# 4.0 Production account - measuring GDP (Module 4)

**Objective**: To show how GDP is estimated from the production side. Focus is on value estimates. This module is mainly about value terms (current prices) that is, measuring the current state of the economy. It focuses on what does gross domestic product (GDP) measures and what it does not. It also presents the production account and defines its core components.

**Learning activities**: Exercises are given and focus on core concepts of the production account such as production boundary, calculation of value added, output and intermediate consumption for select industries. You are encouraged to practice these exercises to have a better understanding of the production account.

## 4.1 Production and Production process

* + Production and Production Process
		- Production – definition
		- Production process
	+ Production boundary: an Overview
	+ Production process reflected in Sequence of Accounts

This Module is on the first two accounts of the main sequence of accounts, viz. *production account* and *generation of income account*. Recall that in the SNA, the integrated sequence of accounts consists of three distinct sub-sets: current account, accumulation accounts and the balance sheets. The Production Account is the starting point in the sequence of accounts under the subset Current Accounts. Together with the generation of income accounts, it can be compiled for individual production units like individual establishments (for instance factories of a multi-establishment company) or a group of establishments as well as institutional sectors and the total economy. All the other accounts are compiled only for institutional units and sectors but not for establishments of multi-establishment enterprise. This is why these two accounts are discussed in this session, while rest of the income accounts are discussed separately in Session 7.

Together the *production account* and *generation of income account* show how income is generated in the process of production. The distribution and use of income thus generated is recorded in the other income accounts (discussed in *Module 7*). The entries of these two accounts thus reflect the level of production (GDP) and the level of income generated in the domestic economy.

**Production and production process**

Production is the central concept in economics. Products resulting from production meet the present and future human needs. The value added in the process provides income and employment to workers and property income to the owners of financial and natural resources. In general terms, *production* is a human activity by which we create (produce) goods and / or services from inputs of raw materials and other intermediate products, using (human) labour and available physical resources like machinery, buildings and land.

*Production – definition*

The SNA defines *production* as *an activity, carried out by an institutional unit, that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.* [*2008 SNA*, 6.2].

In ESA 95, production is defined as “A ‘physical’ process, carried out under the responsibility, control and management of an institutional unit, in which labour and assets are used to transform inputs of goods and services into outputs of other goods and services. Production does not cover purely natural processes without any human involvement or direction. All goods and services produced as output must be such that they can be sold on markets or be least be capable of being provided by one unit to another (or a group of other units) with or without charge.”

*Production process*

All the four kinds of resources – human, natural, produced and financial – are required in a production process. The produced resources are used either as *intermediate consumption* or as capital assets. The other three resources – non-produced resources – used in the production process are what we refer to as *factors of production*.

Out of the value of output generated in the process of production, an enterprise meets the cost of *intermediate consumption* and *CFC*. The latter represents the cost of using produced capital goods, called *fixed assets* in the SNA. The balance left is the *net value added* (*NVA*) which represents the income generated in the production process. This is distributed as *factor compensations* to the owners of the non-produced resources.

Besides, a part of the *NVA* is paid to the government as production tax. Sometimes the enterprises receive subsidies from the government. In national accounts, it is treated as negative production tax. For an economy, the income generated in all production processes run by the resident enterprises represents the *primary income generated in domestic economy*.

While the human resources and natural resources are used physically in the production process, the role of financial resources is in fact to aid the ‘physical’ process. Take for example a manufacturing unit that has borrowed money from bank to purchase its machinery. The machinery is essential for the production process, which was acquired using the financial resources provided by the bank. The bank, the owner of the financial resource, in return is compensated by the interest the manufacturer pays. Had the manufacturer acquired the machinery from its own funds there would not have been any explicit use of financial resources.

**Production boundary: an overview**

Only the goods and services resulting from the activities falling within the production boundary of the SNA are considered to be able to generate value added and thus constitute production of an economy. The production boundary not only defines productive activities but also determines indirectly what the macro-economic aggregates like income, consumption and capital formation are comprised of. For example, whatever is used for ‘final consumption’ or ‘capital formation’ or ‘export’ should necessarily be from the output of an activity falling within the production boundary of the System.

The production boundary for the purposes of the National Accounts is defined as:

***Box 4.1***

***Enterprise, Establishment* and *Industry***

Enterpriseis an institutional unit engaged in production characterized by natural person, legal or social entity, can enter into contract on behalf of own, has ownership rights of assets and makes decisions on income, financial and other assets. Enterprisemay have one or more economic activities. For example, a company that runs a mine and has a number of factories producing different products like steel, machinery and vehicles.

Kind of activity unit (KAU) is an enterprise or part of an enterprise which independently engages in one kind of economic activity or predominantly one kind of economic activity without restriction to the geographical area in which that activity is carried out.

Establishment is a unit which may be an enterprise or part of enterprise that independently engages in one or predominantly one kind of economic activity at one location or within a geographical area for which data are available, or can be meaningfully compiled that allow the calculation of operating surplus. For example, a factory of the company mentioned above that produces heavy machinery used as capital goods as well as parts of vehicles.

An establishment may have multiple economic activities (according to ISIC). Activities of an establishment are classified as primary, secondary and ancillary activities. Primary activity is the production activity with highest share in output or gross value added. Secondary activities are other production activities carried out for sale or disposal to other units. Ancillary activities are those whose output is for internal use of the establishment or enterprise.

An ancillary Unit of an enterprise is one that engages in an ancillary activity which means whose output is for internal use of the establishment or enterprise itself and is not supplied to any other unit. An example of an ancillary unit could be an electricity generation unit of a coal mine that produces electricity only for the operation of the mine. If the electricity generation unit supplies electricity also to other units, then it is no longer considered as an ancillary unit.

Industryis the aggregate of those establishments that are engaged in same kind of economic activity (according to ISIC).

1. The production of all individual or collective goods or services that are supplied to units or intended to be so supplied, including the production of goods and services used up in the process of producing such goods and services;
2. Own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation; and
3. Own-account production of housing services by owner-occupiers (ownership of dwellings) and of domestic and personal services produced by employing paid domestic staff.

The production boundary of SNA includes:

1. The production of all individual or collective goods and services that are supplied or intended to be supplied to production units other than themselves;
2. The own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;
3. The own-account production of housing services by owner-occupiers and personal services produced by the employment of paid domestic staff;
4. The production of all agricultural goods for sale or own final use and their subsequent storage; the gathering of uncultivated crops; forestry; wood-cutting; the collection of firewood; hunting and fishing; carrying of water; the processing of agricultural and other food products; the weaving of cloth, dress-making and tailoring, the production of footwear, pottery, utensils, furnishings etc.

***Box 4.2***

**Housing Services of Owner-Occupied Dwellings**

The production of housing services for their own final consumption by owner occupiers has always been included within the production boundary in national accounts, although it constitutes an exception to the general exclusion of own-account service production.

For the rented dwellings, the rental paid is taken as the value of the production housing services. For owner-occupied dwellings, since no rental is actually paid, the value of the housing services produced is imputed and taken as the output of this activity. The costs incurred for repair and maintenance of these dwellings is taken as the intermediate consumption.

The entire amount of output, in turn, is included in the final consumption expenditure of the households. Note that, purchase or construction of a dwelling by a household is considered as capital formation and not included in the final consumption expenditure of the households.

1. Production and distribution of goods and services whose sale, distribution or possession is forbidden by law, such as narcotics, smuggling of goods and prostitution;
2. Production of goods and services which are deliberately concealed from public authorities in order to avoid the payment of taxes, the meeting of legal standards or compliance with administrative procedures.
3. Natural growth of *cultivated* forests,
4. Development of entertainment, literary or artistic originals and the leasing of the right to use/ exploit those assets.
5. Development of software on own account that can be used for more than one year.
6. Research and development activities carried out for own use by an enterprise. [2008 SNA]
7. Financial intermediation services provided by banks and other financial institutions.
8. Lending exclusively from own funds like money lenders & pawn brokers. [2008 SNA]

Production Boundary excludes:

1. All personal and domestic services that are produced and consumed within the same households, such as
	1. services of cleaning, decoration, cooking, caring for and educating children, caring for sick and old people within the household;
	2. maintenance and repair of household durables;
	3. transportation of household members; and
2. All unpaid voluntary services provided by household members.

**Production process reflected in Sequence of Accounts**

The value of output generated in a production process can be split into two main parts – one for meeting the cost of produced resources and other for using non-produced resources. Reckoning that the cost of (partial) use of fixed assets during the period is in fact the *CFC*, we can say that, in the context of production, the first part represents the product-related transactions, while the second part, in its entries, reflects the income-related transactions.

In the SNA, the entries for production-related transactions for use and disposal of products are made in the *production account*, while those relating to primary income generated, i.e. payment of factor compensations and taxes, are made in the *generation of income account*. The value of production – NVA (or GVA in gross terms) – is the balancing item of the production account. This, being the income generated in the production process, is shown on the resources-side of the generation of income account.

*Points to note:*

1. All goods and services used as *intermediate consumption* are necessarily produced.
2. Produced resources, other than those for intermediate consumption, used in a production process are the fixed assets.
3. Payment for hired fixed assets (called *rental*) is thus included in *intermediate consumption*.
4. Payment for hired natural resources is called *rent* in the SNA.
5. The *rent* is treated as factor compensation, while *rental* is included in intermediate consumption.
6. For an economy, the income generated in all production processes run by the resident enterprises represents the *primary income generated in domestic economy*.
7. The cost of using intellectual property product (*IPP*), often called ‘royalty’, is included in intermediate consumption and not in operating surplus.
8. In the 2008 SNA, the outcome of research and development activities is recognised as *IPP* and are capitalised.
9. The payment for user rights on patented entities, which are now treated as produced assets, are included in *intermediate consumption*.

[In the 1993 SNA, patented entities were classified as non-produced assets. In the 2008 SNA, these are included in *IPP*. (2008 SNA, A3.21 – A3.23)]

1. The IPP is put to use solely as fixed capital formation.
2. Entries in production account relate to transaction of products, while those in generation of income account relate to income.
3. *Intermediate consumption* is transaction of products and thus is recorded only in production account and not in the generation of income account.
4. Payment for engaging a professional (who is treated as an enterprise, such as a lawyer) made by an enterprise is *intermediate consumption* and not compensation of employees.

**Exercise – 4.1: Production and Production process**

Which of the following is included in the Production boundary of SNA?

1. Domestic services by household member for own use
2. Housing services provided by owner-occupied dwellings
3. Unpaid Volunteer in NPI
4. Small repairs to durables and dwellings done by households
5. Gathering firewood in the forest
6. Taking care of infant by mother
7. Maintenance of household durables without hired worker
8. Fishing in the shores of Samoa for own consumption
9. Manufacturing illegal narcotics.
10. Providing services of owner-occupied dwellings

## 4.2 Session II. Production Account and Generation of Income Account

* + - Production account
		- Generation of income account

All transactions relating to production process are of current nature. For example, the flows like intermediate consumption, output, production taxes & subsidies, incomes generated and CFC are all of current nature. In the SNA sequence of accounts, all the production-related flows, other than income generated, are included in the *Production account*. The flows like payment of compensation of employees, operating surplus and mixed income are recorded in *Generation of Income account*.

The generation of income account presents flows of income at the origin, rather than the destination, of primary income. All the other income accounts describe either the flows of income to destinations and destinations to other destinations or use of income by the destinations. In the SNA framework, the destinations are invariably institutional units, and not establishments.

**Production account**

The production account provides a description of productive activity, viz., it tells how the use of inputs and the production of outputs lead to the generation of value added. Production account can be compiled for individual institutional units as well as sectors, they can also be compiled for establishments and thus for industrial sectors (as per ISIC). In concept, the economy-wide production account is the aggregation of a similar account of each unit.

Recall that GDP can be estimated by three approaches. By production approach, it is an aggregated or net output concept, representing the final result of the production activity of all resident production units. Gross Value Added (by activity) is a measure of each producer’s contribution to GDP. It is a measure of the increased or newly created value generated by the production process in question, including any capital used up in the production process. Production account is based on production-side identity:

*GDPmp*≡ *GVObp – IC + product (t-s) + (t-s) on imports*.

The balancing item of this account is GVA for individual establishments or group of establishments and GDP for the economy as a whole. The account also provides for recording CFC. In that case, the balancing item becomes NVA or NDP. In fact, the entire set of SNA accounts can be presented either in gross or net terms. For our purpose, the accounts are discussed only in gross terms.

**Generation of income account**

GDP less consumption of fixed capital is Net Domestic Product (NDP). It is an income concept, which is the total net income generated in the domestic economy by resident production units. All the production-related transactions of income are presented in the system in the Generation of Income account. Claims on value added generated in the production process arises for various use of resources. The claims which are most directly related to productive activity are recorded in the *Generation of income* and the Allocation of *Primary income accounts*.

The *Generation of income account* starts with value added (domestic product in the accounts for the total economy). It specifies the accrual of liabilities of resident enterprises to pay compensation of employees and taxes on production and imports. The balancing item of this account: ‘operating surplus’ (or ‘mixed income’ in the case of households) is an analytically interesting measure of how much of value added generated in the recording period remains for the payment of remuneration for use of borrowed non-produced assets, financial capital and entrepreneurial activity. This account is based on one of the income-side identities:

*GDPmp ≡* (*CE* + *OS* & *MI*) generated in resident enterprises + production (*t-s*) + (*t-s*) on imports.

*Generation of Income Account* is compiled by industries and institutional sectors in parallel with the *production account*. It is part of the SNA accounting structure and constitutes the income approach for the GDP calculation. It presents the activities/sectors which are the source, rather than the destination, of primary income and analyses the extent to which value added can cover compensation of employees and taxes less subsidies on production.

**Structure of Accounts**

The general format of an account in the sequence of accounts is to show how resources are received and uses made. After deducting the uses from the resources, whatever remains is the balancing item. The balancing item of one account is carried forward to the resources side of the next account. Because the production account is the first in the sequence of accounts, there is no balancing item carried forward to its resources side.

As noted earlier, both the production account and the generation of income account can be compiled for individual establishments, institutional units, sectors, as well as for the economy as a whole. The accounts for a part of the economy will be henceforth referred to as the *sectoral accounts*.

For the sectoral accounts, the output, at basic prices, from production is recorded under resources on the right-hand side of the account. The output is often disaggregated into three different kinds of output – market output, non-market output and output for own final use. The uses are recorded on the left-hand side of the account. These consist of intermediate consumption and consumption of fixed capital (CFC).

The balancing item in the production account is value added. It can be measured either gross or net, that is, before or after deducting CFC.

Let’s take an example of a household-run agricultural farm and a company-owned bakery.

*Example 1:* Production and Generation of Income Accounts for a household sector farm and a corporate sector unit.

The basic production-related figures during an accounting period obtained from the production units are as follows:

|  |  |
| --- | --- |
| **Farm** | **Bakery**  |
| Wheat sold (excluding subsidies) | 1000 | Bread sold (including tax) | 1800 |
| Wheat retained own consumption | 500 |  |  |
| Seeds purchased | 150 | Wheat purchased | 1000 |
| Fertilisers used | 30 | Electricity charges paid | 100 |
| Irrigation charges paid | 20 | Other service charges paid | 50 |
| Payment to hired workers | 450 | Wages & salaries paid | 200 |
| Product subsidies received | 100 | Product taxes paid | 80 |
|  |  | Other production tax paid | 10 |

Let us also assume that the CFCs of the farm and bakery are respectively 40 and 70. The production and income generation accounts for the farm would be as follows:

|  |  |
| --- | --- |
| **Uses**  | **Resources** |
| **Production Account** |
|  | Intermediate consumption | GVO*bp* |  |
|  | Seeds |  Market output (at basic price) |  |
|  | Fertilisers | For own use |  |
|  | Irrigation charges | Non-market | x |
|  | ***B.1g GVA*** |  |  |
|  | *CFC* |  |  |
|  | ***B.1n NVA*** |  |  |
| **Generation of Income Account** |
|  | Compensation of employees | ***B.1n NVA*** |  |
|  | Other Production (*t-s*)  |  |  |
|  |  ***B.3n MI*** *(net)* |  |  |

Note that the wheat was sold for ………. and the farm received a (product) subsidy of 100. Thus, the value of wheat sold at basic prices (GVO*bp*) is …………… .

Further, the wheat retained for own consumption, valued at basic prices, is ………… .

Also, note that intermediate consumption is the sum of costs for seeds, fertilisers and irrigation, i.e. + + = ……..

Thus, the GVA is = ……….. and the NVA is =………………. – --------------= …………….

The NVA thus obtained as the balancing item of production account is carried forward to the resources side of the generation of income account. The compensation of employees and the other production taxes less subsidies are recorded on the uses side. The balancing item “Mixed Income (net)” is obtained as the difference between the sums of the resources and uses side.

Thus, the mixed income (net) = ……….. – ………. = …………. .

Similarly, the production and income generation accounts for the Bakery would be as follows:

|  |  |
| --- | --- |
| **Uses**  | **Resources** |
| **Production Account** |
|  | Intermediate consumption | GVO*bp* |  |
|  | Wheat purchased |  Market output (at basic price) |  |
|  | Electricity charges paid | For own use |  |
|  | Other service charges paid | Non-market | x |
|  | ***B.1g GVA*** |  |  |
|  | *CFC* |  |  |
|  | ***B.n1 NVA*** |  |  |
| **Generation of Income Account** |
|  | Compensation of employees | ***B.1n NVA*** |  |
|  | Other Production (*t-s*)  |  |  |
|  |  ***B.2n OS*** *(net)* |  |  |

In this case, the value of bread sold at basic price (GVO*bp*) is sale value minus product tax, which is ………….. (= ………. – ………… ).

Note that for both the units, the balancing items GVA and NVA are at basic prices. The balancing item of generation of income account is *mixed income* in case of the farm (since it belongs to the household sector) and *operating surplus* in case of the bakery (since it belongs to the corporate sector). Also, note that the details of intermediate consumption shown in the above accounts are not presented in practice, since there is too large number of them to be accommodated in such aggregated accounts.

We will now work out these two accounts for the general government sector given in *Box 4.3*. The structure of presenting the data, shown in *Box 4.1*, is a typical example of government’s revenue and expenditure statement.

***Box 4.3***

***Summary Expenditure and Revenue Statement of General Government***

|  |
| --- |
| **Government expenditures and revenues** |
| **1. Revenue**  |  |  | **187** |
| Sales to households  |  | 5 |  |
| Sales to corporations |  | 10 |  |
| Taxes |  | 150 |  |
| Other taxes on production | *15* |  |  |
| Taxes on income  | *135* |  |  |
| Interest income  |  | 12 |  |
| International assistance |  | 10 |  |
| **2. Expense** |  |  | **167** |
| Uses of goods and services |  |  |  |
| Collective non-market activities  |  | 80 |  |
| Goods and services  | *20* |  |  |
| Compensation of employees  | *58* |  |  |
| Consumption of fixed capital  | *2* |  |  |
| Individual non-market activities  |  | 20 |  |
| Goods and services  | *5* |  |  |
| Compensation of employees  | *14* |  |  |
| Consumption of fixed capital  | *1* |  |  |
| Social benefits in kind (reimbursements included)a  |  | 20 |  |
| Social benefits in cash  |  | 22 |  |
| Interest payment  |  | 10 |  |
| Capital transfers  |  | 10 |  |
| International assistance  |  | 5 |  |
|  |  |  |  |
| **3. Net operating balance** (1) - (2)  |  |  | **20** |
| Consumption of fixed capital |  |  | 3 |
| Collective non-market activities  |  | 2 |  |
| Individual non-market activities  |  | 1 |  |
| **4. Gross operating balance** (Net operating balance  |  |  | **23** |
| plus consumption of fixed capital) |  |  |  |
| **5. Acquisition less disposal of non financial assets**  |  |  | **30** |
| Purchases *less* disposal of capital goods  |  | 20 |  |
| Own-construction (includes *CE*) |  | 7 |  |
| Major repairs (includes *CE*) |  | 3 |  |
| **6. Net lending/net borrowing (4) – (5)**  |  |  | **-7** |
| Sale of government bonds  |  | 7 |  |

We will use this statement throughout this text to illustrate construction of the sequence of accounts for the general government.

 *Example 2:* Production and Generation of Income Accounts for general government.

The production and income generation accounts for general government based on the figures provided in *Box 4.3* would be as follows:

|  |  |
| --- | --- |
| **Uses /** changes in assets | **Resources**/changes in liability & net worth |
| **Production Account** |
|  | Intermediate consumption | GVO*bp* |  |
|  |  |  Market output (at basic price) |  |
|  |  | For own use |  |
|  |  | Non-market |  |
|  | ***B.1g GVA*** |  |  |
|  | *CFC* |  |  |
|  | ***B.n1 NVA*** |  |  |
| **Generation of Income Account** |
|  | Compensation of employees | ***B.1n NVA*** |  |
|  | Other Production (*t-s*)  |  |  |
|  |  ***B.2n OS*** *(net)* |  |  |

We will soon see in Session III that the gross value of output of non-market production is measured at cost. This is equal to the sum of intermediate consumption, wages & salaries, CFC and other production taxes. Thus, the value of its non-market output is …….. (= …... + ……).

The value of output under ‘own use’ is 10 on account of own construction and major repairs. Again, intermediate consumption is the cost of goods & services for non-market output and the expenditure for ‘own use’ capital formation, which works out to ….. (= …… + …. + …. + ….). The net operating surplus is by definition *zero*.

This way, we can compile these two accounts for all production units – whether establishments or enterprises. The respective accounts of two or more production units can be combined by simply adding the entries in the corresponding cells. Thus, it is possible to draw these two accounts for any segment of the economy as well as the total economy. When aggregated for the total economy, note that, the balancing item of the production account would be GDP at basic prices.

In order to present the GDP at market prices, the production account for the total economy has an additional entry of ‘product & import taxes less subsidies’ on the resources side. In addition, ‘product taxes less subsidies’ are included in the uses-side of the generation of income accounts. In fact, the detailed presentation on these two accounts for the total economy consists of disaggregation of compensation of employees and production & import taxes & subsidies. Compensation of employees is disaggregated into various components of ‘wages & salaries’ and employers’ actual and imputed ‘social contributions’. Production & imports taxes and subsidies are disaggregated into ‘product’ and ‘other production’ taxes and subsidies. Note that production taxes less subsidies & import duties are also recorded in the resources-side of allocation of primary income account of the general government, whereas income & wealth tax (such as personal income tax and corporate tax) are recorded in the secondary distribution on income account.

[Refer to pages 562-563 of the 2008 SNA for the details.]

The constituents of ‘employers’ social contributions’ are discussed later in this lesson.

*Example 3:* Production and Generation of Income Accounts for an economy.

An example of a summarised version of the production and income generation accounts for the total economy is presented below.

|  |  |
| --- | --- |
|  **Uses**  | **Resources** |
| **Production Account** |
| **1883** | Intermediate consumption | GVO*bp* | **3604** |
|  |  |  Market output (at basic price) | 3077 |
|  |  | For own use | 147 |
|  |  | Non-market | 380 |
|  |  | (*t-s*) on products & import duties | 133 |
|  | ***B.1g GDP*** |  |  |
| 222 | *CFC* |  |  |
|  | ***B.n1 NDP*** |  |  |
| **Generation of Income Account** |
|  |  | ***B.1g GDP*** |  |
|  |  | ***B.1n NDP*** |  |
| **1150** | Compensation of employees |  |  |
| 133 | Product & import (*t-s*) |  |  |
| 58 | Other Production (*t-s*)  |  |  |
|  | ***B.2g & B.3g OS+MI*** *(gross)* |  |  |
|  |  ***B.2n & B.3n OS+MI*** *(net)* |  |  |

*Points to note:*

1. Production account is based on the Production-side identity:

*GDPmp*≡ *GVObp – IC + product (t-s) + (t-s) on imports*.

1. Generation of income account is based on one of the income-side identities, viz.

*GDPmp ≡* (*CE* + *OS* & *MI*) generated in resident enterprises

+ production (*t-s*) + (*t-s*) on imports.

1. Usually, product & import taxes less subsidies are shown in the accounts of the total economy. These are not included in the accounts for any segment of the economy.
2. Inclusion of product & import taxes *less* subsidies in resources-side of the production account and in uses-side of the generation of income account cancel out. Production (t-s) is again included in the resources-side of the allocation of primary income and thus gets included in the national income.
3. Thus, in the production account for a segment of the economy provide GVA at basic prices and that for the total economy GDP at market prices.
4. The sum of OS & MI of individual generation of income accounts for (institutional / industrial) sectors equals the OS & MI of the economy-wide generation of income account.
5. The generation of income account presents flows of income at the source, rather than the destination, of primary income.
6. All the other income accounts describe either the flows of income to destinations and destinations to other destinations or use of income by the destinations. In the SNA framework, the destinations are invariably institutional units, and not establishments.
7. Thus, unlike other accounts of the SNA sequence of accounts, the production account and generation of income accounts can be compiled for individual establishments or a group of establishments.
8. These two accounts can be compiled separately for industrial sectors defined by the ISIC. These are useful for economic analysis and policy making relating to economic activities, as these two together provides information on contribution of as well as income generated from different industrial sectors.
9. Like all other accounts of the SNA, these can as well be compiled for institutional sectors and the total economy.
10. The balancing item of generation of income account is operating surplus for the corporate sectors and mixed income for the household sector.
11. The balancing item of generation of income account is operating surplus *zero* for the general government and NPISHs.
12. For the household sector, the balancing item of generation of income account mainly consists mainly of mixed income.
13. There is also a component of operating surplus in the balancing item for the household sector, because the entire GVA generated by production of housing services by the dwellings owned by households is treated as operating surplus.

Exercise – 4.2:

1. Check one of the entries of accounts for an economy specified in the alternatives ([a], [b], [c] and [d]) in which the following are included
2. Product taxes paid by a company

[a] ***IC*** in Production account

[b] resources-side of production account

[c] none of the above

[d] both the entries

1. Purchase of raw materials that were used for production by a market producer

[a] ***IC*** in Production account

[b] ***OS*** in Generation of income account

[c] Output ‘for own use’ in production account

[d] both the entries

1. Expenditure on goods & services for repair & maintenance of owned dwelling by a household, for which ***GVO*** is measured at cost.

[a] ***IC*** in Production account

[b] Output ‘for own use’ in production account

[c] none of the above

[d] both the entries

1. Corporate tax payable by a company

[a] ***IC*** in Production account

 [b] ***CE*** in Generation of income account

[c] ***OS***  in Generation of income account

[d] none of the above

1. Expenditure on goods & services for R&D activities of a company for its own use

 [a] ***IC*** in Production account

[b] Output ‘for own use’ in production account

[c] none of the above

[d] both the entries

1. The royalty paid by a car manufacturer to the company owning the design of car engines.

[a] ***IC*** in Production account

 [b] Output ‘for own use’ in production account

[c] ***OS***  in Generation of income account

 [d] none of the above

1. An airliner’s expenditure on repair & maintenance of aircrafts legally owned by a bank till the airliners repays the related loan.

[a] ***IC*** in Production account

[b] ***OS***  in Generation of income account

[c] none of the above

[d] both the entries

1. Payment made to an individual licensed accountant by a firm

[a] ***OS*** in Generation of income account

[b] ***CE*** in Generation of income account

[c] ***IC*** in Production account

[d] none of the above

1. Wages & salaries paid by a NPISH.

[a] Non-market output in production account

[b] ***CE*** in Generation of income account

[c] none of the above

 [d] both the entries

1. Unsold finished goods of a manufacturer

[a] Output ‘for own use’ in production account

[b] ***IC*** in Production account

[c] none of the above

[d] both the entries

1. Difference between bank interest and SNA interest payable by an enterprise for a bank loan.

[a] ***OS*** in Generation of income account

 [b] ***IC*** in Production account

[c] none of the above

[d] both the entries

1. Value of ammunitions used by the army.

[a] ***IC*** in Production account

 [b] Output ‘for own use’ in production account

[c] none of the above

[d] both the entries

1. Purchase of war planes by a government

[a] ***IC*** in Production account

 [b] Output ‘for own use’ in production account

[c] none of the above

[d] both the entries

1. A company’s contribution for medical insurance of its workers.

[a] ***IC*** in Production account

 [b] ***CE*** in Generation of income account

[c] none of the above

[d] both the entries

1. Purchase of goods & services for repair and maintenance of officers’ canteen building incurred by a company.

[a] ***IC*** in Production account [b] ***CE*** in Generation of income account

[c] none of the above

[d] both the entries

## **4.3 Session III. Measuring Production - revisited**

**Measuring production-revisited**

Production is generally defined as the economic activity that creates (produces) goods and / or services from inputs of raw materials and other intermediate products, using (human) labour and available productive resources like machinery, buildings and land.

In general terms, production may be described as an activity in which an enterprise uses inputs to produce outputs. Thus, purely natural process, for example, the unmanaged growth of fish stocks in the international waters is not production, whereas the activity of fish farming is production.

**Kinds of output**

*Market Production*

The outputs of these market producers are sold at economically significant prices. SNA does not provide a standard for what should be the economically significant price. However, most countries decide that it must cover at least half of production costs. Market output consists of:

* The total value of goods and services produced in the period and sold at economically significant prices (including output indirectly measured)
* The total value of goods and services bartered
* The total value of goods and services used for payment in kind, including compensation in kind
* The total value of goods and services supplied by one establishment to another belonging to the same market enterprise to be used as intermediate inputs
* The total current value of products produced and added to the inventories of finished goods and work-in-progress intended for one or the other of above use
* Output of insurance services.

Market producers are the establishments of wide range of size and activity. In size they vary from establishments in large corporations to small unincorporated enterprises (owned by households) most of whose products is marketed. Of the enterprises operating in an economy, the market producers are the most commonly found entities.

***Figure 1***

**Kinds of Output**

****

 *Production for own final use*

Output of his category of production are meant for *final use* (*final consumption* and *capital formation*) of the producers themselves. This includes:

* Own-account capital formation, such as
	+ construction of dwelling units by households for their own use,
	+ own-account software development,
	+ research and development
* Output retained for final consumption by owners of unincorporated enterprises, such as
	+ goods produced for own consumption by subsistence farmers,
	+ dwelling services of the owner-occupied dwellings
	+ firewood collected for own use.

*Non-market production*

Production of services that are provided free or at prices not economically significant like free government schools and hospitals, and religious service providing institutions. General government and NPISHs are non-market producers.

**Measuring output**

Three different methods of valuation are recommended for three kinds of output.

*Value of market output*

The output of market products are done at the prices prevailing in the market, i.e. the prices at which the goods services are actually sold or purchased. For the market products like inventories of finished goods and work-in-progress that are yet to be sold, the valuation is done either on the basis of imputed (basic) prices or at cost, i.e sum of all cost of production like intermediate consumption, compensation to employees, *CFC*, other taxes (*less* subsidies) on production and a component of normal profit.

*Value of non-market output*

Non-market output is recommended to be measured at production costs, when it is provided to the households without charge or at a nominal cost. Output at production costs is the sum of the following items:

1. Intermediate consumption;
2. Compensation of employees;
3. Consumption of fixed capital;
4. Other taxes (*less* subsidies) on production.

*Value of output for own final use*

Output for own final use should be valued at the basic prices at which the goods and services could be sold if offered for sale on the market. When reliable market prices cannot be obtained, the value is deemed to be equal to the sum of their costs of production:

1. Intermediate consumption;
2. Compensation of employees;
3. A net return to fixed capital; [introduced in 2008 SNA]
4. Consumption of fixed capital;
5. Other taxes on production.

By convention, no net return to capital is included when own-account production is undertaken by non-market producers. Also by convention, **s**ubsidies on products can only pertain to market output and output for own final use.

**Measurement of output of special industries**

*Distributive Trade*

Trading activities carried out within the economic territory of an economy is called ‘distributive’ trade. [Exports and imports are also trading activities but these are called international trade.] Trading is a service provided for making the goods available to the purchasers. The output of trading activities is *trade margin* defined as:

***GVO*** = Sale - cost of goods sold

Cost of goods sold = Purchases of goods for resale + opening stock of goods for resale

 - closing stock of goods for resale

Thus, ***GVO*** = Sale + closing stock - opening stock - purchases of goods for resale

*Example 1*: Output and GVA in Distributive Trade

Consider a retail store that recorded the following transactions in 2006:

Sale = 50,000

Purchases of goods for sale = 30,000

Opening stock = 4,000 Closing stock = 5,000

Utilities = 200

Expenditure on supplies = 500

 Other services paid = 50

*GVO* = ………… + (……….. - ………..) - …………… = …………….

*GVA* = ………… - (…… + …… +….) = ……….. – …… = …………..

*Commercial Banks*

Commercial banks provide services for both explicit fees and implicit charges. Explicit fees, like fees for issuing a draft or doing money transfer etc., are always recorded as payable by the service-receiving unit to the service-provider, i.e. the banks.

Commercial banks receive implicit service charges mainly for the services of channelling saving of savers to the borrowers. The implicit charges for financial services are measured indirectly and is called *financial intermediation services indirectly measured* (***FISIM***).

Financial institutionsbasically provide these financial services by means of *financial intermediation*, whereby a financial institution (a bank) accepts deposits from units with ‘excess’ funds to other units in need of funds. Each of the two parties pays a fee to the bank for the service provided. The unit lending funds accepts a lower rate of interest than that paid by the borrower, the difference (= combined fees implicitly charged by the bank to the depositor and to the borrower) represents the *FISIM*. However, there is normally little if any *FISIM* payable between banks, since banks usually borrow from and lend to each other at a risk-free rate. The 2008 SNA recommends *FISIM* to be measured as:

 *FISIM*: On Loans = (actual - reference) interest rate

 On Deposits = (reference –actual) interest rate

 that is 

where *fL and fD* represents the *FISIM* – output of the financial services on loans and deposits respectively,

 *YL* the amount lend *YD* the amount borrowed

 *rL* the lending rate *rD* the borrowing rate

 and *rr* the reference rate.

*Example 2*: Output and GVA of Financial Intermediation

Consider that households deposited 500 mill. and bank lent out 300 mill. The bank charges 15% interest on loans while gives 6% on deposits. If the reference rate is 10 %, then what is the FISIM of bank?

FISIM rate on deposit = 10% - 6% = 4 percent

FISIM on Deposit (*fD*) = 500 \*(0.04) = 20 mill.

FISIM rate on loan = 15% -10% = 5 percent

FISIM on Loans (*fL*) = 300 \*(0.05) = 15 mill.

Thus, *GVO* = *fL* + *fD* = ……. mill. + ……. mill. = …….. mill.

There are other deviations in the estimate of FISIM depending upon the availability or choice of reference rate and the data. The *GVA* of banking activity is obtained by subtracting the intermediate consumption (inputs) from the *GVO*.

*Allocation of FISIM*

Since *FISIM* is counted as output, it must also be recorded as consumption of those who use the service. A part of the *FISIM* (*fL*) is consumed by those who take loans from the banks – mainly the enterprises. The other part (*fD*) of the *FISIM* is consumed by the depositors – mainly the households. Up to 1993 SNA, it was permitted to regard *FISIM* as intermediate consumption for the economy as a whole. In 1993 SNA it was suggested, and in 2008 SNA it is recommended that FISIM should be allocated to

* enterprises (as intermediate consumption)
* household (as final consumption)
* export

The 1993 SNA, following the previous practice, suggested that if *FISIM* is not allocated to user sectors, a nominal sector be introduced in the accounting framework. The whole of the value of the output of FISIM may be treated as intermediate consumption of the nominal sector with zero output and negative value added equal in size but opposite in sign to intermediate consumption. The value added of all sectors and industries together is reduced in total by the amount of FISIM.

*Insurance*

In non-life insurance only the risk is covered. When the event occurs for which insurance has been made, the policy holder makes his/ her claim. Thus, for non-life or term insurance

*GVO* = premium payable + supplemental premium - claims

The premium supplements are the notional payments by the policy holders. This is defined to be equal to the investment income earned by the insurance corporations from the financial markets in return to investment of the reserves. Since these reserves are policy holders’ money, the investment income earned should also accrue to them. However, these are usually retained by the insurance corporation and not passed on to the policy holders. Thus, it is considered to be a notional payment of ‘supplementary’ premiums by the policy holders. [*Figure* 2]



However, in life insurance there is an element of saving besides risk coverage. Thus, besides claims the insurance company pays the insured amount after completion of period to the survived person from its actuarial reserve. Thus for Life insurance

 *GVO* = premium payable + supplemental premium - claims - change in actuarial reserve

The *GVA* of insurance activity is obtained by subtracting the intermediate consumption (inputs) from the *GVO*.

*Cultivated assets*

*The gross value of output* (*GVO*) of cultivated assets can be obtained by disposition as

*GVO* = Sales + change in inventory + own final use

*Example 3*: Output and GVA of Cultivated Assets

Consider a case of a cultivated forest where trees were planted and expected to be cut for sale after 4 years. The following are the estimated value of opening, closing stock, intermediate consumption and sales:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Value of**  | **1990** | **1991** | **1992** | **1993** |
| Opening stock  | 0 | 100 | 250 | 400 |
| Closing stock  | 100 | 250 | 400 | 0 |
| Intermediate. consumption | 30 | 70 | 90 | 100 |
| Sales | 0 | 0 | 0 | 700 |

The *GVO* of cultivated forest is obtained as sum of sales, change in inventory and own final use. Note that own final use in this case is 0. GVA is then obtained as difference of *GVO* and intermediate consumption.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Value of**  | **1990** | **1991** | **1992** | **1993** |
| Closing stock  | 100 | 250 | 400 | 0 |
| less opening stock  | 0 | 100 | 250 | 400 |
| Change in inventory |  |  |  |  |
| Sales | 0 | 0 | 0 | 700 |
| = ***GVO*** |  |  |  |  |
| less IC | 30 | 70 | 90 | 100 |
| = ***GVA*** |  |  |  |  |

**Measuring intermediate consumption**

Intermediate Consumption (***IC***) consists ofthe value of all goods (non-durable) and services consumed in the process of production. It includes rentals paid on use of fixed assets, goods and services supplied by other establishments of same enterprise, and goods and services used as inputs into the ancillary activity. Intermediate consumption includes goods and services which are entirely used up by producers in the course of production to produce output of goods and services during the accounting period – whether for the market or for own use.

It however excludes *CFC*, goods and services (intermediate products) produced and used within the establishment, purchase of capital goods and transactions treated as transfers like bad debt provisions/write-offs, taxes, fines, donations. It also excludes factor payments like compensation of employees, land rent, interest (other than allocated FISIM), and dividends paid. The non-transaction economic flows like amortization of goodwill, exchange rate losses, loss on sale of assets, are obviously excluded.

***IC*** includes:

* purchase of small tools and ordinary maintenance and repairs;
* purchase of fixed assets to be used under an operational leasing contract
* expenditure that an owner-occupier incurs on the maintenance and repair of the dwelling
* expenditures on goods and services of households in their capacity as producers

***IC*** excludes:

* labour cost, financial costs and production taxes.
* purchase of military weapons and their supporting systems

[These were treated IC in 1993 SNA. The 2008 SNA, recommends: military weapons systems should be classified as fixed assets and single-use items, such as ammunition and missiles, should be treated as military inventories.]

* machinery and equipment acquired by households for purposes of final consumption (final consumption expenditure)
* the purchase of dwellings (treated as gross fixed capital formation)
* payments of taxes, such as license to own vehicles and license to hunt, shoot or fish
* subscriptions, contributions and dues paid to NPISHs
* voluntary transfers in cash or in kind to charities, relief and aid organizations.

**Boundary between Intermediate Consumption and Compensation of Employees:**

|  |  |
| --- | --- |
| **Intermediate consumption** | **Compensation of employees** |
| Goods and services that employees are obliged to use in order to enable them carry out work1. Tools or equipment used at work.2. Specialized clothing used mainly at work. 3. Accommodation services at the place of work. 4. Transportation and hotel services provided for business. 5. Medical facilities provided because of the nature of work. 6. Meals or drinks provided to workers on active duty. | Goods and services are used by employees in their own time and at their own discretion.1. Durable goods used extensively away from work.2. Uniforms which employees choose to wear extensively away from work. 3. Ordinary housing services provided to employees and their dependents. 4. Services of vehicles used away from work and transportation allowances. 5. Ordinary medical facilities provided to employees and their dependents. |

**Boundary between Intermediate Consumption and *Gross Capital Formation***

|  |  |
| --- | --- |
| **Intermediate Consumption** | **Gross Fixed Capital Formation** |
| 1. Recurrent expenditure on small durable producer goods, like hand tools, that are a small share of total expenditure on machinery and equipment.2. Regular maintenance, repair of fixed assets and replacement of parts that is required to keep fixed assets in working order.3. Expenditure of research and development (R&D). 4. Staff training, market research are recorded as intermediate inputs though they may bring future benefits. 5. Ammunitions used in war.  | 1. Expenditure on hand tools if it is large compared to total expenditure on machinery and equipment.2. Major renovation that is not dictated by the condition of the asset and enhances the efficiency or capacity of fixed assets.3. Mineral exploration, computer software, R&D.4. Expenditure on items that provide defence services, i.e. buildings, roads, airfields. 5. Weapons systems used primarily for defence. |

***IC*** *are recorded* when they enter the process of production - time of use and NOT purchase. ***IC*** is thus derived as sum of purchases of inputs (P) less changes in inventories of inputs (ΔSi): IC = P – (ΔSi)

***IC*** is *Valued* at purchaser's prices when purchased from outside, and at prices that are used to value output plus any additional transport charges when obtained from other establishments belonging to same enterprise.

Module 4, Session – III: Measuring Production - Revisited

Test Your Knowledge

**Exercise – 4.3:**

* 1. Calculation of output

For a firm producing television sets, the following are obtained from its annual accounts:

Sales of televisions: 1 353 500.

Purchase of raw materials: 540 000;

Payment to temporary workers: 350 500;

Machine tools purchased: 264 000.

Inventories of finished products at the start of the period: 245 000;

at the end of the period: 346 700.

Inventories of raw materials at the beginning of the period: 73 200;

at the end of the period: 43 000.

Calculate the output, the intermediate consumption and the value added.

**Solution:** Gross value of output (***GVO***) = sales + ***CII*** of finished products

 =

 =

Intermediate consumption (***IC***) = purchase - ***CII*** of raw materials

 = – ( – )

 =

 Gross value added (***GVA***) = ***GVO*** – ***IC***

=  **–**

 **=**

[Note that machine tools are usually treated as intermediate consumption.]

* 1. Calculation of output for own use

During the accounting year, a farmer produces 4500 Kgs. of wheat, of which he sells 4205 Kgs in the market at 100 money units per Kg. The rest (295 Kgs.) of the wheat produced is retained by the farmer for its own use. The following are the (money) value of production and expenditures:

Sales of wheat (output): 420 500

*of which*, product taxes paid: 4 205.

Purchase of seeds: 540;

Purchase of fertilizers & pesticides: 1 260;

Payment to temporary workers: 5 500.

The farmer did not have in change in inventories.

Calculate the value of output at producers prices, the intermediate consumption and the value added at market prices.

**Solution:**

Producer’s price of wheat = sales of wheat / quantity sold

 =

Basic price of wheat = (sales of wheat – product tax) / quantity sold

 =

Gross value of output at basic price(***GVObp***)= quantity produced \* basic price

 =

 at producers’ price (***GVOpp***) = value of sales + quantity retained \* basic price

 =

Intermediate consumption (***IC***) =

 =

Gross value added (***GVAmp***) = ***GVOpp*** – ***IC***

=

* 1. Calculation of output: the non-market case

The following are simplified data for a unit of general government.

Civil servants’ gross wages and salaries: 562 980;

Employers’ social contributions (PF): 65 450;

Purchases of materials: 85 340;

Tax revenue (receipts) : 485 770;

*CFC*: 124 320.

Calculate output and gross and net value added.

**Solution:**

Gross value of output (GVO) =

Gross value added (GVA) =

Net value added (NVA) =

* 1. Calculation of output: the case of banks

The following are derived from annual accounts of a bank:

commissions earned: 62 890;

interest received: 432 640;

interest paid: 224 880;

purchases of materials: 35 020;

purchases of software: 22 000;

change in inventories: ignorable.

Calculate the output, the intermediate consumption and the value added. Assume the figure for FISIM is interest received minus interest paid.

**Solution:** Gross value of output =

 Intermediate consumption =

 Gross value added =

Note that purchase of software is capital formation. No reference interest rate is specified and also data on average amount of deposits and advances are also not given. Thus, FISIM has to be calculated as the difference between interest received and interest paid.

* 1. Calculation of output: trading

The following are derived from annual accounts of a trader:

sales: 567 800;

total purchases: 120 500;

of which, goods for resale: 87 350;

inventories of goods for resale at start of period: 4 760;

at end of period: 8 400;

inventories of packing materials at the start of the period: 200;

at the end of the period: 100.

Calculate the output, the intermediate consumption and the value added.

Inflation is assumed to be negligible.

**Solution:**

Purchase of goods sold = purchase of goods for resale – ***CII*** of goods for resale

 =

Gross value of output = Trade margin = sales – purchase of goods sold

 =

Intermediate consumption = purchase - ***CII*** of packing materials

 =

 Gross value added =

## **4.4 Session IV. Recording Output**

* + Definition of output
	+ Goods for processing
	+ Recording of output for within-enterprise transactions of goods & services
	+ Recording of output for within-establishment transactions
	+ Research and development activities
	+ Time of recording

Measuring the value of output is the most crucial step of compilation of national accounts statistics (NAS). The value of output of goods & services sold at economically significant prices, called market output, are observable. For NAS, these are estimated based on the data collected from administrative and business sources and through economic surveys and censuses. For the non-market output and output for own use, national accountants have to rely on imputations (or notional estimates) based on observed market prices or data on cost of production. Even for market output, often it is necessary to adopt notional measures for estimating the value of output according to the definition laid down in the SNA.

Let us first take a look at the definition.

### 4.4.1Definition of output

In the 2008 SNA, 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,
	+ consumed by the same establishment, except for goods and services used for capital formation (fixed capital or changes in inventories) or own final consumption.

The definition in 2008 SNA clarifies further the definition given in 1993 SNA, particularly in respect of intra-unit transaction of market output. The 1993 SNA states:

“Output therefore consists only of those goods and services that are produced within an establishment that become available for use outside the establishment. When an enterprise contains more than one establishment, the output of the enterprise is the sum of output of its component establishments.”

[refer to 2008 SNA, 6.89 and 1993 SNA, 6.38]

Application of this definition is straightforward in the context of market output, particularly when the producer and purchaser belong to different institutional units. In such cases, the value of output is taken as the actual value at which the exchange is made and is recorded whenever there is change in economic ownership. When we apply the same principle of economic ownership to exchanges between establishments of same enterprise, determining the value of output of each establishment becomes somewhat more difficult.

Let us take a few examples, including some on intra-unit transactions, to illustrate different cases.

***Box 4.4***

***Legal and Economic Ownership***

*The* ***legal*** *owner of entities such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled in law and sustainable under the law to claim the benefits associated with the entities.* [3.12, 2008 SNA]

*The* ***economic*** *owner of entities such as goods and* *services, natural resources, financial assets and liabilities is the institutional unit entitled to claim the benefits* *associated with the use of the entity in question in the* *course of an economic activity by virtue of accepting the* *associated risks.* [3.26, 2008 SNA]

Every entity has both a legal owner and an economic owner. In most cases, they are the same. But, in some cases they are not the same. Where it is not the same, the risk involved and the associated benefits of using the entity in economic activity lies with the economic owner, while the legal owner continues to own the entity by law.

For example, the legal ownership of aircrafts acquired under financial lease by a Airlines company lies with the bank providing the loan, while the economic owner of the aircrafts is the Airlines. In general within the SNA, when the expression “ownership” or “owner” is used and the legal and economic owners are different, the reference should be understood to be to the economic owner.

1. Inter-unit transaction

An establishment ***A*** (say a farmer) sells products (say wheat) to an establishment ***B*** (say a miller) belonging to a different enterprise. ***B*** uses it as inputs for its production.

This is the most common form of disposal of market output. Clearly, the sale of products (wheat) is included in the output of ***A*** and in the intermediate consumption of ***B***.

### 4.4.2 Goods for processing

With increasing practice of outsourcing, it is becoming more common to have parts of a production process conducted in different establishments. Firms are increasingly sending their material to an affiliate or non-affiliate for processing. This practice is very common in industries such as chemicals, manufacturing of electronic and metal goods. The process of sending goods owned by one establishment for processing to another establishment of the same or different enterprise is called “goods for processing”.

Goods for processing

Consider the case where goods owned by one enterprise (say ***A***) that are sent for processing to another enterprise (say ***B***).

In this case, the receiving enterprise ***B*** (for example, an independent tailor working for a garment-seller) does not take on the responsibility or the ***risk*** of disposal of the finished product. The enterprise ***A*** (garment-seller in the example) owns both the raw materials (cloth) sent for processing as well as the finished product (garments). In such cases, establishment ***A*** is viewed as

* + taking the risks related to production,
	+ determining the price of the processed goods and
	+ finding buyers for them.

Thus, gross value of output *GVO* of ***A*** is the value of garments and that of ***B*** is the *processing services* it receives from ***A***.

**Recording of output for within-enterprise transactions of goods and services**

There considerable movement of goods and services within multi-establishment enterprises. Recording these intra-enterprise transactions is crucial for producing estimates of value added by industrial sectors.

1. Recording of output for within-enterprise transactions of goods

Consider that establishments ***A*** and ***B*** belong to the same enterprise. ***A*** is a coal mine and ***B*** generates electricity using the coal produced by **A**. While ***A*** does not sell any coal in the market, ***B*** sells it product (electricity) in the market. ***B*** decides the amount of electricity to be generated and thus the amount of coal to be procured from ***A***.

When goods move between affiliates (establishments of same enterprises), there is no change of ownership since the entities have the same owner. Where goods move from ***A*** to its affiliate ***B*** and then ***B*** sells the processed goods on the open market, a change of ownership is recorded. In such a case, according to the 2008 SNA, establishment ***B*** (electricity generation unit) is viewed as

* + taking the risks (of damage, destruction and theft etc.) related to production,
	+ determining the price of the processed goods and
	+ finding buyers for them.

Thus, the output of ***B*** is clearly the value of electricity sold in the market. The *IC* of ***B*** includes the value of coal received from ***A***. Thus, the value of coal is treated as output of ***A***.

This intra-enterprise splitting by economic activity (as per ISIC) is necessary for presenting production and income generation accounts by industrial sector.

1. Recording of output for within-enterprise transactions of services

Consider that establishments ***A*** and ***B*** belong to the same enterprise. ***A*** is a tea garden and ***B***, a separate establishment, is the tea processing and packaging unit for the garden. ***A*** sells the packaged tea on the open market.

This is also a case of ‘goods for processing’ with the movement of goods confined within an enterprise. When goods move between affiliates (establishments of the same enterprise), there is no change of ownership since the entities have the same owner. In this case, according to the 2008 SNA, establishment ***A*** (tea garden) is viewed as

* + taking the risks related to production,
	+ determining the price of the processed goods and
	+ finding buyers for them.

Thus, according to the 2008 SNA, the output of ***A*** is clearly the value of packaged tea sold in the market. Output of ***B*** is only the processing services and not the value of the processed tea. The processing services are included in the intermediate consumption of ***A***.

### 4.4.3 Recording of output for within-establishment transactions

1. Within-establishment transactions

A bread manufacturing establishment purchases wheat, mills the wheat to flour and uses the flour for bread making. During an accounting period, the establishment made flour, worth **100** in the market, out of the wheat purchased for making bread. At the end of the accounting period, a part of the flour, worth **20** in the market, remains unused.

In this case, the value of **20** is included in its GVO, against ‘for own use’, and shown as entering its inventory, which eventually would be withdrawn from inventory for use as intermediate consumption in the same establishment in a later accounting period.

The flour, worth **80** (= 100 – 20) in the market, was produced by the establishment but were used for bread making during the accounting period. Goods & services produced and used within same establishment during an accounting period is neither treated as output nor as intermediate consumption.

*Output for own final use*

Both corporates and unincorporated enterprises undertake production for own final use, i.e. capital formation and final consumption. Recall that putting unsold finished products in the inventory and their withdrawal from inventory are both accounted for as capital formation. There are also other kinds of activities of own-account capital formation.

1. Own-account capital formation

An establishment purchases building materials (worth 200) and hires labour (who are paid 150) to build a warehouse for its own use. No fixed assets owned by the establishment was used for building the warehouse.

In this case, the value of **350** is included in the GVO, against ‘for own use’, of the establishment and also included in its capital formation. This is a case of own-account capital formation.

*Output for own final consumption*

Much of the agricultural produce of the farmers are traditionally produced for consumption of his own household. In fact, the activities of subsistence and farming and fishing are quite common in the economies of South and South-east Asia.

1. Own-account final consumption

An establishment, which is a household unincorporated enterprise, grows maize worth **200**, of which a part worth **50** is kept for its household consumption.

In this case, the total value **200** of maize produced is included in the GVO of the establishment, with **150** against ‘market output’ and **50** against ‘for own use’. The amount **50** is also included in its consumption expenditure.

### 4.4.4 Research and development activities

In the 1993 SNA, output of research and development (R&D) activities carried out by an enterprise for its own use was treated as intermediate consumption. All R&D activities were treated as an ancillary activity of the unit. In 2008 SNA, research and (experimental) development is no longer treated as an ancillary activity and its costs are no longer treated just as intermediate consumption but in most cases as fixed capital formation. The outcome of R&D activities is included in intellectual property products.

*[Not recognising the results of R&D activities as capital formation in 1993 SNA was the underlying reason for treating the patented entities as non-produced asset giving rise to property income. This was clearly an inconsistency, particularly when compared with the treatment of mineral exploration activity. Recognizing the outcome of R&D activities as produced assets in 2008 SNA has removed the inconsistency in 1993 SNA.]*

The 2008 SNA recommends that a unit carrying out R&D on a regular basis should be treated as a separate establishment if possible and the output of R&D activities should be recognized as part of capital formation. Being treated as capital formation, the cost of R&D should be included in the output of the respective units.

Research and development undertaken by specialized commercial research laboratories or institutes is valued by receipts from sales, contracts, commissions, fees, etc. in the usual way.

The research and development undertaken by market producers on their own behalf should, in principle, be valued on the basis of the estimated basic prices that would be paid if the research were subcontracted commercially. In most cases, it is not possible to get the estimates of basic prices for the R&D activities. Thus, in practice it is valued on the basis of the total production costs including the costs of fixed assets used in production. Like all other own-account capital formation valued at cost, the output of own-account R&D activities is constituted of:

1. Intermediate consumption;
2. Compensation of employees;
3. A net return to fixed capital; [introduced in 2008 SNA]
4. Consumption of fixed capital;
5. Other taxes on production.

[Net return to fixed assets represents the actual interest paid on borrowed funds or the loss of interest incurred as a result of investing own funds in the purchase of the fixed asset instead of a financial asset – in other words, purchasing plant and machinery instead of depositing the money in a commercial bank or a financial institution]

### 4.4.5 Time of recording

As per rules of accounting time for recoding is on accrual basis. Accrual recording is one where production is recorded over the period during which the process of production takes place, not when the goods or services are sold or delivered, or when payments occur. All output is valued at the same prices whether it is immediately sold or otherwise used or enters into inventories for sale or use later.

It may be noted that output mainly consists only of those goods and services that are produced within an establishment that is available for use outside the establishment. For simplicity, output is usually recorded when production is completed. However, when it takes a long time to produce a unit of output, it becomes necessary to recognize that output is being produced continuously and treat it as ‘work-in-progress’. A value is attributed to the part of the job completed and is treated as addition to inventory.

*Points to note:*

1. For internal within-enterprise transactions, goods delivered from one establishment to other do not involve change in legal ownership but possibly a change in economic ownership.
2. *Economic ownership* of commodities or financial assets and liabilities lie with the institutional unit that is entitled to claim the benefits and the associated risks of using them.
3. Transactions in services are recorded when they are provided, while transactions in goods are recorded when there is a change in economic ownershiprather than the legal ownership
4. When no change in economic ownership is involved with goods changing hands, the receiving establishment does not take on responsibility for the consequences of the continuation of the production process. The 2008 SNA recommends: output of the receiving establishment is only the processing services.
5. When change in economic ownership is involved with goods changing hands, i.e. the receiving establishment sells the product in the market and takes other production-related decisions, the output of the receiving establishment is the value of the product (goods) sold.
6. Output is recorded if the goods and services being produced are
	* provided (sold or given free) to other institutional units or
	* used for **capital formation** (including ***CII***) of the same establishment.
	* used for the **household’s own final consumption**
	* remain unfinished (**work-in-progress**) at the end of the accounting period - recorded as being produced and entering inventories.

The last three constitute output for own (final) use.

**Exercise – 4.4:**

1. Which of the following is included in the Production boundary of SNA?
2. For internal within-enterprise transactions, goods delivered from one establishment to other necessarily involve change in legal ownership.
3. In transactions between two establishments within an enterprise, output of one used by the other should be recorded as output of the former and IC of the latter only when economic ownership of the goods in question changes.
4. *Economic ownership* of commodities or financial assets and liabilities lie with the institutional unit that is entitled to claim the benefits and the associated risks of using them.
5. Transactions in services are recorded when they are provided.
6. Transactions in goods are recorded when there is a change in legal ownership.

1. When no change in economic ownership is involved with goods changing hands and the receiving establishment does not take on responsibility for the consequences of the continuation of the production process, the output of the receiving establishment is only the processing services.
2. When change in economic ownership is involved with goods changing hands, the output of the receiving establishment is the value of the product (goods) sold.
3. When a NPISH provides free service to the households, nothing is recorded as output of the NPISH.
4. The output recorded for goods and services provided free as the cost of production.
5. The value of unfinished products (**work-in-progress**) at the end of the accounting period is not recorded in production account.
6. The value of unsold finished products are recorded as CII as well as output.

## **4.5 Session V. Measuring Intermediate Consumption and Compensation of Employees**

## Contents

* + Coverage of Intermediate Consumption
	+ Main Changes in coverage of IC in 2008 SNA
	+ Rearrangements and Imputations of Transactions
	+ FISIM in production account

Measuring Compensation of Employees

* + Employers’ social contribution

## 4.5.1 Measuring Intermediate consumption

The definition and coverage of intermediate consumption are discussed in some detail in the in Session III of this module. These are also discussed in a very brief form in the following paragraphs. Having summarised the coverage, we will next turn briefly to issues relating to the changes made in the 2008 SNA and selected measurement issues in general.

*Coverage of Intermediate consumption*

The definition and concept of intermediate consumption has been discussed in some detail. The goods & services purchased by the enterprises for using them as inputs for further production are called *intermediate consumption* (***IC***) in national accounts. The enterprises, within themselves, buy and sell intermediate goods & services from each other as they carry out production of goods and services. The goods & services that are not put to use as *intermediate consumption* constitute the goods & services for *final use*.

*Includes*: rentals paid on use of fixed assets (operational lease); goods and services supplied by other establishments of same enterprise; goods & services provided to employees for carrying out their duties; small tools; repair & maintenance; subscriptions & contributions paid to business associations for their services; payments made to the government for services provided (such as water charges, or rental for government owned produced assets) and attributed FISIM and insurance services charges consumed by the enterprise.

*Excludes*:goods and services (intermediate products) produced and used within the establishment; bad debt provisions/write-offs; taxes, fines, donations, dividends, amortization of goodwill; exchange rate losses; land rent, loss on sale of assets, interest (other than allocated FISIM), insurance premiums (other than allocated services charges); expenditures on valuables (work of arts, precious metals, etc.) as stores of value; expenditure on weapons systems and ***CFC***.

In most cases, intermediate consumption in a production process is directly observable. It is recorded when it is actually used in the process of production. Thus, the entire purchase of raw materials is not always included in ***IC***. On the other hand, withdrawal of raw materials from inventory for use in further production is also included in ***IC***. Commonly, ***IC*** of raw materials is measured as:

*Intermediate consumption* = purchases *less* change in inventories of raw materials.

Recall that services of the non-produced resources used in the process of production are not treated as intermediate consumption. Payments made for user rights on non-produced (natural) assets are treated as *rent*.

## 4.5.2 Main Changes in coverage of IC in 2008 SNA

Since 2008 SNA recognises the outcome of R&D activities as *IPP*, the payments for acquiring their user rights are now considered as intermediate consumption, and not as payment of rent. The output of mineral exploration (since 1993 SNA) and R&D (since 2008 SNA) activities are capitalised, i.e. treated as capital formation. The output of such activities has to be valued at cost in most cases. Since ***IC*** is one of the components of cost, expenditures on goods & non-factor services for mineral exploration, R&D and all other own-account capital formation valued at cost are included in ***IC***, ***GVO*** and ***GFCF***.

In 1993 SNA, expenditure on military equipment, including weapons system, were treated as ***IC***. The 2008 SNA recommends that military weapon systems should be classified as fixed assets. However, the single-use items, such as ammunition, missiles, rockets, bombs, etc., are treated as military inventories and form part of ***IC*** when put to use and measured using the ***IC*** measurement formula given above.

*Rearrangements and Imputations of Transactions*

Each entry in the accounts of total economy or a segment of the economy (such as an institutional sector or an industrial sector) represents a macro-economic aggregate (we will henceforth call simply *SNA* *aggregate*). In most cases, the value of a monetary transaction is included in one of the aggregates. But, in some cases, the value of a monetary transaction is rearranged to fit the definitions of the aggregates of the SNA, either by splitting or repeating the observed value.

Often a single monetary transaction taking place between institutional units is decomposed to more than one transaction. These are not recorded in business accounts in the same way as are required for the institutional sector accounts of the SNA. The values of certain transactions in the accounts of the units are thus rearranged for conformity with the SNA framework, as well as to bring out the underlying economic relationships more clearly. These rearrangements of transactions often involve a component of ***IC***. These most commonly occur in transactions with financial institutions. Here we will discuss only how FISIM is dealt with in the production account. Financial account is beyond the scope of th present module.

The practice of splitting the observed value of a transaction is called *partitioning*. The practice of repeating the value of a transaction has a few variants, some of which also involve *partitioning*. These are mainly of three kinds:

* + Rerouting (and attribution)
	+ Re-allocating
	+ Imputing.

The following is a brief description of the methods of adjustment – rearrangement and imputation – of the observed values of transactions done for national accounting.

All monetary transactions take place between institutional units. But, these are not recorded in the business accounts in the same way as are required for the institutional sector accounts of the SNA. The values of certain transactions in the accounts of the units are thus rearranged for conformity with the SNA framework, as well as to bring out the underlying economic relationships more clearly.

***Figure 5.1***



*Partitioning*

Partitioning is simply splitting the observed value of a transaction into two (or more parts) and including each in a different SNA aggregate. For example, when a production unit pays interest on loans to a bank, a part of it treated as payment of property income and the other part is treated as intermediate consumption (of allotted *FISIM*). Further when a borrower household repays a loan in monthly instalments, it consists of both repayment of the principal as well as the interest on loan. The repayment of loan is reflected in the resources-side of financial account of the borrower, while the interest actually paid is distributed as payment of (SNA interest) and household final consumption expenditure. [Please see *Box 5.1*]

*Rerouting (and attribution)*

The following is referred to as *rerouting*:

When a party ***X*** makes a payment to another party ***Y*** but in national accounting it is treated as a payment made to a third party ***Z***, who in turn makes a payment to ***Y***.

Treating the payment from ***A*** as a payment to ***Z*** is also called *attribution*.

For example, employers pay a share as social security contribution to a social security fund which is meant for their employees. [Please see Box 5.2] Here the rerouting is the transaction from employer to employee via social security fund. Employers’ social contributions is first shown as ***CE*** as usesin the *generation of income account*, second as resources in the *primary distribution of income account* of the employees, and third as paid by employees to social insurance schemes in the *secondary distribution of income account* [discussed later in Module 7].

***Figure 5.2***

The method of rerouting is also used for non-monetary transactions, such as reinvestment by a foreign branch. The retained earnings of the foreign branch is attributed to the parent enterprise as its property income. The parent enterprise in turn reinvests in equity of the foreign branch. [Please see *Box 5.2*]

*Re-allocating*

The following is referred to as *re-allocating*: When a party ***X*** (Provincial Government) collects payments from other institutions on behalf of ***Y*** (Central Government) and sends only a part of it to ***Y***. In national accounts, the whole collection is treated as resources of ***Y*** and the part retained by ***X*** is treated as grants from ***Y*** to ***X***

*Imputing*

***Figure 5.3***



The value of most of the non-monetary transactions is required to be imputed for national accounts, based on observed data on prices of similar products or “at cost”. For example, the GVO of the *output for own use* is either imputed with the help of price of similar products or “at cost”. Another example is compensation of employees in kind paid for collective use.

Valuing at cost often involves including the observed value of ‘purchase of materials’ both in intermediate consumption as well as the value of output. Also the compensation of employees gets repeated – once as compensation of employees and other as a component of “cost”.

*FISIM in Production Account*

Recall the discussion on financial intermediation services indirectly measured (FISIM) included in Session 3. FISIM is the output of the financial institutions such as commercial banks. The refined method of measuring FISIM, recommended in the 2008 SNA, relies only on interest receivable on loans and interest payable on deposits, ignoring all other investment incomes. With the inclusion of the activity of lending exclusively from own funds (like money lenders & pawn brokers) in the production boundary, applicability of FISIM is extended to them as well.

According to 1993/ 2008 SNA, a part of this output is finally consumed by the households and the rest is treated as intermediate consumption of enterprises. Before 1993 SNA (also permitted to continue in 1993 SNA), FISIM was not allocated to user sectors, and a nominal sector was assumed in the accounting framework. The whole of the value of the output of FISIM was treated as intermediate consumption of the nominal sector with zero output and negative value added equal in size to intermediate consumption. The value added of all sectors and industries together was reduced in total by the amount of FISIM.

As recommended in the 2008 SNA (as well as in 1993 SNA), when the FISIM is allocated among different users it should be either as final consumption or as intermediate consumption. For the households, a large part of the allocated FISIM is usually taken as final consumption, while for enterprises (including unincorporated household enterprises) the allocated FISIM is entirely taken as intermediate consumption. A part of the FISIM allocated to households is, however, taken as intermediate consumption for servicing loans taken for house building.

Allocation of FISIM to the depositors is recommended to be done as the excess of the SNA interest over bank interest on deposits. On the other hand, allocation of FISIM to borrowers has to be done as the excess of bank interest over SNA interest on loans. The amounts of interest based on the reference rate are called “SNA interest” and the total amounts actually paid to or by the financial institution are described as “bank interest”. [see *Box 5.1*]

While compiling production account – whether for an industrial / institutional sector or for the total economy – it is necessary to include the part of FISIM allocated to enterprises (and to households for services of owner-occupied dwellings) in the intermediate consumption. This cannot be done from the data collected from administrative or business records or from surveys. What can be collected are the interests (property income) paid to and received from the financial institutions, a part of which is either ***IC*** or final consumption. Thus, the usual practice is to first compile the estimates of intermediate consumption not adjusted for FISIM. Next, when FISIM is estimated and allocated to different sectors, these are added to the unadjusted estimates of intermediate consumption and GVA estimates are adjusted accordingly.

The resulting reduction in the GVA causes a reduction in the estimate of operating surplus, particularly property income, based on the observed data. In fact, the estimate of interest paid by the non-financial enterprises are adjusted downwards by the amount of FISIM allocated to intermediate consumption.

***Box 4.5***

**Financial Intermediation Services Indirectly Measured (*FISIM*)**

Financial institutionsprovide financial services by means of ***financial intermediation***, whereby a financial institution (a bank) accepts deposits from units with ‘excess’ funds to other units in need of funds. Each of the two parties pays a fee to the bank for the service provided. The unit lending funds accepts a lower rate of interest than that paid by the borrower, the difference (= combined fees implicitly charged by the bank to the depositor and to the borrower) represents the ***FISIM***. However, there is normally little if any *FISIM* payable between banks, since banks usually borrow from and lend to each other at a risk-free rate. The 2008 SNA recommends *FISIM* to be measured as:

*FISIM* on Loans = (actual - reference) interest rate

 *FISIM* on Deposits = (reference –actual) interest rate

 that is



Where the sum of *fL and fD* represents the *FISIM* - output of the financial services on loans and deposits respectively,

*YL* the amount lend *YD* the amount borrowed

 *rL* the lending rate *rD* the borrowing rate

and *rr* the reference rate.

The amounts of interest actually paid needs to be distinguished from the amount of interest recorded in the SNA after deducting the intermediation services charges represented by the ‘allocated FISIM’. Thus, the following terms are used:

 ***Bank interest*** for

Depositors: 

Borrowers:  and

 ***SNA interest*** for

Depositors: 

Borrowers: 

## 4.5.3 Measuring Compensation of Employees

The definition and coverage of compensation of employees were discussed in some detail in the basic level course as well as reviewed in *Lesson I*. These are also given in *Box 4.6*, in a very brief form. Here, we will discuss issues relating to the changes made in the 2008 SNA and selected measurement issues.

Employers also pay ***CE*** in kind. These include expenditures made for providing goods & services for employees collective use, such as subsidy of an office canteen; goods and services produced as outputs from the employer’s own processes of production, such as free travel for the employees of railways or airlines, or free coal for miners; sports, recreation or holiday facilities for employees and their families.

***Box 4.6***

**Definition and Coverage of *Compensation of Employees*** (***CE***)

*Compensation of employees* (***CE***) is defined as the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period. Compensation of employees is constituted of

* ***wages and salaries*** in cash and in kind, commissions and other benefits to employees or workers for their labour input
* ***employers’ social contribution*** to social security, provident funds, insurance schemes and pension funds;
* ***benefits*** for sickness, unemployment, retirement etc. paid by employers directly to employees (which are called imputed social contributions).

**Includes**: goods and services provided by the employer that are used by employees in their own time and at their own discretion, such as uniforms which employees choose to wear extensively away from work; ordinary housing services provided to employees and their dependents; services of vehicles used away from work and transportation allowances; ordinary medical facilities provided to employees and their dependents; meals provided to farm labourers by farmer’s household.

 **Excludes**: the goods and services provided by the employer that employees are obliged to use for carrying out work such as specialized clothing used mainly at work; accommodation services at the place of work; transportation and hotel services provided for business; medical facilities provided because of the special nature of work; meals or drinks provided to workers on active special duty (example: to armed forces). Also excludes all fees paid for services purchased.

All these are treated as ***IC*** of the employer.

When such goods & services are purchased by the employer, they are valued at purchasers’ prices. When produced by the employer, they should be valued at producers’ prices.

Besides the coverage outlined in *Box 5.2*, 2008 SNA recommends inclusion of stock options as a kind of ***CE*** in kind. This is the practice of employer giving employee an option to buy stocks (shares) at some future date at a given price (strike/exercise price) subject to certain conditions (such as employee is still on the enterprise pay roll).

*Employers’ Social Contribution*

Employers’ social contributions are social contributions payable by employers to social security funds or other employment-related social insurance schemes to secure social benefits for their employees.

Social security schemes are generally operated by general government. There are also other employer-related social insurance schemes may be operated by the employers themselves or by an insurance corporation or may be an autonomous pension scheme.

Employers’ contributions made for the benefit of their employees to these schemes are included in compensation of employees. Although the employers pay the contributions directly to security schemes on behalf of their employees, in national accounts the social contributions are first recorded as ***CE*** and then (a large part of it) being paid by the employees as current transfers to the social security schemes.

*Points to note*:

1. Expenditure on user rights of non-produced resources is not included in ***IC***.
2. Only produced resources can be intermediate consumption. Thus all that are used as intermediate consumption by one unit should necessarily be part of the output of some other unit or withdrawal from inventories of the unit’s output in the past that were put in the inventory.
3. Intermediate consumption cannot be a part of the current accounting period’s output of the same unit.
4. Military expenditures on purchase of weapons systems is not included in ***IC***.
5. Expenditures on purchase of goods and non-factor services for mineral exploration, *R&D* and all other own-account capital formation valued at cost are included in ***IC***, ***GVO*** and ***GFCF***.
6. The interests paid by an enterprise to a financial intermediary are considered to be composed of SNA interest and FISIM. The SNA interest is included in property income payment and FISIM in ***IC***.
7. The interest received by a household from a financial intermediary = SNA interest *minus* FISIM.
8. ***CE*** in kind includes employers’ expenditures made for providing goods & services for collective use of the employees and their families.
9. Employers’ social contributions are payable to the social security schemes for the benefit of the employees. These are included in ***CE***.
10. Employers’ social contributions are recorded as ***CE*** in the generation of income account and a large part of it in secondary distribution of income as current transfers and the rest in use of income account as final consumption.

**Exercise – 4.5:** Mark one of the entries of accounts for an economy specified in the alternatives ([a], [b], [c] and [d]) in which the following are included

1. Product taxes paid by a company

[a] ***IC*** in Production account [ ]

[b] resources-side of production account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. Purchase of raw materials that were used for production by a market producer

[a] ***IC*** in Production account [ ]

[b] ***OS*** in Generation of income account [ ]

[c] Output ‘for own use’ in production account [ ]

[d] both the entries [ ]

1. Expenditure on goods & services for repair & maintenance of owned dwelling by a household.

[a] ***IC*** in Production account [ ]

[b] Output ‘for own use’ in production account [ ]

[c] none of the above [ ]

[d] both the entries

1. Corporate tax payable by a company

[a] ***IC*** in Production account [ ]

[b] ***CE*** in Generation of income account [ ]

[c] ***OS***  in Generation of income account [ ]

[d] none of the above [ ]

1. Expenditure on goods & services for R&D activities of a company for its own use

 [a] ***IC*** in Production account [ ]

[b] Output ‘for own use’ in production account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. The royalty paid by a car manufacturer to the company owning the design of car engines.

[a] ***IC*** in Production account [ ]

[b] Output ‘for own use’ in production account [ ]

[c] ***OS***  in Generation of income account [ ]

[d] none of the above [ ]

1. An airliner’s expenditure on repair & maintenance of aircrafts legally owned by a bank till the airliners repays the related loan.

[a] ***IC*** in Production account [ ]

[b] ***OS***  in Generation of income account [ ]

[c] none of the above [ ]

 [d] both the entries [ ]

1. Payment made to an individual licensed accountant by a firm

[a] ***OS*** in Generation of income account [ ]

[b] ***CE*** in Generation of income account [ ]

[c] ***IC*** in Production account [ ]

[d] none of the above [ ]

1. Wages & salaries paid by a NPISH.

[a] Non-market output in production account [ ]

[b] ***CE*** in Generation of income account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. Unsold finished goods of a manufacturer

[a] Output ‘for own use’ in production account [ ]

[b] ***IC*** in Production account [ ]

 [c] none of the above [ ]

[d] both the entries [ ]

1. Difference between bank interest and SNA interest payable by an enterprise for a bank loan.

[a] ***OS*** in Generation of income account [ ]

[b] ***IC*** in Production account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. Value of ammunitions used by the army.

[a] ***IC*** in Production account [ ]

[b] Output ‘for own use’ in production account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. Purchase of war planes by a government

[a] ***IC*** in Production account [ ]

[b] Output ‘for own use’ in production account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. A company’s contribution for medical insurance of its workers.

[a] ***IC*** in Production account [ ]

[b] ***CE*** in Generation of income account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

1. Purchase of goods & services for repair and maintenance of officers’ canteen building incurred by a company.

[a] ***IC*** in Production account [ ]  [b] ***CE*** in Generation of income account [ ]

[c] none of the above [ ]

[d] both the entries [ ]

***4.6 Session VI. Data Needs and Sources***

## **Contents**

-Data Needs

-Covering Non-observed economy

-Data Needs

We will discuss the data needs separately for the monetary and non-monetary transactions that are important for the entries (other than the balancing items) of production and income generation accounts. For the monetary transactions, which are all in principle observable, national accountants rely on data available from the administrative records, business accounts and statistical surveys. Estimation of aggregates relating to non-monetary transactions is solely the responsibility of the national accountants but should also be based on observed facts. In what follows, we will try to identify the information required for estimating aggregates relating to non-monetary transactions as well as the data required for the monetary transactions.

The records of transactions maintained by businesses are the main source of information for compiling production and income generation accounts. However, before discussing the needs, it is necessary to note that for production and income generation accounts by industrial sector, data available from companies’ accounts alone are not sufficient. Usually, the annual accounts of the companies engaged in production of different kinds do not provide data by industrial classification. Often the NSOs are required to conduct survey of the establishments to generate the data required for compiling production accounts by ISIC categories. It is also necessary to convert the companies’ accounts data into statistics consistent with the national accounts concepts.

*Covering non-observed economy (NOE)*

Besides the companies’ accounts, it is necessary to conduct statistical surveys (and censuses) to obtain production-related data for the market production units that are not included in the corporate sectors. The developing economies are characterised by presence large informal sectors. These form the major part of the NOEs in the respective economies. The large NOEs pose a serious problem in GDP estimation.

The part of the economy difficult to measure has become known as the Non-Observed Economy (NOE). The handbook *Measuring the Non-Observed Economy* (Organisation for Economic Co-operation andDevelopment, International Monetary Fund, InternationalLabour Organisation and CIS STAT (2002).

The most important prerequisite for measuring GDP is to ensure complete or exhaustive coverage of all economic activities carried out in the economy. The SNA productive activities that are excluded from basic statistical data collection program constitute the NOE. It consists of:

* Underground production
* Illegal production
* Informal sector production
* Household production for own final use
* Missed due to deficiencies in basic statistical data collection program

Collecting data from these unincorporated units is often very costly and thus the surveys for this purpose are not conducted regularly – say once in five years. For compilation of annual accounts from these survey results, we need other indicators. The following table indicates the main data needs under all the stated circumstances:

[See Chapter IV of *International Recommendations for Industrial Statistics, 2009*, UNSD, for detailed data items recommended to be collected for industrial statistics. Also refer *Links Between Business Accounting and National Accounting*, UNSD (2000), Series F, No. 76.]

|  |
| --- |
| **Main Data Needs for Production and Generation of Income Accounts – Monetary Transactions** |
| **SNA Aggregate** | **Segment of economy** | **Main Data Needs** |
| 1. ***GVO*** | Non-financial Corporate sector | * Value of turnover / sales / shipments
* Value of stocks of finished goods at beginning and end of accounting period.
* Value of work-in-progress at beginning and end of accounting period
* Receipts from services
* Trade margins
* Other revenues (other than property income)

[also needs conversion to SNA aggregates using links between business accounts and SNA concepts] |
| Financial Corporate sector | * Earnings from (explicit) fees and charges
* Amounts of deposits and loans
* Interest rates – borrowing & lending
* Buying and selling prices of securities and foreign currencies
* Insurance premiums earned and claims paid & outstanding; investment earned
* Contributions & claims f social security schemes
 |
| Household sector(other than agriculture)  | Same as those for non-financial corporate sector if annual data are available. Otherwise,* Same estimates for a benchmark year and
* Production indices or volume indices and price indices by product groups OR suitable proxies for volume indices
 |
| Agricultural sector | * Production (quantity) of crops, livestock & livestock products and fishery products
* Prices of these products
 |

|  |
| --- |
| **Main Data Needs for Production and Generation of Income Accounts – Monetary Transactions** (Contd.) |
| **SNA Aggregate** | **Segment of economy** | **Main Data Needs** |
| 2. ***IC*** | Corporate sectors | * Purchase of goods & services
	+ separately for own account capital formation such as construction, R&D, other IPPs
* Stocks of materials at the beginning and end of the accounting period
* Allocated FISIM
* Allocated insurance services (for enterprises)
 |
| Household sector | Same as those for non-financial corporate sector if annual data are available. Otherwise,* Same estimates for a benchmark year and
* Volume indices and price indices by industry groups OR suitable proxies for volume indices
 |
| 3. ***CE*** | For all sectors | * Wages & salaries paid in cash
	+ separately for own account capital formation such as construction, R&D, other IPPs
* Wages & salaries paid in kind, including
	+ expenses for employees & families’ welfare
* Employers’ social contribution
 |
| 4. Taxes and subsidies | For all sectors | * Product taxes and subsidies
* Other production taxes & subsidies
 |

|  |
| --- |
| **Main Data Needs for Production and Generation of Income Accounts – Non-Monetary Transactions** |
| **SNA Aggregate** | **Segment of economy** | **Main Data Needs** |
| 1. ***GVO*** | Corporate sector | * Cost of materials and ***CE*** and stock of capital used for own account capital formation
 |
| Household sector(other than agriculture)  | Same as those for non-financial corporate sector and * Average house rents and number of owner-occupied dwellings by dwelling type; if not available, expenditure on repair & maintenance, CFC on dwellings, current market value of stock of owner-occupied dwellings and prevailing bank (interest) rate representing rate of return.
* Value of goods produced for self consumption at basic prices
* Expenditure on domestic personnel
 |
| Agriculture | * Quantity goods produced for self consumption and their basic prices
 |
| Government | * Expenses on IC
	+ Goods & services purchased (except weapons systems and other fixed assets)
	+ Change in inventories
* ***CE***
	+ Wages & salaries
	+ Employers’ social contribution
	+ Payable in kind
* ***CFC***
* Production taxes (less subsidies) paid if any
 |
| NPISHs | * Expenses on ***IC***
	+ Goods & services purchased
	+ Change in inventories
* ***CE***: Wages & salaries; Employers’ social contribution and payable in kind
* ***CFC***
* Production taxes (less subsidies) paid if any.
 |

**Module 4, Session – VI: Data Needs and Sources**

**Test Your Knowledge**

**Exercise – 4.6:**

Identify the data source for each element of data required for compilation of GVA and income generated in the process of production in your country of residence. Present the sources in a tabular form, relating he needs and the sources.