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FORMULAS FOR INCOME MAINTENANCE: THEIR DISTRIBUTIONAL IMPACT

Martin David

Jane Leuthold

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1. INTRODUCTION

In 1965, $93 billion was spent by public and private organizations to provide income transfers to individuals and households in the United States. Of that amount $5.5 billion was transferred in the form of public assistance; $30.2 billion was transferred through social insurance programs; and $43.1 billion was transferred through other governmental programs. Private direct income payments from welfare agencies amounted to approximately $14.2 billion.[1] In spite of these transfers, which comprise 17.7 percent of personal income, an estimated 35 million individuals were poor according to the standards established by the Social Security Administration and the President's Office of Economic Opportunity.

The persistence of poverty and near-poverty conditions has prompted numerous proposals for relief of the symptoms of poverty (i.e., lack of money or the ability to purchase an adequate standard of living). Others are aimed at rehabilitation of the poor (i.e., endowing poor persons with salable labor market skills and training them to find jobs in the marketplace). During the past year there has been considerable discussion of programs seeking to fill the poverty-income gap of the poor, i.e., the difference between the actual income of poor families and what is required for a decent level of living.

Among the programs proposed for accomplishing this end are negative rates taxation, guarnteed minimum incomes, and family allowances. All of these programs have certain features in common. They consist of a mathematical and impersonally administered formula of income transfer. The payment is determined by a rate of transfer applied against the income deficiency of the family. Eligibility is conditioned only on an income

and/or asset test. Because of these common characteristics, programs of this type are known as formula-based income transfers.

One of the first formulas for income maintenance was proposed by Milton Friedman.[2] Under the Friedman Plan, the income grant is half of the unused Federal family tax exemptions and deductions. A family of four with no income would receive $1500 [half of (a) four times the Federal exemption of $600 and (b) the minimum standard deduction of $300 for the taxpayer plus three times $100 for his dependents]. This plan is referred to below as the EX-MSD Plan.

A similar plan, but one not tied to the Federal tax system, is the Lampman-Green Plan.[3] Formula income maintenance is accomplished by a rate applied to the amount by which a poverty standard exceeds income for the family. Lampman and Green assumed that the poverty standard could be reasonably well approximated by $1000 for the family head plus $500 for each dependent. A family of four with no income would receive $1500 (1/2 · $3000). This plan is referred to subsequently as the Income Gap Plan.

Another income maintenance plan (proposed by Tobin) pays a basic allowance of $500 to every man, woman and child.[4] Under the Tobin Plan, each unit is subject to a 33-1/3 percent tax rate on income other than the allowance up to the income level at which the tax liability equals the tax liability of the present system.

An alternative income maintenance plan proposed by Schwartz and Theobald is intended to fulfill the subsistence needs of the poor and still maintain a transfer rate of less than 100 percent.[5] This involves some payment of benefits to the near-poor. In principle, the

Schwartz-Theobald version of income maintenance is equivalent to the plans discussed above but utilizes a higher poverty standard.

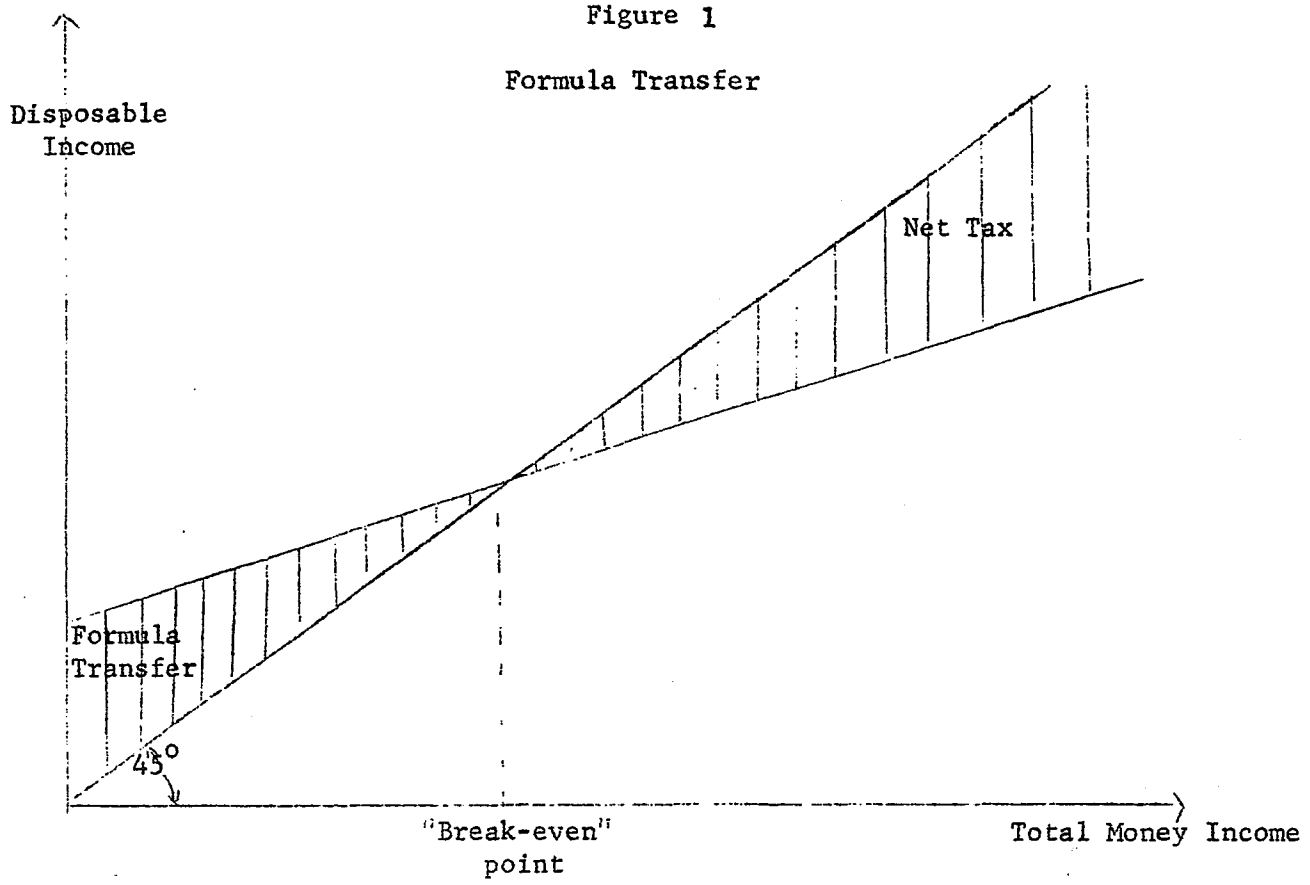
Several other plans have been proposed to provide payments to both the poor and the rich. Such payments or "demogrants" are similar to the foregoing plans since the cost of the transfer must be paid out of the taxable resources of the wealthy if any net income redistribution is to be accomplished. Figure 1 illustrates this similarity.

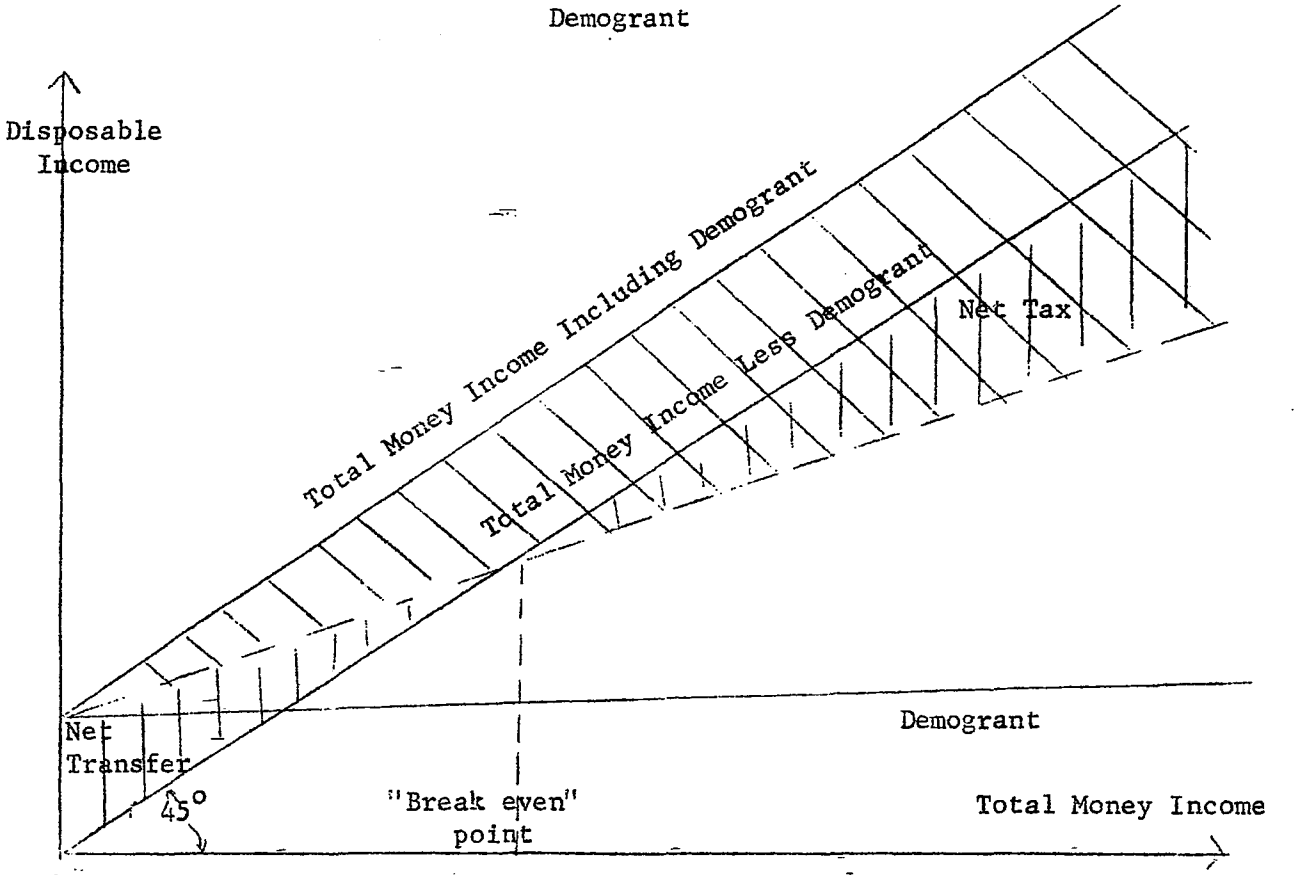
Formula-based income transfer differs from the current system of income maintenance in several important dimensions. First, formula income transfers cover all needy persons, while transfers under the current system are directed for the most part at specific categories of the poor. Second, formula transfers can be directed only to the poor while there tend to be substantial payments to the non-poor under the current system. Finally, formula transfers are aimed at the alleviation of poverty while many of the programs under the current system were created for other purposes.

Federal public assistance serves as an example of a program limited to specific population groups. With the exception of limited (and recent) modifications, these categorical aid programs are based on characteristics that were thought to justify payments to non-employed persons or heads of families.[6] In contrast, formula transfer programs would pay benefits to all families with an income deficiency.

Veterans' benefits illustrate a program that extends benefits to both the poor and the non-poor. Payments can be made either as a matter of right or on the basis of need. The means test applied to determine whether relatives of veterans are indigent is less severe than the means

Figure 1


Formula Transfer
Disposable Income
Net Tax
Formula Transfer
45°
"Break-even" point
Total Money Income


Demogrant
Disposable Income
Total Money Income Including Demogrant
Total Money Income Less Demogrant
Net Tax
Demogrant
Net Transfer
45°
"Break even" point
Total Money Income

test used in public assistance. Thus many persons who are not poor according to standards set by the Office of Economic Opportunity profit from veterans' programs.

Another program not intended exclusively for the poor is social insurance. Social insurance provides benefits to persons and families to assure that anyone with some work experience is entitled to some income (and medical services) when he becomes disabled, unemployed, or when he retires after age 62. Although this program aids poor and non-poor alike, two-fifths of the aged are poor; and Social Security benefits account for 30 percent of the income of families with aged heads.[7]

As a consequence of the mixed character of the public and private programs, only half of the total transfers extended during 1963 were received by families whose pre-transfer income was below the poverty line. Only 10 percent of all families were lifted out of poverty by these transfers.[8] Some may regard such a fraction as a sign of inefficiency, but it should be noted that many of the programs that result in income transfers were established for purposes other than eliminating poverty. Social Security, for example, was originally construed as a program of lifetime income redistribution in which individuals would benefit on the basis of their own past contributions. In actual operation, the program has preserved only a tenuous connection between the individual's past contributions and the benefits he receives. Today, benefits from the plan redistribute income rights among beneficiaries and the program has been more closely tied to subsistence than to lifetime redistribution of income.

In summary, formula income transfers were proposed for the purpose of aiding all the poor. They were conceived of as a means to alleviate the

symptoms of poverty without paying substantial benefits to the non-poor.

A single formula income payment may not meet the immediate needs of all the poor. The poor are extremely heterogeneous. Their poverty may be situational, it may derive from labor market discrimination, or it may be caused by personal traits, emotional disorders, and so forth.[9] A successful balance between income maintenance programs and rehabilitation may require a more complex system of formula income payments than will be discussed here.

For example, generous support could be given to families whose poverty is situational and who are therefore unable to participate in the labor market. (Examples of these are aged and totally disabled persons.) Assistance to the broken family might call for an alternative approach so that labor market participation is not inhibited by the operation of the transfer program. Persons or families whose full-time earnings are not sufficient to place them above the poverty line may require still another form of supplement.

Many questions concerning the potential success of formula income transfers remain unanswered because such programs have never been put into practice in the United States. This paper is an attempt to provide a method for analyzing the effectiveness of alternative formula-based programs and of judging their comparative costs. It consists of a series of simulation experiments in which a variety of formula income transfer programs were extended to a sample of poor families.[10]

The results of the simulation are crude for several reasons. No allowance is made for the response of the poor and the near-poor to a large increase in transfers. No incentives to increase or decrease work

effort or family size are incorporated. No effort is made to forecast the response of state welfare administrations to an income that would be paid directly to the poor by the Federal Government. We view the inclusion of such responses as an important sequel to the present computations. Incentive effects and the accomodation in the existing public transfer programs to formula-based income maintenance cannot be quantitatively appraised on the basis of the present study. When more is known, behavior of poor families and administrators could be added to the present simulation to give better insight into the reactions that may be triggered by a new program of income maintenance.[11]

2. FUNDAMENTAL ISSUES RELATING TO FORMULA INCOME MAINTENANCE PLANS

The technique of this simulation involves computing the amounts of the formula income payments for each eligible unit in a sample of low-income families. The amounts of the payments are sensitive to the parameters of the program: the resource base, the standard of poverty, the receiving unit, and the rate structure.

Under a formula transfer program, if resources of the unit are less than the poverty standard, the unit receives a formula payment. The payment may be proportional to the income deficiency of the unit or it may be graduated to the size of the income deficiency. The poverty standard, the resources, the rate of payment, and the unit to which the payment is made are critical dimensions of formula income maintenance plans. By altering these parameters and examining the distributional results, we are able to analyze the short-run effectiveness of various formulations of formula income transfer programs.

The following chart presents an overview of the plans discussed in succeeding sections.

Formula Income Maintenance Plans

Dimension of the Formula	Options Simulated
A. Resources	A 1 Adjusted Gross Income (excluding transfers and similar to the Federal tax concept)
	A 2 Total Money Income (including transfers, excluding income in kind)
B. Standard of Poverty	B 1 EX-MSD (Friedman-type)
	B 2 Poverty Income Gap (Lampman-type)
C. Receiving Unit	C 1 Families (related individuals occupying a dwelling unit)
	C 2 Adult Units (individuals 18 years of age or older, their spouse, and children under 18)
D. Rate	D 1 Flat rate
	D 2 Graduated rate, decreasing with increases in the income deficiency (Plan B below)
	D 3 Graduated rate, increasing with increases in the income deficiency (Plan C below)

We will discuss each of these dimensions briefly. Comments of others to date have focused on the level of a flat rate and the standard of poverty. We will show that the measure of resources, the receiving unit, and gradation of rates are important policy issues

Measure of Resources

The measure of resources used in determining eligibility and the amount of a formula income payment should reflect the capacity of the

family to meet its subsistence needs. Among the measures suggested for purposes of formula transfer are adjusted gross income (i.e., income excluding transfers and similar to the Federal tax concept) and total money income (i.e., income including transfers but excluding income in kind). Both these measures of resources were used in this simulation.

The results of the simulation show that total money income is to be preferred to adjusted gross income as a measure of the resources of a unit. Adjusted gross income was first proposed as a measure of resources by Friedman in an attempt to link formula income payments to the Federal income tax. The plan that results is clearly undesirable. Payments are distributed to many whose total money income exceeds adjusted gross income by substantial amounts of transfer income. Unless transfer payments are reduced dollar-for-dollar for the amount of formula payment, substantial spillover of payment to high total money income levels occurs (Table 1). Conversely, benefits are less concentrated on the extremely poor. A plan that uses total money income as a measure of family resources and has the same aggregative cost offers substantially larger payments to families whose total money resources are less than $1500.

The Standard of Poverty

The standard of poverty is a parameter of the transfer system, just as personal exemptions are a parameter of our current tax system. In the following discussion the standard is based on family size. It is called the "poverty standard," although, we recognize that the standard is not identical with any poverty line or true measure of subsistence costs. It would be desirable for the standard to be correlated with the level of subsistence income, with allowances for departures from a "poverty line"

Table 1

Simulated Formula Income Maintenance Payment to Families Under an EX-MSD Plan: Adjusted Gross Income Compared to Total Money Income as a Measure of Resources within Total Money Income, 1959

Total Money Income	Percent of Family Units	Mean Amount of Payment TMI-Based Plan 43% rate	Mean Amount of Payment AGI-Based Plan 25% rate
Negative, zero	1%	$648	$377
1 - 600	3	583	397
601 - 1000	5	530	433
1001 - 1500	6	437	406
1501 - 2000	6	323	361
2001 - 2500	5	342	340
2501 - 3000	5	230	284
3001 - 3500	4	165	170
3501 - 4000	5	88	125
4001 - 4500	5	57	82
4501 - 5000	5	24	36
5001 - 6000	11	12	34
6001 - 7000	9	2	9
7001 - 8000	8	0	2
8001 - 9000	6	0	4
9001 - 10000	4	0	0
Over 10,000	13	0	2
Total, Average	100%	$139	$138
Number of families	2800**		
Aggregate Cost (Billions)		$7.4***	$7.4

** The payments are computed according to formulas shown in the Appendix and are applied to a representative stratified sample of U.S. families taken in 1960.

*** Aggregate cost computed by multiplying mean payment by total number of families ($139 x 53.4 mil).

where appropriate. Local variations in subsistence costs and economies of scale might imply a poverty standard that would be administratively awkward or would be an incentive to family actions directed solely toward obtaining maximum transfers.[12]

Substitution of total money income for adjusted gross income as a measure of resources does not eliminate difficulties with a plan that uses Federal tax definitions of exemptions and minimum standard deductions as the poverty standard (EX-MSD Plan simulated in Table 1). Table 2 shows that EX-MSD benefits families that are not poor according to a poverty standard proposed by Lampman and Green. That standard is remarkably close to the Orshansky poverty standards, considering its simplicity.[13] Whether spillover to the non-poor is a serious policy matter depends on whether it is considered important that about 3 percent of the aggregate cost would be paid to the non-poor. This payment would go largely to families barely out of poverty (Table 2).

The Lampman-Green poverty standard for the one-person family with no income equals $1500. This exceeds the value of unused exemptions and deductions. However, each additional family member increases unused exemptions and deductions by $700, while Lampman and Green assume additional subsistence cost at $500. For families of five or more persons unused exemptions and deductions exceed the Lampman-Green standard.

Table 3 contrasts the mean formula income maintenance payment for equal cost plans based on these two standards. The plan based on unused exemptions and deductions (EX-MSD) is based on a 25 percent transfer rate. The plan based on the Lampman-Green standard (Income Gap Plan) is based on an equal cost, 28.5 percent flat rate. As would be expected, the mean

Table 2

Simulated Formula Income Maintenance Payments under an EX-MSD Plan with Resources Measured by Total Money Income: Comparison of Payments to Poor and Non-Poor Families within Total Money Income 1959

Total Money Income	Mean Amount of Payment*	
	Poor**	Non-Poor
Negative, zero	$377	$ 0
1 - 600	339	0
601 - 1000	308	0
1001 - 1500	258	0
1501 - 2000	274	***
2001 - 2500	357	36
2501 - 3000	348	17
3001 - 3500	342	3
3501 - 4000	275	1
4001 - 4500	526	2
4501 - 5000	424	2
5001 - 6000	300	6
6001 - 7000	0	2
Over $7,000	0	0
Average	$308	$ 4
Percent of all families	25%	75%

*EX-MSD Plan, total money income base, family unit, 25% rate.

**Poor in the sense that $1000 + 500S > Y_2$ where S is family size, Y_2 a measure of its resources. See Appendix.

***Less than $1.

Table 3

Simulated Formula Income Maintenance to Poor Families
EX-MSD Plan Compared to a Poverty Income Gap Plan
within Family Size Classes

Size of Family	Mean Amount of Payment: EX-MSD Plan, 25% Rate b/	Mean Amount of Payment: Income Gap Plan, 28.5% Rate b/	Percent of Poor Families	Incidence of Poverty a/
1	$ 131	$207	28%	43%
2	227	208	22	21
3	248	277	10	15
4	324	353	12	17
5	385	365	8	20
6	461	405	9	39
7	718	618	4	35
8	649	481	3	53
9	862	708	3	63
10 or more	1177	686	1	77
Average, Total	$ 308	$308	100%	25%
Aggregate cost (billions)	$ 4.1 c/	$ 4.1 c/		

a/ Ratio of the number of poor families to the total number of families with this characteristic.

b/ Resources were measured by total money income under both plans.

c/ Aggregate cost computed by multiplying mean payment by total number of poor families ($308 x 13.35 mil).

payment under EX-MSD exceeds the mean payment under the Income Gap Plan for families of five or more persons.

Payments from the EX-MSD Plan exceed the Income Gap payments for families whose head is over 65 years as a result of the additional income tax exemption currently available to any individual of that age (Table 4).

The Receiving Unit

To minimize the cost of a formula transfer program it would be wise to take into account the income in kind that is received by poor persons who live with relatives "doubled up" in the same household. For this reason it would be natural to apply a formula transfer to the aggregate income of all persons in a family.

Inequities and administrative difficulties could result. Families that undertake to support ailing and indigent relatives in their own homes might not obtain a formula payment, while families that support a relative in another household might still be able to obtain formula transfers for the relative.[14] In addition, the administrators might be plagued by frequent changes in family composition, with the resulting changes in the level of allowable formula transfers.

Another major problem associated with a family unit plan is that it may lead to family fragmentation. If benefits paid to small families are based on a higher per capita transfer than those granted to large families, a family unit plan may be an incentive for families to break up and file several applications for formula income maintenance.[15]

These problems could be solved by using an adult unit (a person eighteen or over, his spouse if he is married, and any children under eighteen who live with him and for whom he is responsible) as the basis

Table 4

Simulated Formula Income Payments to Poor Families: EX-MSD Plan Compared to a Poverty Income Gap Plan within Classes Based on Age of Head

Age of Family Head	Mean Amount of Payment: EX-MSD Plan 25% Rate a/	Mean Amount of Payment: Income Gap Plan 28.5% Rate a/	Percent of Poor Families	Incidence of Poverty
0 - 24	$166	$258	7	28%
24 - 34	398	392	14	19
35 - 44	448	431	17	18
45 - 54	309	330	19	23
55 - 64	175	257	18	27
65 - 74	273	194	15	39
75 - over	$329	$ 243	11%	65%
All	$308	$ 308	100%	25%
Aggregate cost (billions)	$4.1	$4.1		

a/ Resources were measured by total money income under both plans.

for computing formula transfers. However, a plan based on the adult unit as the receiving unit is considerably more expensive than a comparable plan based on the family unit. In other words, a family unit plan entitles recipients to a higher rate of transfer than a comparable adult unit plan of equal cost (Table 5).

The Rate Structure

Figure 2 illustrates three possible patterns of gradation of the rate structure for a family of four members whose poverty standard is $3000. All plans lead to the same payment to units with no resources. Plans B and C are graduated rate structures. Plan B pays greater benefits to the marginal poor than the flat rate plan. Plan C approaches the benefit level of the flat rate plan only for the "poorest" poor.

Of the three plans, Plan B is the most expensive, Plan C is the least expensive. The schedule of graduated rates used with Plan B is a function of the ratio of the poverty-income gap to the poverty standard. If the family's poverty-income gap is less than one-third of its poverty standard, any increment in resources reduces the formula payment by .75 of the increment. If the ratio is greater than 1/3 but less than 2/3, the formula payment is reduced by half of the movement. Finally if the poverty-income gap is more than 2/3 of the standard, the formula payment is reduced by .25 of any increment resources. As a result, the family with no resources receives 50 percent of the poverty-income gap as a formula transfer under Plan B.

Plan C is the mirror image of Plan B. Increases in resources under this plan lead to a reduction in the formula transfer at rates of .25 and .75 as the ratio of the poverty-income gap to the poverty standard increases

Table 5

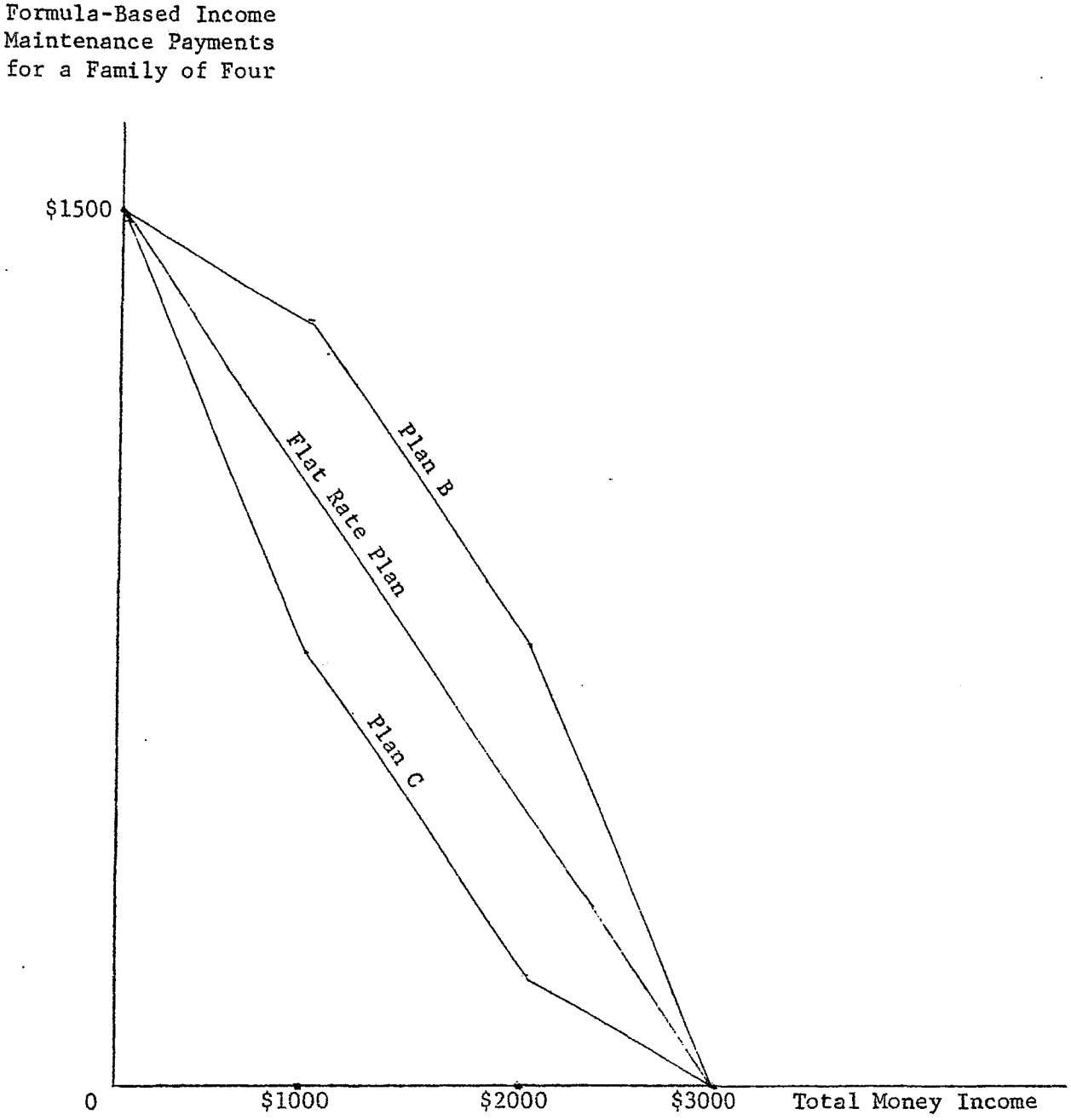
Aggregate Expenditures and Rates of Transfer for Various Income Maintenance Plans, 1959 1/

Plan Description	Form of Plan Comparison: Equal Costs		Equal Rates		Equal Payments 2/	
	Rate of Transfer	Amount (billion)	Rate of Transfer	Amount (billion)	Rate of Transfer	Amount (billion)
EX-MSD Plan						
Adult Unit	19%	$4.3	25%	$5.6	25%	$5.6
Family Unit	25	4.3	25	4.3	25	4.3
Poverty Income Gap Plan						
Adult Unit	18%	$4.3	25%	$5.9	23%	$5.5
Family Unit	29.5	4.3	25	3.7	28.5	4.1

1/ The aggregate base to which these rates apply varies according to the unit to which the plan is administered. Thus a 25 percent rate applied to unused exemptions and deductions of family units results in a different payment than 25 percent applied to the corresponding unused exemptions and deductions of adult-units (see the Appendix for the formulas used).

2/ The differences in amounts under equal payments are due to the fact that under EX-MSD Plan some non-poor are also eligible to receive income payment.

Figure 2



Alternative Income Gap Plans
for Formula Income Maintenance

from less than one-third to more than two-thirds. Like Plan B, a unit with no resources receives 50 percent of the poverty-income gap as a formula transfer.

Plans B and C are compared in Table 6. Each is also compared to a flat rate plan of equal cost. For families with incomes of less than $1,000, the mean income gap payment from the graduated rate (Plan B) is less than the payment from an equal cost, flat rate plan (Plan A). This situation is reversed for families with income greater than $1,000. Comparison of Plan C and its equal cost, flat rate equivalent (Plan D), shows the reverse situation.

Table 7 compares mean payments under the four plans for adult units of different sizes. The aggregate cost is more than in Table 6, in spite of the fact that adult units contain fewer persons than family units. This finding reflects the fact that many poor adult units live with a unit that is not poor. The resources of the family as a whole are adequate, while those of the dependent are not.[16]

The distribution of formula payments both by adult unit size and by life cycle indicate that large units benefit the most in absolute dollar amounts from the gradation proposed in Plan B. The least benefits go to the older couple and single person (see Table 8).

It is likely that any work effort changes resulting from formula payments will depend on the effective marginal income that an individual can obtain from additional work. The marginal income can be expressed as

$$w\,(1 - p - r)$$

where p is the rate of payroll taxes and r is the transfer rate. The larger r, the smaller the return to additional effort and the greater the probability that the plan will cause a shift in the labor supply function.

Table 6

Simulated Formula Income Payments to Poor Families under an Income Gap Plan: A Comparison of Flat and Graduated Rate Plans of Equal Revenue Cost within Total Money Income, 1959*

Total Money Income	Mean Amount of Payment: Flat 65% Rate Plan A	Graduated Rate Plan B	Graduated Rate Plan C	Flat 35% Rate Plan D	Percent of Poor Families	Incidence of Poverty
Less than 0	$1163	$895	$895	$626	2%	100%
0 - 600	982	851	660	529	12	100
601 - 1000	817	782	476	440	19	100
1001 - 1500	591	608	302	318	23	98
1501 - 2000	554	586	267	298	16	68
2001 - 2500	761	816	355	410	11	51
2501 - 3000	668	736	292	360	7	35
3001 - 3500	585	663	237	315	5	27
3501 - 4000	342	394	132	184	3	18
4001 - 6000	399	460	153	215	2	10
Over 6000	0	0	0	0	0	0
Ave., Total	$ 701	$698	$381	$378	100%	25%
Aggregate cost (billion) **	$ 9.4	$ 9.3	$ 5.0	$ 5.1		

*Resources were measured by total money income.

**Discrepancies due to rounding transfer rate.

Table 7

Simulated Formula Income Payments to Poor Adult Units under an Income Gap Plan: A Comparison of Flat and Graduated Rate Plans of Equal Cost within Adult Unit Size 1959*

Size of Unit	Mean Amount of Payment: Flat 60%** Rate Plan A	Graduated Rate Plan B	Graduated Rate Plan C	Flat 40% Rate Plan D	Percent of Poor Adult Units	Incidence of Poverty
1	$ 583	$ 554	$ 419	$ 389	54%	54%
2	507	536	309	338	15	20
3	658	679	418	439	8	19
4	779	836	462	519	8	21
5	822	890	480	548	6	23
6	951	1023	561	634	4	36
7	1138	1244	653	758	2	33
8	1182	1312	658	788	1	46
9	1785	1855	1120	1190	2	72
10	***	***	***	***	***	***
Av., Total	$ 664	$ 671	$ 436	$ 442	100%	33%
Aggregate cost (billions)	$ 14.2	$ 14.3	$ 9.3	$ 9.4		

*Resources were measured by total money income.

**Rate attached to this plan is lower than that illustrated in the previous table because this plan applies to the adult rather than family unit.

***Insufficient observations for a reliable estimate.

Table 8

Simulated Formula Income Payments to Poor Adult Units under an Income Gap Plan: A Comparison of Flat and Graduated Rate Plans of Equal Cost within Life Cycle, 1959*

Life Cycle	Plan A Flat 60% Rate	Plan B Graduated Rate	Percent of Adult Units	Incidence of Poverty
1. No spouse present, no children, under 45	$650	$599	22%	50%
2. Married, spouse present, no children, wife under 45.	441	475	2	11
3. Married, spouse present, children, some under 6, wife under 45.	885	961	14	21
4. Married, spouse present, children, none under 6, wife under 45.	788	860	4	13
5. Married, spouse present, children, some under 6, wife 45 or older.	842	892	6	30
6. Married, spouse present, children, none under 6, wife 45 or older.				
7. Married, spouse present, no children, wife 45 or older	477	517	10	20
8. No spouse present, no children, 45 or older	537	523	32	57
9. No spouse present, but children	870	884	10	60
Average, Total	$664	$671	100%	33%
Aggregate cost (billion)	$ 14.2	$ 14.3		

*Resources were measured by total money income.

To the extent that changes in work effort arise from high rates r the three rate structures differ substantially. Plan B creates the greatest incentive to alter work effort for the marginal poor. Whether such incentives prove a serious problem depends on the degree of labor force attachment of such persons and the latitude for absenteeism, short hours, and discretionary overtime in their place of employment. At the same time, Plan B offers the least incentive to change work habits to those with no income. Whether that is desirable depends on the likelihood that persons with no income from other sources could be pulled into employment under any circumstances. By graduating the rate structure, changes in work effort can be concentrated on those who are already earning income (as in Plan B) or on those who are not in the labor market at all (as in Plan C).

Some insight into the disincentive issue can be obtained by examining the reported labor force status of the poor (Table 9). Among the poor, 41 percent are employed and 10 percent are unemployed. More than a third of the poor do not consider themselves in a position to work even when no formula income maintenance plan is available. These non-labor force poor include two disparate populations—persons who subsist on their own resources, and a small minority who receive assistance payments. For the former, introduction of a formula income maintenance program may reduce the incentive to search for work, an incentive that is already too blunt to bring these adult unit heads into the labor market. For those on assistance, introduction of formula maintenance will provide a positive force to seek work. The effect of such incentives on the labor force participation of these non-labor force groups remains an open question.

Table 9

Distribution and Incidence of Poverty among Adult Units by Labor Force Status of the Head

Labor Force Status of the Adult Unit Head	Percent of Adult Units		Incidence of Poverty
	Poor	All	
Employed	41%	71%	19%
Unemployed	10	6	60
Retired	14	10	49
Student	9	4	32
Housewife	20	8	79
Other	6	1	--
Total, average	100%	100%	33%

For those in the labor force it is unclear how much latitude for the expression of such incentives to change work habits exists under present employment practices. To what extent working habits and desires can be modified by a promise of support at less than the margin of subsistence is again an open question.

Preliminary work by one of the authors using a work-leisure choice model indicates that changes in work effort resulting from a formula transfer program would be minimal. For certain workers in large families or with low wage rates, however, the change in work effort could be substantial. Heads of adult units and spouses with fewer than two children tend to increase hours worked, while spouses with two or more children tend to decrease hours worked for a change in the rate of formula transfer.[17]

3. THE DISTRIBUTION OF BENEFITS TO VARIOUS POPULATION GROUPS

In the previous section, we discussed some aspects of the various income measures, rate structures, receiving units, and poverty standards. In this section we examine certain population groups to see how they are affected by the specification of the unconditional income maintenance plan.

Table 10 shows the distribution of benefits according to the labor force status of the head of the adult unit. (Those who have never worked or who are disabled and not working have been excluded from the table because they represent such a small fraction of the population.)

As one would expect, the EX-MSD Plan provides maximum benefits for the retired. The employed receive nearly as large benefits. The plan fills 35 percent of the poverty-income gap of the retired, 24 percent of

Table 10

Simulated Formula Income Payments to Poor Adult Units: Mean Payments under EX-MSD, Income Gap Plans, and Disposable Income within Labor Force Status of Head, 1959

Labor Force Status	Poverty Income Gap	Amount of Payments a/		Disposable Income b/		Percent of Poverty Income Gap Met by EX-MSD Plan c/	Public Non-Contributory Transfers f/
		EX-MSD Plan (25% Rate)	Income Gap Plan (23% Flat Rate)	EX-MSD Plan (25% Rate)	Income Gap Plan (23% Flat Rate)		
Employed	$1132	$273	$261	$1804	$1792	24%	$ 66
Unemployed	1222	243	282	1176	1215	20	147
Retired	786	276	182	1285	1191	35	229
Student	1186	158	273	495	610	13	16
Housewife	1101	243	254	874	883	22	241
All Poor	$1107	$255	$255	$1301	$1301	23%	137
Aggregate cost (in billion)		$ 5.6 e/	$ 5.5 d/				$2.95

a/ Resources were measured by total money income.

b/ Total money income + EX-MSD transfer - estimated Federal income tax - estimated Federal payroll tax (OASDI).

c/ Ratio of EX-MSD Plan (25% rate) to poverty income gap.

d/ Under income gap plan about 33.22% of adult units are poor (21.460 million units). Aggregate cost of $5.47 billion is derived by multiplying the average payment of $255 by 21.460 million poor units.

e/ Under EX-MSD Plan about 2.04% (1.319 million units) of non-poor adult units are also eligible to receive income payment (average amount of $80.89 per unit). Total income payment of $107 million to non-poor is added to $5.47 billion.

f/ Include public assistance, gifts from private charities and free medical care.

the income gap of the employed, and 23 percent of the income gap of the poverty population. The plan favors the retired because it offers a double exemption for the aged. The large payment for the employed is a bit harder to explain. It may be associated with double exemptions, accruing in this case to aged at work.

By contrast with the EX-MSD Plan, any plan based on the poverty-income gap will provide a constant share of the income gap to all population groups. As comparison of columns 2 and 3 of Table 10 indicates, the difference in the amount of payment under the two plans can be sizeable, although the average payment to all poor adult units is the same under both plans.

The last column of the table shows the average amount of transfers to each group from public assistance and from other aids, including private charities. Substitution of formula income maintenance for these existing programs would increase the poverty-income gap in column 1 by a like amount and would increase payments by a fraction of the existing transfer--25 percent for the EX-MSD Plan and 23 percent for the Income Gap Plan. The amount of such transfer is underreported in the sample, so that the last column indicates an order of magnitude as well as a likely upper limit to the adjustment to formula income maintenance that might occur with the phasing out of existing public assistance measures.

Up to this point plans compared in a given table were equal cost alternatives. Tables 10 through 13 offer an alternative picture. The formula income maintenance programs compared provide equal benefits to the poor, as defined by the Lampman-Green standard. Since EX-MSD payments spill over to the non-poor, that program is more expensive per dollar

Table 11

Simulated Formula Income Payments to Poor Adult Units: Mean Poverty Income Gap, Mean Payments under EX-MSD and Income Gap Plans, and Disposable Income within Life Cycle, 1959

Life Cycle of Head of Adult Unit	Poverty Income Gap	Amount of Payments 1/		Disposable Income 2/		Percent of Poverty Income Gap Met by EX-MSD Plan	Public Non-Contributory Transfers 6/
		EX-MSD Plan (25% Rate)	Income Gap Plan (23% Rate)	EX-MSD Plan (25% Rate)	Income Gap Plan (23% Rate)		
No spouse present:							
a) Under 45, no children	$1084	$134	$249	$ 527	$ 610	12%	$ 23
b) 45 or older, no children	895	187	206	781	800	21	153
c) children present	1451	349	334	1635	1620	24	400
Married, spouse present, wife under 45:							
a) no children	734	100	169	1322	1391	14	56
b) children, some under 6	1474	446	339	2710	2603	30	111
c) children, none under 6	1314	356	302	2283	2230	27	58
Married, spouse present, wife 45 or older:							
a) children, some under 6	1777	551	409	2776	2634	31	326
b) children, none under 6	1341	365	308	2007	1950	27	199
c) no children	795	294	183	1489	1378	40	112
All poor	$1107	$255	$255	$1301	$1301	23%	$137
Aggregate cost (in billion)		$5.6 3/	$5.5 4/				$2.95 5/

1/ Resources were measured by total money income.

2/ Total money income + EX-MSD transfer - estimated Federal income tax - estimated Federal payroll tax (OASDI).

3/ See footnote e/ in Table 10.

4/ See footnote d/ in Table 10.

5/ Total public non-contributory transfers including poor and non-poor amount to $4.63 billion. The figure is derived by multiplying average contributory transfer of $71.59 by the total family units of 64.6 million.

6/ Include public assistance, gifts from private charities, and free medical care.

Table 12

Simulated Formula Income Payments to Poor Family Units: Mean Poverty Income Gap, Mean Payments under EX-MSD and Income Gap Plans, and Disposable Income with Earning Power Potential of Head of Family, 1959

Earning Power Potential of Family Head	Poverty Income Gap	Amount of Payments [a]		Disposable Income [a]		Percent of Poverty Income Gap Met by EX-MSD Plan	Public Non-Contributory Transfers [f]
		EX-MSD Plan (25% Rate)	Income Gap Plan (23% Rate)[b]	EX-MSD Plan (25% Rate)	Income Gap Plan (23% Rate)		
1. Retired or disabled & not working	$1046	$314	$298	$2013	$1997	30%	$256
2. Non-retired:							
a) Negro	1168	312	333	1713	1734	27	187
b) White farmer	1125	357	350	2006	1999	29	292
3. Non-retired, white non-farmers 18-34 years old:							
a) 1-11 years of education	930	259	266	1856	1863	28	217
b) Completed high school	990	269	283	1627	1641	27	226
c) Some college training	1020	255	291	1587	1623	25	146
4. Non-retired, white non-farmer 35 years or older:							
a) 1-11 years of education	1041	298	297	1900	1899	29	163
b) Completed high school	1207	357	345	1826	1814	30	209
c) Some college training	1010	325	288	2063	2026	32	150
All poor	$1079	$308	$308	$1862	$1862	28.5%	$194
Aggregate cost (in billion)		$4.3 [e]	$4.1 [d]				$2.63 [c]

[a] Resources were measured by total money income.

[b] Exact rate used is 28.55%.

[c] Total number of poor family units is 13.553 million. Aggregate cost of public non-contributory transfer including poor and non-poor is $4.65 billion. The figure is the product of total family unit (53.4 million) and average public non-contributory transfer ($87.04).

Table 12 cont'd

d/ Total number of poor family units is 13.553 million, about 25.38% of all family units. The aggregate cost of $4.13 billion is the product of average transfer payment under Income Gap Plan ($308) and total number of poor family units.

e/ Under EX-MSD Plan about 1,383 million of additional non-poor family units are eligible to receive income payment (about 2.59% of all family units) averaging $102.31 per unit. The aggregate cost of $4.27 is the sum of the transfer payment to the poor ($4.13 billion) and to the non-poor (142 million).

f/ Include public assistance, gifts from private charities, and free medical care.

Table 13

Simulated Formula Income Payment to Poor Family Units: Mean Poverty Income Gap, Mean Payments under EX-MSD and Income Gap Plans, and Disposable Income within Education of the Family Head, 1959

Education (year)	Poverty Income Gap	Amount of Payments		Disposable Income 3/		Percent of Poverty Income Gap Met by EX-MSD Plan
		EX-MSD Plan (25% Rate)	Income Gap Plan (28.5% Flat Rate) 1/	EX-MSD Plan (25% Rate)	Income Gap Plan (28.5% Flat Rate)	
None	$ 908	$321	$259	$1791	$1729	35%
1-8	1114	316	317			28
9-11	1013	284	289	1726	1731	28
12	1243	354	354			29
a)	1049	302	290			29
b)	1015	305	289	1672	1680	30
c)	1015	283	289			28
d)	939	278	268			30
N.A.	0	0	0			0
All poor	$1079	$308	$308			28.5%
Aggregate Cost (billion)		$4.3 2/	$4.1			

a) High school plus non-college training, i.e., business college, trade school, etc.
b) College, no degree.
c) College, Bachelor's degree or no advanced degree mentioned.
d) College, advanced degree.

1/ Only 28.5% of poverty-income gap is met under this plan.

2/ See footnote e/ in Table 12.

3/ Total money income plus EX-MSD or income gap transfer less estimated Federal income and payroll taxes.

of benefit to the poor. Readers interested in equal cost comparisons may use the conversion percentages in Table 5 to recalculate these tables.

Even greater disparity in the performance of the EX-MSD and the Income Gap plans can be observed between adult units at different stages in the life cycle. In Table 11 adult units with children or aged members benefit most from the EX-MSD Plan. Young married and young single persons derive substantially less benefit. They would receive barely half of what they would receive under an Income-Gap Plan that provides equal benefits to the poor.

Table 12 shows the distribution of benefits from a plan similar to the previous plan except that the family, rather than the adult unit, is the receiving unit. The EX-MSD Plan fills approximately the same percent of the poverty-income gap of each subclass of the working population.

The ratio between payments under the EX-MSD Plan and the Income Gap Plan rises substantially when adult units are aggregated into families. This is the result of the fact that family size must equal or exceed adult unit size. As we indicated earlier, the increment in unused exemptions and deductions exceeds the increment in the income gap for an additional family member. Moreover, the aggregation of units causes a larger reduction in the Lampman-Green standard than in unused deductions and exemptions, because $1000 of poverty gap is erased for each adult unit head who can be considered a dependent (rather than the head) of a family. Only $200 disappears from the total under the EX-MSD calculation.

Somewhat surprising is the finding that the poverty-income gap shows so little correlation with education. (Compare categories 3a, 3b, and 3c to categories 4a, 4b, and 4c in Table 12) This finding is corroborated

by Table 13. The evidence suggests that hazards which create poverty are present in all population groups and that we may be misled by the typical data on mean incomes which are influenced by large values in a skewed distribution. Median incomes are also misleading as the dispersion of income-earning experience has little influence on that statistic. All education groups have some casualties who become poor and who are likely to exhibit similar income deficiencies.

The choice of the poverty standard makes little difference to the size of payments for various levels of educational attainment except for families whose head has had no education. For these families the EX-MSD payment is larger than the Income Gap payment. Perhaps this occurs because these families have more members. However, a more likely explanation is that this educational group contains a higher percentage of aged persons and they obtain the double exemption for persons over 64 years of age.

4. INTERPRETATION AND SUMMARY

The development and execution of this simulation experiment provides several useful insights into the operation of formula-based income maintenance programs. We summarize the findings of earlier sections under four headings: (1) unexpected findings, (2) anticipated relationships, (3) theoretical contributions, and (4) policy uses.

Unexpected Findings

Three facets of the distribution of benefits highlight the facts that poverty is the result of extreme circumstances, and that the usual statistical information on central tendencies for large groups is not always a reliable indicator of what may happen under a program designed to aid the poor.

First, some families are poor despite the fact that their educational attainments suggest substantial skills and ability. Other factors intervene to prevent marketing those skills at the expected rate of pay. These poverty-stricken families will require formula-based income payments on the same order of magnitude as families whose educational attainments suggest minimal skills and marketable talents (see Table 13).

Second, any plan that places no ceiling on the poverty standard results in extremely high payments to a few large families. This may be desirable, but only if the poverty standard is an acceptable gauge of the need of those large families and if the measure of resources truly reflects their inability to purchase subsistence. If the poverty standard departs from a subsistence level, the resulting formula payment will be a windfall to the large family. This appears to be the case when the poverty standard is based on exemptions and minimum standard deductions. Similarly, if adjusted gross income is used as the measure of the family's resources there will be a few who benefit by large formula-based payments in spite of the fact that their total resources exceed the poverty lines (see Table 1).

Third, combinations of characteristics and their effect on the operation of a formula-based income maintenance plan are not always obvious. Thus it is clear that under the EX-MSD Plan greater benefits accrue to the aged than to persons under 65 years of age because of the double exemption granted to the aged. What is less obvious is that enough persons over 65 are at work for the EX-MSD Plan to reduce the size of the poverty gap by more for the employed than for the unemployed, whose poverty gap is

greater. The unemployed are younger, on the average, than the employed, since aged persons who become unemployed are quire likely to drop out of the labor market.

Anticipated Relationships

The simulations show clearly that a formula-based income maintenance plan can provide aid to groups that are difficult to locate through categorical programs. The employed poor, the educated poor, and poor with large families and little earning power will all receive benefits.

Any deviation from a constant per capita standard produces a concentration of formula-based income maintenance payments in that direction. For that reason the Lampman-Green poverty line formula gives greater benefits to small families than does the EX-MSD Plan, while the EX-MSD Plan provides greater benefits to the aged.

Any plan that provides benefits on a standard that deviates from a true subsistence line will give some aid to the near-poor. However, such spillover of benefits may be associated with greater administrative simplicity, reduction of disincentives, and greater acceptability of the formula-based plan. In addition, if the rate of transfer is low, the aggregate amounts paid to the non-poor may not be large (see Table 2).

We anticipated that gradation of transfers could be used to concentrate benefits at various levels of poverty. A plan that focuses on the extreme poor will cost less than a flat rate plan that provides the same benefit at a zero level of income. Conversely, a plan that provides the greatest benefits to the marginal poor costs more than the flat rate plan that provides equal benefits to those with no resources. This latter plan has some interesting anticipated consequences, however. Large families

with spouse and young children appear to benefit most. This may be socially desirable. Unfortunately, the plan does imply substantial discontinuities in the rate of taxation of additional income just above and just below the poverty line. Those in extreme poverty are taxed at a low rate on any increments to their earnings.

Theoretical Framework for Formula-Based Plans

The Appendix to this paper presents an analytical framework within which it is useful to discuss all formula-based income maintenance and the associated finance problems. While we have not done so here, the framework can be extended to discuss universal per capita grants, the present rent subsidy legislation, and family allowances. In all these programs, increased transfers must be financed with increased taxation so that the effects can be visualized as some standard payment with income offsets just as in the Income Gap or EX-MSD plans. The disposable income estimates in Tables 10-13 are based on 1959 tax rates and law. In effect this implies that formula income maintenance could have been financed by an increased deficit. This assumption would not hold for later full-employment years.

Policy Uses of the Simulation

The data presented in any of the tables that use a flat rate plan can be adjusted to show benefits under alternative rates. For example, in Table 5 the first column is actually 25 percent of the average unused exemptions and deductions of each age group; doubling the rate simply doubles the average benefit shown in the column. Column 2 is 28.5 percent times the average poverty-income gap of the family and can be adjusted in the same fashion.

The simulation indicates clearly that substantial additional costs are associated with use of the adult unit as the unit over which benefits are calculated (see Table 5). The cost could possibly be reduced by imputing income to those who share living arrangements with others. The simulation results presented show true costs only if families do not respond to the value of "transfer splitting" that results from large initial payments to the first member of a household and smaller payments to succeeding members. To the extent that families do respond to that incentive, costs will move to the same level as was simulated for adult units. As we have not incorporated available evidence on undoubling of families in response to income, policy makers will need to judge whether the savings in costs are worth the inequity that results from some families receiving greater benefits than others merely because they are willing and able to rearrange their housing.[18]

The cost and inequity spillover to the non-poor of a program based on adjusted gross income must also be weighed subjectively against the likely effect of alternative rates of transfer on work effort. This simulation provides only either a dollar measure of the difference in cost between two programs using the same rate and different measures of resources, or, alternatively, the difference in rates required for equal cost programs.

Lastly, the results constitute food for thought on the desirability of graduating rates. Arguments can be adduced for either lower-than-average rates to the extreme poor or higher-than-average rates to the extreme poor. The likely work effort effects of grants at different levels of poverty would appear to be an important consideration in the

choice of gradations; again we can offer no solution but can illustrate the distributional impact of benefits under whatever program is desired.

Summary of Distributional Effects

Table 14 summarizes several aspects of the formula income maintenance payments simulated. The distribution of such payments according to the extent of the income deficiency of the adult unit is shown separately for units headed by an employed person and for all others. Differences in the distribution of payments among the poor and the spillover to the non-poor are indicated in columns 3 and 4 of the table. Columns 5 and 6 provide estimates of the Federal taxes paid by the poor. (Income taxes were simulated without a minimum standard deduction option, per 1959 law, which partially accounts for the positive tax liabilities for units with a poverty-income gap.) The mean social security benefits reported by adult units give some indication of the extent to which social insurance aids the poor, while the last column shows the amount of money income to which formula income payments would be added.

Among the employed one can infer that a poverty gap beyond $500 results from increasing requirements rather than from decreasing resources. Among the non-employed a somewhat greater drop in income occurs as the poverty gap rises to $2000, suggesting a combination of more mouths to feed and fewer resources. Clearly social security plays a major role in maintaining income levels for the small non-employed family, a larger role than is suggested by public noncontributory transfers shown in Table 10. Equally clear, a program of modest cost and low rates of transfer will not eliminate income deficiencies, nor will it obviate the need for support from existing transfer programs.

Table 14

Simulated Formula Income Payment to Poor Adult Units: Mean Poverty Income Gap, Mean Payment under Income Gap Plan, Social Security Tax and Benefit Federal Income Tax Liability, and Disposable Income within Labor Force Status and Size of Poverty Income Gap 1959

Labor Force Status of Adult Unit Head 2/	Poverty Income Gap	Distribution of Income Gap (percent)	Amount of Payments		Average Social Security Tax	Average Federal Tax Liability	Average Social Security Benefit	Total Money Income less Estimated Federal Taxes 3/
			EX-MSD Plan (25% Rate)	Income Gap Plan (23% Rate)				
Employed	$ 0	81%	$ 1	$ 0	$104	$783	$ 22	$6315
	1-500	5	47	57	38	8	68	2029
	501-1000	5	139	165	26	1	20	1430
	1001-2000	6	342	331	22	0	16	1292
	over 2000	3	838	664	20	0	11	1325
Mean (Employed)	$219	100%	$53	$50	$89	$632	$24	$5389
All others 1/	$ 0	33%	$ 11	$ 0	$35	$249	$523	$3988
	1-500	12	93	39	7	4	463	1494
	501-1000	18	182	177	4	1	245	927
	1001-2000	35	287	323	3	0	49	325
	over 2000	3	691	593	8	0	14	770
Mean (all others)	$730	100%	$167	$168	$15	$82	$288	$1790
Aggregate cost			$5.6	$5.5				

1/ Include unemployed, retired, student, housewife, never worked, disabled and not working, and status not ascertained.

2/ At time of interview in March and April, 1960.

3/ Total money income less estimated Federal income and payroll taxes.

APPENDIX

Mathematics of the Formula Payment Program

Notation:

N = amount of formula payment

t = transfer rate

Y = resources

B = poverty standard

S = family size

E = earnings

R = transfer income

A = annuity value of assets

X = tax liability

D = disposable income

a, b, c are constant

Identities:

$$Y_1 = E + R + A, \quad Y_2 = E + R, \quad Y_3 = E \qquad (1)$$

$$D_{ijk} = Y_2 + N_{ijk} - X \qquad (2)$$

For all programs

$$N_{ijk} = t_k (B_j - Y_i) \quad \text{if } B > Y \qquad i = 1, 2, 3 \quad j = 1, 2 \qquad (3)$$
$$= 0 \qquad\qquad B < Y \qquad k = 1, 2$$

The subscript i refers to alternative income concepts; j refers to alternative poverty standards; k refers to alternative rate schedules for the income maintenance payment.

For both the EX-MSD and the income gap plan

$$B_j = B_j (S) = a_j + b_j S \qquad j = 1, 2 \qquad (4)$$

For a plan with graduated rates

$$t_1 = t_1 (B_j - Y_i) \qquad j = 1, 2 \quad i = 1, 2, 3 \qquad (5)$$

Otherwise in a flat rate plan

$$t_2 = C \qquad (6)$$

Some insight into disincentives can be obtained by taking derivatives of N_{ijk} with respect to Y_i and differences with respect to family size S.

For example,

$$\frac{\partial D_{2j2}}{\partial E} = \frac{\partial D_{2j2}}{\partial R} = 1 - t$$

or disposable income increases by only a fraction of earnings or categorical assistance payments.

Given the form of B_j, if $a_j \neq 0$, then it is clear that dissolution of a family of S members into two sub-families sizes S_1 and $S - S_1$ will be advantageous. The family payment will be

$$N_{ijk}^{(f)} = t_k (2a_j + b_j S - Y_i)$$

If a_j is sufficiently large the difference between $N^{(s)}$ and $N^{(f)}$ may induce family dissolution. However, if the formula transfer formula recognizes S as the appropriate administrative unit the form of living arrangement will not effect the amount of the payment. $N^{(s)}$ will be paid in any case.[19]

NOTES

[1]"Current Operating Statistics," Social Security Bulletin, Vol. 29, No. 3 (March 1966), pp. 279-301.

[2]Milton Friedman, Capitalism and Freedom (Chicago: University of Chicago Press, 1962), pp. 191-194.

[3]Robert J. Lampman, "Prognosis for Poverty," National Tax Association, Proceedings of 57th Annual Conference (Pittsburgh, September, 1964), pp. 71-81; Christopher Green, Transfer-by-Taxation: An Approach to Improved Income Maintenance, a conference monograph prepared for the Brookings Institution Studies in Government Finance (June 9-10, 1966).

[4]James Tobin, "Improving the Economic Status of the Negro," Daedalus Vol. 94 (Fall, 1965), pp. 889-895.

[5]Edward Schwartz, "A Way to End the Means Test," Social Work, Vol. 9 (July 1964), pp. 3-12; and Robert Theobald, Free Men and Free Markets (New York: C. N. Potter, 1963), pp. 192-197.

[6]When Social Security legislation was enacted in 1935, Aid to the Blind, Aid to the Permanently and Totally Disabled, Old-Age Assistance, and Aid to Families with Dependent Children (originally ADC) were all extended to those families in which the primary (and often the only) breadwinner was incapable of finding remunerative work in the labor market or was prevented from leaving the home to seek work. General assistance was extended to other claimants for relief, but was locally financed and typically extremely limited in duration and scope.

[7]Lenore A. Epstein, "Income of the Aged in 1962: First Findings of the 1963 Survey of the Aged," Social Security Bulletin, Vol. 27, No. 3 (March 1964), p. 3.

[8]Robert J. Lampman, "How Much does the American System of Transfers Benefit the Poor?" Madison, Wis., Institute for Research on Poverty, Reprint 6, 1967.

[9]Martin David, "Incomes and Dependency in Coming Decades," American Journal of Economics and Sociology, Vol. 23 (July 1964), pp. 249-268; and Robert Lampman, "Approaches to the Reduction of Poverty," Papers and Proceedings of the American Economic Association, Vol. LV, No. 2 (May 1965), pp. 521-529.

[10]The sample is thoroughly analyzed in J. N. Morgan, M. H. David, W. J. Cohen, and H. E. Brazer, Income and Welfare in the United States, (New York: McGraw-Hill), 1962.

[11]See, for example, M. David, "Design of Simulation Models of the Household Sector," Madison, Wis.: Social Systems Research Institute, Household and Labor Market Workshop Paper 6503, August, 1965 (presented before the First World Congress of the Econometric Society, September, 1965).

[12]See Harold W. Watts, "The Iso-Prop Index: An Approach to the Determination of Differential Poverty Income Thresholds," The Journal of Human Resources, Vol. II, No. 1 (Winter, 1967), pp. 3-18.

[13]Mollie Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin, Vol. 28, No. 1 (January, 1965), pp. 3-26.

[14]This would not be technically possible if support payments and income-in-kind received by the dependent were fully reported and included in total money income. It is unlikely that such reporting could be easily enforced.

[15]The problem is identical to the income-splitting problem under current Federal tax law. For an excellent discussion see L. Johansen, Public Economics (Chicago: Rand McNally, 1966), pp. 281-282.

[16]Some qualifications are in order. The dependent and the supporting units may prefer doubling up to other housing arrangements. For example, unmarried sisters may prefer living together. One assumes responsibilities for keeping house and the other earns income. In that case lack of income earned by the "dependent" sister does not necessarily imply inability to maintain herself out of poverty. In the data used here some imputed income from food and housing has been assigned to the dependent adult unit. However, the amount assigned is not included in the total money income measure as it could not easily be used as the basis for a formula transfer.

[17]Possibilities arise for increases as well as decreases in work effort in response to changes in the transfer rate. One of the authors is in fact attempting estimates of potential changes in work effort in the context of a work-leisure choice model. See Jane H. Leuthold, "Formula Income Transfers and the Work Decision of the Poor: An Application of a Work-Leisure Choice Model," Unpublished (forthcoming) Ph.D. Diss., University of Wisconsin, 1967.

[18]Some estimates of these disincentives are included in Morgan et al., Income and Welfare in the United States, Chapter 14.

[19]See L. Johansen, op. cit., pp. 224-225, for an interesting illustration from the Norwegian income tax structure.