E-TRAINING ON COMPILATION OF SUT IN AFRICA

ACS/ESNA

2017

Session 1-Reading Materials: GDP Estimation by Production, Income and Expenditure Approaches
GDP estimation by production, income and expenditure approaches
Outline of Presentation

• Introduction
• GDP by production approach
• GDP by income approach
• GDP by expenditure approach
• Links between different approaches
• Data sources
Defining GDP

- Gross domestic product (GDP) is basically a concept of production.
- It measures the total value created in the production of goods and services. GDP combines in a single figure, and with no double counting, all the output (or production) carried out by all the firms, non-profit institutions, government bodies and households in a given country during a given period, regardless of the type of goods and services produced, provided that the production takes place within the country’s economic territory.
- There are three equivalent approaches to measure the GDP, namely the production, income, and expenditure.
GDP by production approach
GDP and General method of estimating production

- GDP = sum of GVA of all economic activities within the country’s territory plus taxes minus subsidies on products.
- GVA at basic prices = GVO at basic prices – IC at purchasers’ prices.
- Gross value of production = value of sales + changes in inventories of finished and semi-finished goods (WIP)

Value of production should include
  - goods and services sold,
  - goods and services bartered,
  - goods & services used for payments in kind, including CoE in kind,
  - goods and services supplied by one establishment to another belonging to the same enterprise,
  - goods produced by households for own consumption and own account fixed capital formation,
  - Subsidies received from government.
What is new in 2008 SNA

• Knowledge capturing products
  ▪ concern the provision, storage, communication and dissemination of information, advice and entertainment in such a way that the consuming unit can access the knowledge repeatedly
  ▪ Output of service industries but with many characteristics of goods;
    − can be traded and re-traded;
    − ownership can be established;
    − can be used repeatedly;
    − may be on a physical medium.

• Revised treatment of deliveries between establishments of the same enterprise depending on whether there is a transfer of economic ownership

• When Output for own final use for market producers estimated by sum of costs, it should include return to fixed capital
Production and products

- **Production**
  - *Production* is an activity, carried out under the responsibility, control and management of an institutional unit, that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.
  - *Production* can be described in general terms as an activity in which an enterprise uses inputs to produce outputs.

- **Products**
  - *Products*—goods and services (including knowledge capturing products) that result from a production process.
  - Particular enterprise may be involved in production of goods / services or both.
Goods and services

- **Goods**
  - Goods are **physical**, produced objects for which a **demand** exists, over which **ownership** rights can be established and whose ownership can be **transferred** from one institutional unit to another by engaging in transactions on markets
  - Ownership, existence of demand and transferability—main characteristics of goods
  - Satisfy needs or wants of households or community or for production of other goods and services

- **Services**
  - Services are the result of a production activity that changes the conditions of the consuming units, or facilitates the exchange of products or financial assets
  - Change effecting services: Change the conditions of goods
    - example: transport, cleaning, repairing
  - Change the physical condition of persons
    - example: medical, beautician services
  - Change the mental condition of persons
    - example: educational, entertainment services
  - Margin services—trade and many financial services
Production boundary (1/3)

Production boundary includes the following:

(a) Goods
   (i) Production of goods for supply to units other than their producers; and
   (ii) Own-account production that is retained by their producers for own final consumption or gross fixed capital formation; and

(b) Services
   (i) Individual and collective services intended to be supplied to units other than their producers,
   (ii) The own-account production of knowledge-capturing products that are retained by their producers for their own final consumption or gross capital formation but excluding (by convention) such products produced by households for their own use,
   (iii) Own-account production of housing services by owner-occupiers, and
   (iv) Domestic and personal services provided by employing paid staff.
Production boundary (2/3): few points

- Illegal production is not excluded from the production boundary
- Non-market production of goods, and bribes, tips, etc. which are made in return for services are within the production boundary
- Own account production of goods include:
  - agricultural products and their subsequent storage; gathering of berries or other uncultivated crops; forestry; wood-cutting and collection of firewood; hunting and fishing;
  - other primary products such as mining salt, cutting peat, the supply of water, etc;
  - processing of agricultural products; production of grain by threshing; production of flour by milling; meat and fish products; preservation of fruit by drying, bottling, etc.; dairy products such as butter or cheese; beer, wine, or spirits; baskets or mats; etc.;
  - other kinds of processing such as weaving cloth; dress making and tailoring; production of pottery, utensils or durables; making furniture or furnishings, etc.
Production boundary (3/3)

- own-account construction of dwellings.
- own account production for GFCF includes the production of fixed assets such as construction, development of software and mineral exploration.
- Production excludes the production of domestic and personal services that are produced and consumed within the same household (with the exception of employing paid domestic staff and the services of owner-occupied dwellings).
- Volunteer activities that result in goods, e.g. the construction of a dwelling or other building are to be recorded as production. Volunteer activities that do not result in goods, e.g. caretaking and cleaning without payment, are excluded.
- “Do-it-yourself” repairs and maintenance to consumer durables and dwellings carried out by members of the household constitute the own-account production of services and are excluded from the production boundary of the SNA. In the case of dwellings, purchases of materials for repairs become intermediate expenditures incurred in the production of housing services. Output of such repairs and maintenance is not separately recorded. Major renovations or extensions to dwellings are output and GFCF.
Output and time of recording

Output

• Output is defined as the goods and services produced by an establishment, excluding
  ▪ the value of any goods and services used in an activity for which the establishment does not assume the risk of using the products in production
  ▪ the value of goods and services consumed by the same establishment except for goods and services used for capital formation (fixed capital or change in inventories) or own final consumption

Time of recording

• Recorded as it takes place and not when the resulting output is sold.
Classification of Output

• Categories of output

  ▪ **Market output** is intended for sale or disposal on the market at prices that are economically significant.
  
  ▪ **Non-market output produced for own final use** consists of goods and services intended to be retained by the producers for their own final consumption or gross fixed capital formation.
  
  ▪ **Other non-market output** includes production by government and non-profit institutions serving households of goods and collective or individual services that are supplied free or at prices that are not economically significant.
Economically significant prices

- Economically significant prices are prices that have a significant effect on the amounts that producers are willing to supply and on the amounts purchasers wish to buy. These prices normally result when:
  - The producer has an incentive to adjust supply either with the goal of making a profit in the long run or, at a minimum, covering capital and other costs; and
  - Consumers have the freedom to purchase or not purchase and make the choice on the basis of the prices charged

- **Rule of thumb**: A particular price is considered economically significant, when price of goods and services cover more than half of the cost of production
General valuation principles in the SNA

- Values agreed upon by transactors
- Market prices therefore basic reference for valuation
- In the absence of market transactions:
  - Market price for similar product (owner-occupied dwellings)
  - Valuation according to costs:
    - Include net return on capital for output for own final use for market producers (new in the 2008 SNA)
    - Exclude return on capital for non-market producers
Valuation of Market Output

- It is the sum of the total values of:
  - Goods and services sold
  - Goods and services bartered
  - Goods and services used for payments in kind, including compensation of employees in kind
  - Goods and services supplied by one establishment to another belonging to the same enterprise
  - Changes in inventories of finished goods and work-in-progress
    - Changes in inventories cannot be for Services, exceptions are some knowledge products (which take more than one year to develop)

Special cases: Trade, banks, insurance
Valuation of Non-market Output for Own Final Use

Goods
• sum of the total values of goods produced, own account fixed capital formation and changes in inventories of finished goods and work-in-progress
• valued at the basic prices at which they could be sold on the market or as the sum of its costs of production: Intermediate consumption + Compensation of employees + CFC + Other taxes on production

Services
• Own-account production of housing services by owner-occupiers (valued at market rentals for similar dwellings)
• Services produced by employing paid domestic staff (valued at wages)
Other Non-market Output

• Government and NPISHs
  ▪ The individual and collective services are supplied free or at prices that are not economically significant
  ▪ Valued as the sum of its costs of production, as Intermediate consumption + Compensation of employees + CFC + Other taxes (less subsidies) on production
  ▪ The net operating surplus by convention is assumed to be zero
Agriculture

• Many crops may have overlapping production cycles with accounting periods.
• A particular crop may be sown in one accounting period and harvested in another accounting period.
• In such cases, SNA suggests applying the principle of work-in-progress in the valuation of output.
• This can be done using some assumptions.
  ▪ Spreading production to different periods in proportion to the costs incurred
  ▪ Sometimes, this may not give correct picture, as input expenditures are normally spent in a particular period
  ▪ An alternative is to simply spread the crop proportionally over its sowing to harvesting periods
• The price that should be used for valuing the production is that of “farm gate” prices that is the price that would be offered to the farmer at the point where the crop is actually harvested.
Construction

- Actual construction output may be more than the output of construction units
- This is because, companies engaged in other activities and households may carry out own account construction or undertake major or minor repairs to the buildings on their own
- Construction output includes both new construction and repairs and maintenance
- The gross fixed capital formation (GFCF) in construction includes only the new construction value
- GFCF of construction = Value of output of construction – repairs and maintenance
- When construction is undertaken for others, it is recorded as both output and GFCF
- When construction is undertaken for further sale, the value of unsold and semi-finished buildings is included in the work-in-progress and change in inventories
- Value of output = cost of materials used (at the place of construction site) + labour costs + CFC + return to capital + net other taxes on production
  Or
- Value of output = sales + subsidies received if any + work in progress
Approaches to measuring output of construction

Three possible approaches

• Best method:
  ▪ Collect information on purchases on construction from all enterprises and households, and expenditures on minor and major R&M

• Second best method:
  ▪ Collect information on construction output from the construction enterprises; and construction undertaken on own account by other enterprises and households, including major and minor R&M

• Third best method: estimate total value of construction from the use of materials available for construction in the country
  ▪ Domestic production + imports – uses for purposes other than construction
Wholesale and retail trade (1/3)

- The distinctive feature trade industry is
  - Sale value of goods is not gross output
  - Cost of sold goods is not IC
- Output of trade industry is margins earned on the products traded
- Output = (sale value of goods – cost of sold goods)
- How to estimate cost of sold goods?
Output of trade industry (2/3)

- Estimating cost of sold goods
  - Goods sold and purchased should refer to the same period
  - But, goods are normally purchased much before the sales
  - Therefore, they enter inventories first
  - At the time of sales, they are taken out of inventories
  - The withdrawals should therefore be revalued to current prices

<table>
<thead>
<tr>
<th>Cost of goods to be sold in the accounting period</th>
<th>Cost of goods purchased for resale in the accounting period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- any additions to the inventories of goods for resale in the accounting period</td>
</tr>
<tr>
<td></td>
<td>+ any withdrawals from inventories of goods for resale in the accounting period</td>
</tr>
</tbody>
</table>
Output of trade industry (3/3)

- A simpler method, if we assume that traders do not hold inventories for long time

\[
\text{Output of trade} = \text{Total sales} - (\text{total purchases} - \text{change in inventories})
\]
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>1</td>
<td>Value of sales in period</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>Value of goods bought for resale</td>
<td>195</td>
</tr>
<tr>
<td>3</td>
<td>Value of goods added to inventories</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Cost of electricity consumed</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Cost of packaging materials</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Compensation of employees</td>
<td>35</td>
</tr>
<tr>
<td>7</td>
<td>Taxes paid on building</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Value of output (1-(2-3))</td>
<td>70</td>
</tr>
<tr>
<td>9</td>
<td>intermediate consumption (4+5)</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>Gross value added (8-9)</td>
<td>52</td>
</tr>
<tr>
<td>11</td>
<td>Compensation of employees (6)</td>
<td>35</td>
</tr>
<tr>
<td>12</td>
<td>Other taxes on production (7)</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Gross operating surplus (10-11-12)</td>
<td>15</td>
</tr>
</tbody>
</table>
Owner-occupied dwellings

- Value of an owner occupied house is a form of imputed output.
- It is both income and expenditure for the occupying households.
- Ideally, the imputed rental would be calculated by taking the market value the rental of a comparable house that is let out.
- Unfortunately, in many cases, comparable market rentals data is not available, especially for rural properties, slum dwellings or government houses.
- In the absence of comparable market rents,
  - Adopt user cost approach
    - Adding (i) repair and maintenance costs, (ii) CFC, (iii) net operating surplus or return to capital
  - Calculate the cost of building a house of the same type and estimate its life or duration before major repairs are needed to make it new.
  - Taking the cost of the house and dividing by this period will give an acceptable (if still very imperfect) measure of the rental equivalent.
Intermediate Consumption

- Intermediate consumption (IC) consists of the value of goods and services used as inputs in the production process.
- They are entirely used up and transformed in the production process.
- Excludes the use of fixed assets and valuables, includes small tools.
- IC is recorded on an accrual basis, i.e. at the time when a good or service is actually used in the production process, as distinct from the time of acquisition.
- IC is normally valued in purchasers’ prices, which consists of (i) basic price received by the producer of the good or service, (ii) transportation costs paid separately by the purchaser, (iii) wholesale and retail trade margins, and (iv) any non-deductible tax less subsidies on the product payable.
- IC = acquisitions – changes in inventories of goods for IC.
Borderline cases

• With compensation of employees
  ▪ Tools and equipment used at work; protective clothing, uniforms; barracks, dormitories etc., travel and hotel services while on business, changing facilities, washrooms etc., medical facilities

• With fixed capital formation
  ▪ Small tools
  ▪ Maintenance and repairs —“Small” or regular are intermediate consumption
  ▪ Large or such as to extend an asset’s life or improve its performance are capital formation
  ▪ Mineral exploration and evaluation—always capital
  ▪ Military equipment—durable goods (bombs, spare parts etc.) are intermediate consumption when withdrawn from inventories
GDP by Income Approach
GDP by Income Approach

- GVA at basic prices by income approach includes,
  - Compensation of employees
  - Other taxes on production
  - Other subsidies on production (−)
  - Consumption of fixed capital
  - Net operating surplus / mixed income

- GDP = ΣGVA at basic prices of all industries + taxes on products − subsidies on products
Compensation of Employees

• Compensation of employees is the total remuneration payable by an enterprise to the employees for work done by them during the accounting period

• For owners of unincorporated enterprise, they are classified as self-employed

• There are three main components of compensation of employees:
  ▪ wages and salaries in cash
  ▪ wages and salaries in kind
  ▪ employers’ social contributions (consist of social contributions payable by the employer for the benefit of their employees. They may be either actual or imputed)
Taxes on Production and Imports

• Comprise all taxes that enterprises incur by engaging in production
  ▪ taxes on products
    - payable on goods and services when they are produced, sold or used. Taxes on products are proportional to the value or quantity of the goods and services on which they are levied
  ▪ other taxes on production
    - payable out of the value added of producers - may be levied on land, fixed assets or the labour employed. Examples are motor vehicle licenses, business licences, real estate taxes, and stamp duties and fees
Subsidies

- They are current transfers that government pays to producers that constitute additions to the income receivable from their output.
- Just as in the case of taxes, there are two categories:
  - Subsidies on products:
    - Subsidies on products are payable per unit of quantity of a product.
  - Other subsidies on production:
    - Other subsidies lack the characteristics of subsidies on products. Examples are subsidies on payroll or workforce and subsidies for interest relief.
Consumption of Fixed Capital

- CFC is a cost of production: for use of fixed assets
- It measures the decline in the current value of the stock of fixed assets during the accounting period
- This current value may differ substantially from the historic costs prevailing at the time when the assets were acquired
- Therefore, CFC differs substantially from depreciation as recorded in business accounts
- Depletion or degradation of natural assets not included
Operating Surplus (OS) and Mixed Income (MI)

- OS Constitutes the surplus accruing from the production process
- It is different from the concept of profit used in business accounting
- The term mixed income is used for unincorporated enterprises owned by members of households
  - As their OS and compensation of employees cannot be segregated
Concepts of Valuation of GDP by production and income approaches

- GVA by activity by production or income approaches can be estimated at basic or producers’ prices. Only at the overall economy level, the GDP at purchasers’ prices can be computed by these two approaches.

- Since, IC is always valued at purchasers’ prices, GVA depends on whether output is measured at basic or producers’ prices.

- Value added at producers’ prices = Value added at basic prices + Taxes on products (exclusive of VAT) – Subsidies on products

- SNA recommends compiling GVA at basic prices.

- GDP = ΣGVA at basic prices of all industries + taxes on products – subsidies on products
Role of Taxes in Prices Related to Goods and Services

- Price concepts used in the SNA: (they are all observable actual transaction or “market prices”) and their difference depends on the treatment of taxes and subsidies on products for the **whole economy**, and also on trade and transport margins for **individual products**.

- Valuation of output:
  - Basic prices (SNA-preferred valuation of output)
  - Producers’ prices

- Valuation of uses of goods and services:
  - Purchasers’ prices
Terminology of taxes

- **(a) Invoiced VAT** is the VAT payable on the sales of a producer; it is shown separately on the invoice which the producer presents to the purchaser;

- **(b) Deductible VAT** is the VAT payable on purchases of goods or services intended for intermediate consumption, gross fixed capital formation or for resale which a producer is permitted to deduct from his own VAT liability to the government in respect of VAT invoiced to his customers;

- **(c) Non-deductible VAT** is VAT payable by a purchaser which is not deductible from his own VAT liability, if any.
Basic and producers’ prices

• Basic prices
  ▪ The **basic price** is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer.
  ▪ This includes all other taxes on production net of other subsidies.

• Producers’ prices
  ▪ Amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any value added tax (VAT), or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.
## Relationship between basic, producer and purchasers’ prices

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<th>From basic to producers’ prices</th>
<th>Basic prices</th>
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<tbody>
<tr>
<td></td>
<td>• plus taxes on products excluding invoiced VAT</td>
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<td>• less subsidies on products</td>
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<td>equals Producers’ prices</td>
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<td>• Plus VAT not deductible by the purchaser</td>
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<td>• Plus wholesalers’ and retailers’ margins</td>
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<td>• Plus separately invoiced transport charges</td>
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<td>Equals purchasers’ prices</td>
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<th>producers’ prices</th>
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<td>• plus Non-deductible VAT by the purchaser</td>
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<td>• plus separately invoiced transport charges</td>
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GDP by expenditure approach
GDP by Expenditure App

GDP at purchasers prices by the expenditure approach =

Final consumption expenditure (by households, government, non-profit institutions serving households)
+ Gross capital formation
  gross fixed capital formation + changes in inventories + acquisitions less disposals of valuables
+ Exports of goods and services, f.o.b.
- Imports of goods and services, f.o.b.
Final Consumption Expenditure by Households (1/2)

- HFCE includes all expenditures by resident households on goods and services for the purpose of consumption minus sales of any existing such goods.
- Covers:
  - all purchases of consumer non-durable and durable goods except dwellings and valuables;
  - imputed purchases of consumer durables by financial leasing;
  - imputed gross rental for owner-occupied housing services;
  - own-account production and consumption of goods;
  - bartered consumer goods and services (net);
  - domestic services provided by domestic servants;
  - goods and services in kind provided by enterprises as wages;
  - imputed financial intermediary (banking, insurance, pension, etc.) service charges;
  - purchases by residents abroad;
  - minus purchases by non-residents in the domestic market.
Final Consumption Expenditure by Households (2/2)

- HFCE should be recorded at purchasers’ prices paid by households including any transport charges and taxes on products that may be payable.

- HFCE includes a number of imputed expenditures.
  - Goods produced for own consumption should be valued at purchasers’ prices although in practice they are identical to basic prices because there are no trade margins and transport charges and net taxes on products.
  - Income in kind is valued at purchasers’ prices if the employer purchases them, otherwise at producers’ prices if they are produced in the enterprise.

- The data sources for household consumption expenditures are:
  - household income-expenditure surveys, retail trade surveys and other administrative data.
  - Commodity flow approaches are widely used in developing countries.
Actual Final Consumption Expenditure by Households

- SNA also has a concept of Actual consumption by households, which is derived as:
  
  + Final consumption expenditure + Final consumption expenditure by government for individual consumption + Final consumption expenditure by NPISH for individual consumption

- The SNA recommends that household consumption be classified by purpose according to the Classification of Individual Consumption by Purpose (COICOP).
Final Consumption Expenditure by Government (1/2)

- GFCE is equivalent to government output, less the value of government sales of non-capital goods and services, plus social benefits in kind.
  - Other government expenditures such as subsidies to industries or costs of capital goods, interest payments, costs of capital goods procurement, etc. do not form part of this.
- GFCE is divided into (i) individual and (ii) collective on the basis of who is consuming these services – households or the community as a whole.
  - Individual final consumption expenditures of government consist mainly of (a) health services including public health, (b) recreation, culture and religion, (c) education, (d) social security and welfare services, and (e) housing, refuse collection and sewerage services.
    - The main characteristic of individual consumption expenditure is that, “it must be possible to observe and record the acquisition of the good or service by an individual household or member thereof and also the time at which it took place”.
Final Consumption Expenditure by Government (2/2)

- Collective final consumption expenditures include only services with the following characteristics:
  
  (a) Collective services can be delivered simultaneously to every member of the community or of particular sections of the community;
  
  (b) The use of such services is usually passive and does not require the explicit agreement or active participation of all the individuals concerned;
  
  (c) The provision of a collective service to one individual does not reduce the amount available to others in the same community or section of the community. There is no rivalry in acquisition.

- Current expenditures defined as collective fall under the broad headings of general public services, defence, public order and safety, economic affairs and environment protection but they also include certain expenditures under housing, health, recreation and culture, education and social protection that are considered to be for the benefit of the community at large.

- The SNA recommends that government consumption be classified by purpose according to the Classification of the Functions of Government (COFOG).
Final Consumption Expenditure by NPISHs

- NPISHs are non-profit institutions which provide goods or services to households free or at prices that are not economically significant
- Output and consumption expenditure data is calculated in the same way as for government
- All services provided by NPISHs are treated as individual in the 1993 SNA although the 2008 SNA recognises that NPISH may also produce collective services such as research activities
- Data is classified according to the Classification of the Purposes of Non-profit Institutions serving households (COPNI)
  - housing, health, recreation and culture, education, social protection, religion, political parties, labour and professional organizations
- In many countries, NPISHs are exempt from paying taxes, but the tax authorities nevertheless collect accounts of NPISHs. This could be a source of data on NPISHs. The other sources could be economic censuses, enterprise surveys, annual accounts, and labour force surveys. The BoP statistics may also provide information on current transfers made to NPISHs
Gross Fixed Capital Formation

• GFCF is measured by the total value of a producer’s acquisition, less disposal, of fixed assets during the accounting period plus certain additions to the value of non-produced assets realized by productive activities of resident producers.
  - **Fixed assets** are produced assets that are used repeatedly or continuously in production processes for more than one year.
  - Fixed assets do not include small tools of insignificant value.
• GFCF also includes major improvements to tangible non-produced assets, plus any costs associated with the transfers of ownership of non-produced assets, major renovations to existing assets, own account GFCF, capital transfers in kind and fixed assets acquired through barter
• GFCF is usually shown by type of asset: (i) Dwellings; (ii) Other buildings and structures; (iii) Machinery and equipment; (iv) Weapons systems; (v) Cultivated biological resources; (vi) Costs of ownership transfer on non-produced assets; and (vii) Intellectual property products
Change in inventories

• *Changes in inventories* are by definition equal to the total value of all goods that enter the inventories of producers minus all goods that are withdrawn from them.

• measured by the value of the entries into inventories less the value of withdrawals and less the value of any recurrent losses of goods held in inventories during the accounting period.

• Inventories are usually classified into three broad categories – finished goods, materials and fuels, and work-in-progress.

  ▪ In agriculture, work-in-progress consists of the natural growth of vineyards, orchards, plantations and timber tracts and the natural growth in livestock that are being raised for slaughter.

• Valuing change in inventories is more complicated than in the case of other aggregates. It can be approximated by taking the difference between closing (i.e. end of year) inventories and opening (i.e. beginning of year) inventories both valued at average annual prices for the year in question.
### Calculating change in inventories at average 2011 prices
(Source: National Accounts Framework in the ICP: Operational Material, ICP 2011 Global Office)

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Value of inventories at beginning of 2011 (i.e. at 31 December 2010)</td>
<td></td>
<td>660</td>
</tr>
<tr>
<td>(b) Value of inventories at end of 2011 (i.e. at 31 December 2011)</td>
<td></td>
<td>855</td>
</tr>
<tr>
<td>(c) Change in value of inventories (i.e. change in book value) in 2011</td>
<td>(a) – (b)</td>
<td>195</td>
</tr>
<tr>
<td><strong>Price indexes for inventories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Price index at beginning of 2011 (base year of volume estimates =100)</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td>(e) Price index at end of 2011 (base year of volume estimates =100)</td>
<td></td>
<td>114</td>
</tr>
<tr>
<td>(f) Average price index for 2011 (base year of volume estimates =100)</td>
<td></td>
<td>112</td>
</tr>
<tr>
<td><strong>Inventories at constant prices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(g) Book value level at beginning of 2011, at constant prices</td>
<td>(a)/(d) x 100</td>
<td>600</td>
</tr>
<tr>
<td>(h) Book value level at end of 2011, at constant prices</td>
<td>(b)/(e) x 100</td>
<td>750</td>
</tr>
<tr>
<td>(i) Change in book value in 2011, at constant prices</td>
<td>(h) – (g)</td>
<td>150</td>
</tr>
<tr>
<td><strong>Change in inventories at average 2011 prices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(j) Change in inventories at average 2011 prices</td>
<td>(i) x (f)/100</td>
<td>168</td>
</tr>
<tr>
<td><strong>Capital gain</strong></td>
<td>(c) – (j)</td>
<td>27</td>
</tr>
</tbody>
</table>
Acquisitions less disposals of valuables

• Valuables are produced goods of considerable value that are not used primarily for purposes of production or consumption but are held as stores of value.

• Valuables are expected to appreciate or at least not to decline in real value, nor to deteriorate over time under normal conditions.

• They consist of precious metals and stones, jewellery, works of art, etc.

• Valuables may be held by any of the institutional units (government, financial and non-financial corporations, households and NPISHs).

• Just as in the case of fixed assets, acquisitions of valuables are valued at their purchase prices together with associated costs of ownership transfer. Disposals are valued at their sale prices less any associated costs of ownership transfer.
Exports and Imports of Goods and Services

- Consist of sales, barter, grants or gifts of goods and services from / to residents to / from non-residents

- Both exports and imports of goods should be recorded at f.o.b. prices

- Imports of individual goods are generally recorded at c.i.f. prices including all costs for transportation and insurance

- Adjustments to compute imports f.o.b. must then be done on the level of total imports

- Exports and imports of Services should include direct purchases by non-residents in the economy and those of residents abroad, respectively

- Data used for exports and imports of goods and services in the GDP should be consistent with that recorded in the balance of payments, as both statistics use same concepts.
## Links between production and expenditure GDP

<table>
<thead>
<tr>
<th>Information available in the Production approach</th>
<th>Links with Expenditure Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output of general government = Intermediate consumption + own account capital formation + Compensation of employees + Consumption of fixed capital + Taxes on products, net of subsidies, paid by government to itself</td>
<td>Government final consumption expenditure (GFCE) = Output – Sales and fees + Expenditure on social benefits in kind</td>
</tr>
<tr>
<td>Output of construction</td>
<td>GFCF (construction) = Output of construction – minor repairs and maintenance + acquisition costs</td>
</tr>
<tr>
<td>Output of dwelling services</td>
<td>Household final consumption expenditure on rentals of dwellings</td>
</tr>
<tr>
<td>Output of paid domestic services</td>
<td>Household final consumption expenditure on paid domestic services</td>
</tr>
<tr>
<td>Additional data that can be compiled while analysing the source data for preparing production GDP</td>
<td></td>
</tr>
<tr>
<td>Change in inventories with all producers</td>
<td>Change in inventories</td>
</tr>
<tr>
<td>Expenditures made by all producers (and households on dwellings of capital nature) on acquisition less disposal of fixed assets plus output of own account production of capital items (construction, machinery and equipment, mineral exploration, R&amp;D expenditures, software, databases, etc.)</td>
<td>GFCF</td>
</tr>
<tr>
<td>Domestic production plus imports (net of exports) of machinery and equipment</td>
<td>GFCF, with suitable adjustments for taxes on products, trade and transport margins and acquisition and installation costs.</td>
</tr>
</tbody>
</table>
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