University of Wisconsin-Madison

IRP Discussion Papers

David Betson
Jacques van der Gaag

LABOR SUPPLY, ECONOMIC WELL-BEING, AND THE STRUCTURE OF THE TRANSFER SYSTEM

DP #756-84

Institute for Research on Poverty
Discussion Paper no. 756-84

Labor Supply, Economic Well-Being, and the Structure of the Transfer System

David Betson
Department of Economics
University of Notre Dame

Jacques van der Gaag
The World Bank

September 1984

*This research was supported in part by a contract to the Institute for Research on Poverty from the U.S. Department of Health and Human Services. The views expressed in this paper are those of the authors and do not necessarily reflect the views of DHHS, the Institute, nor the institutions with which the authors are affiliated.

ABSTRACT

This paper examines implications drawn from labor supply literature for the design of a transfer program for female-headed families when the youngest child turns six years old. It is found that if the average level of support to households remains constant, a "safety-net" view of the system would lead to raising the tax rate dramatically while only moderately increasing the guarantee. In contrast if the transfer system is viewed as attempting to maximize the well-being of households, the optimal policy is to leave the structure unchanged as the child turns six. However, if public opinion led one also to decrease the average support to households as the child turns six, the "safety-net" view would result in adoption of a structure of high tax rates, whereas the Utilitarian view would result in drastic cuts in the guarantee with only modest increases in the tax rate.

Labor Supply, Economic Well-Being, and the
Structure of the Transfer System

Historically, the potential welfare has been separated into two distinct groups: those individuals who are expected to work in order to provide for their primary support, and those who are not expected to work and can look toward the government for support.[1] The composition of these two groups has changed over time but, broadly speaking, those who would be expected to work and provide for themselves include able-bodied married couples with and without children, single individuals, and female household heads whose youngest child is over six years old. The aged, disabled, and women heading households in which the youngest child is under six can be classified as those who are not expected to support themselves.

While it is of considerable policy interest to examine the economic justification and implications of dividing the female-headed household population into these two groups on the basis of the age of the youngest child, this paper takes that division as given. Our paper examines the question of how one would structure a transfer program for the group of single mothers who are not expected to work, and how that program would compare to one designed for single mothers who are expected to work. We examine in particular the empirical literature bearing on the question of how the choice of guarantees and benefit reduction rates in transfer programs would change as the household moves from the not-expected-to-work category to the expected-to-work category.

The hypothetical context of our study is as follows. The government has chosen to implement a transfer system for female-headed households in the form of a standard Negative Income Tax (NIT) which has a guaranteed income equal to G dollars and a single benefit reduction rate (t) which is applied to all sources of income. The government decides a priori to split the potential target population into two groups based upon the age of the youngest child. It has also decided upon the total transfer allocation for each of the two groups. The problem that the government now faces--the one we wish to analyze in this paper--is how to design a transfer system that meets the budget constraints and several general objectives that society might have for the transfer system (specified below).

The focus and many of the conclusions of this paper resemble the insights gleaned from the optimal income tax literature.[2] That literature addresses three interrelated questions: How should income (wealth) be redistributed within society? How much should be transferred? How should society collect the needed revenues for the redistribution? The particular purpose of the literature has been to explore how the answers to these questions depend upon (1) society's goals for redistribution (specified in terms of a social welfare function); (2) such other goals as the appropriate level of expenditures for a public good; and (3) variation within the population with respect to individual preferences concerning work and income, productive capacities, and demographic characteristics such as family size and age. The focus of this paper is limited in comparison to the broader context of the literature, since we only explore the question of how to distribute a given amount of money, ignoring the economic and welfare effects of the taxes needed for the transfers. This relatively narrow question is often the more relevant one for a government planner. For example, the planners of the Carter administration's welfare reform proposal were told to redesign the transfer system under the added constraint that the reformed system's total expenditures could not exceed the level of the existing system.[3] Furthermore, by restricting the focus of the paper, two extensions of the literature can be highlighted: incorporation of empirical labor supply estimates into simulation of the optimal policy, and exploration of how variations in the economic costs of children affect the optimal structure of the transfer system.

A word of caution should be expressed at this point concerning interpretation of the results of this paper and their consequent policy relevance. Throughout, we use the term "optimal policy" to refer to the transfer structure that meets the budget allocation constraints envisioned for the transfer system. Our purpose is to explore how variation in budget allocations, in social objectives, and in characteristics of the population affect the "optimal policy." The reader should focus on how the structure of the transfer system changes rather than on actual levels of transfers.

The next section details the assumptions underlying the characterization of the target population, women heading households. We present the behavioral assumptions concerning household work effort and participation in the transfer program. This section thus specifies the assumptions that will determine the set of program parameters that are feasible for a given transfer budget allocation.

The following section of the paper describes the set of feasible parameters that are implied by the characterization of the population and shows how the set of feasible transfer structures is affected by the economic costs of a child. In order to determine which of the feasible structures is "optimal," the government planner must specify and quantify the purpose or objective that is envisioned for the transfer system. The next section of the paper formulates two alternative (and extreme) objectives for the transfer system and describes their consequences for the design of the program. The final section offers conclusions and describes avenues for future research.

CHARACTERIZATION OF THE TARGET POPULATION

The government seeks to design a transfer system that distributes a given amount of money to female-headed households with children, and has decided to divide the population into two groups based upon the age of the youngest child (six years old). To simplify the analysis, the government is assumed to consider only simple NIT transfer structures of the form:

$$PAY(I) = \begin{cases} G - tI & \text{if } I < G/t \\ 0 & \text{if } I > G/t \end{cases}$$

where

PAY(I) = the payment received if household has income, I,

G = the guaranteed level of income,

t = the benefit reduction rate,

I = income from all non-transfer sources.

The guarantees and benefit reduction rates will be allowed to differ between the two groups of households.

The first task is to determine which combinations of G and t satisfy a given budget allocation. Crucial to this determination is the characterization of the economic environment that the households face and their anticipated reaction to implementation of the program in terms of work effort and program participation. It is this characterization to which we now turn.

To simplify the analysis, we consider only two major sources of differences among individual households: differences in earnings potentials (wage rates) and differences in the economic costs of maintaining a household. To characterize the distribution of earnings potentials it is assumed that wage rates for each of the two groups of households are distributed identically as a displaced truncated lognormal. The parameters of the distribution were chosen so that the median hourly wage rate is \$3.50 and the average wage is \$5.10. The additional parameters were chosen so that no woman's wage fell below \$2.10 nor exceeded \$7.00 per hour.[4]

Another aspect of an individual's earnings potential is her ability to find work at her potential wage. In order to capture the possibility of involuntary unemployment, it has been assumed that there is a given probability (PO) of becoming unemployed which is independent of the individual's earnings potential. For all the simulations in this paper, PO has been set at 20 percent.

With regard to the economic costs of maintaining a household, it is assumed that these differences emerge not between members of a group but between the two groups of female-headed households. Hence any differences in the costs of maintaining a household are assumed to be due to the change in the costs associated with the child becoming older, in particular turning six years old. In the specification of the model used in this paper, there are two important components of the cost of a child:

the cost of the consumption needs of the child and the cost of the services (child care, for example) that must be purchased if the woman works. Intuition might lead one to conclude that as the child grows older, the child's consumption needs will rise. However, as the child grows older the cost of such services as child care will decline, since the child will be attending school.

To formally express these two concepts of cost, define the cost of maintaining a household as the minimum level of expenditures on goods and leisure needed to achieve a given level of economic well-being (denoted by the index U). The relationship between the level of required expenditures (Full Income) and the level of well-being is denoted as the cost function which is assumed to be a function of the structure of the household (age of the child), i.e.,

$$C = E(p,w,U;D)$$

where

$E()$ = the cost (expenditure) function,

p = price of a composite consumption good,

w = wage rate,

U = level of economic well-being (utility), and

D = the demographic characteristics of household.

To make the explicit distinction between the two components of cost, define the function $E()$ as the minimum level of expenditures needed to achieve a given level of well-being if the woman does not work. However, if the woman works, she will incur an additional cost which will be assumed to be fixed but which depends upon the demographic characteristics of the household. In particular, if the woman works, the needed level of expenditures would be equal to

$$C = E(p,w,U;D) + FC(D)$$

where FC(D) are the fixed costs of working.

To translate this description of the costs facing a household into a description of individual behavior, we begin by denoting the level of full income needed to achieve U to be FI if she works. In other words;

$$FI = E(p,w,U;D) + FC(D).$$

Alternatively, her level of economic well-being if she works and has FI can be determined by solving the above expression for U, i.e.,

$$U = V[p,w,FI - FC(D);D].$$

This last expression is denoted in the literature as the indirect utility function, which states the maximum utility that a household with characteristics D can achieve if it faces the prices p and w and has a full income equal to FI-FC(D). From duality theory, Roy's identity states that the work effort of the woman in the market (labor supply, h) can be deduced from the indirect utility function by the following relationship:

$$\frac{-\partial V/\partial w}{\partial V/\partial FI} = T - h[p,w,FI - FC(D);D],$$

where T is the total time available for either work or leisure and h() is the labor supply function.

Thus, the economic costs of maintaining a household are intimately connected to the behavior of the household. In particular, differences in economic costs combined with differences in earnings potential in this framework will explain how individual households will choose one of three states:

(1) not working and receiving a transfer,

(2) working and receiving a transfer, and

(3) working and not receiving a transfer.

Obviously, the extent to which households sort themselves into these three states will determine the set of program parameters (G and t) consistent with a given budget allocation.

To describe the process by which the individual households select themselves into states, we adopt the following notation:

$U(h,X)$ = the direct utility

= the level of well-being enjoyed by the household if it works h hours and consumes X dollars of goods and services,

$V(w,y)$ = the indirect utility function

= the maximum level of utility achievable given the budget constraint:

$X = wh + y$

w = the gross wage rate

y_u = nonemployment income if unemployed ($h = 0$)

y_w = nonemployment income if employed ($h > 0$),

G_u^* = effective guaranteed income if unemployed,

$= G + (1 - t)y_u$

G_w^* = effective guaranteed income if employed

$= G + (1 - t)y_w$.[5]

Underlying the choice framework utilized in this paper is the assumption that the woman will choose the state which maximizes her well-being.

First, consider the decision not to work and hence occupy the first state. If the woman chooses this state then it can be concluded that the utility from not working must exceed that of either of the two other states, i.e.,

$$U(0,G^*_u) > \text{Max}\,\{V[(1 - t)w, G^*_w - FC],\ V(w, y_w - FC)\}.$$

If preferences of the woman are continuous, there will exist a wage rate such that the woman is indifferent toward working or not working. Denote this wage rate as the entering rate, W_e, which is equal to

$$W_e:\quad U(0,G^*_u) = \text{Max}\{V[(1 - t)W_e, G^*_w - FC],\ V(W_e, y_w - FC)\}.$$

Thus, women with a wage rate less than W_e will choose not to work. Women with a wage greater than W_e will choose to work and either receive a transfer payment or not.

Now consider a woman who has a wage rate greater than W_e. Which state will she choose, (2) or (3)? Again, the state she will occupy will depend upon which of the two will make her better off. If preferences are continuous, there will exist a wage rate, W_o, that will make her indifferent between working and receiving a transfer payment (state 2), and working but not receiving a payment (state 3). Denote this wage rate as the exit wage, which is equal to

$$W_{Oh}:\quad V(W_{Oh}, {}^*G_w - FC) = V(W_{Oh}, y_w - FC).$$

Hence if the woman receives a wage rate greater than W_e but less than W_{Oh}, she will choose to work and receive a transfer payment. If the wage rate is greater than W_{Oh}, she will choose to work and support herself.

In order empirically to implement this framework of individual choice, it might seem natural, given the above discussion, first to specify a cost function and to decide on how various demographic characteristics should enter this specification. Once the cost function is known, other functions, such as the indirect and direct utility function and the labor supply function, can be derived. However, this paper has taken an alternative approach, outlined in Betson and van der Gaag (1984). It "recovers" the cost function implicit in a given labor supply function. The labor supply function used in this paper is the most commonly assumed form found in the empirical literature--the linear labor supply function:

$$h(p,w,y;D) = \delta(D) + \alpha w/p + \beta[y - FC(D)]/p,$$

where the intercept term $\delta(D)$ depends upon the demographic characteristics of the household. The parameters are constants, independent of household characteristics. The implicit cost function for the linear labor supply function is

$$E(p,w,U;D) = wT - p[\beta\delta(D)-\alpha]/\beta - \alpha w/p + pU\exp(-\beta w/p).$$ [6]

For this study, the labor supply estimates from the Hausman study, based on 1975 data on female household heads from the Michigan Panel Study, are chosen. The estimates are presented in Table 1.[7] They were chosen because we judge that Hausman's work represented the current state of the art in the labor supply literature. He attempts to control for the influence of the tax and transfer system on the individual's budget constraint, thereby arriving at "uncontaminated" estimates of underlying preference structure.

Table 1

Hausman's Estimates of the Labor Supply of Female Household Heads

α	.351
β	-.122
δ: child over six	.806
child under six	1.064
FC(in thousands):	
child over six	.450
child under six	1.110

Source: Hausman (1981).

As noted in Betson and van der Gaag (1984), the differential in the intercept term in the Hausman estimates implies that the consumption and time costs of a child diminish as the child turns six years old. This result runs counter to the literature on the costs of children, and counter to common sense.[8] Hence, for sake of reality various choices of the intercept term will be used in this paper. For example, a realistic intercept term for the labor supply function of a woman with a child under six is obtained by assuming that the consumption and time costs of a child under six are \$1200 less than the costs of a child six years or older. This assumption implies that the intercept term for the woman with a child under six is .660. Given that the fixed costs of working will fall by \$660 (\$1100 - \$450) when the child turns six, the total additional cost of a child who turns six is \$540 for a working mother. We will use this example as our baseline assumption, and present results for alternative assumptions regarding the cost of children, including the original Hausman estimates.

For all policy simulations it is assumed that both y_u and y_w equal zero.

SIMULATION OF THE SET OF FEASIBLE PROGRAM PARAMETERS

The previous section outlined the assumptions made about the manner in which individuals, through their labor market behavior, can affect the total costs of the transfer program. In this section, we describe how these assumptions affect the set of feasible program parameters that satisfy the initial budget allocations made for the two groups of female-headed households. To normalize the results, the population of each group of households is set equal to one. Thus, instead of referring to the budget allocations made to each group, we can refer to the average support made to each group. The average support (AS) for each group is equal to

$$AS = G[P0 + (1 - P0) \int_{0h}^{W_e} f(w)dw]$$

$$+ (1 - P_0) \{ \int_{W_e}^{W_{0h}} \{G - twh[(1 - t)w,\ G - FC]\} f(w)dw \} .$$

As noted in our introductory remarks, the first task in the design of the transfer system is to construct those combinations of the guarantee and benefit reduction rates that yield equivalent budget costs (average support) to the two groups of female households. Figures 1 and 2 trace three equal cost contours for the two groups of households under the baseline assumptions about the costs of the child.

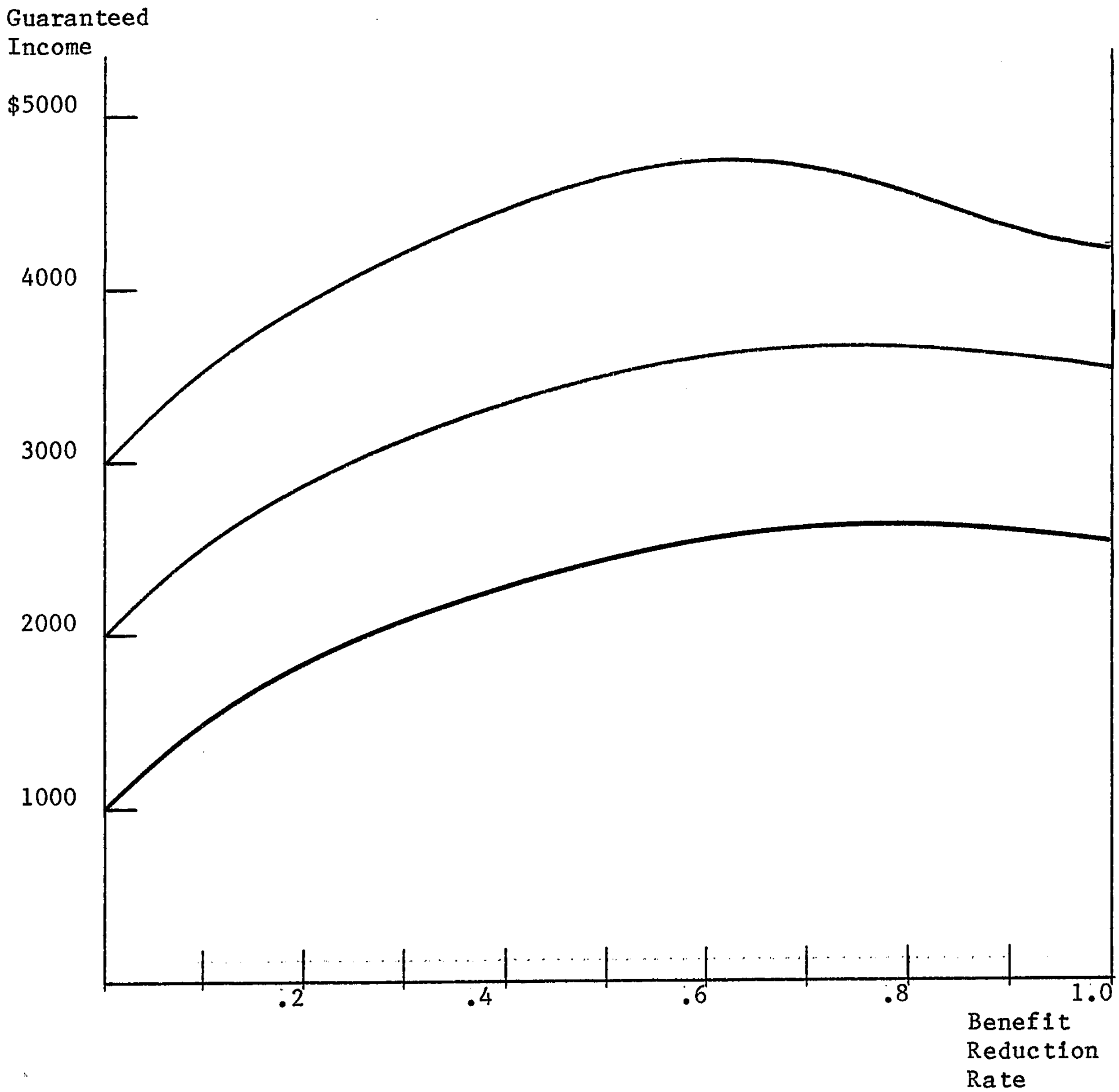

Figure 1

Equal Cost Contours for a Single Mother with Child Over Six

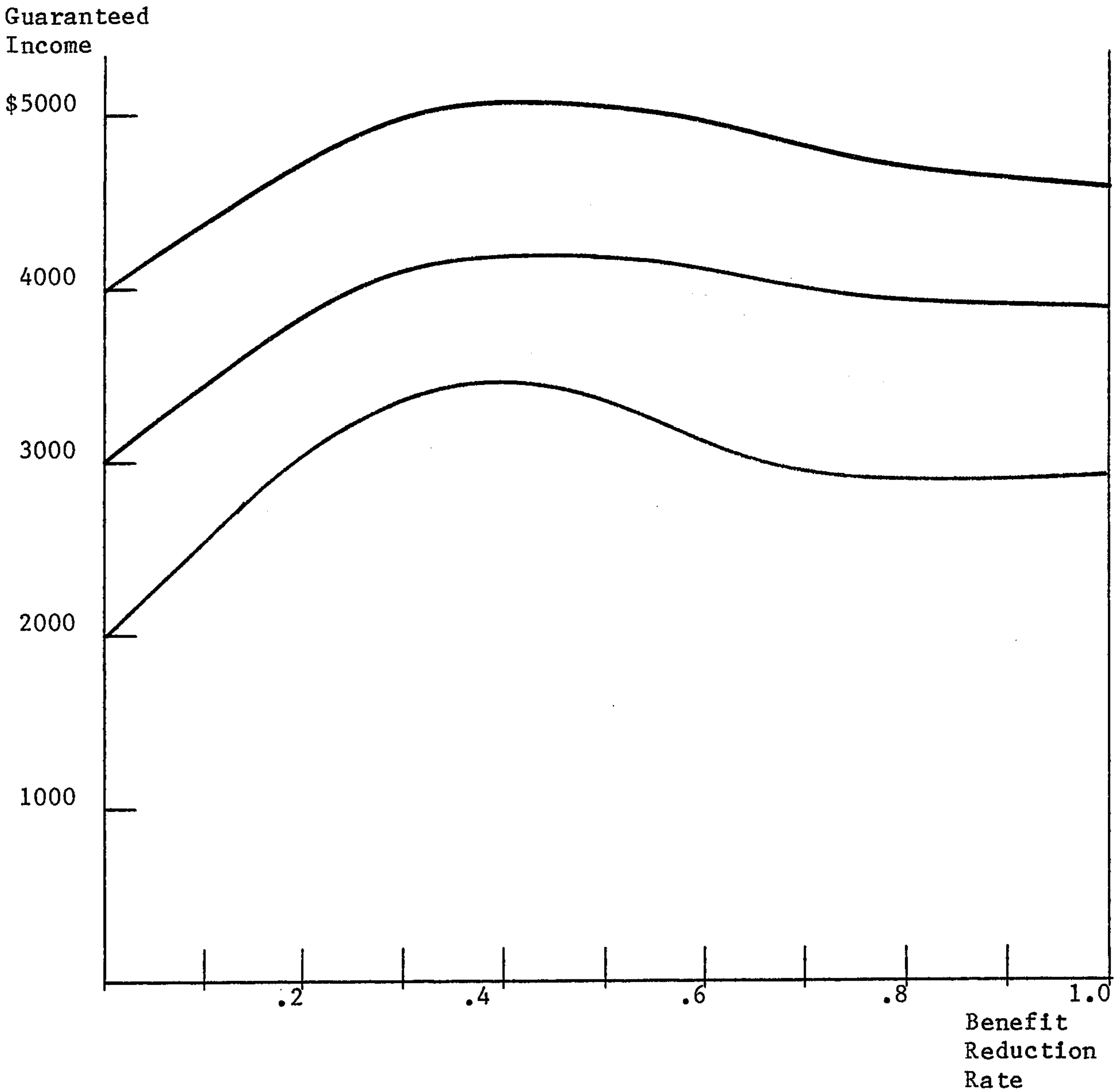

Figure 2

Equal Cost Contours for a Single Mother with Child Under Six
(Baseline Assumptions)

At all the levels of average support simulated for this paper, each group of women displayed, at low levels of tax rates, what could be denoted as increasing marginal returns to cost reduction with respect to the tax rate. That is, in order to hold cost constant, the guarantee has to be increased when the tax rate is increased. For each group, however, further increases in the tax rate, holding the guarantee constant, increased the costs of the program. Thus, in order to hold the costs constant the guarantee had to be lowered.

Since the only economic difference between the two groups of households is the economic cost of the child, the peaks and shapes of these equal cost contours are determined by these cost differentials. Recall the nature of the cost differential faced by these two groups. First, there is a difference in the consumption and time costs of the child (δ). Given the assumptions about the labor supply relationship made in this paper, a rise in the consumption and time costs of a child is associated with a rise in the needs of the household. In order to meet these increased household needs, the woman would increase her work effort. On the other hand, the difference in the fixed costs of working have an adverse effect on work effort. If those fixed costs increase, holding all other factors constant, the woman would reduce her work effort. Hence, given our baseline assumptions about the nature of the economic costs of the child when it turns six, we would expect the woman to increase her commitment to the workplace. Given this increased work effort from the women with children over six, we would expect there to be a more "favorable" trade-off between the guarantee and tax rate, holding the level of average support constant.

Finally, it should be noted that for the population with a child under six, the equal cost contours become horizontal. The explanation is that at the tax rate under which the contours become horizontal, the wage rate required for the woman to enter the labor force (W_e) is equal to the exit wage rate (W_{0h}). At these tax rates, the proportion of the population that receives a payment and works becomes zero. Hence any further increase in the tax rate will not affect costs.

IMPLICATIONS FOR TRANSFER DESIGN

The construction of the equal cost contours provides the government planner with a set of parameter choices consistent with a given allocation of the transfer budget to the two subgroups of households. Which of these feasible combinations of policy instruments should now be chosen? The combination of guarantee and benefit reduction rate will obviously depend upon other objectives the policy makers envision for the transfer system. In order to maintain the generality of the discussion, this paper has up to now been deliberately vague on the policy objectives of the transfer system. However, it should be noted that even for the purpose of making an initial allocation to the two groups, there must be some indication of the government's view of the role of the transfer system. While the views could be as vague as believing that a single mother with a child under six deserves more public support, a more precise definition needs to be spelled out to enable us to use the information generated above. In this section, we discuss two possible specifications of policy objectives and their effect on the design of the transfer system.

The first broad policy objective can be described as follows. Given that there is a fixed sum of money to distribute, society wishes to maximize the economic well-being of the female-headed households. The well-being of the group will be constructed by taking the sum of each individual household's well-being, each household being given equal weight. This objective is operationally defined in the optimal tax literature as the Bentham or Utilitarian Social Welfare Function.

A second, alternative view of the transfer system would expect the system to provide a "safety net" (income floor) for the target group. If adverse circumstances occur (e.g., the head becomes unemployed), then the household has a program to rely on for support. In this case, a possible goal in the selection of program parameters would be to maximize the level of the safety net, i.e., the guarantee. In the optimal tax literature, this type of policy goal is described as the Rawlsian Social Welfare Function.

Table 2 presents the optimal choices of the program parameters for the two groups of female-headed households at various levels of average support and under our assumptions about the structure of the economic costs of a child. Also included in the table are the proportions of the group of households that will not be working (P_{nw}); working and receiving welfare(P_{ww}); and those working and not receiving welfare (P_{ow}).

As Table 2 indicates, the two alternative views of the transfer system imply quite different transfer structures. In general, for any given level of support, the safety net view of the transfer system leads to higher guarantee, higher benefit reduction rate combinations.[9] The

Table 2

Transfer Program Structure Under Two Social Welfare Functions to Maximize Well-Being of Female-Headed Households with Children Under and Over 6

	Utilitarian Function					Rawlsian (Safety-Net) Function				
Average Support to Achieve Policy Objective	Guarantee (G)	Benefit Reduction Rate (t)	Receiving Transfer and Not Working (P_{TNW})	Receiving Transfer and Working (P_{WW})	Not Receiving Transfer and Working (P_{OW})	Guarantee (G)	Benefit Reduction Rate (t)	Receiving Transfer and Not Working (P_{TNW})	Receiving Transfer and Working (P_{WW})	Not Receiving Transfer and Working (P_{OW})
					A. Child over six (δ = .806)					
$1000	$2001	.22	20%	61%	19%	$2987	.86	20%	24%	56%
2000	2790	.16	20	80	0	3854	.73	20	50	30
3000	3699	.15	20	80	0	4647	.61	21	63	16
					B.1. Child under six (δ = .660)					
2000	2722	.15	20	80	0	3237	.38	36	47	17
3000	3634	.14	20	80	0	4032	.36	50	42	8
					B.2. Child under six (δ = .726)					
2000	2790	.16	20	80	0	3382	.41	32	50	18
3000	3699	.15	20	80	0	4158	.38	45	46	9

—table continues—

Table 2, continued

Average Support to Achieve Policy Objective	Utilitarian Function					Rawlsian (Safety Net) Function				
	Guarantee (G)	Benefit Reduction Rate (t)	Receiving Transfer and Not Working (P_{TW})	Receiving Transfer and Working (P_{WW})	Not Receiving Transfer and Working (P_{OW})	Guarantee (G)	Benefit Reduction Rate (t)	Receiving Transfer and Not Working (P_{TW})	Receiving Transfer and Working (P_{WW})	Not Receiving Transfer and Working (P_{OW})
B.3. Child under six (δ = .806)										
2000	2867	.17	20	80	0	3517	.45	27	52	21
3000	3732	.15	20	80	0	4331	.40	37	53	10
B.4 Child under six (δ = 1.054)										
2000	3117	.20	20	78	2	4202	.62	21	50	29
3000	4012	.19	20	80	0	4939	.53	24	61	15

utilitarian objective of maximizing the well-being of the group leads to the selection of program parameters that compose what could be called an income supplementation program for all households. This can be seen in two ways: first, the program structures under this policy view produce a combination of work incentives such that all women who are not working are involuntarily unemployed (recall PO is equal to .20). Second, the program structures selected by this view are such that every household would receive a transfer (P_{ow} is zero for almost all simulations).

In contrast, the safety-net view of the transfer system leads to less welfare usage than the alternative view. In terms of this view, fewer women would generally be working and receiving payments, but in most cases greater proportions of the households would not be working (P_{nw} is greater than .20). Only when the child is over six years of age do we see that this view of the system leads to a program structure where all household heads who are not working are involuntarily unemployed.

Let us now turn to the primary comparison to be addressed in this paper--the change in the optimal transfer structure when the child grows older. As noted in previous sections, the crucial economic factors of this demographic change are believed to be a reduction in the fixed costs of working when the child grows older, together with an increase in the consumption and time costs. In order to highlight this change, we have simulated the optimal structures under five assumptions about the structure of costs faced by the two groups of women. Panel A utilizes the Hausman estimates for a woman with a child over six (δ = .806, FC = .450). Panels B.1-4 concern the group of women with a child under six. It is assumed that all women face a fixed cost of working equal to $1110. Panel B.1 utilizes the assumption that the consumption and time costs of a child rise to $1200 when the child turns six (δ = .660). Under this assumption a working mother's total economic costs of a child would rise by $540 when the child turns six. Panel B.2 assumes a value of .726 for δ, implying that the consumption and time costs of the child rise by the same amount that the fixed costs of working fall ($660). In this case the total cost of the child does not change for a working mother when the child turns six. Panel B.3 makes the assumption that the consumption and time costs of the child remain unchanged when the child turns six (δ = .806), while, as always, the fixed costs fall by $660; the total costs of the child therefore fall $660. Panel B.4 utilizes the Hausman estimates for a mother with a child under six (δ = 1.054). This value of the intercept term implies that the consumption and time costs of the child fall by $2030 when the child turns six.

Although Table 2 presents results under all the assumptions, the major part of our discussion of results will compare Panel B.1 to Panel A.

First, we assume that the budget allocations to the two groups are such that the average support for each group is $3000. As the table indicates, the two views of the transfer system lead to different policy recommendations with respect to how the system should change when the child turns six. The safety-net view leads one to recommend raising the guarantee by $615 (more than the total cost increase to a working mother) but also to drastically increase the benefit reduction rate from 36 percent to 61 percent. In contrast, the Utilitarian view leads one to leave the structure virtually intact. This difference in the policy recommendations remains regardless of the level of average support, which can be seen by comparing the program structures at the lower level of average support of $2000.

In order to construct a rationale for the results of the Utilitarian view, one should recall the earlier characterization of the program structure required by this policy objective, in which we stated that the Utilitarian structure could best be described as a general income supplementation program. Hence if the prime concern is to supplement the income of every household, but only a fixed amount of money is available to do so, the ability to meet this goal would depend on the work effort of the average mother. Given the labor supply assumptions, the average working mother would alter her work effort by only 65 hours annually ($\Delta h = \Delta\delta = \beta\Delta FC$), holding constant the structure of the transfer system. This additional work effort would permit the guarantee to be increased by only about $50. Any further increase in the guarantee to compensate the women for the increased costs must be offset by increases in the benefit reduction rate. However, there will be a limit to the amount by which the guarantee and tax rate can be further increased, owing to the adverse work incentives of these program changes. To reinforce this last point, compare Panels A and B.2. In B.2, the costs of the child remain unchanged for a working mother. Given this assumption, the average working mother will not alter her work effort when the child turns six, and hence the government's ability to change the structure does not exist.

The second result that should be explored is whether the $615 increase in the guarantee implied by the safety net view is determined by the increase in the costs of the child. As noted before, for a working mother the total cost differential under our baseline assumptions is

$540, while for the nonworking mother the total cost differential is $1200. Hence the increase in guarantee of $615 could be interpreted as an average compensation for the increase in costs of maintaining the household. The logic of this interpretation is consistent with the results in Panel B.2, where the cost of the child rises for the nonworking mother and remains unchanged for the working mother. However, the logic of this interpretation breaks down if one utilizes the assumptions about the consumption and time costs utilized in the last two panels. For example, Panel B.3 assumes that the cost differential for a nonworking mother is zero, while for the working mother total costs of the child fall by $660 when the child turns six. Using the logic above, one would expect the guarantee to fall; yet, the optimal policy dictates the opposite result. What this comparison points out is that while the changes in optimal guarantee may correspond to changes in need of population, the change in the structure of costs of a child (fixed versus variable) may be more important in determining the ability of the government to meet these needs. Hence the knowledge of the direction and the magnitude of change in the economic costs are not sufficient to determine how the optimal program will change.

While the above comparisons left the average level of support unchanged, one should recognize that for the case where the child turns six and the economic costs rise, unchanged absolute support levels imply a reduction in the relative generosity of society to the households, which now have a greater need. Perhaps public opinion is such that as the child grows older, the role of the government in supporting the child should diminish and the mother should play an increasing role in the support of the child. In that case the relevant comparisons should be between the average support of $3000 for a child under six with the lower level of average support of, say, $2000 for a household with a child over six. Again the policy recommendations implied by the two alternative views are quite different. The safety-net view leads one to recommend large increases in the tax rate to offset needed reductions in the guarantee. The Utilitarian view, on the other hand, leads one to make only modest increases in the tax rate while reducing the cost of the transfer program mainly by reducing the guarantee.

CONCLUSIONS

This paper has attempted to examine implications drawn from the labor supply literature for the design of a transfer program. Our major interest centered on how a transfer program's structure will change when the youngest child turns six. We found that the design of the structure depends upon the average level of support allocated to the two groups of female-headed households (those with children under and over six) and the ultimate policy objectives that society holds for the transfer schemes. We found that if the average level of support is held constant, a "safety-net" view of the system would lead one to increase the tax rate dramatically while moderately increasing the guarantee. In contrast, if the system is viewed as attempting to maximize the well-being of the group of households, the optimal policy is to leave the structure unchanged.

If public opinion also led one to decrease the level of support to the women as the child turns six, then the two views of the system again lead to different recommendations. The "safety-net" view would result in adoption of a structure with high tax rates in order to maintain a relatively high guarantee, whereas the Utilitarian view recommends drastic cuts in the guarantee with only modest increases in the tax rate. Under the Utilitarian approach, everyone "shares" in the reduction in support made to the group by losing almost equal amounts of payments. Under the "safety-net" approach to transfer policy, the reduction in support is borne by the relatively better-off households. An interesting final observation can be gleaned from these results: under no set of circumstances did the optimal policy lower both the guarantee and the tax rate when the child turned six years old.

At this point we would like to add a cautionary note that serves also as a rationale for future research in this area. It goes without saying that the conclusions reached in this paper may or may not be robust with respect to the various assumptions made in the paper. Before one can have some confidence in the results, further exploration and research are needed--especially concerning the nature of the structure of the costs of the child. In this paper, we found the fixed costs of working to be an important factor in determining the government's ability to distribute income; hence this would be a logical issue on which to spend more research time. Moreover, the paper utilizes only one functional form for the labor supply function and hence only one particular form of the consumption and time costs of a child (see Betson and van der Gaag, 1984). Further research should explore more flexible specifications of the costs of the child in terms of alternative specifications of the labor supply function. It should also allow for more extensive representation of the demographic variables--in particular, the number and ages of the children should be included in a more general manner than simply a change in the intercept term. It is our intention to address these points in future research.

Notes

[1]See Orr and Skidmore (1982) for a description of the historical evolution of the issue of the use of categories in the welfare system and its reform.

[2]Mirrlees (1971, 1972), Sheshinski (1972), and Fair (1971) provide good examples of the methods utilized in the optimal income tax literature and the results obtained.

[3]See Califano (1981) for a discussion of the process of constructing the welfare reform package in the Carter administration.

[4]The parameters of the wage distribution were chosen to represent the distribution of wage rates faced by female heads of families in 1975. The choice of 1975 follows from the labor supply estimates we utilized, which are from a 1975 sample.

[5]In the specification of the model given here, the price of the composite consumption good has been normalized to one and the vector of demographic characteristics, D, has been dropped.

[6]The indirect utility function for the linear labor supply function is

$$V(w,y,FC;D) = \{[\delta(D)+\alpha w/p + \beta(y - FC)/p]/\beta - \alpha/\beta^2\}\exp(\beta w/p),$$

whereas the direct utility function is equal to:

$$U(h,X;D) = (h/\beta - \alpha/\beta^2)\exp\{\beta[\delta(D) + \beta X - h]/(\beta h - \alpha)\}.$$

[7]Hausman's original specification included other demographic variables that have been suppressed in this table, which assumes that all the women in the population are in good health, are renters and have only one child. Also, the original specifications of the econometric model

allowed for variation in the income effect term (β). For this paper, we assume that all the women have the same β equal to Hausman's mean value for β.

[8]Betson and van der Gaag (1984) provide an explanation for this counterintuitive result of the Hausman study.

[9]These results mirror the results obtained in the optimal tax literature. For example, see Fair (1971).

REFERENCES

Betson, D. and van der Gaag, J. 1984. "Alternative estimates of equivalence scales." University of Notre Dame, Department of Economics. Mimeo.

Califano, J. 1981. Governing America. New York: Simon and Schuster.

Fair, R. C. 1971. "The optimal distribution of income," Quarterly Journal of Economics, Vol. 85 (Nov.), 557-579.

Hausman, J. 1981. "Labor supply." In How Taxes Affect Economic Behavior, eds. H. Aaron and J. Pechman. Washington, D.C.: Brookings Institution.

Mirrlees, J. 1971. "An exploration of the theory of optimal income taxation," Review of Economic Studies, Vol. 38 (April), 175-208.

_____. 1972. "Population policy and the taxation of family size," Journal of Public Economics, Vol. 1 (August), 169-198.

Orr, L. and Skidmore, F. 1982. "The evolution of the work issue in welfare reform." In Welfare Reform in America, ed. P. Sommers. Boston: Kluwer Nijhoff.

Sheshinski, E. 1972. "The optimal linear income tax," Review of Economic Studies, Vol. 39 (July), 297-302.