

The negative income tax: would it discourage work?

Advocates of the negative income tax often contend that such a program would provide stronger work incentives than conventional welfare benefits; evidence from recent tests indicates that this assumption may not be well-founded

ROBERT A. MOFFITT

Would government cash transfer payments to the poor, in the form of a negative income tax, discourage work effort among recipients? The strongest evidence for the existence of such a disincentive comes from four income maintenance experiments, each of which tested the effects of the negative income tax on samples of the Nation's low-income population. The findings from the experiments have been released in uneven spurts, as they have become available. This article summarizes the results of all four experiments, shows what we have learned from them, and discusses their limitations in providing correct estimates of work disincentive effects.¹

The experiments were conducted over a number of years in selected "test bore" sites across the country: New Jersey and Pennsylvania (1968-72); rural areas of North Carolina and Iowa (1970-72); Seattle and Denver (1970-78); and Gary, Indiana (1971-74). Three of the tests were limited to specific groups of people; only husband-wife couples were studied in New Jersey and Pennsylvania and in the rural experiment, and only blacks in the Gary test, although the Gary test included both couples and families headed by women. All races and family types were included in the Seattle-Denver study.

The sample sizes for the experiments were: 1,300 in New Jersey and Pennsylvania; 800 in the rural tests; 4,800 in Seattle-Denver; and 1,800 in Gary. The first ex-

periment was conducted in the New Jersey-Pennsylvania area because of its high density of urban poor, because it initially had no Aid to Families with Dependent Children Unemployed Parent Program for husband-wife couples, and because area government officials were very receptive. The rural experiment was designed to study a different group of the population, and thus focused on two States with different types of low-income populations and agricultural bases. Seattle and Denver were chosen to represent the West, and in the case of Denver, to study a Chicano subpopulation. Finally, Gary was selected because its population permitted concentration on black female family heads in the Aid to Families with Dependent Children Program, and because of receptive local officials.

However, the experiments were alike in the most important respect—each attempted to test the negative income tax using classical experimental methods. A sample of the low-income population was selected in each area, and families were assigned to either an "experimental" group or a "control" group. The experimental group received negative income tax benefits, the control group did not, and the effect of the experiment was measured as the difference in work effort between the two groups. The experiments also varied the generosity of benefits to the experimental groups in order to measure the effect of this factor on work effort.

Like all pure negative income tax schemes, the plans provided a positive benefit to families with no earnings at all, whether the head or any other family member

Robert A. Moffitt is assistant professor of economics at Rutgers College, New Brunswick, N.J.

was “voluntarily” or “involuntarily” unemployed; there was no work requirement in any of the experiments. However, to provide work incentives, benefits were not reduced by the full amount of any earnings that the family did receive. That is, the “tax rate” or “benefit-reduction rate” was less than 100 percent. The algebraic statement of the benefit formula is:

$$B = G - tY,$$

where B is the benefit paid to the family, G is the “guarantee level”—that is, the amount paid to a family with no other income—Y is the family’s income level, and t is the benefit-reduction rate.

As is apparent from the benefit formula, an extra dollar of income, Y, reduces the family’s benefit by t dollars, where t is some fraction between 0 and 1. Therefore, because an extra dollar of earnings lowers the benefit by only t dollars, total income does indeed increase—by $1-t$ dollars. The experiment varied levels of the guarantee (G) and reduction rate (t) given to different families in the experimental group. On average, however, a tax rate of .50 and a guarantee level about equal to the poverty line (\$6,191 per year in 1977 for a family of four) were offered. The guarantee level in all cases was higher for larger families.

The economists conducting the experiments expected that the results would show some negative effect on work effort; the important question was what the magnitude of the reduction would be. Moreover, they believed that the size of the work disincentive would vary

with the levels of the guarantee and the benefit-reduction rate: the higher each of them, the greater the work disincentive.² This expectation was held most firmly for married couples, to whom the existing welfare system provides benefits in only a few States. For female heads of families, who are already eligible for conventional welfare benefits, there was no prior expectation of a net change in work effort. In fact, the negative income tax was originally proposed in the 1960’s as a program to increase work incentives relative to the existing welfare system, which at that time had fairly high benefit-reduction rates that may have discouraged work.

Findings confirm expectations

Table 1 shows the difference in hours of work per week between the experimental and control groups, broken down for husbands, wives, and female heads of families in each of the test areas. Work effort is shown as hours of work per week, but most of the studies actually measured work hours over longer periods. For analytical purposes, hours have been standardized here to a weekly basis.

Data presented in the table are unequivocal evidence that hours of work are reduced by the negative income tax. The disincentive effects for husbands range from about 1 percent to 8 percent. For wives, they vary much more—from almost zero to 55 percent (although the latter figure may be a statistical anomaly). Disincentives of 12 to 28 percent were reported for female family heads in the only two experiments for which esti-

Table 1. Average differences in weekly hours between control and experimental groups in four test areas

Area and source of estimate	Husbands		Wives		Female heads of families	
	Absolute difference	Percentage difference	Absolute difference	Percentage difference	Absolute difference	Percentage difference
New Jersey-Pennsylvania						
U.S. Department of Health, Education and Welfare: ¹						
White	-1.9	5.6	-1.4	30.6	—	—
Black	0.7	2.3	0.1	2.2	—	—
Spanish-speaking	-0.2	0.7	-1.9	55.4	—	—
Hall: ²						
White	³ -2.4	7.1	³ -1.5	32.8	—	—
Rural (nonfarm)						
U.S. Department of Health, Education and Welfare and Bawden: ⁴						
North Carolina blacks	³ -2.9	8.0	³ -5.2	31.3	—	—
North Carolina whites	2.1	5.6	-2.2	21.5	—	—
Iowa whites	-0.5	1.2	-1.2	20.3	—	—
Seattle-Denver						
Keeley and others ⁵	³ -1.8	5.3	³ -2.1	14.6	³ -2.6	11.9
Gary						
Moffitt ⁶	-1.6	4.7	0.2	3.7	³ -2.0	27.8

¹ See *Summary Report: New Jersey Graduated Work Incentive Experiment* (U.S. Department of Health, Education and Welfare, 1973).

² See Robert Hall, “Effects of the Experimental Negative Income Tax on Labor Supply,” in Joseph A. Pechman and P. Michael Timpane, eds., *Work Incentives and Income Guarantees* (The Brookings Institution, 1975).

³ Significant at 10-percent level (15 percent for New Jersey Department of Health, Education and Welfare estimate).

⁴ See *Summary Report: Rural Income Maintenance Experiment* (U.S. Department of Health, Education and Welfare, 1976).

⁵ See Michael Keeley, Philip Robins, Robert Spiegelman, and Richard West, “The Labor Supply Effects and Costs of Alternative Negative Income Tax Programs,” *Journal of Human Resources*, Winter 1978, pp. 3-36.

⁶ See Robert A. Moffitt, “The Labor Supply Response in the Gary Income Maintenance Experiment,” *Journal of Human Resources*, Fall 1979, pp. 477-87.

NOTE: Hours differences are regression-adjusted for differences between experimental and control group members in years of education, age, and similar variables.

Dashes indicate data not available.

mates are available, Gary and Seattle-Denver. These represent the differences in hours worked between the experimental group, which received negative income tax payments, and a control group which received Aid to Families with Dependent Children; thus, the results indicate that the negative income tax programs tested also reduced work effort relative to the existing welfare system.

Although the experiments clearly found a work disincentive effect, the ranges of response are rather disconcerting. Moreover, the effects for different demographic groups follow no clear pattern. Interracial variations, for example, appear to be only a result of random statistical error. In fact, in the Seattle-Denver experiment, no statistically significant differences between the races were found. (The Seattle-Denver data in table 1 are averages across all racial groups.)

One interesting finding that has emerged from the experiments relates to the form which work reduction has taken for men. There are strong indications that reductions in total hours of work most often reflect reductions in likelihood of being employed at all, rather than marginal reductions in the hours of those who remain employed. That is, the reduction in total work hours shows up as a decline in the employment rate of the experimental sample relative to that of the control sample.

The policy implications of this finding are ambiguous. On the one hand, withdrawal from the labor force is a major change in work effort, one that society is not likely to accept. On the other hand, this also implies that the total reduction in work hours stems from a rather large response by a small number of men. Therefore, the negative income tax does not appear to have a pervasive effect on the work ethic of the low-income male population; in fact most of the men do not respond at all.

This phenomenon is undoubtedly related to the difficulty in reducing hours of work while remaining employed. Work hours in most jobs held by prime-age men are institutionally fixed and difficult to change. This is less true of the poor than of the population as a whole, low-wage workers being more likely to hold part-time or unstable jobs. But even these workers may be able to reduce work effort mostly by not working at all. However, one way in which workers may be able to adjust hours marginally is by reducing overtime work. There has not been a great deal of attention paid to this possibility, except in the New Jersey experiment, where it did indeed appear that part of the response resulted from a reduction in overtime.

A decrease in the employment rate of the low-income population can occur in several ways. It may take the form of lengthening of time between jobs, longer periods of unpaid vacation and holidays, or permanent withdrawal from employment. Results from some of the experiments indicate that the first of these responses—a

lengthening of time between jobs, often corresponding to an increase in the length of unemployment spells—was the most common. If used for more thorough job search, such unemployment spells may result in higher wages when employment is finally secured. For young workers, some data have also shown an increase in school attendance, which may contribute to the individual's human capital and also ultimately increase wages. Both of these uses of nonwork time are probably more acceptable than increases in pure leisure. However, although this investment should result in greater future earnings potential, no earnings increases were apparent in data from the experimental period.

The lengthening in unemployment spells took an interesting form in the Gary test, where heavy layoffs in the steel industry early in the experiment drove up local unemployment rates. The data showed that both the experimental and control groups increased their work effort over the period of the experiment as unemployment rates in the area dropped, but that the growth in the employment rate of the control group was greater than that in the experimental group. Consequently, this "relative employment reduction" was taken as evidence that the negative income tax resulted in a slower return to work among members of the experimental group, probably because they were using the payments as a form of unemployment insurance. Members of the control group, with much less generous conventional unemployment benefits available were probably forced by economic distress to return to work sooner.

As previously mentioned, the experiments also tested negative income tax plans with various benefit-reduction rates and guarantees. The results in table 1 should be thought of as the responses to plans with a benefit-reduction rate of about .50 and a guarantee level equal to the poverty line—roughly the average across all experiments. Most of the plans currently before Congress propose somewhat lower guarantee levels (equal to 65 percent of the poverty line), which would suggest a smaller work disincentive. Therefore, measures of the work effort resulting from various combinations of benefit-reduction rates and guarantees are needed to predict the responses to different programs.

The following tabulation shows the average effects of selected guarantee and benefit reduction rate adjustments:

<i>Change in negative income tax variable</i>	<i>Change in hours for—</i>		
	<i>Husbands</i>	<i>Wives</i>	<i>Female family heads</i>
An increase of \$20 per week (1977 dollars) in the guarantee level . . .	−0.4	−0.8	−1.8
An increase of 10 percent in the benefit-reduction rate	−0.3	−1.2	+0.5

As indicated, increases in the guarantee level decrease hours of work.³ The effects are largest for female family heads, who appear to be very responsive to the guarantee level, and smallest for husbands. Both husbands and wives also work less, the higher the benefit-reduction rate, with wives responding more than husbands. For female heads, the experimental findings show unexpectedly that increases in the benefit-reduction rate promote work effort. The explanation generally given for this result is that, in economic terms, the "income effect" of the change dominates the "substitution effect"; the reduction in take-home pay caused by the higher benefit-reduction rate strongly induces these women to work more in order to make up for the loss of income. However, the absolute size of this increase in work hours is rather small and is overwhelmed by the large negative effect of an increase in the guarantee level. In fact, the results show that, in general, experimental group members are somewhat more sensitive to changes in the guarantee than to changes in the benefit-reduction rate.

These findings do indeed imply that the response to a cash transfer program with a guarantee set at 65 percent of the poverty line would be smaller than shown in the experiments, which set it at 100 percent. At the lower guarantee level, the percentage reductions in work effort discussed in table 1 would be about 2 percent lower for husbands, 6 percent lower for wives, and 11 percent lower for female family heads.⁴ Nevertheless, work disincentives would remain.

Limitations of the experiments

Several limitations of the experiments should be taken into account when assessing the results. The most important qualification is that the experiments by and large lasted only 3 years, a fact which was known beforehand by the families who agreed to enroll. Participants consequently may have behaved differently than they would in a permanent national program, although it is not obvious whether they would respond more or less under non-test conditions. As Charles Metcalf has shown, there is a tendency for individuals in a short-run experiment to overrespond (reduce work effort more than they would in a permanent program) in order to take advantage of the higher benefits temporarily available from non-work.⁵ This runs contrary to the natural tendency for persons to underrespond simply because a permanent guarantee of income has more impact than a temporary guarantee. On *a priori* grounds, there is no way to tell which tendency dominates.

Fortunately, some families in the Seattle-Denver experiment were enrolled for 5 years (and were told so beforehand), to ascertain whether the duration of the experiment makes a difference. The preliminary results indicate that these individuals responded substantially more than those enrolled for 3 years, suggesting that

the underresponse tendency dominates in test situations. Interestingly, there is also some evidence that this difference was largely due to the rather high guarantee levels offered in Seattle-Denver, and that a national negative income tax with a guarantee closer to 65 percent of the poverty line would have permanent effects closer to those discernible among the 3-year test families.⁶ More research should be forthcoming on this topic.

Another limitation of the experiments is that they yield very little information on the welfare participation rate one might expect from a national negative income tax. Participation rates in existing welfare programs vary substantially (about 20 percent in the Aid to Families with Dependent Children Unemployed Parent Program, 50 percent in the Food Stamp Program, and 90 percent in the Aid to Families with Dependent Children Program), and it is likely that a national negative income tax would not have a 100-percent participation rate. However, the experiments rarely made any formal provision for nonparticipation; families were automatically sent a payment by mail if they reported their income every month—which they were required to do in order to take part in the experiment. Some families left the experiment for this reason, and others undoubtedly refused to participate in the first place because they did not want to be welfare recipients. Therefore, the experiments do not provide much information on the potential nationwide participation rate of eligibles.

A final problem with the experiments relates to the underreporting of income by the experimental and control groups. In the Gary experiment, there is some evidence that the female family heads in the experimental group underreported income substantially more than those in the control group, and that the reduction in work effort indicated by the data was partly spurious.⁷ Rather than the 28-percent response shown in table 1, the evidence suggests that the true response was on the order of 9 percent. Such effects were not significant, however, for husbands, and wives showed no response in any case. A new study just completed in Seattle and Denver shows that the results of the original experiment in those areas were similarly affected.⁸ These findings have implications not only for the estimated work disincentives of transfer programs, with which this article is concerned, but also for the administrative aspects of program cost and quality control.

Despite their limitations, the income maintenance experiments have contributed a great deal to our knowledge of the work disincentives of pure cash transfer programs. We now have a much better idea of what the magnitudes of these disincentives would be if a national program were instituted. And although it has not been discussed in this article, the experiments have also contributed substantially to our understanding of the proper administration of such programs and to our effective

knowledge of program evaluation techniques. In any case, the test results have provided much support for the current emphasis on work requirements and guaran-

teed-jobs programs in welfare reform, and have given us a much better ability to quantify the tradeoffs society would encounter among alternative antipoverty plans. □

— FOOTNOTES —

¹ More detailed information on the results of the experiments may be found in Robert A. Moffitt and Kenneth C. Kehrer, "The Effect of Tax and Transfer Programs on Labor Supply: The Evidence from the Income Maintenance Experiments," in Ronald Ehrenberg, ed., *Research in Labor Economics* (Greenwich, Conn., JAI Press, 1981).

² Economic theory actually predicts that the effect of a change in the benefit-reduction rate can be either positive or negative, depending upon whether the "income effect" dominates the "substitution effect." This is mentioned again below.

³ Actually, a range of estimates have been found in the experiments. These numbers are the midpoints of the ranges. Also, caution should be exercised in using these estimates inasmuch as they refer to *net* changes in G and t over what they would be in the absence of a negative income tax. For example, a positive level of G already exists for female heads and positive levels of t exist for both female heads and married couples from the positive income tax system.

⁴ For example, in 1977, the poverty line for a family of four was \$119 per week, so 65 percent of it is \$77. The difference is therefore \$42. The percentages cited here are derived by multiplying the guarantee-effects in table 2 by \$42 and dividing by the average hours of

work for husbands, wives, and female family heads in the experiments (40, 30, and 35 per week, respectively).

⁵ See Charles E. Metcalf, "Making Inferences from Controlled Income Maintenance Experiments," *The American Economic Review*, June 1973, pp. 478-83.

⁶ See Gary Burtless and David Greenberg, "The Limited Duration of Income Maintenance Experiments and Its Implications for Estimating Labor Supply Effects of Transfer Programs," Technical Analysis Paper 15 (U.S. Department of Health, Education and Welfare, 1978). See also Robert A. Moffitt, "Estimating a Simple Life-Cycle Model of Labor Supply: The Evaluation of a Limited Duration NIT Experiment" (New Brunswick, N.J., Rutgers University, 1979). Mimeographed.

⁷ See David Greenberg, Robert Moffitt, and John Friedmann, "The Effects of Underreporting on Estimation of the Experimental Effects on Work Effort: Evidence from the Gary Income Maintenance Experiment," *The Review of Economics and Statistics* (forthcoming).

⁸ See David Greenberg and Harlan Halsey, "Underreporting and Experimental Effects on Work Effort: Evidence from the Seattle and Denver Income Maintenance Experiments" (SRI International, 1980). Mimeographed.

A note on communications

The *Monthly Labor Review* welcomes communications that supplement, challenge, or expand on research published in its pages. To be considered for publication, communications should be factual and analytical, not polemical in tone. Communications should be addressed to the Editor-in-Chief, *Monthly Labor Review*, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212.
