

Understanding national accounts

2011-09

Chapter 4

Production, what it includes and
excludes

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Disposition

- Production and productivity
- What is included in GDP?
- Some special cases
- Sources used to calculate production
- Exercise

Production and productivity

- Production is a process of combining inputs (such as goods and services) to produce an output that can be used or consumed.
- Production result from three factor of production (labor, capital and intermediate consumption (IC))
- $\text{Output} - \text{IC} = \text{VA}$ - > two factors of production (labor, capital)
- $Y' = (f(L, K) + \text{MFP})'$
- MFP = multifactor productivity
- Change in VA not attributed to neither labor nor capital but result of technical progress
- For example: specific combination of inputs, a better organization, economies of scale etc.

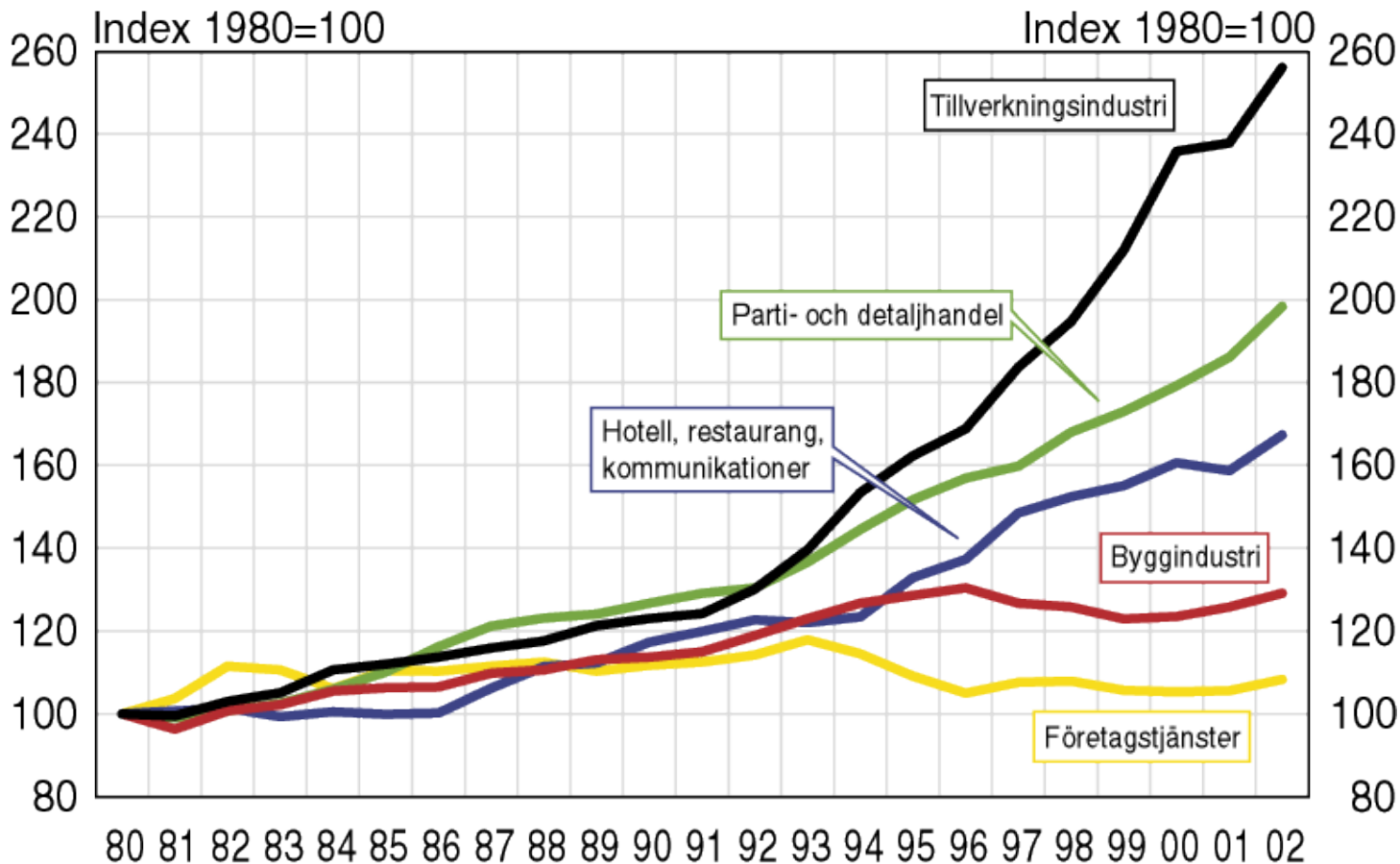
Production and productivity

- MFP - difficult to measure
 - > Labor productivity = Growth in volume of VA – growth in volume of labor inputs
- KLEMS project

Labour productivity market producers

Output volume per hour worked

Statistiska centralbyrån Statistics Sweden



What is included in GDP

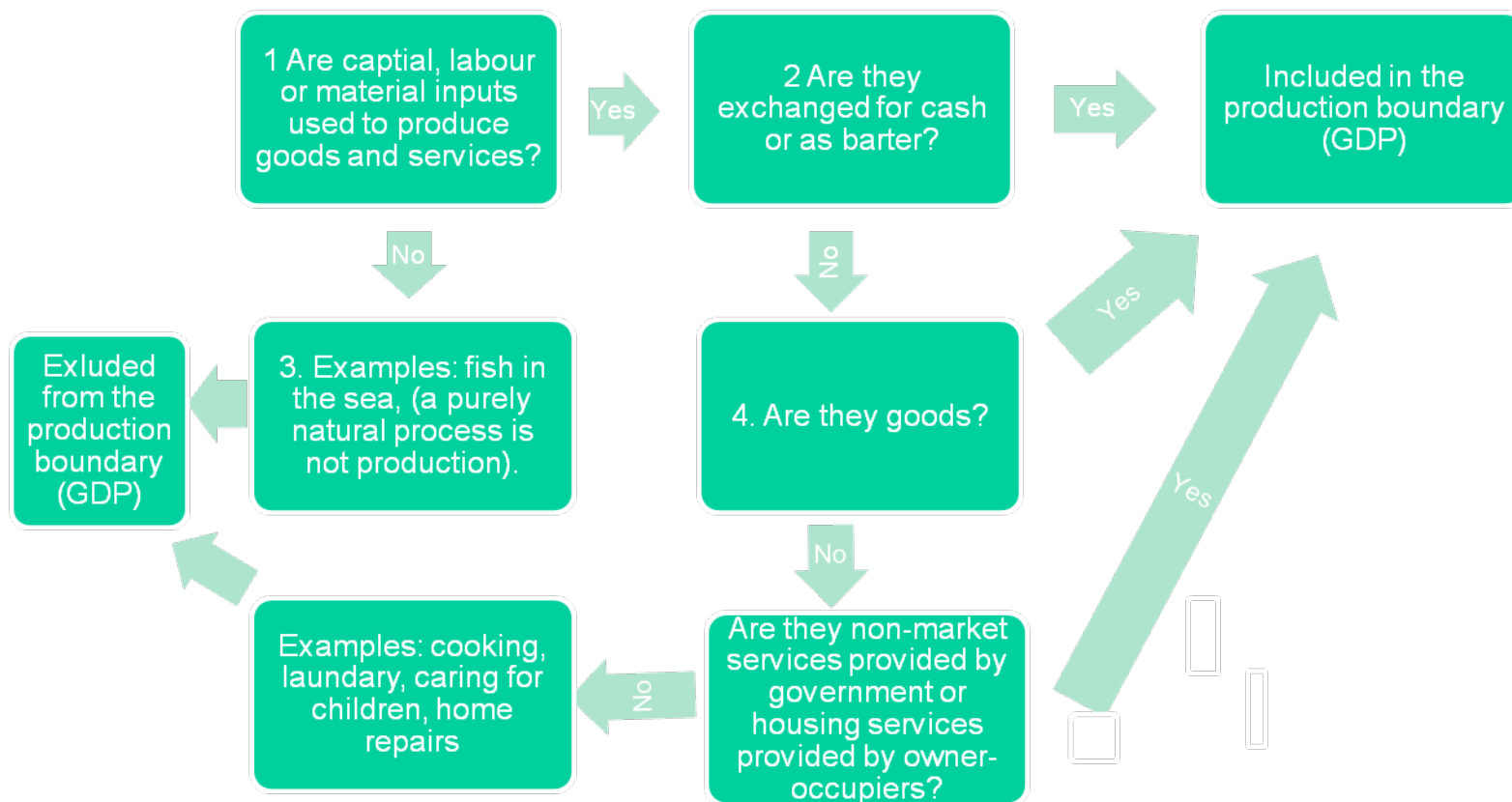
*For a start, output as measured in the NA includes what creates the goods and services that the households **buy** for their everyday need and what firms **buy** to be able to produce these goods and services that households buy.*

But what about services from the general government, the military, roads, cooking and cleaning and housing?

Production

An **ACTIVITY** carried out under the control and responsibility of an institutional unit that uses **INPUTS** of labor, capital, and goods and services to produce **OUTPUTS** of goods and services

The production decision tree



Market production

Market output:

The total value of

Goods and services sold at economically significant prices (in EU > 50% of costs)

Goods and services bartered

Goods and services used for payments in kind

Often measured as the sales:

However need to adjust for changes in inventories of **finished goods and work-in-progress** intended for one of the above uses (*sales is not automatically output. Since not all goods will be sold in the same period as it's produced*)

Non market production

Non market output:

Goods and services produced for own final consumption or gross fixed capital formation

Goods and services supplied free, or at economically insignificant prices, to other institutional units

Changes in inventories of finished goods and work-in-progress intended for one of the above uses

Non market production, cont.

Examples: government production

- no value of output in market prices
- value of output is defined as sum of total costs

Costs of:

Energy	25
Renting	200
Office needs	150
Staff	4000
Consumption of fixed capital	100

Output	4475
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Production: Special Items

Wholesale and retail trade

Output value = trade margin

+ sales of goods purchased for resale

- Purchases of goods for resale

(+change in inventories of goods for resale including normal loss due to wastage and theft)

=Trade margin

Intermediate consumption

Goods and services *consumed* as inputs by a process of production. Ex. basic materials, electricity, IT services etc.

Attention to:

- change in inventories (IC=purchases *minus* change in inventories of goods and services for IC)
- gross fixed capital formation, for example machines, (longer life span and is not consumed during the period)

Some other special cases

FISIM

Financial services indirectly measured, measures the service the banks provide without direct invoicing it. Such as: the service of transferring money between accounts and financial advice etc. To cover this production, we measure the production of banks as:

Output=The sum of their sales + the difference between interest received from borrowers and the interest paid to lenders.

Some other special cases

Car benefits and PC benefits

If an employee, through its employer, has special benefits, this should be treated as private consumption in the NA. To balance the system we also need to create a production value (for the firm providing this service), and a salary for the employee.

Own produced software

In the NA own produces software should be classified as investment and therefore also as a production (to balance). Since there is no statistic information on how big this production is, a model is used.

Illegal and hidden economy

- Is also part of the production frontier.
- However very difficult to measure.
- In Sweden, hidden and illegal economy about 3% of GDP (illegal 0,15%)
- Prostitution, drugs, smuggling, illegal gambling

Sources: Manufacturing Industry and services

Main source: Structural Business Statistics (FEK), Industrial production of goods (IVP)

Adjustments made for NA definitions:

financial leasing, 1-2-year investments,
software bought, insurances, etc...

Exercise 1

Are the following activities part of production according to the NA definition?

1. Handing out passport by local government
2. The production and sales of marijuana
3. Polluting the environment
4. Gathering of raspberries in the woods
5. The natural growth of herring in the North Sea
6. Preparing a meal for your own family
7. The growth of trout at a trout-farm

Yes	No

Exercise 2

Calculate output, IC and value added at current prices.

Sales of cars: 1400 300:-

Purchases:

Cost of raw material: 600 800:-

Energy costs: 101 400:-

Machine tools: 250 000:-

Inventories of raw material at the start of the period: 60 000:-

Inventories of raw material at the end of the period: 43 000:-

Inventories of finished goods at the start of the period: 200 000:-

Inventories of finished goods at the end of the period: 350 000:-

Answers from Birgitta

Exercise 1.

Calculate GDP according to production, expenditure and income approach

Output of goods and services	5941
Imports	1388
HouseholdFinalConsumptionExpenditure	1460
Government Final Consumption Expenditure	797
GrossFixedCapitalFormation	612
Changes in inventories	23
Exports	1621
Compensation of employees	1678
Intermediate consumption	3201
Gross operating surplus/Mixed income	981
Taxes less subsidies on production and imports	467
Taxes less subsidies on products	386
Value added	2740
GDP	3126