CLASS XII

Supplementary Reading Material in Economics

Part B : Introductory Macroeconomics

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PART B : INTRODUCTORY MACROECONOMICS

UNIT 6 - NATIONAL INCOME AND RELATED AGGREGATES

SOME CONCEPTS

CONCEPT OF ECONOMIC TERRITORY

INTRODUCTION

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? Is it simply citizens? Or, it is something else. The answer to these questions leads 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.

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.

CONCEPT OF 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 inludes production activity of the production units located in the economic territory irrespective of whether carried out by the residents or non-residents.

Relation between national product and domestic 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 resident's 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 residents". 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 good into another 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 onthe 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. + Sub-depreciation = $NDP_{fc.}$

or NDP_{fc} + I.T. - Sub+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 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 to the owners of a production unit. The production unit uses profit for (i) payment of corporation tax, (ii) dividend payments and (iii) undistributed profits/ retained earnings.

The main source of factor payments are 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 adjsutments we can arrive at national income

OFCE
+ GFCE
+ GDCF
+ (X-M)

= GDP_{mp}
- Consumption of fixed capital

= NDP_{mp}
- indired 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. ‘Clossing stock - opening stock ‘ equals net change in stocks.

PRECAUTIONS IN MARKING

ESTIMATES OF NATIONAL INCOME

There are a large number of conceptual and statistical problem that orise 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 thanonce. This will lead to overestimation of national income. There are two alternative ways of avoiding double counting: (a) count only valueadded 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 treated as fresh production, and therefore doesn't should not 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, characters, 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 orising 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 seef. 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 include 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 contrast 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 accring 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.

NDPfc

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, 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 which private income is a part.

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 tax, and therefore deducted.

UNIT 7

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 on 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 multiplies. 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 has two components. A part of the LRR is to be kept 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 withdrawals is more than cash reserves at some point of time? There are two reasons. Firstly, 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 in to the banks. Therefore to meet the daily demand 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 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 in 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 are now Rs. 180 (=100+80).

When banks receive new deposits of Rs. 80, the banks 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 sametime 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:

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

In our above illustration the LRR is 0.2 therefore,

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

The total money creation is thus:

Money creation = 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. Currency Authority

The Central Bank is the sole authority for the issue of currency in the country. All the currency issued by the Central Bank is its monetary liability. This means that the Central Bank is obliged to back the currency with assets of equal value. These assets usually consist of gold coins, gold bullions, foreign securities, and the domestic government's local currency securities.

The country's Central Government is usually authorized to borrow money from the Central Bank. Government does this, by selling local currency securities to the Central Bank. The effect of this is to increase the supply of money in the economy. When the Central Bank acquires these securities, it issues currency. This authority of the government gives it flexibility to monetize its debt. Monetizing the government's debt (called public debt) is the process of converting its debt (whether existing or new), which is a non-monetary liability, into Central BanK currency, which is a monetary liability.

Putting and withdrawing currency into and from circulation is also the job of its banking department. For example, when the government incurs a deficit in its budget, it borrows from the Central Bank. This is done by selling treasury bills to the Central Bank, the latter paying for the bills by drawing down its stock of currency or printing currency against equal transfer of the said securities. The government spends the new currency and puts it into circulation.

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 borrowing by selling ad-hoc treatury 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 and Supervisor

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 filled by them.

4. Controller of Money Supply and 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. Generally they are categorised as quantitative and qualitative instruments. Let us first detail with the instruments of quantitative control. i.e. those that affect only the quantity of the particular variable :

1. Bank Rate Policy : The bank rate is the rate at which the central bank lends funds as a 'lender of last resort' to banks, against approved securities or eligible bills of exchange. 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. In actual practice however, the effectiveness of bank rate policy will depend on (a) the degree of banks' dependence on borrower reserves (positive relationship). (b) the sensitivity of banks' demand for borrowed funds to the differential between the banks lending rate and their borrowing rate (positive relationship), (c) the extent to which other rates of interest in the market change and (d) the state of supply and demand of funds from other sources.

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. Successful conduct of OMO as a tool of monetary policy requires first that a well functioning securities market exists. If banks regularly and routinely resort to keeping excess reserves then the utility of such a policy will be doubtful.

3. Varying Reserve Requirements : Banks are obliged to maintain reserves with the Central Bank on two accounts. One is the Cash Reserve Ratio or CRR and the other is the SLR or Statutory Liquidity Ratio. Under CRR the banks are required to deposit with the Central Bank a percentage of their net demand and time liabilities. Varying the CRR is a tool of monetary and credit control. An increase in the CRR has the effect of reducing the banks excess reserves and thus curtails their ability to give credit.

The SLR requires the banks to maintain a specified percentage of their net total demand and time liabilities in the form of designated liquid assets which may be (a) excess reserves (b) unencumbered (are not acting as security for loans from Central Bank) government and other approved securities (securities whose repayment is guaranteed by the government) and (c) current account balances with other banks. Varying the SLR affects the freedom of banks to sell government securities or borrow against them from the Central Bank. This affects their freedom to increase the quantum of credit and therefore the money supply. Increasing the SLR reduces the ability of banks to give credit and vice versa.

We now deal with instruments of qualitative credit control, which deal with the allocation of credit between alternative uses.

1. Imposing margin requirement on secured loans : 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. The advantages of this instrument are manifold. High margin requirements discourage speculative activities with bank credit and therefore divert resources from unproductive speculative activities to productive investments. By reducing speculative activities, there is reduction in the fluctuation of prices.

2. Moral Suasion : This is a combination of persuasion and pressure that the Central Bank applies on the other banks in order to get them to fall in line with its policy. This is exercised through discussions, letters, speeches and hints to banks. The Central Bank frequently announces its policy position and urges the banks to fall in line. Moral suasion can be used both for quantitative as well as qualitative credit control.

3. Selective Credit Controls (SCCs) : These can be applied in both a positive as well as a negative manner. Application in a positive manner would mean using measures to channel credit to particular sectors, usually the priority sectors. Application in a negative manner would mean using measures to restrict the flow of credit to particular sectors.

UNIT 8 - Determination of Income and Employment

Involuntary unemployment : Involuntary unemployment occurs when those who are able and willing to work at the going wage rate do not get 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 and employment is to be studied in the context of two sector model, the third and fourth components of aggregate demand are not discussed in details. The two sectors taken are households and firms.

1. 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.

This demand is influenced by many variables such as price of the goods or services, income, wealth, expected income, tastes and preferences of individuals and so on. Keynes formulated his fundamental Psychological Law of Consumption to lay down a behavioural rule to the process of consumption activity.

Keynes stated that “men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income”. This 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 = Level of 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 comsumption 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, a rupee 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 (1) 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

Consumption C	Change in Consumption C	Income Y	Change in Y	Marginal Prpensity to consume (MPC) = (2)/(4) = C/ Y
(1)	(2)	(3)	(4)	(5)
100	-	0	-	-
180	80	100	100	(80/100) = 0.8
260	80	200	100	(80/100) = 0.8
340	80	300	100	(80/100) = 0.8
420	80	400	100	(80/100) = 0.8
500	80	500	100	(80/100) = 0.8
580	80	600	100	(80/100) = 0.8
660	80	700	100	(80/100) = 0.8
740	80	800	100	(80/100) = 0.8
820	80	900	100	(80/100) = 0.8
900	80	1000	100	(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^o line drawn from the origin. Since the vertical and horizontal axes have the same scale, the 45^o line has the property that at any point on it, the distance up from the horizontal axis (which is consumption expenditure) exactly equals the distance across from the vertical axis (which is income).

Thus, at any point on the 45^o line, consumption expenditure exactly equals income. The 45^o 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^o 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^o 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.

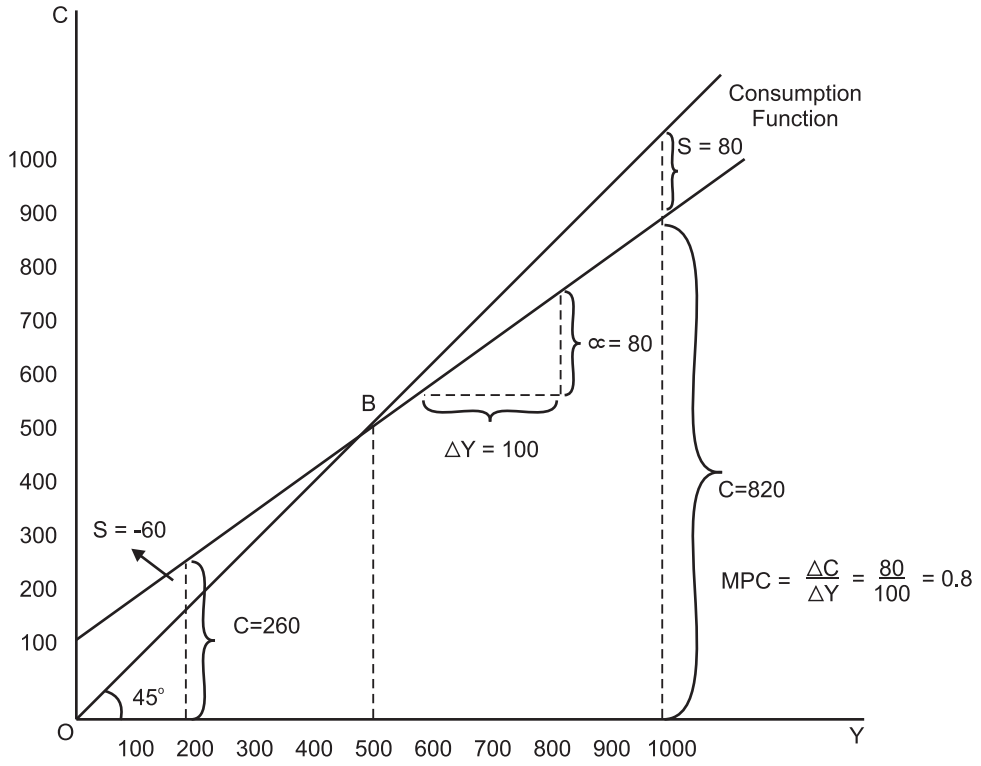

Fig. 1 : The Consumption Function C = 100 + 0.8 Y

At any point to the right of B, the consumption function 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 save, 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 functiuon 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 function 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 function 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 $C = \bar{C} + bY$)

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

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

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, tha 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 △ Y	C	Change in C △C	MPC △C/△Y	Saving S	Change in S △ S	MPS △S/△Y	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	100	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 rises 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

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

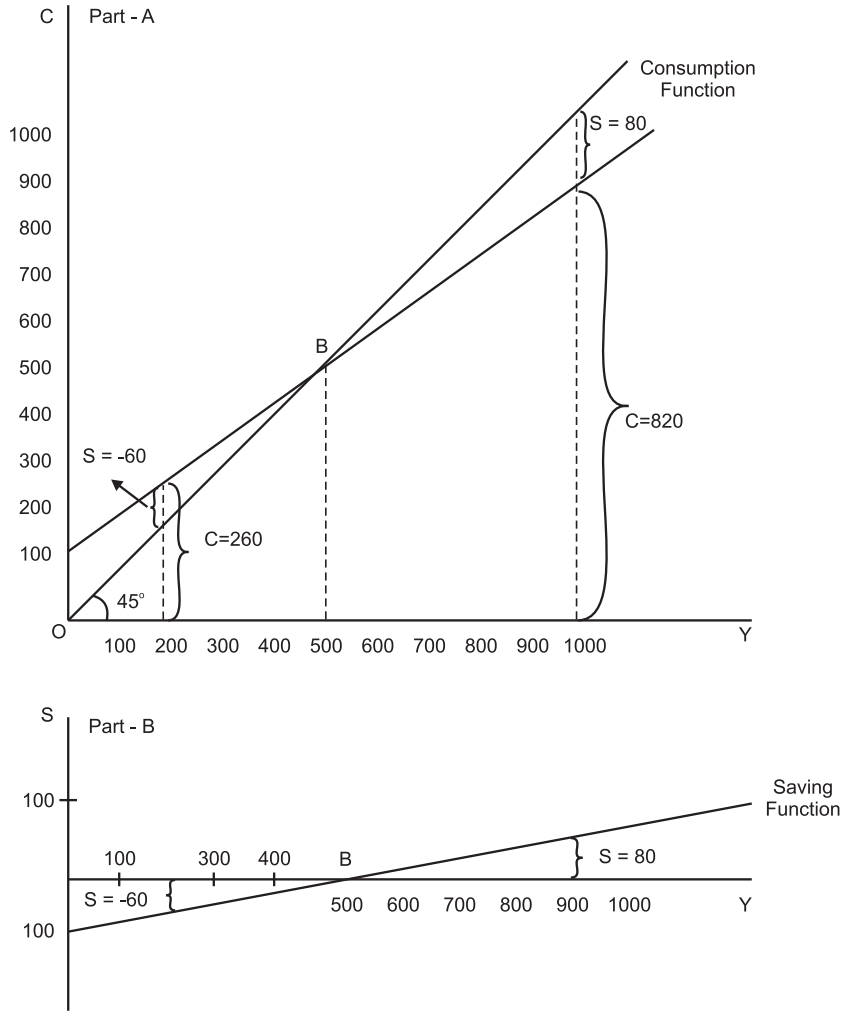

Fig 2 : The consumption Function and its associated Savings Function

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
(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	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 total quantity of goods and services produced in the economic teritory of a country. It refers to the planned aggregate output in the economy. It is assumed that in the short run the prices of goods do not change and the elasticity of supply is infinite. At the given price level, output can be increased till all resources are fully employed. So how much will be the aggregate output will primarily depend upon how much is the aggregate demand in the economy.

The level of output income and employment in an economy move together in the same direction till full employment is reached. Increase in output means, increase in level of employment and increase in level of income. Decrease in output means less employment and lower level of income.

Determination of Equilibrium Level of Output, Income & Employment

We shall confine our analysis of the determination of the equilibrium level of output 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 output determination using the consumption plus investment (C+I) approach. This is illustrated in Fig. 3, which shows total spending or aggregate demand plotted against output or 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 output (measured horizontally).

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

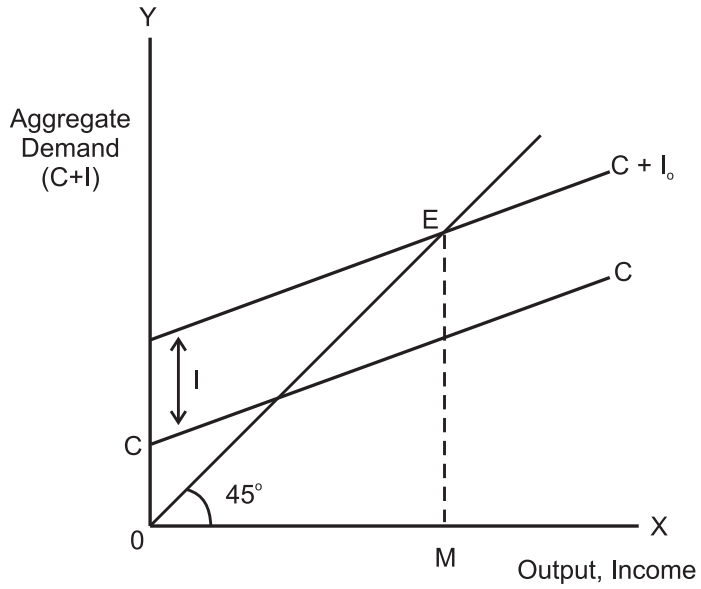

Fig. 3 : Output Determination by Consumption plus Investment approach

The aggregate demand or (C + I_o) 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_o curve interseets 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 output. The level of output corresponding to point E, is the level of output OM. Thus, OM is the equilibrium level of output.

The Adjustment Mechanism

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

Consider the case when the economy is at a level of output greater than the equilibrium level OM in Figure 3. At any such greater level of output, the C + I_o line lies below the 45° line that is planned spending is less than planned output. This means that consumers and firms together would be buying less goods than firms were producing. This would lead to an unplanned undersired 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 output will continue until the economy is back at output level OM, where again aggregate demand equals planned ouput and there is no further tendency to change.

Consider another case when the economy is at a level of output less than the equilibrium level OM. At any such lower level of output, the C + I_o line lies above the 45° line, that is, planned spending is more than planned output. 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 output level OM, where again aggregate demand equals planned output and there is no further tendency to change.

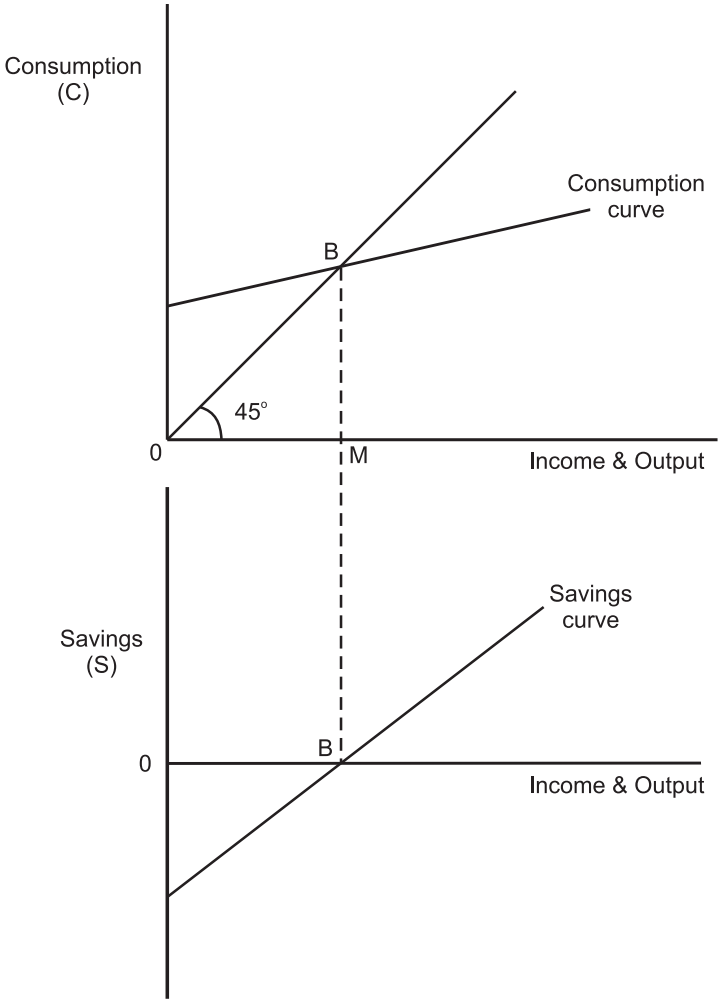

Fig. 4 : The Consumption Function and the corresponding Savings Function

Output Determination Using the Savings Function and the Investment Schedule

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 Schedule

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

If we plot on a graph the level of investment demand at every level of output (and therefore income), we will have the investment schedule. Figure 5 shows the investment schedule.

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

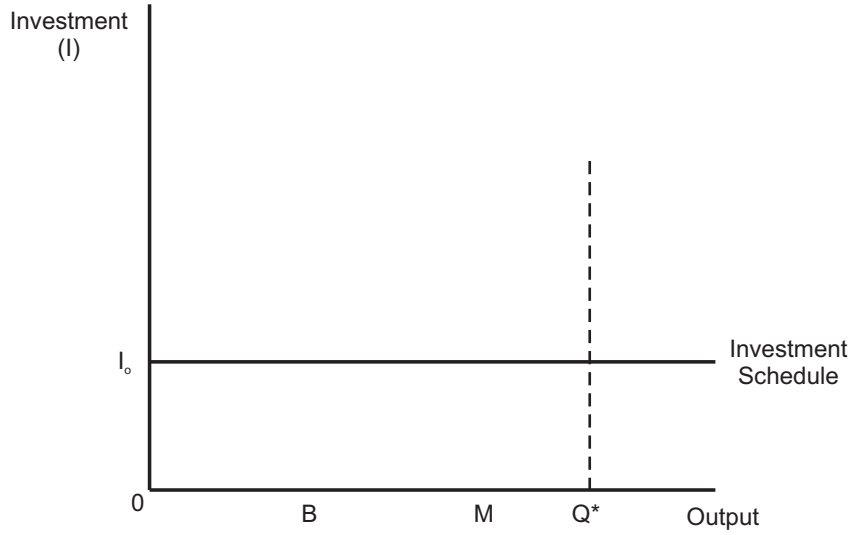

Fig. 5 : The Investment Schedule

Equilibrium Output

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

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

This intersection of the savings function and the investment schedule gives the equilibrium towards which output will gravitate.

Meaning of the Equilibrium

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

The savings function and the investment schedule of Fig. 6 represent planned levels of savings and invesment respectiviely. Thus, at output level OM, firms plan to invest an amount equal to ME. Also, households plan to save an amount equal to ME. However, in general, there is no necessity for acutal saving (or investment) to be equal to planned saving (or invesment). This may be due to mistakes, incorrect forecasting of events, or for a variety of other reasons. In any case, actual savings or investment might be different from planned savings or investment.

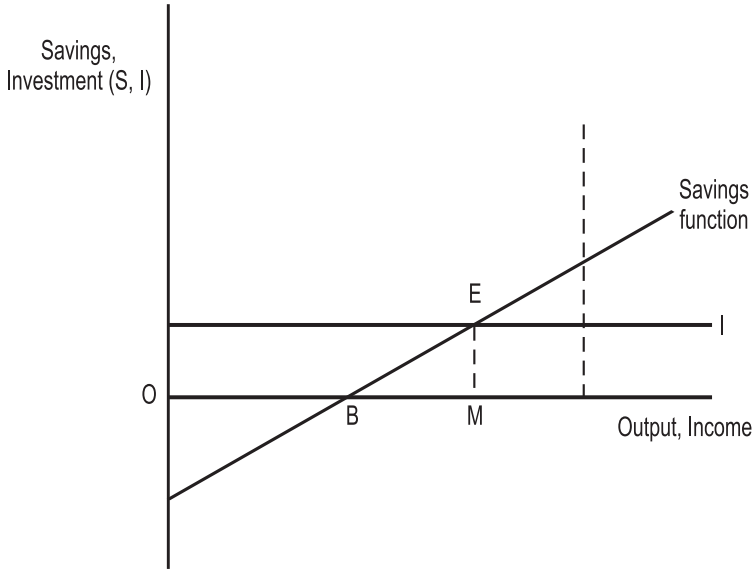

Fig. 6 : Intersection of the Savings Function and the investment schedule

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

The first case is where the economy is at a level of output equal to OM. At this level of output, planned savings of household equals planned investment of firms. Since the plans of households and firms are satisfied, they will be content to continue doing exactly what they had been doing till then. Thus output, employment and income will remain the same. In this case, it is righly called an equilibrium.

The second case is where the economy is at a level of output greater than OM. At the corresponding level of income, the savings function lies above the investment schedule, Therefore, at this level of income households are saving more, that is, they are refraining from consuming by an amount greater than firms are investing. The effect of this will be to cause an undesired, unplanned build-up of inventories of unsold goods. The effect of an undesired. unplanned inventory build-up is to increase the actual level of investment to a level greater than the planned level of investment. Since firms' plans have not materialized, they will act in order to correct the situation. In order to reduce the unsold inventories to the desired level firms will cut back production and reduce employment. The effect of this will be to reduce output until the economy returns to equilibrium at output level OM, where planned savings equals planned Investment,equals actual investment, and there is therefore no further tendency to change.

The third case is where the economy is at a level of output less than OM. At the corresponding level of income, the savings function lies below the investment schedule. Therefore, at this level of income households are saving an amount less than firms plan to invest. Households

are thus, refraining from consuming by an amount less than firms plan to invest. The effect of this will be to cause an unplanned, undesired reduction in inventories of unsold goods. Thus, the acutal level of investment will be less than the planned level of investment. Again, since firms' plans have not materialised, they will act in order to correct the situation. In order to increase inventories to the desired, planned level firms will increase production and increase employment. The effect of this will be to increase output till the economy returns to output level OM, where planned savings equals planned investment, planned investment equals actual investment, and there is thus no further tendency to change.

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

In equilibrium planned expenditure and planned output must be equal

A numerical example will show why the equilibrium level of output occurs when planned spending and planned output are equal. Table 4 shows an example using a consumption function and the associated savings function.

The consumption function is

C = 1000 + 0.67Y

The associated savings function is

S = - 1000 + 0.33Y

Column (2) represents the level of planned consumption at various levels of income. The values in column (2) are derived from the consumption function used above. Column (3) represents the levels of planned saving at various levels of income. The values in column (3) are derived from the savings function used above. Column (5) is a reproduction of column (1). Column (6) shows the level of aggregate demand at various levels of income - it is the sum of consumption demand in column (2) and investment demand in column (4). It shows what firms actually managed to sell.

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

Output and Income	Planned Consum-ption	Planned Saving (3)=(1)-(2)	Planned Invest-ment	Output and Income (5) = (1)	Aggregate Demand (6)=(2)+(4)	Tendency of Output to
(1)	(2)	(3)	(4)	(5)	(6)	(7)
4200	3800	400	200	4200>	4000	Decrease
3900	3600	300	200	3900>	3800	Decrease
3600	3400	200	200	3600=	3600	Equilibrium
3300	3200	100	200	3300<	3400	Increase
3000	3000	0	200	3000<	3200	Increase
2700	2800	-100	200	2700<	3000	Increase

The level of income at which consumption is exactly equal to income (that is, all income is consumed), and therefore, savings is exactly equal zero is known as the break-even level of income. In our example, the breakeven level of income is Rs. 3000 crores.

Now, each change of income of Rs. 300 crores causes a change of Rs. 100 crores in saving, and a change of Rs. 200 crores in consumption. Thus MPS is a constant and is equal to 1/3 and MPC is a constant and is equal to 2/3.

Investment is assumed to be exogenous. Firms plan to invest a constant amount of Rs. 200 crores as shown in column (4). That is, at each level of income, firms plan to purchase Rs. 200 crores of investment goods.

Consider the top row of the Table 4. If firms are producing Rs. 4200 crores of output, then the planned spending or aggregate demand is only R.s 4000 crores. In this situation, there will be an unplanned accumulation of inventories to the tune of Rs. 4200 crores - Rs. 4000 crores = Rs. 200 crores. Firms will respond to this unplanned inventory build-up by scaling down their operations and thus output will decrease.

The opposite case is represented by the bottom row of Table 4. Here, firms are producing Rs. 2700 crores of output but aggregate demand is Rs. 3000 crores. In this situation, there will be an unplanned decrease in inventories to the tune of Rs. 3000 crores - Rs. 2700 crores = Rs. 300 crores. Firms will respond to this unplanned inventory decrease by expanding their operations, thus causing an increase in output.

Thus, when firms as a whole are temporarily producing more than they can sell, they will contract their operations, causing output to fall. When they are temporarily selling more than their current production, they will expand their operations, causing output to rise.

Only when the level of output in column (5) is equal to aggregate demand in column (6) will output be in equilibrium. Firms sales will be just enough to justify continuing their current level of aggregate output. Thus, aggregate output will neither expand nor contract, and will be in equilibrium. The equilibrium level output in our example is Rs. 3600 crores.

The Multiplier

A change in the investment spending will affect output and therefore employment. It is logical that an increase in fixed business investment will increase the level of output and employment through increase in productive capacity. Conversely, a decrease in investment will decrease the level of output and employment.

The operation of the multiplier ensures that a change in investment causes a change in output 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 output.

For example, if an increase in investment of Rs. 100 crores causes an increase in output

of Rs. 300 crores, then the multiplier is 3. If, instead the resulting increase in output is Rs. 400 crores, then the multiplier is 4.

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

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

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

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

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

Since b is nothing but the MPC, we have

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

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

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

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

The multiplier is equal to I/(1-MPC). It is the number by which the change in investment must be multiplied in order to determine the resulting change in output.

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 output.

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 consumption plus investment spending and therefore the total increase in income as follows:

Rs. 1000	= 1 X Rs. 1000
+	+
Rs. 800	4/5 X Rs. 100
+	+
Rs. 640	$(4/5)^2$ X Rs. 1000
+	+
Rs. 512	$(4/5)^2$ X Rs. 1000
+	+
Rs. 409.6	$(4/5)^2$ X Rs. 1000
+	+
:	:
Rs. 5000	[1/{1-(4/5)}] x Rs. 1000
	Multiplier

We have said that the chain of secondary consumption spending is an endless ever-diminishing chain, whose sum is a finite amount.

We may find the sum of the total increase in spending by using the formula for the sum of an infinite geometric progression.

The sum of the total increase in spending and the total increase in income is:

ΔY = 1 x Rs. 1000 + (4/5) x Rs. 1000 + $(4/5)^2$ X Rs. 1000 + $(4/5)^3$ X Rs. 1000 + ...

ΔY = 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 infinte geometric pregression, 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

$\triangle$ Y = Rs. 1000 x 5

$\triangle$ Y = Rs. 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

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

Since MPS = 1 - MPC, we have

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

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 crores. 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 crores, 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 crores of additional investment induces Rs. 5000 crores of additional income, in line with our multiplier arithmetic.

Problems of Excess and Deficient Demand and Measures to Correct Them

Thus far, we have studied the determination of output,income and employment in the Keynesian framework. The equilibrium level of output, income and employment was 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 output that is equal to the full-employment level of output. 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 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 output 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, output and employment to decline, thus pushing the economy into an under-employment equilibrium. Figure 7, depicts the situation of deficient demand.

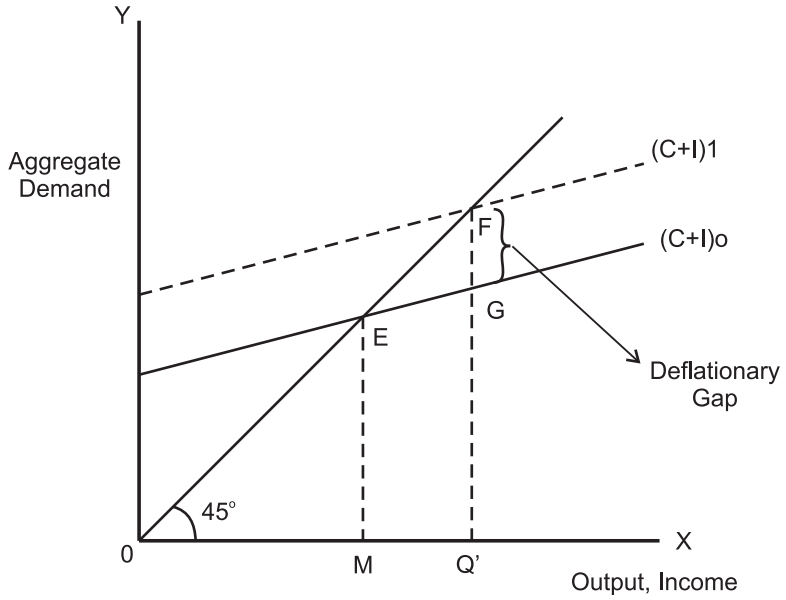

Fig. 7 : Deficient Demand

The Y-axis measures consumption demand, investment demand, and their sum the aggregate demand. The X-axis measures the level of output and income. OQ' is the full employment level of output and income. $(C+1)_0$ and $(C+1)_1$ are two parallel aggregate demand curves, differing only by the amount of investment expenditure.

For the economy to be at a full-employment equilibrium, the aggregate demand should be for a level of output equal to the full-employment level of output OQ'. In other words, aggregate demand should be equal to Q'F. The economy will then be in a full employment equilibrium, corresponding to the point F on the aggregate demand curve $(C+1)_1$ and the economy will produce full-employment level of output OQ'.

Supose,however, that the aggregate demand is for a level of output Q'G, Q'G is less than QF. Then aggregate demand is for a level of output 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 the difference between the level of aggregate demand required to establish the full-employment equilibrium and the actual level of aggregate demand. The deflationary gap is a measure of the amount of deficiency of aggregate demand.

The deflationary gap will set in motion forces that will cause a decline in the economy's output, income and employment. At point G, the aggregate demand curve $(C+1)_0$ lies below the 45^o line. As a result, the aggregate demand Q'G is less than the level of output OQ'. Firms will experience an unplanned build-up of inventories of unsold goods. They will respond by reducing employment and cutting back production. This will reduce the economy's output income and employment, until a new equilibrium is reached at point E. This is an equilibrium because the aggregate demand EM is equal to output OM (since point E lies on the 45^o line).

It will be noted that point E is an under-employment equilibrium. The equilibrium levels of output, income and employment corresponding to point E are less than the full employment

levels of output, income and employment corresponding to point F. Thus, the deficient demand caused deflationary gap and has pushed the economy into an under-employment equilibrium.

Problem of Excess Demand

If aggregate demand is for a level of output more than the full employment level, then a suituation 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.

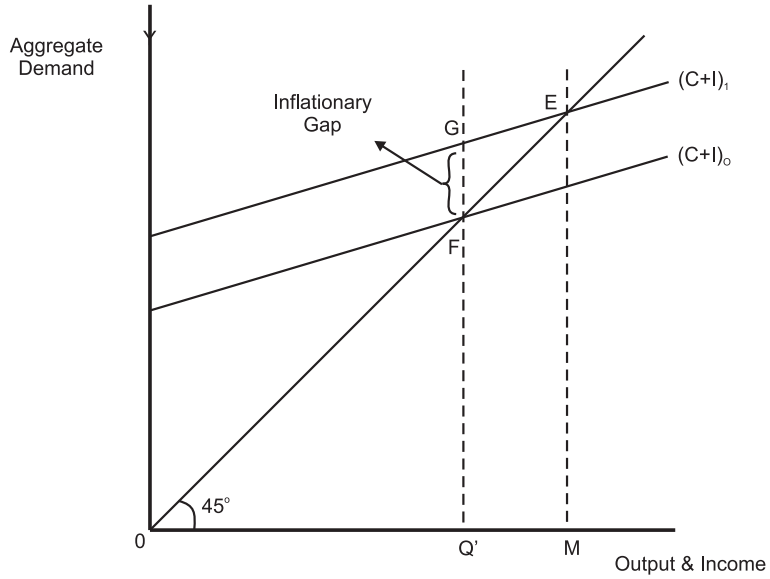

Fig. 8 : Excess Demand

The X-axis measures the level of output and income. The Y-axis measures consumption demand, investment demand, and their sum, the aggregate demand. OQ' is the full employment level of output and income. $(C+I)_o$ and $(C+I)_1$ are two parallel aggregate demand curves, differing only by the amount of investment expenditure.

The economy will be in a full-employment equilibrium at point F on the aggregate demand curve $(C+I)_o$ and the economy will produce full-employment level of output OQ'.

Uptil point Q' increases in nominal income and output correspond to increases in real income and output (since prices are constant). Beyond point Q' increases in nominal income and output do not correspond to any change in real income and output. This is because real income and output cannot increase beyond the full employment level, as all resources are already fully employed. The increases in nominal income and output are merely due to increases in the price level.

Suppose that the aggregate demand is for a level of output Q'G. which is greater than the full-employment level of output. This level of aggregate demand corresponds to point G on the aggregate demand curve $(C+I)_1$. 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 $(C+I)_1$. 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). The rise in price level, given the constant real output, will cause an increase in the nominal output until a new equilibrium is reached at point E. This is an equilibrium because the aggregate demand ME is equal to the output OM (since point E lies on the 45° line).

It will be noted that the real output and real income is the same at the new equilibrium E. Correspondingly, the equilibrium level of employment also is the same. All that has happend is that nominal output and income have increased due to an increase in the price level. Thus the excess demand caused an inflationary gap. which caused inflation, and therefore, the price level to rise. In other words, the economy remains at a full-employment equilibrium, although at a higher price level.

In a three sector ecomony where the three sectors are house-holds, firms and government, aggregate demand is equal to the sum of consumption, investment and government expenditure. Figure 9 shows the effect of G on aggregate demand. For simplicity, we consider government expenditure to be a constant amount. The new aggregate demand curve C+1+G lies parallel above the old aggregate demand curve C+1. This is because, at every level of output the vertical distance between the C+1 curve and the C+I+G curve is the constant amount of government expenditure.

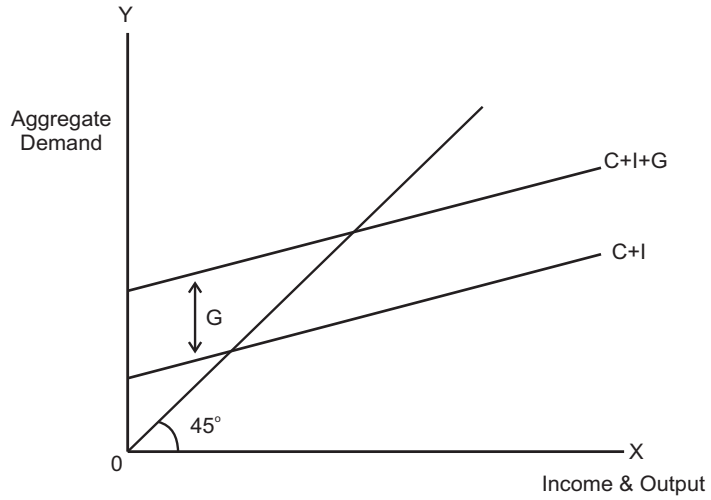

Fig. 9 : Aggregate demand including government expenditure

Thus, the inclusion of government expenditure in aggregate demand causes a parallel upward shift by an amount G in the aggregate demand curve.

We are now in a position to return to the measures that can be taken to remedy the problems of excess and deficient demand. In the following discussion, aggregate demand will be taken to mean the sum of consumption investment and government expenditure, since we are now considering a three sector economy. This modification to the definition of aggregate demand does not however change the nature of or definition of excess and deficient demand.

We will first consider the remedy to the problem of deficient demand.

Remedy for Deficient Demand

As we have seen earlier, if aggregate demand is for a level of output less than the full employment level of output, then a situation of deficient demand exists. Figure 10 depicts the situation of deficient demand in the context of the three sector economy.

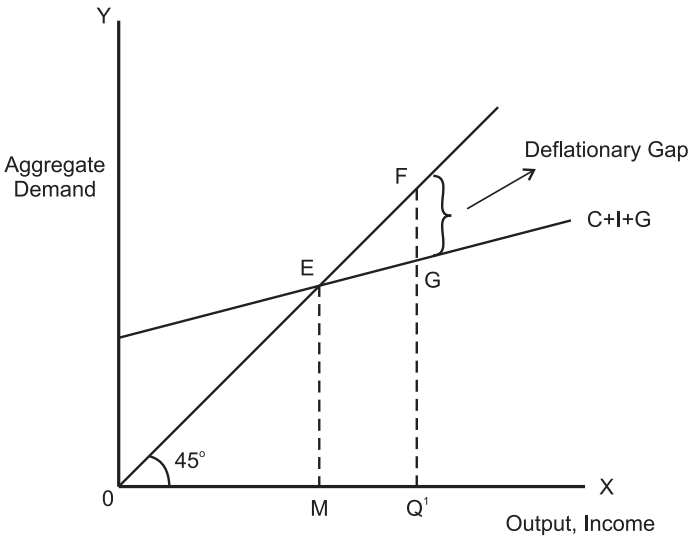

Fig. 10 : Deficient Demand in a Three Sector Economy

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.

Fiscal Policy Measures

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. The increase in government expenditure is shown in figure 11.

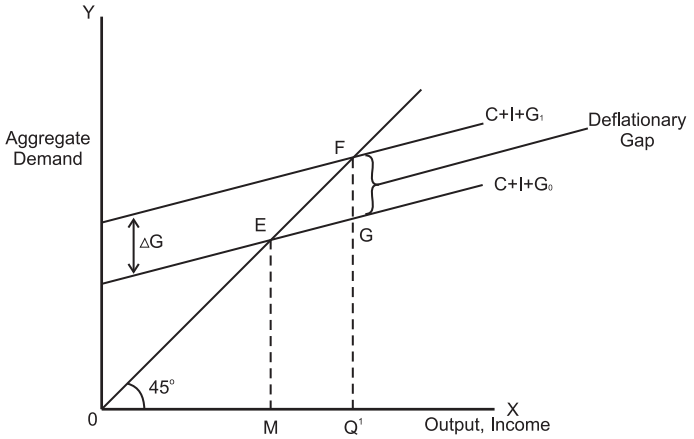

Fig 11. Increase in government expenditure as a remedy for deficient demand

The new level of aggregate demand is $C+I+G_1$ corresponding to a higher level of government expenditure G_1. This level of aggregate demand is sufficient to keep the economy at the full employment equilibrium, thus increase in government expenditure by an amount FG will eliminate the problem of deficient demand.

Monetary Policy Measures

The problem of deficient demand can also be solved by taking resort to monetary policy measures. The aim of the monetary policy measure is to cause an increase in the investment expenditure by firms. This may be done in a two step manner. The first step is to increase the availability of credit. This may be done by reducing the reserve ratios, thus giving commercial banks greater ability to create credit, The next step is to lower the interest rate by increasing the supply of money. The purpose of this step is to ensure the off take of the increased credit by firms. There is an inverse relationship between the rate of interest and the level of investment demand. If the economy's Central Bank lower the interest rate, then there would be an increase in investment demand.

This increase in investment demand would cause an increase in aggregate demand. Thus, by sufficiently lowering the interest rate, the Central Bank may increase investment demand and therefore aggregate demand, until the economy is restored to a full-employment equilibrium.

Remedy for Excess Demand

As we have seen earlier, if aggregate demand is for a level of output greater than the full employment level of output, 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.

Reduce Government Expenditure

Reduction in government expenditure will reduce aggregate demand and remove the inflationary gap. This can also be shown by a diagram in the same way as was done in a two sector model. The C+I+G curve will shift downward showing fall in Government expenditure. The fall in government expenditure should be equal to the inflationary gap.

Monetary Policy Measures

The monetary policy measure to combat the problem of excess demand will operate through a reduction in the investment demand by firms. There is an inverse relationship between the rate of interest and the level of investment demand. If the economy's Central Bank were to increase the interest rate, then there would be a decrease in investment demand.

This decrease in investment demand would cause a decrease in aggregate demand. Thus, by sufficiently raising the interest rate, the Central Bank may decrease investment demand and therefore, aggregate demand, until the inflationary gap is eliminated, and the price level reduced.

UNIT 9

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).

Implications of fiscal deficit.

The extent of fiscal deficit is an indication of how far the government is liviing beyond its means. Fiscal deficit is the amount of borrowings the government has to resort to meet its expenses. A large fiscal deficit means large amount of borrowings. This creates a large burden of interest payment and repayment of loans in the future. A large fiscal deficit may also be inflationary.