

Unit V

- Input Output analysis- assumptions – closed and open model- Hawkins Simon condition- determination of value added

Meaning

- **Input–output analysis**, economic analysis developed by the 20th-century Russian-born U.S. economist Wassily W. Leontief, in which the interdependence of an economy's various productive sectors is observed by viewing the product of each industry both as a commodity demanded for final [consumption](#) and as a factor in the production of itself and other goods.
- Input Output analysis is a form of economic analysis based on the interdependencies between economic sectors. The method is most commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy.

Input –Output analysis

- The analysis usually involves constructing a table in which each horizontal row describes how one industry's total product is divided among various production processes and final consumption. Each vertical column denotes the combination of productive resources used within one industry.

Assumptions...

- (i) The whole economy is divided into two sectors—“inter-industry sectors” and “final-demand sectors,” both being capable of sub-sectoral division.
- (ii) The total output of any inter-industry sector is generally capable of being used as inputs by other inter-industry sectors, by itself and by final demand sectors.
- (iii) No two products are produced jointly. Each industry produces only one homogeneous product.

Assumptions ...

- (iv) Prices, consumer demands and factor supplies are given.
- (v) There are constant returns to scale.
- (vi) There are no external economies and diseconomies of production
- (vii) The combinations of inputs are employed in rigidly fixed proportions. The inputs remain in constant proportion to the level of output. It implies that there is no substitution between different materials and no technological progress. There are fixed input coefficients of production.

Limitations

- Constancy of **Input** Coefficient Assumption Unrealistic:
- Factor Substitution Possible:
- Rigid **Model**:
- Restrictive **Model**:
- Difficulty in Final Demand:
- Quantity of **Inputs** not Constant:
- Solution of Equations Difficult:

The Hawkins – Simon conditions

- **1. The Hawkins – Simon conditions**
- Hawkins – Simon conditions ensure the viability of the system.
- If B is the technology matrix Hawkins – Simon conditions are
 - i. the main diagonal elements in $I - B$ must be positive and
 - ii. $|I - B|$ must be positive.

Types..

- **1.The Open Model:**

- If, besides the n industries, the model contains an “**open**” sector (say, households) which exogenously determines a final demand (non-input demand) for the product of each industry and which supplies a primary input (say, labour service) not produced by the n industries themselves, then the model is an open one

The Closed Model:

- If the exogenous sector of the open input-output model is absorbed into the system as just another industry, the model will become a closed one. In such a model, final demand and primary input do not appear; in their place will be the input requirements and the output of the newly conceived industry. All goods will now be intermediate in nature, because everything is produced only for the sake of satisfying the input requirements of the $(n + 1)$ sectors in the model.

Types...

- **2. The Static Input-Output Model:**

- The input-output model relates to the economy as a whole in a particular year. It shows the values of the flows of goods and services between different productive sectors especially inter-industry flows.

The Dynamic Input-output Model:

- “The model becomes Dynamic when it is closed by the linking of the investment part of the final bill of goods to output. The dynamic input-output model extends the concept of inter-sectoral balancing at a given point of time to that of inter-sectoral balancing over time.

Uses ...

- Input–output models for different regions can also be linked together to investigate the effects of inter-regional trade, and additional columns can be added to the table to perform [environmentally extended input–output analysis](#) (EEIOA).
- The structure of the input–output model has been incorporated into national accounting in many developed countries, and as such can be used to calculate important measures such as national GDP.
- Input–output economics has been used to study regional economies within a nation, and as a tool for national and regional economic planning.
- A main use of input–output analysis is to measure the economic impacts of events as well as public investments or programs as shown by IMPLAN and [Regional Input–Output Modeling System](#).
- It is also used to identify economically related industry clusters and also so-called "key" or "target" industries (industries that are most likely to enhance the internal coherence of a specified economy).

Determination of value added

- In business, the difference between the sale price and the production cost of a product is the **unit profit**. In economics, the sum of the unit profit, the unit depreciation cost, and the unit labor cost is the **unit value added**.
- Summing value added per unit over all units sold is **total value added**. Total value added is equivalent to revenue less intermediate consumption.
- In economics it is the difference between all sales within an industry and the total costs of materials, components and services bought from other businesses over a specific period.
- Economic value added is one industry's contribution to a country's GDP (gross domestic product).

References ...

- <https://www.yourarticlelibrary.com/economics/input-output-analysis-features-static-and-dynamic-model-economics/28970>
- <https://marketbusinessnews.com/financial-glossary/value-added-definition-meaning/>
- <https://www.economicdiscussion.net/input-output-analysis/input-output-analysis-in-economics-economics/26833>
- <https://www.economicdiscussion.net/input-output-analysis/input-output-analysis-in-economics-economics/26833#:~:text=The%20Closed%20Model%3A,of%20the%20newly%20conceived%20industry.>