CLASS XII

Supplementary Reading Material in Economics

Part B : Introductory Macroeconomics

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PART B : INTRODUCTORY MACROECONOMICS

UNIT 5 - NATIONAL INCOME AND RELATED AGGREGATES

SOME CONCEPTS

National income accounting is a branch of macroeconomics of which estimation of national income and related aggregates is a part. National income, or for that matter any aggregate related to it, is a measure of the value of production activity of a country. But, production activity where and by whom? Is it on the territory of the country? Or, is it by those who live in the territory? In fact it is both. This raises further question. What is the scope of territory? Is it simply political frontiers? Or, is it something else? Who are those who live in the territory? Are they simply citizens? Or, someone else. The answers to these questions lead us to the concepts of (i) economic territory and (ii) resident. The two have an important bearing on the estimation of national income aggregates. How? We will explain it a little later.

(1) ECONOMIC TERRITORY

Definition

The first thing to note is that economic territory of a country is not simply political frontiers of that country. The two may have common elements, but still they are conceptually different. Let us first see how it is defined. According to the United Nations :

> Economic territory is the geographical territory administered by a government within which persons, goods and capital circulate freely.

The above definition is based on the criterion "freedom of circulation of persons, goods and capital". Clearly, those parts of the political frontiers of a country where the government of that country does not enjoy the above "freedom" are not to be included in economic territory of that country. One example is embassies. Government of India does not enjoy the above freedom in the foreign embassies located within India. So, these are not treated as a part of economic territory of India. They are treated as part of the economic territories of their respective countries. For example the U.S. embassy in India is a part of economic territory of the U.S.A. Similarly, the Indian embassy in Washington is a part of economic territory of India.

Scope

Based on 'freedom' criterion, the scope of economic territory is defined to cover:

(i) Political frontiers including territorial waters and air space.

(ii) Embassies, consulates, military bases, etc located abroad,but excluding those located within the political frontiers.

(iii) Ships, aircrafts etc, operated by the residents between two or more countries

(iv) Fishing vessels, oil and natural gas rigs, etc operated by the residents in the international waters or other areas over which the country enjoys the exclusive rights or jurisdiction.

Implication

National income and related aggregates are basically measures of production activity. There are two categories of national income aggregates : domestic and national, or domestic product and national product. Production activity of the production units located within the economic territory is domestic product. Gross domestic product, net domestic product are some examples. We will learn more about the implications after studying the concept of resident.

(2) RESIDENT

Introduction

Note that citizen and resident are two different terms. This does not mean that a citizen is not a resident, and a resident not a citizen. A person can be a citizen as well as a resident, but it is not necessary that a citizen of a country is necessarily the resident of that country. A person can be a citizen of one country and at the same time a resident of another country. For example a NRI, Non-resident Indian. A NRI is citizen of India but a resident of the country in which he lives.

Citizenship is basically a legal concept based on the place of birth of the person or some legal provisions allowing a person to become a citizen. On the other hand residentship is basically an economic concept based on the basic economic activities performed by a person.

Definition

A resident is defined as follows:

> A resident, whether a person or an institution, is one whose centre of economic interest lies in the economic territory of the country in which he lives.

The 'centre of economic interest' implies two things: (i) the resident lives or is located within the economic territory and (ii) the resident carries out the basic economic activities of earnings, spending and accumulation from that location

Implications

Production activity of the residents of an economic territory is national product. GNP, NNP, are some examples. National product includes production activities of residents irrespective of whether performed within the economic territory or outside it.

In comparison, domestic product includes production activity of the production units located in the economic territory irrespective of whether carried out by the residents or non-residents.

(3) INTERMEDIATE PRODUCTS AND FINAL PRODUCTS

Goods and services purchased by a production unit from other production units with the purpose of reselling or with the purpose of using them completely during the same year are called **intermediate products.** The expenditure on them is called **intermediate cost or intermediate consumption.**

Goods and services purchased for consumption, i.e., for satisfaction of wants, and for

investment are called **final products.** Expenditure on them is called final expenditure.

FROM DOMESTIC PRODUCT TO NATIONAL PRODUCT

The concept of domestic product is based on the production units located within economic territory,operated both by residents and non-residents. The concept of national product is based on residents, and includes their contribution to production both within and outside the economic territory.Normally, in practical estimates, domestic product is estimated first. National product is then derived from the domestic product by making certain adjustments.Let us see how?

National product is derived in the following way:

National product	=	Domestic product
	+	residents' contribution to production outside the economic territory
	-	non-residents' contribution to production inside the economic territory

In practical estimates the residents' contribution outside the economic territory is called "factor income received from abroad". The non-residents' contribution inside the economic territory is called "factor income paid to abroad". Therefore,

National product	=	Domestic product
	+	Factor income received from abroad
	-	Factor income paid to abroad.

Factor income received from abroad' is added to domestic product because this contribution of residents is in addition to their contribution to domestic product. 'Factor income paid to abroad' is subtracted because this part of domestic product, does not belong to the residents. By subtracting factor income paid' from "factor income received" from abroad, we get a net figure "Net factor income from abroad" popularly abbreviated as NFIA.

National product	=	Domestic product
	+	Net factor income from abroad
	=	Domestic product + NFIA

INDUSTRIAL CLASSIFICATION

Introduction

It means grouping production units into distinct industrial groups, or sectors. This is the first step required to be taken in estimating national income, irrespective of the method of estimation. It is statistically more convenient to estimate national income originating in a group of similar production

units rather than for each production unit separately.

It is now a matter of general practice to group all the production units of the economic territory into three broad groups : primary sector,secondary sector and tertiary sectors. Each of these sector can be further subdivided into smaller groups depending upon the requirement. Let us now explain each sector.

Primary Sector

Primary sector includes production units exploiting natural resources like land, water, sub-soil assets,etc. Growing crops, catching fish, extracting minerals, animal husbandry, forestry, etc. are some examples. Primary means of first importance. It is primary because it is a source of basic raw materials for the secondary sector.

Secondary Sector

Secondary sector includes production units which are engaged in transforming one physical good into another physical good. Such an activity is called manufacturing activity. These units convert raw materials into finished goods. Factories, construction, power generation, water supply are the examples. It is called secondary because it is dependent upon the primary sector for raw materials.

Tertiary Sector

Tertiary sector includes production units engaged in producing services. Transport, trade education, hotels and restaurant, finance, government administration, etc are some examples.This sector finds third place because its growth is primarly dependent on the primary and secondary sectors.

NATIONAL INCOME AGGREGATES

There are many aggregates in national income accounting. The basic among these is Gross Domestic Product at Market Price (GDP_{mp}). By making adjustments in GDP_{mp}, we can derive other aggregates like Net Doemstic product at Market Price (NDP_{mp}) and NDP at factor cost (NDP_{fc}).

Net Domestic Product

Why is GDP_{mp} called gross? GDP_{mp} is final products valued at market price. This is what buyers pay. But this is not what production units actually receive. Out of what buyers pay the production units have to make provision for depreciation and payment of indirect tax like excise, sales tax, etc. This explains why GDP_{mp} is called 'gross'. It is called gross because no provision has been made for depreciation. However, if depreciation is deducted from the GDP, it becomes Net Domestic Product (NDP). Therefore,

GDP_{mp} - depreciation = NDP_{mp}

Domestic product at Factor Cost

Why is GDP_{mp} called 'at market price' ?

Out of what buyers pay, the production units have to make payments of indirect taxes,if any. Sometimes production units receive subsidy on production. This is in addition to the market price which production units receive from the buyers. Therefore what production units actually receive is not the 'market-price' but "market price - indirect tax + subsidies" This is what is actually available to production units for distribution of income among the owners of factors of production. Therefore,

Market price - indirect tax (I.T.) + subsidies = Factor payments (or factor costs)

By making adjustment of indirect tax and subsidies we derive GDP at factor cost (GDP_{fc}) from GDP_{mp}..

GDPmp - I.T. + subsidies = GDP_{fc}

or GDP - net I.T. = GDP_{fc}

Net Domestic Product at Factor Cost

If we make adjustment of both the net I.T and depreciation (also called consumption of fixed capital) we get one more aggregate called Net Domestic Product at Factor Cost (NDP_{fc}).

GDP_{mp} - I.T. + Subsidies - depreciation = $NDP_{fc.}$

or NDP_{fc} + I.T. - Subsidies + depreciation = GDP_{mp}

Net National Product at Factor Cost (NNP_{fc}) or National Income

Net factor income from abroad (NFIA) provides the link between NDP and NNP. Therefore,

NDP_{fc} + NFIA = NNP_{fc}

or NNP_{fc} - NFIA = NDP_{fc}

Similarly,

NDP_{mp} + NFIA = NNP_{mp}

GDP_{mp} + NFIA = GNP_{mp}

Summing up

The three crucial adjustments required for deriving one aggregate from the other are:

Gross - depreciation = Net

Market price - I.T. + Subsidies = Factor cost

Domestic + NFIA = National

METHODS OF ESTIMATION OF NATIONAL INCOME (N.I.) AND OTHER RELATED AGGREGATES

There are three methods of estimation of national income : production (value added), income-distribution and final expenditure methods. You are familiar with the various steps required to be taken in each. Let us see what aggregates are arrived through each method.

(I) Production method (value added method)

In this method we first find out Gross Value Added at Market Price (GVA_{mp}) in each sector and then take their sum to arrive at GDP_{mp}

Sum total of GVA_{mp}

by all the sectors = GDP_{mp}

Then we make adjustments to arrive at national income or NNPfc

GDP_{mp} - Consumption of fixed capital = NDP_{mp}

NDP_{mp} - I.T. + Subsidies = NDP_{fc}

NDP_{fc} + NFIA = NNP_{fc}

(2) Income distribution method

In this method we first estimate factor payments by each sector. The sum of such factor payments equals Net value Added at Factor Cost (NVA_{fc}) by that sector. Then we take sum total of NVA_{fc} by all the sectors to arrive at NDP_{fc}. The components of NDP_{fc} are:

1. Compensation of employees
2. Rent and royalty
3. Interest
4. Profits

NDP_{fc}

System of National Accounts 1993, a joint publication of the United Nations and the World Bank,has elaborated the above components and recommended their use by all the countries in preparing national income estimates.

Compensation of employees 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.

The main components of compensation of employees are :

(1) Wages and salaries

(a) in cash
(b) in kind

(2) Social security contributions by the employers.

Rent is defined as the amount receivable by a landlord from a tenant for the use of land.

Royalty is defined as the amount receivable by the landlord for granting the leasing rights of sub-soil assets.

Interest is defined as the amount payable by a production unit to the owners of financial assets in the production unit. The production unit uses these assets for production and in turn makes interest payment, imputed or actual.

Profit is a residual factor payment by the production unit to the owners of the production unit.

The main source of data on factor payments is the accounts of production units. Since accounts of most production units are not available to the estimators, and also since the accounting practices differ, it is not possible for the estimators to clearly identify the components. Therefore, in cases where total factors payment is estimable but not its different components, an additional factor payment item called 'mixed income' is added. Since this problem arises mainly in case of self-employed people like doctors, chartered accountants, consultants, etc, this factor payment is popularly called "mixed income of the self employed". In case there is such item then,

NDP_{fc} = Compensation of employees
\+ Rent and royalty
\+ Interest
\+ Profit
\+ Mixed income (if any)

There is another term used in factor payments. It is 'operating surplus'. It is defined as the sum of rent and royalty, interest and profits. In that case then:

NDP_{fc} = Compensation of employees
\+ operating surplus
\+ mixed income (if any)

Once we estimate NDP_{fc}, we can find NNP_{fc}, or national income, by adding NFIA.

$NDP_{fc} + NFIA = NNP_{fc}$.

(3) Final expenditure method

In this method we take the sum of final expenditures on consumption and investment. This sum equals $GDP_{mp.}$ These final expenditures are on the output produced within the economic territory of the country. Its main components are:

Private final consumption expenditure (PFCE)
+ Government final consumption expenditure (GFCE)
+ Gross domestic capital formation (GDCF)
+ Net exports (= export - imports) (X-M)

= GDP_{mp}

By making the usual adjustments we can arrive at national income

PFCE
+ GFCE
+ GDCF
+ (X-M)

= GDP_{mp}
- Consumption of fixed capital

= NDP_{mp}
- Indirect Tax
+ Subsidies

= NDP_{fc}
+ NFIA

= NNP_{fc} (National income)

Note that GDCF is composed of the following:

GDCF = Net domestic fixed capital formation
+ Closing stock
- Opening stock
+ Consumption of fixed capital

Also note that. 'Closing stock - opening stock ' equals net change in stocks.

PRECAUTIONS IN MAKING ESTIMATES OF NATIONAL INCOME

There are a large number of conceptual and statistical problems that arise in estimating national income of a country. To minimize error, it is necessary that certain precautions are taken in advance. Some of the methodwise precautions are:

(1) Value added (Production) method

(i) Avoid double counting

Value added equals value of output less intermediate cost. There is a possibility that instead of counting 'value added' one may count value of output. You can verify by taking some imaginary

numerical example that counting only values of output will lead to counting the same output more than once. This will lead to overestimation of national income. There are two alternative ways of avoiding double counting: (a) count only value added and (b) count only the value of final products.

(ii) Do not include sale of second hand goods.

Sale of the used goods is not a production activity. The good should not be treated as fresh production, and therefore doesn't qualify for inclusion in national income. However, any brokerage or commission paid to facilitate the sale is a fresh production activity. It should be included in production but to the extent of brokerage or commission only.

(iii) Self-consumed output must be included.

Output produced but retained for self-consumption, rather than selling in market, is output and must be included in estimates. Services of owner-occupied buildings, farmer consuming its own produce, etc are some examples.

(2) Income distribution method

(i) Avoid transfers

National income includes only factor payments, i.e. payment for the services rendered to the production units by the owners of factors. Any payment for which no service is rendered is called a transfer, and not a production activity. Gifts, donations, charities etc are main examples. Since transfers are not a production activity it must not be included in national income.

(ii) Avoid capital gain

Capital gain refers to the income from the sale of second hand goods and financial assets. Income from the sale of old cars, old house, bonds, debentures, etc are some examples. These transactions are not production transactions. So, any income arising to the owners of such things is not a factor income.

(iii) Include income from self-consumed output

When a house owner lives in that house, he does not pay any rent. But infact he pays rent to himself. Since rent is a payment for services rendered, even though rendered to the owner itself, it must be counted as a factor payment.

(iv) Include free services provided by the owners of the production units

Owners work in their own unit but do not charge salary. Owners provide finance but do not charge any interest. Owners do production in their own buildings but do not charge rent. Although they do not charge, yet the services have been performed. The imputed value of these must be included in national income.

(3) Final expenditure method

(i) Avoid intermediate expenditure

By definition the method includes only final expenditures, i.e. expenditure on consumption

and investment. Like in the value added method, inclusion of intermediate expenditure like that on raw materials, etc, will mean double counting.

(ii) Do not include expenditure on second hand goods and financial assets

Buying second hand goods is not a fresh production activity. Buying financial assets is not a production activity because financial assets are neither goods nor services. Therefore they should not be included in estimates of national income.

(iii) Include the self use of own produced final products.

For example, a house owner using the house for self. Although explicitly he does not incur any expenditure, implicitly he is making payment of rent to himself. Since the house is producing a service, the imputed value of this service must be included in national income.

(iv) Avoid transfer expenditures

A transfer payment is a apayment against which no services are rendered. Therfore no production takes place. Since no production takes place it has no place in national income. Charities, donations, gifts, scholarships, etc are some examples.

DISPOSABLE INCOME

Introduction

Disposable income refers to the income actually available for use as consumption expenditure and saving. It includes both factor incomes and non factor incomes. National income includes only factor incomes. Broadly, therefore, if we are given national income, we can find disposable income by making adjustments of non factor incomes.

National Disposable Income

Given GNPmp, we can derive Gross National Disposable income (GNDI) and Net National Disposable income (NNDI).

GNP_{mp}
\+ Net current transfers from abroad
= GNDI
\- Consumption of fixed capital
= NNDI

ALTERNATIVELY,

NNDI = NNP_{mp}
\+ Net current transfers from abroad

Disposable income aggregate of the private sector

GNDI and NNDI are the disposable income aggregates of the nation. Let us now derive the

disposable income of the private sector of the nation. As a first step, given national income, we deduct national income accruing to the government. Then as a second step we make adjustments of non-factor incomes in various stages to ultimately arrive at personal disposable income. These steps are summed up in the following table.

		NDP_{fc}
Less	:	Income from property and entrepreneurship accruing to the government administrative departments
Less	:	Saving of non-departmental enterprises
		= NDPfc accruing to the private sector
Add	:	Net factor income from abroad
Add	:	National debt interest
Add	:	Current transfers from the government administrative departments.
Add	:	Net current transfers from the rest of the world.
		= Private Income
Less	:	Saving of private corporate sector (net of retained earnings of foreign companies)
Less	:	Corporation tax
		= Personal Income
Less	:	Direct taxes paid by households
Less	:	Miscellaneous receipts of government administrative departments
		= Personal disposable income

Of the above 'national debt interest' is the interest paid by government on loans taken to meet its administrative expenditure, a consumption expenditure. Since interest on loans taken to meet consumption expenditure is not a factor income it was not included in NDP_{fc}. But since it is a disposable income it is added to NDP_{fc} to arrive at disposable income of the private sector, called Private Income.

Miscellaneous receipts of government administrative departments are small compulsory payments by the people to the government in the form of fees, fines, etc and treated like a direct tax, and therefore deducted.

UNIT 6

MONEY AND BANKING

FUNTIONS OF MONEY

Money performs four funtions: medium of exchange, unit of account, store of value and standard of deferred payments. The first three have already been explained (in the NCERT book).

Deferred payments are contracted to be made at some future date. Money serves as a standard of such deferred payments. This function has facilitated borrowing and lending. The function has also led to the creation of financial institutions.

MONEY CREATION BY THE COMMERCIAL BANKING SYSTEM

Meaning

Money is anything usable for undertaking transactions i.e. receipts and payments. The stock of such money in an economy is called money supply. The basic measure of money supply has two components: currency with public and demand deposits in commercial banks. The currency is created by the central bank (Reserve Bank of India in India) and is called **High Powered Money.** Demand deposits are created by the commercial banks and are called **Bank money.**

Commercial banks receive deposits from the public. The depositors are free to withdraw, in part or in full, their deposit amounts by writing cheques. The banks use the money in these deposits to give loans. These functions of the commercial banking system are the basis of deposit creation. How much are the deposits created is determined by the amount of initial deposits by the public and the Legal Reserve Ratio. The quantitative outcome is called money multiplier. Let us explain the process of money creation and the measure of money multiplier. Note that money creation is also called 'deposit creation' or 'credit creation'.

The Process of Money Creation

Let us assume that the entire commercial banking system is one unit. Let us call this one unit simply ''banks'. Let us also assume that all receipts and payments in the economy are routed through the banks. One who makes payment does it by writing cheque. The one who receives payment deposits the same in his deposit account.

Suppose initially people deposit Rs. 100. The banks use this money for giving loans. But the banks cannot use the whole of deposit for this purpose. It is legally compulsory for the banks to keep a certain minimum fraction of these deposits as cash. The fraction is called the Legal Reserve Ratio(LRR). The LRR is fixed by the central bank. It with the central bank, and this part ratio is called the Cash Reserve Ratio. The other part is kept by the banks themselves and is called the Statutory Liquidity Ratio.

Why are the banks required to keep only a fraction of deposits as cash reserves? What will banks do

if the demand for cash withdrawn is more than cash reserves at some point of time? There are two reasons. First the banking experience has revealed that not all depositors approach the banks for withdrawal of money at the same time, and also that normally they withdraw a fraction of deposits. Secondly, there is a constant flow of new deposits for withdrawal of cash, it is sufficient for banks to keep only a fraction of deposits as cash reserve.

Let us now explain the process. Suppose the initial deposits in banks is Rs. 100 and the LRR is 20 percent. Further suppose that banks keep only the minimum required i.e. Rs. 20 as cash reserve, no more no less – Banks are now free to lend the remainder Rs. 80. Suppose they lend Rs. 80. What banks do is to open deposit accounts in the names of the borrowers who are free to withdraw the amount whenever they like. Suppose they withdraw the whole of amount for making payments.

Now, since all the transactions are routed through the banks, the money spent by the borrowers comes back into the banks into the deposit accounts of those who have received this payment. This increases demand deposits in banks by Rs. 80. It is 80 percent of the initial deposit. These deposits of Rs. 80 have resulted on account of loans given by the banks. In this sense the banks are responsible for money creation. With this round increase in total deposits is now Rs. 180 (=100+80).

When banks receive new deposit of Rs. 80, they keep 20 percent of it as cash reserves and use the remaining Rs. 64 for giving loans. The borrowers use these loans for making payments. The money comes back into the accounts of those who have received the payments. Bank deposits again rise, but by a smaller amount of Rs. 64. It is 80 percent of the last deposit creation. The Total deposits now increase to Rs. 244 (=100+80+64). The process does not end here.

The deposit creation continues in the above manner. The deposits go on increasing round after round but each time only 80 percent of the last round deposits. At the same time cash reserves go on increasing, each time 80 percent of the last cash reserve. The deposit creation comes to end when total cash reserves become equal to the initial deposit. The total deposit creation comes to Rs. 500, five times the initial deposit as shown in the table below:

Deposit Creation By Commercial Banks

	Deposits (Rs.)	Loans (Rs.)	Cash Reserves (LRR = 0.2)
Initial	100	80	20
Round I	80	64	16
Round II	64	51.20	12.80
-	-	-	-
-	-	-	-
-	-	-	-
Total	500	400	100

Money Multiplier

How many times the total deposits would be of the initial deposit is determined by the LRR.

The multiple called the money or deposit multiplier, is:

$$\text{Money multiplier} = \frac{1}{LRR}$$

In our above illustration the LRR is 0.2 therefore,

$$\text{Money multiplier} = \frac{1}{0.2} = 5$$

The total money creation is thus:

$$\text{Money creation} = \text{initial deposit x } \frac{1}{LRR}$$

$$= 100x\frac{1}{0.2} = 500$$

Note that lower the LRR, higher the money mulitiplier and more the money creation. If the LRR = 0.1, the money multiplier is 10(=1/0.1). If the LRR is 0.4, the money multiplier is 2.5(=1/0.4)

The Central Bank

The Central Bank is the apex institution of a country's monetary system. The design and the control of the country's monetary policy is its main responsibility. India's central bank is the Reserve Bank of India.

The Central Bank performs the following functions :

1. Bank of Issue.

The Central Bank is the sole authority for the issue of currency in the country. It promotes efficiency in the financial system. Firstly, because this leads to uniformity in the issue of currency. Secondly, because it gives Central Bank direct control over money supply.

2. Banker to the Government

The Central Bank acts as a banker to the government - both Central as well as State governments. It carries out all the banking business of the government, and the government keeps its cash balances on current account with the Central Bank.

As the banker to the government, the Central Bank accepts receipts and makes payments for

the government, and carries out exchange, remittance and other banking operations. The Central Bank also provides short-term credit to the government, so that the government can meet any shortfalls in receipts over disbursements. The government borrows money by selling treasury bills to the Central Bank. The government carries on short term borrowings by selling ad-hoc treasury bills to the Central Bank.

As the government's banker, the Central Bank also has the responsibility of managing the public debt. This means that the Central Bank has to manage all new issues of government loans.

The Central Bank also advises the government on banking and financial matters.

3. Bankers' Bank

As the banker to banks, the Central Bank holds a part of the cash reserves of banks, lends them short-term funds and provides them with centralised clearing and remittance facilities. The banks are required to deposit a stipulated ratio of their net total liabilities (the CRR) with the Central Bank. The purpose of this stipulaton is to use these reserves as an instrument of monetary and credit control. In addition to this the bank holds excess reserves with the Central Bank to meet any clearing drains due to settlement with other banks or net withdrawals by their account holders. The pool of funds with the Central Bank serves as a source from which it can make advances to banks temporarily in need of funds, acting in its capacity as lender of last resort.

The Central Bank supervises, regulates and controls the commercial banks. The regulation of banks may be related to their licensing, branch expansion, liquidity of assets, management, amalgamation(merging of banks) and liquidation (the winding up of banks). The control is exercised by periodic inspection of banks and the returns filed by them.

4. Controller of Credit

The Central Bank controls the money supply and credit in the best interests of the economy. The bank does this by taking recourse to various instruments. These are:

1. **Bank Rate Policy :** The bank rate is the rate at which the central bank lends funds to banks, The effect of a change in the bank rate is to change the cost of securing funds from the central bank. An increase in the bank rate increases the costs of borrowing from the central bank. This will reduce the ability of banks to create credit. A rise in the bank rate will then cause the banks to increase the rates at which they lend. This will then discourage businessmen and others from taking loans, thus reducing the volume of credit. A decrease in the bank rate will have the opposite effect.

2. **Open Market Operations :** OMO is the buying and selling of government securities by the Central Bank from / to the public and banks. It does not matter whether the securities are bought or sold to the public or banks because ultimately the amounts will be deposited in or

transferred from some bank. The sale of government securities to banks will have the effect of reducing their reserves. When the bank gives the Central Bank a cheque for the securities, the Central Bank collects the amounts by reducing the bank's reserves by the particular amount. This directly reduces the bank's ability to give credit and therefore decrease the money supply in the economy. When the Central Bank buys securities from the banks it gives the banks a cheque drawn on itself in payment for the securities. When the cheque clears, the Central Bank increases the reserves of the bank by the particular amount. This directly increases the bank's ability to give credit and thus increase the money supply.

3. **CASH RESERVE RATIO :** Banks are obliged to maintain reserves with the Central Bank. The banks are required to deposit with the Central Bank a percentage of their net demand and time deposits. This minimum percentage is fixed by the Central Bank and is called Cash Reserve Ratio. Varying the CRR is a tool of monetary and credit control. An increase in the CRR has the effect of reducing the bank's excess to funds and thus curtails their ability to give credit.

4. **STATUTORY LIQUIDITY RATIO**: Banks are also required to maintain a specified percentage of their net total demand and time deposits in the form of designated liquid assets with themselves. This specific percentage is called Statutory Liquidity Ratio (SLR).

5. **MARGIN REQUIREMENTS :** A margin is the difference between the amount of the loan and market value of the security offered by the borrower against the loan. If the margin imposed by the Central Bank is 40%, then the bank is allowed to give a loan only up to 60% of the value of the security. By altering the margin requirements, the Central Bank can alter the amount of loans made against securities by the banks.

6. **REPO RATE:** When the commercial banks are in need of funds for a short period, they can borrow from the Central Bank. The rate of interest charged by the Central Bank on such lendings is called Repo Rate. Raising Repo Rate makes such borrowings by the commercial banks costly. As such when Repo Rate is raised, banks are also forced to raise their lending rates. This has a negative effect on demand for borrowings from the commercial banks. Lowering Repo Rate has the opposite effect.

7. **REVERSE REPO RATE:** When the commercial banks have surplus funds they can deposit the same with the central bank and earn interest. The rate of interest paid by the Central Bank on such deposits is called **Reverse Repo Rate.** When this rate is raised, it encourages the commercial banks to park their funds with the central bank. This has the negative effect on the lending capability of the commerical banks. Lowering Reverse Repo Rate has the oposite effect which raises demand for borrowings from the commercial banks.

UNIT 7 - Determination of Income

Involuntary unemployment : Involuntary unemployment occurs when those who are able and willing to work at the going wage rate do not get work. It is distinguished from Voluntary unemployment which refers to that part of population which are able to work by voluntarily prefer not to work.

Full Employment: When the entire labour force of the country is in employment, it is called full employment. Labour force comprises of people who are able to work and willing to work.

Aggregate demand : Aggregated demand means the total demand for final goods in an economy. It also means the aggregate expenditure on final goods in an economy.

The components of aggregate demand are :

1. Demand for goods and services for private consumption also called private final consumption expenditure.

2. Demand for private investment

3. Demand for goods and services by the government

4. Net exports.

Since the determination of income is to be studied in the context of a closed economy without government the third and fourth components of aggregate demand are not discussed in details. The two sectors taken are households and firms.

Consumption expenditure

Demand for goods and services for private consumption is made by household sector. It is also called private final consumption expenditure and will be refered to as consumption expenditure. It must be kept in mind that the consumption expenditure we are discussing is ex-ante i.e. planned consumption expenditure.

The relationship between consumption and income is called the consumption function.The consumption function may be represented by the following equation.

$$C = \bar{C} + bY \qquad \bar{C} > 0,\ 0 < b < I.$$

Where,

C = Consumption

$\bar{C}$ = Autonomous Consumption

b = Marginal Propensity to Consume

Y = Income

The intercept $\bar{C}$ represents autonomous consumption, that is, the amount of consumption expenditure when income is zero. $\bar{C}$ is assumed to be positive, that is there is consumption even in the absence of any income. Hence, it is not possible to think of a situation where there is no consumption at all.

The slope of the consumption function is 'b'. It measures the rate of change in consumption per unit change in income and is also known as the Marginal Propensity to Consume (MPC). For example, if b is 0.6, then a rupee change in income causes a 0.60 rupee change in consumption. If b is 0.45, then a rupee change in income will cause a 0.45 rupee change in consumption.

By assumption, the MPC is positive, and its value ranges between 0 and 1. This means that consumption increases with income, but a rupee increase in income causes less than a rupee increase (of b) in consumption. For example, if b is 0.90, a rupee increase in income causes a 0.90, increase in consumption.

The consumption function may be plotted on a graph with the help of a numerical example. Figure 1 shows the graph of the hypothetical consumption function.

Consider a consumption function given by

$C = 100 + 0.8\ Y$

Since this is an equation of a straight line, the consumption function will have a constant slope.

Table 1 shows the level of consumption for various levels of income.

Column (2) shows the consumption expenditure at various levels of income. The values in column (1) are obtained from the consumption function. Column (5) in table 1 shows how MPC is calculated. As income increases from Rs. 600 to Rs. 700 (an increase of 100 rupees), the consumption increases from Rs. 580 to Rs. 660 (an increase of 80rupees). The MPC is therefore 80/100 = 0.8. The MPC at all levels of income is the same because of the particular consumption function we have used in our example. (Constant slope and therefore constant MPC is a feature of all straight line consumption functions). The information given in the Table 1 can be plotted in a graph, as shown in Fig. 1.

Table 1 : Consumption, Income and Marginal Propensity to Consume

Income (Y)	Consumption C	Change in Y (ΔY)	Change in Consumption (ΔC)	Marginal Propensity to Consume (MPC) = (4)/(3) = $\Delta C/\Delta Y$
(1)	(2)	(3)	(4)	(5)
0	100	-	-	-
100	180	100	80	(80/100) = 0.8
200	260	100	80	(80/100) = 0.8
300	340	100	80	(80/100) = 0.8
400	420	100	80	(80/100) = 0.8
500	500	100	80	(80/100) = 0.8
600	580	100	80	(80/100) = 0.8
700	660	100	80	(80/100) = 0.8
800	740	100	80	(80/100) = 0.8
900	820	100	80	(80/100) = 0.8
1000	900	100	80	(80/100) = 0.8

Fig. 1 shows, the graph of the consumption function C = 100 + 0.8Y.

To understand the figure, it is helpful to look at the 45° line drawn from the origin. Since the vertical and horizontal axes have the same scale, the 45° line has the property that at any point on it, the distance up from the horizontal axis (which is a consumption expenditure) exactly equals the distance across from the vertical axis (which is income).

Thus, at any point on the 45° line, consumption expenditure exactly equals income. The 45° line therefore immediately tells us whether consumption spending (as per the consumption function) is equal to, greater than, or less than the level of income.

The consumption function crosses the 45° line at point B. This point is known as the *breakeven point.* Here households are just breaking even, because the consumption is exactly equal to the income. In our example, the income and consumption at the breakeven point is Rs. 500.

At any point other than B on the consumption function, consumption is not equal to income. At points to the left of B, the consumption function lies above the 45° line. Therefore consumption expenditure is greater than income. For example, at an income level of Rs. 200, the consumption is

Rs. 260. The household must find funds to meet this consumption expenditure. The shortage in income will make them to sell the assets acquired in the past, or to resort to borrowing so that Rs. 60 could be raised for consumption. This act on the part of the household to liquidate their own assets or to go in for a loan is referred to as the process of dissaving. Dissaving is in order to help the households to finance the consumption over and above the level of income.

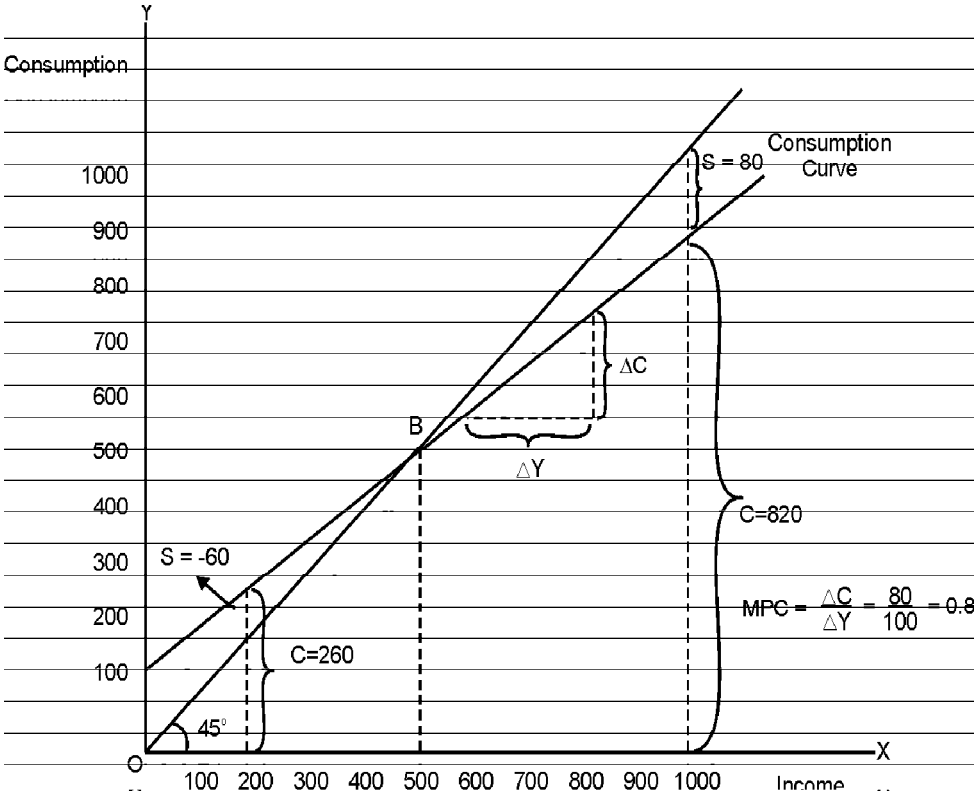

Fig. 1 : The Consumption Curve

At any point to the right of B, the consumption curve lies below the 45° line;therefore consumption expenditure is less than the level of income. The part of income, which is not consumed, is saved. This must be so, because income is either consumed or saved. There is no other use to which it can be put. Savings can be measured in the graph as the vertical distance between the consumption function and the 45° line. For example, at an income level of Rs. 900, consumption is Rs. 820. Therefore, the amount of savings is the diference between the two, that is, Rs. 80.

To sum up: when the consumption curve lies above the 45° line, consumption is greater than income at each level of income. This means that there is dissaving, Where the two lines intersect, the level of consumption is exactly equal to the level of income, When the consumption curve lies below the 45° line, the level of consumption is less than the level of income. This means that there is positive saving. The amount of dissaving or saving is always measured by the vertical distance between the consumption curve and the 45° line.

Consumption and Savings

We shall now look into the relationship between consumption and saving. We may obtain the

savings function from this relationship.

The equation below says that income that is not spent on consumption is saved, that is

$S = Y - C$

This equation tells us that by definition, saving is equal to income minus consumption.

The consumption function, along with the above equation, implies a savings function. The savings function relates the level of saving to the level of income. Substituting the consumption function into the above equation we can get the saving function.

$S = Y - C$

$= Y - (\bar{C} + bY)$ (Since $C = \bar{C} + bY$)

$= Y - \bar{C} - bY$

$= -\bar{C} + Y - bY$

$S = -\bar{C} + (1 - b)Y$

This is the savings function. The intercept term $\bar{C}$ is the amount of savings done when there is zero level of income. It is already shown that $\bar{C}$ is positive. Therefore $\bar{C}$ savings is negative. Thus, there is negative savings $\bar{C}$ at zero level of income. Since negative savings is nothing but dissaving, this means that at zero level of income, there is a dissaving of amount $\bar{C}$. Note that the amount of autonomous consumption is exactly equal to the amount of dissaving at zero level of income. This is because of the fact that $Y = C + S$ (whether S is positive or negative).

The slope of the savings function is (1 - b). The slope of the savings function gives the increase in savings per unit increase in income. This is known as the Marginal Propensity to Save (MPS) Since b is less than one it follows that (1 - b) and therefore MPS is positive. Therefore, savings is an increasing function of income.Suppose the MPC, that is, b is 0.8, then the MPS, that is (1 - b) is 0.2. This means that for every one rupee increase in income, savings increase by 0.2 rupee.

Note that MPS = 1 - b = 1 - MPC. This means that the part of the increase in income, which is not consumed, is saved, This is because income is either consumed or saved. Therefore, it is always the case that MPC + MPS = 1.

Using the numerical example of the consumption function we had earlier given, we can derive the corresponding savings function.

$S = \bar{C} + (1 - b)\ Y$

$= -100 + (1 - 0.8)Y$

$S = -100 + 0.2Y$

Table 2 : Consumption - Saving Relationship

Y	Change in Y (ΔY)	C	Change in C (ΔC)	MPC (ΔC/ΔY)	Saving (S)	Change in S (ΔS)	MPS (ΔS/ΔY)	C+S	MPC+ MPS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0	-	100	-	-	-100	-	-	0	-
100	100	180	80	0.8	-80	20	0.2	100	1
200	100	260	80	0.8	-60	20	0.2	200	1
300	100	340	80	0.8	-40	20	0.2	300	1
400	100	420	80	0.8	-20	20	0.2	400	1
500	100	500	80	0.8	0	20	0.2	500	1
600	100	580	80	0.8	20	20	0.2	600	1
700	100	660	80	0.8	40	20	0.2	700	1
800	100	740	80	0.8	60	20	0.2	800	1
900	100	820	80	0.8	80	20	0.2	900	1
1000	100	900	80	0.8	100	20	0.2	1000	1

Table 2 shows the levels of consumption and savings for various levels of income. Note that (a) consumption plus saving everywhere equals income, and (b) MPC + MPS = 1.
Columns (1) to (5) are repeated from Table 1. Column (6) shows the level of savings at different levels of income. The values in this column are obtained from the savings function. Column (8) in table 2 shows how MPS is calculated. As income increases from Rs. 600 to Rs. 700 (an increase of Rs. 100), the savings rise from Rs. 20 to Rs. 40 (an increase of Rs. 20). The MPS is therefore (20/ 100) = 0.2.

The MPS is the same at all levels of income because of the particular savings function (a linear curve with constant slope) we used in our example (constant slope and therefore constant MPS is a feature of all straight line savings functions).

Column (9) of the table shows the sum of consumption expenditure and savings at every level of income. Note that column (9) is identical to column (1). This is because income is either consumed or saved, there is no other use to which it can be put. Thus, the sum of consumption expenditure and saving must be identically equal to income.

Column (10) of the table shows the sum of the MPC and MPS. Note that the sum of MPC and MPS is equal to one. This means that the part of the increase in income, which is not consumed, is saved. This is because income is either consumed or saved.

The information given in table 2, can be plotted in a graph, as shown in Fig. 2

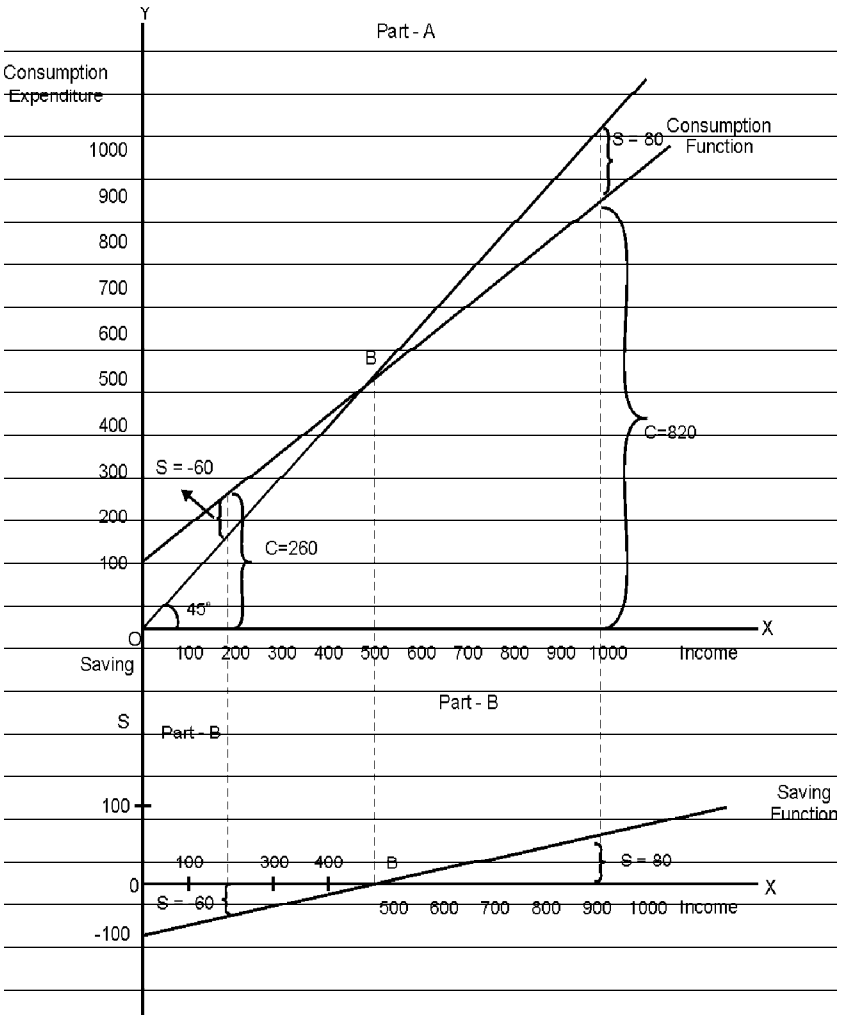

Fig 2 : The consumption Function and its associated Savings Function

Part A of Fig 2 shows the consumption function, Part B shows the savings function. This is the counterpart of the consumption shown in part A. In part A, the amount of saving at any level of income is the vertical distance between the consumption function and the 45° line. The saving function shown in part B can therefore be directly derived from part A.

When income is 500, we see in part A that consumption is 500 and saving equals 0. This is depicted in part B by the intersection of the savings function with the horizontal axis at point B, which corresponds to an income level of 500. When income is 200, consumption is 260 and saving is -60 (dissaving is 60); the savings function lies 60 below the horizontal axis at an income level of 200.

When income is 900, consumption is 820 and saving is 80; the saving function lies 80 above the horizontal axis at an income level of 900.

In general, to the left of points B in part A, the consumption function lies above the 45° line (consumption is more than income). Hence to the left of point B in part B, savings is negative and the savings function lies below the horizontal axis.

To the right of point B in part A, the consumption function lies below the 45° line (consumption is less than income). Hence to the right of point B in part B, savings is positive and the savings function lies above the horizontal axis.

Average Propensities to Consume and Save

From the consumption function, we can find out the value of the consumption income ratio C/Y, at every level of income. At any particular level of income. the ratio of consumption to income is called the Average Propensity to Consume (APC). The APC gives the average consumption - income relationship at different levels of income.

Similarly, from the savings function, we can find out the average savings - income ratio. At any particular level of income, the Average Propensity to Save (APS) is the ratio of savings to income.

We have

APC = C/Y and APS = S/Y

Now, the sum of the APC and APS is always equal to one. This is because income is either consumed or saved. The proof of this statement is as follows; From the relationship between income, consumption and saving, we have

$$Y = C + S$$

Dividing both sides of the equation by Y we have

$$Y/Y = C/Y + S/Y$$

Thus, I = APC + APS

Using the earlier examples of consumption function and savings function we can calculate the values of APC and APS for every level of income. This is done in Table 3.

Table 3 : Average Propensities to Consume and Save

Y	C	APC (2)/(1)	S	APS (4)/(1)	APC+APS (3)+(5)
(1)	(2)	(3)	(4)	(5)	(6)
0	100	-	-100	-	-
100	180	1.8	-80	-0.8	1
200	260	1.3	-60	-0.3	1
300	340	1.13	-40	-0.13	1
400	420	1.05	-20	-0.05	1
500	500	1.00	0	0	1
600	580	0.97	20	0.03	1
700	660	0.94	40	0.06	1
800	740	0.92	60	0.08	1
900	820	0.91	80	0.09	1
1000	900	0.90	100	0.10	1

Note : Figures in table are rounded upto two decimal points

Column (3) shows how APC is calculated. At a particular income level, the APC is the corresponding level of consumption divided by that level of income. Similarly: APS is calculated in column (5). At a particular income level, the APS is the corresponding level of saving divided by that level of income. Column (6) shows the sum of APC and APS. As expected, at every level of income, the sum of APC and APS is equal to one. This is because income is either consumed or saved. Therefore the proportion of income that is not consumed must be saved.

As we can see from the above table. APC is continuously declining as income increases; and APS is continuously increasing as income increases. This means that as income increases, the proportion of income saved increases and the proportion of income consumed decreases.

2. Demand for Private Investment

Demand for private investment refers to the planned or ex-ante investment expenditure by the firms. It includes addition to the stock of physical capital and change in inventory. For simplicity sake it is assumed in our study that the investment expenditure is autonomous. This means investment decisions are not influenced by any of its determinants, including output.

Aggregate Supply : It is the value of total quantity of final goods and services produced in the economic teritory of a country. It refers to the planned aggregate output in the economy.

Determination of Equilibrium Level of Income

We shall confine our analysis of the determination of the equilibrium level of income to an economy with only two sectors, households and firms. Hence, the only components of aggregate demand will be consumption demand and investment demand.

Consumption plus Investment Approach

We may show income determination using the consumption plus investment (C+I) approach. This is illustrated in Fig. 3, which shows total spending or aggregate demand plotted against income. The line CC is the consumption function, showing the desired (planned level) of consumption corresponding to each level of income. We now add desired (planned) investment (which is at fixed level I) to the consumption function. This gives the level of total desired spending or aggregate demand, represented by the $C+I_o$ curve. At every point, the $(C+I_o)$ curve lies above the CC curve by an amount equal to I_o.

The 45^o line will enable us to identify the equilibrium. At any point on the 45^o line, the aggregate demand(measured vertically) equals the total level of income (measured horizontally).

The economy is in equilibrium when aggregate demand, represented by the $C+I_o$ curve is equal to the total income.

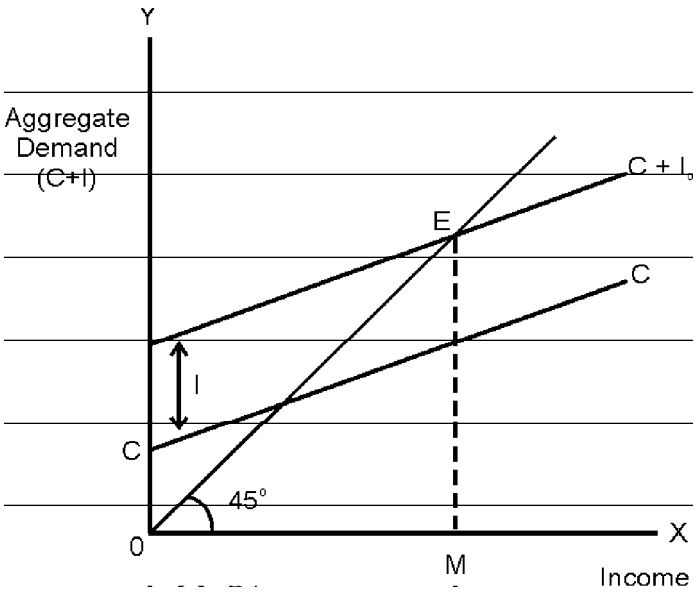

Fig. 3 : Income Determination by Consumption plus Investment approach

The aggregate demand or ($C + I_0$) curve shows the desired level of expenditure by consumers and firms corresponding to each level of output. The economy is in equilibrium at the point where the $C + I_0$ curve intersects the 45° line - point E in Fig. 3. At point E, the economy is in equilibrium because the level of desired spending on consumption and investment exactly equals the level of total income. The level of income corresponding to point E, is the level of income OM. Thus, OM is the equilibrium level of income.

The Adjustment Mechanism

Equilibrium occurs when planned spending equals planned income. When planned spending is not equal to planned income, then income will tend to adjust up or down until the two are equal again.

Consider the case when the economy is at a level of income greater than the equilibrium level OM in Figure 3. At any such greater level of income, the $C + I_0$ line lies below the 45° line that is planned spending is less than planned income. This means that consumers and firms together would be buying less goods than firms were producing. This would lead to an unplanned undesired increase in inventories of unsold goods (representing goods neither sold to households for consumption nor bought by firms for investment) Firms would then respond to this unplanned inventory increase by decreasing employment and hence output. This process of decrease in income will continue until the economy is back at income level OM, where again aggregate demand equals planned income and there is no further tendency to change.

Consider another case when the economy is at a level of income less than the equilibrium at level OM. At any such lower level of income, the $C + I_0$ line lies above the 45° line, that is, planned spending is more than planned income. This means that consumers and firms together would be

buying more goods than firms were producing. This would lead to an unplanned, undesired decrease in inventories. Firms would then respond to this unplanned inventory decrease by increasing employment and hence output. This process of increase in output will continue until the economy is back at income level OM, where again aggregate demand equals planned income and there is no further tendency to change.

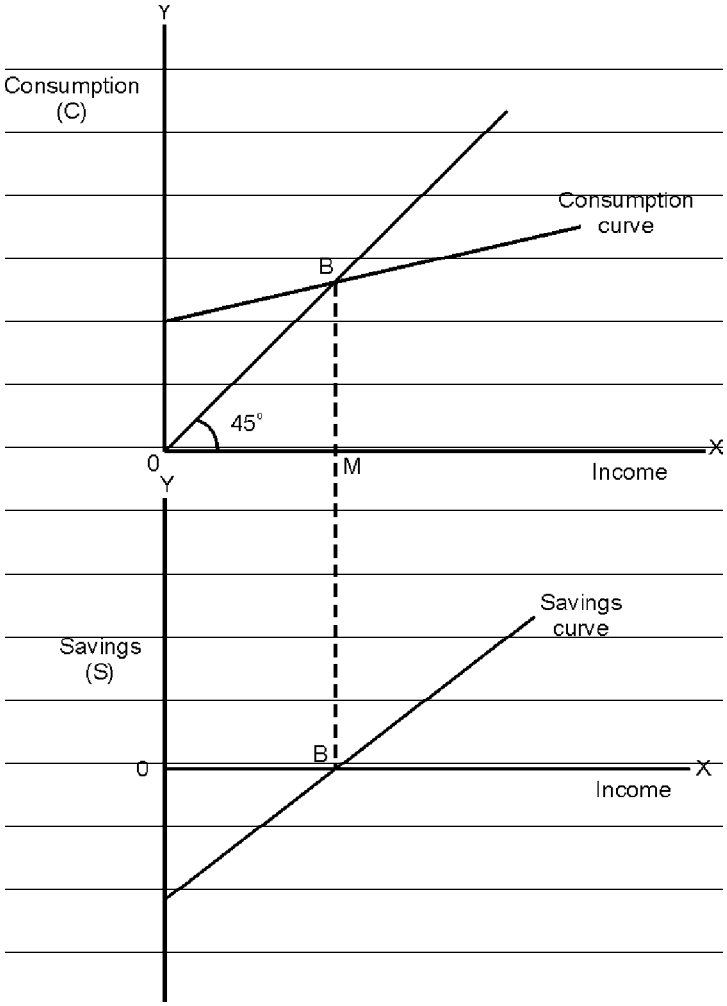

Fig. 4 : The Consumption Function and the corresponding Savings Function

Income Determination Using the Savings and Investment

Saving Function

Figure 4 shows the consumption function and the corresponding savings function. Is it not similar to Fig. 2? Recall that each point on the consumption function shows desired or planned consumption at that level of income. Each point on the savings function shows the desired or planned savings at that income level.

The two functions are closely related, since income always equals consumption plus saving. Therefore these can be called complementary curves.

Investment Function

For simplicity we shall assume that firms plan to invest exactly the same amount every year, regardless of the level of income.

If we plot on a graph the level of investment demand at every level of income, we will have the investment curve. Figure 5 shows the investment curve.

Since firms plan to invest the same amount I_o regardless of the level of income, the investment schedule will be a horizontal line. This is because every point on the investment curve lies at the same height above the horizontal axis, That is, the level of investment demand is the same at every level of income.

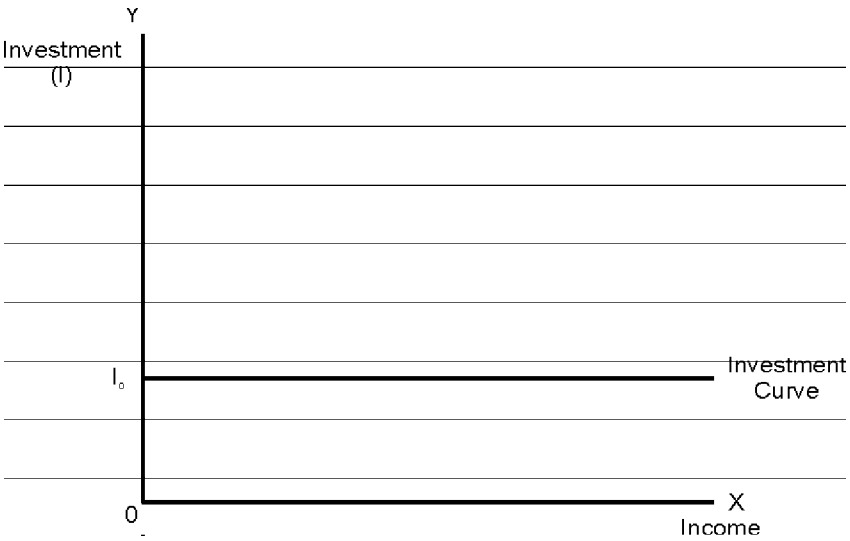

Fig. 5 : The Investment Schedule

Equilibrium Income

By examining the interaction of savings and investment, we can find the equilibrium level of Income. Fig 6. combines the savings curve of Fig. 4 and the investment curve of Fig. 5.

We see the savings curve and the investment curve intersect at point E. This point corresponds to a level of income OM, which is the equilibrium level of income.

This intersection of the savings curve and the investment curve gives the equilibrium towards which income will gravitate.

Meaning of the Equilibrium

Point E is the point of intersection of the savings curve and the investment curve. Thus, only at point E will planned savings of households equal planned investment of firms. When planned savings and planned investment are not equal, income will tend to adjust up or down till they are equal again.

The savings curve and the investment curve of Fig. 6 represent planned levels of savings and

invesment respectiviely. Thus, at income level OM, firms plan to invest an amount equal to ME. Also, households plan to save an amount equal to ME.

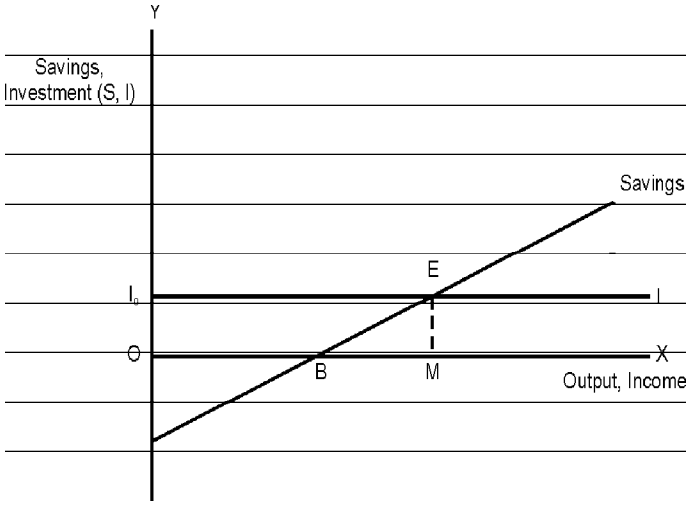

Fig. 6 : Intersection of the Savings curve and the Investment curve

We will look at the mechanism of how income changes until planned savings and planned investment are equal, under three separate cases.

The first case is where the economy is at a level of income equal to OM. At this level of output, planned savings of household equal planned investment. In this case, the economy is in equilibrium.

The second case is where the economy is at a level of income greater than OM. At the corresponding level of income, the savings curve lies above the investment curve, Therefore, at this level of income planned savings are more than planned investments. The effect of this will be to cause an unplanned build-up of inventories. In order to reduce the unplanned inventories to the desired level, firms will cut back production. The effect of this will be fall in income until the economy returns to equilibrium at income level OM, where planned savings equal planned Investment.

The third case is where the economy is at a level of income less than OM. At the corresponding level of income, the savings curve lies below the investment curve. Therefore, at this level of income planned savings are less than planned investment. The effect of this will be to cause an unplanned, reduction in inventories.In order to increase inventories to the desired, planned level firms will increase production. The effect of this will be increase in income till the economy returns to income level OM, where planned savings equal planned investement.

All three cases lead to the same inference. The only equilibrium level of income is OM, where planned saving equals planned investment. At any other level of income, the discrepancy between planned saving and planned investment will cause firms to change their production there by returning the economy to the equilibrium income.

In equilibrium Aggregate Demand equals Aggregate Supply.

Let us take a numerical example to show the same. Consider Table 4 based on $\bar{C}$ = 1000 and MPC = 0.8

Table 4 : Determination of Output (All Figures in Rs. Crore)

Income (Y) (1)	Consumption expenditure (C) (2)	Saving (S) (3)	Investment expenditure (I) (4)	Aggregate Supply (=Y) (5)	Aggregate Demand (C+I) (6)	Income tendency (7)
0	100	-100	300	0	400	Increase
1000	900	100	300	1000	1200	Increase
2000	1700	300	300	2000	2000	Equilibrium
3000	2500	500	300	3000	2800	Decrease
4000	3300	700	300	4000	3600	Decrease
5000	4100	900	300	5000	4400	Decrease

Compare columns 5 and 6. Column 5 shows aggregate supply which by definition equals income (y). Column 6 shows aggregate demand which equals C+I. In row 1, at Y=0, AD exceeds AS. Similarly in row 2, at Y = 1000, AD exceeds AS. This causes unplanned reduction in inventory inducing more production for making up the deficiency. This raises income.

In row 3, at Y=2000, AD equal, AS. This keeps the inventory level unchanged. The economy is in equilibrium.

In rows 4, 5 and 6, AD falls short of AS, causing unplanned increase in inventories inducing producers to produce less till the inventories achieve the desired level. This decreases income.

- **MULTIPLIER**

A change in the investment spending affects income.The operation of the multiplier ensures that a change in investment causes a change in income by an amplified amount, which is a multiple of the change in investment.The multiplier is the number by which the change in investment must be multiplied in order to determine the resulting change in income.

For example, if an increase in investment of Rs. 100 crores causes an increase in income of Rs. 300 crore, then the multiplier is 3. If, instead the resulting increase in income is Rs. 400 crores, then the multiplier is 4.

DERIVATION OF MULTIPLIER (FOR REFERENCE ONLY)

We may derive an expression for the multiplier as follows:

At equilibrium, we have

$Y = C + I$

I.e., income equals the sum of consumption plus investment.

We can use the consumption function to substitute C with the expression $\bar{C}+bY$, to give

$$Y = \bar{C} + bY + I$$

$$\text{so } Y - bY = \bar{C} + I$$

$$\text{or, } Y(I-b) = \bar{C} + I$$

$$\text{or, } Y = \frac{1}{(1-b)} (\bar{C} + I)$$

Since b is nothing but the MPC, we have

$$Y = \frac{1}{(1-MPC)} (\bar{C} + I)$$

To find out the effect of a change in investment on income, we differentiate the equation to obtain.

$$\Delta Y = \Delta I \quad = \quad \frac{1}{I - MPC}$$

So, (Change in income) = (Multiplier) (Change in Investment)

The multiplier is equal to 1/(1-MPC). As we can see. the size of the multiplier depends on value of the MPC. Since O < MPC < 1, the multiplier will be greater than 1. Hence, a change in investment will cause a multiple change in income.

The actual size of the multiplier depends on the value of MPC. For example if MPC is 2/3 then the multiplier is 3. If MPC be at 4/5, the multiplier is 5.

A numerical example will enable us to see the **operation of the multiplier**. Let the MPC be at 4/5. Suppose there is an increase in investment of Rs. 1000. which results in the construction of a new building. Then, the builder, the architect and the labourers together will get an increase in income of Rs. 1000. Since the MPC is 4/5, they will together spend 800 (4/5 of Rs. 1000) on new consumption goods. The producers of those consumption goods will thus have an increase of Rs. 800 in their incomes. Since their MPC is also 4/5, they will in turn spend Rs. 640 (4/5 of Rs. 800. or 4/5 of 4/5 of Rs. 1000). This will cause an increase in income of other people by Rs 640. This process will go on with each new round of spending (and therefore increase in investment) being 4/5 of the previous round.

Thus, an endless chain of secondary consumption spending is set in motion by the primary investment of Rs. 1000. However. not only is the chain of secondary consumption spending endless, it is also ever-diminishing. Eventually, the sum of the secondary consumption expenditures will be a finite amount.

We can calculate the total increase in income as follows:

Working of Multiplier

(Δ I = 1000, MPC = 0.8)

Increase in income (ΔY)	**Increase in C** $(\Delta C) = \Delta Y \times MPC$
1000	800 (= 1000 x 0.8)
800	640 (= 800 x 0.8)
640	512 (= 640 x 0.8)
512	409.6 (= 512 x 0.8)
⋮	⋮
5000	4000 (= 5000 x 0.8)

We have said that the chain of secondary consumption spending is an endless ever-diminishing chain, whose sum is a finite amount. As a result the sum of the total increase in income is:

$\Delta Y = (1 \times Rs.\ 1000) + [(4/5) \times Rs.\ 1000] + [(4/5)^2 \times Rs.\ 1000] + (4/5)^3 \times Rs.\ 1000 + ...$

$\Delta Y = Rs.\ 1000\ [1 + (4/5) + (4/5)^2 + (4/5)^3 + ...]$

The term in square brackets is of the form of the sum of an infinite geometric progression, whose first term is 1 and where constant multiplier 'r' is 4/5.

The formula for the sum of such an infinite geometric progression is 1/(1-r). In our case.

r = 4/5, therefore the sum of the geometric progression is

1 / [1 - (4/5)] = 5

Replacing the term in the square brackets by 5, we have

$\Delta Y = Rs.\ 1000 \times 5 = 5000$

We can see that with an MPC of 4/5, the multiplier is 5.

We may also express multiplier in terms of the marginal propensity to save, that is MPS

$$\text{Multiplier} = \frac{1}{1 - MPC}.$$

Since MPS = 1 - MPC, we have

$$\text{Multiplier} = \frac{1}{MPS}.$$

i.e., if MPS were 1/x, then the multiplier would be x.

In our example, the MPS is 1/5. Let the investment expenditure increase by Rs. 1000 crore. Planned saving will have to rise till it equals the new and higher level of investment, in order to 'bring output to a new equilibrium. The only way that saving can rise is for income to rise.With an MPS of 1/5 and an increase in investment of Rs. 1000 crore, income must rise by Rs. 5000 crores to bring forth Rs. 1000 crores of additional saving to match the new investment. Hence, at equilibrium, Rs. 1000 crore of additional investment induces Rs. 5000 crores of additional income, in line with our multiplier arithmetic.

- **EXCESS DEMAND AND DEFFICIENT DEMAND**

Thus far, we have studied the determination of income. The equilibrium level of income, is determined solely by the level of aggregate demand. The economy will be in full-employment equilibrium if the aggregate demand is for an amount of income that is equal to the full-employment level of income aggregate supply. If the aggregate demand is for an amount of output less than the full employment level of output, then it is known as deficient demand. If the aggregate demand for a level of output is more than full-employment level of aggregate supply output, then it is known as excess demand. We will take up the problems of and remedies for excess and deficient demand individually.

Problem of Deficient Demand

If aggregate demand is for a level of income less than the full-employment level, then a situation of deficient demand exists. Deficient demand gives rise to a 'deflationary gap', which causes the economy's income, to decline, thus pushing the economy into an under-employment equilibrium. Figure 7, depicts the situation of deficient demand.

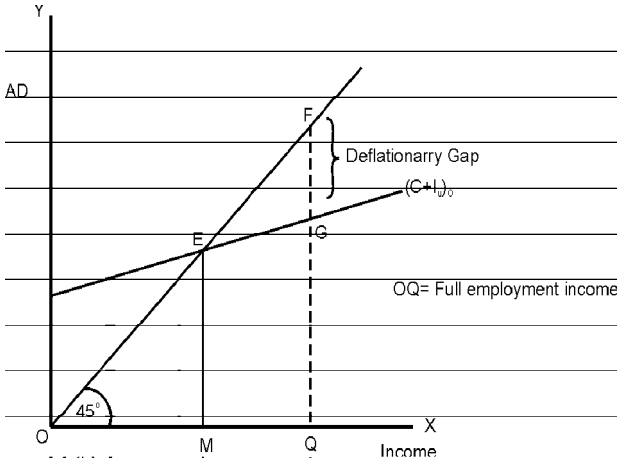

Fig. 7 : Deficient Demand/Deflationary Gap

The Y-axis measures the aggregate demand. The X-axis measures income. OQ is the full employment level of income. $(C+I)_0$ is aggregate demand curve.

For the economy to be at a full-employment equilibrium, the aggregate demand should be for a level of income equal to the full-employment level of income OQ. In other words, aggregate demand should be equal to QF.

Supose,however, that the aggregate demand is for a level of output QG, QG is less than QF. Then aggregate demand is for a level of income which is less than the full-employment level. This level of aggregate demand corresponds to point G on the aggregate demand curve $(C+1)_0$. This results in a situation of deficient demand. The resulting deflationary gap created due to deficient demand is

represented in Figure 7 by FG.

The deflationary gap is called deflationary because it sets in motion forces that cause deflation, i.e., fall in price level.

Problem of Excess Demand

If aggregate demand is for a level of income more than the full employment level, then a situation of excess demand exists. Excess demand gives rise to an inflationary gap; which causes a rise in the price level or inflation. Figure 8 depicts the situation of excess demand.

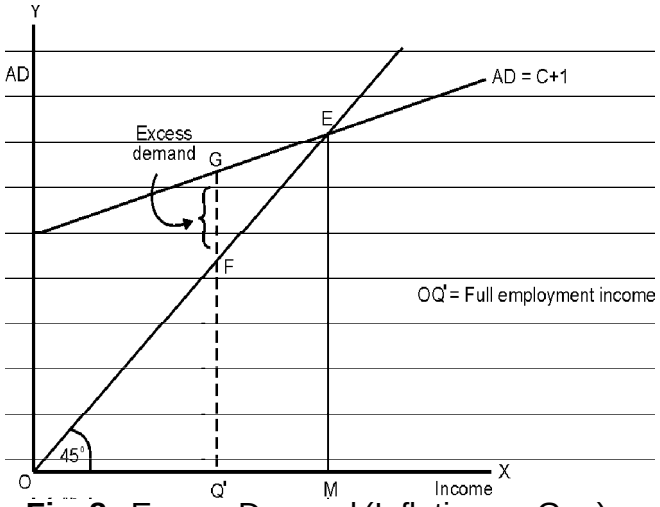

Fig. 8 : Excess Demand (Inflationary Gap)

Suppose that the aggregate demand is for a level of output QG. which is greater than the full-employment level of income. This level of aggregate demand corresponds to point G on the aggregate demand curve (C+I) This is a situation of **excess demand.** The resulting inflationary gap, created due to the excess demand is represented in Figure 8 by FG.

The inflationary gap is the amount by which the actual aggregate demand exceeds the level of aggregate demand required to establish the full-employment equilibrium. The inflationary gap is a measure of the amount of the excess of aggregate demand.

The inflationary gap is so called because it sets in motion forces that will cause inflation or a rise in the price level. At point G, the aggregate demand curve (C+I) lies above the 45° line. As a result, the aggregate demand Q'G is greater than the level of output OQ'. The effect of this will be to create demand pull inflation (an aggregate demand induced rise in the price level).

Remedy for Deficient Demand

In order to remedy the problem of deficient demand, the aggregate demand has to be increased by an amount equal to the deflationary gap. This will move the economy to the full employment equilibrium at point F.

The aggregate demand may be increased by taking recourse to fiscal policy, monetary policy or both.

(i) Increase in government expenditure

We shall first consider the fiscal policy measures to increase aggregate demand. This may be done by either increasing the level of government expenditure or by reducing the amount of taxes. We will consider only increase in government expenditure. If the government expenditure is increased

by an amount equal to the deflationary gap, it will restore the economy to the full-employment equilibrium.

(ii) Increase in availability of credit

The problem of deficient demand can also be solved by taking resort to monetary policy measures. The aim of the monetary policy measures is to cause an increase in the investment expenditure by firms. This may be done by increasing the availability of credit.

More credit can be made available by taking recourse to the various instruments of credit regulation. These are explained under functions of Central Bank.

Remedy for Excess Demand

As we have seen earlier, if aggregate demand is for a level of income greater than the full employment level of income, then a situation of excess demand exists.

In order to remedy the problem of excess demand, the aggregate demand has to be reduced by an amount equal to the inflationary gap. This will keep the economy at full employment equilibrium but will lower the price level and thus combat the inflation. The aggregate demand may be reduced by taking recourse to fiscal policy or to monetary policy.

(i) Reduce Government Expenditure

Reduction in government expenditure will reduce aggregate demand and remove the inflationary gap. The fall in government expenditure should be equal to the inflationary gap.

(ii) Reduce availability of credit

The monetary policy measures, explained under functions of Central bank will combat the problem of excess demand through a reduction in the availability of credit. This decrease in investment demand would cause a decrease in aggregate demand until the inflationary gap is eliminated.

UNIT 8

Capital receipts and Revenue receipts

Capital receipts are receipts that either create a liability (for example - borrowings) or reduce asset (for example disinvestment of PSU).

Revenue receipts are receipts that neither create any liability nor reduce any asset. Tax revenue or non tax revenue are revenue receipts as they neither create any liability nor reduce any asset.

Capital expenditure and Revenue expenditure

Any expenditure by the government that either creates an asset (for example construction of school building etc) or reduces a liability (for example repayment of loan) is categorised as capital expenditure

Any expenditure by the government that neither creates an asset nor reduces a liability is catagorised as revenue expenditure, (for example interest payment, subsidies, grants given to states even if some of these may be for creation of assets).