

# AN OPEN DYNAMIC SYSTEM FOR LONG RANGE PROJECTION OF ECONOMIC GROWTH\*

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## I. *Introduction*

1. The dynamic input-output system described below is designed for a specific narrowly defined purpose. It should enable a forecaster or a planner to determine and to display in a compact manageable form the limitations imposed on the possible growth path of a particular economic system by given sets of input-output coefficients describing its changing structural properties over the period of time covered by the envisaged projection. Such a system naturally contains more unknowns than it has equations; the missing equations are those which in a complete, that is, fully closed, system would describe relationships conventionally referred to as behavioral or instrumental. To the extent to which many complete dynamic models of economic growth, while differing from each other in the form—and the empirical content—of such behavioral equations, incorporate in their structural equations the same sets of flow and capital coefficients, this incomplete dynamic input-output system can in its practical application be visualized as representing the common core of many actual and possible completely closed, or at least less open, models.

In its final, compact formulation the system consists of only as many linear equations as there are "years" in the total interval of time covered by the projection. The number of variables contained in these equations is twice as large—two for each year, one representing the over all level of consumption, the other—the level of total employment.

This compact system is derived, through systematic elimination of variables, from a larger multi-sectoral dynamic system which explicitly traces year by year not only the level of final consumption and of total employment, but also the level of output of each one of all the other sectors of the particular economy.

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