

THE SOCIAL INSURANCE PARADOX*

BY HENRY AARON**

In 1958 Professor Samuelson demonstrated that social insurance could improve the lot of each person in society.¹ Each person could support a portion of the cost of maintaining the retired population in return for which future generations would support him during his retirement. The return on this form of saving would exceed the real rate of interest which was in turn a function of population growth. In this note I present a proof of a related theorem: that social insurance can increase the welfare of each person if the sum of the rates of growth of population and real wages exceeds the rate of interest. I call this theorem, after Samuelson, the social insurance "paradox." This theorem does not conflict with Samuelson's because nothing is assumed here about the level of the interest rate or its determinants, other than it equals both the marginal rate of time preference and the marginal rate of transformation between present and future goods.

I. THE PARADOX STATED

Ideally, private insurers set premiums to equalize the present expected value of benefits and the present expected value of premiums.² A reserve is accumulated for each person. As the number of people covered by insurance increases, the total reserves for all people increase. If the age composition of the insured population remains the same, the rate of increase of total reserves is the same as the rate of growth of the insured population. If the same procedure were followed in social insurance, and if the covered population increased, then the total reserves would likewise increase. In a mature system the amount of reserves would increase at the same rate as population grows if the age composition of the population remains constant. If social insurance premiums were set below the level which would equalize the present expected value of benefits and premiums, the rate of increase of the social insurance trust fund could be reduced. In an extreme case, no social insurance reserves at all might be accumulated. It follows, that if the covered population increases and if no reserve is accumulated, the present expected value of premiums is less than the present expected value of benefits for each person, although for the group as a whole viewed in perpetuity, the equality will be maintained.

The logical implication of the above remarks is that, if no reserve is accumulated in the financing of old-age pensions, each person will receive a larger pension than he has paid for. Or, put another way, the

* Reprinted from the *Canadian Journal of Economics & Political Science*, Vol. XXXII, No. 3, August 1966.

** Professor, University of Maryland.

¹ Paul A. Samuelson, "An Exact Consumption-Loan Model of Interest With or Without the Social Contrivance of Money," *Journal of Political Economy*, LXVI (December 1958), 467-482.

² I am abstracting here from profits, commissions, and other administrative expenses.