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Abstract

Welfare reform's success encouraging employment may be affected by the federal Food Stamp program because many households receive welfare and Food Stamps. Food Stamp benefits could discourage employment because benefits are reduced proportionally with income; alternatively, it could encourage employment by increasing stability and allowing more resources to be allocated toward employment-related expenses. I examine the effects of Food Stamps on exiting welfare and becoming employed for welfare recipients. Results suggest, if anything, that Food Stamps discourage employment, and such benefits may discourage transitions off welfare, too. If so, then it may be necessary to study the determinants of welfare participation (welfare reform and economic growth) in conjunction with other government-assistance programs.

Key Words: Welfare, AFDC/TANF, Employment, and Food Stamps.

JEL Codes: J22, I38, J18

I. Introduction

One of the largest government assistance programs in the United States has traditionally been cash welfare (formerly, Aid to Families with Dependent Children [AFDC]; currently, Temporary Assistance for Needy Families [TANF]), with annual federal, state, and local government expenditures (benefits and administrative costs) reaching a maximum of roughly 26 billion in 1994 (National Poverty Center, 2008). However, during the 1990s, the welfare caseload decreased by roughly 50 %, from a high in 1994 of 5.03 million families to 2.55 million families by 1999 (U.S. Department of Health and Human Services, 2008). Concurrently, the number of individuals served by the welfare program decreased during this time, from a high of 14.20 million individuals (in 1993) to 6.82 million individuals. Since the 1990s, the numbers of welfare caseloads and individuals served have fallen more modestly, with 1.77 million families and 4.15 individuals on welfare in 2006. (U.S. Department of Health and Human Services, 2008).

The decline in welfare receipt is typically attributed to welfare reform and a robust economy during the 1990s (CEA, 1997, 1999; Wallace and Blank, 1999; and Ziliak et al., 2000). Examining each in turn, the 1996 Welfare Reform Act (formally, The Personal Responsibility and Work Opportunity Reconciliation Act – PRWORA) specifically sought to encourage employment. It did so by placing five-year lifetime receipt limits and work requirements on welfare benefits for most recipients, although most states had received waivers to make similar changes as many as four years prior to welfare reform. In addition, the business cycle may have played a role decreasing welfare participation. In particular, economic growth during the 1990s with a relatively low unemployment may have facilitated transitions off welfare to employment.

Other government assistance programs could also affect transitions off welfare and employment. Certainly many recipients are eligible for and receive benefits from multiple programs. For example, Food Stamps, which is now the largest government assistance program for those with low incomes, could affect welfare transitions and employment by changing economic incentives. Food Stamp benefits could *discourage* transitions off welfare to employment by serving as an implicit income tax: earnings generated by employment decrease Food Stamp benefits. To the extent that employment increases disposable income, the value of Food Stamp benefits proportionally decreases or could be terminated altogether. Food Stamp benefits could also decrease the marginal value of earnings from employment.

Furthermore, transaction costs and stigma may not increase proportionately with participation in additional assistance programs (Keane and Moffitt, 1998). That is, additional transaction costs and stigma associated with welfare for those with Food Stamp benefits may be less than for those without Food Stamps. If so, then Food Stamp receipt could discourage transitions off welfare to employment by decreasing transaction costs and stigma associated with participation in welfare.

However, Food Stamps could *encourage* transitions off welfare and employment by increasing economic opportunities. Food Stamp benefits potentially increase economic opportunities by allowing a larger portion of disposable income to be allocated toward employment-related expenses such as transportation and childcare costs. Much the same, Food Stamps could promote transitions off welfare to employment by increasing stability.

Alternatively, any relationship between Food Stamps and welfare transitions and employment could be due to correlation with other factors. First, welfare recipients with Food Stamps may be more likely to have characteristics typically associated with

economic disadvantage relative to welfare recipients without Food Stamp benefits. Certainly Food Stamps are targeted for households with low income. Much the same, those with Food Stamps may comprise a disproportionately large share of long-term welfare recipients. If either are true, then welfare recipients with Food Stamps would be more likely to remain on welfare and less likely to become employed regardless of the Food Stamp benefits.

I examine the effects of Food Stamps on exiting welfare and employment for a sample of welfare recipients using National Longitudinal Survey of Youth (NLSY79) data. Specifically, I first select spells of welfare receipt for NLSY79 respondents who are either simultaneously not employed and employed. Then, I track the non-employed welfare recipients and the employed welfare recipients until they either exit welfare or change their employment status. I then examine the effects of Food Stamps on leaving welfare and employment. In addition, a portion of the analysis explores whether the effects of Food Stamps on welfare and employment are different before and after welfare reform. Throughout, I attempt to control for potential unobserved heterogeneity bias by jointly estimating the various welfare-employment transition probabilities with Food Stamp receipt using a discrete factor random effects model in a maximum likelihood framework.

Results consistently suggest that Food Stamps significantly increase the probability that employed welfare recipients remain on welfare but cease to be employed. There is also some evidence that Food Stamps decrease the probability that welfare recipients who are not employed move off welfare and become employed and that Food Stamps decrease the probability that employed welfare recipients leave welfare while remaining employed, although these results are not statistically significant in some of the model specifications. In

sum, the results suggest, if anything, that Food Stamps discourage employment, and such benefits may discourage transitions off welfare, too. If so, then it may be necessary to study the determinants of welfare participation (welfare reform and economic growth) in conjunction with other government-assistance programs.

II. Background

The Food Stamp program was officially established by the 1964 Food Stamp Act. Its primary goal is to provide adequate nutrition to low-income households -- those living in poverty. The program does this by providing participants coupons (or electric benefits transferred directly to a retailer) redeemable for food at approved grocery stores (USDA, 2003). In 2003, the FSP served an estimated 21.3 million participants (USDA, 2004), and program participants averaged $83.92 in monthly benefits at a cost (which includes administrative costs) of $23.8 billion to the government (USDA, 2004). To be eligible for FSBs, a household must:

- Have gross monthly income less than a household size-specific amount, though the gross income test is disregarded if the household contains an elderly (aged 60 and over) or disabled member.
- Have net monthly income (gross income minus 20 percent of earned monthly income, a standard deduction, child support payments, a dependent care deduction, an excess shelter cost deduction, and medical expenses for elderly and disabled household members) less than a household size-specific amount.
- Have assets whose value is less than a specified amount. This amount is not specific to household size, but the amount is higher if the household contains an elderly or a disabled member. Further, the full value of the family's vehicles is not counted – instead, only each vehicle's value above a year-specific threshold amount is counted as an asset.

Households that receive AFDC/TANF or Supplemental Security Income (SSI) are automatically eligible for benefits. However, if such households have sufficient income, then their Food Stamp allotment may be zero.

III. Literature Review

Many studies have examined factors that influence welfare receipt, including those factors that may have decreased welfare participation after welfare reform during the 1990s (Blank, 2002, and Moffit, 2002, provide reviews of this literature). For example, the CEA (1997, 1999), Wallace and Blank (1999), and Ziliak et al. (2000) attribute between 6 and about 33 % of the decline in welfare participation in the 1990s to welfare reform and up to 78 % of the decline to the business cycle (and a low unemployment rate). Much the same, Hoynes (2000) finds that local labor market conditions significantly affect one-year welfare exit and re-entry rates. In studies specifically examining time limits, Grogger (2003), Grogger and Michalopoulos (2003), and Grogger (2004) find evidence that this particular welfare reform decreased welfare receipt between 13 and 19 % (and increased employment).

In a related section of the literature, many studies have examined the effects of welfare on labor supply. Many (but not all) of these studies find that welfare generates work disincentives (Levy, 1979; Moffitt, 1986). For example, Blau and Robins (1986) find that welfare significantly decreases transitions to employment, and Hoynes (1996) finds that AFDC benefits through the Unemployed Parent (AFDC-UP) program significantly decrease labor supply. Conversely, Moffitt and Rangarajan (1986) conclude that changes in the AFDC tax rate will have little effect on labor supply among female household heads. Relatedly, surprisingly few researchers have examined the effects of Food Stamps on labor supply. Those who do (Fraker and Moffitt, 1988, examine single parents and Hagstrom, 1996, examines married couples) find either negative effects that are small or no effects at all. The studies in this literature are often static, examining

labor supply at one particular time, they often use pre-welfare reform data, and, as suggested, they typically examine one particular government transfer programs in isolation.

Both the literature examining the determinants of welfare and the literature examining the effects of welfare receipt (and the effects of Food Stamps) on labor supply have been extended by studies that simultaneously account for participation in multiple transfer programs. For example, Grogger (2003) examines the effects of the Earned Income Tax Credit (EITC) on welfare use, and Meyer and Rosenbaum (2001) simultaneously examine the effects of welfare, the EITC, and Medicaid on the labor supply of single mothers. A couple of these studies simultaneously examine welfare and Food Stamp program participation. For example, Huffman and Jensen (2005) estimate models for labor force participation, welfare participation, and Food Stamp program participation using 1998 Survey of Programme Dynamics data. They find that welfare receipt increases participation in the Food Stamp program and decreases participation in the labor force and that labor force participation decreases participation in the Food Stamp program. In another example, Fraker and Moffitt (1988), using pre-reform data from 1980, jointly examine the effects of the Food Stamp program and AFDC on labor supply. Accounting for various sources of non-linearity in the budget constraint, they find modest negative effects of both government assistance programs on hours of work, and that increasing welfare and Food Stamp benefits increases participation in the other program. Similarly, Keane and Moffitt (1998) estimate a structural labor supply model with participation in multiple transfer programs (welfare, Food Stamps, and public

housing) using 1984 Survey of Income and Program Participation data. They find that transfer program marginal tax rates have small effects on labor supply.

I seek to build on this literature by examining the effects Food Stamp benefits on quarterly transitions off welfare and employment. This extends the literature, first, because few studies have specifically examined the effects of Food Stamps on welfare recipients moving off welfare. Second, none of the studies cited above examine patterns of welfare receipt, employment, or Food Stamp program participation in a dynamic context.[1] I examine the quarterly probability moving off welfare and changing employment status, following each welfare spell for up to four years. I also extend the literature by examining these effects including post-welfare reform data, when corresponding time limits and work requirements were in force.

IV. Data

I use data from the 1979-cohort National Longitudinal Survey of Youth (NLSY79) to estimate the effects of Food Stamps on transitions off welfare and employment. The NLSY79 began annually collecting information on the labor market and welfare experiences and background characteristics of youths who were between the ages of 14 and 21 in 1979. After 1994, the survey began surveying biennially, and the survey continues on this basis. The original NLSY79 sample contained 6,283 women and an oversample of blacks,

[1] Blank and Ruggles (1996) examine spells of AFDC and Food Stamp Program eligibility and participation, but they do not examine the effects of participating in one program on the other. Much the same, Ribar, Edelhoch, and Liu (2008) examine spells of welfare and Food Stamp program participation in South Carolina, but they do not examine the effects of the programs on each other.

Hispanics, low-income whites, and military personnel. The military sample was dropped in 1984 and the low-income white sample was dropped in 1990, and I do not consider respondents from either sample in my analysis.

The NLSY79 identifies each respondent's employment status and the number of hours of work in every week covered by the survey (1979 through the most recently-released survey, which is currently 2004). Therefore, I am able to construct a work history for each respondent that identifies whether she is employed in each quarter during the survey. Much the same, the NLSY79 collects monthly information about each respondent's participation in government assistance programs. This includes information about AFDC/TANF receipt as well as the receipt of Food Stamps. In particular, the NLSY79 separately identifies whether each respondent receives AFDC/TANF and Food Stamp benefits in each month covered by the survey as well as the amount of each type of benefit received in each month. However, information on welfare program participation is not collected for NLSY79 respondents under the age of 18 who are not married, not in college, and without children. Ultimately, I only include in the analysis observations from the 1988 and successive NLSY79 surveys (when respondents are at least 23 years of age). As a result, in my final sample, welfare usage does not increase simply because youths cross the 18-year threshold.

I first disaggregate each respondent's welfare-employment status in each quarter of the survey into the following mutually exclusive and exhaustive categories: on welfare and not employed, on welfare and employed, not on welfare and employed, and not on welfare and not employed. I consider respondents to be employed in a quarter if they work an average of at least 10 hours a week in that quarter. I then identify each spell of welfare receipt for each respondent, each of which potentially constitutes an individual observation.

From this group, I include in the analysis welfare spells of respondents who are mothers with children under the age of 18. Few of these welfare observations are for respondents who are male or without children under the age of 18. I exclude observations that do not provide the requisite information to be used in the estimation.

It is not necessarily clear which years of data should be included in the analysis. After the 1981 Omnibus Budget Reconciliation Act until welfare waivers were first introduced in the early 1990s, state welfare program characteristics were largely similar. Welfare eligibility criteria began changing in the early 1990s during the pre-welfare reform waiver period, and changes continued with the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), which, along with placing five-year lifetime receipt limits and work requirements on welfare recipients, formally gave states the latitude to determine their welfare program's asset limit. Using pre-welfare reform data (from the 1980s, for example) would have the advantage of including more of the business cycle (or multiple business cycles) and more person-year observations. However, the determinants of welfare transitions and employment for those moving off welfare before and after welfare reform may be different, suggesting using only post-welfare reform data. Further, some have argued that it is useful to include pre-welfare reform waiver-era data from the early 1990s because welfare changes occurring during this time were limited and are easy to quantify; conversely, it may be difficult to control completely for the myriad of changes states initiated after PRWORA.

Ultimately, I estimate the models essentially using data from the pre-reform waiver and welfare reform eras. That is, I only include welfare spells that begin after 1988 or prior to 2004. This results in 945 welfare spells (producing 5,152 welfare-quarter observations)

where the mother is initially on welfare and not employed full-time and 645 welfare spells (1,638 welfare-quarter observations) where the mother is initially on welfare and employed.

I explore the implications of including the supplemental black and Hispanic oversamples by estimating unweighted models with the supplemental samples, weighted models with the supplemental samples, and models with the supplemental samples excluded.[2] When weighted, my sample will be a nationally representative sample of welfare spells beginning from 1988 to 2004 to mothers with children under the age of 18 who were between the ages of 23 and 30 in 1988. However, results from this sample will not necessarily be representative of other cohorts or of welfare spells for this cohort that began prior to 1988 or after 2004.

I follow each spell quarterly until the quarter in which the mother either exits welfare, changes her employment status, or both, up to a maximum of 16 quarters (four years).[3] Once a mother's welfare or employment status changes (that is, once she exits welfare or switches from employed to not employed or from not employed to employed), I am no longer interested in her behavior. Therefore, I have censored each mother's record once she leaves welfare or changes her employment status.

Descriptive Statistics

[2] The results using these three approaches are comparable. For brevity, sample weights are used throughout the analysis (for descriptive statistics and for the regression results).

[3] I also perform the analysis examining monthly rather than quarterly transitions. The results are essentially the same. For ease of interpretation, I present results from quarterly transition rates.

The key outcome variables are the quarterly probabilities that a mother on welfare and not employed will either *(i)* exit welfare and remain not employed, *(ii)* remain on welfare but become employed, or *(iii)* exit welfare and become employed as well as the quarterly probabilities that a mother on welfare and employed will either *(i)* exit welfare and remain employed, *(ii)* remain on welfare but become not employed, and *(iii)* exit welfare and become not employed.[4]

Figure 1 shows the cumulative probabilities that a mother initially on welfare and not employed moves off welfare but remains not employed, remains on welfare but becomes employed, and moves off welfare and becomes employed, holding welfare-employment constant for the remainder of the 16 quarters once a transition has been made. After four years, only slightly more than 10 % of the mothers remain on welfare and not employed. Almost half move off welfare without employment, although a sizable proportion (30 %) remain on welfare and become employed. Figure 2 shows the cumulative probabilities that a

[4] Initially, I attempted to estimate the effects of Food Stamps on the probability of remaining off welfare (conditional on exiting the program), on the probability of remaining employed (conditional on being employed when exiting welfare), and on the types of childcare arrangements and quality characteristics selected (conditional on children being present). However, the sample sizes for these models were too small to provide meaningful estimates. For example, only about 55 % (875) of the welfare spells ultimately exit welfare, and only about 40 % (365) of these were employed. Similarly, of those leaving welfare with employment, less than 100 have children young enough for which to be asked the NLSY79 childcare questions, which is necessary information for estimating the probability of selecting various types of child care arrangements (day care, center care, informal care, etc.).

mother initially on welfare and employed moves off welfare but remains employed, remains on welfare but becomes not employed, and moves off welfare and becomes not employed, again holding welfare and employment constant once a transition has been made for the remainder of the 4-year period. Virtually no one remains on welfare and employed for four years. Roughly 50 % remain on welfare but become not employed, with another 40 % moving off welfare and remaining employed. Surprisingly, figures 1 and 2 suggest that few welfare recipients exit welfare and change their employment status in the same quarter (ultimately, about 15 % in figure 1 and less than 10 % in figure 2).

Figure 3 plots the same probabilities for mothers on welfare but not employed without Food Stamps. Figure 4 does the same for those with Food Stamps. A comparison of these figures suggests that Food Stamps are associated with a lower probability of exiting welfare. However, Food Stamps are associated with a higher probability of becoming employed while remaining on welfare but a lower probability of becoming employed while exiting welfare. Overall, Food Stamps are correlated with a slightly higher probability of remaining on welfare and not employed.

Much the same, figure 5 plots the probabilities of a spell ceasing for mothers on welfare and employed without Food Stamps, as does figure 6 for mothers with Food Stamps. Food Stamps are associated with a lower probability of moving off welfare and remaining employed. Just the opposite, they are positively correlated with remaining on welfare and ceasing to be employed. Food Stamps appear to have little association with simultaneously moving off welfare and ceasing to be employed in the same quarter.

The descriptive statistics and correlations presented thus far do not necessarily represent the causal effects of Food Stamps on welfare receipt and employment. To identify

causal effects, I use multivariate regression analysis to hold constant potentially confounding factors. First, I control for demographic characteristics such as race/ethnicity, age, education, marital status, household composition (household size, the presence of a senior citizen, and the numbers of biological children in various age categories), urban residence, state of residence, and survey year of response. Weighted descriptive statistics (with standard errors that have been adjusted for sample stratification and clustering) and definitions for these and other variables (descriptive statistics of state and year dummy variables are excluded from table 1) are presented in table 1. For example, 37.3 % of my sample is African-American (referred to as black henceforth for brevity) and 9.9 % is Hispanic.

I also control for local (county or SMSA) economic conditions because economic conditions may affect participation in public assistance programs. To do this, I include variables identifying the local unemployment rate, potential earnings (proxied by local per capita income), the % of the local labor force that is female, the % of the local population with a high school education and a college education, the % of the local population employed, and the % of the local labor force in manufacturing and wholesale/retail trade. I add controls for state political orientation because liberal states may have more generous Food Stamp Program eligibility criteria and may also be less likely to stigmatize those who receive welfare. Specifically, I control for state political orientation with variables indicating how often members of the state's congressional delegation (representatives and senators separately) cast liberal votes as measured by Americans for Democratic Action (ADA) as well as the political affiliation of the governor and state legislature (representatives and senators separately) (Americans for Democratic Action, 2005).

Lastly, I control for AFDC/TANF Program characteristics. The 1996 welfare reform act began allowing states to develop their own TANF eligibility standards, benefits, and time limits. Since that time, states have tailored unique TANF programs. I include a TANF dummy variable equal to one if PRWORA welfare reform is in force and a pre-PRWORA welfare waiver dummy variable equal to one if a pre-welfare reform state waiver is in force either terminating or reducing benefits due to time limits, changing work exemption policies, changing sanctions for violations, increasing earned income disregards, changing family cap rules, or implementing work requirements (see Crouse, 1999). In addition, I include controls for other state TANF program characteristics. States differed in their monthly maximum benefit levels (for example, state-specific household size-specific maximum AFDC/TANF benefits for a family of four) prior to PRWORA; after PRWORA, states began differing in their time limits in which recipients may receive TANF benefits (months of allowable lifetime receipt), whether household benefits are capped for births occurring during participation spells (family caps), child age (in months) for which caregivers are exempt from work requirements, their most severe sanctions for program violations (whether the most severe sanction is full or permanent instead of partial and temporary), their income/asset limits, and their earned income disregards (flat dollar amounts and percentages of earnings disregarded from benefits calculation for the first month with earnings). Information required to create these variables is obtained from a report on state AFDC/TANF policies by Crouse (1999) and from the Urban Institute's online Welfare Rules Database (The Urban Institute, 2005).

Table 2 separately presents selected descriptive statistics for demographic variables for welfare spells initially with and without Food Stamp benefits. Those with Food Stamps

do not necessarily appear to be more economically disadvantaged. For example, those with Food Stamps are less likely to be Hispanic, more likely to be married, have smaller family sizes, and are less likely to live in an urban area. However, receiving Food Stamps is associated with being more likely to be black, being younger, having less education, and having more children aged 0 through 17.

V. Empirical Specification

I estimate the effects of Food Stamps on two conditional quarterly probabilities: that a mother on welfare and not employed either exits welfare and remains not employed, remains on welfare and becomes employed, or exits welfare and becomes employed, and that a mother on welfare and employed either exits welfare and remains employed, remains on welfare and ceases to be employed, or exits welfare and ceases to be employed (within 16 quarters). The only mothers who are "at risk" to exit welfare or change their employment status are those who are still on welfare with their initial employment status; once a mother either exits welfare or changes her employment status, the welfare spell-observation exits the sample. Thus, in each quarter of each welfare spell, each mother must make a multinomial discrete-choice decision: whether to exit welfare and whether to switch from employed to not employed or from not employed to employed.

For quarter t, let the expected present discounted value for mother i receiving welfare benefits without employment (WN) be V_{it}^{WN}, let the expected present discounted value for mother i receiving welfare while employed (WE) be V_{it}^{WE}, for mother i not receiving welfare without employment (NN) be V_{it}^{NN}, and not receiving welfare with employment (NE) be V_{it}^{NE}, where

$$V_{it}^{j} = \mathbf{X}_{it}\beta_j + \varepsilon_{itj},$$

X is a vector of explanatory variables, β is a vector of coefficients, and ε is the disturbance for j = WN, WE, NN, and NE. Mother i is assumed to choose activity j from the set of J to maximize utility such that $V_{it}^{j} > V_{it}^{j'}$ for all $j \neq j'$. That is, if mother i is initially on welfare and not employed (model k = 1), then she will select option j_1 from set $J_1 = \{NN, WE, NE\}$ such that $V_{it}^{j_1} > V_{it}^{j_1'}$ for all $j_1 \neq j_1'$, and if mother i is initially on welfare and employed (model k = 2), then she will select option j_2 from set $J_2 = \{NE, WN, NN\}$ such that $V_{it}^{j_2} > V_{it}^{j_2'}$ for all $j_2 \neq j_2'$. For example, if mother i is on welfare and not employed in quarter t, then she will exit welfare and become employed in quarter t+1 if $V_{it+1}^{NE} > \text{Max}\{V_{it+1}^{WN}, V_{it+1}^{WE}, V_{it+1}^{NN}\}$.

I model the corresponding hazard rates (λ_{1it}^{NN}, λ_{1it}^{WE}, and λ_{1it}^{NE} and λ_{2it}^{NE}, λ_{2it}^{WN}, and λ_{2it}^{NN}) using the multinomial logit functional form. To show the impact of spell duration on the hazard rates, I could assume a parametric functional form for the duration variables. However, Meyer (1990, 1995) shows that picking the wrong parametric specification for the duration variables will results in inconsistent estimates. Instead, Meyer recommends a semi-parametric approach where time is represented by a vector of time-varying dummy variables.[5]

Mothers who receive Food Stamps may be systematically different than mothers who do not receive Food Stamp benefits in unobserved ways that are correlated with both welfare receipt, employment, and Food Stamp benefits. Therefore, I estimate both discrete choice

[5] In Meyer's (1990) study of unemployment benefits, he uses duration dummy variables to allow the baseline hazard to spike upward in the interval corresponding to benefit exhaustion.

equations simultaneously with a quarterly equation for the amount of Food Stamp benefits received by mother i in quarter t,

$$Y_{it} = \mathbf{Z_{it}}\alpha + \varepsilon_{3it},$$

where **Z** is a vector of explanatory variables (**X** ≠ **Z**), α is a vector of coefficients, and ε_{3it} is the Food Stamp equation disturbance, allowing cross-period correlation among the unobservables. If the same unobserved factors determine whether mothers receive welfare and are employed as well as whether mothers receive Food Stamps, then failure to control for cross-equation correlation will result in biased estimates. For example, suppose that mothers with high preferences for leisure are more likely to receive welfare without employment and to receive Food Stamp benefits. If so, then Food Stamps would spuriously appear to decrease the probably of switching from receiving welfare without employment because Food Stamps would at least partially serve as a proxy for preferences for leisure.

To model this cross-equation correlation, I assume that the error terms include an independently and identically distributed component (ν) and components representing the unobserved person-specific factors ($\mu_1,\ldots,\mu_M$):

$$\varepsilon_{kj_k it} = \nu_{kj_k} + \sum_{m=1}^{M}(\gamma_{kj_k m0} + (\sum_{\tau=1}^{T-1}\gamma_{kj_k m\tau}\Gamma_{it\tau}))\mu_{itm}$$

$$\varepsilon_{3it} = \nu_3 + \sum_{m=1}^{M}(\gamma_{3m0} + (\sum_{\tau=1}^{T-1}\gamma_{3m\tau}\Gamma_{it\tau}))\mu_{itm}$$

for k = 1 (with j_1 = NN, WE, and NE) and k = 2 (with j_2 = NE, WN, and NN), where the γs are factor loadings, $\sum_{\tau=1}^{T-1}\Gamma_{it\tau}$ is a set of dummy variables in which, for instance, Γ_τ equals one if the welfare spell is of duration τ at time t (welfare spells are tracked for up to 16 quarters,

so T-1 = 15), and M is the number of common factors. This structure assumes that the idiosyncratic disturbances (the νs) are uncorrelated with the unobserved factors (the μs), but cross-equation correlation exists because the error structure contains the same unobserved variables (the μs). Furthermore, interacting a vector of duration dummy variables ($\sum_{\tau=1}^{T-1}\Gamma_{it\tau}$) with the mass points potentially controls for duration-specific unobserved sources of cross-equation correlation. This model's complete conditional likelihood (LL) function contribution for mother i is

$$LL_i(\mu_1,...,\mu_M) = \{\prod_{t=1}^{T} \sum_{j_k=1}^{3} d_{kj_kit} \lambda_{kit}^{j_k} (d_{kj_kit} = 1 \mid \mu_1,...,\mu_M) \times Pr(Y_{it}|\mu_1,...,\mu_M)\}$$

for model k = 1, 2, where d_{kj_kit} is an indicator variable that equals one if mother i switches to welfare-employment state j_k in quarter t, and T is the maximum number of quarters covered by the model (16 months).

Failure to control for unobserved heterogeneity also potentially produces biased results due to dynamic self-selection. In particular, dynamic self-selection bias results because successive quarterly probabilities are estimated from the sample of mothers who remain on welfare without employment (or who remain on welfare with employment). Thus, subsequent time periods may contain a sample of mothers with heterogeneous characteristics. For example, again assume some mothers have high preferences for leisure that are unobserved and that are correlated with remaining on welfare without employment. If so, then exiting welfare and/or becoming employed will be correlated with low preferences for leisure, and the "surviving" sample of mothers who remain on welfare without employment will tend to have high preferences for leisure. Lancaster (1979, 1985) shows that when

dynamic self-selection is present, unobserved heterogeneity will bias the effect of any included regressor toward zero.

To control for unobserved heterogeneity, I use a strategy similar to the one proposed by Heckman and Singer (1984) and used by many others (Gritz 1993; Ham and LaLonde 1996; Blau and Hagy 1998; Hotz, Xu, Tienda, and Ahituv 1999; Mroz 1999) where a step function is used to approximate the distribution of the unobserved variables. That is, I "integrate out" these factors by approximating the unobserved heterogeneity's distribution with a step function of mass points and probability weights jointly with the other parameters. For example, the distribution of each unobserved factor μ is $Pr(\mu=\mu_n) = \theta_n$, with $n = 1,\ldots,N$ and $\sum_{n=1}^{N}\theta_n = 1$ where N is the number of mass points in the distribution of μ, and θ is the probability that μ equals a particular point of support. Identification is achieved by setting the first mass point equal to zero and the second mass point equal to one for each factor. The additional mass points and the probability weights are restricted to lie between zero and one, but the factor loadings are allowed to take any value. With M different factors of μ, the unconditional likelihood function is given by

$$\prod_{i=1}^{I}\sum_{n_1=1}^{N_1}\sum_{n_2=1}^{N_2}\ldots\sum_{n_m=1}^{N_M}L_i(\Theta \mid \mu_{i1},\mu_{i2},\ldots\mu_{iM})\theta_{1n_1}\theta_{2n_2}\theta_{Mn_M}$$

where N, μ, and θ are as defined above and Θ are the other parameters to be estimated.

This approach is adapted from the full information maximum likelihood framework, but instead of assuming that the unobservables between equations are jointly normally distributed, it allows the distribution of the error terms to take any form by estimating a flexible discrete factor step function to approximate the unobserved heterogeneity's distribution. Mroz (1996) and Mroz and Guilkey (1996) show that this estimator performs

well versus two-stage least squares and full information maximum likelihood estimation that assumes jointly normally distributed errors. Specifically, it is more efficient than two-stage least squares, and it is consistent when the errors are not jointly normally distributed.

Gritz (1987) and Heckman and Walker (1990) explain that there are no well-established rules for determining the number of factors and mass points to use in these types of models. Standard log-likelihood ratio tests are inappropriate in this instance since parameters that fall on the boundary space violate the chi-squared distribution conditions. In later work, Gritz (1993), referring to Akaike's Information Criterion (Akaike 1973), suggests adding factors and points of support as long as the value of the likelihood function improves by at least one point for each additional parameter. Alternatively, Blau (1994) and Mroz (1999) continue adding factors and mass points to the model as long as they improve the value of the likelihood function. In my analysis, I use one common factor with three points of support. Specifications using additional factors or points of support did not improve the value of the likelihood function, with many of these specifications failing to converge. Using Gritz's (1993) criteria, I am unable to reject the joint null hypothesis that additional factors and mass points are not warranted because the value of the likelihood function did not significantly improve with any combination of additional factors and mass points. As I added factors and mass points, I examined the change in the coefficients. Continuing to add factors and mass points (in addition to one common factor with three points of support) left the estimates virtually unchanged.

I achieve identification in two ways. First, identification is secured by functional form. Specifically, the index functions and discrete factors enter corresponding equations

non-linearly. Second, I include instruments in the vehicle ownership model that are not included in the employment equation.

As instruments, I use state variation in Food Stamp eligibility laws. The NLSY79 identifies each respondent's state of residence, which enables me to link measures of state Food Stamp eligibility criteria with each respondent. The state Food Stamp eligibility laws control for: whether states provide FSBs via coupons or the Electronic Benefit Transfer (EBT) program (starting in 1989, states began switching from the coupon system to the EBT program, and by 1999, 35 states were providing benefits electronically (Ziliak et al., 2003)); whether only parents or non-parental adults in the household can be considered caregivers of dependents if a child is present; whether the state uses simplified periodic reporting instead of incident reporting; whether residents are categorically eligible for FSBs if they qualify for other types of welfare; whether the state's employment and training sanctions are severe; and whether the state has a FSP-approved outreach plan designed to increase program participation (Gabor and Botsko, 1998; Super and Dean, 2001; Knaus, 2003).

These characteristics will serve as exogenous instruments identifying FSBs if *(i)* they significantly explain Food Stamp receipt and *(ii)* do not significantly affect pregnancy weight gain independently of FSBs. These eligibility criteria are probably valid instruments on both counts. Certainly state Food Stamp eligibility criteria should affect FSBs by determining who is eligible (for empirical evidence of this, see Kabbani and Wilde, 2003). Further, it seems reasonable to assume that state Food Stamp eligibility criteria are unrelated to pregnancy weight gain when controlling for FSBs. For example, state legislatures probably do not alter FSP eligibility criteria based on a state's incidence of ideal pregnancy weight gain. Ultimately, log-likelihood ratio tests indicate that these eligibility characteristics and

Food Stamp eligibility criteria are indeed valid instruments for FSBs. That is, the value of the log-likelihood function significantly improves when these variables are added to the FSBs equation but not when they are added to the pregnancy weight gain equation. [Appendix table A presents a full set of results for the FSBs equation.]

VI. Results

In separate models, I jointly estimate the amount of Food Stamp benefits received and the probabilities of switching from on welfare and not employed to off welfare and not employed, on welfare and employed, and off welfare and employed and the probabilities of switching from on welfare and employed to off welfare and employed, on welfare and no longer employed, and off welfare and no longer employed. Food Stamp-related results are presented in table 3, with a representative set of non-Food Stamp-related results (with the full set of covariates included) presented in appendix table B. I initially include only the individual-specific demographic covariates (model 1), and then I successively add state and year dummy variables (model 2), local economic covariates (model 3), state political variables (model 4), and state AFDC/TANF welfare program characteristics (model 5).

Results show that Food Stamp benefits significantly increase the probability that mothers on welfare and employed remain on welfare and cease to become employed at the 1 % level in all five model specifications. That is, regardless of the combinations of covariates included, Food Stamps seem to discourage employment for welfare recipients. At the same time, Food Stamps decrease the probability that mothers on welfare and not employed exit welfare and become employed. This result tends to be statistically significant at roughly the 10 % level across the five model specifications. However,

Food Stamps do not significantly affect the other possible transitions. For example, there is no significant evidence that Food Stamps prompt mothers on welfare and not employed either to move off welfare and remain not employed or to remain on welfare and become employed.

It is difficult to quantify the magnitudes of the effects discussed above because the multinomial logit model specification is non-linear. Therefore, I next predict the survival rate for remaining on welfare without employment and the cumulative probabilities of moving off welfare without employment, remaining on welfare with employment, and moving off welfare without employment without Food Stamp benefits (figure 7) and with Food Stamp benefits of $200 per month (figure 8) as well as the survival rate for remaining on welfare with employment and the cumulative probabilities of moving off welfare with employment, remaining on welfare without employment, and moving off welfare without employment without Food Stamp benefits (figure 9) and with Food Stamp benefits of $200 in each month (figure 10).

Comparing figures 7 and 8, the probability of remaining on welfare without employment (the survival rate) by the end of the 16 quarters increases by about 2 percentage points with Food Stamps, from roughly 10 to 12 %. Simultaneously, Food Stamp benefits decrease the probability of ultimately moving off welfare with employment by about 5 percentage points, from about 22 to 17 %.

Comparing figures 9 and 10, virtually no one "survives" (remains on welfare with employment) for the entire 16 quarters. Food Stamps increase the probability of switching from welfare with employment to welfare without employment by about 16 percentage points, from roughly 42 to 58 %. Although statistically insignificant, the

probability of moving off welfare while remaining employed is about 17 percentage points lower with Food Stamps.

The results do not seem to be sensitive to the combination of covariates included; however, they may be sensitive to how employment is defined or to sample selection criteria. To explore the robustness of my results, I next re-estimate the models re-defining employment to be *any* market-place work (rather than an average of at least 10 hours per week during the quarter). For this and successive robustness tests, I present results from preferred models that include the full set of covariates, equivalent to model 5 in table 3. Presented as model 1 in table 4, results suggest that Food Stamps continue to increase the probability that mothers on welfare with employment remain on welfare but cease to be employed at the 1 % level. Furthermore, the magnitude of this effect remains largely unchanged. In addition, Food Stamp benefits now also significantly decrease the probability that these mothers move off welfare while remaining employed at the 10 % level. (Actually, this effect was almost statistically significant in table 3, with t-statistics often greater than 1.0). In contrast to the results in table 3, Food Stamps do not significantly affect any of the transitions for mothers on welfare and not employed in model 1.

Much the same, when I again re-specify employment to be market-place work of at least 20 hours per week during the quarter (model 2 in table 4), Food Stamps continue to increase the probability of moving from on welfare and employed to on welfare and not employed. There remain no statistically significant effects on the transitions for mothers on welfare without employment.

Next, I re-estimate the models including only mothers of children under the age of 14 (rather than mothers with children under the age of 18). This is because mothers beginning spells of welfare with children above the age of 13 will not necessarily be constrained by the federal five-year lifetime receipt limit imposed by the 1996 Welfare Reform Act. However, results from model 3 in table 4 are much the same as the original results in table 3: Food Stamps continue to reduce the probability of switching from welfare and employed to welfare and not employed at the 1 % level. The magnitude of this effect remains largely unchanged, as well. Food Stamps also decrease the probability that mothers on welfare without employment will move off welfare with employment, now at the 5 % confidence level.

In a last robustness check, I re-estimate the models including only single mothers rather than mothers regardless of marital status. Results are presented in model 4 in table 4. This specification eliminates only a small portion of the observations, and conclusions remain virtually unchanged.

Welfare recipients after welfare reform may behave differently than those prior to program changes due to, for example, receipt time limits and work requirements. If so, then the effects of Food Stamps after welfare reform may be different. Therefore, I next re-estimate the models using the original sample and original definition of employment, interacting the Food Stamp covariate with a dummy variable indicating whether welfare reform is in force. The results of key covariates are presented in table 5. Starting with the sample of mothers on welfare and employed, the effects of Food Stamps are the same regardless of welfare reform: the Food Stamp-welfare reform interaction term has a statistically insignificant effect on each transition for these welfare recipients (results

presented in the bottom panel of table 5). In addition, Food Stamps now decrease the probability of moving off welfare with employment at the 10 % confidence level, as was true for some of the alternative samples.

Next consider the effects of Food Stamp benefits before and after welfare reform for mothers on welfare and not employed (results presented in the top panel in table 5). Prior to welfare reform, results again show that Food Stamps significantly decrease the probability of moving off welfare with employment. However, Food Stamps with welfare reform have the opposite effect, increasing this transition rate. After welfare reform, Food Stamps also increase employment in other ways. In particular, Food Stamps after welfare reform increase the probability that mothers on welfare and not employed will remain on welfare with employment. This effect is statistically significant at the 1 % level.

I also separately estimate the models for welfare recipients in the south. Examining the effects of Food Stamps on welfare and employment transitions in the south is particularly important because, relative to the non-south, welfare caseloads have fallen much more dramatically since welfare reform, TANF rules are ranked as particularly stringent, and per-capita income and welfare benefits are lower (Henry and Lewis, 2001; Nord ,1998). To do this, I interact the Food Stamps covariate with a dummy variable for residence in the south. Results, displayed in table 6, suggest that the effects of Food Stamps do not vary between the south and non-south. That is, the Food Stamps-south interaction term has statistically insignificant effects on each of the various transition rates. The effects of Food Stamps otherwise remain essentially unchanged, where such benefits decrease the probability that mothers on welfare and employed move

off welfare and remain employed and increase the probability that such mothers remain on welfare and cease to be employed.

In addition, I examine the effects of other government assistance programs. In most cases, the effects of other types of assistance are statistically insignificant. For example, in table 7, I present the effects of Food Stamp benefits and the effects of public housing assistance. As indicated, the effects of housing assistance are statistically insignificant in each instance, although the effects of Food Stamp benefits remain unchanged. This could be because welfare recipients are less likely to receive assistance from other government programs relative to the Food Stamp program. An alternative explanation is that these results are due to data limitations. In particular, the NLSY79 does not collect monthly information about receipt of public housing assistance, as it does for Food Stamp receipt. Instead, information on government housing assistance only reflects receipt as of the survey date.

VII. Discussion and Conclusions

Results in this paper consistently show that Food Stamp benefits increase the probability that employed mothers on welfare remain on welfare but without employment. Furthermore, at least some evidence indicates that Food Stamps decrease the probability that employed mothers on welfare leave welfare while remaining employed and that Food Stamps decrease the probability that mothers on welfare without employment leave welfare with employment. These results are often robust to alternative definitions of employment and to sample selection criteria.

Perhaps Food Stamps discourage employment because such benefits are implicitly taxed as income from earnings increases. Yet another explanation is that Food

Stamps decrease the marginal value of earnings from employment by increasing consumption. Much the same, Food Stamps could discourage transitions off welfare by decreasing the marginal costs of applying for welfare, enrolling in the welfare program, and stigma.

These results are important because they suggest that when attempting to explain declining welfare rolls over the past 15 years, researchers should consider the effects of welfare reform, economic conditions, and another, third factor in their decompositions: other government-assistance programs. These results are new in that others have not jointly examined the effects of other government-assistance programs on transitions off welfare and employment in a dynamic context with post-reform data. This study attempts to address this by examining quarterly welfare and employment transition rates, simultaneously incorporating receipt from one of the largest government-assistance program for those in poverty – the Food Stamp program. This study also is one of the few to incorporate post-welfare reform data. This is important because corresponding results show that the effects of Food Stamps, particularly for mothers on welfare without employment, may be significantly different, where Food Stamps may encourage employment and transitions off welfare with employment.

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Table 1

Descriptive Statistics for the Full Sample

Key Explanatory Variable	**Full Sample**	
Food Stamp Benefits (in $100s)	2.036	(0.064)
Demographic Characteristics		
Black (=1 if black)	0.373	(0.042)
Hispanic (=1 if Hispanic)	0.099	(0.018)
Age (in years)	31.484	(0.232)
Education (in years)	11.846	(0.073)
Marital Status (=1 if married)	0.241	(0.025)
Family Size (number in household)	4.129	(0.104)
Senior Citizen (=1 if a senior citizen is present)	0.068	(0.012)
Children 0 – 2 (number of biological children aged 0 through 2)	0.301	(0.027)
Children 3 – 5 (number of biological children aged 3 through 5)	0.432	(0.027)
Children 6 – 10 (number of biological children aged 6 through 10)	0.858	(0.042)
Children 11 – 13 (number of biological children aged 11 through 13)	0.334	(0.027)
Children 14 – 17 (number of biological children aged 14 through 17)	0.230	(0.020)
Urban (=1 if residence in urban area)	0.759	(0.036)
Economic Conditions Variables		
Local Unemployment Rate (%)	0.071	(0.002)
Local Per Capita Income ($1000s in year-2005 dollars)	11.602	(0.224)
Portion of Local Labor Force Female (%)	0.412	(0.004)
Local Population High-School Educated (%)	0.664	(0.009)
Local Population College-Educated (%)	0.153	(0.005)
Local Population Employed (%)	0.419	(0.005)
Local Labor Force in Manufacturing (%)	0.195	(0.009)
Local Labor Force in Wholesale/Retail Trade (%)	0.184	(0.003)
Political Variables		
Representative's ADA Ranking (higher is more liberal)	0.475	(0.013)
Senator's ADA Ranking (higher is more liberal)	0.563	(0.024)
Democrat Governor (= 1 if governor is a Democrat)	0.416	(0.039)
Portion of State House Democrat	0.567	(0.009)
Portion of State Senate Democrat	0.549	(0.012)
Welfare Characteristics Variables		
Post-TANF (=1 if TANF in force)	0.219	(0.020)
Pre-Welfare Reform Waiver (=1 if state granted a pre-reform waiver)	0.155	(0.018)
State Maximum Benefits (for a family of four in dollars)	4.267	(0.153)
No Time Limit (=1 if lifetime receipt limit in force)[a]	0.130	(0.058)
Time Limit (months of allowable lifetime receipt)[a,b]	57.397	(0.650)
Family Caps (=1 if benefits capped for additional births)[a]	0.468	(0.062)

Child Age (in months under which caregivers are exempt from work)[a]	8.788	(0.747)
Severe Sanctions (if full or permanent instead of partial and temporary)[a]	0.514	(0.061)
Earned Income Disregards (flat dollar amount in first month)[a]	138.898	(12.137)
Earned Income Disregards (percentage amount in first month)[a]	42.174	(1.941)
Asset Limit ($s)[a,c]	2197.419	(111.501)
No Asset Limit (=1 if no asset limit)[a]	0.041	(0.019)
TANF Vehicle Exemption ($s)[a,d]	5017.163	(145.006)
Vehicles Included in TANF Asset Test (=1 if vehicles included in asset test)[a]	0.643	(0.062)
State Eligibility Characteristics		
FSP Vehicle Asset Limit ($1000s)[a]	0.206	(0.036)
EBT (=1 if state uses the EBT program)[a]	0.429	(0.046)
Non-Parental Adults in Household can be Caregivers[a,e]	0.595	(0.062)
Simplified Periodic Reporting (=1 if reporting is periodic)[a,f]	0.833	(0.047)
Categorical Eligibility (=1 if state allows categorical eligibility)[a]	0.693	(0.056)
Severe Sanctions (=1 if sanctions for E&T offenses are severe)[a,g]	0.473	(0.063)
Outreach Plan (=1 if state has FSP-approved outreach plan)[a]	0.526	(0.063)

Sample means with standard errors in parentheses. There are 1,590 welfare spell-observations. [a] Only post-welfare reform childbirths are used for the descriptive statistic. [b] Only observations in states with time limits are used in the descriptive statistics. [c] Only observations in states with asset limits are used in the descriptive statistics. [d] Only observations in states without vehicle exclusions are used in the descriptive statistics. [e] The excluded category is only parents are allowed to be considered the caregiver. [f] The excluded category is incident reporting. [g] Sanctions for E&T offenses are either extended beyond that normally required by the FSP, permanent (instead of temporary), or applied to the entire household (instead of only the offending member). Political variables created with data from the Americans for Democratic Action (ADA) (2005). Information required to create the welfare variables is obtained from a report on state AFDC/TANF policies by Crouse (1999) and from the Urban Institute's online Welfare Rules Database (The Urban Institute, 2005).

Table 2

Descriptive Statistics for Food Stamp Recipients and Non-Recipients

Key Explanatory Variable	**Recipients**		**Non-Recipients**	
Food Stamp Benefits	2.346	(0.060)	0.000	(0.000)
Demographic Characteristics				
Black	0.395	(0.044)	0.232	(0.049)
Hispanic	0.095	(0.017)	0.122	(0.033)
Age	31.380	(0.257)	32.166	(0.514)
Education	11.810	(0.076)	12.081	(0.190)
Marital Status	0.242	(0.026)	0.232	(0.049)
Family Size	4.075	(0.107)	4.483	(0.287)
Senior Citizen	0.070	(0.013)	0.056	(0.021)
Children 0 – 2	0.307	(0.029)	0.260	(0.057)
Children 3 – 5	0.445	(0.030)	0.347	(0.070)
Children 6 – 10	0.879	(0.044)	0.722	(0.089)
Children 11 – 13	0.340	(0.029)	0.291	(0.081)
Children 14 – 17	0.233	(0.021)	0.214	(0.073)
Urban	0.759	(0.039)	0.763	(0.055)

Sample means with standard errors in parentheses. There are 1,395 welfare spells that begin with Food Stamp benefits and 195 welfare spells that begin without Food Stamps.

Table 3

Selected Multinomial Logit Coefficient Estimates from Transition Models: The Effects of Food Stamps on Transitions off Welfare and Employment

Transitions:	Model 1	Model 2	Model 3	Model 4	Model 5
On Welfare, Not Employed to:					
Off Welfare, Not Employed	0.045	0.030	0.026	0.022	0.035
	(0.066)	(0.064)	(0.066)	(0.067)	(0.065)
On Welfare, Employed	0.019	0.008	0.022	0.013	0.016
	(0.064)	(0.070)	(0.072)	(0.071)	(0.074)
Off Welfare, Employed	-0.156*	-0.164*	-0.178*	-0.159	-0.187*
	(0.095)	(0.093)	(0.104)	(0.104)	(0.104)
On Welfare, Employed to:					
Off Welfare, Employed	-0.069	-0.088	-0.103	-0.111	-0.144
	(0.086)	(0.084)	(0.086)	(0.086)	(0.093)
On Welfare, Not Employed	0.278***	0.296***	0.310***	0.304***	0.321***
	(0.079)	(0.090)	(0.093)	(0.096)	(0.093)
Off Welfare, Not Employed	-0.015	0.056	0.092	0.101	0.117
	(0.155)	(0.162)	(0.179)	(0.200)	(0.162)
Log-likelihood Value					
Variables					
Demographic	X	X	X	X	X
State		X	X	X	X
Year		X	X	X	X
Economic			X	X	X
Political				X	X
Welfare					X

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 5,251 observations initially on welfare and not employed and 1,638 observations initially on welfare and employed. Employment is defined as working at least 10 hours per week. The sample includes all female welfare recipients with at least one child under the age of 18.

Table 4

Selected Multinomial Logit Coefficient Estimates from Transition Models: The Effects of Food Stamps on Transitions off Welfare and Employment on Alternative Samples

Transitions:	Model 1	Model 2	Model 3	Model 4
On Welfare, Not Employed to:				
Off Welfare, Not Employed	0.009	-0.003	0.019	0.001
	(0.064)	(0.067)	(0.068)	(0.068)
On Welfare, Employed	-0.016	-0.014	0.005	0.023
	(0.070)	(0.076)	(0.075)	(0.078)
Off Welfare, Employed	-0.169	-0.152	-0.240**	-0.107
	(0.107)	(0.099)	(0.104)	(0.109)
Observations	5,259	5,357	5,081	4,102
On Welfare, Employed to:				
Off Welfare, Employed	-0.161*	-0.116	-0.144	-0.055
	(0.085)	(0.091)	(0.092)	(0.109)
On Welfare, Not Employed	0.279***	0.292***	0.282***	0.374***
	(0.093)	(0.105)	(0.095)	(0.108)
Off Welfare, Not Employed	0.162	0.283*	0.148	0.153
	(0.171)	(0.163)	(0.159)	(0.181)
Observations	1,728	1,346	1,584	1,349
Log-likelihood Value				
Definition of Employment	Hours > 0	Hours ≥ 20	Hours ≥ 10	Hours ≥ 10
Welfare Recipients	All Moms	All Moms	All Moms	Single Moms
Children	Under 18	Under 18	Under 14	Under 18

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. The models contain the demographic, state, year, economic, political, and welfare variables.

Table 5

Selected Multinomial Logit Coefficient Estimates from Transition Models: The Effects of Food Stamps on Transitions off Welfare and Employment with and without Welfare Reform

Transitions:			
On Welfare, Not Employed to:	Off Welfare, Not Employed	On Welfare, Employed	Off Welfare, Employed
Food Stamps	-0.033	-0.066	-0.344***
	(0.087)	(0.086)	(0.119)
Food Stamps*Welfare Reform	0.160	0.324***	0.570***
	(0.113)	(0.115)	(0.163)
On Welfare, Employed to:	Off Welfare, Employed	On Welfare, Not Employed	Off Welfare, Not Employed
Food Stamps	-0.213*	0.266**	-0.040
	(0.117)	(0.110)	(0.188)
Food Stamps*Welfare Reform	0.202	0.205	0.485
	(0.177)	(0.171)	(0.345)

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 5,251 observations initially on welfare and not employed and 1,638 observations initially on welfare and employed. The models contain the demographic, state, year, economic, political, and welfare variables. The log-likelihood function value is XXX.

Table 6

Selected Multinomial Logit Coefficient Estimates from Transition Models: The Effects of Food Stamps on Transitions off Welfare and Employment by Region of Residence

Transitions:			
On Welfare, Not Employed to:	Off Welfare, Not Employed	On Welfare, Employed	Off Welfare, Employed
Food Stamps	0.029	-0.032	-0.163
	(0.078)	(0.087)	(0.118)
Food Stamps*South	0.015	0.146	-0.083
	(0.089)	(0.117)	(0.155)
On Welfare, Employed to:	Off Welfare, Employed	On Welfare, Not Employed	Off Welfare, Not Employed
Food Stamps	-0.191*	0.325**	0.105
	(0.099)	(0.102)	(0.172)
Food Stamps*South	0.202	-0.001	0.053
	(0.148)	(0.137)	(0.287)

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 5,251 observations initially on welfare and not employed and 1,638 observations initially on welfare and employed. The models contain the demographic, state, year, economic, political, and welfare variables. The log-likelihood function value is XXX.

Table 7

Selected Multinomial Logit Coefficient Estimates from Transition Models: The Effects of Food Stamps and Public Housing Assistance on Transitions off Welfare and Employment

Transitions:			
On Welfare, Not Employed to:	Off Welfare, Not Employed	On Welfare, Employed	Off Welfare, Employed
Food Stamps	0.034	-0.081	-0.193*
	(0.065)	(0.075)	(0.104)
Public Housing Assistance	0.022	0.121	-0.244
	(0.162)	(0.187)	(0.319)
On Welfare, Employed to:	Off Welfare, Employed	On Welfare, Not Employed	Off Welfare, Not Employed
Food Stamps	-0.141	0.323***	0.121
	(0.092)	(0.093)	(0.162)
Public Housing Assistance	-0.279	-0.162	0.106
	(0.264)	(0.204)	(0.496)

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 5,247 observations initially on welfare and not employed and 1,638 observations initially on welfare and employed. The models contain the demographic, state, year, economic, political, and welfare variables. The log-likelihood function value is XXX.

Figure 1

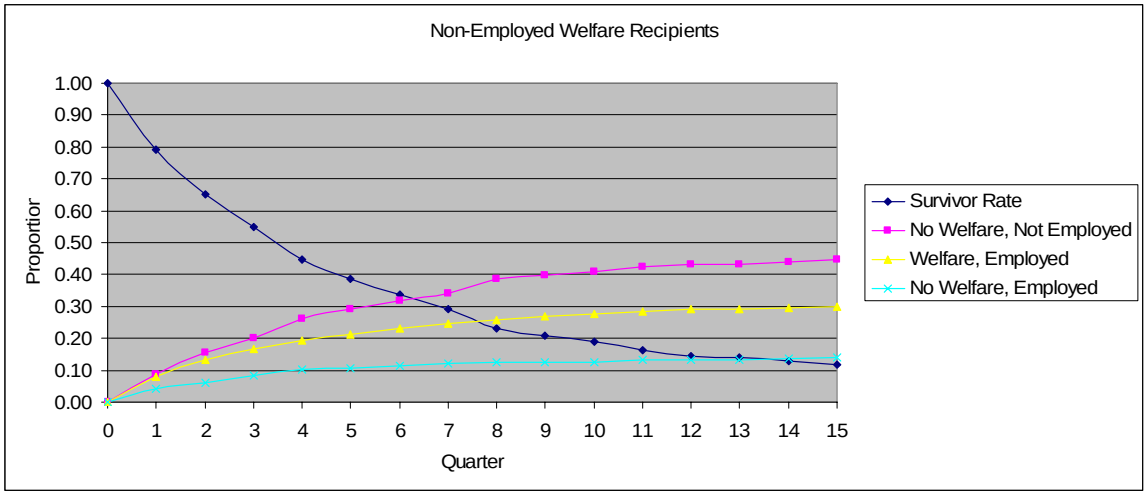


Figure 2

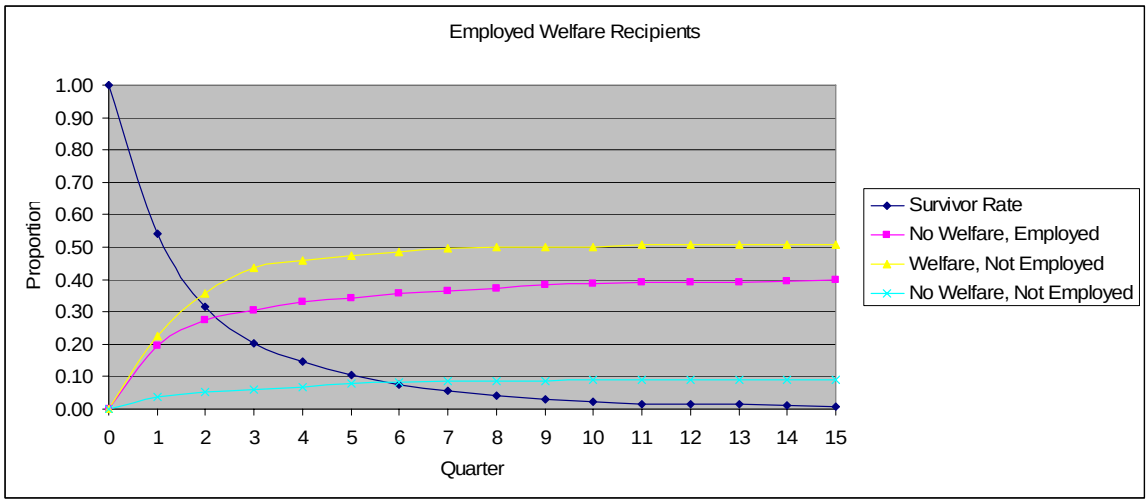


Figure 3

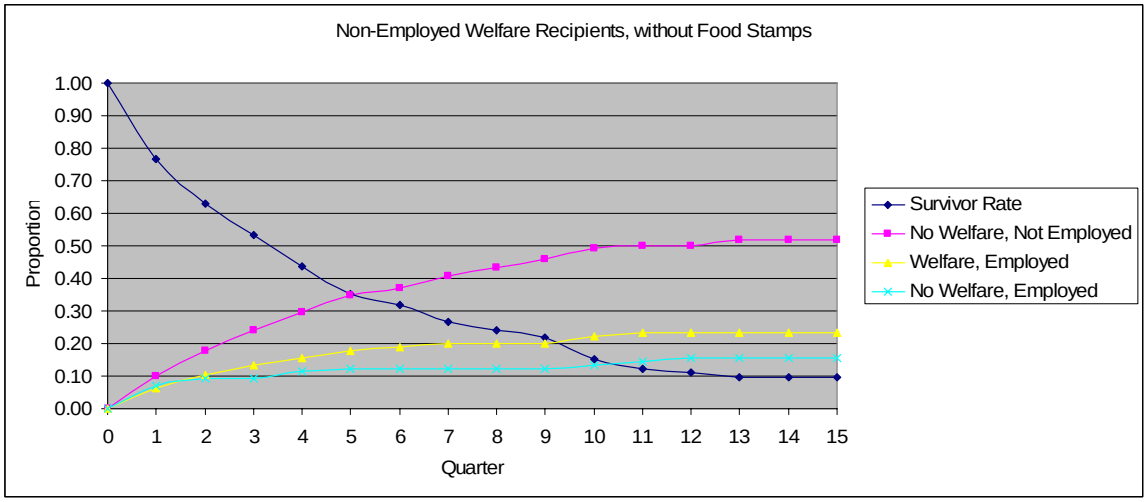


Figure 4

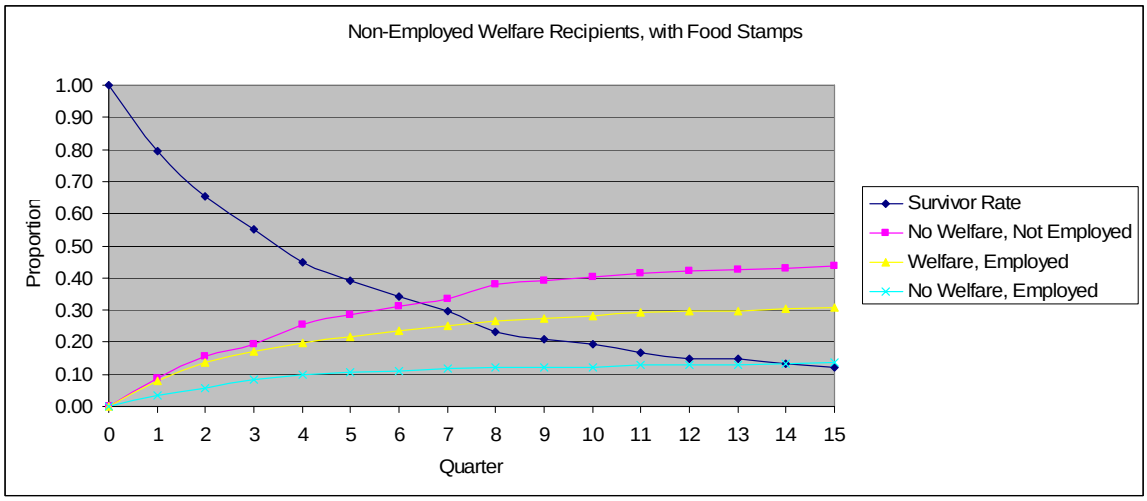


Figure 5

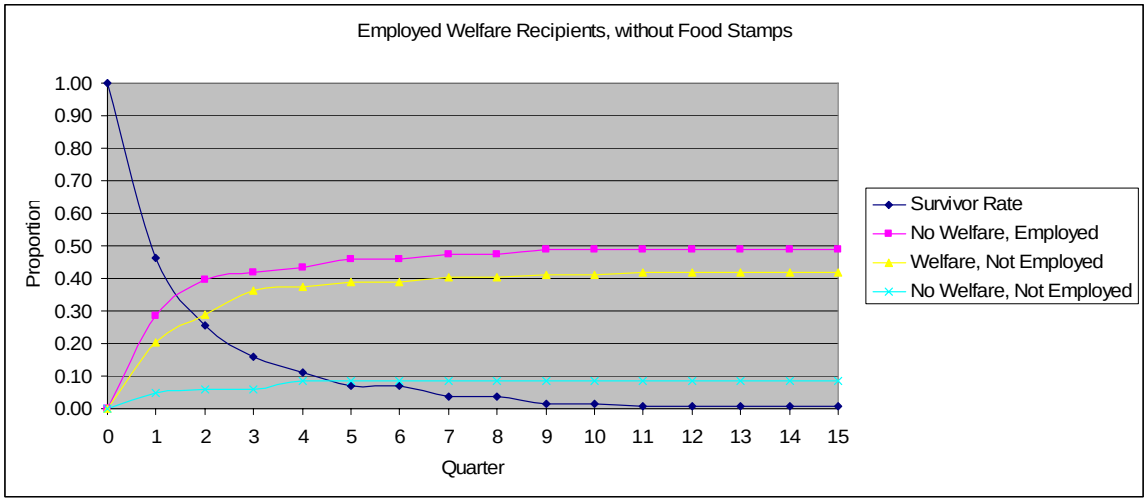


Figure 6

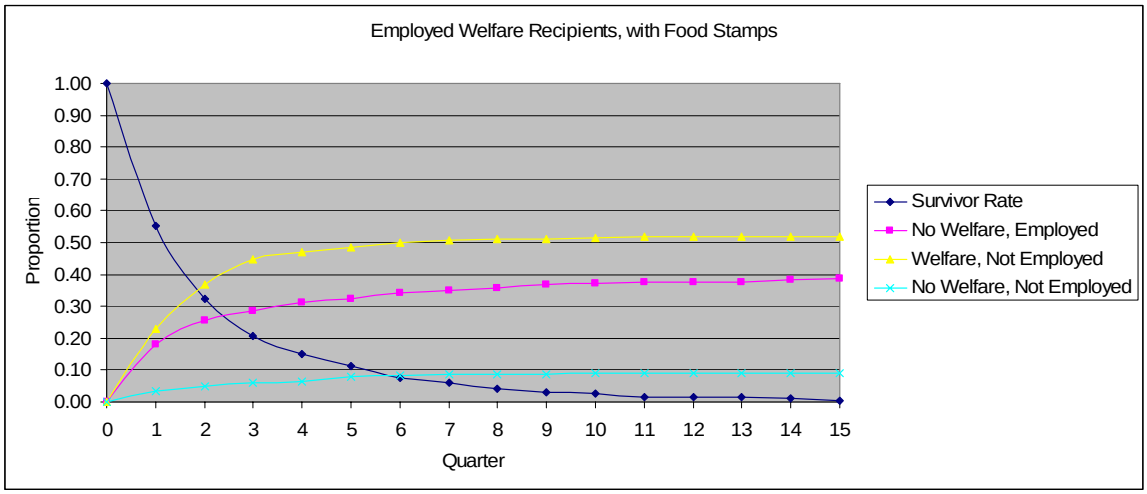


Figure 7

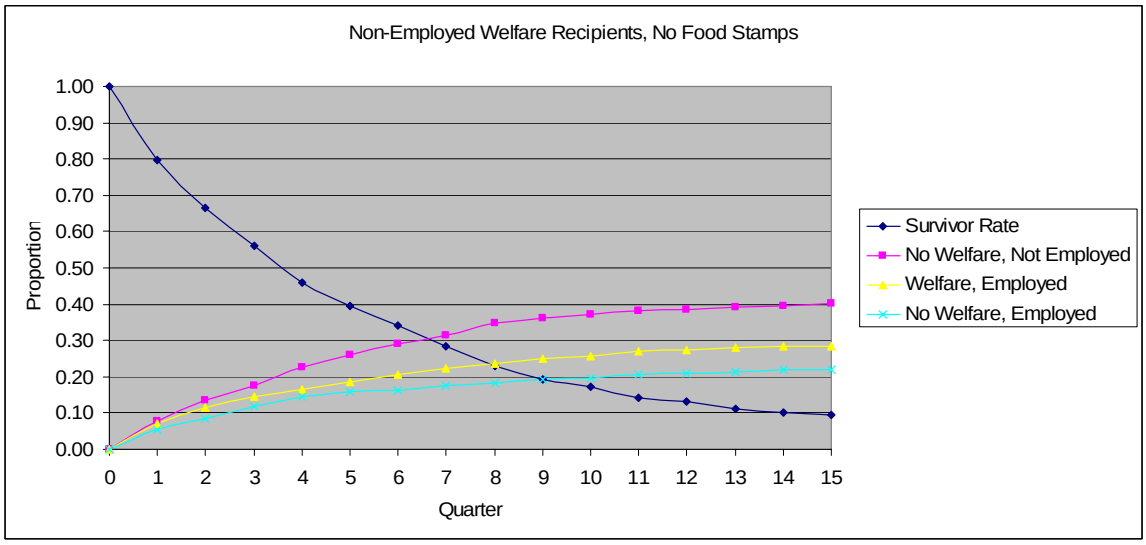


Figure 8

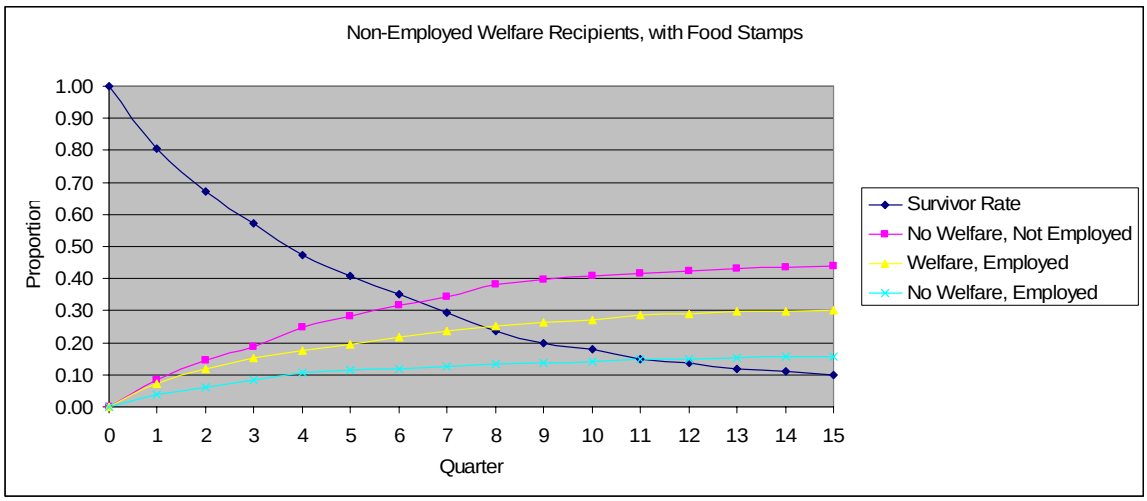


Figure 9

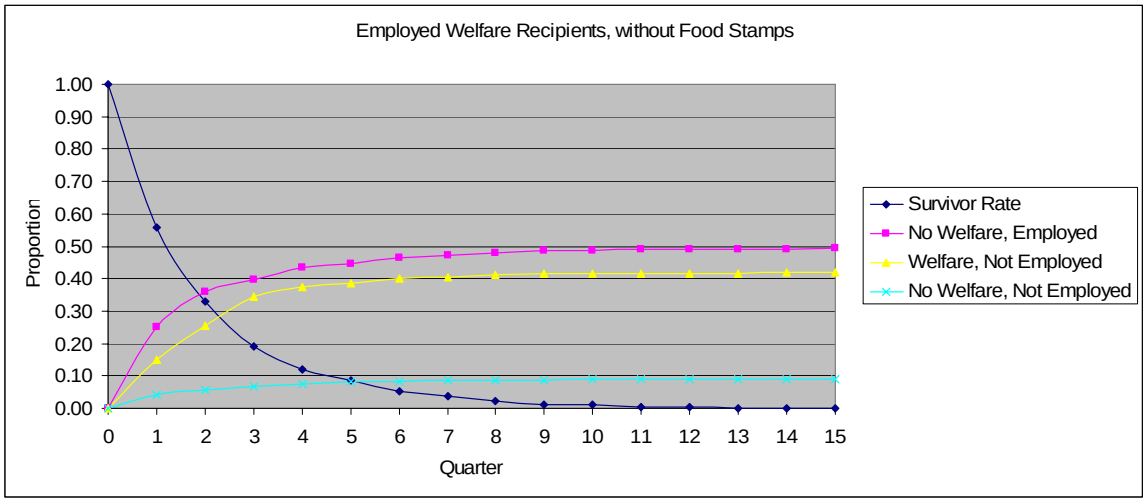
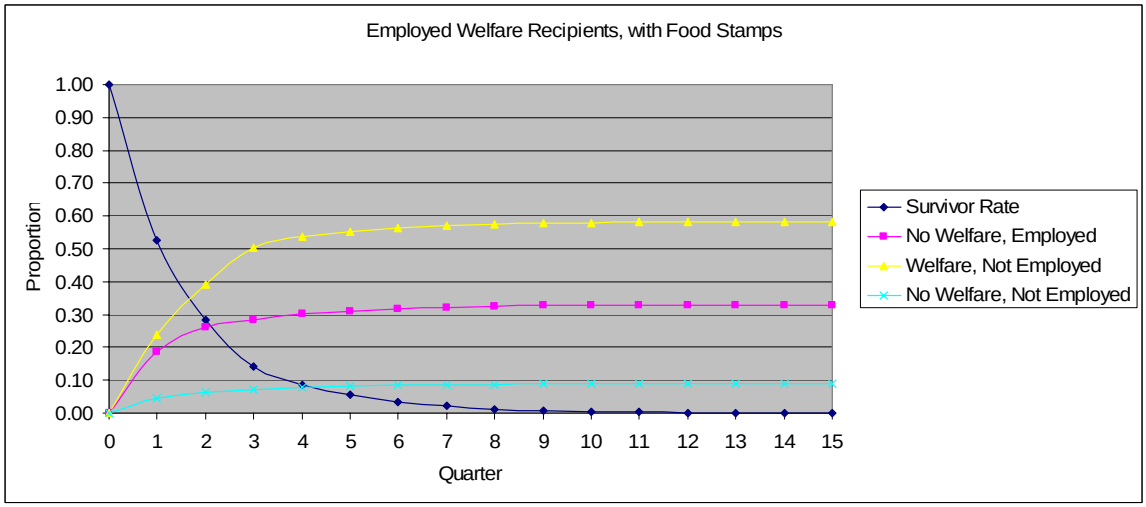


Figure 10



Appendix Table A: Selected Results for the Probability of Receiving Food Stamps

Constant	2.343	(1.638)
Black	1.608***	(0.177)
Hispanic	-0.013	(0.212)
Age	0.013	(0.027)
Education	-0.259***	(0.043)
Marital Status	0.262*	(0.137)
Family Size	-0.313***	(0.036)
Senior Citizen	0.334*	(0.200)
Children 0 – 2	0.506***	(0.118)
Children 3 – 5	0.694***	(0.112)
Children 6 – 10	0.602***	(0.083)
Children 11 – 13	0.489***	(0.120)
Children 14 – 17	0.470***	(0.104)
Urban	-0.974***	(0.185)
Unemployment Rate	-2.684	(2.963)
Per Capita Income	0.058	(0.041)
Labor Force Female	-1.402	(2.192)
Population High-School Educated	-1.089	(1.310)
Population College-Educated	-0.628	(2.218)
Population Employed	0.477	(1.983)
Labor Force in Manufacturing	-4.001***	(0.928)
Labor Force in Trade	3.356	(3.178)
Representative's ADA Ranking	2.878***	(0.495)
Senator's ADA Ranking	0.657***	(0.254)
Democrat Governor	-0.083	(0.145)
State House Democrat	1.352	(1.101)
State Senate Democrat	-2.156**	(0.977)
FSP Vehicle Asset Limit	1.333***	(0.316)
EBT	0.008	(0.241)
Non-Parental Adult Caregivers	-1.333***	(0.308)
Simplified Periodic Reporting	0.240	(0.246)
Categorical Eligibility	0.469*	(0.276)
Severe Sanctions	-1.418***	(0.291)
Outreach Plan	0.163	(0.266)

Standard errors are in parentheses. *$\underline{p} < 0.10$, **$\underline{p} < 0.05$, and ***$\underline{p} < 0.01$. There are 8,428 observations used in the Food Stamp receipt model. The sample includes all female welfare recipients with at least one child under the age of 18. Results are taken from model 5 in table 3 (with the full set of covariates included.) Log-likelihood function value: -5,529.11.

Appendix Table B1: Selected Results from Transition Models: On Welfare, Not Employed

Covariate	Off Welfare, Not Employed		On Welfare, Employed		Off Welfare, Employed	
Constant	4.472	(4.200)	-9.817**	(3.997)	-10.183	(56.373)
Black	-0.969***	(0.255)	0.249	(0.235)	-1.51***	(0.489)
Hispanic	0.003	(0.320)	-0.331	(0.422)	-0.705	(0.559)
Age	-0.026	(0.039)	0.018	(0.043)	-0.046	(0.068)
Education	0.130**	(0.056)	0.035	(0.082)	0.427***	(0.106)
Marital Status	0.738***	(0.213)	-0.493**	(0.245)	0.478	(0.351)
Family Size	0.035	(0.073)	0.052	(0.082)	0.043	(0.133)
Senior Citizen	0.142	(0.243)	-0.132	(0.371)	-0.363	(0.613)
Children 0 – 2	-0.424**	(0.183)	-0.166	(0.193)	-0.615*	(0.338)
Children 3 – 5	-0.813***	(0.178)	0.197	(0.186)	-0.517*	(0.325)
Children 6 – 10	-0.146	(0.157)	0.033	(0.150)	0.287	(0.293)
Children 11 – 13	-0.387**	(0.175)	-0.154	(0.198)	-0.312	(0.327)
Children 14 – 17	-0.144	(0.193)	-0.063	(0.223)	-0.214	(0.376)
Urban	0.720***	(0.287)	0.145	(0.281)	0.302	(0.446)
Unemployment Rate	1.283	(4.851)	-5.682	(5.186)	9.871	(7.874)
Per Capita Income	-0.058	(0.072)	-0.165**	(0.072)	-0.143	(0.124)
Labor Force Female	2.090	(2.919)	-0.496	(3.069)	-1.811	(6.314)
Population High-School Educated	-0.679	(2.221)	3.610	(2.333)	-1.570	(3.251)
Population College-Educated	6.830*	(3.884)	-7.070*	(4.214)	5.652	(6.121)
Population Employed	-4.703	(3.635)	7.178**	(3.342)	4.396	(6.048)
Labor Force in Manufacturing	0.460	(1.636)	-3.738**	(1.587)	1.986	(3.401)
Labor Force in Trade	-6.869	(4.612)	-5.405	(4.716)	11.946	(10.197)
Representative's ADA Ranking	-2.043**	(1.020)	1.641*	(0.932)	-1.738	(1.536)
Senator's ADA Ranking	1.243**	(0.549)	-0.808	(0.520)	-0.418	(0.958)
Democrat Governor	-0.162	(0.256)	0.334	(0.268)	-1.187**	(0.499)
State House Democrat	-1.354	(1.886)	2.993*	(1.716)	-3.491	(3.666)
State Senate Democrat	-1.028	(1.492)	-2.911*	(1.509)	2.444	(2.473)
Post-TANF	0.223	(1.368)	-1.360	(1.375)	1.970	(2.544)
Pre-Welfare Reform Waiver	0.152	(0.365)	0.196	(0.318)	-0.192	(0.676)
State Maximum Benefits	-0.400***	(0.100)	0.359***	(0.110)	-0.401*	(0.216)
No Time Limit	-1.230	(3.523)	1.217	(2.905)	4.785	(56.286)
Time Limit	-0.031	(0.054)	0.027	(0.042)	0.045	(0.937)
Family Caps	-0.124	(0.550)	0.204	(0.543)	0.353	(0.981)
Child Age	0.024	(0.030)	-0.045	(0.037)	0.035	(0.037)
Severe Sanctions	0.844	(0.559)	-0.621	(0.531)	-1.307	(1.016)
Earned Income Disregards	-0.001	(0.002)	0.003	(0.003)	-0.003	(0.006)
Earned Income Disregards	-0.003	(0.012)	0.025*	(0.015)	-0.013	(0.026)
Asset Limit	-0.001	(0.001)	0.001	(0.001)	0.001	(0.001)

No Asset Limit	2.245	(3.397)	-4.114	(3.070)	-1.034	(22.102)
TANF Vehicle Exemption	0.001	(0.001)	-0.001	(0.000)	0.001	(0.001)
Vehicles Included in Asset Test	-0.085	(0.606)	0.282	(0.478)	-1.787*	(0.958)

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 5,251 observations initially on welfare and not employed. Employment is defined as working at least 10 hours per week. The sample includes all female welfare recipients with at least one child under the age of 18. Results are taken from model 5 in table 3 (with the full set of covariates included.) Log-likelihood function value: -5,529.11.

Appendix Table B2: Selected Results from Transition Models: On Welfare, Employed

Covariate	Off Welfare, Employed		On Welfare, Not Employed		Off Welfare, Not Employed	
Constant	-8.760	(6.651)	-0.985	(6.258)	4.303	(22.216)
Black	-0.999***	(0.390)	-0.135	(0.363)	-0.690	(1.174)
Hispanic	-0.497	(0.646)	0.181	(0.446)	-0.971	(1.482)
Age	0.028	(0.067)	-0.055	(0.053)	-0.173	(0.203)
Education	0.183	(0.126)	-0.042	(0.087)	0.417	(0.390)
Marital Status	-0.025	(0.393)	-0.183	(0.332)	0.515	(0.861)
Family Size	0.019	(0.115)	0.073	(0.098)	0.052	(0.295)
Senior Citizen	-0.520	(0.708)	-0.082	(0.406)	0.632	(1.056)
Children 0 – 2	0.123	(0.342)	-0.261	(0.236)	-0.796	(0.779)
Children 3 – 5	-0.230	(0.324)	-0.218	(0.240)	-0.367	(0.620)
Children 6 – 10	-0.141	(0.236)	-0.259	(0.196)	0.277	(0.550)
Children 11 – 13	0.052	(0.312)	-0.418*	(0.259)	-0.481	(0.676)
Children 14 – 17	0.011	(0.3780	-0.692**	(0.268)	0.320	(0.905)
Urban	-0.031	(0.459)	-0.361	(0.415)	0.747	(1.253)
Unemployment Rate	6.826	(8.624)	1.035	(7.058)	-21.947	(21.509)
Per Capita Income	-0.121	(0.107)	0.092	(0.104)	-0.174	(0.381)
Labor Force Female	3.235	(5.578)	5.768	(4.700)	2.502	(13.496)
Population High-School Educated	0.424	(4.055)	-4.228	(3.512)	7.216	(8.658)
Population College-Educated	0.035	(7.124)	1.559	(5.447)	-15.790	(21.067)
Population Employed	5.921	(5.954)	-1.537	(4.878)	3.608	(13.110)
Labor Force in Manufacturing	-2.731	(2.597)	0.718	(1.942)	-3.147	(7.911)
Labor Force in Trade	-4.353	(9.281)	2.800	(7.106)	-20.881	(22.291)
Representative's ADA Ranking	-1.537	(1.428)	1.178	(1.067)	3.278	(4.924)
Senator's ADA Ranking	-0.255	(0.822)	0.063	(0.521)	2.069	(2.207)
Democrat Governor	0.201	(0.459)	0.223	(0.367)	-0.825	(1.173)
State House Democrat	0.938	(3.234)	1.961	(2.640)	1.003	(12.684)
State Senate Democrat	1.116	(2.294)	-1.046	(2.494)	-4.375	(8.349)
Post-TANF	3.106	(2.020)	-0.806	(2.048)	0.256	(7.809)
Pre-Welfare Reform Waiver	1.378***	(0.460)	-0.269	(0.421)	-0.186	(1.278)
State Maximum Benefits	-0.328*	(0.195)	0.299*	(0.160)	-0.642	(0.889)
No Time Limit	1.259	(4.341)	-0.109	(4.048)	-0.691	(19.696)
Time Limit	-0.035	(0.065)	0.017	(0.055)	-0.037	(0.344)
Family Caps	-0.253	(1.159)	-0.252	(0.881)	-1.741	(3.643)
Child Age	-0.009	(0.044)	0.041	(0.085)	-0.058	(0.122)
Severe Sanctions	-1.993**	(1.051)	0.495	(0.798)	-0.482	(3.630)
Earned Income Disregards	0.000	(0.006)	0.003	(0.005)	0.005	(0.020)
Earned Income Disregards	0.045	(0.023)	-0.026	(0.023)	0.050	(0.085)
Asset Limit	0.001	(0.001)	0.001	(0.001)	-0.001	(0.001)

No Asset Limit	2.117	(4.468)	3.317	(4.916)	-18.734	(0.001)
TANF Vehicle Exemption	0.002**	(0.001)	0.001	(0.001)	0.001	(0.001)
Vehicles Included in Asset Test	-0.936	(0.711)	-0.722	(0.692)	-0.996	(2.877)

Standard errors are in parentheses. *p < 0.10, **p < 0.05, and ***p < 0.01. There are 1,638 observations initially on welfare and employed. Employment is defined as working at least 10 hours per week. The sample includes all female welfare recipients with at least one child under the age of 18. Results are taken from model 5 in table 3 (with the full set of covariates included.) Log-likelihood function value: -5,529.11.