

Capital Stock Conference
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Background paper

ESTIMATION OF THE CAPITAL STOCK
AND
INVESTMENT MATRIX
IN INDONESIA

CBS
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I. ESTIMATION OF THE CAPITAL STOCK

1. Introduction

- Investment is an important part of the development of the economy.
- In a long term perspective of macro economic, investment will lift the capital stocks; and any addition in capital stocks will increase the production capability of the society which in turn will accelerate the economic growth.

2. Concept and Definition

The capital stock can be defined in several ways (Michael Ward, 1976) such as:

- Capital as a form of investment is defined as a factor of production in an economic process.
- Capital can also be defined as the nation wealth including human capital and natural resources.
- Capital as an authority of the financial resources, such as claim, bonds which can be transferred or sold.

It is realized that there are several concept and definitions of capital stock depend on the point of views. This paper will only focused the discussion on capital as a factor of production. This implies that the capital stock as a factor can be defined as stock of durable goods, tangible assets and reproducible assets in order to increase output. As a durable good, it implies that the good can be repeatedly used in the process of production. The tangible assets such as: land, sub-soil deposits of mineral and the like are not covered in this concept since it is can not be reproduced.

3 Methodology

The method used to calculate capital stock is the Perpetual Inventory Method (PI). This model is heavily depend upon the availability of the data on fixed capital formation or investment in a long annual time series format. The accuracy of the estimate based on PI will depend on the accuracy of the basic data and the average of live service of that capital goods. The capital formation used in the PI is as constant 1993 prices.

$$S_t^i = S_{t-1}^i + PM_t^i - P_t^i \dots\dots\dots (1)$$

$$P_t^i = p S_{t-1}^i \dots\dots\dots (2)$$

From equations (1) and (2) can be derived:

$$\begin{aligned} S_t^i &= S_{t-1}^i + PM_t^i - p S_{t-1}^i \\ &= PM_t^i + (1-p) S_{t-1}^i \dots\dots\dots (3) \end{aligned}$$

S_t^i = Capital stock of commodity -i, year t.

PM_t^i = Capital formation of commodity -i, year -t.

P_t^i = Depreciation of commodity -i, year -t.

p_i = Depreciation rate of commodity -i, (assumed as constant).

The depreciation rate used in this study is: the depreciation tariff determined by Minister of Finance Decree on taxation number 961, 1983 and number 826, 1984. The decree covers fixed capital grouped by depreciation tariff, but we have done some adjustment based on the live service estimation of each of that capital goods. Hence, the depreciation rate become:

- a. For buildings and construction: 5 %
- b. For motor cars, airplanes, machineries, communication equipments etc.: 15 %
- c. For motor cycles, other transportation equipments: 30 %
- d. For household electrical appliances, ships, trains: 10 %
- e. For other capital goods: 20%.

4. Source of Data

As mentioned earlier that data on capital formation is used to calculate capital stock. The data on capital formation by kind are obtained from the Indonesian Input-Output table 197 I, 1975, 1980, 1985 and 1990. For the years where there is no I-O table, then an interpolation method is adopted using the coefficient from the available Input-Output table.

5. Result of Estimation

The result of the estimation on capital stock can be seen from draft report: Study of Estimation of Capital Stock in Indonesia 1979-1994, September 1995 by Central Bureau of Statistics.

II. INVESTMENT MATRIX

1. Introduction

Up until now, the information on investment is still scarce, while data on investment is needed to be used for the analysis of the economic growth in Indonesia.

The realization of investment in a country in a certain year is equal to total of fixed capital formation plus stock of goods in process, raw material and unsold finished products.

The investment matrix of Indonesia is aimed to give some picture on the value of gross investment, by sectors and also by institutions.

2. Concept and Definitions

Conceptually, investment could be fixed capital formation. Whereas fixed capital formation is defined as procurement building & constructing, purchasing of new capital goods, domestically and purchasing new as well as used capital goods from abroad.

The capital goods covers:

- Building & constructions
- Machineries
- Vehicles
- Value for improvement and major repair of capital goods
- Improvement of land
- Purchasing of productive cattle for breeding, milking, transportation etc., but not for slaughtered for consumption.

3. Methodology

The methodology adopted to estimate investment is a combination of indirect method (commodity flow) and direct method.

From indirect method we can get the figure of the total investment such as by sector or by institutions we must used direct method that can be obtained from special surveys. Unfortunately the special surveys are not cover those kind of investment from households sector, trade, transportation and other service sectors. Hence we have to do some estimation.

4. Source of Data

Source of data for the Investment matrix are obtained from:

- a. Agriculture Census, 1993
- b. Mining Statistics
- c. Large and Medium Manufacturing Statistics
- d. Building and Construction Statistics
- e. Electricity, Gas and Water Supply Statistics
- f. Government Enterprises Statistics
- g. Special Survey on Capital Formation
- h. Input-Output Table etc.

5. Result of Estimation

The result of the Coaptation of Investment Matrix can be seen from the draft report: Investasi di Indonesia or Investment in Indonesia.

TABLE. DEPRECIATION AND USABLE LIFE OF CAPITAL GOODS

Type of Capital Goods	Depreciation (%)	Usable Life (Years)
01. Livestock	35	3
02. Manufacture of furniture and fixtures mainly made of wood, bamboo and rattan	35	3
03. Glass products	20	5
04. Kitchen wares, hand tools and agricultural tools	20	5
05. Furniture and fixture primarily made of metal	20	5
06. Prime moves engine and machinery and apparatus	15	7
07. Electric generator and electrical motor	15	7
08. Communication equipment & apparatus	15	7
09. Household electric appliances	10	10
10. Ship and its repair	10	10
11. Train and its repair	10	10
12. Motorcar except motorcycle	15	7
13. Motorcycle	30	3
14. Aircraft and its repair	15	7
15. Measuring, photographic & optical equipment	15	6
16. Musical instruments	15	6
17. Buildings	5	20