

**Statistisk sentralyrå**

Statistics Norway

Capital Stock Conference

March 1997

Agenda Item III

## **Estimation of the capital stock in Norway**

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**January 1997**

**Paper prepared for the  
Conference on Measuring Capital Stock  
Canberra, Australia, 10 - 14 March 1997**

**Day 1: Review of country practices**

## **1. Introduction**

The Norwegian National Accounts have recently been revised according to the SNA93. As a part of this revision the capital stock figures are currently being re-estimated.

Statistics Norway use the Perpetual Inventory Method to estimate gross and net capital stocks and consumption of fixed capital for about 175 industries.

The PIM-calculations of the capital stock are supplemented with direct observations based on insurance values.

## **2. Types of assets**

In the estimations of the capital stock, we use 16 different types of assets:

- Dwellings
- Other buildings
- Constructions
- Petroleum production wells
- Petroleum production platforms

- Ships
- Aircraft
- Cars
- Buses, trucks
- Rolling stock

- Computers and office equipment
- Other machinery and equipment

- Cultivated assets

- Petroleum exploration
- Computer software

- Valuables

## **3. Asset lives**

The asset lives used in the estimations are mainly based on asset lives from other countries.

The main sources are the asset lives employed by Statistics Sweden and the tables in the OECD-report <<Methods used by OECD countries to measure stocks of fixed capital>>. In case of large differences in asset lives between countries, we have tried to select a value <<somewhere in the middle>>.

For some kinds of assets that are of particular importance in Norway, such as oil production platforms and hydroelectric power plants we have consulted Norwegian experts about the choice of service lives and depreciation profiles.

#### **4. Survival function**

The survival functions are mainly geometric. Empirical studies indicate that this is a more realistic assumption than simultaneous retirement, which was used in the past. In some cases the assumption of simultaneous retirement has been retained.

The parameter of the geometric survival function is estimated as  $2/\text{Asset life}$ , i.e. we use the double declining balance method.

#### **5. Depreciation function**

The depreciation functions are either geometric or linear, depending on the shape of the survival function.

#### **6. Data sources**

##### **6.1 Gross Fixed Capital Formation**

The time series of gross fixed capital formation by industry and asset type are from the National Accounts Supply and Use tables at current and constant (t-1) prices.

The estimates of GFCF are mainly based on direct information on expenditures from industry surveys and government accounts. The direct estimates are supplemented by the commodity flow method for several kinds of assets, such as buildings, ships, aircraft, cars and computers and office equipment.

##### **6.2 Price indices**

The price indices used in the calculation of the Use table at constant prices are based on sources like the Producer Price Index and Import Price Statistics. Indices based on input prices are used for many services.

The price indices of assets such as vehicles, machinery and equipment relate mainly to the assets themselves. Indices for buildings and constructions are mainly based on the prices of the inputs.

The base year of the supply and use tables is always the previous year, so the resulting time series of price indices with a common reference year will be chained Paasche indices. The corresponding volume indices are chained Laspeyres.

The price Indices of GFCF are used to inflate the constant price estimates of gross and net capital and the consumption of fixed capital.

## **7. Weaknesses of the estimates**

The quality of the estimates depend on the accuracy of the assumptions about asset lives and the survival and depreciation functions, It would be useful to have more empirical evidence about these questions, particularly studies based on Norwegian data.

In the future we also hope to be able to estimate the stocks of some assets directly, to provide a benchmark for the PIM-estimates.