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David Christopher Ribar
University of North Carolina at Greensboro

Marilyn J. Edelhoch
South Carolina Dept. of Social Services

Qiduan Liu
University of South Carolina

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David C. Ribar (contact)
Department of Economics
University of North Carolina at Greensboro
P.O. Box 26165
Greensboro, NC 27402
E-mail: dcribar@uncg.edu

Marilyn Edelhoch
Division of Family Assistance
South Carolina Department of Social Services
1535 Confederate Avenue
Columbia, South Carolina 29202
E-mail: marilyn.edelhoch@dss.sc.gov

Qiduan Liu
Institute for Families in Society
University of South Carolina
1600 Hampton Street, Suite 507
Columbia, SC 29208
E-mail: qiduanl@gwm.sc.edu

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Abstract

Several recent changes in the Food Stamp Program have been directed toward households without children. Some, including new work requirements for able-bodied adults without dependents (ABAWDs), were intended to promote self-sufficiency, while others, including easier application and recertification procedures, were intended to increase participation among underserved groups, such as the disabled and the elderly. Despite their relevance to policymakers, adult-only households have been examined by only a few studies. We use administrative records from South Carolina and event-history methods to investigate how spells of food stamp participation for adult-only households vary with ABAWD provisions, recertification intervals, economic conditions and other characteristics. We find that households that were subject to ABAWD policies had shorter spells and lower rates of food stamp participation than other households. We also find that households were much more likely to leave the Food Stamp Program at recertification dates than at other dates. Compared to married households, exit rates were lower for households in high unemployment areas, for female- and black-headed households, for individuals with less education, and for never-married households. We further find that the time limit was associated with exits with and without earnings, suggesting that this policy increased self-sufficiency for some households but left others without support.

Food Stamp Participation among Adult-Only Households

1. Introduction

Recent legislative and administrative changes in the Food Stamp Program have focused new attention on the participation of adult-only households.[1] The biggest legislative changes were the enactment of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996, which limited able-bodied adults without dependents (ABAWDs) to three months of assistance in any three-year period unless they fulfilled specified work requirements, and the American Recovery and Reinvestment Act (ARRA) of 2009, which suspended those requirements. States have also altered their administrative policies, such as the frequency with which they required households to recertify their eligibility for benefits. Several states also undertook outreach efforts and streamlined their application procedures for vulnerable populations, such as the disabled and the elderly. The goal of these changes was to promote self-sufficiency among people who could work, while reducing barriers to participation among those who could not.

Food stamp participation among adult-only households has not been extensively studied, perhaps because the people in these households make up a small share of the food stamp caseload. Barrett (2006) estimates that only 23 percent of food stamp recipients in 2005 lived in adult-only households and that fewer than four percent of recipients were ABAWDs. Adult-only households also tend to experience better economic circumstances than other households. The poverty rate in 2005 was 5 percent for families without children but 14 percent for those with

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children.[2] Nord, Andrews and Carlson (2006) estimated that 92 percent of adult-only households were food secure compared to 84 percent of households with children.

The relevant food stamp policies can also be difficult to analyze. The implementation of many policies and the administration of the program are left to the states, leading to considerable variation in the administrative landscape (Bartlett et al. 2004). Information on administrative procedures is hard to obtain and categorize, and when policies can be measured, they often lack useful, independent variation. For example, a binary indicator for the state-wide adoption of a policy cannot be distinguished from general controls for time effects for that state.

Despite their modest representation in the food stamp caseload and the challenges of investigating the relevant policies, adult-only households are an important population to study. First, while the adult-only households as a whole are better off than other households, adult-only households with low incomes, especially poor, disabled, and elderly households, are extremely vulnerable. In addition, eligible households in these groups have much lower program take-up rates than other groups. Wolkwitz (2007) estimated that food stamp participation rates in 2005 among households with and without children were 81 and 39 percent, respectively. The disadvantages faced by ABAWDs are sometimes overlooked. Bell and Gallagher (2001) have found that many low-income ABAWDs lack job skills or report other caregiving responsibilities; at the same time, ABAWDs can draw on few safety-net supports other than food stamps.

Second, the policies directed toward adult-only households may have been quite consequential. Czajka et al. (2001) estimated that nearly a million ABAWDs were dropped from the food stamp caseload in the first three years following the imposition of time limits. Two

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[2] U.S. Census Bureau, "Detailed Poverty Tables—POV04: Families by Age of Householder, Number of Children, and Family Structure," <http://pubdb3.census.gov/macro/032006/pov/new04_100_01.htm>, accessed Sept. 14, 2009.

unanswered empirical questions are 1) whether policy changes led to these declines and 2) whether people who left the program were able to find work.

Third, policies regarding adult-only households have been areas of both concern and discretion among the states. The concerns have centered on the administrative burden of tracking work effort and countable months under the time limits (Czajka et al. 2001), providing work supports, and monitoring the effectiveness of those supports (U.S. General Accounting Office 2003). With respect to policy discretion, states have been able to obtain waivers from the work requirements for geographic areas that lack jobs and to exempt parts of their ABAWD caseloads. Most states used this discretion in at least some areas, and at least 10 managed to obtain blanket waivers for all of their residents. The ARRA suspended time limits throughout the country from April 2009 until September 2010.

In this article we examine patterns of exit from the Food Stamp Program among adult-only households from 1996 to 2005, applying event-history methods to administrative records from South Carolina. We are especially interested in how work rules for ABAWDs and changes in the state's recertification policies contributed to changes in exit behavior. We also analyze patterns of covered employment immediately following households' food stamp spells to gain insights about their economic well-being.

The administrative records from South Carolina's case management system are a large and precise data source that is representative of all households in the state that began a spell of food stamp receipt after the enactment of the PRWORA. The records indicate the exact dates when spells began and ended and are not subject to the problems of faulty recall, underreporting, and nonresponse that characterize survey data. Such detailed information is critical when

investigating ABAWD time limits and recertification intervals, which should affect exits at particular points in a spell.

Although we only consider a single state, the state's policies applied to identifiable groups of people in different ways, which enables us to identify effects. Consider the waivers and exemptions from the ABAWD time limits. South Carolina applied most of its waivers on a county-by-county basis, with the set of counties changing over time. In addition, because the time limits only applied to people under age 50, it is possible to use households in which all of the members were older than this as pseudo-controls to see if other features of the exempt counties were associated with changes in participation.

South Carolina also has a measurable set of recertification policies. Until October 2002, the state required food stamp recipients with variable incomes to recertify their eligibility every three months and recipients with fixed incomes to recertify every 12 months. In October 2002, the state extended the interval for households with variable incomes to six months, and in February 2005, it decreased the interval for households with fixed incomes, also to six months. Because recertification dates are tied to when a case begins, they can be distinguished from other calendar effects. Ribar, Edelhoch, and Liu (2008) showed that the longer recertification intervals in South Carolina enacted in 2002 contributed to caseload growth among households with children; in the present study, we investigate these relationships for adult-only households.

Our analysis indicates that time limits and recertification frequency each contribute to the length of food stamp spells. Adults who were potentially subject to the ABAWD time limit were more likely to leave food stamps in the first few months of their spells than adults who were not subject to the limit. Also, adults were more likely to leave the program in months when they faced recertifications. The timing of people's exits lines up extraordinarily well with when the

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policies should have had their effects, and the associations are robust to alternative comparisons. We further find that the time limit was associated with exits with and without earnings, suggesting that this policy increased self-sufficiency for some households but left others without support.

2. Food Stamp Program in South Carolina

The Food Stamp Program is a federal-state partnership that is intended to help low-income households obtain more nutritious diets by increasing their food purchasing power. The federal government pays the full cost of benefits; the federal and state governments split the cost of administration, and the state governments administer the program. In South Carolina, the administering agency is the state's Department of Social Services. While eligibility is necessarily limited by income, assets, and other rules, South Carolina explicitly tries to reach as many eligible households as possible and to maintain participation in the program for as long as eligibility lasts. At the same time, the state has emphasized work to those who are able.

As mentioned, the PRWORA toughened employment and training (E&T) requirements for ABAWDs. Prior to the enactment of the PRWORA, South Carolina required most nonelderly, nondisabled adults receiving food stamps to register for work, participate in job search and other E&T activities, and accept reasonable employment if it was offered. Recipients who did not comply could be sanctioned with a temporary loss of benefits. The PRWORA increased the amount of time that ABAWDs had to devote to work or other work activities to 80 hours per month. It also imposed a new time limit—three months of food stamps in any three-year period—for ABAWDs who failed to comply.

The PRWORA gave states the discretion to waive the time limits in areas with weak employment conditions. South Carolina quickly exercised this option, waiving the limits in 24

counties. The Balanced Budget Act of 1997 further allowed states to exempt up to 15 percent of their ABAWD cases from time limits, and the state subsequently received exemptions for several counties under this rule. Although South Carolina waived and exempted ABAWDs from the time limits, it initially maintained its other work requirements and sanctions.

The areas that were waived or exempt varied over time, with just over half of the state's counties being affected in any given year until October 2002. Since then, exemptions have been extended to all 46 counties in the state. South Carolina also made the other E&T components of its Food Stamp Program voluntary, starting in October 2002. We expect participation spells among ABAWDs to be shorter in areas that were subject to the time limits and work rules.

A policy that affects all food stamp households is the frequency of recertification. Technically, food stamp eligibility is determined monthly. However, it would be unduly burdensome to have every household fill out an application and supply the accompanying documentation each month. Instead, states certify households for eligibility for a given period during which the reporting requirements are reduced. At the end of this period, households go through a formal procedure to recertify their eligibility. Until October 2002, South Carolina required food stamp recipients with earnings and other variable sources of income to recertify their eligibility quarterly by mail and annually through face-to-face interviews. Clients with fixed sources of income received certifications of one year, while clients with no income and other highly unstable circumstances were only certified for one to two months. In October 2002, the state lengthened the certification period for households with earnings to six months but kept the interval for households with fixed incomes at 12 months. Then, in February 2005, the state cut the interval for households with fixed incomes to six months. Longer (shorter) recertification

intervals reduce (increase) the compliance burden on households and should lead to longer (shorter) participation spells.

South Carolina also adopted other policies to reduce compliance costs for vulnerable populations. Chief among these was the South Carolina Combined Application Project (SCCAP), which began in 1995. The SCCAP simplifies the application process for Supplemental Security Income and Social Security Disability Insurance recipients who have no earned income and who live alone. The SCCAP uses a short application form, which can be completed at a Social Security office, provides standardized benefits, and reduces the verification procedures. It has become a model for combined application projects in other states.

In 2001, South Carolina began allowing elderly households to maintain resources accumulated through their work lives for emergency situations, such as medical care, extended care, and funeral expenses, and to receive food assistance as long as their income was below 130 percent of the poverty line. Building on its SCCAP experience, the state implemented an Elderly Simplified Application Project (ESAP) in 2004 that allowed people age 60 and over living on fixed incomes to apply for food stamps on a shorter form with less income documentation.

When the PRWORA was enacted, some 146,000 households were receiving food stamps each month in South Carolina. About 31,000 were households in which all of the members were age 50 or older, and about 24,000 were adult-only households with at least one member under age 50. About 10,000 younger adult-only households were receiving benefits under "special" circumstances, which typically meant that all of the members of these households were receiving disability income (or were elderly) and therefore were exempt from the work rules. The remaining younger adult-only households were "regular" cases that potentially included ABAWDs. Figure 1 shows how South Carolina's food stamp caseload has evolved since then.

The figure shows that the numbers of older adult-only cases and younger, special adult-only cases grew from 1996 to 2005 by 67 percent and 60 percent, respectively. In contrast, the number of younger, regular adult-only cases and the food stamp caseload as a whole have been more volatile. The number of younger, regular adult-only food stamp households fell by 43 percent from 1996 to 2000, while the number of food stamp households with children fell by 21 percent. Since 2000, the caseload has skyrocketed, with younger, regular adult-only cases increasing by more than 300 percent and cases with children increasing by nearly 80 percent.

The trends in the overall caseload follow the trends in the unemployment rate, which fell through 2000 but then increased. However, the caseload trends are also consistent with policy changes. These include the imposition of ABAWD time limits after the PRWORA and their subsequent relaxation after 2002. They also include longer recertification intervals after 2002.

3. Previous Research

Food stamp participation among adult-only households has received less attention from researchers than participation among households with children. Nevertheless, the available evidence indicates that the program behavior of adult-only households is different. Bartlett et al. (2004), Farrell et al. (2003), and McKernan and Ratcliffe (2003) estimated household-level models of food stamp participation that included dummy indicators for ABAWD households. They all found that ABAWD households were less likely than other households to participate.

As with the present study, Gleason, Schochet, and Moffitt (1998) estimated hazard models of exits from the Food Stamp Program. They estimated these models separately for five types of households: 1) households in which all of the members were either elderly or disabled, 2) households with ABAWDs, 3) married-couple households with children, 4) single-parent households, and 5) other households with children. The researchers found that the exit behavior

of ABAWDs was especially sensitive to changes in local economic conditions. Kornfeld (2002) analyzed state-level caseloads and also found that nonelderly adult-only households were sensitive to economic changes. Currie and Grogger (2001) estimated cross-section models of program participation for different groups of households. In contrast to the other studies, they found that adult-only households were less responsive to local economic conditions than households with children.

Several studies have examined ABAWD policies. However, the findings have been equivocal. Stavrianos and Nixon (1998) investigated food stamp eligibility, participation, and employment among ABAWDs using pre-PRWORA data. They predicted that a large proportion of ABAWDs would lose their food stamp eligibility and that few would have strong enough work skills to become economically self-sufficient. A subsequent analysis by Czajka et al. (2001) confirmed that many ABAWDs were dropped from the Food Stamp Program because of time limits and that many also confronted employment barriers.

Wilde et al. (2000) and Ziliak, Gundersen, and Figlio (2003) examined food stamp participation, using state-level data and including controls for the percentages of ABAWDs that were exempt from work requirements. Both studies found that exemptions were positively associated with food stamp use, which indicates that the ABAWD rules reduced participation. A state-level analysis by Danielson and Klerman (2006), however, reported little association between ABAWD work rules and food stamp participation. A critical weakness of these studies was that they did not look specifically at ABAWD households but rather at caseloads as a whole.

In a study that is especially relevant for ours, Richardson et al. (2003) surveyed ABAWDs who had left the Food Stamp Program in South Carolina and found that exemption status was not correlated with subsequent employment or reentry into the program. A

shortcoming of the study, however, was that most of its "ABAWD leavers" were youths who had recently moved out of their parents' households and were living on their own.

Recertification policies have also been examined. Currie and Grogger (2001) included measures of the average frequency of recertifications in their models but did not find strong associations between these policies and food stamp receipt for adult-only households. In contrast, analyses by Kornfeld (2002) and Ratcliffe, McKernan, and Finegold (2008) indicated that nonelderly adult-only households did respond to changes in recertification intervals. Kabbani and Wilde (2003) examined Food Stamp Quality Control data and estimated that participation rates were as much as 2.4 percent lower in states with monthly to quarterly recertification requirements than in states with longer intervals. All of these studies used relatively crude statewide measures of recertification intervals. As our earlier policy discussion indicated, intervals can vary substantially among different types of households within states.

Two studies have looked at how the timing of food stamp exits is associated with recertification intervals. Staveley, Stevens, and Wilde (2002) examined administrative data from Maryland and found that exits spiked at likely recertification dates. Ribar, Edelhoch, and Liu (2008) found similar results for South Carolina households with children; their study also showed that exit patterns changed when recertification intervals changed.

Finally, some recent studies have looked specifically at issues associated with elderly recipients. Studying Health Retirement Survey data, Haider, Jacknowitz, and Schoeni (2003) found that eligibility for food stamps increased with age but that take-up rates decreased. Cody (2004) reported results from several county-wide demonstrations of innovations to increase participation among the elderly, including simplified applications, application assistance, and the

provision of commodities instead of a food stamp benefit. For most of these innovations, participation increased more in the demonstration counties than in the comparison counties.

Our empirical analyses improve on the existing observational studies in several respects. First, we are able to capture our primary policies of interest—ABAWD time limits and recertification intervals—in exceedingly fine detail. Most research has relied on statewide average measures that mix policies for different groups of recipients. Second, we use these measures to investigate the timing of food stamp exits. Time limits and recertification intervals should have their impacts at particular points in spells. Third, we examine employment outcomes that immediately follow food stamp spells. This provides an indication of whether exits might be associated with economic improvements for households.

4. Analysis Data

The primary data for our investigation come from food stamp case management records, covering the period from October 1996 until December 2005. We use these records to analyze spells of program participation by adult-only households. Households in our sample can experience multiple spells. We supplement the case records with earnings data from South Carolina's Unemployment Insurance (UI) system. The earnings records allow us to distinguish between food stamp spells that are and are not followed by a quarter of covered employment.

The food stamp case records include complete, right-censored, and left-censored spells. Right-censored spells are those for which the end date is missing. In this study, spells that were ongoing on December 31, 2005, are right-censored. We also censor spells at the point where information on any of the explanatory measures is missing. Hazard procedures are used to address the loss of information associated with right-censoring. Spells that were ongoing as of October 1, 1996, are left-censored. We drop these program spells from our analysis.

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Food stamp benefits in South Carolina are paid once a month, and the state almost always closes cases on the last day of the month. Because of these data features, we measure and model the duration of participation spells in discrete monthly units. The spells themselves should refer to continuous months of benefit receipt. However, the administrative records contain some short breaks. In processing the data for each household, we smooth the information by combining spells of program participation that are separated by a month or less (that is, by ignoring short breaks). This kind of smoothing is commonly applied in event-history studies of caseloads and is intended to eliminate artificial transitions associated with administrative "churning." This treatment is also consistent with state policies that consider program receipt spells that resume within one month of a previous spell to be continuations of the earlier spells.

For each month of participation, the records indicate the benefits that the household received as well as the economic information that entered the benefit calculation, including the gross reported earned and unearned income amounts. We use the benefit and income variables in our multivariate analyses, adjusting all dollar amounts to 2005 levels using the Consumer Price Index for Urban Consumers.

The records also indicate whether the household was receiving benefits under "regular" or "special" circumstances. Most special cases were receiving disability income or contained members who were all age 60 or older. These cases were generally exempt from work rules, including the ABAWD work rules. The "regular/special" designation, along with information on the age composition of the household, helps to identify potential ABAWD cases. In particular, cases with members under age 50 who receive benefits under "regular" circumstances are potential ABAWD cases, while cases with older members and those who receive benefits under "special" circumstances can be excluded as ABAWD cases.

For each household, the program records identify a primary informant (PI), who is responsible for the household's financial decisions and able to provide information about its members. We extract data on this person's gender, age, and race/ethnicity. To describe educational attainment, we construct two mutually exclusive indicators for whether the PI completed high school but did not go on to college or whether the PI completed at least some college; the excluded category consists of those who did not complete high school. We also construct continuous measures of the years of education through high school and of the years of postsecondary education. Our analyses include indicators for whether the PI is currently or formerly married; the omitted category is "never married." The data also indicate the number of people in the household and whether all of the household members are age 60 or older.

We use information on the household's county of residence to link the administrative records to monthly measures of the county unemployment rate as an indicator of economic opportunities. As a policy measure, we also include a time-varying indicator for whether ABAWDs in the county were exempt from the PRWORA time limits.

For each person in the food stamp case management records, we have also obtained quarterly earnings records, if any, from the state's UI system. The UI database contains earnings information for most private, nonagricultural employers. However, it overlooks government employment and some types of private-sector jobs, such as agricultural and domestic work. It also misses employment by people who commute out of the state to work. We use these data to construct measures of whether anyone in the household had covered earnings in the quarter following their last month of food stamp participation.[3]

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[3] As a sensitivity check, we also constructed indicators of whether the household had earnings in the same quarter as it exited. This respecification had little effect on our results.

The universe for our analysis is the set of adult-only households in South Carolina who began a spell of food stamp receipt between October 1996 and December 2005. There are more than 200,000 households in the administrative data that meet these criteria. To reduce the size of the analysis file, we randomly select one out of every 11 households that ever appear in the records. Our analysis sample excludes a few additional observations with (a) inconsistent spell information, (b) missing information, (c) PIs who change over time, and (d) PIs who are younger than 18 or older than 90 years of age at the start of their spells. These exclusions result in the loss of about 10 percent of the sample. The final extract contains information for 20,581 households with 28,638 participation spells, covering 421,760 months of benefit receipt.

In our empirical analyses, we separately examine 16,895 spells that began as regular cases with at least one household member under the age of 50, 3,474 spells that began as special cases with at least one household member under the age of 50, and 8,269 spells that began with all household members age 50 and older. Of the spells that are observed to completion, 52 percent of the spells for regular cases with members under 50 are followed by covered earnings. This compares to 26 percent of the spells for special cases with members under 50 and 23 percent of the cases will all household members 50 and older. Table 1 lists the means of the variables in our sample separately for the households with different types of members.

5. Descriptive Analysis of Spell Data

Figure 2 displays nonparametric Kaplan-Meier estimates of the hazard functions for spells of food stamp participation for selected cohorts of adult-only households from South Carolina. From the top row to the bottom, separate estimates are calculated for households that began food stamp spells before 2001, households that began spells in the second half of 2002, and households that began spells in 2005. These cohorts cover the three periods of

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recertification rules. In the left column, estimates are calculated for households that began their spells with earnings and were likely subject to the variable-income recertification rules, and in the right column, estimates are calculated for households that began spells with only unearned income and were likely subject to the fixed-income rules.

The most striking features of the hazard functions are the sharp spikes at three-, six-, or twelve-month intervals, which coincide with the dates when the households would have been required to recertify their eligibility. The estimates indicate that households are several times more likely to leave the Food Stamp Program in recertification months than at other times.

On the left side of the figure, the exit probabilities for households with earnings jump at quarterly intervals prior to 2001, which matches the initial recertification policy for households with variable incomes. The quarterly spikes in the hazard functions disappear in the second half of 2002, leaving only semiannual spikes, which again mirrors the relevant recertification policy. This semiannual pattern for households with earnings continues into 2005. From the right side of Figure 2, we see that households that began their food stamp spells with only unearned income had annual spikes in their exit probabilities prior to 2005 and semiannual spikes thereafter. This corresponds precisely to the recertification rules for fixed-income households.

Figure 2 indicates that the timing of exits was associated with recertification dates and that exit behavior changed when recertification policies were changed. These changes had implications for spell lengths and participation levels. Survival function estimates (not shown) reveal that the median spell length for adult-only households with earnings increased from about five months in the period when recertifications occurred quarterly to 10 months when recertifications occurred semiannually. Similarly, the median spell for households with only

unearned income decreased from a length of nearly two years when recertifications were conducted annually to one year after recertification intervals were reduced.

Figure 3 displays hazard functions that are calculated separately for younger regular, younger special, and older adult-only households who were living in counties with and without ABAWD exemptions. We limit these analyses to spells that began before 2002, the year that exemptions were applied statewide. The comparisons across different types of households are motivated by a concern that geographic differences in exit behavior might not only reflect differences in the treatment of ABAWDs but also differences in the economic and other local circumstances that led to the ABAWD exemptions.

The top panel in Figure 3 indicates that younger, regular adult-only households in nonexempt counties were more likely to leave the Food Stamp Program during the first few months of their spells than similar households in exempt counties. For younger households that stayed on the food stamp program for more than five months, there were only modest differences in subsequent exit behavior. The bottom two panels in Figure 3 indicate that there were few appreciable differences in exit behavior by exemption status for younger special households and for older households during their spells. Thus, the estimates show that living in a nonexempt county hastened exits from the Food Stamp Program mainly among younger regular adult-only households and mainly during the initial months of their spells. The specific combination of results reinforces the interpretation that ABAWD policies affected participation.

Survival estimates (not shown) indicate that the changes in participation associated with the ABAWD time limits may be substantial. In counties with the time limits before 2002, the median spell length for younger, regular adult-only households was three to four months. In counties without the time limits, the median spell length was two months longer.

Figure 4 also disaggregates exits by county exemption status but distinguishes between exits that were and were not followed by covered earnings. Because older households and special households experience few exits involving earnings, we only report results for younger, regular households. The left panel of the top row shows hazard functions for the combined event of leaving food stamps and receiving covered earnings in the following quarter, while the right panel shows hazard functions for leaving food stamps without such earnings. The graphs indicate living in a nonexempt country is associated with higher rates of each type of exit during the first few months of a food stamp spell. The graphs also indicate that exits involving earnings are more likely to occur early in a spell than later in a spell. The results suggest that the ABAWD time limits encourage work-related exits but also lead to other exits.

The middle row of Figure 4 repeats this analysis but distinguishes between households that do and do not receive covered earnings in the same quarter as their food stamp exits. The UI earnings data do not indicate the precise start and stop dates of work; thus, earnings in the same quarter could precede the exits. However, the change in the measurement of earnings does not alter the results substantively. In the bottom row of Figure 4, we consider a more stringent indicator of economic self-sufficiency—receiving earnings and remaining off food stamps in the quarter following an exit. The results for these exits are similar to those just involving earnings.

6. Multivariate Analysis

Our empirical analysis considers how food stamp spell duration patterns vary with different recertification interval and possible time limit policies. Estimates of duration patterns are known to be sensitive to confounding influences from other variables, so it is important to examine the food stamp hazard functions using multivariate techniques that control for observed and unobserved characteristics of the households. The multivariate analysis also allows us to

examine both policies together. We estimate two types of discrete-time models: standard single-destination hazard models of any kind of exit from the Food Stamp Program and competing-risk models of exits that are and are not followed by covered employment. For the single destination models, the hazard, $h(t)$, of leaving food stamps at duration t for a given household is specified as

$$h(t) = \frac{\exp\left(A'T(t) + B'X(t) + \eta\right)}{1 + \exp\left(A'T(t) + B'X(t) + \eta\right)} \tag{1}$$

where $T(t)$ represents a vector of duration variables, including the recertification date indicators; $X(t)$ is a vector of other observed explanatory variables; and η is an unobserved random variable that is constant within and across spells for the household.

For the competing-risk models, the hazards of exiting with employment, $h_1(t)$, and without employment, $h_2(t)$, are specified as

$$h_j(t) = \frac{\exp\left(A'_j T(t) + B'_j X(t) + \lambda_j \eta\right)}{1 + \sum_{k=1}^{2} \exp\left(A'_k T(t) + B'_k X(t) + \lambda_k \eta\right)} \quad \text{for } j = 1, 2. \tag{2}$$

The presence of unobserved heterogeneity in the hazard functions is a substantial complication that can lead to biased estimates if unaddressed. Following Heckman and Singer (1984), we assume that the unobserved heterogeneity term, η, follows a discrete distribution with two points of support.[4]

Each of our hazard models includes flexible controls for spell duration effects. The models include individual dummy variables for each of the first 24 months of a spell, dummy variables for the next four quarters of a spell, and dummy variables for the next two six-month periods. The omitted category represents durations beyond four years.

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[4] We experimented with additional points of support, but these models failed to converge.

To capture effects associated with living in a county with exemptions from the ABAWD time limits, the models also interact all of the duration variables with the ABAWD exemption indicator. Thus, wholly separate duration dependence patterns are estimated for households living in exempt and nonexempt counties.

The models also incorporate controls for potential recertification months—quarterly and annual spell-month indicators for months before October 2002, semi-annual and annual spell-month indicators for months between October 2002 and January 2005, and another set of semi-annual and annual indicators for months after January 2005. We also interact all of these measures with a dummy variable indicating whether the household began the most recent year of its spell with earnings. The interactions are intended to capture differences in recertification requirements for households with and without variable incomes.

The models also include dummy variables for each fiscal year (FY 1997 is the omitted category). The time trend measures are included to account for statewide policy changes, such as the elimination of mandatory work requirements in 2002 and the introduction of the ESAP in 2004. Policies were often changed at the start of fiscal years rather than of calendar years. The measures also account for statewide economic, demographic, and attitudinal shifts over time.

Table 2 reports selected coefficient estimates from the single-destination models estimated separately for younger adult-only regular households, younger adult-only special households, and older adult-only households. For brevity's sake, the table omits the coefficients for the general duration variables, the interactions of the ABAWD exemption indicator with the duration variables after the first year (interactions for the first year are displayed), and the finite mixture controls for unobserved heterogeneity. Complete results are available upon request.

The first 12 rows of Table 2 list results for the dummy-variable controls for recertification months. The estimates indicate that younger adult-only regular households were significantly more likely to leave the Food Stamp Program at expected recertification dates than at other times—at quarterly intervals before October 2002 and at semiannual intervals thereafter. During the period between October 2002 and January 2005, these households also had higher exit rates at annual intervals. Interactions with the earnings status variable indicate that households with earnings were much more likely to leave at the "short" recertification dates and much less likely to leave at the "long" (annual) dates.

In contrast to the younger regular households, younger special households were not especially likely to leave the Food Stamp Program in short recertification months unless they had earnings. However, they were likely to leave the program in long recertification months— annually before 2005 and semiannually after that. Older adult-only households increased their exits at short recertification dates and even more so at long dates. As with younger regular and special households, older adult-only households with earnings were especially likely to leave at short recertification dates. The patterns for all three groups correspond to the fixed- versus variable-income policies for recertifications and the findings from Figure 2.

The next 12 rows of Table 2 report the estimated coefficients for the interactions of the ABAWD exemption dummy and the duration controls. The coefficients for younger regular households are significant and negative for the first five months of a spell, indicating that these households were less likely to leave the Food Stamp Program if they did not face the ABAWD time limits. The coefficient on the interaction in the fourth month, immediately following the time limit, is the largest. Significant negative coefficients are also estimated for the seventh, eighth, tenth, and twelfth months, while a significant positive coefficient appears for the eleventh

month. Coefficients for the interactions beyond the twelfth month are not shown; however, of these, only the coefficient for the fourteenth month is significant.

Among younger special households, only two coefficients for interactions of the ABAWD exemption indicator and duration controls are statistically significant, and both of these are positive. The ABAWD exemption interactions are only marginally jointly significant (p-value = 0.08) and consistent with random differences in exit patterns. Similarly, there are few detectable differences in exit behavior between older adults living in exempt and nonexempt counties. The ABAWD interactions for this group were jointly insignificant (p-value = 0.19).

Among the other results, recipients with larger benefits were less likely to leave the Food Stamp Program, while those with larger earnings were more likely to leave. Higher levels of unearned income increased exits for older households and younger special households. The lack of any income at the start of a food stamp spell, an indicator of unstable circumstances, was also associated with faster exits for older households and younger special households.

Households headed by women and by blacks were generally less likely to exit food stamps, while households with better educated heads were more likely to exit. Households with married adults also had faster exit rates. Younger regular households with formerly married heads had higher exit rates than similar households with never-married heads. Among younger special households, the opposite was true—being formerly married reduced the chances of exiting. The associations between household size and food stamp exits also varied across types of households, with the relationship being negative for younger regular households, positive for younger special households, and mostly absent for older households. High unemployment rates were associated with longer food stamp spells for all three types of households.

The last coefficients in Table 2 are those for the fiscal year dummy variables. These estimates reveal that after accounting for other household, economic, and policy characteristics, exit rates for younger regular households were highest in the year immediately following the enactment of the PRWORA and much lower after the work requirements for food stamp recipients were relaxed at the end of FY 2002. Among younger special households, conditional exit rates increased in the first few years following the enactment of PRWORA. Conditional exit rates for older households did not appear to change much over time.

Simulations. The descriptive and multivariate analyses each reveal that the recertification and ABAWD policy measures were strongly associated with the timing of people's exits from the Food Stamp Program. Many of the estimated associations with the hazard rates are large. For example, the estimated hazard rate for a young regular adult-only household in the fourth month of a food stamp spell in a nonexempt county was more than double the hazard rate for a similar household living in an exempt county. The hazard rate for a young regular household with earnings was more than five times higher in a recertification month than in a nonrecertification month.

Despite these strong associations, the practical significance is unclear. For one thing, many of the hazard probabilities are small, so even a quintupling produces a modest absolute value. Also, hazard probabilities are conditional, with effects that cumulate. Changes in early-duration hazards can easily diminish the practical effects of late-duration hazards. Lastly, the controls that we use to measure the recertification and ABAWD policies involve numerous interactions of variables, which complicate interpretations.

To illustrate the implications of the hazard results, we use the coefficients from Table 2 and the analysis data to conduct a series of partial caseload simulations. The simulations are

partial because we only consider spells that began after October 1996, so we only examine the "new" caseload. Also, we have only modeled one of the relevant processes that contribute to caseload changes—the exit process—and have not modeled program entry or reentry behavior. In the simulations, we take the initial entry recorded in the data as given. For each household that then begins an initial spell of food stamp receipt, we simulate its exit behavior. After a simulated exit, we use the average monthly reentry rates from the data to simulate movements back onto food stamps. Upon a simulated reentry, we once again simulate exit behavior, and so on. Our procedure effectively treats the entry and reentry rates as given and only considers the caseload implications of exit behavior.[5] Results for the analysis are reported in Table 3.

We begin the analysis by calculating the relevant average monthly caseloads from fiscal years 1997 to 2005 using the actual spell data. Estimates of the "new spell" caseload, which omits cases that were ongoing at the start of FY 1997, differ from the general levels depicted in Figure 1. By FY 1999, the estimated new spell caseload for younger regular adult-only households is very similar to the total caseload for this group. This is because younger regular households tend to have brief spells. In contrast, the event-history caseload numbers for younger special households and older households are substantially below the levels from Figure 1.

The next rows in Table 3 report results from a baseline simulation in which all of the explanatory variables in the event history sample, including the policy measures, are kept at their observed values. The baseline simulation accurately reproduces the caseload statistics for the analysis sample, with most of the simulated numbers being very close to the actual figures.

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[5] It would be valuable to model the determinants of households' program entry and reentry behavior; however, we lack the data to do this. The case records only describe characteristics for households while they are applying for or receiving food stamps. The data do not describe the general set of potential applicants. The records also do not follow households after they leave food stamps and do not adequately characterize the risk set for reentry.

The next rows list results from a simulation that sets the ABAWD exemption indicators for all counties in all years to one. This simulates what would have happened to the adult-only caseload in South Carolina if no one had been subject to the ABAWD time limits from FY 1997-2002 (recall that the entire state was exempt after October 2002). The simulations indicate that lower rates of exit among younger regular adult-only households—the households with potential ABAWDs—would have led that caseload to be 9-11 percent higher from FY 1998-2002 as well as slightly higher afterwards. Thus, exit behavior that was associated with the ABAWD time limits appears to have reduced the relevant caseload in South Carolina. The simulations indicate that the exemptions had little association with the younger special adult-only caseload and the older caseload.

Another way to look at the ABAWD policies is to consider what would have happened if South Carolina had not obtained exemptions and waivers. The next rows in Table 3 list results from simulations in which the exemption indicators are all set to zero. In this scenario, the numbers of younger regular adult-only cases fall in all years. A comparison of these results to those in the rows above suggests that the exit behavior associated with the ABAWD time limits reduced caseloads by 10-20 percent in the counties where they were in effect. Once again, there is no indication that exemption status was associated with the younger special or older caseloads.

The next rows in Table 3 list results from simulations that extend South Carolina's initial quarterly recertification intervals for variable incomes and annual intervals for fixed incomes past FY 2002 to the end of the analysis period. The simulations indicate that the shorter intervals for households with earnings would have increased exits and reduced participation slightly among younger regular households. The small size of the change is mostly attributable to the fact that less than a quarter of the younger regular households received earnings; thus, few of

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these households were subject to the variable-income recertification intervals. Younger regular households also had higher rates of exit in the initial months of their spells. The simulations indicate that maintaining the initial recertification policy would have had little effect on the older caseload and the younger special caseload.

The next simulations in Table 3 set the county unemployment rates after September 2000 at their September 2000 values. Unemployment in South Carolina began to climb in late 2000, and fixing the rates simulates what would have happened if the state's economy had not slowed. The results from Table 3 indicate that caseloads would have been modestly smaller.[6]

The last set of simulations in Table 3 freeze the general time trend effects after FY 2001. The time trend controls capture state-wide changes in policies and other characteristics. For younger regular and special adult-only households, the trend effects reached a turning point in FY 2001, with hazard rates after that year being lower. The lower hazard rates are consistent with more lenient income reporting policies and later with the elimination of mandatory work policies. The simulations indicate that residual time trend effects contributed to a substantial rise in the younger adult-only caseload after FY 2001.

Sensitivity analyses. The models in Table 2 all include monthly benefits and reported incomes. In the administrative system, these amounts are recorded at the beginning of the month, so they are not determined simultaneously with the household's exit decision. Nevertheless, the amounts are potentially endogenous. By including the measures in Table 2, we err on the side of overcontrolling for household economic characteristics. We reestimated the models, dropping the benefit and income measures, but there were few changes in our results.

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[6] The models and simulations include controls for earnings and time trends. When these controls are removed, the estimated effects of the unemployment rates become more important.

The models in Table 2 include selective periodic controls for recertification dates—quarterly and annual indicators before October 2002 and semiannual and annual indicators thereafter. It is possible to respecify the model to include quarterly, semiannual, and annual indicators before and after October 2002 along with interactions with earnings status. When we did this we discovered that the extra periodic indicators were jointly significant for younger adult-only households but not for older households. However, adding these variables did not alter our other findings or the simulated impacts of recertification changes.

An additional issue with the primary (uninteracted) recertification controls is that they are effectively identified from behavior that occurs after the second year of a program spell. Recall that the models include dummy variable controls for duration dependence through the first two years of a spell and restricted controls thereafter. The uninteracted recertification controls, which could not be distinguished from a completely general set of duration controls, are identified through the restrictions after the second year. We estimated alternative specifications that strengthen the identification of the recertification controls by replacing the duration dummy variables with linear splines. One specification used splines with a series of four-month segments; another specification used splines with six-month segments. These restrictions did not lead to any appreciable changes in the estimated coefficients for the recertification controls.

Lastly, the models include finite-mixture controls for unobserved heterogeneity. We re-estimated the models, dropping these controls, but saw no substantive changes in the results. Complete results for all of these alternative specifications are available upon request.

Leaving the Food Stamp Program for work. We also estimated competing-risk hazard models for younger regular adult-only households that distinguished between food stamp exits that were and were not followed by a quarter of UI-covered earnings. Table 4 lists coefficient

estimates from a competing-risk specification with the same explanatory variables as the model in the first column of Table 2. The first column in Table 4 lists coefficients for food stamp exits without earnings, while the second column lists coefficients for exits with earnings.

The estimates from Table 4 indicate that younger regular adult-only households were more likely to leave the Food Stamp Program with and without earnings in short recertification months. Both types of exits were especially high for households that reported earnings at the beginning of their recertification periods. At long (annual) recertification dates prior to February 2005, households were more likely to exit food stamps without covered earnings.

Estimated coefficients for the interactions between ABAWD exemptions and the duration controls indicate that younger regular adult-only households were much less likely to exit food stamps with or without earnings in the first five months of their spells. After five months, exemption status was negatively associated with earnings exits but not with nonearnings exits. The multivariate estimates from Table 4 are consistent with the descriptive results from Figure 4 and suggest that the ABAWD time limits increased exits with and without subsequent earnings.

Among the other results, higher levels of education and better economic conditions were positively associated with earnings exits. Larger household sizes were negatively associated with nonearnings exits. Both types of exits were lower in the later years of the analysis period, after the food stamp work requirements were relaxed.

7. Conclusion

Adult-only households have been at the center of several important changes in food stamp policy. In this study, we examine food stamp participation and subsequent employment for these households using post-PRWORA administrative data from South Carolina. We conduct descriptive analyses of food stamp spells and estimate multivariate models of policy,

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economic, and demographic factors that contribute to food stamp exits. The analyses distinguish among households with and without potential ABAWD members.

The use of event-history methods allows us to examine how two duration-dependent policies—time limits for ABAWDs and recertification requirements for the broader caseload—are associated with the timing of food stamp exits. Cross-section and longitudinal differences in the applicability of these policies help us to identify associations. However, the timing of associations with participation spells is also important. The short (three-month) ABAWD time limits should have their largest effects early in a food stamp spell, and recertification policies should have their largest effects in particular months. This is exactly what the data reveal.

Among households with potential ABAWD members, we find those who were subject to the time limits were much more likely to leave the Food Stamp Program in the first few months of their spells than those who were not subject to the limits. There are few differences in exit behavior after the first few months. In addition, we find almost no differences in exit behavior among households with older adults or adults who are likely to be receiving disability income. When we examine the caseload implications of these results, we find that exits associated with the time limits reduced the ABAWD caseload by up to 20 percent.

Exits were also much more likely to occur in recertification months than in other months. South Carolina lengthened the recertification intervals for some households in October 2002 and shortened the intervals for other households in February 2005. These intervals also differed depending on a household's source of income. The differences over time and across groups in recertification policies are plainly evident in the event-history data. Our analyses indicate that the longer recertification intervals led to longer participation spells among adult-only households

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with earnings. However, the change only contributed to a modest increase in the adult-only food stamp caseload because few adult-only households had earned income.

In addition to the results for specific policy measures, the empirical analyses generate findings for other economic and demographic variables. For instance, local unemployment rates were negatively associated with food stamp exit rates and positively associated with caseload levels. Similarly, lower levels of household income were associated with lower exit rates. Never-married households were less likely than married-couple households to leave the Food Stamp Program. Female- and black-headed households also tended to have low exit rates.

We also examined whether the food stamp exits for potential ABAWD households were followed by UI-covered earnings. The time limit policy was intended to encourage work and self-sufficiency. We find that potential ABAWD households that were subject to the time limits were more likely to experience earnings-related exits than households that were exempt from the limits. However, exposure to the time limits was also associated with higher rates of exits without earnings, suggesting that the policy increased resources for some households but reduced resources for others.

While the analyses produce a number of strong and useful findings, it is important to keep some of the limitations in mind. One limitation is that we were only able to examine households who participated at some point in the Food Stamp Program. We do not examine households who may have been eligible for food stamps but never elected to participate. Another limitation is that the analyses only consider participation outcomes and do not directly examine the underlying eligibility and compliance behaviors.

With the growing diversity in food stamp policies across states, it may also be difficult to extrapolate the results from South Carolina to other states. The state had stringent work policies

prior to 2002 that may have led to shorter spells and lower caseloads even in the absence of the ABAWD time limits. The effects of the ABAWD time limits in other states might have been stronger. At the same time, South Carolina had some especially accommodating policies for disabled and elderly adults that may not have been replicated elsewhere.

Still, the analysis illustrates the advantages that detailed and accurate program data can bring. The policy context in South Carolina allowed us to characterize the applicability of food stamp recertification and ABAWD policies for particular groups of recipients, and the administrative data allowed us to look for associations at particular points in spells. Furthermore, the vast amount of data available from the state's case records allowed us to examine groups that make up a relatively modest share of the food stamp caseload. Future research on food stamp policies would benefit from continuing to work with such data from single states or small numbers of states.

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Figure 1. Households Receiving Food Stamps Each Month in South Carolina
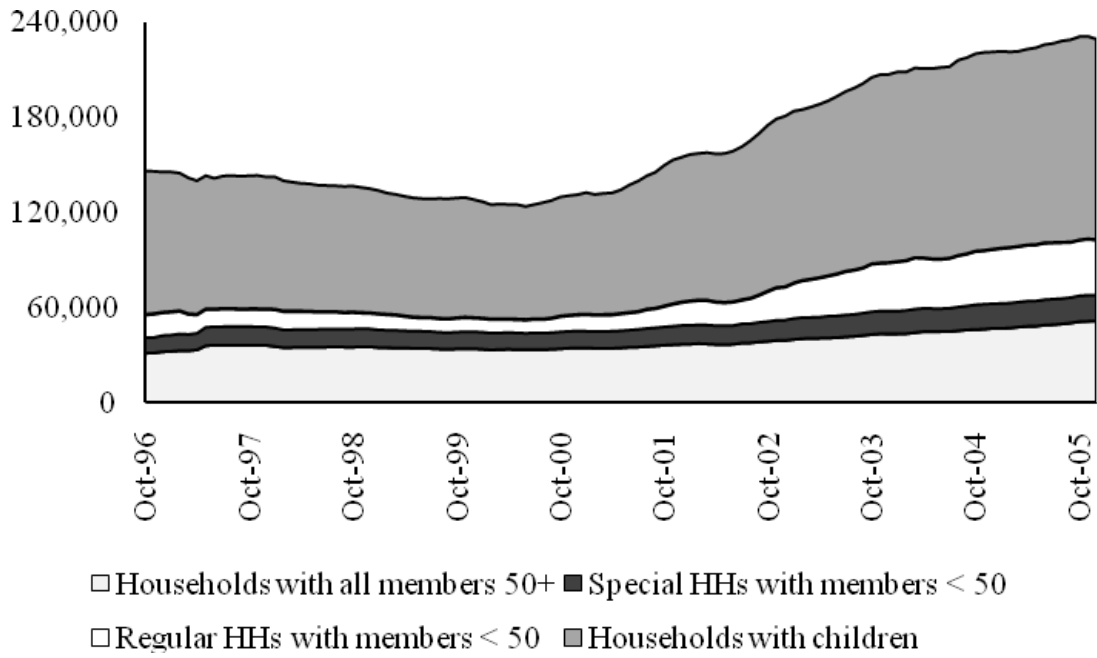
Note: Authors' calculations using administrative data from South Carolina.

Figure 2. Nonparametric Hazards of Food Stamp Program Exits for Adult-Only Households with Different Initial Incomes

Spell began before 2001
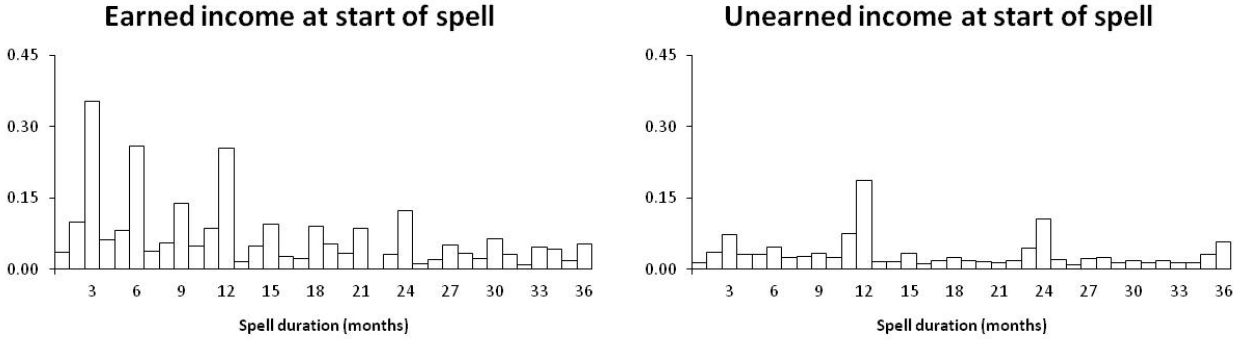
Spell began in second half of 2002
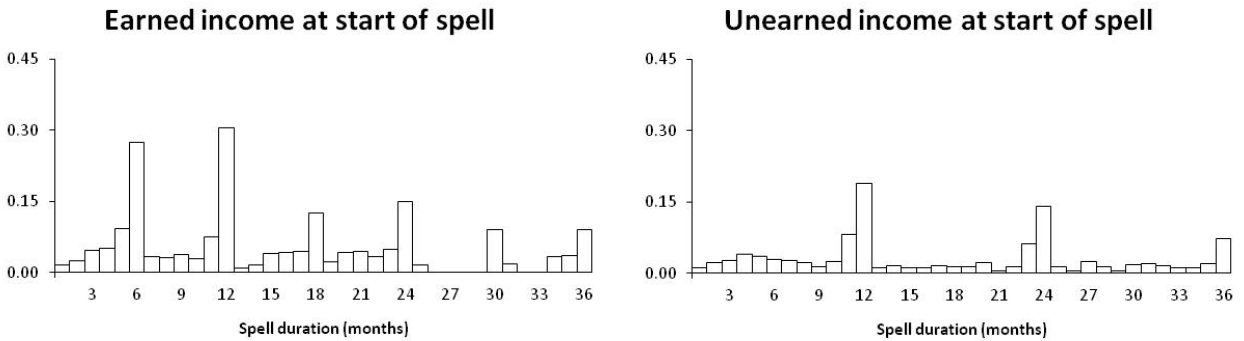
Spell began in 2005
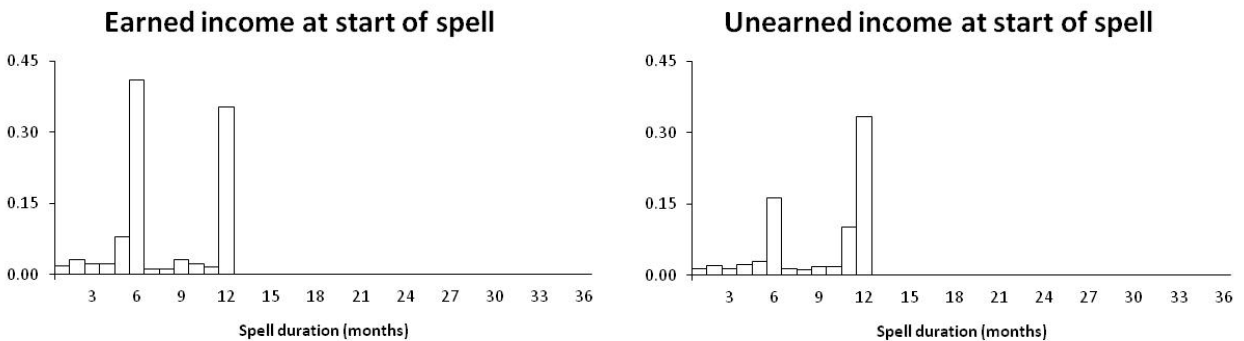
Note: Figures are Kaplan-Meier hazards calculated using administrative data from South Carolina.

Figure 3. Nonparametric Hazards of Food Stamp Program Exits for Adult-Only Households Living in Counties with and without ABAWD Exemptions
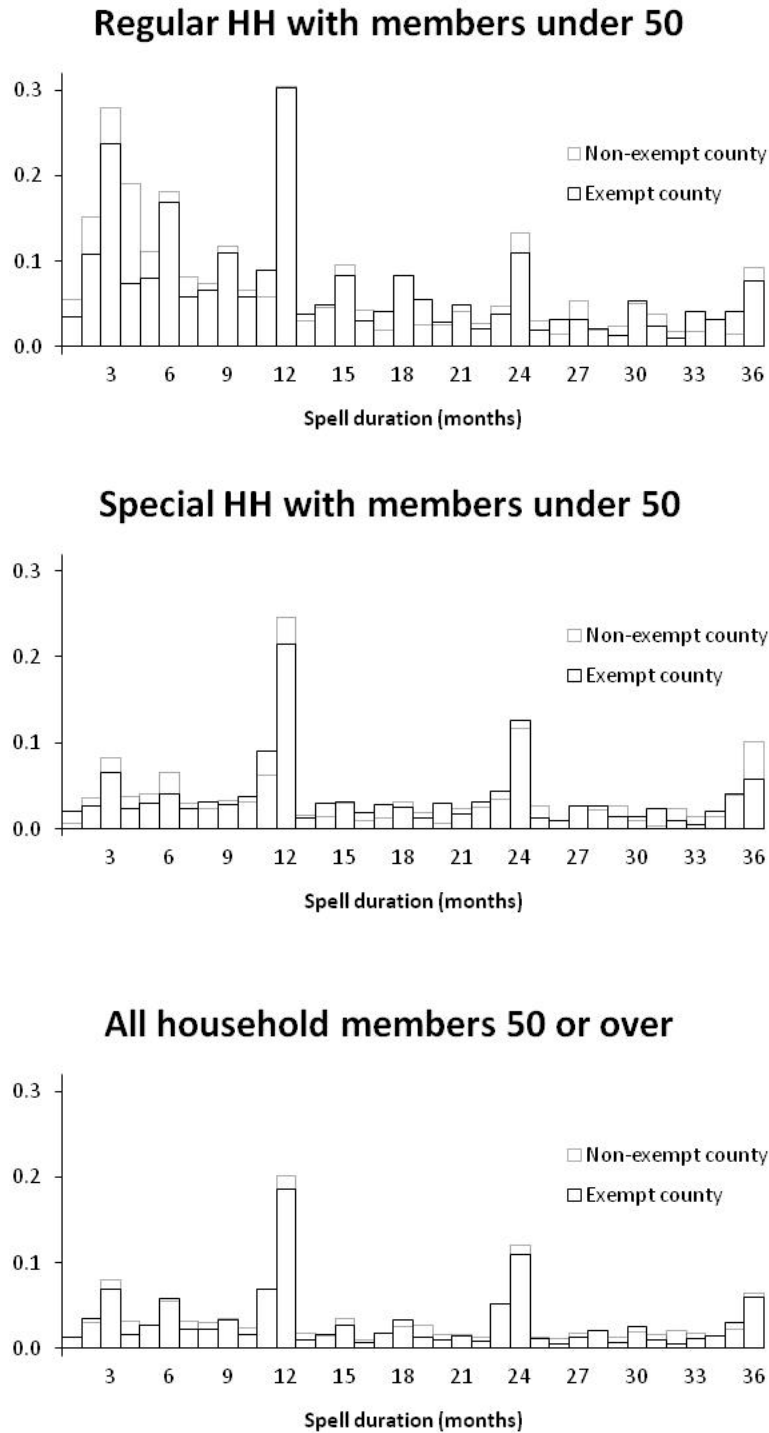
Note: Figures are Kaplan-Meier hazards calculated using administrative data from South Carolina for Food Stamp Program spells that began before 2002.

Figure 4. Competing-Risk Hazards of Food Stamp Program Exits for "Regular" Adult-Only Households Living in Counties with and without ABAWD Exemptions
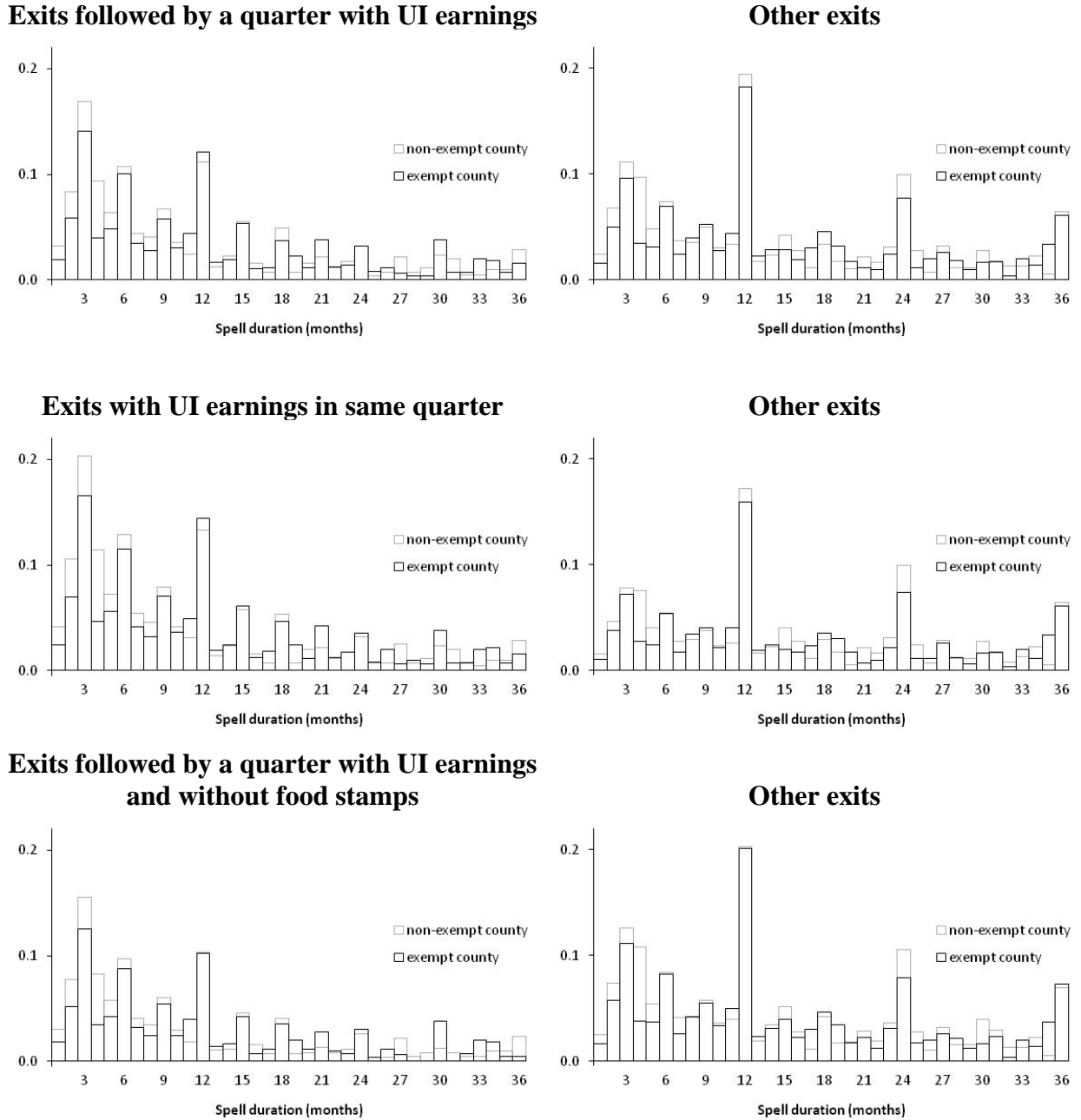
Exits followed by a quarter with UI earnings　　　**Other exits**

Exits with UI earnings in same quarter　　　**Other exits**

Exits followed by a quarter with UI earnings and without food stamps　　　**Other exits**

Note: Figures are Kaplan-Meier hazards calculated using administrative data from South Carolina for Food Stamp Program spells among that began before 2002 among "regular" households with members under age 50.

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Table 1. Means of Analysis Variables

|	Regular households with members under age 50	Special households with members under age 50	Households with no members under age 50
Selected characteristics at start of spell			
Female	0.51	0.56	0.61
African American	0.63	0.53	0.56
Other race/ethnicity (nonwhite)	0.01	0.01	0.01
Age	34.79	40.90	60.20
Years of schooling	11.24	10.45	9.66
Currently married	0.09	0.19	0.14
Formerly married	0.32	0.42	0.69
All household members age 60 or older	-.-	-.-	0.39
Household size	1.14	1.46	1.12
No income	0.63	0.03	0.30
Any earnings	0.26	0.09	0.11
Special case	-.-	-.-	0.58
Number of spells	16,895	3,474	8,269
Number of complete spells (exits)	13,553	2,385	5,399
Complete spells followed by earnings	7,023	621	1,265
Selected characteristics of spell months			
Monthly food stamp benefits	152.03	80.86	72.88
Monthly earnings	129.74	17.79	23.14
Monthly unearned income	92.26	617.25	508.67
Any income	0.43	0.97	0.83
Any earnings	0.22	0.04	0.05
Unemployment rate	6.91	6.27	6.46
Exempt from ABAWD restrictions	0.80	0.70	0.73
Number of spell months	177,878	71,294	172,588

Note: Estimates computed using administrative data from the South Carolina Department of Social Services.

Table 2. Selected Coefficients from Discrete-Time Hazard Models of Food Stamp Exits

	Regular households with members under age 50	Special households with members under age 50	Households with no members under age 50
Recertification months			
Quarterly (before Oct. 2002)	0.6976 ***	0.1636	0.4154 ***
	(0.0597)	(0.1300)	(0.0827)
Semiannual (Oct. 2002–Jan. 2005)	0.2536 ***	-0.0266	0.1427
	(0.0890)	(0.2314)	(0.1242)
Semiannual (after Jan. 2005)	1.8150 ***	1.2858 ***	1.0803 ***
	(0.0870)	(0.2257)	(0.1336)
Annual (before Oct. 2002)	-0.0771	0.6448 ***	0.7400 ***
	(0.1589)	(0.2094)	(0.1306)
Annual (Oct. 2002–Jan. 2005)	0.7737 ***	1.1929 ***	1.0975 ***
	(0.1697)	(0.2819)	(0.1600)
Annual (after Jan. 2005)	-0.3200 *	0.1993	0.3795 **
	(0.1675)	(0.2789)	(0.1706)
Earnings at start of cert. period x quarterly (before Oct. 2002)	0.9832 ***	1.5069 ***	1.4599 ***
	(0.0570)	(0.1900)	(0.1198)
Earnings at start of cert. period x semi-annual (Oct. '02–Jan. '05)	1.9362 ***	1.5385 ***	1.4774 ***
	(0.0929)	(0.3845)	(0.1833)
Earnings at start of cert. period x semi-annual (after Jan. 2005)	0.8461 ***	1.0963 ***	1.1116 ***
	(0.1009)	(0.3764)	(0.2188)
Earnings at start of cert. period x annual (before Oct. 2002)	-1.0670 ***	-1.3597 ***	-1.3949 ***
	(0.1339)	(0.3580)	(0.2339)
Earnings at start of cert. period x annual (Oct. 2002–Jan. 2005)	-1.7059 ***	-2.1218 ***	-1.3047 ***
	(0.1330)	(0.5895)	(0.2383)
Earnings at start of cert. period x annual (after Jan. 2005)	-0.3938 ***	-0.6872	-1.6634 ***
	(0.1449)	(0.5671)	(0.3213)
Interactions of county ABAWD exemption with			
1st spell month	-0.3300 ***	0.9415 **	0.1107
	(0.0908)	(0.3938)	(0.2065)
2nd spell month	-0.6344 ***	-0.1839	-0.0276
	(0.0614)	(0.2095)	(0.1443)
3rd spell month	-0.3810 ***	-0.2072	-0.2541 **
	(0.0574)	(0.1718)	(0.1127)
4th spell month	-0.9508 ***	-0.0783	-0.1402
	(0.0717)	(0.2224)	(0.1578)
5th spell month	-0.3080 ***	-0.1601	0.0611
	(0.0881)	(0.2145)	(0.1639)
6th spell month	0.0081	-0.2680	0.1590
	(0.0805)	(0.2112)	(0.1383)
7th spell month	-0.1939 *	0.1112	-0.2506
	(0.1132)	(0.2761)	(0.1700)

8th spell month	-0.3134 **	-0.0102	-0.0478
	(0.1237)	(0.2929)	(0.1817)
9th spell month	-0.1528	-0.1882	-0.1078
	(0.1129)	(0.2750)	(0.1751)
10th spell month	-0.3344 **	0.0949	-0.3454
	(0.1488)	(0.2747)	(0.2100)
11th spell month	0.3196 **	0.4315 **	-0.0267
	(0.1442)	(0.2030)	(0.1279)
12th spell month	-0.1880 **	-0.1551	-0.0195
	(0.0889)	(0.1322)	(0.0996)
Personal and household characteristics			
Monthly food stamp benefits (/100)	-0.1449 ***	-0.0803 *	-0.1077 **
	(0.0329)	(0.0468)	(0.0469)
Monthly reported earnings (/100)	0.0415 ***	0.1393 ***	0.0913 ***
	(0.0064)	(0.0176)	(0.0116)
Monthly reported unearned income (/100)	-0.0011	0.0497 ***	0.0491 ***
	(0.0074)	(0.0135)	(0.0105)
No income at start of spell	0.0386	0.5092 ***	0.3643 ***
	(0.0305)	(0.1376)	(0.0501)
Any earnings at start of certification period	-0.3688 ***	0.0013	0.0364
	(0.0415)	(0.1295)	(0.0806)
Special case at start of certification period			-0.5743 ***
			(0.0580)
Female	-0.3681 ***	-0.0770	-0.2967 ***
	(0.0241)	(0.0500)	(0.0365)
African American	-0.2078 ***	-0.1751 ***	-0.1958 ***
	(0.0236)	(0.0503)	(0.0352)
Other race/ethnicity (non-white)	0.1990	0.3052	0.0661
	(0.1460)	(0.3038)	(0.1584)
Age spline 18-21 years	-0.0385	-0.0508	
	(0.0269)	(0.1021)	
Age spline 22-30 years	0.0163 ***	-0.0168	
	(0.0057)	(0.0166)	
Age spline 31-40 years	-0.0256 ***	0.0003	
	(0.0044)	(0.0108)	
Age spline 41-50 years	-0.0276 ***	-0.0070	
	(0.0045)	(0.0090)	
Age spline 51-60 years	0.0250	0.0268 **	-0.0289 ***
	(0.0163)	(0.0106)	(0.0076)
Age spline 61-70 years			-0.0467 ***
			(0.0081)
Age spline 71 years and more			0.0248 ***
			(0.0063)
Years of elementary and secondary schooling spline	0.0109	0.0517 ***	0.0206 ***
	(0.0086)	(0.0130)	(0.0079)

Years of post-secondary schooling spline	0.0918 *** (0.0214)	0.0691 (0.0660)	0.0803 * (0.0445)
Completed high school or GED	0.0174 (0.0314)	0.0728 (0.0649)	0.0845 * (0.0491)
Completed college	-0.0196 (0.1355)	-0.0494 (0.3031)	-0.0116 (0.2649)
Currently married	0.2846 *** (0.0406)	0.3288 *** (0.0751)	0.3512 *** (0.0700)
Formerly married	0.1134 *** (0.0268)	-0.1169 ** (0.0581)	0.0226 (0.0470)
All household members age 60 or older			0.1861 *** (0.0655)
Household size	-0.1419 *** (0.0405)	0.1411 ** (0.0587)	-0.0450 (0.0638)
County unemployment rate	-0.0162 *** (0.0052)	-0.0372 *** (0.0119)	-0.0205 ** (0.0083)
General time trend controls			
Fiscal year 1998	-0.1507 *** (0.0555)	0.2827 * (0.1600)	-0.1410 (0.1076)
Fiscal year 1999	-0.0179 (0.0557)	0.6684 *** (0.1550)	0.1412 (0.1049)
Fiscal year 2000	-0.0468 (0.0564)	0.5672 *** (0.1569)	0.1456 (0.1053)
Fiscal year 2001	-0.1184 ** (0.0542)	0.5929 *** (0.1536)	0.1121 (0.1030)
Fiscal year 2002	-0.3272 *** (0.0535)	0.5420 *** (0.1557)	0.0882 (0.1014)
Fiscal year 2003	-0.6381 *** (0.0597)	0.1081 (0.1635)	-0.0288 (0.1087)
Fiscal year 2004	-0.5828 *** (0.0574)	0.4352 *** (0.1586)	0.0143 (0.1056)
Fiscal year 2005	-0.8382 *** (0.0593)	0.1054 (0.1649)	-0.0713 (0.1079)
Fiscal year 2006	-0.4982 *** (0.0709)	0.4416 ** (0.1913)	0.0716 (0.1217)
log likelihood	-41,366.00	-9,018.13	-20,975.86
Number of spells	16,895	3,474	8,269
Number of monthly observations	177,878	71,294	172,588

Note: Coefficients from discrete-time logistic hazard models estimated using administrative data from the South Carolina Department of Social Services. The models also include duration controls, complete interactions of the duration controls with an indicator for ABAWD exemption status, and finite mixture controls with two points of support for unobserved heterogeneity. Asymptotic standard errors appear in parentheses.

* Significant at .10 level.   ** Significant at .05 level.   *** Significant at .01 level.

Table 3. Simulation Results

Analysis/ Fiscal year	Regular households with members under age 50		Special households with members under age 50		Households with no members under age 50	
	Estimated caseload (000s)	Difference from baseline simulation	Estimated caseload (000s)	Difference from baseline simulation	Estimated caseload (000s)	Difference from baseline simulation
Observed caseload from spells that began after October 1996						
1997	5.4	-2%	2.5	0%	5.5	-2%
1998	8.8	-3%	5.1	0%	10.8	1%
1999	8.9	-4%	5.4	0%	11.8	1%
2000	8.8	-5%	6.0	-2%	13.0	-1%
2001	11.2	-3%	6.4	-4%	15.2	-1%
2002	15.5	-4%	7.3	-4%	18.0	-1%
2003	24.6	-2%	9.0	-4%	22.1	-1%
2004	32.7	-2%	10.0	-3%	25.7	-1%
2005	37.7	-3%	10.7	-5%	28.5	-3%
Baseline simulation						
1997	5.5		2.5		5.6	
1998	9.1		5.1		10.7	
1999	9.3		5.4		11.7	
2000	9.3		6.1		13.1	
2001	11.6		6.7		15.4	
2002	16.1		7.6		18.2	
2003	25.1		9.4		22.3	
2004	33.3		10.3		26.0	
2005	38.9		11.3		29.4	
Universal exemptions (no ABAWD time limits)						
1997	5.8	5%	2.6	4%	5.6	0%
1998	9.9	9%	5.2	2%	10.8	1%
1999	10.3	11%	5.4	0%	11.9	2%
2000	10.2	10%	6.1	0%	13.3	2%
2001	12.7	9%	6.6	-1%	15.5	1%
2002	17.6	9%	7.5	-1%	18.4	1%
2003	26.1	4%	9.4	0%	22.4	0%
2004	34.1	2%	10.3	0%	26.0	0%
2005	39.5	2%	11.3	0%	29.4	0%

No ABAWD exemptions

1997	5.2	-5%	2.5	0%	5.5	-2%
1998	8.3	-9%	5.1	0%	10.6	-1%
1999	8.5	-9%	5.5	2%	11.7	0%
2000	8.5	-9%	6.1	0%	13.0	-1%
2001	10.6	-9%	6.8	1%	15.3	-1%
2002	14.8	-8%	7.7	1%	18.1	-1%
2003	22.6	-10%	9.6	2%	22.1	-1%
2004	29.7	-11%	10.6	3%	25.8	-1%
2005	34.8	-11%	11.6	3%	29.2	-1%

Initial recertification policy maintained

2003	24.4	-3%	9.5	1%	22.1	-1%
2004	31.9	-4%	10.4	1%	25.4	-2%
2005	38.5	-1%	11.6	3%	28.8	-2%

No change in the unemployment rate after September 2000 (no recession)

2001	11.4	-2%	6.6	-1%	15.3	-1%
2002	15.6	-3%	7.3	-4%	17.9	-2%
2003	24.2	-4%	8.9	-5%	22.0	-1%
2004	31.7	-5%	9.8	-5%	25.4	-2%
2005	37.2	-4%	10.7	-5%	28.3	-4%

No time trend effects after FY 2001

2002	15.2	-6%	7.5	-1%	18.2	0%
2003	21.6	-14%	8.8	-6%	21.8	-2%
2004	26.7	-20%	9.3	-10%	25.1	-3%
2005	28.7	-26%	9.9	-12%	27.9	-5%

Note: The caseloads are simulated by applying the hazard model coefficients to monthly administrative data from the South Carolina Department of Social Services. The calculations use the actual initial entry behavior and average monthly reentry rates from the administrative data. Therefore, the differences from the base simulations only reflect changes in exit rates; initial entry and reentry behavior are effectively held constant.

Table 4. Selected Coefficients from Discrete-Time Competing-Risk Hazard Models of Food Stamp Exits for Regular Households with Members under Age 50

	Exit without UI-covered earnings	Exit with UI-covered earnings
Recertification months		
Quarterly (before Oct. 2002)	0.6779 ***	0.7329 ***
	(0.0827)	(0.0839)
Semiannual (Oct. 2002–Jan. 2005)	0.3512 ***	0.1464
	(0.1182)	(0.1329)
Semiannual (after Jan. 2005)	1.7425 ***	1.8970 ***
	(0.1180)	(0.1205)
Annual (before Oct. 2002)	0.2832	-0.7725 ***
	(0.2007)	(0.2630)
Annual (Oct. 2002–Jan. 2005)	0.8895 ***	0.4293
	(0.2166)	(0.2775)
Annual (after Jan. 2005)	-0.1011	-0.7369 ***
	(0.2126)	(0.2719)
Earnings at start of cert. period x quarterly (before Oct. 2002)	0.8551 ***	1.0230 ***
	(0.0897)	(0.0715)
Earnings at start of cert. period x semi-annual (Oct. '02–Jan. '05)	1.6715 ***	2.1634 ***
	(0.1379)	(0.1291)
Earnings at start of cert. period x semi-annual (after Jan. 2005)	0.8053 ***	0.8578 ***
	(0.1513)	(0.1258)
Earnings at start of cert. period x annual (before Oct. 2002)	-1.0365 ***	-0.7597 ***
	(0.1898)	(0.1845)
Earnings at start of cert. period x annual (Oct. 2002–Jan. 2005)	-1.6150 ***	-1.6595 ***
	(0.1928)	(0.1768)
Earnings at start of cert. period x annual (after Jan. 2005)	-0.7188 ***	-0.0984
	(0.2215)	(0.1777)
Interactions of county ABAWD exemption with		
1st spell month	-0.2703 **	-0.3858 ***
	(0.1354)	(0.1226)
2nd spell month	-0.5356 ***	-0.7354 ***
	(0.0840)	(0.0853)
3rd spell month	-0.3618 ***	-0.3859 ***
	(0.0786)	(0.0744)
4th spell month	-0.9831 ***	-0.8910 ***
	(0.0963)	(0.0986)
5th spell month	-0.3589 ***	-0.2475 **
	(0.1282)	(0.1162)
6th spell month	0.0826	-0.0370
	(0.1145)	(0.1040)
7th spell month	-0.1943	-0.1514
	(0.1572)	(0.1580)

8th spell month	-0.0040	-0.6024 ***
	(0.1727)	(0.1740)
9th spell month	-0.1227	-0.1315
	(0.1620)	(0.1519)
10th spell month	-0.1343	-0.4858 **
	(0.2107)	(0.2033)
11th spell month	0.2439	0.4663 **
	(0.1880)	(0.2158)
12th spell month	-0.1630	-0.1877
	(0.1063)	(0.1254)
Personal and household characteristics		
Monthly food stamp benefits (/100)	-0.1308 **	-0.1077 ***
	(0.0519)	(0.0417)
Monthly reported earnings (/100)	-0.0592 ***	0.0876 ***
	(0.0104)	(0.0081)
Monthly reported unearned	-0.0023	-0.0030
income (/100)	(0.0108)	(0.0101)
No income at start of spell	0.2013 ***	-0.1406 ***
	(0.0406)	(0.0438)
Any earnings at start of	-0.3028 ***	-0.4124 ***
certification period	(0.0631)	(0.0551)
Female	-0.4204 ***	-0.2582 ***
	(0.0285)	(0.0340)
African American	-0.3197 ***	-0.0412
	(0.0278)	(0.0342)
Other race/ethnicity (nonwhite)	0.3098 *	0.0874
	(0.1625)	(0.1969)
Age spline 18-21 years	-0.0657 *	-0.0209
	(0.0376)	(0.0358)
Age spline 22-30 years	0.0295 ***	0.0079
	(0.0074)	(0.0079)
Age spline 31-40 years	-0.0168 ***	-0.0351 ***
	(0.0053)	(0.0063)
Age spline 41-50 years	-0.0173 ***	-0.0388 ***
	(0.0055)	(0.0067)
Age spline 51-60 years	0.0059	0.0538 **
	(0.0225)	(0.0230)
Years of elementary and	0.0020	0.0268 **
secondary schooling spline	(0.0099)	(0.0128)
Years of postsecondary	0.0453	0.1226 ***
schooling spline	(0.0288)	(0.0290)
Completed high school or GED	-0.1104 ***	0.1462 ***
	(0.0368)	(0.0459)
Completed college	0.0945	-0.0498
	(0.1834)	(0.1819)

Currently married	0.1751 ***	0.3870 ***
	(0.0548)	(0.0563)
Formerly married	0.1049 ***	0.1080 ***
	(0.0315)	(0.0390)
Household size	-0.3141 ***	-0.0399
	(0.0645)	(0.0504)
County unemployment rate	-0.0063	-0.0242 ***
	(0.0065)	(0.0071)

General time trend controls

Fiscal year 1998	-0.1888 **	-0.1083
	(0.0762)	(0.0741)
Fiscal year 1999	0.0115	-0.0479
	(0.0752)	(0.0756)
Fiscal year 2000	-0.0314	-0.0644
	(0.0759)	(0.0764)
Fiscal year 2001	-0.0291	-0.1957 ***
	(0.0720)	(0.0739)
Fiscal year 2002	-0.1950 ***	-0.4370 ***
	(0.0714)	(0.0724)
Fiscal year 2003	-0.4626 ***	-0.7840 ***
	(0.0800)	(0.0825)
Fiscal year 2004	-0.4308 ***	-0.6768 ***
	(0.0772)	(0.0781)
Fiscal year 2005	-0.7263 ***	-0.8909 ***
	(0.0798)	(0.0807)
Fiscal year 2006	-0.3486 ***	-0.5958 ***
	(0.0950)	(0.0984)

log likelihood	-49,761.54
Number of spells	16,895
Number of monthly observations	177,878

Note: Coefficients from discrete-time MNL hazard models estimated using administrative data from the South Carolina Department of Social Services. The models also include duration controls, complete interactions of the duration controls with an indicator for ABAWD exemption status, and finite mixture controls with two points of support for unobserved heterogeneity. Asymptotic standard errors appear in parentheses.
 * Significant at .10 level.   ** Significant at .05 level.   *** Significant at .01 level.