

so one can speak of a member of generation t without specifying the individual. Let the symbol C_t^1 stand for the first-period consumption of a member of generation t , and let C_t^2 stand for his second-period consumption. A member of generation t is assumed to value any given consumption plan (C_t^1, C_t^2) according to the value, $U(C_t^1, C_t^2)$, taken on by a "regularly shaped" utility function U at (C_t^1, C_t^2) . The utility function U is assumed to be the same for all generations.

Continuing in Samuelson's footsteps, we now proceed to assume that output is nondurable and thus cannot be carried over from one period to the next. This assumption reduces the production possibilities in the model (that is, the possibilities of using output in one period in the production of output in another period) to naught. It is clear, furthermore, that the assumptions made so far are so restrictive as to rule out from the outset any possibility of trades, markets, or prices. A member of generation t who wishes to engage in a transaction cannot find anyone willing and able to participate in the transaction on the opposite side.

Given that production and trade have both been dispensed with, there remains only one other economic activity to be considered—distribution. This function is still open in our economy, for output can be taken from the young who earn it and given to the old who do not. Thus, our first task will be the examination of alternative distribution schemes. However, before proceeding with this examination, we must define the notion of "the rate of interest." Writing r_t for the rate of interest in period t , we *define*:

$$r_t = \frac{C_{t-1}^1 + C_{t-1}^2 - 1}{1 - C_{t-1}^1}$$

or

$$1 + r_t = \frac{C_{t-1}^2}{1 - C_{t-1}^1}.$$

Two things should be noted: (a) $1 + r_t$ is *not* a price; that is, no transactions are ever held using it as a rate of exchange. It is not even an "implicit price," in the sense of a price which emerges as a byproduct of efficient allocation of resources. It is, rather, an *ex post* rate of exchange which is *inferred* from observation of the consumption pattern of a member of generation $t-1$, and it has reference neither to trade nor to efficiency.¹ (b) When $C_{t-1}^1 = 1$, r_t is clearly not defined. If $C_{t-2}^1 = 1$ and $C_{t-1}^2 = 0$, we shall say that r_t can be any real number, and if $C_{t-1}^1 = 1$ and $C_{t-1}^2 > 0$, we shall say that $r_t = +\infty$.

III. DISTRIBUTION OF OUTPUT

As has already been remarked, the only economic function remaining in the model of the foregoing section is that of *distribution of output*. A pair of sequences,

$$\begin{aligned} \{C_t^2, t=0, \pm 1, \pm 2, \dots\}, \\ \{C_t^1, t=0, \pm 1, \pm 2, \dots\}, \end{aligned}$$

with nonnegative elements will be referred to as a *distribution scheme*.

¹ Note, however, that if a member of generation $t-1$ were to maximize utility subject to a given r_t , then $1 + r_t$ would, as usual, equal the marginal rate of substitution of second-period consumption for first-period consumption.