117-72

INSTITUTE FOR RESEARCH ON POVERTY

The Effect of Income Maintenance Laws
On Fertility in the United States

Glen G. Cain

DISCUSSION PAPERS

THE UNIVERSITY OF WISCONSIN–MADISON, MADISON, WISCONSIN

THE EFFECT OF INCOME MAINTENANCE LAWS ON FERTILITY IN THE UNITED STATES

Glen G. Cain

A modified version of this paper was prepared for the President's Commission on Population Growth and the American Future. It is also part of the on-going research project at the Institute for Research on Poverty on the effects of income maintenance laws on fertility. The appendices to this paper are printed separately as Institute for Research on Poverty Discussion Paper 118-72 and are available to those interested in the detailed tabulations and calculations underlying the summary tables in the paper. The research reported here was supported, in part, by funds granted to the Institute for Research on Poverty at the University of Wisconsin pursuant to the provisions of the Economic Opportunity Act of 1964. The author wishes to thank Robinson G. Hollister, Swarthmore College, and Joseph Small, Mathematica, Inc., for their advice and assistance. The author has also benefited from discussions with the late Ritchie Reed. The opinions expressed herein are the sole responsibility of the author.

April 1972

ABSTRACT

The potential effects of income maintenance laws on fertility are examined in terms of an economic model, and some rough estimates are offered of the quantitative magnitudes of these effects. The type of income maintenance law examined is a version of a negative income tax, like the Family Assistance Plan, and the first part of the paper discusses the ways in which such a program might influence the incentives to have additional children. On the basis of a priori reasoning, scattered empirical evidence, and the author's judgment, the paper develops several arguments for a presumed pronatal effect of such programs. First, the increases in income for families receiving benefits will enable them to afford more children. Second, the direct cash assistance which is forthcoming for each additional child lowers directly the costs of raising the child. Third, the disincentives to work because of the decline in transfer payments as earnings increase--effectively a tax on earnings or a cut in wages--may encourage the wife to stay out of the labor force and substitute the production of home goods for market goods; when she does this, the result may be more births. Finally, some discussion is made of the potential pronatal effects of various income in-kind subsidies, like day care subsidies. The final part of the paper attempts to quantify the effect of these changes in incentives on fertility. The data and models used are imperfect, however, and this exercise may be more valuable as an exposition of methodology than as a statement of a set of accurate estimates.

Income Maintenance Laws and Fertility in the United States

I. Introduction and Summary

A recurring theme of this paper is the inadequacy of existing empirical evidence and scientific analyses for predicting the effects on demographic behavior of a program like the Family Assistance Plan, which extends children's allowances to husband-wife, low-income families. It is because of these fundamental limitations in data and theory that a great deal of effort is devoted in this paper to a priori reasoning about demographic effects of these laws and to the marshalling of a large amount of statistical information to help determine what aspects of the economics of child rearing will be changed in important ways.

The United States, like all other high income nations, has various laws providing income guarantees and income supplements to certain categories of families with children. The laws provide, in effect, children's allowances and, as such, offer incentives to fertility. Currently the main group of families affected are female-headed families with incomes below a state determined poverty line which varies widely among the states. The laws will soon be extended to a wider population of families and modified in various ways which are likely to increase the pronatal incentives.

Programs which provide children's allowances constitute the prime example of a shift in the costs of raising children from (some) parents onto other persons (some of whom may be parents). Indeed, in no other aspect of economic policy does the government so directly affect fertility. A study of population policy in or for the United States would not be

Families with a father present and families with working members will be covered. Furthermore, the coverage is likely to extend to families in higher income ranges, as the programs become more generous over time--a point discussed later.

Another reason for not analyzing the fertility effects of AFDC is that it has been and is bewildering in the variety of benefits allowed and in the rules for eligibility among the fifty states and over time. The recent Presidential Commission on Income Maintenance Programs stated bluntly that: "There are no data to indicate directly the relationship between welfare payments and family size."[2] The commission report did suggest, however, that the "indirect evidence," mainly in the form of comparisons with nonwelfare and nonpoor families and by comparisons across states, did not support a positive relationship. In the light of the conditions for being on welfare--abject poverty and an absent father--this is not surprising. Moreover, we should note that among states there is a negative association between ruralness and low socio-economic status of the population on the one hand and the level of generosity of welfare payments and coverage on the other hand. This relation militates against observing a positive relation among states between the level of generosity of welfare and fertility, since low payment states are likely to be the poor rural states that would have high fertility independent of welfare programs. I would judge that the experience of the AFDC program regarding fertility effects has not been analyzed with sufficient care to permit any conclusions.

The experience of other nations is similarly unhelpful in attempting to predict the fertility effects of existing or proposed IMLs in the U.S. One problem is that the payment levels in other nations are substantially

below the amounts that would be paid in the U.S. (with the possible exceptions, recently, of France and Belgium). Another is that the plans are administered quite differently regarding who is eligible and how the income status of a family affects its payments. As will be discussed below, the reduction in payments as income rises is a feature of the plans (like FAP) proposed in the U.S. that has a special importance in potential effects of fertility. Finally, most scholars who have examined the effects of children's allowances in other countries have concluded that too many other conditions were changing over time and that each country's experiences are too different from one another's to permit valid measurements of these effects.[3]

In the absence of useful evidence from the experience with children's allowances in this or other nations, the assessment of the fertility effects of IMLs consists of a priori predictions based on a consistent theory and supported by available indirect evidence. It is argued in this paper that the IMLs such as FAP will produce changes in the incomes of families, in the direct costs of children, and in the effective wage rates of family members (especially the wife) which may all be presumed to be pronatal.

The increases in income for families receiving benefits enables them to afford more children. The direct cash assistance which is forthcoming for each additional child directly lowers the costs (or, alternatively, raises the benefits) of raising the child. So do most of the income-in-kind provisions commonly advocated, such as Medicaid, housing subsidies, and subsidized child care. Finally, the disincentive to work because of the decline in transfer payments as earnings increase--effectively a tax on earnings or a cut in wages--may discourage the wife from entering the labor force; the result may be more births.

To amplify the last point, consider that an important cost of the mother's time in raising children is the earnings foregone--at least for the vast majority of women who engage in some market work in their adult life. This cost is reduced by the IML. Since her labor market time is no longer so valuable, she may shift to the production of more home goods, like children.

Two types of IMLs are examined in this paper--FAP and a somewhat more generous plan which, it is argued, will probably evolve from FAP. Under FAP a family of two adults and two dependent children would be eligible for $2400 in annual payments if it had no other income, and an additional child would increase its benefits by $400. The marginal tax rate on earnings of the family's adult members, which is the amount by which transfer payments decline as income rises, is 67 percent. The more generous plan provides a guarantee of $3000 for a four-person family, allows $650 for a third child, and has a 50 percent effective tax rate on additional income. It is estimated in this paper that the incomes of low income families will be increased by 20 percent on the average and that the costs of raising a child will be reduced by about 45 percent by the IML. The two plans analyzed do not differ much in these respects. The reduction in the costs of children under FAP is, however, predominantly attributable to the reduction in the value of the labor market time of the wife and less due to the direct cash payments. The opposite is true of the more generous plan.

It is roughly estimated that the combination of income increases and cost reduction of the above magnitudes will produce an increase in fertility of around 15 percent for low income families. The number of children ever

born might increase, therefore, by about .5 children per family. This appears to be a small, but certainly nontrivial, increase in the completed fertility of low income parents, with various effects on the long run social and economic status of the families than can only be guessed at.

There is little doubt, however, that the effect of an increase in fertility of this magnitude on the part of poor families will have only slight and insignificant effects on the fertility rates in the total population, since (in 1969) husband-wife families covered by IMLs constitute only about 10 to 20 percent of the total number of husband-wife families. The number of families covered by FAP is estimated to be about 3.5 million, but 1.5 are single-parent (female-headed) families. About $3.6 billion in benefits would be paid, although the exact amounts paid to female-headed families depends on the way in which the welfare payments currently being paid out through AFDC are calculated. The more generous IML examined provides benefits to about 7.0 million families. Almost 5.0 million were husband-wife families. The transfer payment costs of this latter plan amount to $8.4 billion. (The costs are based on a static picture in 1969 and assume no change in income or family size of the recipients.)

I conclude that the fertility effects of an IML are significant and deserve further study, but that they do not appear to be large enough to justify opposing this type of reform by those who feel strongly about population growth. Even accepting the most "pessimistic" assumptions about the response by the poor to an IML in the form of extra fertility, we should keep in mind three points: (a) the fertility rates of the poor (like that of the nonpoor) have been declining recently and improvements in birth control usage will operate to maintain this trend; such improvements permit a reduction in "unwanted births," which are more prevalent among the poor;[4] (b) the number of poor people is declining over time, so

fewer people will be receiving payments (or large payments); (c) among the current poor, the likely improvements in the children's health, education, and other effects of an upbringing in a better economic situation, may bring about a reduction in their fertility behavior when they become parents in the next generation.

Given a general commitment to an IML like FAP, there are several policy recommendations that could be made in the face of the pronatal biases. If all childless poor families were eligible to receive benefits, the "first baby bonus" would be eliminated. Another way to diminish birth bonuses is to make payments for children rise with their age and decrease with their parity. Greater emphasis could be given to substituting cash benefits for those income-in-kind subsidies that are pronatal, such as housing and other goods and services complementary to children. The in-kind subsidies to family planning service would, of course, generally be antinatal and can be justified on the grounds of permitting parents more control over their own destiny as well as from the standpoint of reducing fertility incentives. Finally, the implicit tax on earnings from market work should be kept as low as financially feasible to avoid the employment disincentive for the wife.

The policy recommendations, like the other summary statements made in this introductory section, are developed in greater length and, in some instances with more qualifications, in the following four sections. Let me repeat that the purpose of this paper is to examine the effect on fertility of the type of IMLs which are likely to operate in the United States in the coming years. In Section II a general description of an IML will indicate the ways in which fertility is affected. Special attention will be given to subsidies to child care services, which are a common provision of the laws currently proposed. A theoretical framework

for analyzing the fertility effects of an IML is given in Section III. The theory has, in fact, a wider application to the structure of incentives to fertility among nonpoor families with incomes above the level of eligibility for income supplements. Section IV provides some empirical, quantitative estimates of the variables and parameters relevant to the analysis. In the final section of the paper some policy recommendations are suggested.

II. Features of Income Maintenance Laws that Affect Family Size

A. A General Description of the Relation Between Family Size and Cash Benefits of IMLs.

The Family Assistance Plan (FAP) proposed by President Nixon offers a prototype of an IML which is likely to prevail in the United States in the coming years.[5] It has gone through several revisions in the House and Senate, but the current version, H.R. 1, is basically similar to Nixon's proposal.[6] It reforms the existing welfare system by providing a federally-financed income guarantee and by extending cash transfers to the working poor. FAP is basically designed to aid poor families with children who are either under 18 years of age or who are 18 to 21 and in school. A family's income and size principally determine its FAP benefits. Income transfers are a maximum when family income is zero, and the transfers are reduced as income rises. The larger the family size, the higher are the benefits for any given income below the level of eligibility and, as shown in Table 1, the level rises with family size. Each of the first two adults in a family with dependent children is entitled to an income guarantee of $800 per year, $400 for each of the first three children, $300 each for the next two, $200 for the sixth child, and zero thereafter.

These amounts would be paid to a family with no other income. Thus, as shown in Table 1, a family of four, two adults and two children, would be eligible to receive $2400 per year.

In all liklihood the income guarantee, and therefore the breakeven level (the point at which income transfers are reduced to zero), will be periodically revised upwards to allow for rises in the cost of living. In addition, the level will undoubtedly rise in terms of "real income" as the generosity of the benefits expand after the initial passage of the bill establishes the principle of income maintenance for all families. Median family income has been rising in real terms at about a 2 percent annual rate per year, and the poverty line--always a relative income concept to some extent--will surely be tied to the average growth rate to some degree. Another source of pressure to raise income eligibility levels are the higher breakeven points for families receiving welfare in the largest states. Since the desire to replace the existing welfare system is a powerful motive behind FAP, there will be persistent pressures to raise FAP benefit levels to the point where they can replace welfare without making current welfare recipients worse off.

Table 2 illustrates an IML, modeled after FAP but with higher benefit levels, which reflects the probable increases in the near future. The income guarantee is $850 per year for each of the first 2 adults with a declining scale for each additional child beginning with $650. The schedule of benefits for families of different size and with no other source of income is shown in Table 2. The tax rate is assumed to be 50 percent, lower and more generous than FAP's 67 percent. Throughout this paper I will refer to the plan shown in Table 2 as the "Generous IML" to distinguish it from FAP.

TABLE 1

Family Size, Income Guarantee Amount, and "Breakeven" Income Level (where Payments are Reduced to Zero) in the May, 1971, Version of the Family Assistance Plan

Family Size	Amount for additional child	Income Guarantee	Breakeven Level*
2 (one adult)	400	1200	2520
3 (two adults)	400	2000	3720
4 "	400	2400	4320
5 "	400	2800	4920
6 "	300	3100	5370
7 "	300	3400	5820
8 " or more	200	3600	6120

Note: The amount of cash benefits is determined by the formula:

$$P = G - 2/3\ (Y - 720)$$

Where P equals the annual benefit payment, G equals the guarantee shown in column 2, and Y equals the family's other income, then with a 2/3 tax rate and a "disregard" or "set-aside" of the first $720.

*The breakeven level of income is determined by solving for Y when P = 0 and the guarantee is specified by family size.

It is important to understand that these guarantee levels are not the same as the income levels determining eligibility for the receipt of some amount of cash benefits. A basic reform provided by FAP is to permit families to retain some fraction of their cash benefits when family income or earnings is or rises above zero. In the simple plan illustrated in Table 2, benefits are reduced by 50 percent of the amount by which income from other sources (such as wage or salary earnings) increases. Under this plan, benefits would be reduced to zero when income from other sources reaches twice the guarantee level. (See column 3 of Table 2.)

The reduction in benefits operates as an implicit tax on earned income; the higher the reduction, the higher is the implicit tax. In the case of a dollar reduction in benefits for each dollar increase in earnings, the implicit tax on earnings is 100 percent. The reform, which allows a partial rather than a full reduction in payments greatly increases the number of families covered by the IML because it raises the income point at which benefits are reduced to zero. Furthermore, more families are concentrated in the bracket between, say, $4000 and $8000 than in the 0 to $4000 bracket. Note that the number of families brought under coverage rises not only when the guarantee levels rise but also when the implicit tax on other sources of income declines. If the tax were one-third instead of one-half, the breakeven level for a family of four would rise from $6000 to $9000, and families in this income bracket would be brought under the coverage of the plan.

The costs of bearing and raising children are reduced by an IML in a direct way by virtue of the income allowance payment. A family with no other income would receive up to $400 per child under FAP and up to $650 per child under the Generous IML. Indeed, for any level of income that

TABLE 2

A More Generous Income Maintenance Plan than FAP

Family Size	Amount per additional child	Guarantee at Zero Earned Income	Breakeven Point*
2 (one adult)	650	1500	3000
3 (one adult)	650	2150	4300
3 (two adults)	650	2350	4700
4 "	650	3000	6000
5 "	650	3650	7300
6 "	500	4150	8300
7 "	500	4650	9300
8 "	400	5050	10100
9 "	300	5350	10700
10 "	200	5550	11100

Note: The amount of cash benefits is determined by the formula:

$$P = G - 1/2Y$$

Where P equals the benefit payment, G equals the guarantee shown in column 2, and Y equals the family's other income.

*The breakeven level of income (when P = 0) is simply equal to twice the guarantee.

falls under the breakeven level, the increase in cash payments for an additional child would be $400 under FAP and $650 under the other plan. Thus, a family of four with two children and with $3500 in annual income would receive $547 in FAP payments or $1250 from the Generous IML.[7] Each child may be said to receive an average benefit of $136 (= $597/4) or $310 (= $1250/4) in the two plans, respectively, although if any one child were to leave, the cash benefits to the family would decline by $400 (in FAP) or $650. Similarly, a new (third) child would add these amounts, $400 or $650, to the family's benefits.[8] In the rest of the paper I will deal only with the concept of marginal benefits (or additional cash transfer payments) associated with changes in the number of children.

Table 3 shows the number of families eligible for the plans in the U.S. in 1969 and the amounts of cash benefits, under the assumption that the families' earnings, income from other sources, and family size would be the same with the program as without. In other words, no change in behavior as a result of the IML is allowed for in the calculation of this static picture. (The details of the calculations behind the summary information in Table 3 are given in Appendix A, Tables A.2-A.13.) Several points are noteworthy. One is that the costs of FAP, $3.6 billion, appear quite small in the light of the current expenditures for welfare in the United States, which are on the order of $30 billion.[9] The second is the sharp increase in costs for the Generous IML, which more than double despite the modest increase (by 25 percent) in guarantee levels (from $2400 to $3000 for a family of four) and modest reduction in tax rates (from 67 percent to 50 percent). This shows the sensitivity of the numbers of families covered to the higher breakeven levels of the Generous IML. The

number of families rises from 3.5 million to 7.0 million, and the costs of the program rise accordingly.

Another point, which is highly relevant to the issue of fertility effects, is the sharp increase in the number and proportion of husband-wife families among the covered population in moving from FAP to the Generous IML. They constitute 71 percent of all families in the Generous IML and only 59 percent of the families in FAP. This reveals the relatively high proportion of female-headed families in the lowest income categories, or, conversely the lower incidence of husband-wife families in the lowest income categories. The desired objectives of increasing the generosity of FAP by raising the basic income guarantee and by lowering the implicit tax rate will mean that, increasingly, large numbers of husband-wife families will face the pronatal incentives that are described in this paper.

One intriguing pronatal incentive of FAP is the so-called "first-baby bonus," which refers to the fact that married couples (or single persons) with no children are ineligible for any FAP benefits until or unless they have a child by birth or adoption. A childless married couple becomes eligible for a $2000 annual guarantee upon having their first child. A single female becomes eligible for a $1200 annual guarantee if she obtains a child, and if she married someone before or after the birth, the new family is eligible for $2000. Of course, very few married couples or single people have zero income, so most eligible families would receive less than the full guarantee. However, they would be eligible for some amount of transfer payments if their incomes are less than $3720, which is the breakeven level for the two-adult, three person family. Moreover,

TABLE 3

Numbers of Families Covered and Projected Benefit Payments of FAP and the Generous Income Maintenance Law, U.S., 1969

	FAP	Generous IML
Number of Families*	3,538	7,003
Husband-wife families	2,087	4,974
Female-headed families	1,451	2,029
Number of Persons*	16,278	34,511
Husband-wife families	10,539	26,212
Female-headed families	5,739	8,299
Total Amount of Benefits Paid#	$3,607	$8,405
Husband-wife families	2,129	5,669
Female-headed families	1,478	2,736

Source: See Appendix A, Tables A.2-A.13 for sources and the detailed data underlying these figures.

*in thousands

#in millions

FAP provides options for subsidized medical care, day care services, training and other benefits; and these could raise the incentive considerably.

The number of childless married couples below the breakeven level is relatively small, however. As shown in Table A.1 of Appendix A, in 1967 only 181,100 childless wives aged 15-34 lived in families earning below the poverty line, which was approximately $2000 for a two-person family. By contrast, there were 1,388,000 childless single women aged 15-34 (over 1 million of whom were 15-19) living in families below the poverty line. Another 1,760,100 wives, aged 15-24 and childless, lived in families above the poverty line, but perhaps a sizeable fraction of these young couples earned less than $3720, which would make them eligible for some FAP payments <u>if</u> they had a child.

It is impossible to tell how many of these women would respond to the "first-baby bonus." Perhaps several hundred thousand have sufficiently low incomes and look favorably enough on the prospect of motherhood to make the incentive relevant. Among those that would respond positively, perhaps the only effect would be a change in the <u>timing</u> of the first birth. Although an earlier birth would leave the woman susceptible to the risk of more pregnancies in the remaining years, it is questionable whether the completed cohort fertility would be much affected.

The mention of single women in the foregoing discussion raises the issue of the IML's incentives to marriage--or, more realistically, to an <u>earlier</u> marriage (since a some-time marriage is nearly universal among U.S. women). An increase in completed fertility could result from earlier marriages, since here again the wife would face more years of the risk of

pregnancy. As birth control becomes increasingly effective, however, this source of higher fertility levels should be minor. It is also true that any lowering of the mean age of childbearing has a "mechanical" effect operating to increase the rate of population growth, but this is a small effect in a population that has as low mortality and low fertility as the U.S. (Of course, what is considered a small effect to one person may not be small to another. A brief discussion of the relation between the age of childbearing and the rate of population growth, but this is some quantitative estimates, is given in Appendix D.)

B. The Tax on Income and Earnings from Work

Now let us examine how the costs of children are affected by the implicit tax the IML imposes on earned income. It is likely that the largest cost component in raising children is the cost of the mother's time. (See Section III.) We will refer to the time costs as indirect costs to distinguish them from the direct costs in the form of money outlays on food, clothing, shelter, medical care, and so on. Generally, we can measure the costs of her time by the wage she could earn in the labor market. If the market earnings foregone by a woman who stays at home to care for a child are, say, $3000 per year, then this amount should be added to the direct costs (minus the children's allowance payment) of child care in arriving at the total costs. Note, however, that with an IML the loss in $3000 would be offset by an increase in government transfer payments of $2000 (when the implicit tax is 67 percent) and by $1500 (when the implicit tax is 50 percent) for any mother whose family income is below the breakeven point. Thus, where the opportunity cost in terms of the "time-price" of children had been equal to the wage rate without an

IML, it is reduced to one-third (or one-half) the wage rate with the law for those wives in families with incomes below the breakeven levels.

As noted earlier, the most recent version of FAP, H.R. 1, specified a 67 percent tax on earnings in excess of $720 per year. (No tax is levied on the first $720 of annual earnings.) Actually, the real tax rate on earnings will be higher since the social security tax is 5.2 percent, a fee system for medical insurance operates as a tax, and, beyond a certain point, positive income taxes will begin to take effect. The current version of FAP generates a combination of taxes that raise the marginal tax to nearly 90 percent over certain ranges of gross earnings. (See Table B.1 in Appendix B.) Even the Generous IML will produce tax rates of 60 to 70 percent over wide ranges of incomes below the breakeven point of $6000 (for a family of four). (See Table B.2 in Appendix B.)

Thus, although the reduction of financial disincentives to work as compared with existing welfare laws was a highly acclaimed objective of FAP, the disincentives are still severe for those who had previously been on welfare--about 1-1/2 million families--and are both severe and new to the additional 2 million non-welfare families among the working poor. Consider that currently the working poor often pay no federal income tax because their earnings are below the tax exempt levels or, at higher income levels, pay rates of around 14 percent. (Of course, social security taxes add another 5.2 percent.) The increase to effective tax rates of more than 70 percent may prove to be jolting, and we can do little more than speculate about the disincentives to work that may result. In the context of this paper, however, we focus on the reduction in opportunity costs of having children.

Since there are various social pressures, as well as a work requirement in FAP, which will constrain the male head of the household to stay at work, it is likely that the negative work response to the disincentives will be most pronounced on the part of wives, older children, or aged family members who do not face the same constraints. The wife may decide that the rewards of market work are so low that staying home is preferable, and this decision may lead to bearing more children.

C. Subsidies to Child Care Services

To the extent that wives will choose to work despite the high taxes, they will generally continue to view children as a competing demand on their time. To this extent, bearing children will still carry the costs of foregone earnings. To work, despite the presence of children who need care, imposes on the mother the monetary costs of providing substitute care or the psychic costs of putting up with inferior substitutes. However, there are various provisions in FAP which seek to lower these costs.

FAP allows a deduction from income for costs of child care of up to $2000 for an employed mother, widowed father, or other guardian. If the implicit tax rate on income is 67 percent, then deducting the full costs of child care lessens these costs to the family by 67 percent with the federal and state governments absorbing the other 67 percent in the form of higher FAP and state supplemental benefits. A complete subsidy could be affected by allowing a deduction of the cost divided by the tax rate (e.g., a deduction of 1-1/2 times the costs under FAP or double deduction when the tax rate is 50 percent), with a specified maximum deduction, but this scheme would offer no incentives to spend less on child care than the maximum allowable. Mothers do have varying demands for child care costing different amounts, and the suppliers of child care

services are able to provide the services at a variety of prices. With full reimbursements of the costs, neither the demander nor the supplier has incentives to economize in the transaction and the result is an inefficient use of resources.

The extent to which day care is to be provided and the amount and allocation of the subsidy has profound implications for the costs of IMLs and, very likely, for the work and fertility decisions of women covered by the IML. These issues merit a detailed examination.

It is helpful to look at child care in the same terms we are accustomed to using in examining other components of an income guarantee plan. Thus, we can consider the value of child care services, which ought to be approximately equal to the costs of child care, as an income-in-kind transfer payment. Just as the basic cash guarantee is $2400 per year for a family of 4, child care may be viewed as providing, say, $1200 worth of annual services per child. Let us assume that a family of 4 has one child under 6 and that the parents take advantage of the subsidized child care services. Given the value of the service, how do we decide how to pay for its costs? If it is not to be the parents, how do we decide who among the parents receives the subsidy? Some criteria are necessary.

It is natural and proper in the context of an income maintenance program to make the child care services, like food stamps or medical insurance benefits, income conditioned. That is, the benefits of subsidized child care can be offered to all people below a certain income level and, most importantly, the amount of the subsidy can vary inversely with the income of the person, thereby declining as income rises to a breakeven point. The justification for this method of determining who is to receive the services is, briefly, in terms of spreading a limited amount of funds

to the most people and, in particular, to the most needy people. This argument holds for a static situation. In a dynamic context, i.e., a context in which people's behavior changes over time, the argument for graduating the subsidies inversely to income is to avoid or minimize incentives to people to reduce their incomes in order to qualify for the subsidy.

The way in which FAP benefits decline as income of the recipient family increases is well understood. If a similar method for allocating the benefits of child care services is used, then we can think of an income-conditioned implicit fee system for child care. Such fees constitute implicit taxes on income.

Viewed in this manner the problems of allocating child care services are all too familiar. A high "guarantee" of child care services requires, in general, a high breakeven income (the income where the benefit declines to zero), and thereby becomes very costly due to the large number of eligible recipients--families with young children and incomes below the breakeven point. Clearly, $1200 a year must be considered a high guarantee. (Note that it amounts to 50 percent of the cash guarantee. That a family is, in a sense, required to spend up to one-third of its income on one item is rather startling. If the amount of expenditures on the child care program exceeds $1200 per year per child, as many programs envision, then the implicit budget allocation imposed on the families becomes even more unbalanced.)

If a high breakeven is to be avoided, then a high implicit tax rate is required. As discussed above, and illustrated in Table B.3 in Appendix B, tax rates are already so high that adding yet another means of an income-conditioned system of fees for child care will further

erode the incentive to work or to obtain income from any source. If a high guarantee and low tax rates are simultaneously adopted (and, therefore, a high breakeven point), the costs to the public treasury of providing child care could run up to $20 or $30 billion. It is doubtful if Congress or the Administration is willing to spend this much, and the pressures to reduce the costs will probably lead to a system of rationing by non-income categories. Either this system of rationing works against the purpose of aiding the poor, or it sets up new types of incentives which resemble the "old" welfare system which FAP is intended to reform.

What then are some of the options available for dispensing child care? The commonest method for rationing child care involves the use of a work test regarding a "released adult" (which, for convenience, can be assumed to be the mother). There are several drawbacks to relying on a work test, however. One is simply that there are many poor families in which the mother is not currently a viable candidate for labor force activity but whose children nevertheless could profit greatly from good quality child care. Such families are likely to be poorer than families where the mother can work, especially if the husband is also working. It seems regressive to deprive the poorest families of subsidized child care.

Another problem concerns the potential "notch" effect which would be involved if the mother loses her job or had to quit working. Would she be cut off from her subsidy? If the answer is yes, but only after several months have elapsed, then could she simply get a job for one week after this elapsed time and then get a renewed grace period? The policing problem would be severe. There is also the question of what defines

work. Is working one hour a week, 10 hours a week, 20 hours a week, or 35 hours a week sufficient to be eligible for the subsidy? How many weeks per month or per quarter are required?

To the extent that fees are used to allocate child care, less reliance need be placed on the work test as a rationing device. But the fees are the source of the implicit tax rates. In an attempt to keep the implicit tax rates on the poor low, the Department of HEW has suggested plans in which no fees are charged for child care until the families reach the breakeven point for the income maintenance plan covering them. (Recall that the breakeven point for FAP is $4320 for a family of four.)[10] However, the inexorable arithmetic produces a very high breakeven point of around $10,000 for families of four persons. (See Table B.3 in Appendix B.) One unsatisfactory device to avoid having middle income families receive subsidies is to institute a notch such that a family must fall below it to become eligible, but then may rise above it without losing the subsidy. This will create glaring inequities since some families who have gotten "on the rolls" may be receiving the subsidy and yet have higher income than other families who are not receiving the subsidies because they never got on the rolls. It also creates a crazy set of incentives for families to drop temporarily just below the notch in order to get on the rolls. This system should be avoided and the way to avoid it is to start the taxes earlier and not have such a high breakeven point.

We need to understand that with child care subsidies, as with cash income or food stamp subsidies, there is no escape from an implicit tax. Basically the problem amounts to one of rationing the good, in this case child care, among a potentially large number of applicants. How severe this problem will be depends on the number and quality of the child care slots and the number of potential demanders for these positions. A recent

article by Nancy Hicks in the New York Times (November 30, 1970, page 1) indicates that the demand for slots is likely to be high. The article states that "there are more than 11.6 million working mothers in this country today, more than 4 million of these with children under six years old. However, only 640,000 licensed day care spaces are available. More than one-third of these are privately run." The Department of Labor in 1965 conducted a survey to determine the arrangements that 6.3 million working mothers made for their 12.3 million children under age fourteen. It found that only 15 percent of the children needed no special arrangements for their care because the mother worked only during school hours. About 45 percent of the children were cared for in their homes, usually by another relative, and 16 percent were cared for in someone else's home. Thirteen percent were watched by their own mothers during work, as it might happen in a family business. Nearly 1 million children or eight percent cared for themselves. Only about three percent of the children were cared for in group day care centers.[11]

The implication of the preceding discussion is that the supply of child care services is likely to be inadequate to meet the increasing demand in the foreseeable future. We should be willing to experiment with different fee arrangements and different levels of provision of child care services.

Thus, there are a number of unresolved issues in attempting to design a child care subsidy that will promote equity, incentives to work, and keep costs at a reasonable level. Whatever the design, the program would appear to lower the costs of bearing and raising children and thus be pronatal in its effect. Although I believe this appearance is correct, there is a natural tendency to think of ways in which subsidized day care is antinatal, on the grounds that it will foster career commitments which

would be competitive with childbearing. It may be worth developing the arguments by which this issue is analyzed.

Subsidized day care (sdc) clearly lowers the cost of working for a mother for any given number of children she has, and it lowers the cost of children for any given amount of market work she engages in. Conventional economics, as well as common sense, leads us to expect that for the wife with a fixed number of children (either desired or achieved) the reduced cost of work brought about by the sdc will encourage more work. Similarly, for the wife with a fixed commitment (desired or actual) to market work, the reduced cost of children will encourage more children.[12] Thus, we should expect, with these decision contexts, either the same number of children and more work or the same amount of work and more children--clearly, a net pronatal outcome.

Now let us consider a less restricted decision contest in which both the number of children and the time to be spent in market work (or career commitment) are simultaneously chosen. We can imagine that the wife views the options she has regarding the amount of market work and children as a set of discrete packages shown in Figure 1. The numbers refer to children, and a number follwed by a plus sign indicates children of "higher quality"--i.e., more resources of time and money are given them. The letters referring to a low, medium, high, or maximum commitment in time, training, and energy to a career of market work. The commodity-choice space is shown in Figure 1.

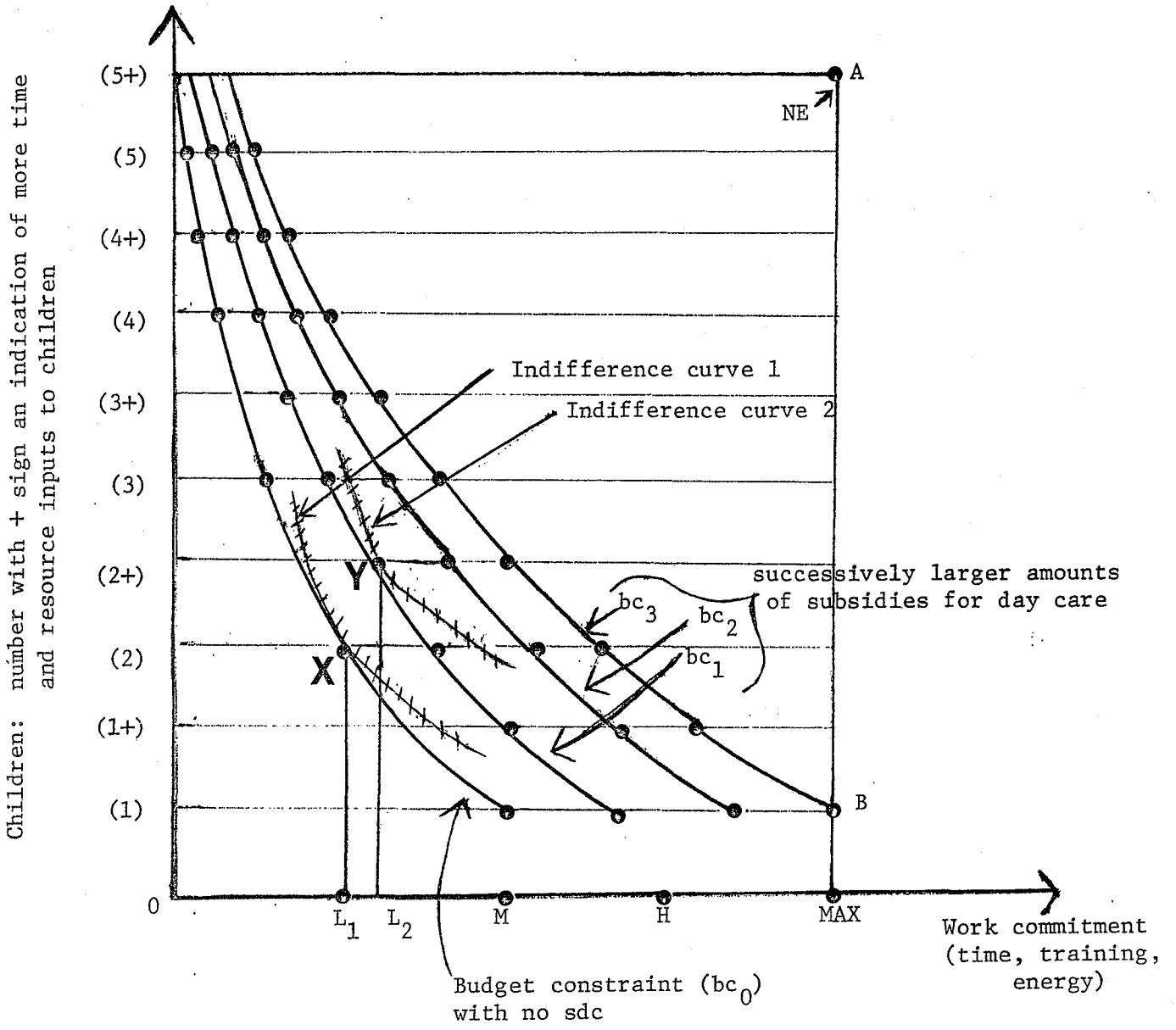
Now, with no budget constraints--if the wife had unlimited amounts of money--she could afford to have as many children as she desires (within the range of normal family sizes, at least) and pursue a career with a high

degree of commitment--a movement toward point A in Figure 1. (Of course, the location of point A will vary widely among women.) Realistically, however, the wife must sacrifice one or the other use of her time and resources--children or career. This constraint is shown by the budget curves (bc's), which show the attainable trade-offs for a wife with given tastes, abilities, resources, etc.[13] Note that with the initial budget constraint, with no sdc, she can attain (1, M), or one child and a medium commitment to a career, and (0, MAX), but nothing in between. A general and basic point which should be kept firmly in mind is that <u>the costs of attaining any given package are lower with sdc</u> (except for the zero children packages). If neither component of the package is an inferior good and tastes are unchanged, then sdc ought to produce a movement towards the northeast corner of the figure--towards more of both commodities or at least to a package in which no less of any component is chosen. In the example of Figure 1, the package chosen with no sdc is X, (2, L_1) and with the first level of an sdc, the wife chooses Y (2 +, L_2). Again, these types of moves would, on the whole, be pronatal.

How can this conclusion be reversed, without invoking the argument that children are inferior goods? It seems to me that some special shapes to the preference maps (or indifference curves) have to be imposed on the commodity-choice space shown in Figure 1. As the figure is drawn, the woman cannot achieve high-to-maximum commitment to work and have more than one child <u>without</u> subsidized day care. Perhaps she feels that although she would like to work full-time in a career, a strong desire for at least one child prohibits such a career commitment unless sdc at a level of 2 or 3 years were provided. Furthermore, without any

Figure 1:

Diagram showing trade-offs between children and market work, with varying amounts of subsidized day care



sdc and the "impossibility" of a full career (given the stronger commitment to at least one child), the woman prefers two children and a low commitment to market work. What I am leading up to is a situation in which the package of one child and a full commitment is like a new product that becomes available with the introduction of sdc. The sdc could produce, in effect, a discontinuous jump to a new commodity-choice space. If enough women had these types of preferences, the sdc could become antinatal.

It seems to me that wives who would normally have a high probability of being in poor families and covered by an income maintenance program, are not likely to make the "high intensity" career commitment that we might associate with, say, the woman Ph.D., artist, or entrepreneur. Thus, I doubt that an sdc would propel poor women from say, two or three, M or L, packages to, say, the (1,H) package.

A second possible discontinuity, which is less involved and perhaps more plausible, is that preferences or tastes of the wife would change in response to either the option for more market work (or the experience of market work) and would change in a way that would make her more market-work oriented. The women might become more career oriented after once being encouraged to work by the sdc. Or to consider a case that may be more relevant to a poor woman, she might become "addicted" to market goods, which would require a commitment to more market work and, perhaps, to fewer children--the encouragement to work by the sdc program gets the woman and her family "hooked on money." Finally, there is the possibility that the risk of accidental pregnancy is reduced when the woman has a commitment to market work. To all these possibilities, I would only suggest that we should retain a healthy skepticism of claims that such

nonrevolutionary changes as the introduction or expansion of sdc will have marked effects on peoples' values or preferences or tastes--some effects, yes, but really pronounced effects are dubious. Of course, once you entertain the notion that preferences are easily changeable in drastic ways, then it is easy to speculate on all manner of unexpected and unconventional consequences and outcomes. It seems to me that the burden of proof should be on the person who argues for such changes. Until his case is proven, I would assume that changes in taste will do little more than moderate the magnitude of the changes in behavior that "conventional theory" predicts.

D. Summary

The income maintenance programs that are soon to prevail in the United States will extend and strengthen the pronatal incentives that have always existed in a welfare system with children's allowances and sharp disincentives to work covering female-headed households. From the point of view of this writer, the general thrust of the reforms in bills like FAP are welcome and laudable. Nevertheless, the proper design and administration of such legislation, along with making further improvements, depends on knowing as much about the behavioral consequences of the law as is feasible with existing social science techniques of analysis. In focusing on fertility, we have noted the following pronatal features of FAP.

1. The extension of coverage to the working poor families with a male head present, a group most likely to have more children. The old incentive for the husband to desert his family in order to permit them to qualify for welfare benefits is nearly eliminated.[14]

2. Direct cash allowances that rise with the number of children.

3. A relatively large "first-baby bonus" (of $2000) to an indeterminant (but not a large) number of families without children, with a wife under 34 years of age.

4. Very high implicit tax rates on earnings, which will reduce the costs of having children by lowering the lost (or foregone) earnings of the mother who reduces the amount of market work she would otherwise perform.

5. Subsidized child care which lowers further the ostensible costs of children--costs in the form of a deterence to market work.

It should be noted for the record that there are other ways in which IMLs can (and probably will) affect the costs of children. Medicaid or some other form of subsidized health care lowers the costs of health care of children. Similarly, public housing priced below market costs or housing allowances to families lowers the cost of housing children. It is probable that the costs of education may be subsidized in various ways as well. We do not have good information on the nature, amounts, and administration of these various subsidies, nor on how important they might be as incentives to childbearing, so the analyses of these provisions will not be undertaken.

A quantitative measurement of the fertility effects of IMLs clearly depends on answers to the following questions:

1. What variables influence fertility behavior?

2. How will the values of these variables be changed by an IML?

3. What are the quantitative effects on fertility of the variables?

It will come as no shock to any reader to learn that we have very imperfect answers to each of these questions. The most careful and thorough study of each of these questions can only narrow the bounds on our ignorance. The first step is to choose or develop a model or theory which addresses the first question. This effort is made in the next section.

III. A Model for Analyzing the Effect of IMLs on Fertility

A. Economic Models: General Consideration

Economic theories of fertility behavior have in common with sociological and psychological theories, a focus on the household--the husband and wife, principally--as the decision-making unit. As theories from the behavioral sciences, all are intended to explain or predict variations in fertility behavior as a consequence of variation in societal and economic-environmental variables--variables which affect the psychological or attitudinal variables that define a state of mind prior to making a decision and taking action. Physiological factors, which are studied by the medical and biological scientists, are usually taken as "givens." For the economist, especially, the emphasis is on the decision or "choice" aspects of the model. This leads not only to a deemphasis of most physiological factors relating to fecundity or sterility but also of the "chance" factors in fertility behavior. Indeed, economic models should become increasingly relevant precisely because the advances in the effectiveness and acceptablility of birth control by parents has enlarged the deterministic part of the model and diminished the stochastic part.

In economic models of fertility, children are considered as entities which parents choose to have because of the pleasure or utility they derive

from them. It may or may not make any difference that the utility stems from satisfying desires to "propagate the race," from material goods obtained from children for the parents' use, or, to take a more contemporary view, from the psychic pleasures derived from the love and affection between parents and children. The effective demand for children, like that for any good or service that gives utility, is constrained by the household's income or budget. Children obviously cost a lot in modern industrial societies in terms of the expenditures on material goods (direct costs) parents make in their support and in terms of the labor time expended (the indirect costs). The income of the household and the prices of the goods and services necessary to bear and raise children are arguments in the function defining the household demand for children. If, in some particular context, the income and price variables are inoperative on fertility behavior--either because they do not vary or because their effects on fertility are zero--then an economic model would have little explanatory power.

It should be evident that an income maintenance law changes the income constraints of poor and near-poor households and changes also several specific "prices" of children. Children's allowances, in fact, carry both income and price effects. The nature of a "pure" income effect can be understood by imagining that a lump sum payment the size of a children's allowance was given each year to married couples <u>without conditioning the payment on the presence or number of children</u>. One question is, what is the effect of this "pure" income increase on fertility? When the transfer payment is tied to the presence and number of children, it affects the price of children in addition to the income of the household. The two effects can, in principle, be separated conceptually

and empirically. Other price effects are also generated. Recall that income maintenance programs change the price of the time of the parents by changing their effective wage rates in the market, and, furthermore, that prices of child care, medical care, and housing may also be directly affected by the program.

In an ideal experiment the effects of these variables could be measured by randomly selecting a population of households covered by an IML and randomly assigning different incomes and prices (or, as one mode, different income maintenance programs) to the households, including as one assignment a null set (or "no program") to comprise a control group. By following the families over their childbearing years, the effects of the variables, or of the specific programs, could be measured. In the absence of this sort of experiment it is necessary to rely on a mixture of a priori judgments and empirical evidence drawn from non-experimental sources to derive the signs and magnitudes of the effects of the variables. The remainder of this section of the paper deals with the extent and limitations of economic theory and empirical work to supply answers.

Without developing the formal apparatus underlying the propositions of economic theory, we can nonetheless summarize briefly, with varying degrees of certainty, the predicted directions of the effects of the variables. The pure income effect on the number of children is probably positive--parents will have, on the average, more children because they can afford more.[15] This is not a logical proposition but a judgmental one. Consider the contrary view. One argument for a zero effect of income is that social or self-imposed pressures raise the "price" of children in lock-step with income. No doubt such pressures exist but some positive effect is still likely. We do not believe that higher incomes have a zero effect on the quantity of cars purchased just because social pressures

may dictate that the most important income effect is on buying a higher quality car. If, however, children were considered an "inferior good," like shoe repairs or peanut butter, then a larger income would bring about a decrease in the quantity demanded. This situation does not appear to be the norm. Neither is the special case of a negative effect of income on fertility which could arise when wives do not have the option of working in the market. In this special situation a higher income could so shift the composition of household goods away from children (because they are so time-consuming) that fewer would be demanded with a higher income than with a lower income.[16] Since market work is a viable option over the childbearing years of nearly all women in the United States, this source of a negative effect of income does not appear likely either.

As mentioned in the previous chapter, the important price changes that an IML will bring about all appear to lower the direct or indirect costs of childbearing. Price effects, which include a substitution effect and an income effect, are always negative, except for rare circumstances which should not apply here. A negative substitution effect is axiomatic in economic theory: rational households shift away from goods that have become relatively more expensive to goods that have become relatively cheaper.[17] Thus, the price reduction stemming from a children's allowance is expected to have a positive effect on the demand for children (and this would be true even if the pure income effect were zero or mildly negative). The other price effects--the lower opportunity costs of the parents' time (especially the wife's), the lower child care costs, and so on, are all expected to be pronatal. No doubt, individual families could be found to respond in unexpected ways and some special situations could be thought of to change the predictions, but the general tendencies outlined above ought to prevail.

B. Estimating Relationships Derived from Economic Models

The theoretical discussion about economic models cannot, of course, inform us of the quantitative magnitudes of the relationsips to fertility of the various variables in the models. Unfortunately, there have been only limited attempts by economists to estimate these relationships. That there are formidable obstacles hindering these attempts with existing data will become evident in the following discussion of the steps necessary to apply the theoretical model empirically to measure the income and wage effects of IMLs on fertility.

Empirical economic research about fertility usually begins with the household's demand for children as a function of: (a) the income of the household; (b) the wage rates of the family members; (c) the prices of goods complementary with and substitutable for children; (d) the preferences of the household (parents) for children relative to other home produced goods, to market goods, and to leisure; (e) the fecundity of the parents, and finally; (f) the "technology" of birth control. This list, although not exhaustive, already imposes requirements which empirical data do not satisfy.

One simplification of the analysis is to restrict the variable representing the quantity demanded of children to completed fertility and thereby abstract over the complicated month-by-month or year-by-year pattern of decision-making. There are two serious costs of this simplifying restriction. One is the necessity either to wait for women to reach at least age forty or to use various proxy measures for completed fertility. A commonly used, but less than satisfactory, proxy is the "expected number of children." Another device is to hold constant the age of the wife and assume that the actual number already born will

be strongly correlated with the completed number. A second disadvantage of a focus on completed fertility is that the income, wage, price and other variables should then pertain to the entire span of childbearing years. In practice we seldom have measures of these variables for more than a single year, and such point-in-time measures must be assumed to represent their "lifetime" counterparts.

Still simplifying the model, let us assume that the only market wage rate relevant to the fertility decision is that of the wife. This implies several restrictions, most of which are fairly tolerable. One is that the husband's wage rate affects only the money income of the household, since he is assumed to do no housework, so his wage will not affect the household allocation between market work and homework. A second restriction is that the present and future earnings (or wage rates) of children are assumed to be irrelevant. This could be justified on the grounds that their earnings are negligible over the first 17 or 18 years of the child's life and, past that age, contribute solely to the welfare of the children-as-adults. The earnings of children after they become adults would, in any case, be so heavily discounted by the parents that the demand for children is unlikely to be affected. The final restriction is the implicit assumption that the homework productivity of the wife is not correlated with her market wage rate or with other variables included in the model finally arrived at for statistical testing and estimation. This permits us to ignore the home productivity or home wage, which is fortunate since it is one of several unmeasurable variables in the model. The importance of this last point will become evident below when we consider the difficult-to-measure preferences variable.

The model may now be summarized as follows:

$$F_i = F(Y_i, W_i, P_{1i}, P_{2i}, \cdots, P_{ki}, T_i, H_i, K_i) + e_i$$

where i is a subscript denoting the ith household

F_i = completed cohort fertility.

Y_i = family income, which equals husband's labor income, the nonlabor income of the household, and the wife's earnings.

W_i = the wife's (market) wage rate.

P_{ki} = other relevant prices in bringing up children, such as the prices of food, clothing, medicine, housing, education and, if relevant, children's allowances.

T_i = the tastes or preferences for children relative to all other goods.

H_i = the health and fecundity traits of the parents.

K_i = the knowledge of and efficiency in the use of birth control techniques.

e_i = an error term, reflecting the stochastic element in the model.

For purposes of illustrating a point, let us make some further drastic simplifying assumptions, which might actually be plausible in some situations. (1) Assume that children's allowances are not relevant, as they might not be if only female heads of poor households were eligible to receive such allowances and if the population being studied were nonpoor husband-wife families who did not, in fact, consider welfare payments relevant to their decisions. There are, in fact, a number of practical difficulties that stand in the way of estimating directly the effects of children's allowances from existing welfare plans. There is substantial state variation in administrative practices regarding who is permitted to receive payments, in the amounts actually paid to recipients (even where the ostensible allowance appears to be the same within a state), and in regulations governing the behavior of recipients (such as amount spent on housing, allowances for work expenses, and so on). These administrative

and discretionary practices are difficult or impossible to measure. Within a state those who apply for welfare are likely to be self-selectively different from the rest of the population, and across states there may be selective migration due to the same sort of non-quantifiable personal factors. Again, there is little or no control for such selectivity characteristics which the investigator can impose on his model, and it would be hard to tell what part of the behavioral response is due to these characteristics of individuals, and what is due to the allowances, per se. Presumably, with a large enough research effort, some of these problems could be overcome, but little reliability can be attached to direct measures of effects of children's allowances for the immediate future. For these reasons, I will bypass this issue in the exposition of measuring economic effects on fertility in this section.

(2) To simplify the model further, we assume a cross-section where the prices of all goods and services are either constant (as they would be for, say, home appliances) or relatively unimportant where they might vary (doctors' fees, housing prices, child care prices). (3) Assume that variations in fecundity, birth control knowledge, and tastes can be mainly captured by a number of measurable variables such as the education, residence, age, race, and religion of the husband and wife. (4) Finally, assume that the remaining variations in fecundity, birth control knowledge, and tastes (which stem from various unmeasured personality traits, chance circumstances, and physical traits) are uncorrelated with the variables measuring income and wages.

Under all these assumptions, the model for fertility estimation would be specified as a function of income, the wife's wage, and the collection of variables "controlling" for other sources of fertility variation that might be correlated with income and wages. The two types of cross-section

data typically available to economists are data for individual households obtained from surveys and survey data which are grouped into observations for various types of geographical areas. In the former case, the ith observation is an actual household unit. In the latter, the ith observation is, say, a city, and the interpretation is that variables for an average or typical household in the city are being measured. Using cross-section data of either form, the economic model might be estimated by regression analysis. Assuming that fertility is an additive linear function of income, wages, and the "other" variables, the regression equation would appear as follows:

$$F_i = a_0 + a_1 Y_i + a_2 W_i + \sum_{j=1}^{k} c_{ij} V_{ij} + u_i$$

The interpretation of the new symbols is that a_1 is the effect of the husband's income on completed fertility, holding constant the other variables in the model; that a_2 is the effect of the wife's wage rate on fertility under similar ceterus paribus conditions, and so on. (Sampling variability in these estimates is ignored in the discussion at this point.) Now, assuming that the relationships (i.e., the a_i's) between fertility and income and wages are approximately the same for poor people as for the nonpoor, it is fairly straightforward to determine the income and wage effects on fertility of an income maintenance program. The income effect, a_1, is presumed positive and wage effect, a_2, is presumed negative with respect to fertility for reasons previously discussed. (Although these are fundamentally empirical questions to be answered by research, it facilitates the discussion of the hypothetical example to assume their signs.) The change in family income owing to the program's transfer payments would be multiplied by a_1, obtained as the estimate of the effect of the husband's income. The change in the wage rate brought about by the program would be multiplied by a_2. The parameter, a_2, contains an income effect and a substitution effect, but

their separate estimation need not concern us here.[18] If the income effect is positive, then clearly, the income effect of a transfer payment program would be pronatal, since the opportunity to receive transfer payments unambiguously improves the economic welfare of the families. Of course, given the new opportunity structure (i.e., the option of receiving transfer payments and the new and lower net wage rates), the families may choose to work somewhat less and thereby receive higher transfer payments and lower earnings, but they have been made better off by the income maintenance program. The wage rate effect is also expected to be pronatal, since the lower wage rate (a negative change) multiplied times the negative effect, a_1, produces a positive effect on fertility. No measure of the price effect of children's allowances is available from the model, but this would presumably accentuate the other pronatal effects.

The next section provides some quantitative estimates of various changes in the values of the variables (Y and W) and of the parameters (a_1 and a_2), but, here, the discussion is aimed solely at indicating, in a rough and overly simplified way, the methodology of obtaining measures of impact of an IML by economic research. Perhaps, the enormous difficulties in the way of obtaining estimates--the need for heroic assumptions about the role of unobservable variables in the model, for example--is the clearest message which has been communicated.

One important insight from the model discussed so far should be noted. The effect of income is measured holding constant the wife's wage. The two variables are, as an empirical matter, positively correlated. This is a natural consequence of selective mating in which men and women of similar socio-economic backgrounds tend to marry each other. In the absence of statistical controls over the wife's wage, its negative

effect would be partially embodied in the husband's income effect. Thus, the effect on fertility of the family (or husband's) income would be misestimated and biased in a negative direction. This is a very simple point, but it is worth emphasizing because most of the previous demographic research on the relationship between income and fertility has measured the effect of income without any or adequate controls over the wife's wage rate. Since the predominant finding has been a zero or even negative effect of income, there is a liklihood of underestimating the pronatal effects (or overestimating the antinatal effects) of income increases from children's allowances or other such programs.[19]

The principal difficulties blocking the "straightforward" calculation of effects on fertility of an income maintenance program may be summarized briefly. The most serious problem, in this writer's opinion, is the incomplete control over the variables representing "tastes." If, as is plausible, tastes for children are negatively correlated with tastes for market goods and tastes for market goods are positively correlated with income--<u>even</u> after controlling for such variables as the wage, education, residence, age, race, etc.--then a negative effect on income could show up but be fully attributable to the tastes factor. Remember, that in the context of a change in an IML, the tastes variation in the cross-section would be inoperative, since the same individuals (with their existing "personalities") would be affected. By and large, only the income, price, and wage variables would change, and it is for this reason that the correlation between "tastes" and these variables must be purged in an estimation procedure with the typical body of cross-section data.

Obtaining unbiased estimates of wage and income effects is hampered by two additional and related problems. One is the presence of substantial

error in measuring income and wages. The errors are partly a result of conceptual shortcomings--income and wages do not measure the lifetime concepts which the model ideally requires--and partly due to faulty instruments of measurement--respondent error, non-response bias, etc. As is well known, any "random" errors in the measurement of independent variables in a regression model will bias their effects toward zero. Inaccurate measures of the critical policy variables of wages and incomes are especially troublesome in the face of the inclusion of a number of variables such as education and occupation, which partly represent these same wage and income concepts and partly represent tastes and birth control knowledge. We know, for example, that a higher education of the wife permits her to obtain a "better" job--i.e., more remuneration, either in the form of wages or wage-equivalent benefits--but to some extent education also represents the factors of tastes and birth control knowledge. Random assignments of different wage rates to women avoids this intercorrelation, but the assignments in the real world environment are hardly random. The result is a set of estimates of effects of wage and education variables in a regression model which cannot be interpreted unambiguously.

C. Summary

The foregoing brief review of the methodological difficulties of policy-relevant empirical research on the economics of fertility is intended to warn the reader that existing research is unlikely to provide even approximately accurate answers to such policy questions as the effects of income maintenance laws on the birth rates of poor and non-poor groups, the effect on work behavior, the effect of child care services on fertility and on work and so on. The methodological discussion also points up the potential usefulness of more ambitious efforts in gathering data and

designing studies, including controlled experiments, to improve the research capabilities of economists--a topic taken up in the final part of the paper.

Despite the absence of reliable quantitative estimates of the relationships between fertility and those variables altered by IMLs, a good deal that is relevant for policy decisions may be learned by the combination of qualitative predictions suggested on a priori grounds and by the descriptive statistics which simply measure the relevant variables. The next section examines the costs of children and the changes in costs that an IML entails. With due caution already expressed, some estimates of the quantitative effects on fertility are also offered.

IV. Estimates of the Quantitative Effects of Income Maintenance Laws on Fertility and Population Growth

A. Reductions in the Cost of Children

The amount of money transfered to families and the number of families covered by IMLs were presented in Section I as part of a general overview of the impact of IMLs. The effect of the resulting changes in incomes and "prices" of children on the fertility of the covered population is, of course, unknown and, indeed, is a matter for guesswork, given the present state of knowledge.

To narrow somewhat our region of ignorance on this question, we can determine with a moderate degree of accuracy the changes in costs of children brought about by the IMLs. With these data one can determine the percentage reduction in costs and make at least a judgment as to whether this reduction is large or small. The focus will be on the changes in the incomes of and costs to the parents, who are the decision-makers regarding fertility.

It should be noted at the outset that the concept of the cost of children is beset with a number of ambiguities in most practical situations. The economist wishes to measure the change in the price of children of a given "quality," where the term "quality" refers to the subjective assessment by the parents of the level of utility they get from the combination of numbers of children, their natural endowments, and the expenditures of time and money devoted to them. (Quality has no humanistic connotation here at all.) Since quality cannot be observed directly, the simplifying assumption is made that the larger the amount of the quantities of time, goods, and services devoted to children, the higher the quality of the child. It follows that if all parents faced the same prices and were free to choose among the quantities (subject to their budget constraint), then the larger the particular family's expenditures on children (prices x quantities), the larger is the quality of the child to that family. There is no pretense, it should be noted, of making inter-family comparisons of quality (or utility), and, fortunately, the analysis usually does not require such a comparison (although policy decisions regarding the distribution of costs and benefits usually do--implicitly if not explicitly).

At any moment in time the costs of children--in the limited sense of "expenditures" on children--vary by family income, by family size, by residence, and countless other characteristics. Any statistical average of costs may conceal important distributional characteristics and differences. There are also practical difficulties in measuring the "marginal cost" of an additional child (which may mean the cost of the first child), when, as is usually the case, only average expenditure data are available. With these considerations and reservations in mind, let

us examine the costs of children to low income families in the U.S. as the first step in determining the fraction that would be "absorbed" by an IML.

1. Direct Costs of Children

Recall that in Section I we divided the costs of children to parents into direct and indirect costs. The latter include the time component of children. Direct costs are measured by the costs to the parents of goods and services for children--obstetrical service, subsequent medical services, food, housing, clothes, and so on. (A list of the expenditure categories and further explanation of the methodology of obtaining the costs is given in Appendix C.) The staff of the Population Commission has prepared estimates of these direct costs which show that the present value at birth of the average direct costs for an urban family which adopts a low-cost budget is approximately $12,000 as of 1969.[20] The marginal cost of a third child, calculated in the same present value terms, is about $8000 for this type of family.[21] The offset to these costs from an IML is the present value of the additional transfer payments received by the parents over the 18 or so years in which the child remains a dependent member of the family. We have already noted in Section I that under FAP, parents earning less than breakeven levels of income will receive an additional $400 in transfer payments per year for each additional child they have up to three and lesser amounts for more children. The present value of an annual payment of $400 for 18 years, using an eight percent rate of discount is $3548. Under the more generous plan (see p. 12), in which the marginal benefit (payment) for an additional first, second, or third child is $650, the present value,

calculated the same way, is $6090. If the incomes of the families covered by the IML increase over time, as we would expect in a growing economy, then the total IML benefits will decline (unless the generosity of the plan increases at the same rate as the increase in family income.)[22] Nevertheless, considering the third child under FAP, as long as the family receives less income than the breakeven level minus $600, the marginal benefit of the child will be $400. In the more generous IML the marginal benefit of the child is $650 as long as the family earns less than the breakeven level minus $1300.

This point may be clarified with some examples. Assume that the FAP schedule (shown in Table 1) prevails with no increase in benefits for the next 18 years. A family of four earning $3500 would receive $547. With a third child the benefit would increase by $400 to $947. This third child would be worth $400 in extra benefits until such time as the family's annual income increased beyond $4,320 (equals $600 less than the breakeven level for a family of five, which is $4920.) At an income of $4320 the FAP payment is just $400, and it will decrease at a rate of 67 cents for each additional dollar of earnings. If family incomes were increasing at a rate of two percent per year then in 11 years it would be earning $4351, and the marginal value of the third child (in terms of FAP payments) would begin to drop below $4000, and by the end of 18 years the family income would be $4998 and the FAP payments would have declined to zero. If this were the time pattern of income, the present value of the annual FAP payment attributed to the third child would be approximately $330, which is not too much less than the amount (= $3548) based on a constant $400 benefit for all 18 years. Moreover, if the generosity of FAP were to increase by an average of just one percent per

year, then at the end of 11 years the new formula for a family of five would be: FAP payment = \$3123 - 2/3 (Y = \$803),[23] with a breakeven level of \$5487. In this case, the hypothetical family earning \$3500 at the beginning of the period and increasing its income at two percent per year would maintain its \$400 benefit (or close to it) from the third child for the full 18 years. (In the 18th year, the family would be earning \$4998 and its FAP payment would be equal to \$3123 - 2/3 (\$4998 - \$803) = \$326.) If the Generous Plan were adopted, then the family of five would retain its \$650 benefit as long as its income was less than \$6000 (which equals a breakeven level of \$7300 minus \$1300). If the family was earning \$3500 at the beginning of the period, its income would have to increase by more than three percent, and the generosity of the plan not increase at all, to bring about an annual benefit of less than \$650 after 18 years elapsed.

As the examples show, it is not unrealistic to imagine that the two levels of IML payments for additional children--\$400 and \$650--are constant over the full 18 year period in which a new born child remains a dependent. Clearly, some families that are close to breakeven levels will receive less than this constant amount, particularly if, as is reasonable, the incomes of those relatively younger poor families with dependent children increase at a more rapid rate than does the generosity of the IML payments. But for many poor families, their low current incomes and modest prospects for increases will enable them to receive the full payment for their last child for many years into the future.

Since the marginal costs of a third child are about \$8000 and the marginal cash benefits of a third child are about \$3500 under FAP and \$6000 under the more generous plan, the direct costs of the third child are reduced by around 44 percent under FAP and by 75 percent under the Generous IML shown in Table 2.

These percentage reductions are clearly sizeable, and their reasonableness may be confirmed by noting that $400 (or $650) annual benefits do constitute a large fraction of the year-by-year average costs of children as shown in Appendix C, Table C.1. (The marginal costs of additional children are less than the average, when economies of scale are present as assumed, and the costs are lower in the early years of the child's upbringing. Thus, the present value of costs are smaller relative to the present value of benefits, which are assumed to remain the same each year.)

I will use the marginal benefit/cost ratio of a third child as an approximation to the direct cost reductions of "additional" children, and this should be about 40 to 70 percent, depending on the generosity of the IML. The quantitative effect of this reduction will be discussed after the indirect costs are estimated.

2. Indirect Costs

Several conceptual issues which underlie the effort to measure the reduction in indirect costs of children resulting from the operation of an IML have already been discussed in Section I. Recall that the time input of the mother is the source of indirect costs, and the wage rate she could or does obtain by working in the labor market is considered to be the value of her time relevant to her decision to work more or less in the market or home or to consume more or less leisure. (The emphasis on "more or less" indicates that the decisions are "marginal," and that the market wage rate is a measure of the marginal value of the hours being allocated.) Finally, the point was made that the market wage rate of the wife (as of any member of the family) was effectively reduced by the amount of the implicit tax rate of the IML. Ostensibly, this reduction

is 67 percent under FAP and 50 percent under the alternative Generous IML, but the full tax rate, after including other sources of taxes, will probably be closer to 80 percent in FAP and 60 percent in the alternative. (See Appendix B.)

These tax rates imply that any reduction in earned income by the wife will be offset by increased cash (or other in-kind) benefits by these percentages. In what follows, I undertake the task of estimating the size of these indirect costs in relation to the total costs of children. The principle in estimating the amount of indirect costs is to measure the amount and chronology of market time and leisure foregone in the bearing and upbringing of children. The distinction between average time given up per child and the marginal time lost for an additional child is important, because the largest cost appears to result from the birth of the first child, and subsequent births are less costly. Actually, the costs, in terms of the effect on market work by the mother, will differ depending on her age, the age of other children (if any), and other factors, as well as on the parity of the birth. Taking account of all these variables would yield different cost estimates for each combination, and I found it necessary to adopt some simplifying assumptions and restrict the analysis of two of the more interesting and revealing cases. First, we can examine the indirect costs of having one child under 14 years of age under the condition that no other children under 14 are present. This corresponds closely to the costs of a first child, although it is a little more general than this. Second, the indirect costs of having a third child for a mother with two children of specified ages will be examined. Detailed information on the data, sources, assumptions, and computations for the following estimates are presented in Appendix C.

Indirect costs of having any children under fourteen years of age. In this case a comparison is made between the average time at market work for a wife with no children under 14 and the average market work of those wives whose youngest child is at different ages between 0 and 14. I assume that only children under 14 years of age affect (i.e., reduce) the market work by the wife. Initially, I will also assume that the number of her children is irrelevant and that it is the age of the youngest that matters. This assumption will be dropped when it becomes necessary to estimate the marginal costs of an additional child for wives who already have one or more.

The data on hours worked per year is obtained from several sources but the principal one is the comprehensive study of labor force participation by Bowen and Finegan using the 1960 census data.[24] Updating the figures on annual hours worked to 1969 would not much change the differentials between wives with and without young children. The important advantage of the Bowen-Finegan measures are the adjustments made for factors other than the presence of children to obtain the net effect of children on hours worked. The other factors held constant are color, age, and schooling of the wife; the employment status of the husband; and other family income (excluding the wife's earnings).

It is important to stress that when the comparison group of wives with no children under 14 is used, their average amount of market time supplied (given average values for the just-cited list of factors other than children) is considered to be the best estimate of the market time that would have been supplied by the wives with children if the latter had decided not to have children. The reason this point is emphasized is that the average amount of annual hours spent in labor market employment by wives with no children under 14 is only slightly more

than 1000 hours--far short of what is normally considered full-time work (2000 hours).[25] Thus, the costs in market employment foregone for wives with children is not considered to be 2000 hours per year, since we have little reason to believe that they would behave so differently--i.e., work so much more--than wives who do not have children.

A birth of a child to a wife who has no other children (under the age of 14) results in an expected reduction in hours worked per year from 1000 to 106 the first year, from 1000 to 191 the second year, and so on in decreasing amounts until 14 years later when the time spent at market work is assumed to be equal for wives who had a child and those who did not. The cost of each hour of work is assumed to be $2.25,[26] and the present value of the wages foregone is about $13,000 over the 14 years. In the calculation of the present value of the future earnings, an allowance is made for annual rate of increase in real wages of one percent using a seven percent discount rate instead of an eight percent rate.

To this amount must be added the leisure time foregone because of the housework devoted to children--although a careful distinction should be made between leisure time and work time spent on children. Several judgmental assumptions were made to measure these costs of leisure foregone. The hours spent in child-related housework were assumed to be 14 per week for children aged 0-3, 10 hours per week for children 4-6, and 5 hours thereafter until the children were 14 years of age. Even limited to hours of <u>work</u> spent with children, the figures appear conservatively low. The value of this time was assumed to be $1.75 per hour. (It is true that at the margin, and in equilibrium, the home wage ought to equal the market wage, but the lower estimate allows for the possible imperfections or rigidities that could cause a gap in the home and market wage and for a declining

marginal value of leisure making the average value of leisure time foregone--which is relevant for measuring the total value--less than the marginal value.) The present value of the leisure time foregone adds about $7000 to the indirect costs of children.

Thus, the total indirect costs of bearing and raising a first child is about $20,000. This compares with the total direct costs of raising a child which averaged $12,000.

Indirect costs of having a third child. In examining the costs and benefits in IML payments for an additional child in a family with other children already present, we previously considered the case of a two parity family. The reason this size of family is selected is that the decision to have or not to have the third child is often considered to involve a good deal of discretion (it is an "elastic" choice in the sense that economists use the term), and it is a decision most parents confront.

In measuring the costs of market work foregone in having the third child, the comparison group will be mothers with two children, aged 4 and 6. Thus, for the first year the differences in hours worked is shown by a comparison between wives with two children aged 4 and 6 and wives with three children, aged 0, 4, and 6. The comparison is continued for the next 18 years, using the respective measures of annual hours worked as they apply to mothers with two and three children of successively older ages. The pattern is shown in Table C.3 in Appendix C. Again, the value of the differences in hours worked is based on an hourly wage of $2.25, and a present value of the earnings differentials over the next 14 years is computed using a seven percent discount rate; which assumes a one percent annual increase in real wages.

The costs of the third child computed in this manner is approximately $7200. As might be expected, the negative effect of a third child on market work activity is considerably less than was the effect of a "first child," and the costs are correspondingly lower--$7200 as compared with $13,000. The cost in leisure time foregone in the homework devoted to the additional child is assumed to be $7000, the same as before, so the total indirect costs of time given up for the third child is $14,200. This exceeds the marginal direct costs, which were $8000.

As before we can look upon the IML's reduction in the costs of foregone labor market earnings as equal to the extra transfer payments, and these will be provided to the families at a rate equal to the implicit tax rate on earnings. With a 75 percent effective tax rate from FAP and a 60 percent effective tax rate from the generous IML, the reduction in costs amounts to $5400 under FAP and $4320 under the generous IML.

3. Summary of the Reduction in the Costs of Children

The effect that an IML will have on reducing the net cost of children may be summarized briefly on the basis of the specific and hypothetical (but fairly typical) examples of family circumstances used for computations. We will restrict the summary discussion to the effects on marginal net costs, where the margin involves a third child. As shown in Table 4 below, the total marginal costs of a third child at time of birth amount to $22,200 in present value terms, of which $8000 are direct costs and $13,200 are indirect costs. The effect of FAP on these costs for a family which had been earning $3500 and which remains below the breakeven level of income is to reduce the costs by $8900, or

TABLE 4

Costs of a Child and Reductions in the Costs as a Consequence of an Income Maintenance Law

(All dollar amounts are in terms of present values at time of birth)

I. Costs of a child	Average for all Children[a]	Average for a Third Child[a]
A. Direct Costs	$12,000	$8,000
B. Indirect Costs		
Market Wages Foregone	13,000	7,200
Leisure Foregone	7,000	7,000
Total Costs	$32,000	$22,200

	Average for a Third Child	
	FAP[b]	Generous Plan[c]
II. Reductions in the costs of a child as a consequence of an IML (for covered families)		
A. Direct benefits-- Payments for the additional (third) child	$3,500[d]	$6,000[e]
B. Indirect benefits-- absorption of foregone earnings	5,400[d]	4,320[e]
Total Reduction in Costs	$8,900	$10,320

	FAP[b]	Generous Plan[c]
III. Percent Reductions in the total cost of a third child for covered families by sources of the cost reduction		
A. Reduction in direct costs as a percent of total costs	16%	27%
B. Reduction in indirect costs as a percent of total costs	24%	19%
Total reduction in costs as a percent of total costs	40%	46%

Footnotes to Table 4:

Note: Details underlying the calculations are given in the text and appendices.

[a]Low-cost budgets were used to represent the case of low income families.

[b]FAP provides a $2400 guarantee for a family of four and a 67% tax rate on income.

[c]The Generous Plan offers a $3000 guarantee for a family of four and a 50% tax rate on income.

[d]The family is assumed to have been earning $3500 a year at the onset of the program and to remain below the breakeven point of $4920 for the next 18 years. The total effective tax rate on the earnings of the family is assumed to be 75%. (See Table B.1 in Appendix B for a discussion of the effective tax rate facing families covered by FAP.)

[e]The family is assumed to have been earning $3500 a year at the onset of the program and to remain below the breakeven point of $7300 for the next 18 years. The total effective tax rate on the earnings of the family is assumed to be 60 percent. (See Table B.2 in Appendix B.)

40 percent. About 24 percentage points of the 40 are attributable to the absorption (or making-up) of lost earnings by the wife who has the additional child.

Under the Generous IML the reduction in costs for the same family is, surprisingly, only slightly more--amounting to $10,320, or 46 percent of the total costs. The more generous transfer payments--$650 per year for the additional child instead of $400--do provide an amount of direct benefits which is considerably larger ($6000 instead of $3500), but the lower tax rate on earnings (50 or 60 percent instead of 67 or 75 percent) means that less of the foregone earnings are replaced in the more generous plan. We should note, however, that the assumption that the income of the family in the example remains below the breakeven level eliminates an important way in which the Generous IML would reduce costs to a greater extent than FAP ; namely, by permitting families to remain covered over a higher income range. If we had assumed that the hypothetical family earned more than $3500 or had a faster growth of income over time, the transfer payments and the associated implicit tax on earnings under FAP would have been curtailed or eliminated before the entire 18 years of child raising had elapsed. Since the Generous IML has a higher breakeven level, this curtailment would have come later, if at all, and the reduction in costs of children would, of course, continue longer and amount to a larger sum.

Let us conclude by remarking on the significance of cost reduction. First, the size of the cost reduction--40 to 46 percent of total costs, which includes the costs of foregone leisure time--is clearly quite large. Except for a small proportion of families who have received AFDC-UP, low income, intact families have not confronted subsidies to children of these magnitudes. Second, the largest source of the subsidy involves the

indirect subsidy which makes up for the costs of foregone earnings by the wife. Some rough estimates of the effects on fertility stemming from these subsidies of an IML follow in the last part of this section.

B. Estimates of the Quantitative Effects of IMLs on Fertility

As was pointed out in Section III of this report, there are no reasonably definitive studies of the quantitative effects on fertility from changes in income, wage rates, and other prices associated with children. We cannot, therefore, make any reasonably definitive predictions about the effects on fertility of IMLs. My own work, mainly dealing with a 1960 cross-section of wives, grouped by SMSAs, may be used to illustrate the method of making predictions; at best, it may be suggestive of the orders of magnitude involved.[27] The study produced estimates of the net effects on fertility of income and of the wife's wage rate. No measure of a children's allowance is available with 1960 data pertaining to husband-wife families, and I will assume that the "price" effect from changes in wives' wage rates applies generally to all price changes, and in particular to the sum of direct and indirect price changes as these terms have been used in this paper.

In the study mentioned it was found that a 10 percent increase in wage rates for white wives (across SMSAs in 1960) was associated with a three percent decrease in the number of children ever born, and that a 10 percent increase in income (from sources other than the wife's earnings) was associated with a one percent increase in the number of children ever born. These effects were measured holding constant a number of variables intended to permit isolating the <u>net</u> wage and income effects.

We have seen that the change in costs (or price) of children from an IML is about minus 45 percent--that is, the price of an "additional" (third) child is reduced by about 45 percent. Thus, if the wage rate effect on fertility applied to the overall price reduction (which includes the wage rate reduction) then a 45 percent decrease would be associated with a 13-1/2 percent increase in completed fertility.[28]

The change in income of the family covered by an IML could be computed by examining the present value of the payments over time as a proportion of the present value of family income. It is simpler and for purposes of these rough estimates sufficiently accurate to denote the change in income in another way. Under FAP a five-person family which is earning $3795 will receive $750 in transfer payments (about equal to 20 percent of family income), and under the Generous IML a family of five which is earning $5200 will receive $1050 in transfer payments (also about equal to 20 percent of family income). Accepting these earnings levels as typical for the relevant time period, we can assume that the percentage increase in income from the IMLs is about 20 percent. With an income elasticity of 0.1, a 20 percent increase in income yields a two percent increase in the number of children ever born.[29]

On the basis of these rough estimates, the combined effects of these two (presumed) pronatal features of an IML--increased income and, most importantly, reduced costs of children--would increase the completed fertility of women covered by the IML by 15-1/2 percent. Thus, if the current average completed fertility of families (or wives) below the breakeven level of incomes is 3.7 children, a 15-1/2 percent increase would mean .57 more children and raise the level to 4.3 children.[30] Of course, if the average completed fertility of covered families were as low as 3.0 (on the assumption of a continued sharp decline in total

fertility over the coming years), the increase would be smaller--only .47 children, to a level of about 3.5 children per family.

While increases in fertility of .5 children per family are certainly non-negligible, the number of wives affected will be only a minority of all wives in the childbearing ages. In 1967, only 9.8 percent of wives 14-39 were in families below the poverty line (of about $3500 for a family of four in 1967), and this percentage is declining over time. It is interesting to note that in the same year about 12 percent of the total population lived in families below the poverty line, which indicates the disproportionate representation of the aged and of single-person households in the poverty population. However, the relevant income line for coverage of IMLs is the breakeven level of income, and this varies from about 115 percent of the poverty line under FAP to 160 percent of the poverty line under the Generous IML. In 1967, 17 percent of the total population lived in families below 125 percent of the poverty line (which was about $4375 for a family of four in 1967). The representation of husband-wife families increases as income increases, so the proportion of wives 14-39 among all wives under the breakeven level of income was probably around 14 percent. If the Generous IML prevailed the breakeven level income of 160 percent of the poverty line (now about $3770 for a family of four) would include around 21 percent of all husband-wife families.[31]

The trend is for non-aged husband-wife families to make up a smaller proportion of the poor and for the poor to become a smaller fraction of the total population. Therefore, we may estimate that the percent of non-aged husband-wife families with incomes below the breakeven levels for an IML will probably be around 15 percent. Therefore, a 15-1/2 percent increase in fertility on the part of 15 percent of the childbearing

population yields only a 2-1/2 percent increase in fertility of the total population. We may conclude that, although the increase in fertility on the part of the low income population is non-negligible--and the repercussions of this increase on their life styles and social mobility may well be important--the overall effect on population growth will be very slight. If, for example, the net reproduction rate (NRR) in the U.S. was 1.25 (implying that about 2.57 children were born per woman)[32] the increase of 2-1/2 percent would mean a NRR of 1.28. The result of this change in NRR for the stable (or intrinsic) growth rate of the population is an increase from 0.747 percent to 0.825 percent; i.e., an increase of only about eight one-hundredths of one percent.[33] To the extent that there are external costs of population growth in the form of pollution and congestion, the additional growth stemming from the IML appears not to contribute much to these costs.

There are, however, two types of monetary costs stemming from the increase in numbers of children in families covered by the IML. First, there are costs of a lower national income because of the decrease in market work by the mothers who have the additional children. If half of the low income wives have an extra child, the reduction in market earnings are about $1200 per year per mother or about $600 a year per low income mother. As shown in Appendix Table C.2, the effect of an extra child is roughly to reduce the amount of time the mother spends at work by about 500 hours per year. The annual loss in national income would be around $1.5 billion under FAP and $3.5 billion under the Generous IML. The higher amount is less than three-tenths of one percent of national income.

Second, an added financial tax burden on the nonpoor sector occurs because of the increases in transfer payments to covered families which have additional children. The initial costs of the increase of one child for every two families would be about $1 billion under FAP and $2 billion under the Generous IML, although these amounts would decline over time as incomes rose and the numbers of families eligible for full payments for the additional child decrease. With the personal income tax at a level of $100 billion the increase is around one percent, which amounts to around $150 per taxpayer.

The reader should realize that all these estimates are quite rough. Their principal justification is to sharpen our perception of the ways in which the demographic effect of IMLs affect the economy.

V. Conclusions and Policy Recommendations

A. Overview

Policy recommendations can never be made solely on the basis of scientific analysis, and when the analysis is as short on empirical verification and quantification as that pertaining to demographic consequences of income maintenance laws, the recommendations must be circumspect indeed. What follows is a mixture of a summary of tentative conclusions of the foregoing analysis and policy recommendations that depend partly on conclusions and partly on assumptions about political values.

There are many persuasive arguments for reforming the current welfare system in the direction of a negative income tax plan like FAP, and the conclusions from this report about demographic consequences of this type of reform offer nothing so persuasive in opposition. Consider

that the income supplements to the working poor families with male heads present should encourage family stability, improve the welfare of children in the family--including their health, education, and future capacity to function as self-supporting adults, reduce the incentive for migration and residence decisions to be based on the disparities in welfare among states, and increase incentives to work for those who had been recipients of welfare under existing welfare systems. It is clear that there are a number of beneficial demographic effects among those listed.

A detraction of the reform in IMLs which expand coverage and increase benefits is, as the preceding sections of the paper argue, that the fertility of the families will increase. Increasing the birth rate is, in general, probably not a desired objective of population policy in the U.S., and it would be difficult to argue in favor of a policy which increases the birth rate of only the low income population. The increase for the low income population was crudely estimated to be around 15 percent, which in terms of completed fertility is about "one-half" of one child per family. This amounts to an increase from a level of, say, 3.3 children ever born per covered family to 3.8.

The first point to make about an increase of this amount is that it will have a very small impact on the birth rate and population growth rate for the U.S. population as a whole. The second point to make is that this increase is based on a model of behavior in which parents are voluntarily adapting to a new opportunity locus, which implies that the additional births are "wanted." To the extent that the additional births are wanted, the principal costs of this fertility increase is as follows:

(a) a smaller money national income (reduced by, perhaps, 0.1 to 0.3 percent) because of less market work by the mothers in low-income families who have additional children; (b) the "external diseconomies" (such as congestion costs) of the very slight increase in population; (c) the added financial tax burden on the families above the breakeven level of income to pay for the increase in transfer payments to covered families with additional children. These latter costs might be as high as $1 billion under FAP, but they do not constitute a reduction in national income--only a redistribution.

To the extent that the birth increases which are stimulated by the IML are not planned and are "unwanted," then the already oppressive economic strains on the affected families will be intensified and may more than offset the increase in transfer payments for the family.

There is a major and unresolved issue regarding the relation for the family unit between poverty and the number (and timing) of children. Although the emphasis in this paper was on the effect of income on fertility, there are feedback effects <u>from</u> the entire set of interconnected decisions regarding age of marriage, numbers of children, and the spacing of the children <u>to</u> the family's pattern of physical and human asset accumulation and income generation.[34] This issue also involves the effect of the number of siblings on a child's intelligence and educational achievement and the entire question of intergenerational transmission of poverty.[35] Much of the debate concerns the identification of what the causal variables are among the observed set of associations, and there is little that is conclusive at this point. In any case it is our hope that the main effect of increasing transfer payments to poor families is to reduce the transmission of poverty to the children of these families.

Even if all of the pronatal effects and their costs mentioned above are realized, several offsetting trends should be noted to keep the problem in proper perspective. First, there is the evidence that the poor currently have more children than they desire. This fact, combined with the trend toward improvements in birth control technology and in its dissemination to poor families, suggests that the fertility of the poor will be declining over time, given no other changes in factors affecting fertility. Thus, although an IML will probably increase fertility by the poor, this increase will be moderated by the trend away from the current disequilibrium situation of "excess fertility."

Second, the trend of rising incomes and, especially rising wage rates, will clearly work to diminish the percent of families in poverty. The initial number of families covered by a program such as FAP is, of course, far larger than the current number receiving "children's allowances," but once covered, the trend will be one of diminishing numbers. Moreover, this trend will be accelerated if families with children have a working father present, since the major source of increases in the numbers of poor persons has been the growth in female-headed families. Limited time spent in market work is clearly the fundamental reason for the low incomes of these families, although we should not overlook the fact that low wages available to the female head is an important reason for her limited participation in the labor force. Heightened family stability, with at least one adult able to work full-time, will be a major contribution to the elimination of long-run poverty among families with young children, even though this same phenomenon will probably increase birth rates. Of course, a reform in IMLs to promote the stability

of marriages is only one factor--and perhaps not a major one--among many affecting marital stability in our society. To summarize, the trend of decreasing numbers of poor people means that the pronatal effects of IMLs will be affecting a smaller and smaller number of families.

B. Specific policy changes recommended for IMLs

The overall thrust of IMLs is pronatal, and there is not much scope for reducing this bias. In general, one may modify certain features of the program's design to limit the pronatal influence, but a more effective step may be in adopting additional programs that have antinatal features. Thus, during the near future, when "excess" fertility (or "unwanted" births) will constitute a sizeable addition to the number of extra births of poor families covered by an IML, open access and even subsidized access to all acceptable forms of birth control is probably the single most important program to consider as a counter (antinatal) influence. As matters now stand, birth control, especially in the form of abortions, is not only not subsidized but is severely restricted (or "taxed").

If, as I believe, employment opportunities in good paying jobs for women is a significant counter alternative to bearing more children, we should consider ways of encouraging this alternative. The problem here is that, although job training and breaking down the barriers of job discrimination against women are desirable programs which will raise the wage the wife can earn, her effective take-home pay is sharply reduced by the IML's implicit tax on earnings. A dilemma exists between lowering the implicit tax of the IML so as to encourage work by those who had

been covered by the previous high-tax program versus the expansion of coverage as a consequence of the lower tax, which will raise the tax on earnings for those who are newly brought under coverage of the plan. For example, if the annual guarantee is $3000 for a family of four, a 100 percent tax means that there are severe disincentives to work for those making less than $3000 per year, but for those over this amount, the (positive income) tax is quite low until the very high income brackets are reached. When the implicit tax rate is lowered to, say, 50 percent, then all those making less than $3000 will have an increased incentive to employment (and a lower incentive to bear children), but those earning $3000 to $6000 will find their coverage by the IML is associated with an increase in their effective tax rate from 0 or 14 percent to 50 percent. My own judgment is that the lower implicit tax rate of an IML is highly desireable--both because of the larger transfers it brings to low income families and because of its greater work incentive for covered families. I believe extending the pronatal bias among the lower middle income groups is not so serious as facing the low income groups with near-confiscatory tax rates.

Some less important ideas for reducing the pronatal bias of the IML are the following: (a) eliminate the "first-baby bonus" by extending coverage of the IML to childless families; (b) decrease the size of the children's allowance for each additional child past the first; (c) increase the size of the allowance with the age of the child--which necessarily means that newly born children will be eligible for reduced amounts.

Point (a) is consistent with the philosophy of using IMLs to alleviate poverty without regard to such "irrelevant" categories of deservedness such as whether the poor household contains children. Point (b) is a recognition of the economies of scale in raising children and avoids the extra subsidy to more children that would be implicit in a constant amount of a children's allowance for children of a higher parity. Similar reasoning applies to point (c) on the gradation of payments by age, since older children, up to the age when they enter the labor force, are more costly than younger children. For those (unlike myself) who believe that the poor have markedly short time horizons (or, equivalently, very high internal rates of discount), the strategy of keeping payments relatively low for the youngest ages may have special appeal.

C. The need for further research

Although the social scientist's call for more research has come to be a familiar litany at the end of his papers, there is little question that the need is acute on the issue of the effects of changes in economic variables, particularly in the area of income maintenance, on demographic behavior. This paper has dealt at great length with the relatively narrow issue of how changes in income, children's allowances, and wage rates as a consequence of an IML covering husband-wife, low-income families would affect the latter's fertility. Other changes that might be part of welfare reform legislation, such as Day Care, Medicare and work training, were only briefly touched upon. There are other important groups in society whose fertility behavior was not investigated, such as that of poor single people and female heads of households, as well as that of the non-poor (who will face somewhat higher tax rates and who may react to the higher fertility on the part of poor families).[36] Finally, there are other

aspects of demographic behavior like nuptiality, morbidity and migration, which, not only will be affected by IMLs, but will have repercussions on fertility behavior. These issues were given scant attention in this paper.

Most of the analysis was devoted to direct income and price effects on fertility of low income families and on the fertility implications of an IML's effect on labor force behavior and wage rates. We have some, but clearly inadequate, theoretical and empirical information to bring to bear on this issue. We have less satisfactory evidence on the effect of the prices of housing, day care, education, or other services relevant to the demand for children.

A variety of research strategies appears to be required to measure the behavioral parameters of interest. The underlying models are not well developed, although some interesting work is under way. The existing data has many limitations and, as was suggested in Section III, there are some inherent limitations in estimating the relevant behavioral parameters with nonexperimental data. There are also difficulties in a controlled experiment, as well, although the approach is, as I have argued elsewhere, feasible.[37]

Until we have better information about the responses people make to governmental policies and programs we obviously cannot design them effectively. There is no escape from the explicit and implicit policies which now direct behavior in the areas of poverty and demography. These areas are too important to leave to the design by uninformed makers or special interest groups.

NOTE: Most of the detail behind the quantitative estimates in Sections II to V is relegated to several appendices which are printed as Institute Discussion Paper 118-72.

FOOTNOTES

[1]Welfare in Review, (Washington, D.C.: Department of Health, Education, and Welfare, Sept./Oct., 1969) pp. 51-52.

[2]Background Papers, (Washington, D.C.: President's Commission on Income Maintenance Programs, 1971) p. 119.

[3]See, as examples, V. H. Whitney, "Fertility Trends and Children's Allowances Programs," in Children's Allowances and the Economic Welfare of Children, E. M. Burns ed., Citizens Committee for Children of New York, Inc., (1968), pp. 123-139; and Ronald Freedman, "The Sociology of Human Fertility ; a Trend Report and a Bibliography," Current Sociology (1961/1962) , esp. p. 63.

[4]Larry Bumpass and Charles Westoff, "The Perfect Contraceptive Population: Extent and Implications of Unwanted Fertility in the United States," Science (September, 1970), pp. 1177-82.

[5]This section draws upon the paper, "The Family Assistance Plan: An Analysis and Evaluation," by D. Lee Bawden, Glen G. Cain, and Leonard J. Hausman, Public Policy (Spring 1971), pp. 323-354.

[6]See Report of the Committee on Ways and Means on H.R. 1, House Report No. 92-231, 92nd Congress, 1st Session, Social Security Amendments of 1971, (Washington, D.C.: U.S. Government Printing Office, May 26, 1971). All references to the new bill will stem from this Committee Print.

[7]Using the formulas from Tables 1 and 2 for determining annual benefits for a family of four we have: FAP benefits = 2400 - 2/3 (3500-720) = $547, and Generous IML benefits = 3000 - 1/2 (3500) = $1250.

[8]There is no unambiguous way to measure the average benefit in terms of cash transfer payments per child. Restricting the example to FAP and the case of a benefit level of $547 for the married couple with two children (and $3500 in annual income), the average annual benefit per child could be measured as $547/4 = $136, weighting each member equally. It could be measured as $547/2 = $273, on the grounds that the two children determine the eligibility of the family ; that is, without dependent children the married couple would receive no benefits. Or the average benefit could be measured as $182/2 = $91, where $182 is the children's portion of the benefits under the weighting system in which each child's benefits equal $400 and each adult's benefits equal $800 at zero earned income. Thus

$$\left(\frac{\$800 = \text{children's benefits}}{\$2400 = \text{total family benefits}}\right) \times \$547 = \$182 = \text{the children's share of the family's benefits.}$$

[9]Robert J. Lampman has estimated that in 1967 (before the large increase in welfare rolls from 1967 to 1971) the total amount of cash benefits to poor persons was $27 billion. This included $18.5 billion of social insurance benefits and $8.4 of public assistance and excludes veterans benefits and various income-in-kind benefits for education, health, housing, etc. See his Ends and Means of Reducing Income Poverty, (Chicago: Markham Publishing Co., 1971), p. 109.

[10]The plans and fee schedules suggested by the Department of HEW were presented in several memoranda during 1970 and 1971. Note that if the child care subsidy were $1200 per year (for one child) and the fees were 10 percent of income in excess of $4320 (for a family of four), then the subsidy would continue until the family earned $16,320! If the fees were 20 percent, the breakeven point (when the subsidy ceased) would be $10,320--above the median level of family income. The marginal positive income tax rates and social security taxes would combine with the child care fees (of 20 percent of income) to produce a relatively stiff 40-plus percent tax.

[11]Seth Low and Pearl G. Spindler, "Child Care Arrangements of Working Mothers in the United States," Children's Bureau Publications No. 461 (Washington, D.C.: U.S. Department of Health, Education and Welfare and U.S. Department of Labor, 1968).

[12]Actually, price theory provides an insight into one possibility which reverses these expectations and which might escape a common sense approach--namely, the possibility that either children or work (really work-plus-market-goods obtained by work) are inferior goods, so that rises in income reduce household purchases of the commodity. If this were true, then the textbook curiosity of a reduced price--which raises the household's income--leading to a reduced amount purchased could arise. I do not believe that either commodity should be viewed as inferior, in the economists' sense of the term, but in my opinion, the argument for the commodity defined as the mother's work-plus-market-goods being inferior is stronger than that for the commodity defined as children. If so, this would accentuate the pronatal effects of sdc, but this point will not be pursued. The effect on income on the demand for children is discussed in Section III.

[13]The budget constraints are drawn with a curvature to reflect the extra large reduction in work and career commitment when the first child is born. Conversely, going from 4 children to 5 involves a small reduction in career commitment.

[14]For a discussion of the ways in which some incentives to desert remain in FAP, see Bawden, Cain, Hausman, op. cit., pp. 346-347.

[15]The idea that a larger income (and a corresponding relaxation of the budget constraint) leads to a larger purchase of all normal "goods"--here assuming that the quantity of children is considered a normal good--is the economic interpretation behind Rainwater's otherwise ambiguous and nonoperational conclusion that: "we can abstract one central norm about middle class and working class families: one shouldn't have more children than one can support, but one should have as many children as one can afford." Lee Rainwater, Family Design, (Chicago: Aldine Publishing Co., 1965), p. 150.

[16]The full explanation of this case, which is too technical and lengthy to repeat here, is found in Robert Willis, "A New Approach to the Economic Theory of Fertility Behavior," unpublished, available from the National Bureau of Economic Research, Inc., 1970. Briefly, the idea is that a wife who is confined to the home has no market wage but only a "home wage" to determine her allocation of time between home and leisure. More income means more goods at home which increase her home wage (just as more capital in a nation increases the wage rates in the nation). At a higher home wage the wife will shift away from time-intensive production activities. Since children are time-intensive, this negative price effect could swamp the positive "pure" income effect and result in fewer children being demanded. When, however, market work is an option, a rise in the home wage of the wife will, in general, lead to less market work and more home work, and this shift will, in general, be pronatal.

[17]For an analysis of why market behavior will reveal this negative substitution effect even when individual households are behaving "irrationally"--at least irrational in the sense of chance decision-making or "inertia" decision-making--see, Gary S. Becker, "Irrational Behavior and Economic Theory" Journal of Political Economy (February 1962).

[18]The separation of income and substitution effects, a_1 and b_1 respectively, may be obtained as follows:

$F = a_1 Y_f + b_1 W$ where Y_f is full family income composed of the wife's earnings, $\bar{M}W$ -- $\bar{M}$ being her equilibrium time spent at work--and all other sources of income, Y, (such as husband's earnings, rents, dividends, transfer payments, and so on); W is the wife's wage rate, as before; and b_1 is the substitution effect of the wage change and differs from a_2 which was the wage effect embodying both income and substitution effects.

$$F = a_1 (Y + \bar{M} W) + b_1 W$$

$$= a_1 Y + (a_1 \bar{M} + b_1) W = a_1 Y + a_2 W$$

So: $b_1 = a_2 - a_1 \bar{M}$

[19]It is better understood that another source of a downward bias in the measured effect of income on fertility is the positive correlation between income and birth control knowledge. The commonly observed negative effect of income may be attributed to the positive correlation between income and such knowledge. The underlying causal relation is, however, not well understood. Do poor people have less means for obtaining birth control knowledge or, as one alternative, less motivation? If the wife has a low market earnings ability, this could lead to a low motivation for such knowledge. Thus, including the wife's wage variable in the model may be necessary to measuring and understanding the effects of the variables used to represent birth control knowledge.

[20]Susan McIntosh and Ritchie Reed, "Costs of Children," in Technical Reports, Commission on Population Growth and the American Future, (Washington, D.C., 1971).

[21]This is an approximation using the gross undiscounted costs of a third child and obtained by maintaining the same ratio of gross costs to present value costs for the marginal costs of the third child as is shown in the Commission paper for the gross average costs to the present value of the average costs. (See Appendix C.)

[22]Also, as the children reach their teens and beyond, they may start to earn money which may be thought to reduce the transfer payments. However, this effect will be negligible both because of the discounting of earnings which will be forthcoming in 15 or more years into the future and because the IMLs will probably exempt (or disregard) a sizeable amount of children's earnings. FAP disregards earnings from children up to a limit that is unspecified in the bill when computing the amount of a cash benefit for the family.

[23]The new formula assumes that the $2800 guarantee for a family of five has been increased to an average rate of one percent per year and that the $720 set-aside has also been increased at this rate.

[24]William Bowen and T. A. Finegan, The Economics of Labor Force Participation (Princeton: University of Princeton Press, 1968).

[25]The Bowen-Finegan estimate for 1960 is 1020 hours (see Appendix C). Robert E. Hall has estimated that in 1967, white wives, aged 20-59, from moderately low income families, with average earnings abilities, worked 1050 hours if they had no children. See his, "Wages, Income, and Hours of Work in the U.S. Labor Force," unpublished manuscript, forthcoming in Income Maintenance and Labor Supply: Econometric Studies, Institute for Research on Poverty Monograph Series, (Chicago: Markham Publishing Co.).

[26]The median earnings of women aged 14 and over who worked full-time, year-around was $4977 in 1969. (See, "Income in 1969 of Families and Persons in the United States," Current Population Reports, Series P-60, No. 75, December 14, 1970, Bureau of the Census, Table B, p. 4.) If full-time, year-around work consists of 40 hours per week for 50 weeks, the average wage was $2.49, and if the average number of hours is 38 per week for 50 weeks, the average wage is $2.62. I assume, conservatively, that the average wage earned by full-time, year-round workers is $2.50. per hour. If, as I believe, the earnings abilities of year-round, full-time workers tend to be somewhat higher than that which applies to all women, then a lower figure is more appropriate for representing what the average woman (among all women) could earn by working. I have assumed that the relevant wage rate is $2.25 per hour for the average wife with children.

[27]See Glen G. Cain and Adriana Weininger, "Economic Determinants of Fertility," Institute for Research on Poverty Discussion Paper 84-70. The main advantages of this study are the availability of measures of "permanent" income, wage rates facing wives, and the suppression of "tastes" variation by virtue of aggregation. Also, the results for 1960 were supported by tests with data from 1940. A shortcoming of the model used is the restriction to a single decision (regarding fertility) and one equation in a context in which several other decisions (requiring several equations) are probably involved. Another limitation is use of a static cross-sectional model for a decision involving a long time horizon. These points are developed more fully in the paper.

[28]The effect of the wife's wages on fertility is here measured in elasticity terms; the wage rate elasticity is defined as: $\frac{\%\text{ change in quantity}}{\%\text{ change in wage}}$, and is here equal to -0.3. Assuming the percentage change in "price" has the same effect as the percentage change in wages, we have:

(% change in price) (-0.3) = % change in quantity (fertility)
or (45) (-0.3) = -13.5.

[29]The income elasticity (=0.1) is defined as the percentage of change in quantity "purchased" with respect to (or divided by) the percentage change in income. Note that the increase in fertility due to the increase in income is quite small, so that even if the effect of income on fertility were zero, the estimates of the effects of IMLs on fertility offered in this paper would not change much.

[30]The Bureau of the Census reports that in 1967 the number of children ever born to wives 14-39 in poor families was 3.7 per wife, and their total expected number was 4.3. The use of 3.7 in the text above as the total expected number allows for downward trend since 1967 and for inclusion of the lower parity families above the poverty line but below the IMLs breakeven level of income. The number of children ever born for wives 14-39 in families above the poverty line was 2.3 per wife in 1967, and the expected completed fertility was 3.0. See, "Previous and Prospective Fertility: 1967," Current Population Reports Series P-20, No. 211, (Washington, D.C.: Bureau of the Census, January 26, 1971), p. 2.

[31]The figures are approximations based on extrapolations of the numbers and percent of families below the poverty line, allowing for the rising proportions of husband-wife families.

[32]It is implicitly assumed that the 2.57 children ever born all survive to the end of the childbearing ages. This contrary-to-fact, simplifying assumption does not affect the results significantly.

[33]An approximate formula for the growth rate, $r = \sqrt[T]{NRR-1}$, was used, where T is the mean length of one generation (here assumed to be 30). A discussion of the relation between NRR and r is given in L. I. Dublin and A. J. Lotka, "On the True Rate of Natural Increase," Journal of the American Statistical Association (1925).

[34]See especially the work of Ronald Freedman and Lolagene Coombs. For example, "Economic Considerations and Family Growth Decisions," Population Studies, (November 1966), pp. 197-222.

[35]See the discussion and references in J. D. Wray, "Population Pressure on Families: Family Size and Child Spacing," Reports on Population/Family Planning (New York: Population Council, August 1971), pp. 424-429.

[36]For some attention to these questions see, James A. Sweet, "Some Deomgraphic Aspects of Income Maintenance Policy," in L. L. Orr, et al., eds., Income Maintenance (Chicago: Markham Publishing Co., 1971), pp. 111-125.

[37]Glen G. Cain, "Experimental Income Maintenance Programs to Assess the Effect on Fertility," in Orr, et al., op. cit., pp. 126-137.