UNIT 3 THE PRODUCTION PROCESS

Structure

3.0 OBJECTIVES

After going through this unit, you would be able to :

- classify different purchases by a production unit into investment, intermediate costs and factor costs;
- define the concepts of intermediate and final products;
- describe the composition of income account of a production unit;
- explain the concept and measures of value added;
- derive value added account from income account of a production unit; and
- explain relation between value added and income generations.

3.1 INTRODUCTION

The main focus in national income accounting is on production unit. This aspect we have already emphasized in the last unit. We had also noted income-generating flows between different transactor groups on the one hand and production units on the other. Which of these flows are relevant from which angle of national income ? What combination of these flows gives the national income? This unit attempts to answer some of these and similar questions. Since the main focus is on production units and since the national income originates from, and terminates at production units this unit ultimately aims at highlighting the contribution of a production unit to national income. The national income accounting term for such a contribution is 'Value added'. As such the main emphasis in this unit is on value added by a production unit and its relevance in estimating national income. The different methods of estimating national income are explained in detail in the next unit.

3.2 PURCHASES BY A PRODUCTION UNIT

A production unit buys many goods and services to carry out its activities. An understanding of these purchases would be of great help in understanding national income accounting terms based on these purchases.

We take the example of a production unit engaged in producing garments. It makes three types of purchases. In the first type we take purchases which are required to establish the unit. The unit requires building, machines, furniture, transport vehicles, and other necessary fixtures and equipment. These goods are required before any production of garments is commenced. Such goods are called fixed capital assets in business accounts and 'capital formation' in national income accounting as we have noted in Unit 2.

From where does our garment unit purchases these assets ? Obviously it purchases these assets from other production units. For what purpose? For own-use or for reselling? The answer is 'for own use'. The purpose is to produce garments by using these assets and not further reselling these assets. When the unit sells garments the cost of fixed capital assets is not included in cost of producing garments. What is included is only the value of depreciation or consumption of fixed capital but not the whole cost of these assets. The point to emphasise here is that a production unit purchases fixed capital assets for own use and not for reselling. This point is very important in distinguishing various types of purchases by a production unit.

The second type of purchases includes clothes, thread buttons, needles, stickers, packing materials, electricity, water services of fashion designing agencies, services of advertising agencies and advertising mediums, etc. These goods and services are also purchases from other production units. We can label all such purchases as 'materials and services purchased from other production units'. For what purpose? The purpose is top convert these materials and services into garments. When the unit sells garments it actually sells (or resells) all the materials and services purchased from other production units. There are two points to be emphasized here. First, the purchases are made from other production units. Second, the purchases are made for resale.

Before we take up third type of purchases let us first note down the similarity and the dissimilarity in the first two types of purchases. The Similarity is that both purchases are made from other production units. The dissimilarity is that fixed capital assets are purchased for own use while materials and services are purchased for resale. This dissimilarity is the basis of distinction between the two types of purchases. The technical names by which these two purchases are differentiated in national income accounting are ‘final purchases’ and ‘intermediate purchases’, respectively. The products so purchases so purchases are called ‘final products’ and ‘intermediate products’. Goods purchased by a production unit from other production units for own use are final products. Goods and services purchased by a production units from other production units for resale are intermediate products. We will come back to the systematic definition of these two terms a little later in thus unit (Sections 3.4 and 3.5). Let us first explain the third type of purchases.

In addition to the above two types of purchases what else does our garment unit requires for production ? It requires land or a place, finance, workers and somebody to organize these three. It hires land by paying rent. It gets finance by paying interest. It hires workers by paying wages and salaries, etc. It employs (presumably) entrepreneur to organize and take initiative in starting a production unit. The entrepreneur provides service in expectation of profit. All such purchases are called purchases of factory services because these are provided by the owners of factors of production. In reality when these owners join hands in producing a good or a service, a production unit is formed. So these owners are necessarily the insiders as compared to the first two types of purchases which were from outsiders. This makes the third type of purchases distinct from the first two types of purchases. The third type of purchases are called purchases of factor services. The expenditure incurred on these is called ‘factor cost’.

We have identified three types of purchases by a production unit. These are :

1) Final Purchases : Purchases of capital goods for own use.
2) Intermediate purchases: Purchases of materials and services meant for resale from other production units.
3) Factor services purchases: Purchases of factor services from factor owners.

The costs incurred on the above purchases are respectively:

1) Investment or capital formation.
2) Intermediate costs.
3) Factor cost.

3.3 ACCOUNTING STATEMENTS OF A PRODUCTION UNIT

The information about the various types of purchases made by a production unit is found in the two accounting statements a unit normally prepares. The statements are Income Statement and Balance Sheet. The Income Statement is also known as profit and Loss Account Statement. The Income statement records income position while the Balance Sheet shows capital position of the production unit. The Income Statement records the current years production activity of the production unit. The Balance Sheet records the investment activity of all the previous years as well as the current year.

Out of the three types of costs, intermediate costs and factor costs relate to the current production activity and so recorded in the income Statement. Investment or capital formation is recorded in the Balance Sheet. The accounting statement relevant for calculating value added is income statement. A simplified format of the Income Statement (or Profit and Loss Account) of a production unit is given below (Table: 3.1)

Table 3.1: Income Statement of ABC & Co. for the year 2004-05

(Rs.Lakhs)

Debits (Payable)	**Credits (Receivable)**
Opening Stock	Sales
Purchases	Closing Stock
Depreciation Provision	Dividends received
Excise duty	Rent received
Wages and Salaries	Interest received
Rent Paid	Subsidies received
Interest Paid	
Corporate tax	
Dividends paid	
Retained earnings	
Total payables	Total receivables

The above statement will be helpful in identifying intermediate costs and factor costs.

We can now proceed to explain the concept of intermediate products.

Check Your Progress 1

1) List the accounting statements of a production unit which record different types of purchases.

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2) A production unit buys a machine, consults an expert, employs an engineer. Classify these purchases into different types.

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3.4 INTERMEDIATE PRODUCTS

All goods and services purchased by a production unit from other production unit for resale are termed as intermediate products. The expenditure incurred on these is intermediate cost. Two qualifications are necessary for purchase of any good or service to be included in the category of intermediate products. These are:

1) The good or service is purchased from other production units.

2) The good or service is meant for resale.

Take, for example a farming unit. Seeds, fertilizers, pesticides, electricity, water, etc. are its intermediate purchases. In case of a manufacturing unit raw materials, electricity, water, constancy service, etc. are intermediate purchases. In case of trading unit goods purchased for resale, packing material, advertisement, etc. are all intermediate purchases.

Pick up any purchase by a production unit and apply the above two tests and you can know whether the purchase is intermediate cost or not. Take, for example, payment of wages by a production unit. It is a purchase by a production unit alright but not from another production unit. A worker is not a production unit so it is not an intermediate cost. What is the payment of consultancy fees to a charted account firm ? It is an intermediate cost because charted accountant firm is a production unit. If the production unit employs its own charted accountant on payment of salary it is not intermediate cost because here the charted accountant is not a production unit but an employee.

All intermediate costs are included in the current cost of production. This act of inclusion in current cost amounts to reselling of intermediate products. We are studying the concept of intermediate products in the context of value added by a production unit. Intermediate products are purchased from other production units. So these are the contributions of other production units and not of the given production unit. This fact must be kept in mind while estimating 'value added.' We are interested only in the contribution of the given production unit. The item 'purchase' on the debit side in the above format (Table3.1) of Income Statement is essentially the intermediate cost of ABC & CO.

3.5 FINAL PRODUCTS

It is the resale criteria which separated intermediate products from final products. All purchases not meant for resale are the purchases of final products. Who purchases final products ? Both consumers and production unit. Consumers purchase for satisfaction of wants. Production units for investment, for example, machines, buildings and other permanent fixtures. Purchases of final products by production units are not recorded in the Income Account because these are not included in current cost. These are included in the capital cost (only the depreciation part is included in current cost). As such these pur4chases are not meant for resale but for 'own use' as investment by a production unit. Purchases by consumers are also not meant for resale but for 'own use'.

On the basis of the above we can now define final products in more concrete terms **: All goods and services purchased for investment and consumption**

(and not for resale) are final products. Remember purchases by consumers are not the final purchases only. Purchases of investment goods by production units are also final purchases.

3.6 INTERMEDIATE VS FINAL PRODUCTS : SOME PRECAUTIONS

While identifying a good (or a service) as intermediate or final, a student must keep in mind the following. First, it is not the nature but the use that determines whether a good or a service is intermediate or final. For example, a food item may give the impression as if it is purchased only by consumers. The temptation is to treat all food items such as wheat, rice, vegetables, pulses, spices, etc. as final products on the assumption that these are purchased by consumers only. But when food items are purchases by production units like hotels, restaurants, fast food centres, vegetables vendors, canteens, etc. these are to be treated as intermediate products because these are purchased for reselling in the form of cooked food.

Second, not all products purchased by production units are intermediate products. Production units purchase both intermediate products and final products. All purchases of single-use goods like materials and services from other production units are purchases of intermediate products while purchases of durable use goods, i.e. fixed capital goods, are purchases of final products.

Third, final products are purchased both by consumers and production units.

The general impression might be that final products are purchased by consumers only.

3.7 COMPOSITION OF INCOME ACCOUNT

A highly simplified format of Income Account of production unit has been given above (Table 3.1). This account is a source of data for calculating value added. Let us now explain the structure of this account.

3.7.1 Credit (Receivable) Side

The first item on the credit side is ‘sales’. It is the value of output sold during the year. Remember it is not the value of output produced but sold. Actual sales may be ‘less than’ or ‘greater than’ output. If sales are less than output it means that some part of the current output has remained unsold. How is this unsold output accounted ? It becomes a part of the closing stock or the stock that exists at the end of the year. If sales are more than the output it means that the whole of output produced in the current year has been sold and in addition a portion of the unsold of the previous years has also been sold. This reduces the closing stock.

The next item is ‘closing stock’. It refers to the value of the stock of materials, semi-finished goods and finished goods lying with the production unit at the end of the year. Suppose we refer to the year 2004-2005 starting on 1st^{t} April 2004 and ending in 31st^{t} March 2005. Then closing stock is the stock on 31st^{t} March 2005. This included unsold output of the previous years as well as the current year. Only the unsold output of current year is relevant for estimating value added.

The next group of items comprises of interest, dividends, rent, subsides, etc. received by a production unit. It receives interest on money lent, rent or land, dividends on investment of funds in other production units. It may received receive subsidy on current output from government.

For calculating value added we can classify the receivables of a production unit into two groups: (1) Those connected with current production activity of its own and (2) Those which are not. In the first group are covered the sales, closing stock and subsidies. In the second group are covered the rest i.e. dividends, rent and interest etc. received. The second group items relate to production activity of 'other' production units and are not relevant for calculating value added of the given production unit. Only first group items are relevant.

3.7.2 Debit (Payables) Side

The first item is 'opening stock'. It refers to the stock of material semi-finished goods and finished goods lying with the production unit at the begining of the year, say on 1st April 2004 of the year 2004-05. This was also the closing stock of the previous year 2003-04 i.e. On 31stt March 2004 where it was treated as receivable. Why is the value of opening stock treated as 'payable' ? From whom does the production unit buys this opening stock ? In accounting it is assumed that production unit purchases the entire of its won closing stock of previous year. So it is recorded as payable of the current year.

The next item is 'purchase'. It refers to purchases of materials and services from other production units. It is purchase of intermediate products and the expenditure on these is intermediate costs. The production unit starts its operations on the basis of opening stock and new purchases in the current year.

'Depreciation provision' is the estimated value of consumption of fixed capital. Excise duty is a tax on manufacturing and is classed as indirect tax. All taxes on production like excise duty, sales tax, customs octori, etc. are indirect taxes.

Payables in the form of wages and salaries, rent, interest and profits are factor payments. The sum of corporate tax, dividends paid and retained earnings equal profits. These are the items in which profit is allocated. Corporate (income) tax is tax on profits of production units. Remember it is an income tax on production units and not on its owners. The owners are taxed separately when they actually receive dividends from production units. It is called personal income tax. The Income Account of a production unit records only corporate tax. Dividend payment is another use of profits of q production unit. Retained earnings are that part of profits, which are not distributed among the owners but retained in the production unit itself.

Check Your Progress 2

1) Define intermediate products.

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2) Define final products.

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3) List different types of factor payments by a production unit.

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3.8 VALUE ADDED BY A PRODUCTION UNIT

Income Accounting is the source of data for calculating value added. The composition of the account is explained above. Let us now explain its relevance in calculating value added.

3.8.1 Value Added Defined Generally

Is the current output of a production unit is entirely its own contribution ? No. To produce this output the production unit purchases materials and services i.e. intermediate products. The contribution of production unit is reduced by intermediate purchases. Intermediate products are the contributions of 'other production units' and not of the given production unit. So,

Value added by a production unit = Value of output
– Purchases of intermediate products

3.8.2 Specific Measures of Value Added

The general meaning of value added as given above is termed as Gross Value Added at Market Price (GVAmp) in national income accounting.

GVAmp = Value of output – Intermediate costs

The subscripts 'gross' and 'market prices' give a specific meaning to GVAmp. 'Gross' indicates that the measure is gross of consumption of fixed capital; and no deduction is made on this account. 'Market price' indicates that the output is valued at the price paid by the buyers. It is measure from the buyers side.

3.8.3 Different Measures of Value Added

Factors owners are synonymous with a production unit. Value added by a production unit is value added by the four factors jointly. But factor owners do not have a claim on the entire GVAmp. Depreciation and indirect taxes do not belong to factor owners. Factor owners get only what is left over after deducting depreciation and indirect taxes from GVAmp. It has led to two more measures of value added. Before we take up the additional measures it is necessary to mention one more adjustment. A production unit may get subsidy on its current output. Subsidy adds to receipts and is in addition to GVAmp. Subsidy has the effect opposite that of indirect tax. Subsidy increases the claims of factor owners while the indirect tax reduces the same. The net effect is indirect tax less subsidies. So in order to arrive at value added at factor cost (GVAfc), from GVAamp we deduct net indirect taxes. (= indirect taxes – subsidies)

The two additional measures, in addition to GVAmp, are Net Value Added Market Price (NVAmp) and Net Value Added at Factor Cost (NVAfc). These are derived as follows:

NVAmp = GVAmp – depreciation

NVAfc = NVAmp – indirect taxes + subsidies

3.9 DERIVING VALUE ADDED ACCOUNT OF A PRODUCTION UNIT

3.9.1 Income Account of a Production Unit

We are now familiar with specific and technical measures of value added. We know that the main sources of data for national income accounting is the Income Account. Let us now explain how we can derive these value added from the income account of a production unit. We now attach imaginary figures to our simplified format of the Income Account of ABC + Co.

Table 3.2: Income Account of ABC & Co. for the year 2004-05

Debits (Payable)		**Credits (Receivable)**	
Opening stock	10	Sales	500
Purchases	200	Closing stock	20
Depreciation provision	20	Subsidies	10
Indirect taxes	40	Dividends received	30
Wages and salaries	100	Interest received	25
Rent paid	30	Rent received	15
Interest paid	80		
Corporation tax	40		
Dividends paid	60		
Retained profits	20		
Total	**600**	**Total**	**600**

3.9.2 Production Account of a Production Unit

The above account (Table 3.2) is essentially a sales plus other income account. What we need is an output or production account. For this we have to make certain modifications in the Income Account. The First variable required to calculate value added is the value of output. Output equals sales plus unsold output. The unsold output is added to the closing stock. The excess of closing stock over opening stock equals addition to stocks So, Value of Output = Sales + Closing stock – Opening stock

We can derive Production Account from the Income Account by making two sets of modifications :

1) Transfer opening stock from debit side to the credit side with sign reversed.

2) Transfer subsidies, dividends, interest and rent received from credit side to the debit side as negative payments and adjust with their counter parts on the debit side. If no counterpart exists the same may simply be recorded as negative payments. For example deduct rent received from rent paid and record the outcome as rent paid. Similarly the items net interest paid and net dividends paid can be recorded. Subsidies are adjust with indirect taxes and the outcome recorded as net indirect taxes paid. These adjustments are made to separate production activity of ABC & Co. from its other sources of income.

The production Account derived after making the two adjustment is given in Table 3.3.

Table 3.3: Production Account of ABC & CO, for the 2004-05

Debits (Payable)		**Credits (Receivable)**	
Net indirect taxes (40-10)	30	Sales	500
Depreciation	20	Closing stock	20
Purchases	200	Less Opening stock	10
Wages and salaries	100		
Net rent paid (30-15)	15		
Net interest paid (80-25)	55		
Corporate tax	40		
Net dividends paid (60-30)	30		
Retained profits	20		
Allocation of value of output	510	Value of output	510

The above account (Table 3.3) now records value of output (credit side) and the various cost incurred (debit side) on producing this output. All the variables required for calculating value added are now clearly indicated in the above account.

3.9.3 Value Added Account of a Production Unit

The Production Account now can be conveniently converted into Value Added Account by transferring the relevant variables from the debit side to the credit side with signs reversed as is done in Table 3.4

Table 3.4: Value Added Account of ABC & Co. for the year 2004-05

Debits (Payables)		**Credits (Receivables)**	
Wages and salaries	100	Sales	500
Net rent paid	55	Closing stock	20
Corporate tax	40	Less Opening stock	10
Net dividends paid (60-30)	30	= Value of output	510
Retained profits	20	Less Purchases	200
		= GVAmp	310
		Less Depreciation	20
		=NVAmp	290
		Less Net indirect taxes	30
Allocation of value added	260	= NVAFe	260

The credit side of the above account (Table 3.4) records NVAfc which is a measure of contribution of ABC & Co. to national income. The debit side records the allocation of NVAfc among the factor owners jointly contributing to NVAfc.

3.10 VALUE ADDED AND INCOME GENERATION

NVAFc measure income generated by a production unit. The sum total of NVAFc by all the production units located within the economic (domestic) territory is called Net Domestic Product at Factor Cost (NDPfc). NDPfc is the major constituent of national income. By adding Net Factor Income Received from Abroad (NFIA) to NDPfc we get National Income which is technically called Net National Product at Factor Cost (NNPfc). The relationship between different measures of value added and different aggregates relating to national income is given below.

$$\sum \text{GVAmp} + \text{NFIA} = \text{GNP mp}$$
$$\sum \text{NVAmp} + \text{NFIA} = \text{NNP mp}$$
$$\sum \text{NVAfc} + \text{NFIA} = \text{NNP fc}$$

National income is generated by the factor owners. So it is distributed among factor owners in the form of wages and salaries, rent, interest and profits. The profit is allocated among corporation tax, dividends and retained profits.

As we shall see in the next unit the credit side and debit side of the Value Added Account are nothing but the summarized methods of estimating national income through ‘production’ and ‘income-distribution’ approaches.

Check Your Progress 3

1) Why is GVAmp called ‘gross’ ?

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2) Why is NVAfc called ‘at factor cost’ ?

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3) What is sum of NVAfc by all production units in a country called ? Is it national income.

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3.11 LET US SUM UP

Any production process requires three types of purchases to be made by a production unit. The first type includes purchases of capital goods called purchases of final products. The second type includes purchases of intermediate products. The third type includes purchases of the services of factors of production from factor owners. The costs incurred on these purchases are respectively investment, intermediate costs and factor costs. Expenditure on investments is recorded in the Balance Sheet while intermediate and factor costs are recorded in the Income Statement of a production unit.

Intermediate products include those goods and services which are purchased by a production unit from other production units and meant for resale. Final products are those goods and services which are purchased for consumption (by consumers) and investment (by production units) and not meant for resale. The distinction is important in under standing the concept of value added.

Income Account of a production unit is the source of a data for estimating value added. The excess of value of output over intermediate costs is equal added. The measure so derived is termed as Gross Value Added at Market Prices (GVAmp). The subscript ‘gross’ indicates that the measure is gross of depreciation. Market price indicates that the measure is gross of net indirect taxes (= indirect tax less subsidies). By subtracting depreciation from GVAmp we get Net Value Added at Market Price (NVAmp). By subtracting net indirect taxes from NVAmp we get NVA at factor cost (NVAfc). The sum NVAfc by all production units plus net factor income received from abroad equals national income.

The Income Account of a Production unit can be converted into a value added account by making suitable modifications (Table 3.4). The credit side of value Added Account records NVAfc or the contribution of production unit to national income. The debit side records allocation of NVAfc among the factor owners as factor owners who generate income.

3.12 KEY WORDS

Factor Cost	:	Cost incurred on employment of factors of production in the form of wages and salaries, rent, interest and profit.
Final Products	:	Goods and services purchased for consumption (by consumers) and for investment (by production units) meant for 'own use' and not for resale.
Income Statement	:	Profit and loss account of a production unit.
Intermediate Products	:	Goods and services purchased by a production unit from other production units and meant for resale directly or indirectly.
Value Added	:	Measure of contribution of a production unit to National income. It equals value of output less intermediate costs.

3.13 SOME USEFUL BOOKS

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3.14 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) a) Income Account records intermediate purchases and purchase factor services.

   b) Balance sheet records investment.

2) a) Purchase of machine is a final purchase because it is meant for investment.

   b) Purchase of services of a consultant is an intermediate purchase because it is a purchase from other production units and meant for resale.

   c) Employing an engineer is a purchase of factor service because the employed Engineer is paid salary.

Check Your Progress 2

1) The goods and services purchased by one production unit from other production units and meant for resale are intermediate products.

2) The goods and services purchased for consumption (by consumers) and for investment (by production units and not meant for resale are final products.

3) a) Wages and salaries

   b) Rent

   c) Interest

   d) Profits

Check Your Progress 3

1) GVAmp is called 'gross' because depreciation has not been deducted from this measure.

2) NVAfc is called 'at factor cost' because it is derived after deducting 'net indirect tax' from market price'. Net indirect tax is that element of market price, which is not available for distribution among factor owners.

3) It is called ANAet Domestic Product at Factor Cost. It is not national Income. By adding Net factor Income Received From Abroad to NDPfc we can get measure of national income.