benefits. The investment benefits can theoretically be measured in the market place directly by contrasting the value of increased productivity with the resource cost of creating these benefits—the standard basis for benefit-cost analysis. Consumption benefits cannot be easily measured directly, but may be an important element of program impact for human resource programs. Thus, it is possible that considerations like justice and equity, consumption benefits in our terminology, would lead to expenditures on programs which are not justified by the economic or investment benefits alone. Indeed, such consumption benefits ordinarily form a major portion of the justification for human resource programs. But not for the more purely economic physical resource programs and herein lies a crucial difference which makes comparison between the two difficult or meaningless.

The costs of programs are theoretically easier to measure. The costs to the individual beneficiary himself are the opportunity costs of his participation. Thus, for example, if the results of a program were that all students remained in school an additional year, the foregone earnings associated with that additional year of school must be incorporated. The cost to society is the foregone output which could have been produced by the resources used in the program. In our example, both the foregone production of the students undertaking an additional year of school and the equipment, teacher output and the like are resource costs to society. The costs to the government are straightforward. They are the budgetary costs expended on the program.

We believe that the Federal Government must look beyond its own budgetary process in determining whether an investment should or should not be made. Once having determined that an investment is a good one for society, it is useful to see what transfer payments between individuals are necessary so that we may assess the political desirability of such transfers. The assessment of the political desirability is traditionally the function of the President and the Congress. The benefit-cost analyst has little to add in making these decisions except to make the extent and nature of the transfers explicit in reports of the studies.

It is at this stage that discounting plays an important role in the analysis of costs and benefits of programs. The traditional use of discounting in benefit-cost analyses of human resource programs is to determine the present value of future benefits. However, discounting may also be used to make different costs comparable. For example, as shown in Mahoney and Rosen's comparative study of Head Start and Upward Bound, an essential difference between these two programs is the length of time which intervenes between the incurring of cost in each program and the onset of returns. Upward Bound costs are incurred just a few years before participants enter the labor force, while Head Start costs are incurred eleven years earlier in a youth's life than this.

For purposes of such comparisons, it can be assumed that the target population is the same for the programs and that the programs are substitutes for one another. The assumption is that a child is to be treated once—either as a preelementary school child in Head Start or as a high school student in Upward Bound. The comparison is to determine at what point we would be indifferent between providing the child with either program.

Discounting eliminates the distortion which would accompany a dollar comparison of costs incurred at different points in time. Were it assumed that Head Start and Upward Bound will have the same upward impact on lifetime earnings, then the choice between programs (as investments) would rest on a comparison of their costs. If returns are identical, the two programs will be equivalent if the costs (properly discounted) are the same. If we simplify by assuming that the primary economic benefit derived from Head Start and Upward Bound is that associated with educational gains, then a measure of educational level may be used as a proxy for the economic benefits (although this strict measure of quantitative incremental educational attainment ignores a quality impact which is one of the bases of the Head Start program).

At present, there exist some estimates of the educational attainment of Upward Bound students. These estimates are incomplete primarily because the program is new enough that no graduate has had time to complete college. In any case, these quantitative educational gains estimates, in conjunction with per-student costs to the Federal Government for Upward Bound and Head Start permit some "cost effectiveness" estimates to be calculated. Such a calculation indicates the importance of discount rates.

The question is posed as follows: Given the estimated educational gain of Upward Bound participants, how much educational gain must Head Start pro-