This could create the opportunity for surplus fulfillment of some of the constraints (4.5), (4.6), (4.7). Deliberate violation of (4.10) might occur if the constant tax rate r_1 that is consistent with the initial obligation $0(1)$, were considered too low in the long run. In this case a higher terminal obligation than that established by (4.10) (and (4.11) and (4.12)) would be justified.

A brief commentary is in order on the problem of specifying the coefficients of the objective function. Relative values must be established for running the system at a deficit, paying various cohorts less than they earn and/or less than a socially adequate benefit, and for creating a terminal obligation that implies a higher future tax rate. Moreover, if higher future tax rates are acceptable, then windfall benefits are available and their distribution over various cohorts depends on the objective function coefficients assigned to the slack and artificial variables and the paramater H that constrains the terminal obligation $0(T)$. The difficulty of establishing these coefficients is considerable; but it should be emphasized that this intrinsic difficulty is merely spotlighted—not created—by the linear programing formulation. In the next section we shall offer further comment on the problems of parameter specification in the linear programing model.

The linear programing problem formulated here should involve no serious computational difficulties for values of T even greater than 100. Some of the elaborations we have suggested might involve many more variables and constraints—but even then the computational outlook is favorable. These more elaborate models, in common with the simple model, have a special network structure; this means that prospects would be excellent for finding or developing a special algorithm capable of practical computation of very large problems. A second potential benefit of this special structure is the possibility, which we have not yet explored, for further analysis and interpretation of the social security planning problem by means of duality theory of linear programing.

Hopefully we have indicated by these remarks that a range of formulations exist for this problem and that more analysis will be required before definitive knowledge is available to outline the limits and possibilities inherent in the social security mechanism.

V. Concluding Observations

Our purpose here is to relate our analysis to a more general view of the social security planning problem. This problem requires a practical synthesis of complex empirical data and predictions, a balancing of the interests of present and future generations, and compliance with underlying administrative and economic realities. While it is obvious that theoretical work by economists, sociologists, statisticians, etc., can be useful to the planner, the exact means of applying such expertise are less obvious. Basic reliance, of course, must always be placed on the synthetic ability of the informed, intelligent planner. But, well defined, systematic procedures that guarantee optimality, if appropriately used, can certainly benefit the planning process. Such procedures are increasingly beneficial if they explicitly formalize the channels through which empirical predictions, value judgments, and theoretical results—e.g., from economics—impinge on the final plan.