# MIXING WELFARE AND WORK:

# EVIDENCE FROM THE PSID, 1980-87

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## INTRODUCTION

Reciprocal obligation and time limits on welfare benefits became law in August of 1996 when President Clinton signed the *Personal Responsibility and Work Opportunity Act*. This attempt to transform welfare into "a hand up rather than a hand out" rests on the assumption that work, training, and job search obligations will provide recipients with the means to avoid the potentially Draconian effects of limiting family assistance to a maximum of five cumulative years.[1] Everyone agrees that many welfare recipients lack the basic skills and/or attitudes necessary to find and hold jobs that will provide for a family. It is hoped that reciprocal obligation ("workfare") will impel welfare recipients to acquire these skills and attributes through required training, job search, and work activities. Time limits will also change incentive structures for those recipients who may be welfare dependent or lazy [Murray, 1984; Mead, 1986]. The expectation is that training and work experience will raise future income streams enough to allow recipients to support themselves once time limits take effect.

Several recent studies suggest that reciprocal obligation would be effective policy. For example, O'Neill, Bassi and Wolf [1987] found that women who worked while receiving AFDC experienced shorter spells of welfare. This implies that requiring work as a condition of receiving public assistance might be an effective way of bringing about self-sufficiency. Other studies have evaluated the effectiveness of welfare employment programs.[2] For example, Gueron [1990] found that well-funded programs in locations with good employment opportunities were effective in reducing AFDC participation rates. Schiller and Brasher [1993] also found reduced AFDC participation in Ohio counties requiring work with welfare.

While these findings suggest that reciprocal obligation will be an effective instrument of welfare reform, the literature also includes studies that question the effectiveness of work requirements in enhancing long-term self-sufficiency. Bane and Ellwood [1983] found high rates of poverty and recidivism among recipients who worked their way off of welfare. Their evidence indicates that 40 percent of those who earned

their way off AFDC experienced another spell on welfare. About this same percentage of women have incomes below the poverty line in the years after their welfare spell. Harrison [1978] developed a landmark study of how American households mix welfare and work, reporting levels of mixing from 1968 through 1972 that served to challenge the notion that work experience fosters self-sufficiency. Using data from the Panel Survey of Income Dynamics (PSID), he found that 92 percent of welfare recipients mixed welfare and work at some time over the period.

Harrison explains such results by arguing that welfare recipients are somehow confined to jobs that are low paying and unstable. Faced with job opportunities that, in general, will not support a family, individuals combine welfare and work as part of a strategy to do so. By extension, attempts to alter the skills and attitudes of welfare recipients through reciprocal obligation and time limits can serve as a "hand up" *only* if jobs that accord self-sufficiency for families exist, or will be created, to accommodate these new labor-market entrants. That is, altering skills and attitudes of welfare recipients may be a necessary, but not a sufficient, condition to bring about self-sufficiency. Proponents of this view stress the significance of the structure of occupational opportunities, and make explicit the possibility that jobs paying poverty-level wages will continue to exist and that some sector of the population will always be found to work these jobs. In fact, reciprocal obligation may compel welfare recipients to accept such jobs. Fundamental to this view is the concern that individual investments in education and training may alter *who* works at particular jobs, but it may not alter the general structure of occupational opportunities.

As a policy, reciprocal obligation has several advantages. Its supporters argue that work requirements discourage welfare abuse and provide training and work experience that will end dependency. However, this policy can succeed only if the jobs that welfare recipients move into lead to self-sufficiency. We explore this issue by examining the experiences of those who voluntarily mix work and welfare. Since voluntary 'mixers' hold the same class of jobs that workfare programs are likely to offer, their experiences tell us something about the nature of these occupations. We try to identify labor market states into which welfare recipients who mix welfare with work are likely to move. We find that those who mix welfare and work are more likely to keep mixing than to work (without welfare), or receive AFDC (without work). Thus, our results are consistent with studies that highlight the structure of occupational opportunities available to the poor.

## DATA AND METHODOLOGY

Data for this study are derived from the Panel Survey of Income Dynamics (PSID), which contains human capital, income, and demographic information on over 7000 families. Over-sampling of low-income families makes this longitudinal data particularly useful for tracking the experiences of welfare recipients.

In any given year, an individual from our sample can generate income in one of the following categories or 'states': 1) mixing welfare and work, 2) working only, 3) receiving only AFDC income, or 4) receiving neither AFDC nor wage income. Data in Table 1 report the percentage distribution among these states (by category and year)

### TABLE 1

### Percent Distribution of AFDC Recipients
### By Activity, 1980-1987

| Year | Work | Mix AFDC & Work | AFDC | No AFDC/Work |
|------|------|-----------------|------|--------------|
| 1980 | .25 | .25 | .41 | .09 |
| 1981 | .22 | .25 | .44 | .09 |
| 1982 | .29 | .16 | .42 | .14 |
| 1983 | .28 | .17 | .42 | .13 |
| 1984 | .30 | .20 | .38 | .12 |
| 1985 | .34 | .19 | .32 | .14 |
| 1986 | .37 | .19 | .30 | .14 |
| 1987 | .35 | .21 | .26 | .18 |

N = 242

Source: PSID, 1981-1988
Rows may not sum to 1 due to rounding error.

for this subsample of welfare participants.[3] Changes in the distributions closely follow business cycle trends and policy changes over the period. For example, the percentage working decreases and the percentage receiving only AFDC increases as the recession deepens from 1980 to 1981. The economic expansion that began in 1984 is associated with an increase in the percent working and a decrease in the percent receiving only AFDC. Since the study period overlaps the enforcement of the Omnibus Budget Reconciliation Act of 1981 (OBRA), we must be mindful of the effect of this policy on the work behavior of welfare recipients. Among other things, OBRA changed the nature of mixing as a strategy. Prior to 1982 welfare recipients could increase their total income by working while receiving AFDC. After 1982, all benefits were subject to an implicit 100 percent tax.[4] While AFDC participants could still use mixing as a strategy if they received aid during unemployment spells, they could no longer supplement income by working while receiving welfare. Therefore, this implicit tax on earned income altered mixing as a strategy, discouraging mixing and encouraging movement to one of the other categories. The data from Table 1 suggest that a respondent who abandons a strategy of mixing is more likely to enter a state other than continued welfare use. A recurring finding in our analysis is that individuals who no longer mix are more likely to work than to receive welfare.

## MULTINOMIAL LOGIT MODEL

Much of the recent research on welfare use, including the paper by O'Neill et al., utilizes hazard functions to examine the duration of welfare spells.[5] While this technique is appropriate in addressing the issue of welfare dependence and the length of a spell, it is not well suited for exploring the factors that are related to movement between income-generating categories. The multinomial logit approach and longitu-

dinal data used in this study are better suited for addressing the issues raised here in light of Harrison's concern that welfare spells may be numerous and part of a long-term strategy. That is, logit analysis provides information distinct from the hazard model. The hazard model provides insight into the factors that affect the length of a welfare spell. Logit analysis and longitudinal data allow us to explore the influence of past mixing activity on the probability of moving from mixing welfare and work to one of the other income-generating categories, such as working only.

To estimate the probabilities of moving from mixing to the other possible states the PSID data was pooled over the 1980-87 period. The general form of the multinomial logit model used to predict the activity of AFDC recipients is:

$$(1) \ln e \ (P_i/P_0) = B_1 + B_2 Age + B_3 Kidle2 + B_4 Black + B_5 Never\text{-}Married + B_6 YrsMixing + B_7 (YrsMixing)^2 + B_8 HighSch + B_9 SMSA + B_{10} Unemp + B_{11} Year$$

where $P_0$ refers to the probability that a woman mixed welfare and work (received wage and AFDC income in the same year). $P_i$ refers to the probability of working only, receiving only AFDC income or neither working nor receiving AFDC income. The alternatives are mutually exclusive and the probabilities are constrained to sum to one. *YrsMixing* is equal to the number of years that the respondent combined wage and AFDC income.[6] Years mixing range from 0 to 8 years.[7] Year is a dummy variable for each year from 1981 to 1987. The constant ($B_1$) represents 1980. Table 2 lists definitions for each variable used in the model.

Equation 1 was estimated using a sub-sample of the PSID respondents who received at least one dollar of AFDC income between 1980 and 1987, and who participated in the PSID every year over the period.[8] Age, the presence of young children, unemployment rate in the state of residence, living in an SMSA, and being an African-American, never-married, or a high school graduate are traditional factors thought to influence women's labor market participation. However, this specification allows us to examine the effect of mixing on the probability of being in a given category, holding constant factors that affect participation. While the unemployment rate controls for the effect of recession, the year dummy variables measure the effects of factors that change over time, such as national policy or the work-leisure preferences of individuals.

The primary focus of our model is on the variable for years mixing. As mentioned earlier, O'Neill et. al [1987] find that recipients who work while receiving AFDC have shorter spells on welfare. This evidence is based on the observation of one welfare spell. Looking beyond one spell, Bane and Ellwood [1983] and Harrison [1978] find high rates of continued welfare use among those who mix welfare and work. The specification of Equation 1 and the longitudinal data allow us to examine transitional probabilities given the recipient's history of mixing. Rather than basing our findings on a single spell of welfare, we are able to examine how accumulated past mixing (whether of continuous or intermittent duration) affects the mixing-work transition. For example, if an increase in years mixing is associated with a higher probability of working relative to mixing, these results would reflect more favorably on the likelihood that reciprocal obligation will foster genuine self-sufficiency. However, if re-

## TABLE 2
### Definition Of Independent Variables

| | |
|---|---|
| Age | The ages of respondents range between 20 and 65. |
| Kidle2 | Kidle2 is equal to one if the female head of household had a child age 2 or less living with her, and equals zero otherwise. |
| Black | Black is equal to one if the respondent is African-American, and equals zero otherwise. |
| Never-Married | Never-Married is equal to one if the respondent has never been married, and is equal to zero otherwise. |
| YrsMixing | YrsMixing is the number of years that the respondent combined wage and AFDC income. Years mixing range from 0 to 8 years. |
| YrsMixing$^2$ | The square of YrsMixing is included to test for a non-linear relationship. |
| HighSch | HighSch is equal to one if the respondent graduated from high school, and is equal to zero otherwise. |
| SMSA | SMSA is equal to one if the respondent lives within a standard metropolitan statistical area, and is equal to zero otherwise. |
| Unemp | Unemp is the yearly unemployment rate in the state of residence. |
| Year | Year is a dummy variable for each of the years from 1981-87. The constant ($B_1$) represents 1980. |

sults indicate that a history of mixing is associated with a higher probability of more mixing, relative to working, this would raise concern regarding the efficacy of reciprocal obligation and time-limited welfare benefits.

## RESULTS

The means of all independent variables, except the dummy variables for year and the square of years mixing are reported in Table 3. These means are for individuals in each of the categories (working only, mixing welfare and work, receiving AFDC income only, and neither working nor receiving AFDC). Results reported in Table 3 suggest that those who worked were least likely to have young children and to be black. These individuals are also the most likely to be high school graduates and the least likely to reside within an SMSA. They live in states with relatively low unemployment. Individuals who mixed welfare and work are the youngest and are also likely to be high school graduates, have a young child, and to reside within an SMSA. The means for years mixing across the categories indicates movement between mixing and the other labor market and welfare states over the period. Those receiving

## TABLE 3
### Means Of Independent Variables
### By Category

| Variable | Work | Mixing | AFDC | No Work or AFDC |
|---|---|---|---|---|
| Age | 36.62 | 35.62 | 35.74 | 42.79 |
| | (9.80) | (10.32) | (10.28) | (11.20) |
| Kidle2 | .17 | .25 | .25 | .18 |
| | (.38) | (.43) | (.44) | (.38) |
| Black | .85 | .89 | .91 | .88 |
| | (.35) | (.31) | (.29) | (.33) |
| Never-Married | .40 | .48 | .51 | .29 |
| | (.49) | (.50) | (.50) | (.46) |
| YrsMixing | 1.04 | 2.27 | .33 | .35 |
| | (1.20) | (1.51) | (.70) | (.83) |
| HighSch | .54 | .52 | .39 | .31 |
| | (.50) | (.50) | (.49) | (.46) |
| SMSA | .80 | .84 | .85 | .81 |
| | (.40) | (.36) | (.36) | (.39) |
| Unemp | .081 | .083 | .089 | .076 |
| | (.02) | (.02) | (.03) | (.03) |
| N | 579 | 389 | 716 | 252 |

Source: PSID, 1981-1988. Standard deviations appear in parentheses.

only AFDC are the most likely to be black, never-married and to have a young child. These individuals have a low likelihood of being high school graduates and reside in states with high unemployment. Individuals not working or receiving AFDC are the oldest, and the least likely to be never-married or to be high school graduates. These individuals also reside in states with the lowest unemployment rates.

Coefficients for the multinomial logit model (under $P_i/P_0$) and partial derivatives (under $P_i/X$) are reported in Table 4. A coefficient under the column $P_i/P_0$ can be interpreted as a change in the natural log of the odds ratio of working relative to mixing welfare and work, given a one unit change in the independent variable. The coefficients for years of mixing suggest that another year of mixing decreases the probability of working relative to mixing.[9] This probability decreases at a diminishing rate.[10]

Results from the year dummy variables suggest that the trend in the intercepts closely follows the enforcement of OBRA. The year dummy variables increase after 1981. This change may be explained by OBRA's tax changes. In addition to tightening eligibility requirements, OBRA increased the implicit tax rate on earned income to 100 percent. This increase lowers the break-even income level; hence, some respondents who mixed work and welfare prior to 1982 may have benefited by leaving the program through work. These results suggest that OBRA's implicit tax on earned income was effective in promoting work and self-sufficiency relative to continued

## TABLE 4
### Multinomial Logit Results: Logit Coefficients
### (Under $P_i/P_0$), Partial Derivatives of Probabilities
### (Under $\partial P_i/\partial X$)

| Variable | $P_1/P_0$ | $\partial P_1/\partial X$ | $P_2/P_0$ | $\partial P_2/\partial X$ | $P_3/P_0$ | $\partial P_3/\partial X$ |
|---|---|---|---|---|---|---|
| Constant | .529 | --- | -.482 | --- | -1.692 | --- |
| | (1.05) | | (-.87) | | (-2.54) | |
| Age | .011 | .0003 | .018 | .005 | .065 | .006 |
| | (1.33) | | (1.93) | | (6.00) | |
| Kidle2 | -.416 | -.108 | -.042 | .042 | -.204 | -.006 |
| | (-2.17) | | (-.21) | | (-.80) | |
| Black | .195 | -.031 | .645 | .149 | .627 | .039 |
| | (.75) | | (2.26) | | (1.91) | |
| Never-Married | -.190 | -.074 | .182 | .075 | -.137 | -.014 |
| | (-1.11) | | (.97) | | (-.58) | |
| YrsMixing | -2.160 | -.141 | -3.427 | -.648 | -3.719 | -.210 |
| | (-12.43) | | (-17.92) | | (-16.35) | |
| YrsMixing² | .214 | .012 | .352 | .067 | .405 | .024 |
| | (7.72) | | (10.21) | | (10.73) | |
| HighSch | .347 | .141 | -.338 | -.133 | -.455 | -.049 |
| | (2.15) | | (-1.95) | | (-2.14) | |
| SMSA | -.361 | -.082 | -.116 | .016 | -.404 | -.028 |
| | (-1.64) | | (-.48) | | (-1.45) | |
| Unemp | .708 | -1.236 | 12.009 | 3.285 | -7.270 | -1.217 |
| | (.20) | | (3.16) | | (-1.63) | |
| 1981 | .630[a] | .056 | .892[a] | .161 | .910[a] | .046 |
| 1982 | 2.025[a] | .292 | 1.974[a] | .272 | 2.769[a] | .162 |
| 1983 | 2.322[a] | .320 | 2.386[a] | .346 | 3.134[a] | .177 |
| 1984 | 2.488[a] | .326 | 2.721[a] | .419 | 2.893[a] | .134 |
| 1985 | 2.965[a] | .413 | 3.040[a] | .443 | 3.546[a] | .177 |
| 1986 | 3.329[a] | .470 | 3.375[a] | .488 | 3.848[a] | .186 |
| 1987 | 3.254[a] | .442 | 3.417[a] | .507 | 4.041[a] | .208 |

Log-Likelihood = -1952.0
Chi-squared = 1194.3
N = 1936

Source: PSID, 1981-1988. t-statistics appear in parentheses.
a. Dummy variable for year is significant at .05 level.

mixing. Other results indicate that the respondent's age, race, marital status, and the unemployment rate are not significantly related to this odds ratio. However, high school graduation, young children, and living within an SMSA impact the odds ratio in predictable ways.

The column of coefficients under $P_2/P_0$ refers to the natural log of the odds ratio of receiving AFDC only and mixing welfare and work. An increase in the years of mixing is associated with a lower odds ratio. Once again, the sign and significance level of the squared term suggests a U-shaped curve.[11] This finding suggests that those with a history of mixing welfare and work continue to mix as opposed to receiving

only AFDC.[12]  It is frequently argued that experience with welfare undermines motivation and fosters dependence [Murray, 1984; Mead, 1986].  The effect of another year of mixing on the odds of (only) working relative to (only) receiving AFDC can be obtained by taking the difference between coefficients from the two odds ratios ($P_1/P_0$ and $P_2/P_0$).  For example, the effect of another year of mixing on the odds ratio of working relative to receiving AFDC is .912.[13]  This result suggests that, while a history of mixing decreases the odds of being in the other categories relative to mixing, another year of mixing increases the probability of (only) working relative to (only) receiving AFDC.  This suggests that mixing welfare and work does not undermine motivation.

The trend in the year dummy variables indicates a significantly higher odds ratio for all years relative to the level in 1980.  Once again, the change in the magnitude of the differential intercept terms closely follows the enforcement of OBRA in 1982.  Moffit [1984] has shown that the high tax on earned income decreases the labor supply of those who remain on AFDC.  The trend in the intercept terms is consistent with Moffit's findings.  Other results from this odds ratio indicate that age, completing high school, unemployment rates, and being African-American are all related to this odds ratio at conventional levels of significance.

The column of coefficients under $P_3/P_0$ refers to the natural log of the odds ratio of neither working nor receiving AFDC relative to mixing welfare and work.  While these results are necessary to the estimation, they are more difficult to interpret since these respondents must find arrangements for financial support other than working or receiving welfare.  Again, an increase in years mixing reduces this odds ratio and the relation is U-shaped, suggesting that a history of mixing increases the likelihood of mixing in the future relative to securing other means of financial support.[14]  The pattern in year dummy variables is the same as in the other equations, indicating an increase in the odds ratio after 1981.  The higher marginal tax rate on earned income may make mixing welfare and work less appealing relative to other arrangements of financial support.

The critical Chi-squared value for the likelihood ratio test is 79.49.[15]  Since the computed value (1,194.3) is greater than the critical value we can reject the hypothesis that the logit coefficients are equal to zero.  The high number of observations (1,936) is due to pooling the data over the period.

Logit results measure the effect of a change in an independent variable on the respective relative odds ratio.  However, Greene [1990] cautions that, in a multinomial logit model, it is important to examine the partial derivative of each of the probabilities because changes in the log-odds ratios and changes in the probabilities need not have the same sign.[16]  The partial derivatives of the probabilities (when the independent variables are equal to the sample means) are reported in Table 4 under the columns $\partial P_i/\partial X$.[17]  These derivatives indicate the change in the probability (of working, for example) given a change in the independent variable.  Partial derivatives of the probability of working are reported under the column $\partial P_1/\partial X$.  Many of the partial derivatives have the same sign as the logit coefficients.  However, the partial derivatives indicate that African-Americans have a lower probability of working.  Significantly, another year of mixing decreases the probability of working by .13.[18]  This

result is consistent with the multinomial logit results that also imply a diminishing probability of working (only) with increases in years mixing.  Small changes in the unemployment rate have a large effect on the probability of working.  The partial derivatives for the year dummy variables follow the same trends as the logit coefficients.

The partial derivatives of the probability of receiving only AFDC (reported under $\partial P_2/\partial X$) for Age, Black, Never-Married, YrsMixing, HighSch, and Unemp have the same signs as the logit coefficients.  The presence of young children increases the probability of receiving AFDC.  One more year of mixing decreases the probability of receiving only AFDC by .586.  Small changes in the unemployment rate have a large effect on this probability.  The partial derivatives for the year dummy variables follow the same trend as the logit year dummies.  The partial derivatives of the probability of receiving neither AFDC nor wage income are reported under $\partial P_3/\partial X$.  All the partial derivatives have the same sign as the logit coefficients.  Another year of mixing decreases the probability of receiving neither AFDC nor wage income by .188.

The overall probabilities (obtained from the logit results) are reported in Table 5.[19]  These probabilities are calculated with all the independent variables equal to the sample means and again when years mixing equals 1 + the mean of years mixing.  Hence, these data tell us how another year of mixing affects the odds of being in each category.  As years mixing increases by one over the mean, the probability of mixing increases (from 9 to 51 percent) and the probability of being in all other categories decreases.  The greatest decrease is in the probability of receiving only AFDC.  Another year of mixing has little effect on the probability of working.

## CONCLUSIONS AND POLICY IMPLICATIONS

Taken together, the results reported in Tables 4 and 5 imply that another year of mixing is most likely to result in more mixing and reduces the relative probabilities of being in a category other than mixing.  Partial derivatives of the probabilities indicate that another year of mixing reduces the probability of working, of receiving AFDC, and of receiving neither AFDC nor wage income.  Finally, the overall probabilities illustrate that another year of mixing increases the probability of mixing and decreases the probabilities of the other categories.

A possible explanation of the relation between past mixing and increases in the likelihood of more mixing is that welfare use results in welfare dependence [Mead, 1986; Murray, 1984].  The use of AFDC may change the tastes of recipients in such a way that individuals come to prefer AFDC income to wage income.  In a utility framework, exposure to AFDC may change the locus of the labor-leisure trade-off, or it could involve changes in the shape of the utility curves in favor of more leisure.  However, the logit results suggest that while mixing welfare and work may result in more welfare use instead of working only, there is little evidence to suggest that welfare recipients who continue to work develop a taste for more leisure.  On the contrary, our results suggest that more mixing reduces the probability of receiving only AFDC since the relative odds of working to receiving only AFDC is an increasing function of years mixing.  Also, the results reported in Table 5 indicate that one more year of

## TABLE 5
### Overall Probabilities Derived From
### Multinomial Logit Results

| I. Probabilities | Evaluated at independent variables equal to sample means (Years Mixing = .93). |
|---|---|
| | $P_0 = .09$ |
| | $P_1 = .40$ |
| | $P_2 = .40$ |
| | $P_3 = .11$ |
| II. Probabilities | Evaluated at independent variables equal to sample means (except Years Mixing = .93 + 1). |
| | $P_0 = .51$ |
| | $P_1 = .35$ |
| | $P_2 = .12$ |
| | $P_3 = .03$ |

$P_0$ is the probability of mixing welfare and work.
$P_1$ is the probability of only working.
$P_2$ is the probability of receiving only AFDC.
$P_3$ is the probability of not receiving AFDC or wage income.

See note 19 for a description of the process employed to obtain overall probabilities.

mixing has a large negative effect on the probability of receiving only AFDC. One more year of mixing does not have such a large impact on the probability of working. The point here is that, at least for mixers, there is no evidence to support the view that experience with welfare makes individuals less likely to pursue work.

Our findings indicate that those who mix are willing to work, and that they use welfare to supplement earnings from the jobs they are able to obtain. Further, these results tend to reinforce concern that reliance on the policy of reciprocal obligation may compel welfare recipients to fill jobs that will not provide for self-sufficiency. These concerns are heightened by the increase in supply of low-wage labor that will accompany policies of reciprocal obligation and time-limited welfare benefits. It is important that future research focus on the work and welfare experiences of those who participate in the recently mandated programs of reciprocal obligation.[20] Development of specialized data sets that effectively track the histories of participants would further this end.

## NOTES

1. Time limits on federally-funded assistance may be reduced at the option of individual states. States are also permitted to exempt up to 20% of the caseload from this time limit.
2. Welfare employment programs have varied from unpaid (public sector) work to job search activity in exchange for AFDC benefits. See Nightingale and Burbridge [1987] for a full discussion of these policies.
3. The present study requires us to define mixing based on yearly activity. A person is defined as a "mixer" if they received AFDC and wage income in the same year. Our data do not allow us to determine the percentage of the year worked relative to the percent on welfare, nor are we able to determine if they received AFDC and wage income simultaneously. However, we are able to determine the mean relative AFDC-wage income (from 55 to 100 percent) over the period.
4. Before 1982, AFDC benefits decreased by $.67 as income increased by one dollar. Hence, there was an implicit tax on earned income. Before OBRA the first $30 and one third of earned income was exempt from the "tax." OBRA limited the exemption to four months (for the one-third disregard) and eight months (for the first $30). After these periods the implicit tax is 100 percent, meaning that another dollar of earned income reduces welfare benefits by one dollar. See Nightingale and Burbridge for a discussion of changes under OBRA.
5. See Blank [1986] and Feaster et. al [1987] for other examples of the use of the hazard model in the estimation of welfare duration.
6. Years mixing welfare and work is derived by summing the years of mixing as an individual engages in another year of this activity between 1980 and 1987. There are eight records (data years) for each individual. If a respondent mixed in 1980, years mixing for the 1980 record year equal one. If the respondent did not mix in 1981, years mixing for the 1981 record year still equal one. Then, if the respondent mixed in 1982, accumulated years mixing equals two for the record year for 1982. Therefore, the coefficients (B6 and B7) measure the effect of mixing on the odds ratios as individuals accumulate another year of mixing. This method of using longitudinal features of the PSID to measure an individual's accumulated history of mixing welfare and work follows the same procedure used by England et al. [1988] to measure an individual's accumulated work experience from a longitudinal sample.
7. Since we do not use the PSID prior to 1980, we do not include information on mixing prior to 1980. Consequently, if those who mix work and welfare tend to have long histories of mixing (more than 8 years), our analysis will overstate the effect of another year of mixing on the odds ratios. This problem is unavoidable since, even if we went back to the inception of the PSID (1968) we would not be able to measure the welfare and work activities of individuals whose activity precedes 1968.
8. In the present study we define a welfare recipient as an individual who received AFDC income and do not include those who only received some other form of public assistance, such as food stamps.
9. This finding did not change when estimates of the model included as additional independent variables the respondent's wage rate and dummy variables for the state of residence to control for differences in welfare policies between states. Odds ratios were also estimated using a sample of PSID respondents who did and did not participate in AFDC over the period. Results of this estimation are similar to those reported and are available from the authors upon request.
10. The minimum of the relationship occurs at years mixing equal to 10.0. In the sample, years mixing ranges from 1 to 8 years.
11. The minimum of the relation occurs at years mixing equal to 9.7.
12. This result did not change when we estimated the odds ratio using different specifications that included the respondent's yearly AFDC income and dummy variables for the state of residence to control for differences in welfare policies between states.
13. This is calculated from the linear and square coefficients and the sample means for years mixing. The $t$-value for the coefficients is calculated in the same way. For example, the $t$-value is 5.49 = $(-12.43)-(-17.92)$.
14. The minimum of the relation occurs at years mixing equal to 9.2.
15. This is the critical value at a .05 level of significance.
16. Since there are only two categories in a binary logit, changes in the log-odds ratios and changes in the actual probabilities must have the same sign. Interpretation is more difficult in a multinomial logit because changes in the log-odds ratios and changes in the probabilities need not have the same sign. For example, a near-zero coefficient on a given variable means that the log-odds of being in one category relative, to a reference category, do not change as the variable changes. This could occur either because the variable has essentially no effect on the probability of being in either category, or because the variable increases (or decreases) the probability of being in each category by the same percentage. Therefore, it is useful to calculate the partial derivatives of each of the probabilities (of working, of receiving AFDC, of neither working nor receiving AFDC) with respect to each of the independent variables.

17. Partial derivatives are evaluated at the sample means using the following equation (see Hill [1983] and Greene [1990] for a more detailed discussion): $\partial P_i/\partial X = P_i(1-P_i)B_i - P_iP_iB_k - P_iP_lB_l - P_iP_mB_m$ where $i, k, l$ and $m$ equal mixing, work (only), AFDC (only), and neither AFDC nor work. $P$ equals the overall probabilities (see note 19 for derivation of $P$) and $Bi-m$ are the relevant coefficients from the odds ratios. The sample means are: Age = 36.90, Kidle2 = .22, Black = .88, Never-Married = .44, YrsMixing = .93, YrsMixing$^2$ = 2.57, HighSch = .45, SMSA = .83, Unemp = .084, Year Dummy (for each) = .125

18. Since the effect of mixing on $P_i$ is not linear the partial derivative ($\partial P_i/\partial YrsMixing$) = -.14 + .012 YrsMixing, or -.13 (when YrsMixing equals the sample mean).

19. The overall probabilities ($P$) are derived in the following way: $P_i = e^{\Sigma BiXi} / e^{\Sigma BiXi} + e^{\Sigma BkXk} + e^{\Sigma BlXl}$ Where $i, k$ and $l$ = work, AFDC, neither AFDC nor work and all independent variables are equal to their means.

20. In the Gueron [1990] study, follow-up data is too short to determine long-term self-sufficiency and recidivism is not discussed. While Schiller and Brasher [1993] track participants over a longer period, their data do not address recidivism, nor does it provide much information on what activities are pursued once an individual leaves AFDC.

## REFERENCES

Bane, M. and Ellwood, D. *The Dynamics of Welfare Dependence: The Routes to Self-Sufficiency*. Washington, D.C., Department of Health and Human Services, 1983.

Blank, R. *How Important is Welfare Dependence?* Cambridge, MA, NBER Working Paper no. 2026, 1986.

England, P., Farkas, G., Dou, T., and Kilbourne, B. Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects, *American Sociological Review*, 1988, 544-558.

Feaster, D., Gattschalk, P., Jakuben, G. Impact of 1981 AFDC Reforms on Months Worked and Welfare Duration, *Journal of Human Resources*, Fall, 1987, 542-550.

Greene, W. *Econometric Analysis*. New York, MacMillan, 1990.

Gueron, J. Work and Welfare: Lessons on Employment Programs, *Journal of Economic Perspectives*, Winter, 1990, 79-98.

Harrison, B. How American Households Mix Work and Welfare, *Challenge*, May-June, 1978.

Hill, A. Female Labor Force Participation in Developing and Developed Countries-Considerations of the Informal Sector. *Review of Economics and Statistics*, 1983, 459-68.

Mead, L. *Beyond Entitlement: The Social Obligations of Citizenship*. New York, Free Press, 1986.

Moffit, R. *Assesssing the Effect of the 1981 Federal AFDC Legislation on the Work Effort of Women Heading Households: Framework for Analyzing the Evidence and Data*. Madison, Institute for Research on Poverty Discussion, discussion paper #742A-84, 1984

Murray, C. *Losing Ground: American Social Policy 1950-1980*. New York, Basic Books, 1984.

Nightingale, D. and Burbridge, L. *The Status of Work-Welfare Programs in 1986: Implications for Welfare Reform*. Washington, D.C., Urban Institute, 1987.

O'Neill, J., Bassi, L., and Wolf, D. The Duration of Welfare Spells, *Review of Economics and Statistics*, May, 1987, 241-248.

Schiller, B. and Brasher, N. Effects of Workfare on AFDC Caseloads, *Contemporary Policy Issues*, Vol. 11, 1993, 39-48.