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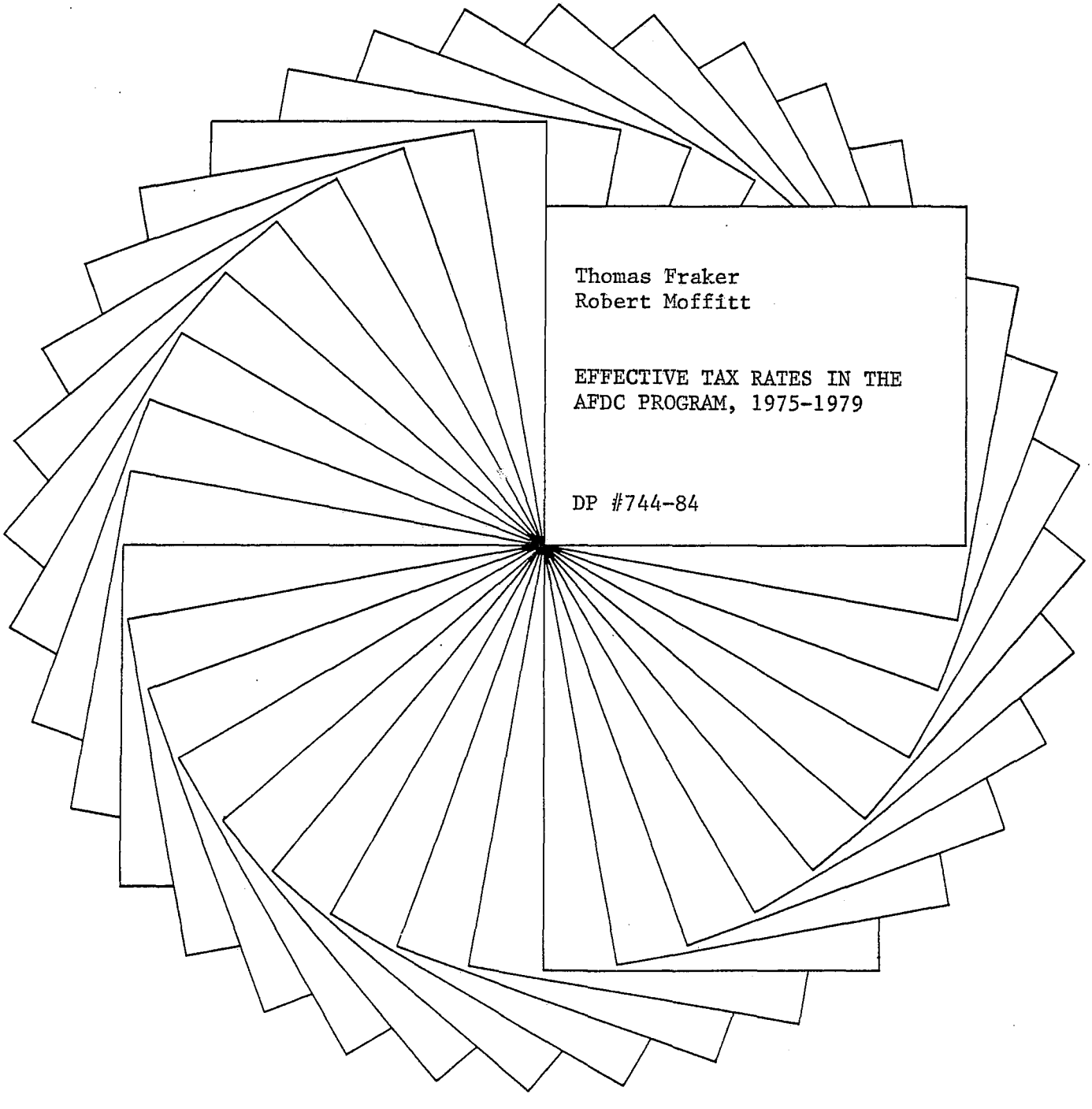

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ABSTRACT

Estimates of effective tax rates on earned and unearned income in the AFDC program from 1975 to 1979 are presented. Although effective tax rates are quite a bit lower than nominal rates (from 25 to 29 percent lower on earned income and from 76 to 80 percent lower on unearned income), there was very little change over the period. These results together with those of other studies suggest relative stability in effective AFDC tax rates over the 1970s.

Effective Tax Rates in the AFDC Program, 1975-1979

The estimation of "effective," or actual, as opposed to "nominal," or officially stated, tax rates (benefit-reduction rates) in the Aid to Families with Dependent Children program has generated a certain amount of literature. Lurie (1974) pointed out that because of deductions in the AFDC benefit formula and because states impose various restrictions on benefits, effective tax rates are usually lower than nominal rates. She provided estimates for the year 1971 showing that effective AFDC tax rates on earnings were about 29 percent, considerably lower than the nominal rate of 67 percent applicable at that time. Hutchens (1978) provided additional estimates showing the change in effective rates between 1967 and 1971, a period during which the nominal rate was reduced from 100 percent to 67 percent. He found that the effective rate changed from 65 to 37 percent over that period.[1]

In this paper we report the results of our estimates of effective AFDC tax rates in 1975 and 1979. We think they are of interest for several reasons:

1. It is of general interest to update prior estimates to see if the effective-nominal difference still applies.[2]

2. The period 1975-1979 is of particular interest because average real benefits fell during the 1970s, since states failed to increase dollar benefit levels to keep up with inflation. The decrease may have simply been a result of failing to raise guarantees; whether tax rates were increased is an open question.

3. The results should be useful for labor-supply studies of the AFDC program and for studies of state decision-making in the program.[3]

Our findings indicate that real guarantees fell from 1975 to 1979, but that there was only a slight increase in mean effective tax rates over the period. Effective tax rates are, however, still much lower than nominal rates.

EFFECTIVE TAX RATES AND GUARANTEES, 1975-1979

As previous studies have done, we used federal AFDC surveys to estimate our tax rates. The surveys were collections of AFDC budget data from a sample of cases in all the states, and were conducted every two years up to 1979. We utilize the 1975 and 1979 studies. Sample sizes are fairly large (about 35,000 and 23,000 on the two respective surveys), but still not large enough to estimate tax rates in all states. We confine ourselves to states in which there are at least 80 observations for both years. There are 33 such states in the data, accounting for over 90 percent of the U.S. caseload.[4]

The basic strategy is to regress the benefit received by a household on its income. The coefficient on income measures the effective tax rate and the intercept measures the effective guarantee. We break up income into earned and unearned components, and we also enter variables for family size to pick up variations in the guarantee. Our equation is:

$$B = \alpha_0 + \alpha_1 K_2 + \alpha_2 K_3 - tE - rN + \varepsilon,$$

Where B is the (monthly) benefit; K_2 equals one if there are at least two children in the family, and zero otherwise; K_3 equals the number of children in excess of two, equal to zero if there are only one or two children in the family; E is gross monthly earnings; N is monthly

unearned income; and ε is an error term. The guarantee for a family of four is hence $(\alpha_0 + \alpha_1 + 2\alpha_2)$.[5] The coefficient "t" measures the tax rate on earnings and the coefficient "r" measures the tax rate on unearned income. We do not use ordinary least squares to estimate the equation because a truncation problem exists: those cases with low values of the error term are not in the sample because they have zero benefits and hence are not recipients. (This issue has been discussed before; see Hutchens, 1978.) We use instead a truncated Tobit procedure that provides consistent estimates of the coefficients. The technique is described in the Appendix.[6]

Table 1 summarizes the results for 1975 and 1979. The first three columns show the effective guarantees for a family of four as derived from our benefit equation. The underlying coefficients are shown in the Appendix. These guarantees are on average about 6 percent higher than official "maximum amount paid" values, suggesting that there are non-earnings-related deductions of this magnitude. However, although nominal guarantees increased from 1975 to 1979, the table shows that most states did not increase them enough to keep up with inflation. The average real reduction in the guarantee level was 11 percent.

Effective tax rates on earned and unearned income are shown in the remaining columns. Mean effective tax rates on earned income were 25 percent in 1975 and 29 percent in 1979, while those on unearned income were 76 and 80 percent in the corresponding years. We thus find that there was a slight increase in tax rates over the period.[7]

We suspect that this increase could have resulted from the passive action of failing to increase caps on deductions sufficiently to keep up

Table 1

Effective AFDC Tax Rates and Guarantees in 1975 and 1979

	Effective Guarantee, Family of Four[a]			Effective Tax Rate on Earnings			Effective Tax Rate on Unearned Income		
	1975	1979	Real Growth Rate	1975	1979	Increase (+) or Decrease (-)	1975	1979	Increase (+) or Decrease (-)
Alabama	$149.4	178.8	-0.11	0.18	0.32	+	0.84	1.00	+
Arkansas	153.9	210.1	0.01	0.06	0.20	+	0.35	1.01	+
California	351.0	467.9	-0.01	0.23	0.26	+	0.89	0.85	-
Colorado	293.2	371.1	-0.06	0.39	0.40	+	0.83	na[b]	na[b]
Connecticut	390.1	491.8	-0.07	0.43	0.41	-	0.90	1.06	+
D.C.	339.4	364.3	-0.20	0.25	0.30	+	0.73	0.98	+
Florida	191.0	217.3	-0.16	0.25	0.21	-	0.95	0.68	-
Georgia	159.5	165.2	-0.23	0.14	0.13	-	0.54	0.93	+
Illinois	361.0	374.3	-0.23	0.32	0.55	+	0.97	0.86	-
Indiana	272.2	315.7	-0.16	0.19	0.17	-	0.64	0.43	-
Kansas	312.8	356.7	-0.16	0.38	0.47	+	0.95	0.98	+
Kentucky	263.2	244.9	-0.31	0.20	0.21	+	0.94	1.08	+
Louisiana	167.1	192.0	-0.15	0.25	0.28	+	0.77	0.94	+
Maine	271.3	294.5	-0.20	0.06	0.31	+	0.41	0.97	+
Maryland	251.8	388.9	0.14	0.21	0.18	-	0.83	1.00	+
Massachusetts	370.4	446.6	-0.11	0.27	0.28	+	0.45	0.75	+
Michigan	431.5	567.0	-0.03	0.36	0.36	0	0.89	0.94	+
Minnesota	399.9	474.1	-0.12	0.23	0.27	+	0.95	0.94	-
Mississippi	73.9	127.8	0.28	0.04	0.13	+	0.19	0.42	+

(table continues)

Table 1 (cont.)

	Effective Guarantee, Family of Four[a]			Effective Tax Rate on Earnings			Effective Tax Rate on Unearned Income		
	1975	1979	Real Growth Rate	1975	1979	Increase (+) or Decrease (-)	1975	1979	Increase (+) or Decrease (-)
Missouri	183.1	276.9	0.12	0.02	0.22	+	0.08	0.71	+
New Jersey	395.2	425.5	-0.20	0.28	0.28	0	1.01	0.97	-
New York	448.5	488.8	-0.19	0.33	0.30	-	0.93	0.83	-
N. Carolina	214.0	211.7	-0.27	0.28	0.25	-	0.99	0.65	-
Ohio	234.3	333.3	0.05	0.38	0.47	+	0.96	0.62	-
Oregon	362.4	479.4	-0.02	0.34	0.28	-	0.71	0.92	+
Pennsylvania	372.7	402.6	-0.20	0.25	0.29	+	0.99	0.98	-
S. Carolina	136.9	144.2	-0.22	0.17	0.13	-	0.53	0.37	-
Tennessee	145.5	167.6	-0.15	0.11	0.16	+	0.33	0.15	-
Texas	160.2	160.5	-0.26	0.28	0.31	+	0.97	0.86	-
Virginia	289.4	313.7	-0.20	0.39	0.38	-	0.91	0.59	-
Washington	367.1	483.9	-0.02	0.36	0.37	+	0.87	0.77	-
W. Virginia	236.7	245.5	-0.23	0.38	0.31	-	0.92	0.88	-
Wisconsin	403.0	494.4	-0.09	0.25	0.27	+	0.92	0.61	-
Unweighted Average	277.5	329.6	-0.11	0.25	0.29	+	0.76	0.80	+

[a] $B = \alpha_0 + \alpha_1 + 2\alpha_2$; see text for explanation of equation.

[b] Insufficient observations.

with inflation. In any case, the levels of the tax rates are clearly below their nominal values of 67 and 100 percent for earned and unearned income, respectively. This reflects income-related deductions and restrictions in the benefit formula that reduce marginal tax rates, such as maximum benefit ceilings and ratable reductions. It should also be noted that, since income and payroll taxes are fully or partly reimbursed in the AFDC benefit formula, the total tax rate on income is about 16 percent (the average tax rate in the United States) higher than our coefficients indicate. These higher rates are still considerably below nominal rates.[8]

Our tax rates are not very different from those found by Lurie in 1971 (29 percent). They are a bit smaller than those of Hutchens in 1971 (37 percent), but this may be a result of a difference in the definition of the tax rate.[9] Our conclusion is that effective tax rates showed relatively stability over the 1970s. In future research it will be interesting to compare these rates to those obtaining in the period after 1981, when federal legislation increased nominal AFDC tax rates to the original figure, roughly 100 percent.

NOTES

[1]Moffitt (1979) also estimated effective tax rates, but in only one state (Indiana).

[2]Robert Hutchens has also estimated tax rates for 1979 for 14 states, reported in an unpublished memorandum. He found no change in tax rates from 1971 to 1979.

[3]The 1975 estimates have already been used in published studies by Gramlich (1982) and Moffitt (1983) and in unpublished work by George Jakubson and Daniel Feaster. The 1979 rates will be used by the present authors in a forthcoming study of labor-supply effects of AFDC and food stamps. Several researchers in this field have also indicated interest in having such estimates available for use in other studies.

[4]There were a few additional states for which we could estimate our equations in one of the years but not the other. The results for those states are available upon request from the authors.

[5]We should note that, because there are significant nonlinearities in the benefit formula--see the studies by Lurie and Hutchens--our coefficients should be interpreted as average marginal tax rates. We doubt that, from a behavioral point of view, recipients perceive much more than average rates.

[6]OLS regressions were also estimated, and showed coefficients quite close to those we present. The reason is that the R^2's in the regressions were usually very high; as a consequence, the variance of the error term is small and does not cause very much bias. Nevertheless, we present the maximum likelihood estimates because they are consistent.

[7]The difference may not be significant. We have not tested it because it would involve pooling the data sets, a practical impossibility since the two years of data are in different computer installations.

[8]The 16 percent figure is the percentage of U.S. personal income that is paid in taxes of all types. Since the federal income tax is progressive, the figure should be smaller for a low-income sample. Note too that the figure increased from 14 to 16 percent from 1975 to 1979, implying that total tax rates increased a bit more than Table 1 indicates.

[9]Hutchens excluded from his calculations the zero marginal tax rates generated by maximum grant provisions.

APPENDIX

A modification in the standard Tobit procedure is required because the limit values (B = 0) are not in the sample. The required modification was outlined in a paper by Hausman and Wise (1977) and requires constructing the probabilities of observing a benefit value of B conditional upon its being positive. According to Bayes' Law, a conditional density equals an unconditional density divided by the probability of the conditioning event; hence the requisite conditional density here is the unconditional probability density of observing a value of B, divided by the probability that B is positive. The log likelihood function is the sum of these logged probabilities:

$$L = \sum_{\substack{\text{all} \\ \text{obs.}}} \log[g(z_1)/(1 - F(z_2))],$$

where g is the normal density, F is the normal distribution function,

$$z_1 = (B - \alpha_0 - \alpha_1 K_2 - \alpha_2 K_3 + tE + rN)/\sigma,$$

$$z_2 = (-\alpha_0 - \alpha_1 K_2 - \alpha_2 K_3 + tE + rN)/\sigma,$$

and σ is the standard error of ε, assumed to be distributed N $(0, \sigma^2)$.

Table A-1

Family Size Coefficients in 1975 and 1979

	1975			1979		
	α_0	α_1	α_2	α_0	α_1	α_2
Alabama	68.7	38.5	21.1	90.1	29.3	29.7
Arkansas	110.8	20.3	11.4	133.9	28.2	24.0
California	212.7	49.7	44.3	286.8	66.5	57.3
Colorado	164.1	42.7	43.2	214.1	48.6	54.2
Connecticut	229.7	58.6	50.9	295.3	64.1	66.2
D.C.	201.1	48.3	45.0	202.8	50.1	55.7
Florida	108.3	36.3	23.2	123.9	40.2	26.6
Georgia	87.6	36.1	17.9	105.1	21.1	19.5
Illinois	215.5	44.5	50.5	223.7	45.4	52.6
Indiana	140.8	50.2	43.1	160.3	59.6	47.9
Kansas	192.2	44.2	38.2	211.4	58.5	43.4
Kentucky	140.4	53.4	34.7	114.0	45.5	42.7
Louisiana	83.6	34.7	24.4	95.2	39.6	28.6
Maine	133.0	48.1	45.1	171.4	48.9	37.1
Maryland	147.9	41.5	31.2	198.7	64.4	62.9
Masssachuetts	226.0	48.4	48.0	277.3	54.5	57.4
Michigan	235.8	68.1	63.8	297.0	80.0	95.0
Minnesota	250.6	59.5	44.9	306.2	58.3	54.8
Mississippi	33.9	19.4	10.3	65.8	32.8	14.6
Missouri	92.2	29.3	30.8	179.8	34.1	31.5
New Jersey	224.2	77.8	46.6	246.1	80.0	49.7

(table continues)

Table A-1 (cont.)

	1975			1979		
	α_0	α_1	α_2	α_0	α_1	α_2
New York	266.1	63.6	59.4	290.1	66.5	66.1
N. Carolina	158.5	23.7	15.9	158.1	21.2	16.2
Ohio	146.0	27.7	30.3	189.8	47.1	48.2
Oregon	197.9	54.5	55.0	279.8	66.0	66.8
Pennsylvania	227.6	51.7	46.7	250.0	60.8	45.9
S. Carolina	75.1	20.8	20.5	77.9	22.7	21.8
Tennessee	101.7	15.4	14.2	96.7	22.9	24.0
Texas	87.4	32.4	20.2	86.2	32.7	20.8
Virginia	180.3	46.3	31.4	193.1	51.2	34.7
Washington	227.0	44.1	48.0	287.9	71.8	62.1
W. Virginia	136.1	63.8	18.4	155.8	46.9	21.4
Wisconsin	255.4	62.4	42.6	316.6	50.0	63.9

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