

realistic analytical basis than the static assumptions concerning taxes and benefits accepted reluctantly in previous studies. Similarly, it is believed that a proportional imputation of the employer tax is preferable to ignoring its burden altogether. However, at this stage the only imputation is at the aggregate level, since only average taxes and benefits per worker are being considered. Assuming that workers as a whole bear the entire tax, it follows that the *average* tax per worker must include the tax nominally assigned to employers, regardless of how it is distributed among workers.

The model to be suggested approximates certain features of the current and developing social security system and incorporates available official data such as projections by the Social Security Administration of population by age group and mortality rates by sex. The result is a mixture of theoretical and empirical elements. It abstracts from many of the details of the present tax-benefit structure in an effort to focus on the key effects of the growth process. The present analysis also departs from earlier work in another way. Instead of assuming particular rates of return, the criterion stressed is the estimated yield to a particular type of participant on his "investment" in social security.

The basic assumptions of this simple growth model are: (1) Real earnings per employee grow at a fixed rate,  $r$ ; (2) real retirement benefits per beneficiary grow at the same rate,  $r$ ; and, therefore, are related to average earnings by a fixed factor,  $k$ ; <sup>20</sup> and (3) the system is financed on a pay-as-you-go basis. <sup>21</sup>

The particular tradeoff between the tax rate and the taxable earnings ceiling to be used in raising the required tax is left unspecified at this stage. Nonretirement benefits and the taxes needed to raise them are both excluded from this model, and this avoids the bias produced by weighing old-age benefits alone against taxes raised for more general purposes. The postulated pay-as-you-go financing and fixed benefit-earning ratio are intended to provide an approximate skeleton of the dynamic features of the actual detailed social security structure. Although never precisely realized, they should permit a more meaningful analysis of the projected system than that possible with earnings, tax rates, and benefit rates held constant.

This preliminary framework abstracts completely from the detailed differentials in tax and benefit rates by income levels and family

<sup>20</sup> Despite some irregularities this is roughly the experience of the system in the 1940-64 interval. For example, when benefits began to be paid in 1940 the mean payment for a beneficiary and wife was about 43 percent of mean earnings of covered workers. In 1964 the ratio was 37 percent. The ratio lagged between 1940 and 1949 as coverage widened, then jumped to the current level and has been relatively stable since. (See *Social Security Bulletin, Annual Statistical Supplement*, 1964, pp. 27 and 29.) This assumption concerning the growth rate of *average* benefits abstracts from the pattern at the individual level under the present system. Average benefits promised each earner grow with the rise in his taxable earnings and with statutory increases. Only the latter raise benefits after retirement. Thus the benefits of a newly retired worker will tend to start out above the average level but lag behind the average in later years. Allowance for this time path would yield a somewhat higher estimate of the present value of the benefit stream upon retirement. However, this might well be offset by the higher tax estimate that would result from allowing for below-average earnings in early years and above-average earnings later.

<sup>21</sup> Some growth in the actual trust fund is foreseen by the Social Security Administration over and above the interest accumulated, but it is generally agreed that the system is far closer to a pay-as-you-go basis than a fully funded basis. In fact, the Chief Actuary, Mr. Myers, interprets the financing basis as unchanged from the beginning "insofar as general principles are concerned—namely, that full actuarial reserves are not developed; rather, over a long-range future period, the income is estimated to meet the outgo." (Letter to David Lawrence reproduced in *Hearings Before the Joint Economic Committee on the 1967 Economic Report of the President*, Feb. 7, 8, and 9, 1967, pt. 2, p. 354.)