are as follows:

- Nearly two thirds (65%) of spells end after two years, and of those the majority end after only one year. The average length of stay for individuals in the Food Stamp Program is 3.2 years.
- The rate of leaving the program after the third year of receipt is fairly slow and steady, with just a few cases closing each year.
- Only 5.5% of spells last more than 10 years.
- Individuals who live in AFDC households have much longer spells than average, lasting nearly 5.8 years, with 17% still ongoing after 10 years. Still, half of these spells are over after the third year.
- Individuals who live in households with some earned income have relatively short spells, averaging just under three years in length.
- Individuals who live in a household with an elderly head tend to have somewhat longer spells than the food stamp population as a whole, lasting an average of 3.7 years.
- Finally, single-person households have spells that are about the same as for the population as a whole (average spell length 3.1 years).

Although as discussed below, the distributions for individuals differ systematically from those of families, the qualitative relationships are the same: spells are longest for individuals in households which receive AFDC or have an elderly head, and shortest for households which contain one or more earners.

[1]It should be noted that a single individual is not the same as a one-person household. For example, a person who is single initially may marry, have children, and then split off to be single again. The individual is followed through all these changes; the corresponding household, according to our rules, consist instead of the spouse and children at the end of all the changes.

4.5.3 Sources of Differences Between Family-Level and Individual-Level Mean Spell Lengths

A striking feature of the preceding section was the finding that the mean length of a food stamp spell was substantially shorter for an individual than for a family--3.2 versus 4.6 years. This finding was replicated for every subgroup as well. Furthermore, only 5 percent of individual spells last eleven or more years, compared with 11 percent of family spells.

Figure 4.1 displays the difference in distributions graphically. We see that individuals have proportionately more 1 and 2 year spells, and proportionately fewer very long spells, than families.

Differences between the distributions could arise due to a number of factors. These can be seen most clearly by considering a single pair of years. An individual who is receiving food stamps in Year 1 can experience six outcomes in Year 2:

(1) s/he may die;

(2) s/he may drop out of the survey;

(3) s/he may remain in the same household, and continue to receive food stamps;

(4) s/he may remain in the same household, but stop receiving food stamps;

(5) s/he may split off to form a new household, and continue receiving food stamps; or

(6) s/he may split off to form a new household, and stop receiving food stamps.

Similarly, the household of which the individual was a member may experience three outcomes in Year 2:

(a) it may drop out of the survey;

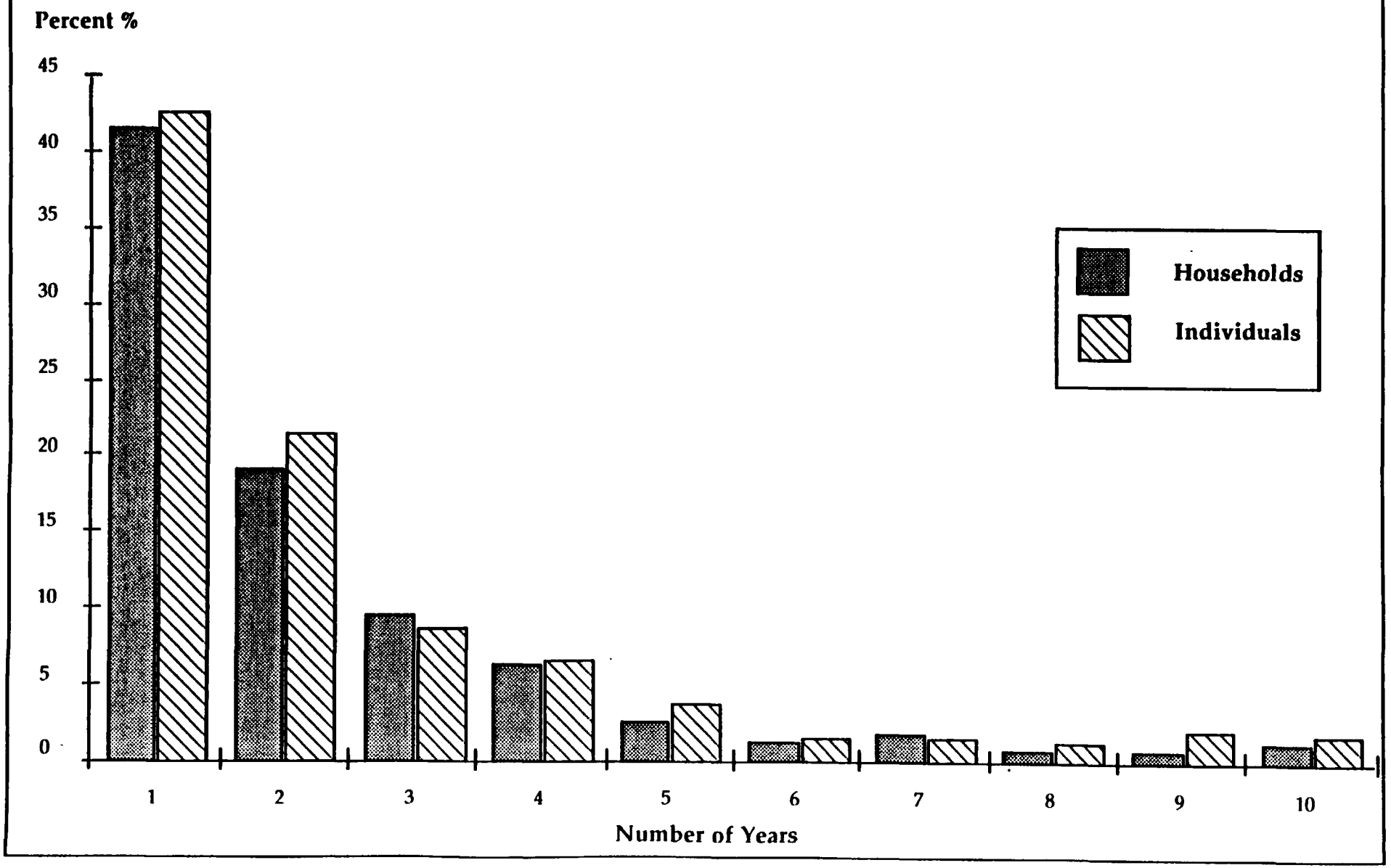
(b) it may continue to receive food stamps; or

(c) it may stop receiving food stamps.

Some of the possibilities for an individual preclude some of the possibilities for a household, and vice versa. For example, if the individual remains in the household and continues to receive food stamps (choice (3))

Figure 4.1

DISTRIBUTION OF LENGTHS OF SPELLS FOR HOUSEHOLDS AND INDIVIDUALS



then the household must continue to receive food stamps (choice (b)); and if the individual remains in the household and stops receiving food stamps (choice (4)) then the household must have stopped receiving food stamps (choice (c)).

Three events that would lead to the probability of closure for an individual differing from the probability of closure for a household are the following: (1) the individual could die, while the household continued to receive food stamps; (2) the individual could split off and stop receiving food stamps, while the household continued to receive food stamps; or (3) the individual could split off and continue to receive food stamps, while the household stopped receiving food stamps. The first and second of these would lead to longer food stamp spells for households than for individuals, as we actually observe; the third, which we would expect to be less common, would lead to longer food stamp spells for individuals than for households.

In addition, there are two compositional factors that could lead to a divergence in distributions, even without any split offs or deaths. First, suppose that the food stamp population consists of large households and small households, and that large households have a higher probability of closure than small ones. The members of large households necessarily comprise a greater proportion of individuals than the large households comprise of households. Hence the closure rate for individuals, which is a weighted average of the closure rates for individuals residing in large and small households, would be greater than the closure rate for households.

The second compositional effect is related to the fact that both the individual and the household data show a dramatic concentration of closures in the first year. When a split-off household forms, the first year that it receives food stamps may not in fact be the first year that the individuals in it received food stamps. Consequently, the first-year closure rate of split-off households may be lower than the first-year closure rate for households that were known to have existed the year before they started receiving food stamps. The fact that every individual gets a chance to experience the high first-year closure rate, but some split-off households do not, could also lead to higher closure rates for individuals than for households.

4.6 Multivariate Analyses of Closures

The descriptive findings reported in the preceding sections are useful indicators of trends among subgroups with regard to dependency on the Food Stamp Program. The obvious limitation of univariate analysis of this kind is that it cannot permit the assessment of marginal effects of particular characteristics in the food stamp population. That is, we cannot determine the extent to which, controlling for other measured characteristics, earners are more likely to quit the program after a short period of time than other participants. The higher observed closure rate of earners could be due to some other characteristic highly correlated with earners, such as sex, education or receipt of other income. To answer this sort of question, multivariate analysis is required.

Four separate models of closures have been estimated, corresponding to four types of food stamp households: households consisting of a single parent with children under the age of 18; households consisting of two or more adults with children under the age of 18; single-person households; and households consisting of more than one adult and no children. This typology is identical to that used in the OBRA analysis and is repeated here for consistency and for its implications for model development. Some variables of central interest for one household type may be irrelevant for other household types. For example, the number of dependent children is potentially a strong predictor of the closure rate for a single-parent household, but clearly not applicable for single-person households. The unemployment rate has been included in every model, but we expect its effect on the closure rate to be more significant for two-parent households than for one-parent households.

The independent variables are all measured during the first year of the spell, since the central question addressed in these analyses is "given characteristics of the applicant upon first entering to the program, what is the rate of closure?" The reader should be reminded of the weaknesses inherent in using annual data. Most variables are measured at a point in time, usually the day of the interview. Conditions such as number of children and marital status can easily change in the course of the first year of the spell, but these changes will go unaccounted for until the next year's interview.

The independent variables fall into the following groups:

- Household composition: family size, number of children under 18, the presence of a child under 6, and whether or not the family is of the "nuclear type", that is the head lives with his spouse and children only;

- Demographics of the head of household: race, age, sex, and whether or not the head is a high school graduate;

- Sources of household income: receipt of AFDC, other welfare, Social Security, and earned income;

- Macroeconomic variables: region, county unemployment rate, and an indicator of whether or not the spell started before or after the elimination of the purchase requirement (1979); and

- Length of spell: dichotomous variables measuring the length of the spell before closure (1,2,3, up to 8 or more years). These variables are intended to capture "duration dependence", e.g. the effect of elapsed time on the probability of a household leaving the program.

Models were specified in part by first estimating a set of effects using ordinary least squares regression. Variables that were not significant at the .30 level were then dropped from the logit models.

We turn next to discussing the results of each of the four models.

4.6.1 One-Adult Households With Children

As shown in Table 4.6, the average annual closure rate for this type of household is 18.5%. This rate varies substantially, however, depending on a variety of household characteristics and conditions.

Each additional dependent child reduces the annual probability of closure by 2.0 percentage points. Families with white heads are, all else equal, 8.0 percentage points more likely to close in a given year than families headed by nonwhites, while families with heads under age 30 are 8.1 percentage points less likely to close than families with older heads.

The presence of earned and unearned income have large effects, as anticipated. A family that is initially on AFDC is 8.5 percentage points less likely to close in a given year than a non-AFDC family with the same measured characteristics, while a household is significantly more likely to end its food stamp spell if there is earned income initially, by 10.0 percentage points per year.

Table of Contents

Table 4.6

LOGISTIC MODEL OF CLOSURES: ONE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	S.E.	Impact
Intercept	-.1975	.4032	-.0298
Number of Children under age 18	-.1314**	.0644	-.0198
Demographics of Head			
Male	.4856	.4479	.0732
White	.5323***	.1707	.0803
Under 30 years old	-.5360***	.1562	-.0808
High School graduate	.1842	.1403	.0278
Receipt of AFDC	-.5601***	.1522	-.0845
Presence of Earned Income	.6610***	.1532	.0997
Region			
Northeast	-.3700**	.1512	-.0558
West	-.0550	.2093	-.0083
Unemployment Rate in County of Residence	-.1093	.0802	-.0165
Post EPR	-.4378**	.1445	-.0660
Duration of Spell			
1 years	.1978	.1485	.0298
4 years	-.3942	.2603	-.0594
5 years	-.9489***	.3535	-.1431
6 years	-2.8680***	1.0175	-.4324
7 years	-.6867	.4585	-.1035
Over 7 years[a]	-2.0192***	.7342	-.3044
Family-Years: 1656			
Mean Annual Closing Rate: 0.1850			

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

[a]Spells lasting 8, 9, 10, or 11 years were combined due to few observations for each spell length.

Several macroeconomic variables also have important impacts. First, households located in the northeast region of the United States[1] have significantly lower closure rates than in the South, while the effect of living in the West relative to the South is insignificant. Second, a spell that began in the post-EPR period, after 1979, has substantially lower closure rate than a spell beginning before the EPR. This administrative change, and/or concurrent macroeconomic changes, reduced the closure rate by 6.6 percentage points per year for this household type. The unemployment rate in the county of residence has a negative effect on the closure rate that is not statistically significant.

Finally, with respect to the effect of the duration of the spell, a strong negative effect is observed for spells lasting five or more years relative to spells in their first year. (The excluded category is spells that have lasted two to three years.) That is, the longer a spell lasts, the less likely it is to close.

4.6.2 Multiple-Adult Households with Children

Table 4.7 shows the results of the logit model estimated for the second household type, about three-quarters of which are two-parent households of the nuclear type: head and spouse living with their children and no others. The mean annual closure rate for this family type is the highest of all types, at about 29.7 percent.

Household size and structure have important effects. For every additional child, the likelihood of a spell closing each year is reduced by 1.2 percentage points, while for every additional adult, the likelihood of a spell closing is increased by 1.7 percentage points. Non-nuclear families are 5.9 percentage points less likely to close than nuclear families. Both the race and the education of the household head have significant effects as well: cases headed by whites are 4.9 percentage points more likely to close, and cases headed by high school graduates are 5.3 percentage points more likely to close, than other similar cases.

---

[1] See Chapter 3 for an explanation of how the region variable is constructed.

Table of Contents

Table 4.7

LOGISTIC MODEL OF CLOSURES:
MULTIPLE-ADULT HOUSEHOLDS WITH CHILDREN

Variable	Coefficient	S.E.	Impact
Intercept	-1.4572***	.2772	-.3042
Number of Children under age 18	-.0593**	.0287	-.0124
Number of Adults	.0831	.0574	.0173
Non-Nuclear Family Type	-.2815***	.1057	-.0588
Demographics of Head			
White	.2337**	.0982	.0488
High School graduate	.2526***	.0929	.0527
Receipt of AFDC	-.7591***	.1139	-.1585
Receipt of Other Welfare	-.4386***	.1710	-.0916
Presence of Earned Income	.6047***	.1831	.1263
Region			
Northeast	.1249	.0973	.0261
West	.1924	.1485	.0402
Unemployment Rate in County of Residence	-.0127	.0087	-.0027
Post EPR	-.6655***	.0931	-.1389
Duration of Spell			
1 year	.8132***	.1467	.1698
2 years	.3155*	.1622	.0659
4 years	-.3476	.2285	-.0726
5 years	-.8593***	.3080	-.1794
6 years	-1.0305***	.3799	-.2152
7 years	-.6375	.3875	-.1331
Over 7 years	-.5597	.3560	-.1169
Family-Years: 2836			
Mean Annual Closing Rate: 0.2970			

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

[a]Spells lasting 8, 9, 10, or 11 years were combined due to few observations for each spell length.

Table of Contents

Table of Contents

Table 4.8

LOGISTIC MODEL OF CLOSURES: ONE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	S.E.	Impact
Intercept	-.8419**	.3924	-.1599
Demographics of Head			
White	.5273***	.1528	.1002
Male	.2479*	.1579	.0471
Receipt of Social Security	-.4496**	.1922	-.0854
Receipt of Other Welfare	-.2996*	.1805	-.0569
Presence of Earned Income	.3582**	.1584	.0680
Region			
Northeast	.1359	.1676	.0258
West	.3831*	.2035	.0728
Unemployment Rate in			
County of Residence	-.2191**	.0879	-.0416
Post EPR	-.3058**	.1500	-.0581
Duration of Spell			
1 year	.7179***	.2272	.1364
2 years	.3412	.2505	.0648
4 to 5 years	-.4674	.3080	-.0888
Over 5 years[a]	-1.7544***	.5114	-.3333
Family-Years: 1211			
Mean Annual Closing Rate: 0.2550			

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

[a]Spells lasting 6, 7, 8, 9, 10 or 11 years were combined due to few observations for each spell length.

4.6.4 Multiple-Adult Households Without Children

The final household type for which closure rates were analyzed has a mean annual closure rate of 31.1 percent, as shown in Table 4.9. About three-quarters of these households consist of husband and wife.

Of the household composition and demographic variables, only education has a significant impact for these households: households headed by high school graduates are 11.3 percentage points more likely to close per year. Receipt of Social Security and GA or other public assistance substantially reduces closure rates by 8.9 and 10.4 percentage points, respectively, per year.

Macroeconomic variables have important effects: each percentage point increase in the county unemployment rate reduces the annual closure rate by four percentage points per year, and EPR is again estimated to have a significant and negative impact on closures, of 16.1 percentage points per year.

We see the same pattern of falling closure rates over time as was observed for the other household types: spells are substantially more likely to close in their first year than in later years of activity.

4.6.5 Summary

With the exception of regional effects, which were scattered, there was general substantive agreement among the four closure models in direction and significance of effects of virtually all of the covariates. In particular, it was found that:

- for households with children, presence of additional children reduces the closure rate;
- for three out of the four groups, cases head by whites have significantly lower closure rates than cases head by nonwhites;
- except for one-adult households, neither sex nor age of head of household has any significant effect;
- in two of the four groups, cases headed by high school graduates have higher closure rates than cases headed by high school dropouts;

Table 4.9

LOGISTIC MODEL OF CLOSURES: MULTIPLE-ADULT HOUSEHOLDS WITHOUT CHILDREN

Variable	Coefficient	S.E.	Impact
Intercept	-.3973	.4085	-.0851
Demographics of Head			
White	.2700	.1723	.0579
High School graduate	.5291***	.1828	.1134
Receipt of Social Security	-.4156**	.1943	-.0891
Receipt of Other Welfare	-.4830**	.2473	-.1035
Region			
Northeast	.2545	.1856	.0545
West	.2246	.2526	.0481
Unemployment Rate in			
County of Residence	-.2025**	.0969	-.0434
Post EPR	-.7515***	.1667	-.1610
Duration of Spell			
1 year	.9352***	.2308	.2004
2 years	.4290	.2634	.0919
Over 3 years[a]	-1.0847**	.4305	-.2324
Family-Years: 842			
Mean Annual Closing Rate: 0.3110			

***Statistically significant at the 1 percent level.
**Statistically significant at the 5 percent level.
*Statistically significant at the 10 percent level.

[a]Spells lasting 4, 5, 6, 7, 8, 9, 10 or 11 years were combined due to few observations for each spell length.

- receipt of AFDC, Social Security, and other welfare have significant negative effects on closure rates, while presence of earnings has a significant positive effect for three of the four groups;

- the unemployment rate in the county of residence has a significant negative effect for the two childless household types;

- closure rates were significantly lower after the EPR for all four groups; and

- closure rates are highest in the earlier years of a spell and lowest in the later years.

Table 4.10 translates the significant impacts of the models on annual probability of closure into impacts on expected length of spell. We assume that the expected length of a spell can be sufficiently well approximated by the inverse of the average annual closure rate. We use the average closure rate over the observation period as a benchmark. (This is downward biased estimate of the true average closure rate, because the ends of the right-censored spells are excluded.) For example, Table 4.6 indicates that the closure rate for one-adult households with children is 0.1850 during the sample period. Each additional child decreases this rate by 0.0198. Centering the effect of an additional child around 0.1850 yields alternative annual closure rates of (0.1850 ± 0.0099), or 0.1949 and 0.1751. These correspond to average lengths of spell of 5.13 and 5.71 years, respectively. Hence the impact on an additional child is calculated as (5.71 - 5.13), or 0.58 years, i.e., 7 months.

Some conclusions we can draw from this table are:

- for multiple adult households, the presence of an additional adult can be expected to reduce the expected length of spell by about 2 months;

- for households with children, the presence of an additional child increases the expected length of spell from 2 to 7 months;

- non-nuclear families tend to have spells that are 8 months longer, other things equal;

- households headed by whites have spells that are shorter by amounts ranging from 7 months to over 2 years, depending on household type;

Table 4.10

IMPACTS ON EXPECTED LENGTH OF SPELL

	One-Adult Households with Children	Multiple-Adult Households with Children	Single Individuals	Multiple-Adult Households Without Children
Additional Child	+7.0 months	+1.7 months	--	--
Additional Adult	--	-2.4 months	--	--
Non-nuclear Family Type	--	+8.1 months	--	--
White Head of Household	-29.5 months	-6.7 months	-19.2 months	--
Head of Household under 30	+29.8 months	--	--	--
Head of Household a High School Graduate	--	-7.2 months	--	-14.6 months
Receipt of AFDC	+31.2 months	+23.2 months	--	--
Receipt of Social Security	--	--	+16.2 months	+11.3 months
Receipt of Other Welfare	--	+12.8 months	+10.6 months	+13.2 months
Presence of Earnings	-37.7 months	-18.0 months	-12.8 months	--
Additional Percentage Point of Unemployment	--	--	+7.7 months	+5.4 months
Post EPR	+23.9 months	+20.0 months	+10.9 months	+21.4 months

- receipt of AFDC increases the expected length of spell by 2 to 2½ years;

- receipt of Social Security and other welfare each increase the expected length of spell by about a year;

- presence of earnings reduces the expected length of spell by 1 to 3 years, depending on household type;

- each additional percentage point of unemployment increases expected length of spell by 5 to 8 months for households without children; and

- spells tend to be 1 to 2 years longer, depending on household type, since the elimination of the purchase requirement.

REFERENCES

Allison, Paul D. (1982). "Discrete Time Methods for the Analysis of Event Histories." In Samuel Leinhardt (ed.) Sociological Methodology 1982, Jossey-Bass, San Francisco: 61-98.

Bane, Mary Jo, and David T. Ellwood (1983). The Dynamics of Dependence: The Routes to Self-Sufficiency. Report to U.S. Department of Health and Human Services. Urban Systems Research and Engineering, Inc., Cambridge, MA.

Bane, Mary Jo, and David T. Ellwood (1985). "Slipping Into and Out of Poverty: The Dynamics of Spells." Unpublished manuscript.

Barnes, Roberta, and Demetra Nightingale (1985). "Analysis of Longitudinal Food Stamp Case Record Data." The Urban Institute, Washington, D.C.

Bergsman, Anne (1986). "Preparation of Final Analysis Data Tape." The Urban Institute, Washington, D.C.

Carr, Timothy J., Pat Doyle, and Irene Smith Lubitz (1984). Turnover in Food Stamp Participation: A Preliminary Analysis. Mathematica Policy Research, Inc., Washington, D.C.

Coe, Richard (1977). "Participation in the Food Stamp Program Among the Poverty Population." In G.J. Duncan and J.N. Morgan (eds.) Five Thousand American Families--Patterns of Economic Progress, Vol. 5. Ann Arbor, MI: Institute for Social Research, University of Michigan: 249-271.

Coe, Richard (1979). "An Examination of the Dynamics of Food Stamp Use." In G.J. Duncan and J.N. Morgan (eds.) Five Thousand American Families--Patterns of Economic Progress, Vol. 7. Ann Arbor, MI: Institute for Social Research, University of Michigan: 183-268.

Coe, Richard (1981). "A Preliminary Empirical Examination of the Dynamics of Welfare Use." In M. Hill, D. Hill, and J.N. Morgan (eds.) Five Thousand American Familes--Patterns of Economic Progress, Vol. 9. Ann Arbor, MI: Institute for Social Research, University of Michigan: 121-168.

Coe, Richard (1983a). "Nonparticipation in Welfare Programs by Eligible Households: The Case of the Food Stamp Program." Journal of Economic Issues, Vol. XVII, No. 4: 1035-1056.

Coe, Richard (1983b). "Participation in the Food Stamp Program, 1979." In G.J. Duncan and J.N. Morgan (eds.) Five Thousand American Familes--Patterns of Economic Progress, Vol. 10. Ann Arbor, MI: Institute for Social Research, University of Michigan: 121-159.

Czajka, John L. (1981). Determinants of Participation in the Food Stamp Program: Spring 1979. Draft final report to the U.S. Department of Agriculture. Mathematica Policy Research, Inc., Washington, D.C.

Doyle, Pat (1985). "Further Analysis of Serial Multiple Benefit Receipt." Memo to the U.S. Department of Agriculture. Mathematica Policy Research, Inc., Washington, D.C.

Duncan, Greg J., and Martha S. Hill (1985). "Conceptions of Longitudinal Households: Fertile or Futile?" Journal of Economic and Social Measurement, Vol. 13, No. 3-4: 361-375.

Ellwood, David T. (1986). Targeting 'Would-Be' Long-term Recipients of AFDC. Report to the U.S. Department of Health and Human Services. Mathematica Policy Research, Inc., Washington, D.C.

Ellwood, David T. (1986). "Working Off Welfare: Prospects and Policies for Self-Sufficiency of Female Family Heads." Unpublished manuscript.

Flinn, C.J., and J.J. Heckman (1982). "Models for the Analysis of Labor Force Dynamics." In G. Rhodes and R. Basmenn (eds.) Advances in Econometrics, Vol. 1. London, CT: JAI Press, Inc.: 35-95.

Fraker, Thomas and Robert Moffitt (1988). "Effects of Food Stamps on Labor Supply." Journal of Public Economics.

Goodman, Leo A., and William H. Kruskal (1979). Measures of Association for Cross Classifications. New York, N.Y.: Springer-Verlag Publishers.

Hamilton, William L. (1988). Food Stamp Program Certification Costs: Interim Report. Abt Associates Inc., Cambridge, MA.

Hollonbeck, Darrell, and James C. Ohls (1984). "Participation Among the Elderly in the Food Stamp Program." The Gerontologist, 24, 6: 616-621.

Hutchins, Robert M. (1981). "Entry and Exit Transitions in a Government Transfer Program: The Case of Aid to Families with Dependent Children." The Journal of Human Resources. Vol. XVI, No. 2: 217-237.

Kirlin, John A. (1982). A Longitudinal Analysis of Case Closures, Reopenings, and Benefit Changes in the Massachusetts NPA Food Stamp Program. Abt Associates Inc., Cambridge, MA.

Kirlin, John A., and Sally R. Merrill (1985). A Longitudinal Study of Participation Patterns in the Food Stamp Program. Draft final report to the U.S. Department of Agriculture. Abt Associates Inc., Cambridge, MA.

Kirlin, John A. (1985). Patterns of AFDC Dependency in Michigan and Massachusetts (draft). Abt Associates Inc., Cambridge, MA.

Long, Sharon (1985). Turnover in the Food Stamp Program: A Methodological Review. Mathematica Policy Research, Inc., Washington, D.C.

Lubitz, Irene S., and Timothy J. Carr (1985). Turnover in the Food Stamp Program in 1979: The Role of Trigger Events. Final report to U.S. Department of Agriculture. Mathematica Policy Research, Inc., Washington, D.C.

MacDonald, Maurice (1977). Food Stamps and Income Maintenance. New York: Academic Press.

MacDonald, Maurice (1985). Serial Multiple Benefits and Monthly Income Adequacy. Final report to U.S. Department of Agriculture. Mathematica Policy Research, Inc., Washington, D.C.

Merck, Carolyn (1980). Turnover and Recidivism in the Food Stamp and Aid to Families with Dependent Children Programs. Final report to U.S. Department of Health, Education, and Welfare. Mathematica Policy Research, Inc., Washington, D.C.

O'Neill, June A., Laurie J. Bassi, and Douglas A. Wolf (1987). "The Duration of Welfare Spells." Review of Economics and Statistics, May: 241-248.

Plotnick, Robert (1983). "Turnover in the AFDC Population: An Event History Analysis," Journal of Human Resources, Vol. 18, No. 1: 65-81.

Rein, Martin, and Lee Rainwater (1978). "Patterns of Welfare Use." Social Service Review, December, 52: 511-534.

Ruggles, Patricia (1988). "Welfare Dependency and Its Causes: Determinants of the Duration of Welfare Spells." Paper presented at the Annual Meeting of the American Economic Association. The Urban Institute, Washington, D.C.

Seagrave, Charles (1975). The Cyclical Behavior of Transfer Income Programs: A Case Study of the Current Recession. U.S. Department of Health, Education and Welfare, Washington, D.C.

Springs, Ricardo C. (1978). Food Stamp Participation Patterns in Seattle, Washington--1971. Final report to State of Washington Department of Social and Health Services. Mathematica Policy Research, Inc., Washington, D.C.

Tuma, Nancy B. (1982). "Nonparametric and Partially Parametric Approaches to Event-History Analysis." In S. Leinhardt (ed.) Sociological Methodology 1982. Washington, D.C.: Jossey-Bass Publishers.

Wolf, Douglas A. (1985). "Dynamics Analysis of Food Stamp Longitudinal Data: Design of an Econometric Model and Preliminary Results." (Draft) The Urban Institute, Washington, D.C.

Table of Contents

APPENDIX A

LITERATURE REVIEW SUMMARY TABLES

This appendix consists of three summary tables. The first two, which are reproduced from Sharon Long's methodological review of the literature on Food Stamp Program participation (1985), present information on the methods used in various descriptive and multivariate studies. The third table outlines the substantive findings of numerous studies of Food Stamp Program participation.

Table of Contents

Table A.1

SUMMARY OF THE METHODOLOGY OF DESCRIPTIVE STUDIES ON THE DYNAMICS OF PROGRAM PARTICIPATION

Study	Program(s) Considered	Issue(s) Addressed	Sample Time Frame	Sample, Sample Period (Sample Size)	Data Source (Limitations)	Unit Followed Over Time	Definition of a Spell	Major Advance(s) Over Previous Work
Springs (1977)	FS and AFDC	Number of participants over time Duration of participation Frequency of participation Composition of participating households	Fixed time-period	Families with household head aged 18 to 58 in 1971, 1971 (approximately 571 families)	Control group of the DIME (non-representative sample)	Sample restricted to households with same headship status in 1971	Number of consecutive months during which household receives FS benefits	Considered extent of participation and eligibility over time Used monthly data
Rein and Rainwater (1978)	AFDC	Number of participants over time Duration of participation Frequency of participation AFDC income as share of total income	Fixed time-period	Families of females aged 18-54 in 1968, 1968-1974 (3,086 families)	PSID (annual data)	Females aged 18-54 in 1968	Number of consecutive calendar years during which family receives annual AFDC income of $100 or more	Considered extent of family's reliance on welfare over time
Merck (1980)	FS and AFDC	Number of participants over time Duration of participation Frequency of participation Composition of participating households	Fixed time-period	Families with household head aged 18 to 58 in 1971, January 1971-December 1974 (approximately 571 families)	Control group of the DIME (non-representative sample)	Sample restricted to households with same headship status from January 1971 to December 1974	Number of consecutive months during which household receives AFDC or FS benefits	Used monthly data
Coe (1981)	FS, AFDC SSI, GA, and Social Security	Number of participants over time in all programs combined, cash programs only, and food stamps only Frequency of participation in all programs combined, cash programs only, and food stamps only Duration of participation in any welfare program Characteristics of welfare program participants	Fixed time-period	All individuals for which there was data for the entire sample period 1969-1978 (12,562 individuals)	PSID (annual data)	Head of household	Number of consecutive calendar years during which household receives any welfare benefits, cash program benefits only, or food stamps only	Considered participation in multiple assistance programs

Table A.1
(continued)

Study	Program(s) Considered	Issue(s) Addressed	Sample Time Frame	Sample, Sample Period (Sample Size)	Data Source (Limitations)	Unit Followed Over Time	Definition of a Spell	Major Advance(s) Over Previous Work
Bane and Ellwood (1983)	AFDC	Duration of participation Frequency of participation Routes of entry to and exit from program participation Probability of exit from AFDC by specific routes	Fixed time-period	Female headed households with children, 1968-1979 (477 spells)	PSID (annual data)	Female household head	Number of consecutive calender years during which household receives annual welfare income of more than $250	Considered paths of entry to and exit from program participation
Carr, Doyle and Lubitz (1984)	FS	Number of participants over time Duration of participation Frequency of participation Characteristics of program participants Probabilities of entry to and exit from FSP by participant characteristics Turnover in FSP eligibility over time	Fixed time-period	Household units, 1979 (approximately 2,205 households per month)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months during which household receives food stamps	Considered turnover in both participation and eligibility Used monthly data
Lubitz and Carr (1985)	FS	Relationship of changes in household circumstances (trigger events) to program participation	Fixed time-period	Household units, 1979 (approximately 2,500 households per month)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months during which household receives food stamps	Considered relationship between changes in household circumstances and program entry and exit Used monthly data

Table of Contents

Table A.1
(continued)

Study	Program(s) Considered	Issue(s) Addressed	Sample Time Frame	Sample, Sample Period (Sample Size)	Data Source (Limitations)	Unit Followed Over Time	Definition of a Spell	Major Advance(s) Over Previous Work
MacDonald (1985)	FS, Social Security, SSI, UI, AFDC	Average monthly participation in multiple program categories Average monthly duration in multiple program categories Number of participants in multiple program categories over time Impact of multiple program transfers on extent of poverty over time	Fixed time-period	Household units, 1979 (approximately 7,205 households per month)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months household received benefits in 1 of 11 multiple program categories	Considered multiple program participation and impact of multiple benefits on extent of poverty over time Used monthly data
Doyle (1985a)	FS, Social Security, SSI, UI, AFDC	Frequency of transitions between multiple program categories over time Duration of participation in multiple program categories Gross flows of participants across multiple program categories	Fixed time-period	Household units present in the sample for all months, 1979 (7,174 households)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months household received benefits in 1 of 9 multiple benefit categories	Considered transitions between multiple program categories Used monthly data

Table of Contents

Table A.2

SUMMARY OF THE METHODOLOGY OF MULTIVARIATE STUDIES ON THE DYNAMICS OF FOOD STAMP PROGRAM PARTICIPATION

Study	Program(s) Considered	Issue(s) Addressed	Sample Time Frame	Sample, Sample Period (Sample Size)	Data Source (Limitations)	Unit Followed Over Time	Definition of a Spell	Endogenous Variables
Coe (1979)	FS	Determinants of turnover in FSP population	Two points-in-time	All households in 1977 which did not use food stamps in 1973 (5,132 households) All households in 1977 which did use food stamps in 1973 (835 households)	PSID (annual data)	Head of household	Receipt of food stamps in 1976	Whether household received food stamps in 1976 given did not receive in 1973 Whether household received food stamps in 1976 given food stamps were received in 1973
Coe (1981)	FS, AFDC, SSI, GA, and Social Security	Patterns of participation in welfare programs Determinants of turnover in FSP population	Fixed time-period	All individuals for which there was data for the entire period 1969-1978 (5,573 individuals)	PSID (annual data)	Head of household	Number of consecutive calendar years of receipt of any welfare income	Whether individual received any welfare income in a given year Whether individual received any welfare income in only one of the ten sample years Whether individual received any welfare income in six or more of the ten sample years Whether individual started receiving welfare given previously not receiving Whether individual stopped receiving welfare given previously receiving
Kirlin and Merrill (1983)	FS and FS in conjunction with AFDC, GA, or SSI	Determinants of turnover in FSP population Transitions in participation in FSP in conjunction with other assistance programs	Fixed time-period	Random sample of FS cases from October 1979 through August 1981 (17,838 food stamp spells, 12,781 non-food stamp spells)	Case files of the South East District Office of Cook County, Chicago Office of Illinois Department of Public Aid (non-representative sample, limited socio-economic data)	Head of household	Number of consecutive months in which FS only, FS/SSI, FS/AFDC, or FS/GA case remained open Number of consecutive months in which former FS only, FS/SSI, FS/AFDC, or FS/GA case remained closed	Probability of exit from FS category in month given previously on food stamps Probability of re-entry to FS category in month given previously not on food stamps

Table of Contents

Table A.2
(continued)

Study	Program(s) Considered	Issue(s) Addressed	Sample Time Frame	Sample, Sample Period (Sample Size)	Data Source (Limitations)	Unit Followed Over Time	Definition of a Spell	Endogenous Variables
Carr, Doyle, and Lubitz (1984)	FS	Determinants of turnover in FSP population	Fixed time-period	Household units, 1979 (667 food stamp spells, 7,276 non-food stamp spells) FS eligible household units, 1979 (506 food stamp spells, 1,344 non-food stamp spells)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months during which family receives food stamps Number of consecutive months during which family receives no food stamps	Probability of entry to FSP given not previously on food stamps Probability of exit from FSP given previously on food stamps
Lubitz and Carr (1985)	FS	Determinants of turnover in FSP population Relationship of "trigger events" (e.g., job loss or gain, change in family status) and FSP population turnover	Fixed time-period	Household units, 1979 (625 food stamp spells, 5,295 non-food stamp spells)	ISDP	Households headed by primary sample members followed regardless of changes in household composition	Number of consecutive months during which family receives food stamps Number of consecutive months during which family receives no food stamps	Probability of entry to FSP given not previously on food stamps Probability of exit from FSP given previously on food stamps

Table of Contents

Table A.2
(continued)

Study	Estimation Technique	Types of Exogenous Variables Included	Method of Handling Right-censored Spells[1]	Method of Handling Left-censored Spells[2]	Method of Handling Prior Event History	Method of Handling Heterogeneity[3]	Method of Handling Duration Dependence[4]
Coe (1979)	Path model regression analysis	Personal characteristics in 1973 and 1976 Family status in 1973 and 1976 Changes in labor force status between 1973 and 1976 Changes in AFDC status between 1973 and 1976	Not considered	Not considered	Not considered	Not considered	Not considered
Coe (1981)	Pooled ordinary least squares	Personal characteristics at beginning of sample period Family status in each year Labor force status in each year Labor force conditions in each year Previous welfare program experience	Not considered	Not considered	Included measures of previous welfare program experience as explanatory variables	The correction for prior event history may also correct for unmeasured heterogeneity	Estimated separate equations for probability of one year of welfare receipt and probability of 6 or more years of welfare receipt
Kiriin and Merrill (1983)	Maximum likelihood estimation of discrete analogue to continuous hazard model for each assistance category	Personal characteristics at beginning of spell Labor force status at beginning of spell Labor force conditions within spell	Incorporated in the likelihood function	Restricted spells to those beginning within sample period	Included measures of previous program participation as explanatory variables	The correction for duration dependence may also control for heterogeneity	A measure of length of spell was included as an explanatory variable

Table A.2
(continued)

Study	Estimation Technique	Types of Exogenous Variables Included	Method of Handling Right-censored Spells[1]	Method of Handling Left-censored Spells[2]	Method of Handling Prior Event History	Method of Handling Heterogeneity[3]	Method of Handling Duration Dependence[4]
Kiefer and Neumann (1983) (continued)		Program characteristics at beginning of spell Occurence of a recertification within spell Number of months of spell (For analysis of case re-opening, variables defined as of end of previous spell					
Carr, Doyle, and Lublitz (1984)	Maximum likelihood estimation of continuous constant hazard model (Event history analysis)	Personal characteristics at beginning of spell Labor force status at beginning of spell Program characteristics at beginning of spell	Incorporated in the likelihood function	Assumed prior history of spell does not affect spell	Each occurrence assumed to be independent	A random error term was included in the model to reflect unmeasured heterogeneity	Transitions assumed to be independent of state
Lublitz and Carr (1985)	Maximum likelihood estimation of continuous constant hazard model (Event history analysis)	Personal characteristics at beginning of spell and changes within spell Labor force status at beginning of spell and changes within spell	Incorporated in the likelihood function	Assumed prior history of spell does not affect spell	Each occurrence assumed to be independent	A random error term was included in the model to reflect unmeasured heterogeneity	Transitions assumed to be independent of state

[1] A right-censored spell is a spell for which the ending date is not observed.

[2] A left-censored spell is a spell for which the beginning date is not observed.

[3] Heterogeneity refers to characteristics which vary among individuals or across time for the same individual.

[4] Duration dependence arises if an individual's probability of exiting from the program changes with the length of time participating in

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(Chronological Order)

AUTHOR(S)	ANALYSIS SAMPLE/ LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXITING/DURATION
Springs (1978)	1971 SIME (575 families) Note: Families were defined as those households with a head between ages 18 and 58; elderly and single-person households were excluded.	Participation rate using a version of the Accounting Period Simulation (APS) model: NPA / PA Black: .32 / .76 White: .45 / .88 Overall: .39 / .83	Mean spell duration during 1971 for NPA families was 6 months; for PA families, 11 months.
Coe (1979)	1973 and 1977 waves of PSID (6,007 households in 1977 that did/did not participate in FSP in 1973 (835 and 5,132 resp.)) Note: Household composition problems result from intervening changes.	Highest participation rates for: AFDC participants; unemployed head; increase in number of children; female head; head worked fewer than 1,500 hours in 1976. 41% of eligible households participated.	Lowest exit rates for: AFDC participants; unemployed head or head who worked fewer than 500 hours in 1976; greater number of children; low education; non-white. High turnover: Over 4-year period, 14.8% of households used food stamps at some time; 2.8% on FSP all 4 years. Of those participating in 1973, 50% closed by 1977.

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

AUTHOR(S)	ANALYSIS SAMPLE LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXISTING/DURATION
Merck (1980)	1971-1974 DIME (1,208 families) Note: Families were defined as those households with a head between ages 18 and 58 and at least one dependent; elderly, singles, and childless couples excluded.	Recidivism was highest among two-parent families, with 63.1% of those families having 2 or more participation spells, including 26.1% who had 3 or more spells.[1]	More turnover in Food Stamp Program than in AFDC. Annual/monthly (turnover rate) ranged from 1.39 to 1.69 during the sample period, with a mean of 1.56. Turnover among two-parent families is greater than among single-parents. % in FSP for all 4 years: One Parent 31.9; Two Parents 4.3 Mean spell length (months): One Parent 33.8; Two Parents 19.5
Coe (1981)	1968-1979 PSID (5,573 households containing 12,562 individuals who were included in the sample in 1970)	21.7% of individuals received food stamps in at least one year 1968-71 and 1972-78.	Duration (years) / Percent of Households: 0 — 78.3; 1 — 7.2; 2-5 — 10.1; 6-9 — 3.8; 10 — 0.7 Approximately 60-75% of food stamp recipients in any year received benefits in the following year.

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

[redacted]

AUTHOR(S)	LIMITATIONS	ENTERING/RECIDIVISM	EXISTING/DURATION
Czajka (1981)	Spring wave of ISDP 1979 Research Panel (7,200 food unit[1] subsets over 3 reference months) Note: Period too short to do longitudinal analyses.	Highest participation rates for: 20-49 year olds; 2+ children under 16; presence of children under 6; blacks; low education (8th grade or less); receipt of other welfare. Lowest participation rates for elderly.	Not considered.
Kirlin (1982)	NPA food stamp case files of the Massachusetts Department of Public Welfare	Approximately 25% of all closed cases reopened within 2 months; 60.4% remained closed at least 11 months. 3 types of cases dominated: long-term receipt, long-term closed, or on-and-off	Highest exit rates due to: recertification; procedural changes (most are circumstantial); eligibility for other assistance (e.g., SSI); increase in income. Nearly 40% had spells of under 7 months; 1.7%

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

AUTHORS	ANALYSIS SAMPLE LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXITING/DURATION
Coe (1983a)	1979 wave of PSID (949 households eligible for Food Stamp Program Participation)	45.4% of eligible households participated. More than 40% of eligible nonparticipants believed they were ineligible. Lowest participation rates for: elderly unmarried persons, those not participating in other welfare programs, residents of rural areas, employed persons, farmers, the more educated, childless households, and unmarried male heads, with the latter four groups being the most likely to have negative personal feelings toward using food stamps. Physical access was a problem for the employed and the disabled.	Not considered.
Coe (1983b)	1979 wave of PSID (993 households eligible for Food Stamp Program participation)	Aggregate participation rate was 46.1%. Lowest participation rates for: unmarried elderly, unmarried men of all ages, employed persons, and those residing in small towns. Highest participation rates for: households receiving other public assistance income, those with children, the less educated, and those with lower incomes. 54 percent of the eligible nonparticipants cited their belief that they were ineligible as the reason for their nonparticipation. About one-half cited financial reasons for their belief, while the remainder mentioned nonfinancial reasons.	Not considered.

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

AUTHOR(S)	ANALYSIS SAMPLE LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXITING/DURATION
Carr, Doyle, and Lubitz (1984)	1979 ISDP Panel (3,205 food stamp eligible household units per month for one year)	Highest participation rates for: AFDC participants; large households; no earner; single head with children; non-white; unemployed; elderly or disabled; low education. The probability of receipt in month t, given non-receipt in month t-1 = 0.53	Lowest exit rates for: AFDC participants; non-white; female head; singles; elderly or disabled; unemployed; low education; shorter spell length,[1] no earner. About 67% received benefits for under one year. 40% of single parents, no earners, and elderly households received benefits for all 12 months of the study. Annual/monthly (turnover rate) = 1.7 11% reopened or reclosed within one year. 7.3% of cases that received food stamps in month t are closed by month t + 1.
Hollonbeck and Ohls (1984)	1981 SSI/Elderly Food Stamp Cashout Demonstratation Survey[2] (2,262 households from NC, SC, or OR, comprised of only elderly (65 or older) members)	Highest participation rates for: 65-69 year olds; female heads; low education; shorter distance to food stamp office; households with no past determination of ineligibility; awareness of eligibility.	Not considered.

Table of Contents

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

AUTHOR(S)	ANALYSIS SAMPLE LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXITING/DURATION
Kirlin and Merrill (1985)	Case files of the Southeast District Office of Cook County, Chicago Office of the Illinois Department of Public Aid. (17,838 food stamp spells, 12,781 spells of non-assistance between October 1979 and August 1981)	Participation in other programs increased likelihood of Food Stamp Program participation. 30% of all closed cases reopened within 22 months. Cases reopened quickly or not at all: 50% of reopenings occurred within 3 months of closure; over 60% within 6 months.	Expected duration depended on category of assistance: Turnover Ratio AFDC/FS = 37 months 1.22 SSI/FS = 33 1.42 GA/FS = 15 1.49 NA/FS = 10 1.72 Overall = 19 1.39 Median spell length = 9 months. Non-whites and those with prior food stamp participation in the last 2 years had longer spells.
Lubitz and Carr (1985)	1979 ISDP Panel (625 food stamp spells, 5,295 non-food stamp spells, or approximately 2,500 households per month)	Trigger events: Decrease number of earners; decline in income; household splitting; exhaustion of UI benefits; length of previous spells. Changes in earnings/earners had greater impact than household composition changes.	Trigger events: Increase in income; increased number of earners; receipt of unemployment insurance; marriage. Average duration of receipt for female with 2 children was 27 months.

Table A.3

SUMMARY OF FINDINGS ON FOOD STAMP PROGRAM PARTICIPATION
(continued)

AUTHOR(S)	ANALYSIS SAMPLE LIMITATIONS	CHARACTERISTICS AFFECTING ENTERING/RECIDIVISM	CHARACTERISTICS AFFECTING EXITING/DURATION
Wolf (1985)	OBRA (Sample of 6,700 food stamp case files or 94,063 case-month records[1] from October 1980 through December 1983)	Not considered.	Duration dependence: exit rate declined as length of spell increased. Lowest exit rates for: AFDC participants; elderly; large households; no earnings; increased unemployment rate; season (April - September). Post-OBRA duration medians[2] ranged from non AFDC/FS with earnings - 5.4 months to AFDC/FS without earnings - 15.2 months.

Table of Contents

APPENDIX B

LOCATIONS OF THE OBRA SITES

Table B.1

OBRA SITES

Site Number	Site Name	State	FNS Region	Urban
01	Perry County	Alabama	Southeast	No
02	Dekalb County	Alabama	Southeast	No
03	Mississippi County	Arkansas	Southwest	No
04	Solano County	California	West	Yes
05	Los Angeles County (ElMonte)	California	West	Yes
06	Alameda County (Hayward)	California	West	Yes
07	Arapahoe County	Colorado	Mountain Plains	Yes
08	Fremont County	Colorado	Mountain Plains	No
09	San Miguel County	Colorado	Mountain Plains	No
10	Middletown	Connecticut	Northeast	Yes
11	Pasco County	Florida	Southeast	Yes
12	Dade County (SW 1st. St., Miami)	Florida	Southeast	Yes
13	Dade County (W. Flagler, Miami)	Florida	Southeast	Yes
14	Hillsborough County	Florida	Southeast	Yes
15	Pottawatomie County	Oklahoma	Southwest	Yes
16	Craig County	Oklahoma	Southwest	No
17	Roanoke	Virginia	Mid-Atlantic	Yes
18	Ford County	Illinois	Midwest	No
19	Cook County (W. Oak St.)	Illinois	Midwest	Yes
20	Cook County (N. Milwaukee Ave.)	Illinois	Midwest	Yes
21	Polk County	Iowa	Mountain Plains	Yes
22	Clark County	Kentucky	Southeast	Yes
23	Lawrence County	Kentucky	Southeast	No
24	Franklin Parish	Louisiana	Southwest	No
25	Fall River	Massachusetts	Northeast	Yes
26	LaPeer County	Michigan	Midwest	Yes
27	Wayne County (Harper St., Detroit)	Michigan	Midwest	Yes
28	Wayne County (Inkster)	Michigan	Midwest	Yes
29	Saginaw County	Michigan	Midwest	Yes
30	St. Louis	Missouri	Mountain Plains	Yes
31	Missoula County	Montana	Mountain Plains	No
32	Las Vegas	Nevada	West	Yes
33	Bergen County	New Jersey	Mid-Atlantic	Yes
34	Middlesex County	New Jersey	Mid-Atlantic	Yes
35	Monmouth County	New Jersey	Mid-Atlantic	Yes
36	Oneida County	New York	Northeast	Yes
37	New York City (E. 34th St.)	New York	Northeast	Yes
38	New York City (Hinsdale-Brooklyn)	New York	Northeast	Yes
39	Monroe County	New York	Northeast	Yes
40	New York City (Broadway)	New York	Northeast	Yes
41	Halifax County	North Carolina	Southeast	Yes
42	Cherokee County	North Carolina	Southeast	No
43	Martin County	North Carolina	Southeast	No
44	LaMoure County	North Dakota	Moutain Plains	No

Table B.1

OBRA SITES
(continued)

Site Number	Site Name	State	FNS Region	Urban
45	Allen County	Ohio	Midwest	Yes
46	Mecklenburg County	North Carolina	Southeast	Yes
47	Lucas County	Ohio	Midwest	Yes
48	Susquehanna County	Pennsylvania	Mid-Atlantic	No
49	Philadelphia (Federal Dist.)	Pennsylvania	Mid-Atlantic	Yes
50	Saluda County	South Carolina	Southeast	No
51	Williamsburg County	South Carolina	Southeast	No
52	Yankton	South Dakota	Mountain Plains	No
53	Dallas (Ross Ave.)	Texas	Southwest	Yes
54	Mission	Texas	Southwest	Yes
55	Greenville	Texas	Southwest	No
56	Spokane (S. Arthur)	Washington	West	Yes
57	Spokane (N. Washington)	Washington	West	Yes
58	McDowell County	West Virginia	Mid-Atlantic	No
59	Fond Dulac County	Wisconsin	Midwest	Yes
60	Racine County	Wisconsin	Midwest	Yes

APPENDIX C

SELECTION OF SPELLS TO BE INCLUDED IN ANALYSES

by Trond Petersen

We consider two approaches to analyzing the PSID food stamp spells, approach one (A1) and approach two (A2). In A1 only the first nonleft-censored spells are analyzed. In A2 all nonleft-censored spells are analyzed. In discussing the relative merits of A1 and A2 we take the following to be the central research question to be answered:

Suppose 100 people walk in at random requesting and then receiving food stamps today; what would be the mean time spent on food stamps?

A1 gives the correct answer to two research questions, namely:

(1) What is the distribution of time spent in first non-left-censored spell? (This is not the central research question.)

(2) What is the distribution of time spent in any spell? (This is the central research question.)

The conditions under which we get the right answer from A1 are:

(a) There is no unobserved heterogeneity in the rates of entering, leaving, and reentering food stamps, and

(b) the spells on an individual are independently and indentically distributed (i.i.d.) and that the distribution is exponential (no duration dependence).

The qualification in (b) can probably be relaxed with no consequence for the conclusion. However, these estimates, given the conditions in (a) and (b), will be less efficient, though consistent, than the estimates one would obtain using A2.

The procedure based on A2 gives the correct answer to the central research question in two situations, described in (3) and (4) below.

(3) A2 gives the mean time spent in any spell, given the window (i.e., time-frame) of the data. The window refers to the observation period of the OBRA or PSID data. For this period, A2 gives the right answer to the central research question but we need not be able to generalize beyond 1984.

In PSID, this window is quite wide, 11 years, while in OBRA it is narrow. One might be able to extract enough information from PSID to generalize beyond 1984, provided one assumes that the process has reached some stationarity.

(4) A2 gives the distribution of time spent in any spell, provided (a) there in no unobserved heterogeneity in the rates of entering, leaving, and reentering food stamp spells, and (b) that the spells are i.i.d. and exponentially distributed.

This is the same conclusion as reached with respect to A1, but A2 estimates will be more efficient.

Our general conclusion is therefore: A2 is the best feasible procedure if one wants to answer the central research question. It will not give a perfect answer to the question, but it will be the best feasible answer. A better answer would require a lot more work and would be quite difficult to construct. Specifically, one would have to compute rates of entering food stamps for the first time, rates of leaving food stamps, and rates of reentering food stamps. From these three rates one can compute the mean time of any random spell. This is not possible even in principle for the OBRA.

APPENDIX D

PROPERTIES OF THE DISCRETE LOGISTIC ESTIMATOR OF HAZARD RATE MODELS

by Stephen Kennedy

We have specified a discrete hazard rate model of the form:

$$(1) \qquad \ln\left(\frac{h_{it}}{1-h_{it}}\right) = X_i'\beta + \Sigma\alpha_t d_t$$

where:

h_{it} = The hazard rate for the i^{th} case in the t^{th} period

X_i = A set of (initial) individual characteristics

β, α_t = Unknown coefficients

d_t = A dummy for the t^{th} period.

We have estimated this using maximum likelihood based on all the periods observed for each individual--that is, the log likelihood function is:

$$(2) \qquad L = \sum_i [\ln h_{it_i} + \sum_{a=1}^{t_i} \ln(1-h_{ia})]$$

where:

t_i = The period in which the i^{th} case terminates.

It is sometimes claimed that this assumes that the time periods are independent, and that since it is likely that successive observations for individuals are in fact correlated, the error of estimate is probably substantially understated. This criticism seems at first glance quite convincing. The concern is, however, misplaced, and rests on a misunderstanding of how these models work.

Our reasons for this conclusion are twofold and are discussed below.

1. <u>Despite appearances, the model we use does not treat each time period as an independent observation.</u>

We can most easily illustrate this in terms of a slightly simplified version of the model. Let us assume that we have divided the population into k independent categories and that we specify:

(3) $h_{ij} = e^{\theta j}/(1 + e^{\theta j})$ for all periods

where:

h_{ij} = The hazard rate for the i^{th} case in the j^{th} category (assumed to be constant over periods)

θ_j = The parameter of the j^{th} category.

We observe a set of individuals who remain in the program for the various periods (t_i). By the definition of the hazard rate,

(4) $f(t_{ij}) = (1 - h_{ij})^{t_{ij}-1} h_{ij}$

where:

$f(t_{ij})$ = The probability that the i^{th} case in the j^{th} group drops out in the t_{ij}^{th} period

h_{ij} = The hazard rate for the i^{th} case in the j^{th} group.

Accordingly, the log likelihood function for our observation is:

(5) $L = \underset{ji}{\Sigma\Sigma}[\ln h_{ij} + (t_{ij} - 1)\ln(1 - h_{ij})]$

or, substituting Eq. (3) into Eq. (5),

(6) $L = \underset{j\ i}{\Sigma[\Sigma}(\theta_j + t_{ij}\ln(1 + e^{\theta j}))]$

Now as Allison (1982) points out, this is the log-likelihood for the observed durations, and this should be our first clue that the computation cannot possibly be treating each time period as independent. However, despite this insight, Allison and others have worried that one could somehow endlessly increase the number of observations by taking shorter periods.

But consider the actual solution to Eq. (6):

(7) $\frac{\partial L}{\partial \theta_j} = \underset{i}{\Sigma}[1 + t_{ij}e^{\theta_j}/(1 + e^{\theta_j})] = 0$

$$\hat{h}_j = (e^{\hat{\theta}_j}/(1 + e^{\hat{\theta}_j})) = \frac{n_j}{\underset{i}{\Sigma} t_{ij}} = \frac{1}{d_j}$$

where:

n_j = The number of individuals in the j^{th} category

t_{ij} = The duration of the i^{th} individual for the j^{th} category

d_j = The mean duration in the j^{th} category $(\Sigma_i t_{ij}/n_j)$.

$$(8) \qquad \frac{\partial L}{\partial \theta_j \theta_r} = \begin{cases} 0 \text{ if } j \neq r \\ \Sigma_i(-t_{ij})h_j(1-h_j) \text{ if } j = r \end{cases}$$

$$(9) \qquad \text{Var } \hat{\theta}_j = \left(\frac{d_j}{d_j - 1}\right)\left(\frac{1}{n_j}\right)$$

Notice that the error of estimate for $\hat{\theta}_j$ depends on the number of persons in the category (n_j), not the number of observed periods (Σt_{ij}) . It is true that computationally the maximum of Eq. (6) can be obtained from an algorithm that would be used if all the spells were independent observations. In fact, however, they are not independent observations and the vector of spell outcomes for each individual always takes a very special form (a string of zeros followed by a one).

The point is that despite appearances, this is like any other hazard rate model; what we are really analyzing is the observed duration for each individual. The hazard rates and sequence of spells only enter in specifying the distribution (likelihood) of durations.

2. The observation that the model does not treat the individual spells as independent observations does not mean that the model cannot be misspecified. However, while we can test the hypothesis that the model is not completely specified, we cannot incorporate random effects into the estimation.

For this discussion, we need to return to our actual model. There are two issues--testability and estimation.

(a) Testability. The model is complete if h_{it} is exactly expressed by Eq. (1). In this case, individual variation in duration will simply reflect the distribution dictated by the hazard rates. Thus we can test the completeness of the model. The log likelihood associated with the logistic specification of Eq. (1) is:

$$(10) \qquad L = \Sigma[\ln(\frac{h_{iti}}{1-h_{iti}}) + \sum_{a+1}^{t_i} \ln (1 - h_{iti})$$

Now say we allow a unique value of h_{it} for each individual

$$(11) \qquad \ln(\frac{h_{it}}{1-h_{it}}) = \chi_i'\beta + \alpha_t = \varepsilon_i \quad , \text{ for all } t$$

Estimating the ε_i by maximum likelihood yields the FOC

$$(12) \qquad 1 = \sum_{a=1}^{t_i} h_{it} = 0 \qquad i = 1 \ldots n$$

so that a solution is

$$(13a) \qquad \hat{\beta} = 0$$

$$(13b) \qquad \hat{\alpha}_t = 0$$

$$(13c) \qquad h \quad = h \quad = (\frac{e^{\varepsilon i}}{(1+e^{\varepsilon i})}) = \frac{1}{t_i}$$

which yields

$$(14) \qquad L_0^* = \sum_i [\ln(t_i - 1) - t_i \ln t_i]$$

We can compare this with the L_1^* we get in our model by assuming that ($\varepsilon_i = 0$). As usual,

$$(15) \qquad \frac{1}{2}(L_0^* - L_1^*) \sim \chi^2(n - r)$$

where:

n = The number of observations

r = The number of parameters in the model.

This again points out that what we are really analyzing is duration, not hazard rates. In binomial discrete choice problems we have no good measure of goodness of fit because we cannot distinguish between a model in which outcomes are driven by a common probability and models in which the probability for each individual is a random variable. (We can test for

specific variables, we just cannot estimate a general individual level variance of the "residual.") In this duration model we can examine goodness of fit--the model generates a minimum variation for observed durations and we can see if we reach this. This is roughly comparable to looking to see whether R^2 is one in an OLS regression.

(b) Estimation. Say that the test above leads one to the not surprising conclusion that there are variables one has left out, can one incorporate some sort of individual effects model to take account of them? The answer is no. One can, of course, estimate the $\hat{\varepsilon}_i$ of Eq. (13c) and then see whether one can say anything about their distribution, but that is what the model does. One can also, of course, try added variables. What one cannot do is incorporate a simple random effects model. Say we specify that h_{it} is a linear function of parameters, θ, and an individual term, ε, distributed $f(\varepsilon)$. The likelihood function is as before, but with an added term in $f(\varepsilon)$.

$$(16) \qquad L = \sum_i [\ln h_{iti} + \sum_{a=1}^{t_i-1} \ln(1 - h_{iti}) + \ln f(\varepsilon_i)]$$

Let

$$(17) \qquad A = \sum_i \ln h_{iti} + \sum_{a=1}^{t_i-1} \ln(1 - h_{iti})$$

The FOC for the ε_i are

$$(18) \qquad \frac{\partial A}{\partial \varepsilon_i} + \frac{f'(\varepsilon_i)}{f(\varepsilon_i)} = 0$$

But by the linearity assumption

$$(19) \qquad \frac{\partial A}{\partial \varepsilon_i} = (\text{constant}) * \frac{\partial A}{\partial \theta_j}$$

Thus the FOC on θ when substituted into Eq. (18) gives as conditions for the ε_i:

$$(20) \qquad \frac{f'(\varepsilon_i)}{f(\varepsilon_i)} = 0$$

$$(21) \qquad \varepsilon_i^* = \text{constant for all } i$$

which is useless.

This should not be too surprising and again reflects the first observation made at the beginning of this appendix. When we estimate hazard rate models, we are simply developing a likelihood function (i.e., specifying a distribution for) what we observe, which is the length of time each person stays in the program. Each spell does not in fact contribute repeated observations on individuals, but only one observation--duration. In some situations, e.g., analysis of employment spells, one may have many repeated observations (a sequence of spells of employment and unemployment). This leads to a richer set of testable models. In our situation, however, the multiplicity of spells is quite limited. The additional complexity of such analysis for the subset of cases with multiple spells does not seem justified given the research questions we are addressing.

APPENDIX E

LENGTHS OF ONGOING FOOD STAMP SPELLS

We now wish to calculate the distribution of length for an ongoing food stamp spells -- that is, the length of a spell so far, up to the month in which it is observed. In this analysis, we include all spells that are in progress each month--both right-censored and left-censored, as well as those which both begin and end in the observation period. For left- censored spells that are ongoing in month m, it is known only that they have been running for at least m + 1 months.

E.1 Methodology

The approach used here is to proceed analogously to the methodology used in Section 1, by calculating a sort of hazard rate. In this context, the hazard rate for t months is the proportion of those ongoing spells that are longer than t - 1 months that are exactly t months long as of the time of observation--not a very meaningful construct. This proportion must always lie between 0 and 1 inclusive, however, so that the implied cumulative density connection will be monotonic, as desired.

An example will help clarify this. Suppose that we take observations in months 10 and 11 of the period. In month 10, we observe various numbers of spells that are currently in their first, second, . . . , tenth month of activity, plus some that were left-censored and are hence only known to be beyond their tenth month of activity. Let us suppose that we see x_1, x_2, . . . x_{10}, and x_{10+} spells in each of these states, adding up to a total of X ongoing spells. Similarly, in month 11 we observe spells in months 1 through 11 of activity, plus some spells beyond their eleventh month: y_1, y_2, . . . , y_{11}, y_{11+}, for a total of Y ongoing spells.

The hazard rate for spells one month in length is the proportion of all spells greater than length 0 which are exactly one month long when observed, i.e. $(x_1 + y_1)/(X + Y)$. Similarly, the hazard rate for spells two months in length is equal to $(x_2 + y_2) / (X + Y - x_1 - y_1)$. Hazard rates up to t = 10 are likewise defined; the last one would be $(x_{10} + y_{10})/(x_{10} + x_{10+} + y_{10} + y_{11} + y_{11+})$. Finally, the hazard rate for t = 11 would be $y_{11}/(y_{11} + y_{11+})$. Note that the left-censored spells observed in month 10 that were

known to have lasted at least 11 months are not used in calculating the 11-month hazard rate, because it is unknown whether these episodes lasted exactly 11 months.

Hazard rates can thus be calculated for t = 1 to 39, using all months of data. As in the preceding section, the cumulative and marginal density functions can then be calculated iteratively. Because all active case months are used in the calculations, small sample sizes and volatile hazard rates are less of a problem than they were in calculating lengths of completed spells. Furthermore, there is no behavioral reason to expect periodicity of the ongoing hazard rates or frequencies. The mean lengths of ongoing spells for the various types of recipients were therefore calculated under the assumption that the hazard rates were constant after 36 months. That is, a "long-run" hazard rate was calculated based on spells of length 37, 38, and 39 months, and the average length of an ongoing spell of length greater than 36 months was estimated as 36 months plus the inverse of this rate. The hazard rate-like construction used in these calculations has no obvious interpretation. Modelling it as a constant in the long run is merely a convenient way of expressing the equivalent idea that the distribution of cases which have been receiving benefits for more than three years is geometric with respect to months of activity.

E.2 Findings

Table E.1 shows the distribution of lengths of ongoing spells for all food stamp recipients and for food stamp recipients of various types. Practically half of all active cases are in their first 12 months of recipiency. Another 20 percent are in their second year. The mean length of an ongoing spell is about 21 months.

The results for subgroups are as follows:

AFDC Recipients. About 40 percent of this group is in the first year of recipiency, and about 25 percent in the second year. The mean length of ongoing spells is 22 months.

Work Registrants. Half of all work registrants are in their first nine months of recipiency, and 60 percent are within their first year. Only 10 percent are beyond their third year. The mean length of ongoing spells is 15 months.

Table of Contents

Table E.1

DISTRIBUTION OF LENGTH OF ONGOING EPISODES OF FOOD STAMP RECEIPT (Percent)

Number of Months	All Cases	AFDC Recipients	Work Registrants	Earned Income Cases	Elderly	Singles
1	6.87	3.99	9.51	9.18	2.57	7.03
2	6.34	4.10	8.68	8.01	2.52	6.38
3	5.59	4.15	7.34	7.18	2.42	5.40
4	4.81	4.03	5.99	6.14	2.29	4.56
5	4.28	3.88	5.19	5.21	2.22	3.96
6	3.92	3.64	4.69	4.71	2.17	3.61
7	3.40	3.33	3.88	3.86	2.01	3.12
8	3.11	3.18	3.51	3.44	2.00	2.85
9	2.92	3.09	3.30	3.32	1.99	2.64
10	2.71	2.97	2.96	3.04	1.97	2.46
11	2.57	2.89	2.69	2.86	1.95	2.34
12	2.44	2.75	2.49	2.67	1.94	2.24
13-18	11.40	13.56	11.40	11.38	9.95	10.36
19-24	8.46	10.31	7.97	7.09	8.89	8.33
25-36	12.56	15.75	10.32	8.50	15.49	12.52
37+	18.62	18.36	10.09	13.40	39.59	22.20
Mean length of spell	20.80	21.50	14.59	16.82	39.48	23.19

Earned Income Cases. Like work registrants, half of all earners are in their first nine months of a food stamp episode, and 60 percent are within their first year. The mean length of ongoing spells is 17 months.

Elderly. Only a quarter of elderly food stamp recipients are in their first year of a food stamp episode; 40 percent of them are beyond their third year. The mean length of ongoing spells for this group is 39 months.

Singles. Nearly half of all one-person households receiving food stamps are in their first year of recipiency. Another 20 percent are in their second year. The mean length of ongoing spells is 23 months.

These data for one-person households are disaggregated by age, race, and sex in tables E.2 and E.3. The median spell lengths are shown in Table E.4.

The pattern of increasing median length of ongoing spell with age was to be expected, inasmuch as age was measured during rather than at the beginning of the spell. An 18-year old, for example, could not have an ongoing spell longer than 12 months, while an elderly individual could have been receiving food stamps continuously for many years. Thus these variations in median length of ongoing spell do not represent differences in food stamp dependency, as that term is often used--i.e. amount of time that the individual will continue to receive food stamps. That concept is better measured by the median length of completed spells.

Females tend to have greater median ongoing spell lengths than males, when age and race are controlled for. Racial patterns are mixed.

E.3 Completed versus Ongoing Food Stamp Spells

It was remarked earlier that the mean ongoing spell could be longer than the mean completed spell because the caseload at any point in time is dominated by the long-term cases from many past cohorts; or shorter than the mean completed spell, because ongoing episodes are on average sampled only halfway through. Table E.5, which compares mean completed and ongoing episode lengths, reveals both of these phenomena at work. For some subgroups, such as AFDC recipients and the elderly, completed episodes are longer on average than ongoing episodes, while for other subgroups, such as earners and singles, ongoing episodes are longer on average than completed episodes. For the

Table of Contents

Table 1.2

DISTRIBUTION OF LENGTH OF ONGOING SPELLS: SINGLE MALES

Months	White youth	Black youth	Hispanic youth	White middle	Black middle	Hispanic middle	White elderly	Black elderly	Hispanic elderly
1	18.27	10.89	25.98	12.67	7.62	11.51	2.40	2.20	3.41
2	15.63	9.81	18.30	10.93	7.03	10.39	2.38	2.12	3.12
3	11.11	8.34	9.58	8.59	6.14	9.19	2.30	2.16	2.81
4	7.75	7.12	7.24	6.80	5.29	6.89	2.21	2.21	2.14
5	6.10	5.85	5.69	5.55	4.59	6.08	2.11	2.13	2.18
6	5.68	5.57	4.74	4.83	3.98	5.57	2.09	2.31	2.22
7	4.63	4.71	3.80	3.94	3.37	3.79	2.15	2.09	2.27
8	4.12	4.22	4.74	3.34	3.13	3.67	2.29	2.14	2.33

Table of Contents

Table F.3

DISTRIBUTION OF LENGTH OF ONGOING SPELLS: SINGLE FEMALES

Months	White youth	Black youth	Hispanic youth	White middle	Black middle	Hispanic middle	White elderly	Black elderly	Hispanic elderly
1	17.32	11.15	11.95	5.82	4.32	9.13	2.05	2.17	2.84
2	15.34	10.88	11.74	5.48	4.09	8.79	2.01	2.22	2.76
3	11.66	9.11	10.18	4.90	3.74	7.96	1.90	2.18	2.79
4	9.59	7.79	8.50	4.23	3.37	6.75	1.84	2.06	2.71
5	7.37	6.96	6.72	3.64	3.07	6.70	1.86	2.02	2.51
6	5.72	6.65	5.82	3.29	2.88	5.96	1.77	1.98	2.54
7	4.89	4.93	5.88	2.94	2.84	5.20	1.73	1.80	2.46
8	3.87	4.25	4.47	2.61	2.38	5.15	1.70	1.89	2.61
9	3.03	3.20	2.52	2.49	2.15	4.72	1.70	1.95	2.53
10	2.38	2.55	2.56	2.41	2.22	4.06	1.67	1.85	2.81
11	2.20	2.35	2.60	2.18	2.29	3.78	1.73	1.75	2.85
12	2.25	1.78	2.12	2.20	2.36	3.08	1.76	1.76	2.76
13	1.80	1.89	2.17	2.07	2.15	2.98	1.53	1.49	2.55
14	1.46	1.82	1.67	1.84	1.93	2.86	1.55	1.42	2.60
15	1.36	1.93	1.71	1.66	1.73	2.27	1.52	1.36	2.64
16	1.10	2.05	1.71	1.58	1.69	2.11	1.58	1.35	2.56
17	1.12	1.69	1.14	1.57	1.64	1.46	1.54	1.47	2.62
18	1.14	1.80	1.14	1.43	1.53	1.27	1.61	1.47	2.68
19	1.02	1.11	1.14	1.41	1.66	1.34	1.53	1.47	2.60
20	0.58	0.90	0.57	1.44	1.74	1.11	1.46	1.54	2.67
21	0.58	0.95	0.57	1.47	1.62	1.16	1.45	1.31	2.60
22	0.58	0.68	0.60	1.51	1.50	0.91	1.49	1.30	2.36
23	0.44	0.73	0.63	1.45	1.36	0.96	1.40	1.29	2.28
24	0.44	0.80	0.66	1.32	1.21	1.03	1.39	1.37	2.20
25	0.44	0.89	0.70	1.23	1.03	0.71	1.28	1.27	2.12
26	0.29	1.01	0.75	1.19	1.10	0.74	1.31	1.15	2.02
27	0.29	1.19	0.82	1.15	1.08	1.17	1.30	1.25	2.12
28	0.29	1.49	0.90	1.03	1.16	1.24	1.28	1.11	2.23
29	0.29	0.93	1.01	0.97	1.25	1.35	1.40	0.82	2.36
30	0.29	0.00	0.00	1.07	1.24	0.51	1.31	0.76	2.29
31	0.29	0.00	0.00	0.80	1.37	0.59	1.04	0.67	1.74
32	0.29	0.00	0.00	0.80	1.37	0.74	0.98	0.76	1.34
33	0.29	0.00	0.00	0.80	1.53	1.11	0.90	0.88	1.47
34	0.00	0.00	0.00	0.79	1.73	1.11	0.93	1.04	1.65
35	0.00	0.00	0.00	0.76	1.80	0.00	0.95	1.28	1.13
36	0.00	0.00	0.00	0.72	2.21	0.00	1.19	1.63	0.89
37+	0.00	6.53(a)	7.06(b)	27.73	27.68	0.00	46.36	46.88	16.08
Sample Size	1022	834	226	4276	2849	624	4837	2491	914

NOTES: (a) This value is for 35 or more months.
(b) This value is for 36 or more months.

Table of Contents

Table E.4

MEDIAN LENGTH OF CURRENT SPELL FOR ONGOING ONE-PERSON CASES

	MALE				FEMALE			
	White	Black	Hispanic	Total	White	Black	Hispanic	Total
Age	3	6	2	5	4	6	85	
18-24	(1144)	(1378)	(127)	(2649)	(1022)	(834)	(226)	(2082)
25-64	4	6	5	9	7	12	12	16
	(3977)	(4040)	(556)	(8533)	(4276)	(2849)	(624)	(7779)
65+	19	12	12	25	24	20	37	29
	(1460)	(820)	(293)	(2573)	(4837)	(2491)	(914)	(8242)
Total	8	12	9		21	22	12	

Table of Contents

Table E.5

COMPARISON OF MEAN COMPLETED AND ONGOING SPELL LENGTHS

	Completed		Ongoing
All Cases	17.6 months	<	20.8 months
AFDC Recipients	30.8	>	21.5
Work Registrants	14.5	=	14.6
Earners	11.8	<	16.8
Elderly	42.1	>	39.5
Singles	15.4	<	23.2

caseload as a whole, the latter pattern also holds: the mean ongoing spell is longer than the mean completed spell.

This table suggests that on the whole, the dominance of long-term cohorts is the more important phenomenon. It will be recalled, however, that in order for a particular spell to contribute more to raising the mean ongoing spell length than to raising the mean completed spell length, it must be more than twice as long as the mean completed spell. For AFDC recipients and the elderly, groups for which the mean completed spell is quite long, only a tiny percentage of spells meet this condition. Hence for these subgroups, the fact that ongoing cases are sampled on average only halfway through their duration is the more important phenomenon.

Table of Contents

APPENDIX F

DETAILS ON DISTRIBUTION OF COMPLETED SPELLS

Figure F.1

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: AFDC RECIPIENTS

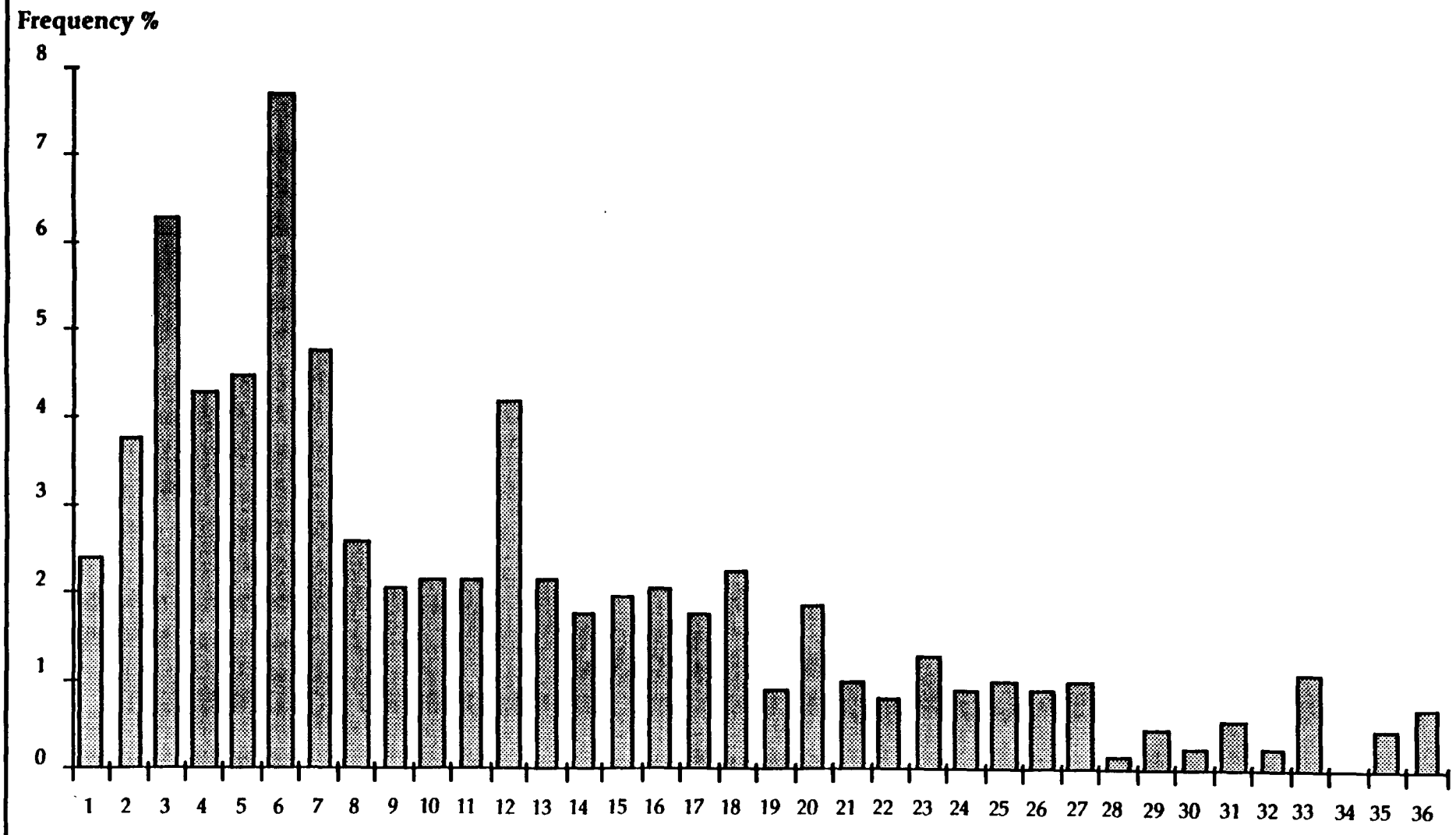


Figure F.2

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: WORK REGISTRANTS

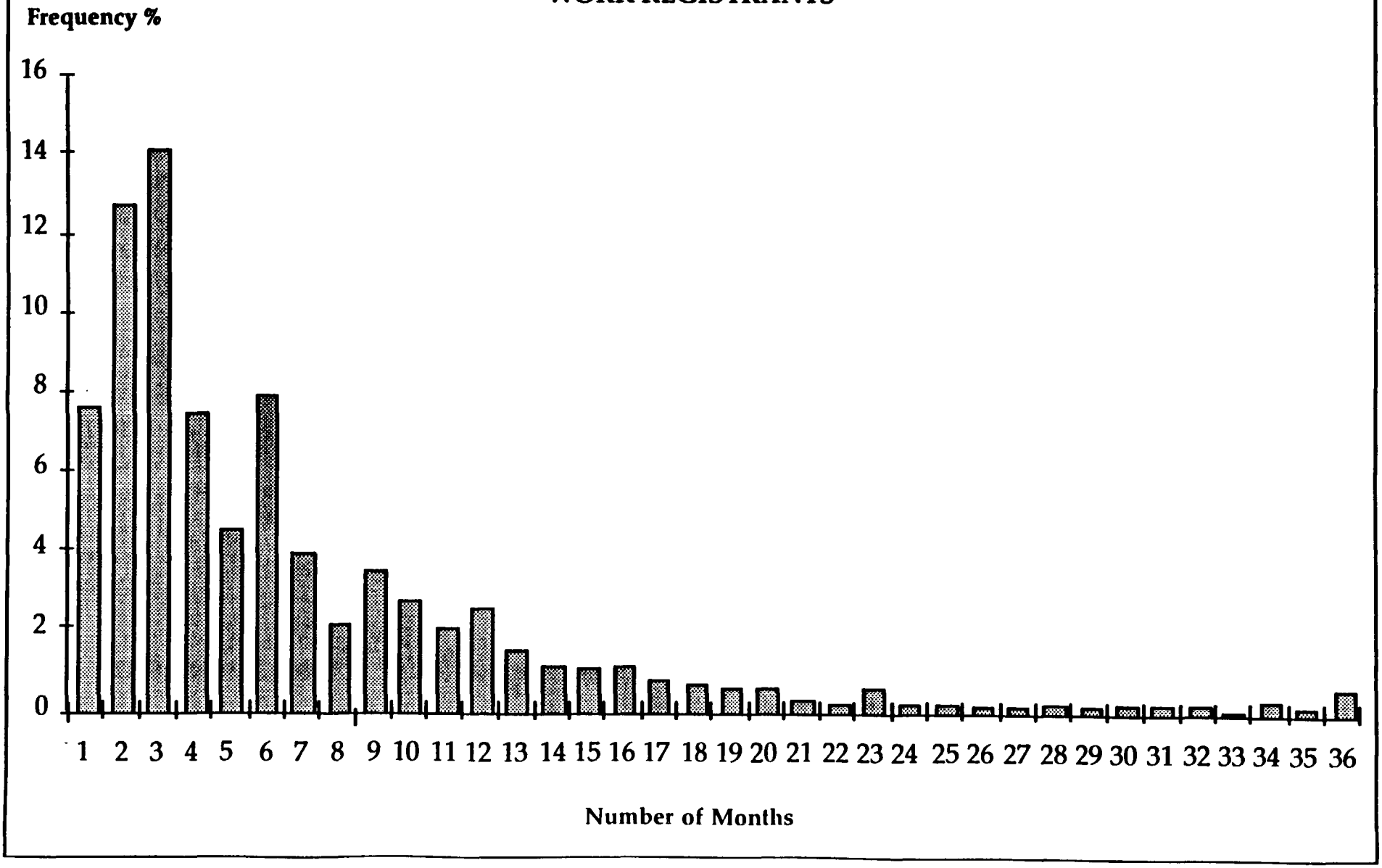


Figure F.3

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: EARNED INCOME

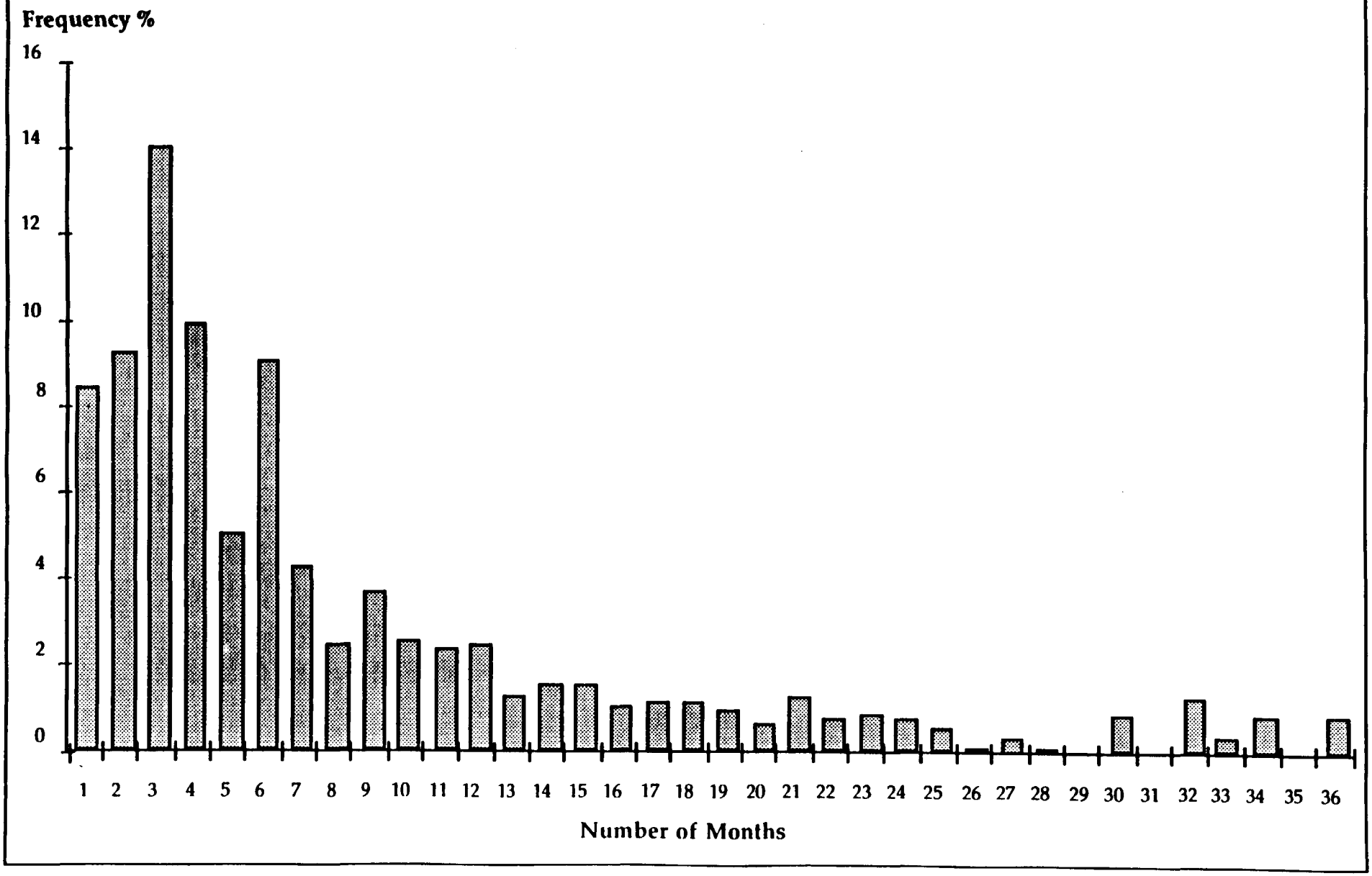


Figure F.4

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: ELDERLY

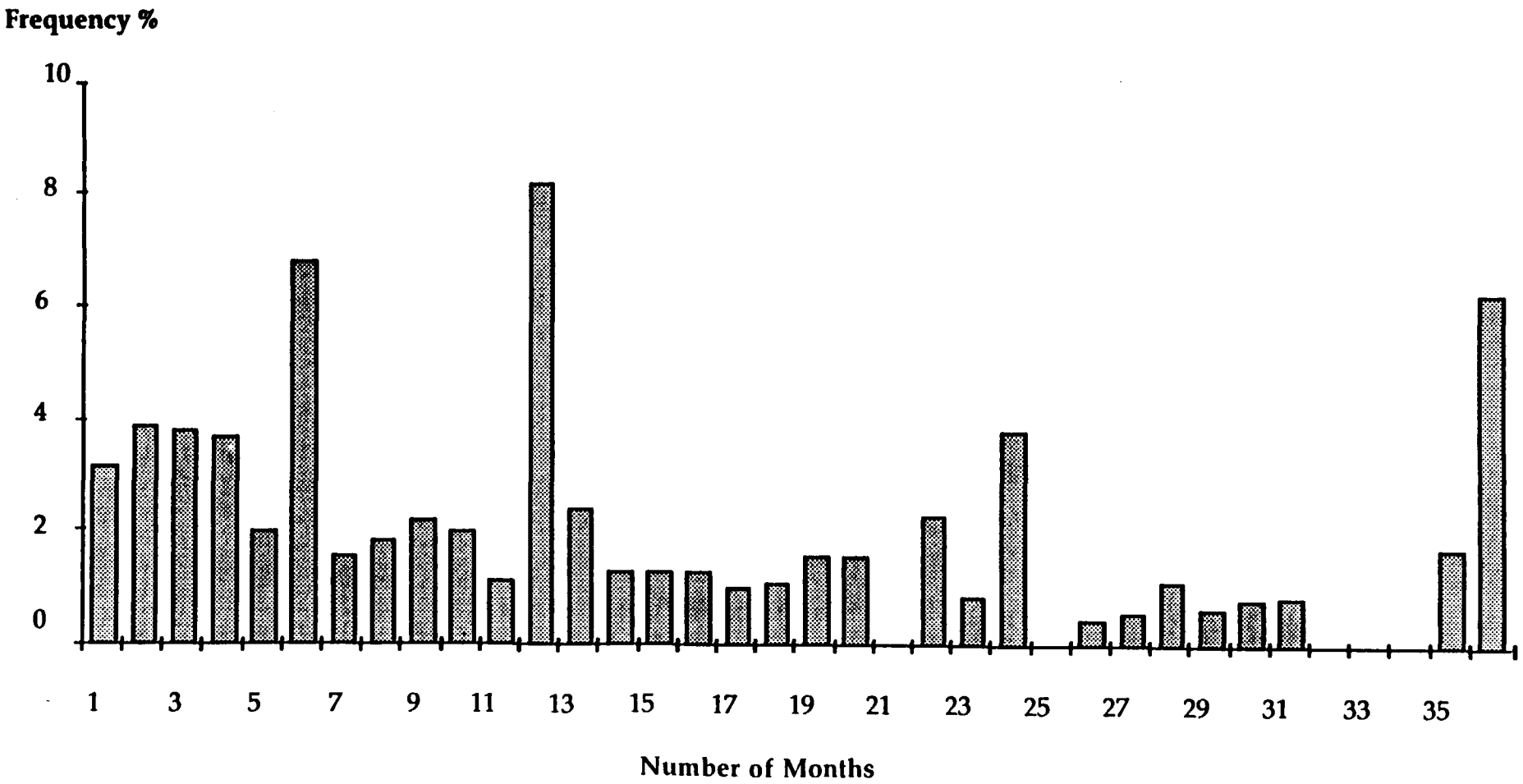


Figure F.5

DISTRIBUTION OF LENGTHS OF COMPLETED EPISODES OF FOOD STAMP RECEIPT: SINGLES

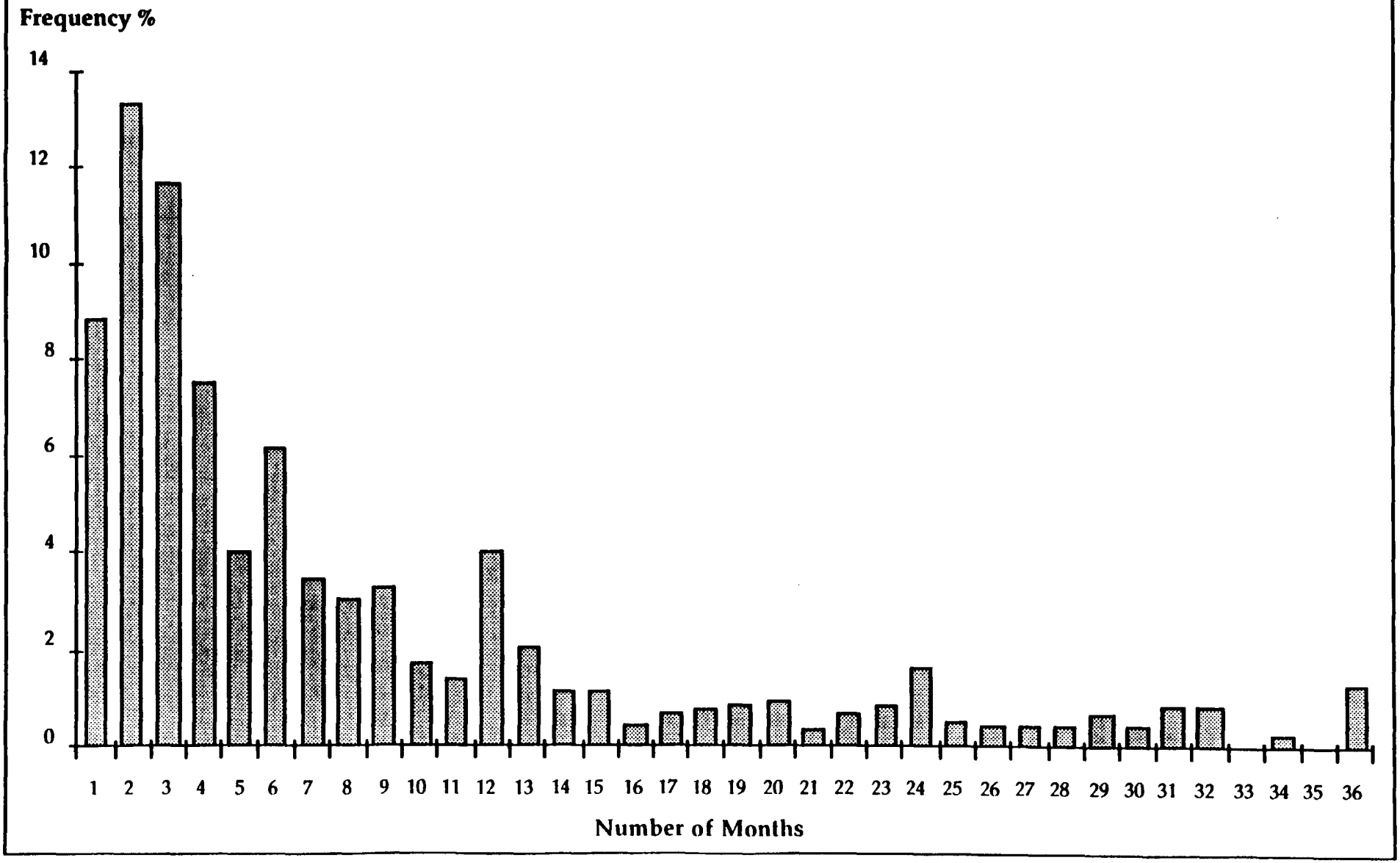


Table of Contents

Table F.1

DISTRIBUTION OF LENGTH OF COMPLETED SPELLS: SINGLE MALES

Months	White youth	Black youth	Hispanic youth	White middle	Black middle	Hispanic middle	White elderly	Black elderly	Hispanic elderly
1	12.38	9.40	31.25	12.75	7.26	9.84	2.94	5.88	0.00
2	20.99	12.17	25.00	17.53	11.42	13.61	5.88	0.00	0.00
3	18.96	10.32	10.94	14.20	11.03	16.02	3.04	0.00	25.00
4	8.87	11.12	4.10	9.40	7.53	7.34	6.08	6.27	0.00
5	3.48	4.27	4.10	4.57	5.64	3.94	3.04	0.00	0.00
6	6.48	6.02	4.10	6.21	8.16	11.19	6.08	6.27	0.00
7	3.01	6.02	0.00	4.70	3.55	0.00	0.00	0.00	0.00
8	5.41	2.39	0.00	2.01	1.64	4.76	0.00	6.27	0.00
9	1.86	5.58	4.10	2.56	5.42	2.56	0.00	0.00	0.00
10	1.28	1.72	0.00	1.30	2.59	0.00	0.00	7.53	12.50
11	1.44	0.86	4.10	1.39	1.77	2.56	0.00	0.00	0.00
12	2.50	0.86	4.10	5.03	1.89	5.12	10.42	22.59	12.50
13	1.78	3.55	0.00	0.61	3.57	2.56	0.00	0.00	0.00
14	1.78	4.59	0.00	0.32	0.54	2.56	0.00	0.00	0.00
15	2.18	0.92	4.10	1.64	1.10	5.12	0.00	0.00	0.00
16	0.00	1.01	0.00	0.34	0.56	0.00	3.68	9.04	0.00
17	0.00	1.07	0.00	0.37	0.59	0.00	3.92	0.00	0.00
18	1.27	2.27	0.00	0.00	0.70	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	1.67	0.72	0.00	5.49	0.00	0.00
20	1.27	0.00	0.00	0.43	1.48	2.56	0.00	0.00	0.00
21	1.27	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	25.00
23	0.00	1.22	0.00	0.52	0.79	0.00	0.00	0.00	0.00
24	0.00	2.44	0.00	1.09	1.71	0.00	0.00	12.05	0.00
25	0.00	0.00	0.00	0.00	1.98	0.00	0.00	0.00	0.00
26	0.00	3.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	.	0.72	1.12	0.00	0.00	0.00	25.00
28	0.00	1.52	.	0.00	1.12	0.00	7.06	0.00	0.00
29	1.27	0.00	.	0.00	0.00	0.00	7.06	0.00	0.00
30	0.00	0.00	.	1.45	0.00	0.00	0.00	0.00	0.00
31	1.27	0.00	.	0.72	0.00	0.00	0.00	0.00	0.00
32	0.00	5.08	.	0.88	0.00	0.00	0.00	0.00	0.00
33	.	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
34	.	.	.	0.00	0.00	0.00	0.00	0.00	0.00
35	.	.	.	0.00	0.00	0.00	0.00	0.00	0.00
36	.	.	.	0.00	0.00	0.00	.	24.09	0.00
37+	1.27(a)	2.54(b)	4.10(c)	7.08	14.61	10.25	35.31(d)	0.00	0.00
Sample size	202	149	32	494	303	61	34	17	10

NOTES: (a) This value is for 33 or more months.
(b) This value is for 34 or more months.
(c) This value is for 27 or more months.
(d) This value is for 36 or more months.

Table of Contents

Table F.2

DISTRIBUTION OF LENGTH OF COMPLETED SPELLS: SINGLE FEMALES

Months	White youth	Black youth	Hispanic youth	White middle	Black middle	Hispanic middle	White elderly	Black elderly	Hispanic elderly
1	10.23	4.26	0.00	6.10	4.10	7.02	2.08	1.89	0.00
2	19.82	11.26	12.00	11.27	6.79	10.53	3.26	0.00	0.00
3	11.26	14.08	12.00	11.80	9.43	11.24	1.14	4.00	4.00
4	8.47	3.71	8.44	9.93	5.37	0.00	2.31	0.00	8.00
5	4.96	4.94	8.44	5.11	2.79	1.98	1.23	2.14	0.00
6	3.62	15.12	0.00	5.20	1.93	8.15	3.80	4.60	0.00
7	5.43	5.33	0.00	3.37	6.23	2.04	0.00	0.00	0.00
8	4.94	6.66	18.19	1.48	3.22	2.19	2.65	2.30	0.00
9	5.65	5.54	0.00	1.52	2.15	6.56	2.69	2.36	0.00
10	2.18	2.77	0.00	2.66	1.07	0.00	0.00	4.87	0.00
11	0.73	1.65	10.23	1.08	0.00	2.65	0.00	4.87	0.00
12	4.82	0.00	0.00	1.66	7.66	2.80	11.55	10.07	0.00
13	0.88	0.00	0.00	4.12	3.44	2.80	2.95	2.62	0.00
14	0.88	0.00	0.00	3.72	0.00	3.00	0.00	0.00	0.00
15	0.94	0.00	6.14	1.29	0.00	0.00	0.00	0.00	0.00
16	0.00	1.90	0.00	0.66	0.00	0.00	0.00	0.00	0.00
17	2.14	0.00	0.00	1.42	1.39	0.00	0.00	3.17	0.00
18	1.28	0.00	0.00	0.00	0.00	0.00	1.75	3.17	0.00
19	0.00	0.00	0.00	0.73	2.96	0.00	3.80	0.00	0.00
20	1.65	0.00	0.00	0.00	4.61	0.00	1.96	3.85	5.87
21	0.00	0.00	0.00	0.00	1.76	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	1.63	0.00	0.00	4.20	4.17	0.00
23	0.00	0.00	0.00	1.74	4.13	0.00	2.10	0.00	0.00
24	0.00	0.00	0.00	0.87	4.43	0.00	10.50	4.17	7.47
25	2.48	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	4.43	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	16.37	0.00	2.46	0.00	0.00	0.00	0.00
30	0.00	0.00	.	0.00	0.00	0.00	3.82	0.00	0.00
31	0.00	5.70	.	0.00	2.46	0.00	0.00	0.00	12.44
32	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
33	.	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
34	.	0.00	.	2.90	0.00	0.00	0.00	0.00	0.00
35	.	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00
36	.	0.00	.	0.00	0.00	0.00	.	0.00	0.00
37+	7.43(a)	17.09	8.19(b)	17.39	17.21	39.05	38.20(c)	41.74	62.22
Sample size	176	94	26	246	132	57	96	53	25

NOTES: (a) This value is for 33 or more months.
(b) This value is for 30 or more months.
(c) This value is for 36 or more months.