THE IMPACT OF CYCLICAL CHANGES IN UNEMPLOYMENT ON THE AID TO FAMILIES WITH DEPENDENT CHILDREN PROGRAM

James M. Suarez, Hunter College, CUNY*

Aid to Families with Dependent Children (AFDC) is one of the largest and most severely criticized public assistance programs in the United States. During 1974, $7.9 billion in cash was spent on AFDC and there were 3.3 million families with 11 million people getting aid in December of that year. Taxpayers, administrators, recipients, and observers have expressed dissatisfaction with the program, often quite strongly. Controversy over the welfare system usually centers on the work incentives of aid recipients. An almost totally neglected issue is the impact of changes in the aggregate employment situation on welfare rolls. After an introductory statement of the program's procedures and a short summary of previous research, the paper will analyze the link between cyclical fluctuations in unemployment and the number of people on welfare. Empirical regression results will be presented and independent evidence supporting the conclusions will be discussed.

When enacted in the 1930s, AFDC was viewed as a relatively minor program aimed at helping needy children in families where the fathers were deceased. At first, only children received assistance. Then in 1950 the adult in the family responsible for the children, typically the mother, was given aid. In 1961, states were permitted the option of extending benefits to needy families where the father is unemployed or employed less than 100 hours per month. About half the states have elected the unemployed father part of the AFDC program, but only 101,000 families with 461,000 recipients, less than 5 percent of the total welfare caseload, were covered by this section in February, 1974. Thus, AFDC is essentially a public assistance program for mothers with children and without a male breadwinner.

Average monthly AFDC money payments per family ranged from $50 in Mississippi to $336 in New York in December, 1974. The actual variation in family living standards is not as wide as suggested by the disparity in cash payments from state to state. Perhaps most importantly, the inverse relationship between food stamp bonus values and AFDC payments reduces the interstate differentials among welfare recipients. Total family income provided by food stamp bonuses and AFDC varies much less than welfare benefits alone. In addition to food stamps, AFDC families may receive such assistance as medicaid, school lunch programs, public housing, and federal student aid. Despite these programs, the income of most welfare families falls far short of the poverty level, particularly in the low-paying states.

A mixture of federal, state and local agencies affects the operation of the AFDC program. Welfare assistance depends on satisfying both categorical and financial conditions. The federal government sets the family characteristics for eligibility. Benefits are available solely to families in which the father is deceased, incapacitated, unemployed or employed part-time (at the option of the state), or absent from the home for a long time.

Within the broad federal guidelines, state governments generally assume the responsibility for the income maintenance plan. The states administer the AFDC program, set the financial standard for aid, and determine the eligibility of potential recipients. Each state decides how much is required for shelter, food, clothing, other basic needs, and any special needs of the family. Localities calculate the specific payment for the eligible family by comparing the family's income less allowable deductions to its financial requirement.

The federal government makes grants under a complicated formula to the states to pay for its portion of the public assistance benefits for AFDC families. The federal share of welfare payments averages about 55 percent, with the participation in each state based on per capita income. Federal funds cover half of the administrative costs of the state and local governments.

Cross-section studies of the AFDC program on state data by Collins, Garfinkel and Orr, and Winegarden, have demonstrated that the level of unemployment contributes significantly to the variation in the number of welfare recipients across the states. In contrast, previous research based on time series data has failed to yield convincing proof of a connection between cyclical swings in unemployment and AFDC. Using graphs and simple correlation coefficients to analyze the years 1953 to 1965, Daniel P. Moynihan concluded that the historically close ties between AFDC cases and the unemployment rate seemed to have been severed in the early 1960s as the welfare rolls rose and the employment rate fell. A few years later, Nancy H. Teeters implicitly contested the Moynihan thesis for she discovered from her regression analysis that over the period 1950 to 1970 "the rate of growth in the AFDC welfare rolls is highly responsive to the rate of change in the number of unemployed people" (page 628). Since the Teeters study relied heavily on a quadratic time trend variable, her finding must be regarded as tentative. The purpose of this paper is to examine the cyclical behavior of unemployment and AFDC in greater de-

tail.

I. The Model and Data

Unemployment can affect the AFDC rolls by influencing the income, the work position, and the family situation of potential recipients in many ways. As joblessness rises, family heads may be thrown completely out of work or be reduced to part-time positions. If, as a result of complete or partial unemployment, family income falls below the state financial requirement level, the family could qualify for welfare. Unemployment of a father often leads to family strife and in some instances abandonment. If the father leaves the household and the family has a low-enough income, the family would become eligible for public assistance. An unemployed father may decide not to marry the mother so that the family will be eligible for AFDC benefits. A weak labor market discourages mothers who are able and willing to work from seeking jobs. Conversely, as employment and income climb, fewer families would tend to be in a position to receive benefits. Prosperity usually promotes family formation and stability.

The general form of the model is very straightforward: a fluctuation in unemployment will lead to a change in the welfare rolls in the same direction. This is a single equation, single independent variable approach to determine whether changes in joblessness have a direct effect on the number of persons receiving AFDC benefits. A change in unemployment is likely to affect welfare rolls over a number of months so the model assumes a distributed lag reaction pattern. Without regard to the response time between movements in joblessness and AFDC, the hypothesis is:

$$CADFC = f(CU, e)$$

where CAFDC is the change in the number of AFDC recipients, CU is the change in the number of unemployed persons, and e is a random disturbance term. Although all the distributed lag coefficients should theoretically have positive signs, the hypothesis imposes no a priori constraints on the magnitude of the coefficients or the length of the lag.

The relationship between AFDC and unemployment was examined by regressing changes in the number of persons receiving welfare benefits as a distributed lag of changes in unemployment on aggregate monthly time series data for the years 1951 to 1974. The Social Security Bulletin supplied statistics on public assistance. Labor market data came from Employment and Earnings.

The change in the logarithm of the number of persons receiving AFDC benefits was the dependent variable while the change in the logarithm of the number of jobless persons was the inde-

pendent variable. Transformation of the original data into changes in logarithms helps reduce autocorrelation in the estimated equation and approximates for small changes making the percentage growth in the number of welfare recipients a function of the percentage increase in unemployment. Furthermore, this data adjustment makes the results comparable to the earlier Teeters study on the unemployment-welfare relationship.

The data were not seasonally adjusted before estimating the regression. Recent econometric research has indicated that smoothing the variables prior to estimating the coefficients can significantly influence the apparent explanatory power of the equation and introduce serial correlation in the residuals. Serial correlation in the presence of distributed lags will generally bias the estimated coefficients if the explanatory variables are treated incorrectly as uncorrelated with the residuals when in fact they are correlated. Serial correlation also leads to inefficient estimates.

II. Regression Analysis

Changes in the logarithm of AFDC recipients were regressed on changes in the logarithm of the number of unemployed persons for the entire period. Inspection of the results suggested that the relationship had altered during the years. The Chow test, an analysis of variance test, was conducted to question the null hypothesis that the regression coefficients were statistically the same for the various subperiods. If the calculated F values were less than the critical F values at the 1 percent level of confidence, the null hypothesis would have been accepted. The Chow test indicated the equation was not structurally stable over the three subperiods 1951-1965, 1966-1971, and 1972-1974. The calculated F values well exceeded the critical F values at the 1 percent confidence level. Therefore, the null hypothesis of an unchanging structure of AFDC response to unemployment fluctuations was rejected.

Since significant shifts in the sensitivity of AFDC rolls to labor market conditions had occurred, separate equations were estimated for each subperiod. The Bjorck-Golub procedure was used to adjust the ordinary least squares method for autocorrelation. Lags were estimated by the Almon technique with a second-degree polynomial. In the regressions, CLAFDC is the monthly change in the logarithm of AFDC recipients, CLU is the monthly change in the logarithm of the number of unemployed persons, $\sum$ CLU is the sum of the Almon distributed lag weights, MSF is the monthly seasonal factor, df is the degree of freedom, R^2 is the coefficient of determination, DW is the Durbin-Watson statistic, SEE is the standard

error of estimate, and the t-statistics of the coefficients are in parentheses.

Table. The Impact of Cyclical Changes in Unemployment on the Aid to Families with Dependent Children Program.

Period: 1951-1965

$$CIAFDC = 0.010 + \sum_{i=2}^{10} 0.108\ CLU_{t-1} + MSF$$
$$\quad\quad\quad (10.62) \quad\quad (7.35)$$

Almon Distributed Lag Weights: CLU

t-2	t-3	t-4	t-5	t-6	t-7
.006	.011	.015	.017	.018	.017
(4.85)	(5.13)	(5.52)	(6.09)	(6.87)	(7.58)

t-8	t-9	t-10
.015	.011	.006
(6.32)	(3.24)	(1.10)

df = 154
R^2 = .660
DW = 1.71
SEE = 0.003

Monthly Seasonal Factors:
Feb. -0.002 (-1.72)
Mar. -0.003 (-2.70)
Apr. -0.007 (-5.58)
May   -0.010 (-6.71)
June -0.013 (-9.90)
July -0.016 (-11.9)
Aug. -0.012 (-8.55)
Sep. -0.010 (-7.15)
Oct. -0.008 (-5.95)
Nov. -0.005 (-3.51)
Dec. +0.001 (+0.85)

Period: 1966-1971

$$CIAFDC = 0.016 + \sum_{i=0}^{8} 0.265\ CLU_{t-i} + MSF$$
$$\quad\quad\quad (3.35) \quad\quad (7.36)$$

Almon Distributed Lag Weights: CLU

t	t-1	t-2	t-3	t-4	t-5
.035	.039	.041	.041	.038	.033
(2.90)	(5.10)	(5.85)	(5.37)	(5.08)	(4.92)

t-6	t-7
.024	.014
(3.47)	(1.20)

df = 58
R^2 = .728
DW = 1.84
SEE = 0.005

Monthly Seasonal Factors
Feb. -0.000 (-0.05)
Mar. -0.003 (-0.37)
Apr. -0.010 (-1.37)
May   -0.012 (-1.82)
June -0.023 (-5.77)
July -0.019 (-3.94)
Aug. -0.004 (-0.91)
Sep. -0.002 (-0.21)
Oct. -0.002 (-0.27)
Nov. -0.001 (-0.16)
Dec. +0.008 (+1.64)

Period: 1972-1974

$$CIAFDC = 0.009 + \sum_{i=2}^{9} 0.180\ CLU_{t-1} + MSF$$
$$\quad\quad\quad (3.44) \quad\quad (2.95)$$

Almon Distributed Lag Weights: CLU

t-2	t-3	t-4	t-5	t-6	t-7
.011	.019	.025	.029	.031	.030
(1.84)	(1.99)	(2.20)	(2.50)	(2.87)	(2.90)

t-8	t-9
.027	.022
(2.02)	(1.05)

df = 22
R^2 = .700
DW = 1.85
SEE = 0.003

Monthly Seasonal Factors
Feb. -0.003 (-0.95)
Mar. -0.004 (-0.89)
Apr. -0.010 (-2.21)
May   -0.014 (-2.90)
June -0.012 (-4.06)
July -0.011 (-3.39)
Aug. -0.008 (-2.11)
Sep. -0.010 (-2.73)
Oct. -0.008 (-2.01)
Nov. -0.007 (-2.16)
Dec. -0.002 (-0.53)

The coefficients of determination, the R^2 - statistics, are not exceptionally high, but, considering that the data are in the form of monthly changes, the equations fit fairly well. The sums of the lagged unemployment coefficients are highly significant. Each distributed lag weight is greater than zero and almost every individual distributed lag weight is very significant. The response patterns are reasonable. A sum of the lags less than one makes sense for it is improbable that a given change in joblessness will cause an even greater change in welfare recipients. In brief, the overall relationship holds satisfactorily and each equation is significant.

Although the size of the welfare roll varies with swings in unemployment in each subperiod, AFDC has become more responsive to aggregate joblessness since 1965. In the earliest years, a 10 percent rise in unemployment would lead to a 1.1 percent increase in AFDC. More recently, a 10 percent gain in unemployment would cause a 2.6 percent growth in welfare rolls in 1966-71 and a 1.8 percent rise in 1972-74 (see Chart). The difference between the two summed lag coefficients in 1951-65 and 1966-71 is significant at the 99 percent confidence level. The relatively few degrees of freedom for 1972-74 limit the usefulness of testing for significant differences in regression coefficients for this period.

Not only is the magnitude of the summed distributed lag of unemployment greater in recent years, but also the changes in unemployment make their impact felt somewhat more quickly. Including the current month, the effect is spread over eleven months in 1951-65, eight months in 1965-71, and ten months in 1972-72. Less than 15 percent of the total impact of unemployment occurs in the first four months in 1951-65 compared to 60 percent and 21 percent in four months in 1966-71 and 1972-74. In fact, a rise in joblessness has a greater influence in three months in 1966-71 and six months in 1972-74 than in eleven months in the earliest period.

While the present research and the prior Teeters work cover different time spans and use different techniques, the studies offer some fruitful comparisons. For the years 1960-70, Teeters found the sum of an eight-quarter Almon lag to be 0.287, surprisingly close to the seven-month lag of 0.265 for 1966-71 in this paper. It is important to note that compared to this analysis Teeters used seasonally adjusted quarterly data, employed a time trend variable, had a longer lag (eight-quarters), a higher R^2 – statistic (0.88), and a larger standard error of estimate (0.008). The greater standard error of estimate may reflect the questionable device of having a quadratic time trend in the equation.

Teeters's much longer lag and higher coefficient of determination may be due to her use of seasonally adjusted quarterly data. Christopher Sims demonstrates that prior seasonal adjustment and data aggregation over time can distort regression results. Zvi Griliches in his well-known survey of distributed lags says "that estimates based on annual data often imply longer lags than similar estimates based on quarterly data" (page 46). The same phenomenon seems to hold when moving from quarterly to monthly observations. Aggregation

over time will normally tend to heighten the apparent explanatory power of the model by raising the size of the computed R^2-statistic.

Methodological differences between the two studies should not obscure their fundamental agreement on the substantial evidence indicating that variations in unemployment have a significant positive impact on the size of AFDC rolls. Through rigorous statistical methods, the Chow test, this paper supports Teeters's intuitive belief that the relationship between joblessness and welfare markedly changed in 1966. The most recent shift in the response of welfare cases to unemployment came about the time Teeters published her research. The results for the latest period are not as strong as for the previous ones. Nevertheless, the major findings for 1972-74 are significant.

Discovery of the structural breaks in the welfare-unemployment relationship led to a search for the reasons for the shifts. One factor that was explored in some detail was the AFDC payment level. An index of welfare benefits to average earnings was included in the regressions in an attempt to measure the relative attractiveness of being on welfare. When the level of benefits rises to earnings, low-income individuals have a greater incentive to apply for welfare. The actual variable used in the regressions was average monthly earnings in manufacturing. The welfare benefits/average earnings variable did not prove significant in any of the equations. Interestingly, Winegarden has determined that the average monthly payments do not account for the variation in the number of welfare recipients among states. Welfare rolls may be less sensitive to benefit payments than widely believed.

A combination of less quantifiable forces could have caused the different behavior of AFDC and joblessness in the mid-1960s. A greater percentage of eligible persons may have become aware of their right to assistance and applied for benefits. Welfare may have become more socially acceptable. Welfare services and "welfare rights" have received considerable publicity. State eligibility standards seem to have been liberalized. Poor people could have migrated into states with more generous plans (South to North) or to a more liberal locality within a state (rural to urban areas). The family unit may have weakened and become unstable. As the single parent family became more widespread in all social class levels, social attitudes about the necessity of a family unit may have undergone change.

In his presentation to this body last year, Mitsuo Ono mentioned a number of factors that could contribute to the change in the relation-

ship since 1971. Administrative procedures for determining eligibility could have been tightened. Some welfare cases appear to have been moved to the adult assistance programs and subsequently to the Supplemental Security Income program. The population of female headed families eligible for welfare benefits has not grown. More widows are being helped by Social Security. The income cutoff line, the level of income above which families would not qualify for AFDC, has been lifted by the lowest paying states. Higher income cutoff levels improve AFDC's coverage of the poor population and extend the aid welfare cases can receive before being closed.

Another possible influence may be the absolute level of the demand for workers. The aggregate unemployment rate averaged 5.3 percent during 1954-65, 4.2 percent for 1966-71, and 5.4 percent in 1972-74. The employment and earnings prospects for welfare recipients may be much brighter when unemployment is around 4 percent than when it is above 5 percent. Welfare beneficiaries seem to wind up in low-paying jobs where they are the last hired and the first to be let go. Further research is needed to understand more clearly the forces that in the last ten years caused the shifts in the welfare-unemployment relationship.

III. Additional Evidence and Conclusions
The finding that the number of AFDC recipients depends significantly on overall labor market conditions can be supported by independent evidence on the shifting work force characteristics of the welfare population. Betty Burnside reported that 14 percent of the AFDC mothers were actually employed in 1971, a year when the unemployment rate averaged 5.9 percent. Perry Levinson found that 45 percent of the AFDC mothers in 1968 had "high employment potential," meaning they had either completed 12 years of schooling or had previous job experience as white-collar or skilled blue-collar workers. The 1968 percentage of AFDC women with high employment potential represented nearly a doubling from the 25 percent of 1961. The number of welfare recipients who are working or whose level of education or previous work experience makes them potentially very employable suggests that the number of AFDC cases should indeed be responsive to the aggregate demand for labor.

Recent legislative changes in the welfare program which made the earnings rule more generous and established the Work Incentive (WIN) Program have made AFDC more sensitive to fluctuations in business activity. Major amendments in 1967 required states to disregard

the first $30 of monthly earnings, one-third of the remaining earnings, work related expenses, and child care costs from consideration in determining assistance payments. Before the reform in the earnings rule, many states effectively taxed welfare beneficiaries's wages after deduction for work related expenses at a 100 percent rate because AFDC payments were reduced by a dollar for every dollar earned.

The WIN program reorganized and expanded the existing occupational training program. WIN was designed to train AFDC recipients, place them in jobs, induce private sector employers to hire WIN trainees, and provide child care, counselling and supportive services. The program's goal is to help welfare beneficiaries move from relief rolls to payrolls. In 1971 registration in the WIN program became mandatory (at the threat of losing welfare benefits) for all able-bodied AFDC recipients with no preschool children at home. These modifications in the welfare program, on the whole making employment more attractive and attainable, have probably strengthened the ties between AFDC and the job market.

In conclusion, this analysis shows that the AFDC program is quite sensitive and responds quickly to the aggregate employment situation. A rise in unemployment will, in a few months, have a significant impact on welfare rolls. Currently a 10 percent increase in joblessness will lead to a 1.8 percent rise in AFDC recipients. The structural shifts in the welfare-unemployment relationship suggest that social forces, administrative practices, legislative amendments, and demographic changes may also be important determinants of the size of welfare rolls.

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Chart. THE CUMULATIVE IMPACT OF A 10 PERCENT CHANGE IN UNEMPLOYMENT ON AFDC.