

a heavier contribution burden in relation to benefits than earlier generations. Students of social insurance answer the question about solvency by pointing out that in a public insurance program there is no need to provide actuarial reserves against future contingencies. These are met from future income. But this means that the relationship between contingent benefits and future taxable income is of crucial importance. This relationship leads directly to the question of benefit versus burden for succeeding generations.

We shall assume that in order to be sustainable, the rates of contribution and benefit must not only adequately meet the needs of the present generation of beneficiaries, but that they must also meet the needs of each succeeding generation, and at the same time they must avoid allowing one generation to become a net burden on another. In other words, we need to devise an old-age pension plan that meets the criteria of both social adequacy and intergenerational equity. We use this concept of equity to mean that each generation is entitled to benefits equal to the interest compounded value of its own contributions.³ The benefit increases which are consistent with this plan, assuming they are also consistent with wage-pension preferences, can be considered sustainable increases.

We need to recognize at the outset the likelihood of incompatibility of our dual criteria of social adequacy and intergenerational equity. Only in an ideal world with continuous and invariant changes is there some assurance of compatibility, but not in a world subject to fluctuations in earning and employment levels. To deal with the uneven empirical environment our best alternative is to work out a plan which enables us to minimize deviation from established criteria. In this paper we approach this problem in two steps. First, we develop a mathematical model that generates sustainable rates on the assumption that there is no conflict between social adequacy and intergenerational equity. Second, we introduce a linear programming model which enables us to minimize the disutility stemming from shortrun inconsistency between the two criteria. In section V we shall argue that planning based on the linear programming model establishes, among other benefits, an improved medium for the application of the research efforts of social scientists to the planning problems of the social security system. Before turning to these models, we shall present, in the following section, the basic features of our pension plan and the main assumptions of the analysis. For the sake of analytical simplicity we have abstracted from many aspects of the real world, and we have deviated in important respects from the structure of the existing old-age pension system. These abstractions and deviations, however, do not affect the general theoretical objectives of this analysis.

II. STRUCTURE OF THE PENSION PLAN

Our mathematical models are restricted to old-age pension plans. We deal only with primary beneficiaries and do not take into account their dependents. Nor are we directly concerned with survivorship

³ The conflict between equity and social adequacy can exist on both intragenerational and intergenerational levels. We do not deal with intragenerational (intracohort) redistributions of benefits, which can be treated separately from questions of intergenerational redistribution and equity.