

Input-Output Models for Planning in a Mixed Economy - A New Approach

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The Closed Leontief Model

The original input-output model as formulated by Professor Leontief was one of a general equilibrium type, popularly known as the closed version, described in condensed form below:

Let x_1, x_2, x_3 be the outputs of three sectors in the economy x_1, x_2 being intermediate sectors and x_3 the household sector. Let x_{ij} ($i, j = 1, 2, 3$) be the flows or deliveries from sector i to j in such a system. Then two sets of balance relations could be set up.

The first set of balance relations is given by,

$$\sum_j x_{ij} = x_i$$

e.g., the deliveries to all sectors from any originating sector make up the total output in static equilibrium.

The second set is given by,

$$\sum_i x_{ij} p_i = x_j p_j$$

which states that the cost of the product in equilibrium is equal to the value of the output.

Assuming a set of production function of the type $x_{ij} = a_{ij} x_j$, enables us to develop two models to determine the outputs and the prices which are treated as unknowns through the following systems of equations.

Output System

$$a_{11} x_1 + a_{12} x_2 + a_{13} x_3 = x_1 \quad 1.1$$

$$a_{21} x_1 + a_{22} x_2 + a_{23} x_3 = x_2 \quad 1.2$$