DANTULURI NARAYANA RAJU COLLEGE (A)::BHIMAVARAM

M.A.ECONOMICS

I SEMESTER PAPER - II

MACRO ECONOMIC ANALYSIS - I

STUDY MATERIAL

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DANTULURI NARAYANA RAJU COLLEGE (A)::BHIMAVARAM

P.G. Department of Economics

M.A. Degree ExaminationSemester-I

Paper-II: MACROECONOMIC ANALYSIS-I

PAPER-II

Module-1:NationalIncome Accounts

National income components –GDP, NDP, GNP, NNP at Market price and Factor cost, and different forms of national income accounting, Circular Flow of Income in two, three and four-sector economy; social accounting, input-output accountingflow of funds accounting and balance of payments accounting.

Module 2: Keynesian Model of Income determination & Consumption Function:Keynesian Model of Income determination & Investment function

Keynes psychological lawof consumption-implications of the law; short-run and long- run consumption function; Empirical evidence on consumption function; Income-consumption relationship-absolute income, relative income, life cycle and permanent income hypotheses. Marginal efficiency of investment and level of investment; marginal efficiency of capital and investment-long run and short run; The Accelerator and investment behavior.

Module3:Demandfor Money:

Classical approach to demand for money-Quantity theory approach, Fisher's equation, Cambridge quantity theory, Keynes's liquidity preference approach, transaction, precautionary and speculative demandfor money-aggregate demand for money;

Module4:Neo-classical andKeynesian Synthesis:

Neo-classical and Keynesian views on interest: The IS-LM model; Extension of IS-LM model with government sector; Relative effectiveness of monetary and fiscal policies: Extension of IS-LM models with labour market and flexible prices.

TextBooks:

1. Ackley, G. (1978), Macroeconomics: Theory and Policy, Macmillan, New York. Blackhouse, R. and A.Salansi (Eds.) (2000), Macroeconomics and the Real World (2Vols.), Oxford University Press, London.
2. Macroeconomicanalysis,Edwardshapiro,S.Chandpublishing.
3. Macroeconomictheory, M.l.Jingon,vrindapublication,NewDelhi.

References:

1. Branson, W.A. (1989), Macroeconomic Theory and Policy, (3rd Edition), Harper and Row, New York.
2. Dornbusch,R.andF.Stanley91997),Macroeconomics,McGrawHill,Inc.,New York.Hall, R.E. and J.B. Taylor (1986), Macroeconomics W.W.Norton, New York.

3. Advancedmacro economics,K.R.Gupta,Atlanticpublishers&distributors Pvt.ltd.

MODEL PAPER

DANTULURI NARAYANA RAJU COLLEGE (A)::BHIMAVARAM
P.G. Department of Economics
M.A. Degree ExaminationSemester-I
Paper-II: MACROECONOMIC ANALYSIS-I

SECTION –A

Time:3Hours. M**ax.Marks:75**

Note:(1)Answer either(a) or(b) fromeach of1to4 questions.
(2) Inquestion No:5, answer any five from(a) to (h).
(3) Each question carries fifteen marks.

1. (a).ExplaintheNationalincomecomponents,anddifferentformsofnationalincome accounting?

(Or)

(a). Define Circular flow of Income in Four-Sector Economy?

2. (a).Explain Keynes psychological Lawof Consumption?

(Or)

(b).Define the Permanent Income Hypothesis?

3. (a)Briefly explain Fisher and Cambridge approaches of Demand for Money?

(Or)

(b) Explain the Keynes approaches of Demand f or Money?

4. (a)Briefly explain the IS-LM model the effects of monetary and fiscal polices?

(Or)

(b) Explain the IS-LM model with Labour Market and Flexible Prices?

SECTION –B

Answerany**FIVE** of the following

5SocialAccounting?
6.Input - OutputAccounting?
7.Acceleratorand investment behavior?
8.Keynes liquiditypreference?
9.Absolute income Hypothesis?
10.Lifecycle hypothesis?
11.Marginal efficiency of investment?
12.Classical approach to demand for money?

UNIT-I

NATIONAL INCOME MEANING AND MEASUREMENT

INTRODUCTION

National income is an uncertain term which is used interchangeably with national dividend, national output and national expenditure. On this basis, national income has been defined in a number of ways. In common parlance, national income means the total value of goods and services produced annually in a country. In other words, the total amount of income accruing to a country from economic activities in a year's time, is known as national income. It includes payments made to all resources in the form of wages, interest, rent and profits.

DEFINITIONS OF NATIONAL INCOME

The definitions of national income can be grouped into two classes: *One*, the traditional definitions advanced by Marshall, Pigou and Fisher; and *two*, modern definitions.

The Marshallian Definition

According to Marshall: "The labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial including services of all kinds. ...This is the true net annual income or revenue of the country or national dividend."[1] In this definition, the word 'net' refers to deductions from the gross national income in respect of depreciation and wearing out of machines. And to this, must be added income from abroad.

The Pigouvian Definition

A.C. Pigou has in his definition of national income included that income which can be measured in terms of money. In the words of Pigou, "National income is that part of objective income of the community, including of course income derived from abroad which can be measured in money."[2] This definition is better than the Marshallian definition. It has

proved to be more practical also. While calculating the national income now-a-days, estimates are prepared in accordance with the two criteria laid down in this definition. *First*, avoiding double counting, the goods and services which can be measured in money are included in national income. *Second*, income received on account of investment in foreign countries is included in national income.

Fisher's Definition

Fisher adopted 'consumption' as the criterion of national income whereas Marshall and Pigou regarded it to be production. According to Fisher, "The National dividend or income consists solely of services as received by ultimate consumers, whether from their material or from the human environments. Thus, a piano, or an overcoat made for me this year is not a part of this year's income, but an addition to the capital. Only the services rendered to me during this year by these things are income."[3] Fisher's definition is considered to be better than that of Marshall or Pigou, because Fisher's definition provides an adequate concept of economic welfare which is dependent on consumption and consumption represents our standard of living.

Modern Definitions

From the modern point of view, Simon Kuznets has defined national income as "the net output of commodities and services flowing during the year from the country's productive system in the hands of the ultimate consumers." On the other hand, in one of the reports of United Nations, national income has been defined on the basis of the systems of estimating national income, as net national product, as addition to the shares of different factors, and as net national expenditure in a country in a year's time. In practice, while estimating national income, any of these three definitions may be adopted, because the same national income would be derived, if different items were correctly included in the estimate.

CONCEPTS OF NATIONAL INCOME

There are a number of concepts pertaining to national income and methods of measurement relating to them.

(A) Gross Domestic Product (GDP)

GDP is the total value of goods and services produced within the country during a year. This is calculated at market prices and is known as *GDP* at market prices. Dernberg defines GDP at market price as "the market value of the output of final goods and services produced in the domestic

territory of a country during an accounting year."

There are three different ways to measure *GDP* : Product Method, Income Method and Expenditure Method. These three methods of calculating *GDP* yield the same result because National Product = National Income = National Expenditure.

1. The Product Method. In this method, the value of all goods and services produced in different industries during the year is added up. This is also known as the value added method to *GDP* or *GDP* at factor cost by industry of origin. The following items are included in India in this : agriculture and allied services; mining; manufacturing, construction, electricity, gas and water supply; transport, communication and trade; banking and insurance, real estates and ownership of dwellings and business services; and public administration and defence and other

(B) GDP at Factor Cost

GDP at factor cost is the sum of net value added by all producers within the country. Since the net value added gets distributed as income to the owners of factors of production, *GDP* is the sum of domestic factor incomes and fixed capital consumption (or depreciation).

Thus *GDP* at Factor Cost = Net value added + Depreciation.

GDP at factor cost includes : (i) compensation of employees i.e., wages, salaries, etc. (ii) operating surplus which is the business profit of both incorporated and unincorporated firms. [Operating Surplus = Gross Value Added at Factor Cost—Compensation of Employees—Depreciation] (iii) Mixed Income of Self-employed.

Conceptually, *GDP* at factor cost and *GDP* at market price must be identical. This is because the factor cost (payments to factors) of producing goods must equal the final value of goods and services at market prices. However, the market value of goods and services is different from the earnings of the factors of production. In *GDP* at *market price* are included indirect taxes and are excluded subsidies by the government. Therefore, in order to arrive at *GDP* at *factor cost*, indirect taxes are subtracted and subsidies are added to *GDP* at market price.

Thus, *GDP* at Factor Cost = *GDP* at Market Price - Indirect Taxes + Subsidies.

(C) Net Domestic Product (NDP)

NDP is the value of *net* output of the economy during the year. Some of the country's capital equipment wears out or becomes obsolete each year during the production process. The value of this capital consumption* is some percentage of gross investment which is deducted from *GDP*. Thus

Net Domestic Product = *GDP* at Factor Cost - Depreciation.

(D) Nominal and Real GDP

When *GDP* is measured on the basis of current price, it is called *GDP* at current prices or nominal *GDP*. On the other hand, when *GDP* is calculated on the basis of fixed prices in some year, it is called *GDP* at constant prices or real *GDP*.

Nominal *GDP* is the value of goods and services produced in a year and measured in terms of rupees (money) at current (market) prices. In comparing one year with another, we are faced with the problem that the rupee is not a stable measure of purchasing power. *GDP* may rise a great deal in a year, not because the economy has been growing rapidly but because of rise in prices (or inflation). On the contrary, *GDP* may increase as a result of fall in prices in a year but actually it may be less as compared to the last year. In both cases, *GDP* does not show the real state of the economy. To rectify the underestimation and overestimation of *GDP*, we need a measure that adjusts for rising and falling prices. This can be done by measuring *GDP* at constant prices which is called *real GDP*. To find out the real *GDP*, a base year is chosen when the general price level is normal, i.e., it is neither too high nor too low. The prices are set to 100 (or 1) in the base year. Now the general price level of the year for which real *GDP* is to be calculated is related to the base year on the basis of the following formula which is called the *deflator index* :

$$\text{Real } GDP = \frac{\text{GDP for the Current Year}}{} \times \frac{\text{Base Year (=100)}}{\text{Current Year Index}}$$

Suppose 1990-91 is the base year and *GDP* for 1999-2000 is Rs. 6,00,000 crores and the price index for this year is 300.

Thus, Real *GDP* for 1999-2000 = Rs. 6,00,000 x 100/300 = Rs. 2,00,000 crores

(E) GDP Deflator

GDP deflator is an index of price changes of goods and services included in *GDP*. It is a price index which is calculated by dividing the nominal *GDP* in a given year by the real *GDP* for the same year and multiplying it by 100. Thus,

$$GDP \text{ Deflator} = \frac{\text{Nominal (or Current Prices) } GDP}{\text{Real (or Constant Prices) } GDP} \times 100$$

$$\text{For example, GDP Deflator in 1997-98} = \frac{1426.7\text{th. crores}}{1049.2\text{th. crores at}} \times 100 = 135.9 \text{ at 1993-94 prices}$$

It shows that at constant prices (1993-94), *GDP* in 1997-98 increased by 135.9% due to inflation (or rise in prices) from Rs. 1049.2 thousand crores in 1993-94 to Rs. 1426.7 thousand crores in 1997-98.

(F) Gross National Product (GNP)

GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad. *GNP* includes four types of final goods and services: (1) consumers' goods and services to satisfy the immediate wants of the people; (2) gross private domestic investment in capital goods consisting of fixed capital formation, residential construction and inventories of finished and unfinished goods; (3) goods and services produced by the government; and (4) net exports of goods and services, i.e., the difference between value of exports and imports of goods and services, known as net income from abroad.

In this concept of *GNP*, there are certain factors that have to be taken into consideration :

First, *GNP* is the measure of money, in which all kinds of goods and services produced in a country during one year are measured in terms of money at current prices and then added together. But in this manner, due to an increase or decrease in the prices, the *GNP* shows a rise or decline, which may not be real. To guard against erring on this account, a particular year (say for instance 1990-91) when prices be normal, is taken as the base year and the *GNP* is adjusted in accordance with the index number for that year. This will be known as *GNP* at 1990-91 prices or at constant prices.

Second, in estimating *GNP* of the economy, the market price of only the *final products* should be taken into account. Many of the products pass through a number of stages before they are ultimately purchased by consumers. If those products were counted at every stage, they would be included many a time in the national product. Consequently, the *GNP* would increase too much. To avoid double counting, therefore, only the final products, and not the intermediary goods should be taken into account.

Third, goods and services rendered *free* of charge are not included in the *GNP*, because it is not possible to have a correct estimate of their market

price. For example, the bringing up of a child by the mother, imparting instructions to his son by a teacher, recitals to his friends by a musician, etc.

Fourth, the transactions which do not arise from the produce of *current* year or which do not contribute in any way to production, are not included in the *GNP*. The sale and purchase of old goods, and of shares, bonds and assets of existing companies are not included in *GNP* because these do not make any addition to the national product, and the goods are simply transferred.

Fifth, the payments received under *social security*, *e.g.*, unemployment insurance allowance, old age pension, and interest on public loans are also not included in *GNP*, because the recipients do not provide any service in lieu of them. But the depreciation of machines, plants and other capital goods is not deducted from *GNP*.

Sixth, the *profits* earned or *losses* incurred on account of changes in capital assets as a result of fluctuations in market prices are not included in the *GNP* if they are not responsible for current production or economic activity. For example, if the price of a house or a piece of land increases due to inflation, the profit earned by selling it will not be a part of *GNP*. But if, during the current year, a portion of a house is constructed anew, the increase in the value of the house (after subtracting the cost of the newly constructed portion) will be included in the *GNP*. Similarly, variations in the value of assets, that can be ascertained beforehand and are insured against flood or fire, are not included in the *GNP*.

Last, the income earned through illegal activities is not included in the *GNP*. Although the goods sold in the black market are priced and fulfil the needs of the people, but as they are not useful from the social point of view, the income received from their sale and purchase is always excluded from the *GNP*. There are two main reasons for this. *One*, it is not known whether these things were produced during the current year or the preceding years. *Two*, many of these goods are foreign made and smuggled and hence not included in the *GNP*.

Three Approaches to GNP

After having studied the fundamental constituents of *GNP*, it is essential to know how it is estimated. Three approaches are employed for this purpose. *One*, the income method to GNP; *two*, the expenditure method to *GNP*; and *three*, the value added method to *GNP*. Since gross income equals gross expenditure, *GNP* estimated by all these methods would be

the same with appropriate adjustments.

1. Income Method to GNP

The income method to *GNP* consists of the remuneration paid in terms of money to the factors of production annually in a country. Thus *GNP* is the sum total of the following items :

(i) Wages and salaries. Under this head are included all forms of wages and salaries earned through productive activities by workers and entrepreneurs. It includes all sums received or deposited during a year by way of all types of contributions like overtime, commission, provident fund, insurance. etc.

(ii) Rents. Total rent includes the rents of land, shop, house, factory, etc. and the estimated rents of all such assets as are used by the owners themselves.

(iii) Interest. Under interest comes the income by way of interest received by the individual of a country from different sources. To this is added, the estimated interest on that private capital which is invested and not borrowed by the businessman in his personal business. But the interest received on governmental loans has to be excluded, because it is a mere transfer of national income.

(iv) Dividends. Dividends earned by the shareholders from companies are included in the *GNP*.

(v) Undistributed corporate profits. Profits which are not distributed by companies and are retained by them are included in the *GNP*.

(vi) Mixed incomes. These include profits of unincorporated business, self-employed persons and partnerships. They form part of *GNP*.

(vii) Direct taxes. Taxes levied on individuals, corporations and other businesses are included in the *GNP*.

(viii) Indirect taxes. The governement levies a number of indirect taxes, like excise duties and sales tax. These taxes are included in the price of commodities. But revenue from these goes to the government treasury and not to the factors of production. Therefore, the income due to such taxes is added to the *GNP*.

(ix) Depreciation. Every corporation makes allowance for expenditure on wearing out and depreciation of machines, plants and other capital equipment. Since this sum also is not a part of the income received by the factors of production, it is, therefore, also included in the *GNP*.

(x) Net income earned from abroad. This is the difference between the

value of exports of goods and services and the value of imports of goods and services. If this difference is positive, it is added to the *GNP* and if it is negative, it is deducted from the *GNP*.

Thus *GNP* according to the Income Method = Wages and Salaries + Rents + Interest + Dividends + Undistributed Corporate Profits + Mixed Income + Direct Taxes + Indirect Taxes + Depreciation + Net Income from abroad.

2. Expenditure Method to GNP

From the expenditure view point, *GNP* is the sum total of expenditure incurred on goods and services during one year in a country. It includes the following items.:

(i) Private consumption expenditure. It includes all types of expenditure on personal consumption by the individuals of a country. It comprises expenses on durable goods like watch, bicycle, radio, etc., expenditure on single-used consumers' goods like milk, bread, ghee, clothes, etc., as also the expenditure incurred on services of all kinds like fees for school, doctor, lawyer and transport. All these are taken as final goods.

(ii) Gross domestic private investment. Under this comes the expenditure incurred by private enterprise on new investment and on replacement of old capital. It includes expenditure on house construction, factory-buildings, all types of machinery, plants and capital equipment. In particular, the increase or decrease in inventory is added to or substracted from it. The inventory includes produced but unsold manufactured and semi-manufactured goods during the year and the stocks of raw materials, which have to be accounted for in *GNP*. It does not take into account the financial exchange of shares and stocks because their sale and purchase is not real investment. But depreciation is added.

(iii) Net foreign investment. It means the difference between exports and imports or export surplus. Every country exports to or imports from certain foreign countries. The imported goods are not produced within the country and hence cannot be included in national income, but the exported goods are manufactured within the country. Therefore, the difference of value between exports (X) and imports (M), whether positive or negative, is included in the *GNP*.

(iv) Government expenditure on goods and services. The expenditure incurred by the government on goods and services is a part of the *GNP*. Central, state or local governments spend a lot on their employees, police and army. To run the offices, the governments have also to spend on

contingencies which include paper, pen, pencil and various types of stationery, cloth, furniture, cars, etc. It also includes the expenditure on government enterprises. But expenditure on transfer payments is not added, because these payments are not made in exchange for goods and services produced during the current year.

Thus *GNP* according to the Expenditure Method=Private Consumption Expenditure (C) + Gross Domestic Private Investment (I) + Net Foreign Investment (X–M) + Government Expenditure on Goods and Services (G) = C+ I + (X–M) + G.

As already pointed out above, *GNP* estimated by either the income or the expenditure method would work out to be the same, if all the items are correctly calculated.

3. Value Added Method to GNP

Another method of measuring *GNP* is by value added. In calculating *GNP*, the money value of final goods and services produced at current prices during a year is taken into account. This is one of the ways to avoid double counting. But it is difficult to distinguish properly between a final product and an intermediate product. For instance, raw materials, semi-finished products, fuels and services, etc. are sold as inputs by one industry to the other. They may be final goods for one industry and intermediate for others. So, to avoid duplication, the value of *intermediate products* used in manufacturing final products must be subtracted from the value of total output of each industry in the economy. Thus, the difference between the value of material outputs and inputs at each stage of production is called the value added. If all such differences are added up for all industries in the economy, we arrive at the *GNP* by value added. *GNP* by value added = Gross value added + net income from abroad. Its calculation is shown in Tables 1,2 and 3.

Table 1 is constructed on the supposition that the entire economy for purposes of total production consists of three sectors. They are agriculture, manufacturing, and others, consisting of the tertiary sector. Out of the value of total output of each sector is deducted the value of its intermediate purchases (or primary inputs) to arrive at the value added for the entire economy. Thus the value of total output of the entire economy as per Table 1, is Rs. 155 crores and the value of its primary inputs comes to Rs. 80 crores. Thus the *GDP* by value added is Rs. 75 crores (Rs. 155 *minus* Rs. 80 crores).

TABLE 1 : GDP BY VALUE ADDED

s*(Rs. cror*

Industry	Total Output	Intermediate Purchases	Value Added
(1)	(2)	(3)	(4) = (2-3)
1. Agriculture	30	10	20
2. Manufacturing	70	45	25
3. Others	55	25	30
Total	155	80	75

TABLE 2
VALUE ADDED AT FACTOR COST

(Rs. Crores)

1.	Market Value of output	155
2.	*Less:* cost of intermediate Goods	80
3.	Gross value added	75
4.	*Less:* depreciation	8
5.	Net value added or domestic product at market prices	67
6.	*Less:* indirect taxes	7
7.	Net value added at factor cost	60

The total value added equals the value of gross domestic product of the economy. Out of this value added, the major portion goes in the form wages and salaries, rent, interest and profits, a small portion goes to the government as indirect taxes and the remaining amount is meant for depreciation. This is shown in Table 3.

Thus we find that the total gross value added of an economy equals the value of its gross domestic product. If depreciation is deducted from the gross value added, we have *net* value added which comes to Rs. 67 crores (Rs. 75 *minus* Rs. 8 crores). This is nothing but net domestic product at market prices. Again, if indirect taxes (Rs. 7 crores) are deducted from the net domestic product of Rs. 67 crores, we get Rs. 60 crores as the net value added at factor cost which is equivalent to net domestic product at factor cost. This is illustrated in Table 2.

TABLE 3 : GROSS DOMESTIC PRODUCT

(Rs Crores)

1. Wages and salaries	45
2. Income from rent	3
3. Net interest	4
4. Profits of companies	8
Net Value Added or NDP	60
5. Indirect taxes	+ 7
6. Depreciation	+ 8
Gross Value Added or GDP	75
7. Net income from abroad	+ 5
Gross National Income	80

Net value added at factor cost is equal to the net domestic product at factor cost, as given by the total of items 1 to 4 of Table 2 (Rs. 45+3+4+8 crores=Rs. 60 crores).

By adding indirect taxes (Rs 7 crores) and depreciation (Rs 8 crores), we get gross value added or GDP which comes to Rs 75 crores. If we add net income received from abroad to the gross value added, this gives us gross national income. Suppose net income from abroad is Rs. 5 crores. Then the gross national income is Rs. 80 crores (Rs. 75 crores + Rs. 5 crores) as shown in Table 3.

Its Importance. The value added method for measuring national income is more realistic than the product and income methods because it avoids the problem of double counting by excluding the value of intermediate products. Thus this method establishes the importance of intermediate

products in the national economy. *Second*, by studying the national income accounts relating to value added, the contribution of each production sector to the value of the *GNP* can be found out. For instance, it can tell us whether agriculture is contributing more, or the share of manufacturing is falling, or of the tertiary sector is increasing in the current year as compared to some previous years. *Third*, this method is highly useful because "it provides a means of checking the *GNP* estimates obtained by summing the various types of commodity purchases."

Its Difficulties. However, difficulties arise in the calculation of value added in the case of certain public services like police, military, health, education, etc. which cannot be estimated accurately in money terms. Similarly, it is difficult to estimate the contribution made to value added by profits earned on irrigation and power projects.

(G) GNP at Market Prices

When we multiply the total output produced in one year by their market prices prevalent during that year in a country, we get the Gross National Product at market prices. Thus *GNP* at market prices means the gross value of final goods and services produced annually in a country *plus* net income from abroad. It includes the gross value of output of all items from (1) to (4) mentioned under *GNP*. *GNP* at Market Prices = *GDP* at Market Prices + Net Income from Abroad.

(H) GNP at Factor Cost

GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country. It includes all items mentioned above under income method to *GNP less* indirect taxes. *GNP* at market prices always includes indirect taxes levied by the government on goods which raise their prices. But *GNP* at factor cost is the income which the factors of production receive in return for their services alone. It is the cost of production. Thus *GNP at market prices is always higher than GNP at factor cost*. Therefore, in order to arrive at *GNP* at factor cost, we *deduct* indirect taxes from *GNP* at market prices. Again, it often happens that the cost of production of a commodity to the producer is higher than a price of a similar commodity in the market. In order to protect such producers, the government helps them by granting monetary help in the form of a *subsidy* equal to the difference between the market price and the cost of production of the

commodity. As a result, the price of the commodity to the producer is reduced and equals the market price of similar commodity.

***GNP* at Factor Cost = *GNP* at Market Prices – Indirect Taxes + Subsidies.**

(I) Net National Product (NNP)

NNP includes the value of total output of consumption goods and investment goods. But the process of production uses up a certain amount of fixed capital. Some fixed equipment wears out, its other components are damaged or destroyed, and still others are rendered obsolete through technological changes. All this process is termed *depreciation or capital consumption allowance*. In order to arrive at *NNP*, we *deduct* depreciation from *GNP*. The word 'net' refers to the exclusion of that part of total output which represents depreciation. So *NNP* = *GNP*—Depreciation.

(J) NNP at Market Prices

Net National Product at market prices is the *net* value of final goods and services evaluated at market prices in the course of one year in a country. If we deduct depreciation from *GNP* at market prices, we get *NNP* at market prices. So *NNP* at Market Prices = *GNP* at Market Prices—Depreciation.

(K) NNP at Factor Cost

Net National Product at factor cost is the *net* output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called *National Income*. This measure differs from *NNP* at market prices in that indirect taxes are *deducted* and subsidies are *added* to NNP at market prices in order to arrive at *NNP* at factor cost.[4] Thus

NNP at Factor Cost = NNP at Market Prices - Indirect taxes+ Subsidies
= *GNP* at Market Prices - Depreciation - Indirect taxes + Subsidies.
= National Income.

Normally, *NNP at market prices is higher than NNP at factor cost because indirect taxes exceed government subsidies. However, NNP at market prices can be less than NNP at factor cost when government subsidies exceed indirect taxes.*

(L) Domestic Income

Income generated (or earned) by factors of production within the country from its own resources is called domestic income or domestic product. Domestic income includes : (*i*) Wages and salaries, (*ii*) rents, including imputed house rents, (*iii*) interest, (*iv*) dividends, (*v*) undistributed corporate profits, including surpluses of public undertakings, (*vi*) mixed incomes consisting of profits of unincorporated firms, self-employed persons, partnerships, etc., and (*vii*) direct taxes.

Since domestic income does not include income earned from abroad, it can also be shown as : Domestic Income = National Income— Net income earned from abroad. Thus the difference between domestic income and national income is the net income earned from abroad. If we add net income from abroad to domestic income, we get national income, *i.e.*, National Income = Domestic Income + Net income earned from abroad. But the net national income earned from abroad may be positive or negative. *If exports exceed import, net income earned from abroad is positive*. In this case, *national income is greater than domestic income*. On the other hand, when *imports exceed exports, net income earned from abroad is negative and domestic income is greater than national income*.[5]

(M) Private Income

Private income is income obtained by private individuals from any source, productive or otherwise, and the retained income of corporations. It can be arrived at from *NNP* at Factor Cost by making certain additions and deductions. The *additions* include transfer payments such as pensions, unemployment allowances, sickness and other social security benefitgifts and remittances from abroad, windfall gains from lotteries or from horse racing, and interest on public debt. The *deductions* include income from government departments as well as surpluses from public undertakings, and employees' contribution to social security schemes like provident funds, life insurance, etc.

Thus Private Income = National Income (or *NNP* at Factor Cost) + Transfer Payments + Interest on Public Debt — Social Security — Profits and Surpluses of Public Undertakings.

(N) Personal Income

Personal income is the total income received by the individuals of a

country from all sources *before payment of direct taxes* in one year. Personal income is never equal to the national income, because the former includes the transfer payments whereas they are not included in national income. Personal income is derived from national income by deducting undistributed corporate profits, profit taxes, and employees' contributions to social security schemes. These three components are excluded from national income because they do reach individuals. But business and government transfer payments, and transfer payments from abroad in the form of gifts and remittances, windfall gains, and interest on public debt which are a source of income for individuals are added to national income. **Thus Personal Income = National Income – Undistributed Corporate Profits – Profit Taxes – Social Security Contribution+ Transfer Payments + Interest on Public Debt.**

Personal income differs from *private income* in that it is less than the latter because it excludes undistributed corporate profits.

hus Personal Income = Private Income – Undistributed Corporate Profits – Profit Taxes.

(O) Disposable Income

Disposable income or personal disposable income means the actual income which can be spent on consumption by individuals and families. The whole of the personal income cannot be spent on consumption,because it is the income that accrues before direct taxes have actually been paid. Therefore, in order to obtain disposable income, direct taxes are *deducted* from personal income. Thus Disposable Income=Personal Income – Direct Taxes.

But the whole of disposable income is not spent on consumption and a part of it is saved. Therefore, disposable income is divided into consumption expenditure and savings. Thus Disposable Income = Consumption Expenditure + Savings.

If disposable income is to be deduced from national income, we *deduct* indirect taxes *plus* subsidies, direct taxes on personal and on business, social security payments, undistributed corporate profits or business savings from it and *add* transfer payments and net income from abroad to it.

Thus Disposable Income = National Income – Business Savings – Indirect Taxes + Subsidies – Direct Taxes on Persons – Direct Taxes on Business – Social Security Payments + Transfer Payments + Net Income from abroad.

(P) Real Income

Real income is national income expressed in terms of a general level of prices of a particular year taken as base. National income is the value of goods and services produced as expressed in terms of money at current prices. But it does not indicate the real state of the economy. It is possible that the net national product of goods and services this year might have been less than that of the last year, but owing to an increase in prices, *NNP* might be higher this year. On the contrary, it is also possible that *NNP* might have increased but the price level might have fallen, as a result national income would appear to be less than that of the last year. In both the situations, the national income does not depict the real state of the country. To rectify such a mistake, the concept of real income has been evolved.

In order to find out the real income of a country, a particular year is taken as the base year when the general price level is neither too high nor too low and the price level for that year is assumed to be 100. Now the general level of prices of the given year for which the national income (real) is to be determined is assessed in accordance with the prices of the base year. For this purpose the following formula is employed.

$$\text{Real } NNP = NNP \text{ for the Current Year} \times \frac{\text{Base Year Index (=100)}}{\text{Current Year Index}}$$

Suppose 1990-91 is the base year and the national income for 1999-2000 is Rs. 20,000 crores and the index number for this year is 250. Hence,

Real National Income for 1999-2000 will be = $20000 \times \frac{100}{250} =$ Rs. 8000 crores. This is also known as national income at constant prices.

(Q) Per Capita Income

The average income of the people of a country in a particular year is

called Per Capita Income for that year. This concept also refers to the measurement of income at current prices and at constant prices. For instance, in order to find out the per capita income for 2001, at current prices, the national income of a country is divided by the population of the country in that year

$$\text{Per Capita Income for 2001} = \frac{\textit{National income for 2001}}{\textit{Population in 2001}}$$

Similarly, for the purpose of arriving at the Real Per Capita Income, this very formula is used.

$$\text{Real Per Capita Income for 2001} = \frac{\textit{Real national income for 2001}}{\textit{Population in 2001}}$$

This concept enables us to know the average income and the standard of living of the people. But it is not very reliable, because in every country due to unequal distribution of national income, a major portion of it goes to the richer sections of the society and thus income received by the common man is lower than the per capita income.

METHODS OF MEASURING NATIONAL INCOME

There are four methods of measuring national income. Which method is to be used depends on the availability of data in a country and the purpose in hand.

(1) Product Method. According to this method, the total value of final goods and services produced in a country during a year is calculated at market prices. To find out the *GNP*, the data of all productive activities, such as agricultural products, wood received from forests, minerals received from mines, commodities produced by industries, the contributions to production made by transport, communications, insurance companies, lawyers, doctors, teachers, etc. are collected and assessed at market prices. Only the final goods and services are included and the intermediary goods and services are left out.

(2) Income Method. According to this method, the net income payments received by all citizens of a country in a particular year are added up, *i.e.*,

net incomes that accrue to all factors of production by way of net rents, net wages, net interest and net profits are all added together but incomes received in the form of transfer payments are not included in it. The data pertaining to income are obtained from different sources, for instance, from income tax department in respect of high income groups and in case of workers from their wage bills.

(3) Expenditure Method. According to this method, the total expenditure incurred by the society in a particular year is added together and includes personal consumption expenditure, net domestic investment, government expenditure on goods and services, and net foreign investment. This concept is based on the assumption that national income equals national expenditure.

4. **Value Added Method.** Another method of measuring national income is the value added by industries. The difference between the value of material outputs and inputs at each stage of production is the value added. If all such differences are added up for all industries in the economy, we arrive at the gross domestic product.

DIFFICULTIES OR LIMITATIONS IN MEASURING NATIONAL INCOME

There are many conceptual and statistical problems involved in measuring national income by the income method, product method, and expenditure method. We discuss them separately in the light of the three methods.

(A) Problems in Income Method

The following problems arise in the computation of National Income by income method.

1. Owner-occupied Houses. A person who rents a house to another earns rental income, but if he occupies the house himself, will the services of the house-owner be included in national income. The services of the owner- occupied house are included in national income as if the owner sells to himself as a tenant its services. For the purpose of national income accounts, the amount of imputed rent is estimated as the sum for which the owner-occupied house could have been rented. The imputed net rent is calculated as that portion of the amount that would have accrued to the house-owner after deducing all expenses.

2. Self-employed Persons. Another problem arises with regard to the

income of self-employed persons. In their case, it is very difficult to find out the different inputs provided by the owner himself. He might be contributing his capital, land, labour and his abilities in the business. But it is not possible to estimate the value of each factor input to production. So he gets a mixed income consisting of interest, rent, wage and profits for his factor services. This is included in national income.

3. Goods meant for Self-consumption. In under-developed countries like India, farmers keep a large portion of food and other goods produced on the farm for self-consumption. The problem is whether that part of the produce which is not sold in the market can be included in national income or not. If the farmer were to sell his entire produce in the market, he will have to buy what he needs for self-consumption out of his money income. If, instead he keeps some produce for his self-consumption, it has money value which must be included in national income.

4. Wages and Salaries paid in Kind. Another problem arises with regard to wages and salaries paid in kind to the employees in the form of free food, lodging, dress and other amenities. Payments in kind by employers are included in national income. This is because the employees would have received money income equal to the value of free food, lodging, etc. from the employer and spent the same in paying for food, lodging, etc.

(B) Problems in Product Method

The following problems arise in the computation of national income by product method :

1. Services of Housewives. The estimation of the unpaid services of the housewife in the national income presents a serious difficulty. A housewife renders a number of useful services like preparation of meals, serving, tailoring, mending, washing, cleaning, bringing up children, etc. She is not paid for them and her services are not include in national income. Such services performed by paid servants are included in national income. The national income is, therefore, underestimated by excluding the services of a housewife. The reason for the exclusion of her services from national income is that the love and affection of a housewife in performing her domestic work cannot be measured in monetary terms.

2. Intermediate and Final Goods. The greatest difficulty in estimating national income by product method is the failure to distinguish properly between intermediate and final goods. There is always the possibility of including a good or service more than once, whereas only final goods are included in national income estimates. This leads to the problem of double

counting which leads to the overestimation of national income.

3. Second-hand Goods and Assets. Another problem arises with regard to the sale and purchase of second-hand goods and assets. We find that old scooters, cars, houses, mechinery, etc. are transacted daily in the country. But they are not included in national income because they were counted in the national product in the year they were manufactured. If they are included every time they are bought and sold, national income would increase many times. Similarly, the sale and purchase of old stocks, shares, and bonds of companies are not included in national income because they were included in national income when the companies were started for the first time. Now they are simply financial transactions and represent claims. But the commission or fees charged by the brokers in the repurchase and resale of old shares, bonds, houses, cars or scooters, etc. are included in national income. For these are the payments they receive for their productive services during the year.

4. Illegal Activities. Income earned through illegal activities like gambling, smuggling, illicit extraction of wine, etc. is not included in national income. Such activities have value and satisfy the wants of the people but they are not considered productive from the point of view of society. But in countries like Nepal and Monaco where gambling is legalised, it is included in national income. Similarly, horse-racing is a legal activity in England and is included in national income.

Consumers' Service. There are a number of persons in society who render services to consumers but they do not produce anything tangible.

They are the actors, dancers, doctors, singers, teachers, musicians, lawyers, barbers, etc. The problem arises about the inclusion of their services in national income since they do not produce tangible commodities. But as they satisfy human wants and receive payments for their services, their services are included as final goods in estimating national income.

5. Capital Gains. The problem also arises with regard to capital gains. Capital gains arise when a capital asset such as a house, some other property, stocks or shares, etc. is sold at higher price than was paid for it at the time of purchase. Capital gains are excluded from national income because these do not arise from current economic activities. Similarly, capital losses are not taken into account while estimating national income.

6. Inventory Changes. All inventory changes (or changes in stocks) whether positive or negative are included in national income. The

procedure is to take changes in physical units of inventories for the year valued at average current prices paid for them. The value of changes in inventories may be positive or negative which is added or subtracted from the current production of the firm. Remember, it is the change in inventories and not total inventories for the year that are taken into account in national income estimates.

7. Depreciation. Depreciation is deducted from *GNP* in order to arrive at *NNP*. Thus depreciation lowers the national income. But the problem is of estimating the current depreciated value of, say, a machine, whose expected life is supposed to be thirty years. Firms calculate the depreciation value on the original cost of machines for their expected life. This does not solve the problem because the prices of machines change almost every year.

8. Price Changes. National income by product method is measured by the value of final goods and services at current market prices. But prices do not remain stable. They rise or fall. When the price level rises, the national income also rises, though the national production might have fallen. On the contrary, with the fall in the price level, the national income also falls, though the national production might have increased. So price changes do not adequately measure national income. To solve this problem,

economists calculate the *real* national income at a constant price level by the consumer price index.

(C) Problems in Expenditure Method

The following problems arise in the calculation of national income by expenditure method :

(1) Government Services. In calculating national income by expenditure method, the problem of estimating government services arises. Government provides a number of services, such as police and military services, administrative and legal services. Should expenditure on government services be included in national income ? If they are final goods, then only they would be included in national income. On the other hand, if they are used as intermediate goods, meant for further production, they would not be included in national income. There are many divergent views on this issue. One view is that if police, military, legal and administrative services protect the lives, property and liberty of the people, they are treated as final goods and hence form part of national income. If they help in the smooth functioning of the production process by maintaining peace and security, then they are like intermediate goods

that do not enter into national income, In reality, it is not possible to make a clear demarcation as to which service protects the people and which protects the productive process. Therefore, all such services are regarded as final goods and are included in national income.

(2) Transfer Payments. There arises the problem of including transfer payments in national income. Government makes payments in the form of pensions, unemployment allowance, subsidies, interest on national debt, etc. These are government expenditures but they are not included in national income because they are paid without adding anything to the production process during the current year. For instance, pensions and unemployment allowances are paid to individuals by the government without doing any productive work during the year. Subsidies tend to lower the market price of the commodities. Interest on national or public debt is also considered a transfer payment because it is paid by the government to individuals and firms on their past savings without any productive work.

2. **Durable-use Consummers' Goods.** Durable-use consumers' goods also pose a problem. Such durable-use consumers' goods as scooters, cars, fans, TVs, furnitures, etc. are bought in one year but they are used for a number of years. Should they be included under investment expenditure or consumption expenditure in national income estimates ? The expenditure on them is regarded as final consumption expenditure because it is not possible to measure their used up value for the subsequent years.

But there is one exception. The expenditure on a new house is regarded as investment expenditure and not consumption expenditure. This is because the rental income or the imputed rent which the houseowner gets is for making investment on the new house. However, expenditure on a car by a household is consumption expenditure. But if he spends the amount for using it as a taxi, it is investment expenditure.

(3) Public Expenditure. Government spends on police, military, administrative and legal services, parks, street lighting, irrigation, museums, education, public health, roads, canals, buildings, etc. The problem is to find out which expenditure is consumption expenditure and which is investment expenditure. Expenses on education, museums, public health, police, parks, street lighting, civil and judicial administration are consumption expenditure. Expenses on roads, canals, buildings, etc. are investment expenditure. But expenses on defence

equipment are treated as consumption expenditure because they are consumed during a war as they are destroyed or become obsolete. However, all such expenses including the salaries of armed personnel are included in national income.

IMPORTANCE OF NATIONAL INCOME ANALYSIS

The national income data have the following importance.

1. For the Economy. National income data are of great importance for the economy of a country. These days the national income data are regarded as accounts of the economy, which are known as *social accounts*. These refer to net national income and net national expenditure, which ultimately equal each other. Social accounts tell us how the aggregates of a nation's income, output and product result from the income of different individuals, products of industries and transactions of international trade. Their main constituents are inter-related and each particular account can be used to verify the correctness of any other account.

2. National Policies. National income data form the basis of national policies such as employment policy, because these figures enable us to know the direction in which the industrial output, investment and savings, etc. change, and proper measures can be adopted to bring the economy to the right path.

3. Economic Planning. In the present age of planning, the national data are of great importance. For economic planning, it is essential that the data pertaining to a country's gross income, output, saving and consumption from different sources should be available. Without these, planning is not possible.

4. Economic Models. The economists propound short-run as well as long- run economic models or long-run investment models in which the national income data are very widely used.

5. Research. The national income data are also made use of by the research scholars of economics. They make use of the various data of the country's input, output, income, saving, consumption, investment, employment, etc., which are obtained from social accounts.

Per Capita Income. National income data are significant for a country's per capita income which reflects the economic welfare of the country. The higher the per capita income, the higher the economic welfare of the country.

6. Distribution of Income. National income statistics enable us to know about the distribution of income in the country. From the data pertaining to wages, rent, interest and profits, we learn of the disparities in the incomes of different sections of the society. Similarly, the regional distribution of income is revealed. It is only on the basis of these that the government can adopt measures to remove the inequalities in income distribution and to restore regional equilibrium. With a view to removing these personal and regional disequibria, the decisions to levy more taxes and increase public expenditure also rest on national income statistics.

SOCIAL ACCOUNTING

Meaning

The term 'social accounting' was first introduced into economics by J.R. Hicks in 1942. In his words, it means 'nothing else but the accounting of the whole community or nation, just as private accounting is the accounting of the individual firm'. Social accounting, also known as national income accounting, is a method to present statistically the inter-relationships between the different sectors of the economy for a thorough understanding of the economic conditions of the economy. It is a method of studying the structure of the body economic. It is a method of studying the structure of the body economic. It is a technique of presenting information about the nature of the economy with a view not merely to get an idea of its prosperity, past or present, but also to get guidelines for state policy to influence or regulate the economy.

In the words of Edey, Peacock and Cooper : "Social accounting is concerned with the statistical classification of the activities of human beings and human institutions in ways which help us to understand the operation of the economy as a whole. The field of studies summed up by the words 'social accounting' embraces, however, not only the classification of economic activity, but also the application of the information thus assembled to the investigation of the operation of the economic system." In other words, social accounting describes statistically the economic activities of the different sectors of the entire economy, which indicates their mutual relationships and provides a framework for analysis.

COMPONENTS OF SOCIAL ACCOUNTING

The principal forms of ecnomic activity are production, consumption, capital accumulation, government transactions and transactions with the rest of the world. These are the components of social accounting. If the incomings and outgoings of a country relating to these five activities are shown in the form of accounts,they show a closed network of flows representing the basic structure of the economy. These flows are always expressed in money terms. We classify these flows as follows :

(1) Production Account. The production account relates to the business sector of the economy. It includes all forms of productive activity, i.e., manufacturing, trading, etc. It covers public and private companies, proprietory firms and partnerships, and state-owned business undertakings. Since all productive activity takes place within this sector, all payments flow from it to the other sectors. The production account of the business sector is shown in Table 1.

Table 1 : Production Account

(Rs Crores)

Payments		*Receipts*	
1. Payments to personal sector, i.e., wages, etc. (2-5)	279	5. Consumption expenditures (2-1)	219
2. Payments to government (3-5)	12	Government Pur6c.hases (3-1)	30
3. Business saving (4-3)	97	7. Gross private domestic investment (4-1)	36
4. Imports of goods and services (5-2)	98	8. Exports of goods and services (5-1)	24
Gross national income	309	309 Gross national expenditure	

Note : Figures in brackets relate to corresponding Table and item number.

Payments to personal sector include rent, interest, dividend, wages, salaries, employees' compensation and proprietors' income. The item 'payments to government' includes producers' net payment to government in the form of taxes and social security payments. Business saving refers to producers' retained income or corporate saving. The last item relates to payments made to the foreign sector for imports of goods and services. These figures make up gross national income.

The receipt side of the production account shows the incomings to the business sector from sales of goods and services to the household or personal sector. Government purchases refer to goods and services sold by the business sector to the government. Gross private domestic investment comprises the gross flow of capital goods (fixed capital formation) and the net change in inventories. Net exports refer to the income earned by the business sector by selling goods and services to the rest of the world. The total of all these items gives GNP by expenditure.

(2) Consumption Account. The consumption account refers to the income and expenditure account of the *household* or *personal sector*. The household sector includes all consumers and non-profit making institutions such as clubs and associations. The consumption account is shown in Table 2.

Table 2 : Consumption Account (Rs Crores)

Payments		*Receipts*	
1. Consumption expenditure (1-5)	219	5. Receipts from business, wages and salaries, etc. (1-1)	279
2. Payments to government (3-6)	45	Receipts from g6o.vernment (3-2)	6
3. Personal saving (4-4)	15		
4. Transfers to foreigners (5-3)	68.		
Personal outlay and saving	285	Personal income	285

Note : Figures in brackets relate to corresponding Table and item number.

The major item in the left side of the consumption account is the expenditure of household consumers in buying goods and services from the business sector to satisfy their wants. Payments to government include taxes and special insurance contributions. The next item refers to personal saving used for investment by the household sector. The item 'transfers to foreigners' might be taken to relate to investment in foreign securities or expenses by the residents on education or travel abroad. The right hand side of the account shows income of business and household consumers as the major item which comes in the form of wages and salaries, profit, interest, dividend, rent and receipts from current transfers, etc. Receipts from government include transfer paymants and net interest payments on public debt.

(3) Government Account. The government account relates to the outflows and inflows of the government sector. In the government sector are included all public authorities—centre, states and local authorities in a country. The government account is shown in Table 3.

Table 3 : Government Account (Rs Crores)

Payments		*Receipts*	
1.Payments to business (1-6)	30	5R. eceipts from business (1-2)	12
2.Payments to persons (2-6)	6	6.Receipts from persons (2-2)	45
3.Government surplus (4-5)	15		
4.Payments to foreigners (5-4)	6		
Government outlay and surplus	57	Government receipts	57

Note : Figures in brackets relate to corresponding Table and item number.

All items in the preceding Table have already been explained in the two accounts contrained in Tables 2 and 3, except item 3. This refers to investment made by the government out of its surplus or saving. However, the important point to be noted is that state-owned business enterprises are

excluded from the government sector as they have been included in the business sector because like private enterprises public undertakings produce goods and services for sale.

(4) Capital Account. The capital account shows that saving equals domestic and foreign investment. Saving is invested in fixed capital and inventories within the country and/or in international assets. The capital account is shows in Table 4. The gross private investment includes the gross flow of capital goods and net change in inventories. Net foreign investment is the foreign surplus on current account. On the right side, gross saving includes business and personal savings and government surplus.

Table 4 : Capital Account (Rs Crores)

Payments		*Receipts*	
1. Gross private domestic investment (1-7)	36	5B. usiness saving (1-3)	9
		4. Personal saving (2-3)	15
4. Net foreign investment (5-5)	3	5. Government surplus (3-3)	15
Gross investment	39	Gross saving	39

Note : Figures in brackets relate to corresponding Table and item number.

(5) Foreign Account. Foreign account shows the transactions of the country with the rest of the world. This account covers international movements of goods and services and transfer payments and corresponds to the current account of the international balance of payments. The foreign account or the rest-of-the world account is shown in Table 5. For simplicity, such services as freight and insurance have not been shown separately. All items have been already explained in the preceding accounts. It should be noted that in the foreign account 'exports' have been shown under payments (on the left side) and 'imports' under receipts (on the right side). This is because the amount received by the nationals of the country for exports is paid to foreign countries in exchange for imports and transfer payments. Here payments and receipts relate to the rest of the world and not to the country itself.

The five-account system detailed above relates to flows of the economy in terms of production, consumption, government transactions,capital accumulation, and transactions with the rest of the world. The accounts

based on them are known as functional accounts, as they are based on a classification of transactions according to their functions.

Table 5 : Foreign Account (Rs Crores)

Payments		*Receipts*	
1. Exports of goods and services (1-8)	24	2I. mports of goods and services (I-4)	9
		3. Transfer payments to foreigners by persons (2-4)	6
		4. Transfer payments to foreigners by government (3-4)	6
Net receipts from foreigners	24	5. Net foreign investment (4-2)	3
		Net payment to foreigners	24

Note : Figures in brackets relate to corresponding Table and item number.

Presentation of Social Accounts

Social accounts are presented on the double-entry basis like private accounts. Prevailing consensus is to present social accounts in the form of a social accounting table as recommended by the United Nations. A social accounting table is called a social accounts *matrix*. A transaction matrix is used for social accounts in which each row contains payments to other sectors and each column contains receipts form other sectors. Every single entry is both in a particular row and in a particular column. For balancing social accounts a row-total must equal its corresponding column-total. A matrix of social accounts is shown in Table 6 which presents the relationship between the flows of payments and receipts in accounts given in Tables 1 to 5.

Table 6 : Flow Matrix of Social Accounts

(Rs Crores)

Receipts from / Payments to	Accounts					
	1 Production	2 Consumption	3 Government	4 Capital	5 Foreign	Total
1. Production	-	279	12	9	9	309
2. Consumption	219	-	45	15	6	285
3. Government	30	6	-	15	6	57
4. Capital	36	-	-	-	3	39
5. Foreign	24	-	-	-	-	24
Total	309	285	57	39	24	714

In Table 6, each account has one row which shows the payments, and one column which shows the receipts, as explained below.

Row 1 shows payments made by the business sector to the tune of Rs. 279 crores to the consumption sector as wages, salaries, etc., Rs 12 crores to the government as taxes, Rs 9 crores as corporate saving to the capital account of firms and Rs 9 crores for importing goods and services from abroad.

Row 2 shows payments made to the business sector by the household sector amounting to Rs. 219 crores for buying goods and services from it, Rs 45 crores to the government in paying taxes, and insurance contributions, Rs. 15 crores to the investment (capital) sector in the form of saving by household consumers and Rs. 6 crores as investment in foreign securities, expenses on education, travel etc. in foreign countries.

Row 3 relates to the outflows of the government sector. The government pays Rs. 30 crores to the business sector for purchasing goods and services from it, Rs. 6 crores to the household sector as net interest payments on public debt and as transfer payments in the form of pension, gratuity, etc., Rs. 15 crores of government surplus is spent for investment purposes, and Rs. 6 crores are paid to foreign countries for goods and services received from them. The last item also includes expenditure on the maintenance of embassies abroad, and on delegations to foreign countries.

Row 4 relates to the capital account of the economy out of which payment of Rs. 36 crores is made to business sector for capital goods and net change in investories, and Rs. 3 crores are net foreign investments.

Row 5 relates to the rest of the world account or foreign account to which payments of Rs. 24 crores are made by selling or exports of goods and services to foreigners.

Similarly, the receipts of each sector can be explained columnwise from **Table 6.**

The social accounts matrix presented in Table 6 further reveals three things. *First*, each cell (i.e., rectangular box) shows the equality of the payments to one sectoral account and the receipts from another sectoral account. For example, payment of Rs. 279 crores by the production sector to the consumption sector, reading row-wise in the Table is shown as the receipt of the consumption sector, reading column-wise.

Second, the total payments of each sectoral account equal the total receipts of that sector. For example, the total payments of the production sector reading row-wise amounting to Rs. 309 crores equal the total receipts of this sector, reading column-wise.

Third, the total payments of all sectors equal the total receipts of all sectors in the social accounting matrix. They are Rs. 714 crores both row-wise and column-wise in the Table.

Importance of Social Accounting

Social accounting helps in understanding the structure of an economy and relative importance of the different sectors and flows. It is a key to the evaluation and formulation of government policies both in the present and future.

The uses of social accounting are as follows :

In Classifying Transactions. Economic activity in a country involves innumerable transactions relating to buying and selling, paying and receiving income, exporting and importing, paying taxes, etc. The great merit of social accounting lies in classifying and summarising these different kinds of transactions properly, and deriving from these such aggregates as national income, national expenditure, saving, investment, consumption expenditure, production expenditure, government spending, foreign payments and receipts, etc.

In Understanding Economic Structure. Social accounting helps us to understand the structure of the body economic. It tells us not only about the national income but also about the size of production and consumption, the level of taxation and saving and the dependence of the economy upon foreign trade.

In Understanding Different Sectors and Flows. Social accounts throw

light on the relative importance of the different sectors and flows in the economy. They tell us whether the contribution of the production sector, the consumption sector, the investment sector or the rest of the world sector is greater than the other sectors in the national accounts.

In Clarifying Relations between Concepts. Social accounts help in clarifying the relationships between such related concepts as net national product at factor cost and gross national product at market prices.

In Guiding the Investigator. Social accounts are a guide for the economic investigator by indicating the type of data which might be collected for analysing the behaviour of the economy. Such data might relate to gross national product, government expenditure on goods and services, private consumption expenditure, gross private investment, etc.

In Explaining Trends in Income Distribution. Variations in the components of social accounts are a guide to the trends in income distribution within the economy.

In Explaining Movements in GNP. Movements in gross national product valued at constant prices and expressed per head of population indicate changes in the standard of living. Similarly, changes in the level of productivity can be measured by relating gross national product valued at constant prices to working population per head.

Provide a Picture of the Working of Economy. Social accounts provide an *ex post* picture of the working of the economy. "They can also be used as a framework for drawing up an *ex ante* forecast of the likely outcome of the economy in the future. Thus, social accounts ensure consistency of forecasts, both internally and in relation to other known facts."

In Explaining Interdependence of Different Sectors of the Economy. Social accounts also provide an insight into the interdependence of the different sectors of the economy. This can be known from a study of the matrix of social accounts.

In Estimating Effects of Government Policies. The importance of social accounts lies in estimating the effects of government policies on
different sectors of the economy and in formulating new policies in keeping with changes in economic conditions, as revealed by national income accounts. Their main function is to help the government judge, guide or control economic conditions and to formulate economic policies which aim at maximisation of national income, keeping employment at a high level, reducing inequalities of income and wealth, preventing undue rise in prices, conserving foreign exchange, etc.

Helpful in Big Business Organisations. Social accounts are also used by big business houses for assessing their performance and to improve their prospects on the basis of the statistical information about the various sectors of the economy.

Useful for International Purposes. Social accounting is also useful for international purposes. A comparative study of the social accounts of different countries of the world helps in the categorization of countries into underdeveloped, less developed and developed. It is on the basis of social accounts that the various agencies of the United Nations make provisions for aid to poor countries of the world.

Basis of Economic Models. Social accounts form the basis for economic models for the purpose of analysing the bahaviour of the economy as a whole, of economic forecasting and of illuminating problems of economic policy.

Difficulties of Social Accounting:

The preparation of social accounts presents the following difficulties:

Imputations. In preparing social accounts, all incomes and payments are measured in money. But there are many goods and services which are difficult to impute in terms of money. They are services of the housewife in her home, painting as hobby by an individual, a teacher teaching his children at home, etc. Similarly there are a number of non-traded or non-marketed products and services. They are vegetables produced in the kitchen garden and consumed by the family itself, rental value of house occupied by the owner himself, a portion of farm produce retained by the farmer for personal consumption, etc. All such non-market transactions which cannot be assessed in money terms present problems in preparing social accounts accurately.

Double Counting. The greatest difficulty in preparing social accounts is of double counting. It arises from the failure to distinguish between final and intermediate products. For instance, flour used by a bakery is an intermediate product and that by a household the final product. Similarly, 'the purchase of a newly constructed building by the government is taken under *consumption output* of the economy. On the other hand, the purchase of the same building by a private firm becomes *gross investment* for the year'. Thus the same product is shown as consumption and investment in social accounts. Such problems lead to difficulties in preparing social accounts.

Public Services. Another problem is of estimating a number of public

services in social accounts. They are police, military, health, education, etc. Similarly, the contributions made by multipurpose river valley projects cannot be fitted into the social accounts because of the difficulty of assessing their numerous benefits in monetary terms.

Inventory Adjustments. All inventory changes whether negative or positive are adjusted in the production accounts by inventory valuation adjustment. But the difficulty is that firms record inventories at their original costs and not at their replacement costs. When prices rise, there are gains in the book value of inventories. But when prices fall, there are losses in the value of inventories, So for correct calculation of inventories in business accounts under social accounting, inventory valuation adjustment is required which is a very difficult thing.

Depreciation. Another problem in business accounts under social accounting is of estimating depreciation. For instance, it is very difficult to estimate the current depreciation rate of a capital asset whose expected life is very long, say fifty years. The difficulty increases further when prices of assets change every year. Unlike inventories, it is very difficult to have depreciation valuation adjustment in social accounts.

INPUT-OUTPUT ACCOUNTING

The input-output analysis tells us that there are industrial inter-relationships and inter-dependencies in the economic system as a whole. The inputs of one industry are the outputs of another industry and vice versa, so that ultimately their mutual relationships lead to equilibrium between supply and demand in the economy as a whole. Coal is an input for steel industry and steel is an input for coal industry, though both are the outputs of their respective industries. A major part of economic activity consists in producing intermediate goods (inputs) for further use in producing final goods (outputs). There are flows of goods in "whirlpools and cross currents" between different industries. The supply side consists of inter-industry flows of intermediate products and the demand side of the final goods. In essence, the input-output analysis implies that in equilibrium the money value of aggregate output of the whole economy must equal the sum of the money values of inter-industry inputs plus the sum of money values of inter-industry outputs.

The national income accounts are related to an economy's final product. They do not explicitly show the inter-industry flows of outputs and

their relationships which the goods and services demanded. The input-output analysis analyses these relationships. It is, thus, an improvement over the national income accounting method.

Input-Output Table

The input-output accounting of national income is presented in an input- output table which is based on a 'transactions matrix'. A transactions matrix shows how the total output of one industry is distributed to all other industries as inputs and for final demand. A set of *m n* quantities or values arranged in *m* rows and *n* columns in a rectangular or square form is a matrix. That is why an input-output table is often called input-output matrix. The columns and rows of an input-output table 'provide industrial breakdowns of the final expenditures and income payments that enter into the national income accounts.'

A simple input-output matrix of an economy is shown in Table 7. Its rows show the amount of each industry's output sold to every other industry and to final buyers. The columns show the amount of each industry's inputs bought from every other industry, and from imports and factor services, known as primary inputs because they are not produced by the industries in the country.

Table 7: Input-Output Transaction Matrix

(Rs Crores)

Purchasing Sectors → / Selling Sectors ↓	Inputs to			Final Demand (X+K+G+C)	Total Gross Output
	Agricul-ture	Manufac-turing	Others		
	1	*2*	*3*	*4*	*5*
Agriculture	-	15	5	22	42
Manufacturing	12	-	17	16	45
Others	8	12	-	30	50
Inports	7	5	8	7	27
Primary inputs	15	13	20	-	48
Total Gross Input	*42*	*45*	*50*	*75*	*212*

In this table, the total gross output of the agriculture sector of the economy is set in the first row (to be read horizontally). It consists of Rs. 15 crores to the manufacturing sector, Rs. 5 crores to the other sectors, and Rs. 22 crores to satisfy the final demand which comprises exports (X), capital

(K), government (G) and personal consumption (C). Thus the total gross output of the agriculture sector is Rs. 42 crores = Rs. 20 crores of intermediate products (Rs. 15 crores plus Rs. 5 crores) + Rs. 22 crores of final demand. Similarly, the second row shows the distributon of total output of the manufacturing sector of the economy valued at Rs. 45 crores per year. Likewise, the other rows show the distribution of output of other sectors, and from imports and primary inputs.

Taking columnwise (to be read downward), the first column shows inputs to the agriculture sector coming from the various sectors of the economy. For instance, inputs worth Rs. 12 crores come from the manufacturing industries, Rs. 8 crores from other sectors, Rs 7 crores from imports and Rs 15 crores from primary inputs. Primary inputs are the sum of payments as wages, profits, etc. and depreciation. They are also called *value added*. Thus the total gross input of the agriculture sector is 12+8+7+15=Rs. 42 crores. Similarly, the other columns show inputs to manufacturing and other sectors, and to final demand. The column relating to 'final demand' has been shown as nil against primary inputs. This means that the households of a country simply consume (or spend) but do not sell any thing to themselves. For instance, labour is not directly consumed.

It may be noted that the row total must equal the column total of the economy in the input-output table. It means that total gross output must equal the total gross input of the economy.

How to Find out GNP, GNI and GNE from the Input-Output Table?

Inter-industry transactions are not included in national income accounting. This is done in order to avoid the errors of multiple counting. In fact, intermediate goods (inputs and outputs) always enter into the production of goods. Thus only final demand or payments to factors enter into GNP at factor prices. In the preceding table, GNP *at factor prices* is Rs. 48 crores. The total resources available to the economy are GNP (primary inputs) *plus* imports: Rs. 48 crores + Rs 27 crores=Rs 75 crores. This is *Gross national Income* (GNI). GNI of Rs 75 crores is also the difference between total gross output and the total value of inputs or intermediate products, i.e., Rs 212 crores — Rs 137 crores = Rs 75 crores. Gross National Expenditure is the sum of payments to satisfy final demand which includes exports (X), capital expenditure (K), government

expenditure (G) and consumption expenditure (C). Thus the total of final demand column in the table which is equal to Rs 75 crores (=22+16+30+7) is the gross national expenditure (GNE) of the economy which equals GNI.

Input Co-efficient or Technical Co-efficient

There are two types of relationships which indicate and determine the manner in which an economy behaves and assumes a certain pattern of flows of resources. They are : (a) the internal stability or balance of each sector of the economy, and (b) the external stability of each sector or inter-sectoral relationships. Leontief calls them the "fundamental relationships of balance and structure." When expressed matematically, they are known as the "balance equations" and the "structural equations."

If the total output of say *Xi* of the *i*th industry be divided into various number of industries 1, 2, 3,...n, and the final demand *Di* then we have the balance equation :

$$Xi = xi_1 + xi_2 + xi_3 + \ldots xi_n + Di \qquad \ldots(1)$$

and if the amount say *Yi* absorbed by the "outside sector" is also taken into consideration, then the balance equation of the *i*th industry becomes

$$Xi = xi_1 + xi_2 + xi_3 + \ldots xi_n + Di + Yi \qquad \ldots(2)$$

It is to be noted that *Yi* stands for the sum of the flows of the products of the *i*th industry to consumption, investment and exports, net of imports, etc. It is also called the "final bill of goods" which is the function of the output to fill. Since xi_2 stands for the amount absorbed by industry 2 of the *i*th industry, it follows that *Xij* stands for the amount absorbed by the *j*th industry of *i*th industry.

$$aij = \frac{xij}{Xj}$$

The "technical co-efficient" or "input co-efficient" of the *j*th industry is denoted by:

Cross-multiplying, we have

$$xij = aij.Xj \qquad ...(3)$$

where *xij* is the flow from industry *i* to industry *j, Xj* is the total output of industry *j*; and *aij*, as already noted above, is a constant, called "technical co-efficient" or "flow" or "flow co-efficient" in the *i*th industry. Equation
(3) is called a 'structural equation'.

The structural equation tells us that the output of one industry is absorbed by all indusries so that the flow-structure of the entire economy is revealed.

A number of structural equations *xij = aij.Xj* give a summary description of the economy's existing technological conditions. The table showing input co-efficients is called "a technology matrix".

The technology matrix of Table 7 is shown in Table 8.

These input co-efficients have been arrived at by dividing each item in the first column of Table 7 by its first row total and each item in the second column by its second row total and so on. Each column of the technological matrix reveals how much agriculture, manufacturing and other sectors require from each other to produce a rupee's worth of output. The first column shows that a rupee's worth of agriculture output requires inputs.

Table 8. Technology Co-efficient Matrix (Input Co-efficient)

	Inputs to Agriculture	Inputs to Manufacturing	Input Oth
Agriculture	—	(15/45=) .33	(5/50=)
Manufacturing	(12/42=) .29	—	(17/50=)
Others	(9/42=) .19	(12/45=) .27	
(Primary inputs)	(22/45=) .52	(18/45=) .40	(28/50=)
Total	1.00	1.00	1

worth 29 paise from manufacturing, 19 paise from others and 52 paise

from primary inputs.

The input co-efficient table can be utilised to measure the direct and indirect effects on the entire economy of any sectoral change in total output of final demand.

Limitations of Input-Output Accounting Analysis

Following are the limitations of input-output analysis:

1. Constancy of Input Coefficient Assumption Unrealistic. The input-output analysis has its shortcomings. Its framework rests on the assumption of constancy of input co-efficient of production. It tells us nothing as to how technical co-efficients would change with changed conditions. Again some industries may have identical capital structures, some may have heavy capital requirements while others may use no capital. Such variations in the use of techniques of production make the assumption of constant co-efficients of production unrealistic.

2. Factor Substitution Possible. This assumption of fixed co-efficients of production ignores the possibility of factor substitution. There is always the possibility of some substitutions even in a short period, while substitution possibilities are likely to be relatively greater over a longer period.

3. Rigid Model. The rigidity of the input-output model cannot reflect such phenomena as bottlenecks, increasing costs, etc.

4. Restrictive Model. The input-output model is severely simplified and restricted as it lays exclusive emphasis on the production side for the economy. It does not tell us why the inputs and outputs are of a particular pattern in the economy.

5. Difficulty in Final Demand. Another difficulty arises in the case of "final demand" or "bill of goods." In this analysis, the purchases by the government and consumers are taken as given and treated as a specific bill of goods. Final demand is regarded as an independent variable. It might, therefore, fail to utilize all the factors proportionately or need more than their available supply. Assuming constancy of co-efficiency of production, the analysis is not in a position to solve this difficulty.

6. Quantity of Inputs not Constant. This analysis operates on the basis of a fixed quantity of an input for the production of per unit of output. As factors are mostly indivisible, the increases in outputs are not expected to be in proportion to the increases in inputs.

7. Solution of Equations Difficult. The input-output model works on equations which cannot be solved easily. First, the model of equations is

prepared and then large numbers of data are collected. Equations require thorough knowledge of higher mathematics and even the collection of data is not so easy. This makes the construction of input-output model difficult.

Importance

Despite these limitations, the concept of input-output is of tremendous practical value and importance.

(1) A producer can know from the input-output table, the varieties and quantities of goods which he and the other firms buy and sell to each other. In this way, he can make the necessary adjustments and thus improve his position vis-a-vis other producers.

(2) It is also possible to find out from the input-output table the inter-relations among firms and industries about possible trends toward combinations.

(3) The effects of a prolonged strike, of a war and of a business cycle can be easily perceived from the input-output table.

(4) The input-output model has come to be used for national income accounting "because it provides a more detailed breakdown of the macro aggregates and money flows."

(5) The input-output analysis is also used for national economic planning.

The input-output model provides the necessary information about the structural co-efficients of the various sectors of the economy during a period of time or at a point of time which can be utilized for the optimum allocation of the economy's resources towards a desired end

FLOW OF FUNDS ACCOUNTS

The national income accounts do not tell anything about monetary or financial transactions whereby one sector places its savings at the disposal of the other sectors of the economy by means of loans, capital transfers, etc. In fact, the national income accounts do not take into consideration the financial dimensions of economic activity and they describe product accounts as if they are operated through barter. The flow of funds accounts are meant to supplement national income and product accounts. The flow of funds accounts were developed by Prof. Morris Copeland[1] in 1952 to overcome the weaknesses of national income accounting.

The flow of funds accounts list the sources of all funds received and the uses to which they are put within the economy. They show the

financial transactions among different sectors of the economy and the link between saving and investment aggregates with lending and borrowing by them. The account for each sector reveals all the sources of funds whether from income or borrowing and all the uses to which they are put whether for spending or lending. This way of looking at financial transactions in their entirety has come to be known as the flow of funds approach or of sources and uses of funds.

In the flow of funds accounts, all changes in assets are recorded as uses and all changes in liabilities are recorded as sources. *Uses of funds* are increases in assets if positive or decreases in assets if negative. They refer to capital expenditures or *real investment* spending which involve the purchase of real assets. *Sources of funds* are increases in liabilities or *net worth* or *saving* if positive, and repayment of debt or dissaving if negative. Net worth is equal to a sector's total assets *minus* its total liabilities. Therefore a change in net worth equals any change in total assets *less* any change in total liabilities.

Flow of Funds Matrix

The flow of funds accounting system is presented in the form of a matrix by placing sources and uses of funds statements of different sectors side by side. It is an interlocking self-contained system that reveals financial relationships among all sectors of the economy. For the economy as a whole, total liabilities must equal total financial assets, although for any one sector its liabilities may not equal its financial assets. The consolidated net worth of an economy is consequently identical to the value of its real assets. This implies that saving must equal investment in an economy. Any single sector may save more than it invests or invest more than it saves. But the economy-wise total of saving must equal investment.

Table 9 presents the flow of funds matrix of an economy. For simplicity, we take the flow of funds accounts matrix of an economy divided into four sectors: households, nonfinancial corporations, financial institutions, and the government. These institutional sectors are shown in columns and various types of transactions in rows.

Table 9. Flow of Funds Accounts Matrix

(Rs crores)

Sectors / Transactions / Category		Households		Non-financial Corporations		Financial Institutions		Government		Saving and investment
		U	*S*	*U*	*S*	*U*	*S*	*U*	*S*	
1.	Gross saving	–	27	–	17	–	–	–	–4	40
2.	Gross investment	12	–	28	–	–	–	–	–	40
3.	Net financial investment (4 – 5)	15	–	–11	–	–	–	–4	–	0
4.	Financial uses (net) (6+7+8+9+10)	25		3		6				34
5.	Financial sources (net) (6+7+8+9+10)		10		14		6		4	34
6.	Demand deposits	7	–	–1	–	–	6	–	–	0
7.	Government securities	4	–	2	–	–2	–	–	–	0
8.	Corporate securities	14	–	–	14	–	–	–	–	0
9.	Mortgages	–	10	–	–	8	–	2	–	0
10.	Net increase in FOREIGN ASSETS	–	–	2	–	+	–	–2	–	0

Note : 'U' refers to uses of funds and 'S' to sources of funds.

First take the columns. The household sector includes nonprofit organisations within it. Nonfinancial corporations include savings and loan associations, mutual savings banks, insurance companies, pension funds, mutual funds, etc. The remaining sectors are self-explanatory. The last column showing saving and investment is a measure of domestic saving and investment of all sectors *minus* the rest of the world.

Row 1 which relates to gross saving which is a *source* of funds for households (Rs 27 crores) and non-financial corporations (Rs 17 crores), and the minus figure of Rs. 4 crores for the government indicates a deficit in its budget.

Row 2 relates to gross investment which is a *use* of funds by households (Rs. 12 crores) and non-financial corporations (Rs 28 crores). The last column of the table shows that saving and investment are equal to Rs 40 crores each. The figures of saving and investment are supposed to havebeen taken from the national income accounts of the economy.

Row 3 shows net financial investment which is the excess of saving over investment or uses over sources of each sector. For instance, the household sector makes positive net investment of Rs 15 crores (27-12), while the non-financial corporate sector incurs *negative* net investment of Rs 11 crores because it makes investment in excess of saving (17-28). The same is the case with the government which is shown as minus Rs 4 crores. (It can also be arrived at by deducting the figure of S of row 5 from the U figure of row 4 of each sector).

Row 4 shows financial uses (net) of funds. They feer to lending. It equals the sum of the change in each sector's holding of financial assets which include demand deposits, government securities, corporate securities, mortgages and net increase in foreign assets. Thus the net financial uses of the household sector are Rs 25 crores which include Rs 7 crores of demand deposits *plus* Rs 4 crores of government securities *plus* Rs 14 crores of corporate securities. Similarly for the remaining sectors.

Row 5 Financial sources (net) of funds shows the liability of each sector. They refer to borrowing. For instance, the government sector shows the acquisition of financial assets of Rs 4 crores by selling securities to the household sector.

Two important points sould be noted: *first*, financial uses (net) and financial sources (net) of the economy must equal. They are Rs 34 crores in our table. *Second*, changes in assets (uses) and liabilities (sources) of each type of fund must total up to zero. This is revealed by the last column of the table in relation to rows 6, 7, 8, 9 and 10. In the case of row 10 we have taken net increase in foreign assets to be zero for the sake of convenience. If it is a positive figure, the balance will show surplus in the international current account of the national income accounts and a negative figure will show a deficit.

Limitations

The flow of funds accounts are beset with a number of problems which are discussed as under:

1. The flow of funds accounts are more complicated than the national income accounts because they involve the aggregation of a large number of sectors with their very detailed financial transactions.
2. There is the problem of valuation of assets. Many assets, claims and obligations have no fixed value. It, therefore, becomes difficult to have their correct valuation.
3. Similarly, economists have failed to decide about the inclusion of

human wealth in flow of funds accounts.

Importance

The flow of funds accounts present a comprehensive and systematic analysis of the financial transactions of the economy. As such, they are useful in a number of ways.

1. The flow of funds accounts are superior to the national income accounts. Even though the latter are fairly comprehensive, yet they do not reveal the financial transactions of the economy which the flow of funds accounts do.
2. They provide a useful framework for studying the behaviour of individual financial institutions of the economy.
3. According of Prof. Goldsmith, they bring "the various financial activities of an economy into explicit statistical relationships with one another and with data on the nonfinancial activities that generate income and production."

DIFFERENCE BETWEEN FLOW OF FUNDS ACCOUNTS AND NATIONAL INCOME ACCOUNTS

The flow of funds accounts differ from national income accounts in many ways.

First, the national income accounts are confined exclusively to nonfinancial transactions. They neglect the link between saving and investment aggregates with lending and borrowing by different sectors of the economy.

Second, the national income accounts confine all real investment to the business sector with the exception of building construction. Consumers and governments are not allowed to invest in national income accounts. The flow of funds accounts treat consumer purchases of durable goods as real investment. Government enterprises are included in the producing sector of national income accounts but in the flow of funds accounts they are included in the government sector.

Third, the number of sectors in flow of funds accounts are more with larger details than in the national income accounts. They are defined

institutionally in flow of funds accounts whereas they are defined functionally in national income accounts.

Fourth, there are fewer imputations in the flow of funds accounts than in national income accounts. For instance, taxes are carried on a cash basis in flow of funds accounts whereas some sectors are shown on an accrual basis in national income accounts.

BALANCE OF PAYMENTS ACCOUNTS

The balance of payments of a country is a systematic record of all its economic transactions with the outside world in a given year. It is a statistical record of the character and dimensions of the country's economic relationships with the rest of the world. According to Bo Sodersten, "The balance of payments is merely a way of listing receipts and payments in international transactions for a country." B.J. Cohen says, "It shows the country's trading position, changes in its net position as foreign lender or borower, and changes in its official reserve holding."

Structure and Classification

The balance of payments account of a country is constructed on the principle of double-entry book-keeping. Each transaction is entered on the credit and debit side of the balance sheet. But balance of payments accounting differs from business accounting in one respect. In business accounting, debits (–) are shown on the left side and credits (+) on the right side of the balance sheet. But in balance of payments accounting, the practice is to show credits on the left side and debits on the right side of the balance sheet.

When a payment is received from a foreign country, it is a credit transaction while payment to a foreign country is a debit transaction. The principal items shown on the *credit side* (+) are exports of goods and services, unrequited (or transfer) receipts in the form of gifts, grants etc. from foreigners, borrowings from abroad, investments by foreigners in the country and official *sale* of reserve assets including gold to foreign countries and international agencies. The principal items on the *debit* side (–) include imports of goods and services, transfer (or unrequited) payments to foreigners as gifts, grants, etc., lending to foreign countries, investments by residents to foreign countries and official *purchase* of reserve assets or gold from foreign countries and international agencies.

These credit and debit items are shown vertically in the balance of

payments account of a country according to the principle of double-entry book-keeping. Horizontally, they are divided into three categories : the current account, the capital account and the official settlements account or the official reserve assets account.

The balance of payments account of a country is constructed in Table 10.

Table 10. Balance of Payments Account

Credits (+) (Receipts)	*Debits (–) (Payments)*
1. Current Account	
Exports	*Imports*
(a) Goods	(a) Goods
(b) Services	(b) Services
(c) Transfer Payments	(c) Transfer Payments
2. Capital Account	
(a) Borrowings from Foreign Countries	(a) Lending to Foreign Countries
(b) Direct Investments by Foreign Countries	(b) Direct Investments in Foreign Countries
3. Official Settlements Account	
(a) Increase in Foreign Official Holdings	(a) Increase in Official Reserve of Gold and Foreign Currencies
	Errors and Omissions

1. Current Account. The current account of a country consists of all transactions relating to trade in goods and services and unilateral (or unrequited) transfers. Service transactions include costs of travel and transportation, insurance, income and payments of foreign investments, etc. Transfer payments relate to gifts, foreign aid, pensions, private remittances, charitable donations, etc. received from foreign individuals and governments to foreigners.

In the current account, merchandise exports and imports are the most

important items. Exports are shown as a positive item and are calculated *f.o.b*. (free on board) which means that costs of transportation, insurance, etc. are excluded. On the other side, imports are shown as a negative item and are calculated *c.i.f.* (costs, insurance and freight) and included. The difference between exports and imports of a country is its *balance of visible trade* or merchandise trade or simply *balance of trade*. If visible exports exceed visible imports, the balance of trade is favourable. In the opposite case when imports exceed exports, it is unfavourable.

In the current account, the exports of goods and services and the receipts of transfer payments (unrequited receipts) are entered as credits (+) because they represent receipts from foreigners. On the other hand, the imports of goods and services and grant of transfer payments to foreigners are entered as debits (–) because they represent payments to foreigners. The net value of these visible and invisible trade balances is the balance on current account.

2.Capital Account. The capital account of a country consists of its transactions in financial assets in the form of short-term and long-term lendings and borrowings and private and official investments. In other words, the capital account shows international flows of loans and investments, and represents a change in the country's foreign assets and liabilities. Long-term capital transactions relate to international capital movements with maturity of one year or more and include direct investments like building of a foreign plant, portfolio investment like the purchase of foreign bonds and stocks and international loans. On the other hand, short-term international capital transactions are for a period ranging between three months and less than one year.

There are two types of transactions in the capital account—private and government. Private transactions include all types of investment : direct, portfolio and short-term. Government transactions consist of loans to and from foreign official agencies.

In the capital account, borrowings from foreign countries and direct investment by foreign countries represent capital inflows. They are positive items or credits because these are receipts from foreigners. On the other hand, lending to foreign countries and direct investments in foreign countries represent capital outflows. They are negative items or debits because they are payments to foreigners. The net value of the balances of short-term and long-term direct and portfolio investments is the balance on

capital account. The sum of current account and capital account is known as the basic balance.

3.The Official Settlements Account. The official settlements account or official reserve assets account is, in fact, a part of the capital account. But the U.K. and U.S. balance of payments accounts show it as a separate account. "The official settlements account measures the change in nations's liquidity and non-liquid liabilities to foreign official holders and the change in a nation's official reserve assets during the year. The official reserve assets of a country include its gold stock, holdings of its convertible foreign currencies and SDRs, and its net position in the IMF". It shows transactions in a country's net official reserve assets.

4. Errors and Omissions. Errors and omissions is a balancing item so that total credits and debits of the three accounts must equal in accordance with the principles of double entry book-keeping so that the balance of payments of a country always balances in the accounting sense.

MEASURING DEFICIT OR SURPLUS IN BALANCE OF PAYMENTS

If the balance of payments always balances, then why does a deficit or surplus arise in the balance of payment of a country? It is only when all items in the balance of payments are included that there is no possibility of a deficit or surplus. But if some items are excluded from a country's balance of payments and then a balance is struck, it may show a deficit or surplus.

There are three ways of measuring deficit or surplus in the balance of payments.

First, there is the *basic balance* which includes the current account balance and the long-term capital account balance.

Second, there is the *net liquidity balance* which includes the basic balance and the short-term private non-liquid capital balance, allocation of SDRs, and errors and omissions.

Third, there is the *official settlements balance* which includes the total net liquid balance and short-term private liquid capital balance.

If the total debits are more than total credits in the current and capital accounts, including errors and omissions, the net *debit balance* measures the *deficit* in the balance of payments of a country. This deficit can be settled with an equal amount of *net credit balance* in the official settlements account. On the contrary, if total credits are more than total

debits in the current and capital accounts, including errors and omissions, the *net debit* balance measures the *surplus* in the balance of payments of a country. This surplus can be settled with an equal amount of *net debit* balance in the official settlements account.

THE CIRCULAR FLOW OF INCOME

MEANING

The circular flow of income and expenditure refers to the process whereby the national income and expenditure of an economy flow in a circular manner continuously through time. The various components of national income and expenditure such as saving, investment, taxation, government expenditure, exports, imports, etc. are shown on diagrams in the form of currents and cross-currents in such a manner that national income equals national expenditure.

CIRCULAR FLOW IN A TWO SECTOR ECONOMY:

We begin with a simple hypothetical economy where there are only two sectors, the household and business. The household sector owns all the factors of production, that is, land, labour and capital. This sector receives income by selling the services of these factors to the business sector.

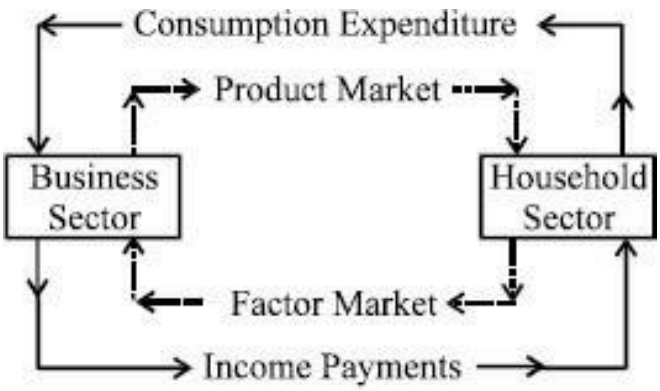


Fig. 1.

The business sector consists of producers who produce products and sell them to the household sector or consumers. Thus the household sector buys the output of products of the business sector. The circular flow of income and expenditure in such an economy is shown in Figure 1 where the product market is shown in the upper portion and the factor market in the lower portion. In the product market, the household sector purchases goods and services from the business sector while in the factor market the household sector receives income from the former for providing services. Thus the household sector purchases all goods and services provided by the business sector and makes payments to the latter in lieu of these. The

business sector, in turn, makes payments to the households for the services rendered by the latter to the business-wage payments for labour services, profit for capital supplied, etc. Thus payments go around in a circular manner from the business sector to the household sector, and from the household sector to the business sector, as shown by arrows in the output portion of the figure. There are also flows of goods and services in the opposite direction to the money payments flows. Goods flow from the business sector to the household sector in the product market, and services flow from the household sector to the business sector in the factor market, as shown in the inner portion of the figure. These two flows give GNP=GNI.

Circular Flow with Saving and Investment Added

The actual economy is not as explained above. In an economy, "inflows" and "leakages" occur in the expenditure and income flows. Such leakages are saving, and inflows or injections are investment which equal each other.

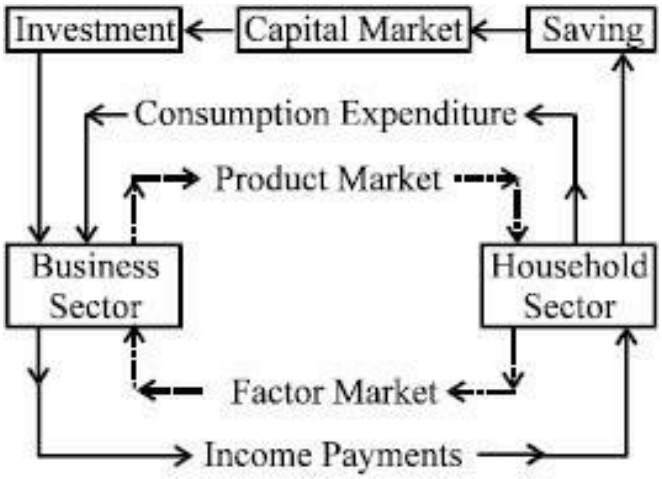


Fig. 2.

Figure 2 shows how the circular flow of income and expenditure is altered by the inclusion of saving and investment. Expenditure has now two alternative paths from household and product markets: (i) directly via consumption expenditure, and (ii) indirectly via investment expenditure.

In Figure 2 there is a capital or credit market in between saving and investment flows from households to business firms. The capital mark refers to a number of financial institutions such as commercial banks, savings banks, loan institutions, the stock and bond markets, etc. The capital market coordinates the saving and investment activities of the households and the business firms. The households supply saving to the capital market and the firms, in turn, obtain investment funds from the capital market.

CIRCULAR FLOW IN A THREE-SECTOR CLOSED ECONOMY

So far we have been working on the circular flow of a two-sector model of an economy. To this we add the government sector so as to make it a three-sector closed model of circular flow of income and expenditure. For this, we add taxation and government purchases(or expenditure) in our presentation. Taxation is a leakage from the circular flow and government purchases are injections into the circular flow.

First, take the circular flow between the household sector and the government sector. Taxes in the form of personal income tax and commodity taxes paid by the household sector are outflows or leakages from the circular flow. But the government purchases the services of the households, makes transfer payments in the form of old age pensions, unemployment relief, sickness benefit, etc., and also spends on them to provide certain social services like education, health, housing, water, parks and other facilities. All such expenditures by the government are injections into the circular flow.

Next take the circular flow between the business sector and the government sector. All types of taxes paid by the business sector to the government are leakages from the circular flow. On the other hand, the government purchases all its requirements of goods of all types from the business sector, gives subsidies and makes transfer payments to firms in order to encourage their production. These government expenditures are injections into the circular flow.

Now we take the household, business and government sectors together to show their inflows and outflows in the circular flow. As already noted, taxation is a leakage from the circular flow. It tends to reduce consumption and saving of the household sector. Reduced consumption, in turn, reduces the sales and incomes of the firms. On the other hand, taxes on business firms tend to reduce their

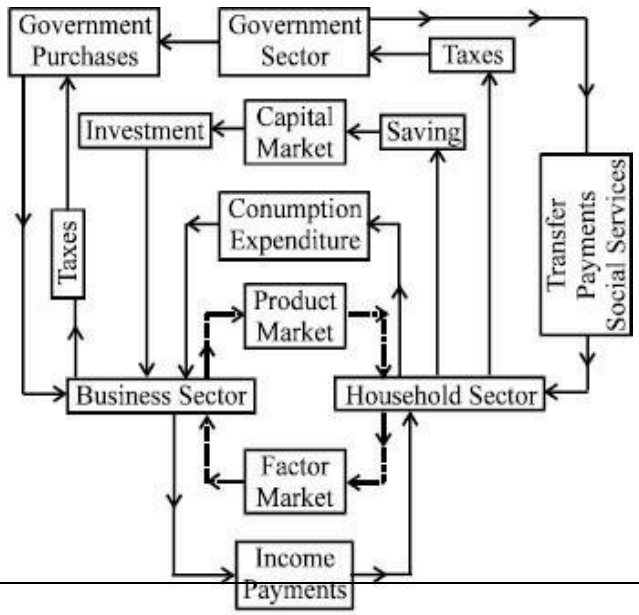


Fig. 3.

investment and production. The government offsets these leakages by making purchases from the business sector and buying services of the household sector equal to the amount of taxes. Thus total sales again equal production of firms. In this way, the circular flows of income and expenditure remain in equilibrium.

Figure 3 shows that taxes flow out of the household and business sectors and go to the government. Now the government makes investment and for this purchases goods from firms and also factors of production from households. Thus government purchases of goods and services are an injection in the circular flow of income and taxes are leakages.

If government purchases exceed net taxes then the government will incur a deficit equal to the difference between the two, i.e., government expenditure and taxes. The government finances its deficit by borrowing from the capital market which receives funds from households in the form of saving. On the other hand, if net taxes exceed government purchases the government will have a budget surplus. In this case, the government reduces the public debt and supplies funds to the capital market which are received by firms.

ADDING FOREIGN SECTOR : CIRCULAR FLOW IN A FOUR-SECTOR OPEN ECONOMY

So far the circular flow of income and expenditure has been shown in the case of a closed economy. But the actual economy is an open one where foreign trade plays an important role. Exports are an injection or inflows into the economy. They create incomes for the domestic firms. When foreigners buy goods and services produced by domestic firms, they are exports in the circular flow of income. On the other hand, imports are leakages from the circular flow. They are expenditures incurred by the household sector to purchase goods from foreign countries. These exports and imports in the circular flow are shown in Figure 4.

Take the inflows and outflows of the household, business and government sectors in relation to the foreign sector. The household sector buys goods imported from abroad and makes payment for them which is a leakage from the circular flow. The households may receive transfer

payments from the foreign sector for the services rendered by them in foreign countries.

On the other hand, the business sector exports goods to foreign countries and its receipts are an injection in the circular flow. Similarly, there are many services rendered by business firms to foreign countries such as shipping, insurance, banking, etc. for which they receive payments from abroad. They also receive royalties, interests, dividends, profits, etc. for investments made in foreign countries. On the other hand, the business sector makes payments to the foreign sector for imports of capital goods, machinery, raw materials, consumer goods, and services from abroad. These are the leakages from the circular flow.

Like the business sector, modern governments also export and import goods and services, and lend to and borrow from foreign countries. For all exports of goods, the government receives payments from abroad. Similarly, the government receives payments from foreigners when they visit the country as tourists and for receiving education, etc. and also when the government provides shipping, insurance and banking services to foreigners through the state-owned agencies. It also receives royalitie interest, dividends etc. for investments made abroad. These are injections into the circular flow. On other hand, the leakages are payments made for the purchase of goods and services to foreigners.

Figure 4 shows the circular flow of the four-sector open economy with saving, taxes and imports shown as leakages from the circular flow on the right hand side of the figure, and investment, government purchases and exports as injections into the circular flow on the left side of the figure. Further, imports, exports and transfer payments have been shown to arise from the three domestic sectors—the household, the business and the government. These outflows and inflows pass through the foreign sector which is also called the "Balance of Payments Sector." If exports exceed imports, the economy has a surplus in the balance of payments. And if imports exceed exports, it has a deficit in the balance of payments. But in the long run, exports of an economy must balance its imports. This is achieved by the foreign trade policies adopted by the economy.

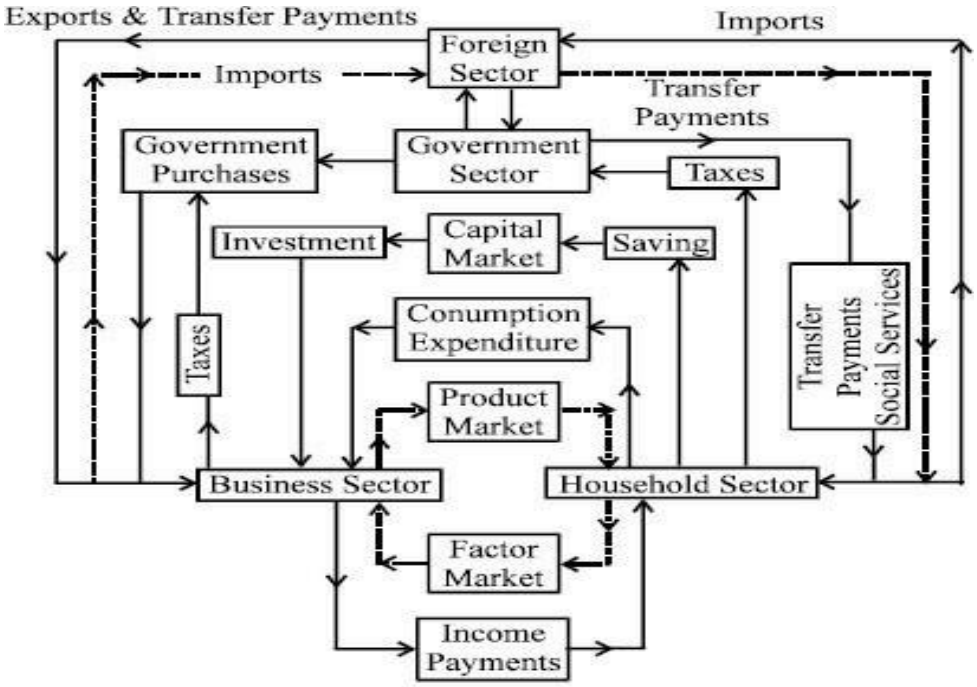


Fig. 4.

The whole analysis can be shown in simple equations :

$$Y = C + I + G \qquad \text{...(1)}$$

where Y represents the production of goods and services, C for consumption expenditure, I investment level in the economy and G for government expenditure respectively.

Now we introduce taxation in the model to equate the government expenditure.

Therefore, $Y = C + S + T$ ...(2)

Where S is saving T is taxation.

By equating (1) and (2), we get

$$C + I + G = C + S + T$$
$$I + G = S + T$$

With the introduction of the foreign sector, we divide investment into domestic investment *(Id)*

and foreign investment (I_f) and get

$$I_d + I_f + G = S + T$$

But $$I_f = X - M$$

where X is exports and M is imports

$$I_d + (X - M) + G = S + T$$

$$I_d + (X - M) = S + (T - G)$$

The equation shows the equilibrium condition in the circular flow of income and expenditure.

IMPORTANCE OF THE CIRCULAR FLOW

The concept of the circular flow gives a clear-cut picture of the economy. We can know whether the economy is woking efficiently or whether there is any disturbance in its smooth functioning. As such, the circular flow is of immense significance for studying the functioning of the economy and for helping the government in formulating policy measures.

1. Study of Problems of Disequilibrium. It is with the help of circular flow that the problems of disequilibrium and the restoration of equilibrium can be studied.

2. Effects of Leakages and Inflows. The role of leakages enables us to study their effects on the national economy. For example, imports are a leakage out of the circular flow of income because they are payments made to a foreign country. To stop this leakage, government should adopt appropriate measures so as to increase exports and decrease imports

3. Link between Producers and Consumers. The circular flow establishes a link between producers and consumers. It is through income that producers buy the services of the factors of production with which the latter, in turn, purchase goods from the producers.

4. Creates a Network of Markets. As a corollary to the above point, the

linking of producers and consumers through the circular flow of income and expenditure has created a network of markets for different goods and services where problems relating to their sale and purchase are automatically solved.

5. Inflationary and Deflationary Tendencies. Leakages or injections in the circular flow disturb the smooth functioning of the economy. For example, saving is a leakage out of the expenditure stream. If saving increases, this depresses the circular flow of income. This tends to reduce employment, income and prices, thereby leading to a deflationary process in the economy. On the other hand, consumption tends to increase employment, income, output and prices that lead to inflationary tendencies.

6. Basis of the Multiplier. Again, if leakages exceed injections in the circular flow, the total income becomes less than the total output. This leads to a cumulative decline in employment, income, output, and prices over time. On the other hand, if injections into the circular flow exceed leakages, the income is increased in the economy. This leads to a cumulative rise in employment, income, output, and prices over a period of time. In fact, the basis of the Keynesian multiplier is the cumulative movements in the circular flow of income.

7. Importance of Monetary Policy. The study of circular flow also highlights the importance of monetary policy to bring about the equality of saving and investment in the economy. Figure 2 shows that the equality between saving and investment comes about through the credit or capital market. The credit market itself is controlled by the government through monetary policy. When saving exceeds investment or investment exceeds saving, money and credit policies help to stimulate or retard investment spending. This is how a fall or rise in prices is also controlled.

8. **Importance of Fiscal Policy.** The circular flow of income and expenditure points toward the importance of fiscal policy. For national income to be in equilibrium desired saving plus taxes (S+T) must equal desired investment plus government spending (I + G). S+T represent leakages from the spending stream which must be offset by injections of $I + G$ into the income stream. If $S + T$ exceed $I + G$, government should adopt such fiscal measures as reduction in taxes and spending more itself. On the contrary, If $I + G$ exceed $S + T$, the government should adjust its revenue and expenditure by encouraging saving and tax revenue. Thus the circular flow of income and expenditure tells us about the importance of

compensatory fiscal policy.

9. Importance of Trade Policies. Similarly, imports are leakages in the circular flow of money because they are payments made to a foreign country. To stop it, the government adopts such measures as to increase exports and decrease imports. Thus the circular flow points toward the importance of adopting export promotion and import control policies.

10. Basis of Flow of Funds Accounts. The circular flow helps in calculating national income on the basis of the flow of funds accounts. The flow of funds accounts are concerned with all transactions in the economy that are accomplished by money transfers. They show the financial transactions among different sectors of the economy, and the link between saving and investment, and lending and borrowing by them.

To conclude, the circular flow of income possesses much theoretical and practical significance in an economy.

UNIT -II

THE CONSUMPTION FUNCTION

INTRODUCTION

One of the important tools of the Keynesian economics is the consumption function. This chapter deals with the consumption function, its technical attributes, its importance and its subjective and objective determinants along with Keynes's Psychological Law of Consumption.

MEANING OF CONSUMPTION FUNCTION

The consumption function or propensity to consume refers to income-consumption relationship. It is a "functional relationship between two aggregates, *i.e.*, total consumption and gross national income."[1] Symbolically, the relationship is represented as $C = f(Y)$, where C is consumption, Y is income, and f is the functional relationship. Thus the consumption function indicates a functional relationship between C and Y, where C is the dependent by Y is the independent variable, *i.e.*, C is determined by Y. This relationship is based on the *ceteris paribus* (other things being equal) assumption, as such only income-consumption relationship is considered and all possible influences on consumption are held constant.

In fact, the propensity to consume or consumption function is a schedule of the various amounts of consumption expenditure corresponding to different levels of income. A hypothetical consumption schedule is given in Table I.

TABLE I : CONSUMPTION SCHEDULE

Income *(Rs Crores)* (*Y*)	Cons *C*
0	
60	
120	
180	
240	
300	

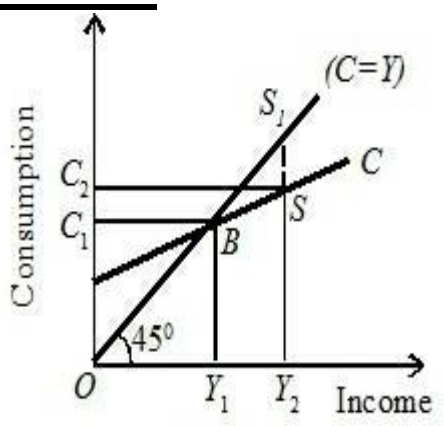


Fig. 1.

360 320

Table I shows that consumption is an increasing function of income because consumption expenditure increases with increase in income. Here it is shown that when income is zero during the depression, people spend out of their past savings on consumption because they must eat in order to live. When income is generated in the economy to the extent of Rs 60 crores, it is not sufficient to meet the consumption expenditure of the community so that the consumption expenditure of Rs 70 crores is still above the income amounting to Rs 60 crores (Rs 10 crores are dis-saved). When both consumption expenditure and income equal Rs 120 crores, it is the basic consumption level. After this, income is shown to increase by 60 crores and consumption by 50 crores. This implies a stable consumption function during the short-run as assumed by Keynes. Figure 1 illustrates the consumption function diagrammatically. In the diagram, income is measured horizontally and consumption is measured vertically. 45° is the unity-line where at all levels income and consumption are equal. The C curve is a linear consumption function based on the assumption that consumption changes by the same amount (Rs 50 crores). Its upward slope to the right indicates that consumption is an increasing function of income. *B* is the break-even point where $C=Y$ or $OY_1 = OC_1$. When income rises to OY_1consumption also increases to OC_2, but the increase in consumption is less than the increase in income, $C_1C_2 < Y_1Y_2$. The portion of income not consumed is saved as shown by the vertical distance between 45° line and *C* curve, *i.e.*, SS_1. "Thus the consumption function measures not only the amount spent on consumption but also the amount saved. This is because the propensity to save is merely the propensity not to consume. The 45° line may therefore be regarded as a zero-saving line, and the shape and position of the *C* curve indicate the division of income between consumption and saving."

PROPERTIES OR TECHNICAL ATTRIBUTES OF THE CONSUMPTION FUNCTION

The consumption function has two technical attributes or properties: (i) the average propensity to consume, and (ii) the marginal propensity to

consume.

(1) The Average propensity to Consume. "The average propensity to consume may be defined as the ratio of consumption expenditure to any particular level of income."[2] It is found by dividing consumption expenditure by income, or $APC = C/Y$. It is expressed as the percentage or proportion of income consumed. The *APC* at various income levels is shown in column 3 of Table II. The *APC* declines as income increases because the proportion of income spent on consumption decreases. But reverse is the case with *APS* (average propensity to save) which increases with increase in income (see column 4). Thus the *APC* also tells us about the the average propensity to save, $APS=1—APC$.

Diagrammatically, the average propensity to consume is any one point on the *C* curve. In Figure 2 Panel (A), point *R* measures the *APC* of the *C* curve which is OC_1/OY_1. The flattening of the *C* curve to the right shows declining *APC*.

(2) The Marginal Propensity to Consume. "The marginal propensity to consume may be defined as the ratio of the change in consumption to the change in income or as the rate of change in the average propensity to consume as income changes."[3] It can be found by dividing change in consumption by a change in income, or $MPC = \Delta C/\Delta Y$. The *MPC* is constant at all levels of income as shown in column 5 of Table II. It is 0.83 or 83 per cent because the ratio of change in cosumption to change in income is $\Delta C/\Delta Y = 50/60$. The marginal propensity to save can be derived from the *MPC* by the formula 1–*MPC*. It is 0.17 in our example (see column 6).

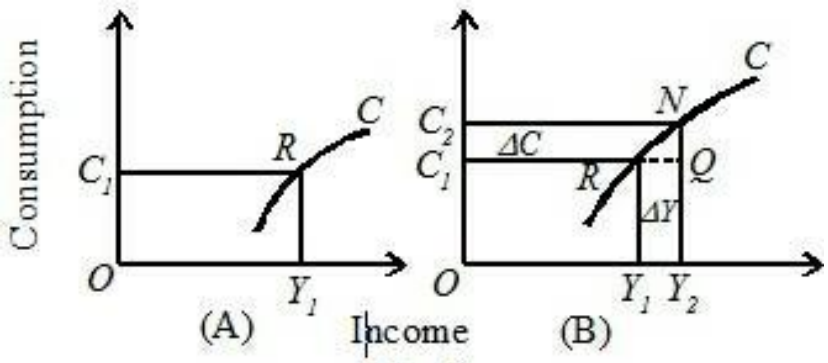


Fig. 2.

Diagrammatically, the marginal propensity to consume is measured by the gradient or slope of the *C* curve. This is shown in Panel (B) by *NQ*/*RQ* where *NQ* is change in consumption (ΔC) and *RQ* is change in income (ΔY) or C_1C_2/Y_1Y_2.

Significance of MPC;

The MPC is the rate of change in the APC. When income increases, the MPC falls but more than the APC. Contrariwise, when income falls, the MPC rises and the APC also rises but at a slower rate than the former. Such changes are only possible during cyclical fluctuations whereas in the short-run there is change in the MPC and MPC<APC.

TABLE II

(Rs. Crores)

(1) Income Y	(2) Consump-tion(C)	(3) APC=C/Y	(4) APS=S/Y (1-APC)	(5) MPC= ΔC/ΔY	(6) MPS=ΔS/ΔY (1-MPC)
120	120	$\frac{120}{120}$ = 1 or 100%	0	—	—
180	170	$\frac{170}{180}$ = 0.92 or 0.92%	0.08	$\frac{50}{60}$ = 0.83	0.17
240	220	$\frac{220}{240}$ = 0.91 or 91%	0.09	$\frac{50}{60}$ = 0.83	0.17
300	270	$\frac{270}{300}$ = 0.90 or 90%	0.10	$\frac{50}{60}$ = 0.82	0.17
360	320	$\frac{320}{360}$ = 0.88 or 88%	0.12	$\frac{50}{60}$ = 0.83 or 83%	0.17

Keynes is concerned primarily with the *MPC*, for his analysis pertains to the shor-run while the *APC* is useful in the long-run analysis. The post-Keynesian economists have come to the conclusion that over the long-run *APC* and *MPC* are equal and approximate 0.9. In the Keynesian analysis the *MPC* is given more prominence. Its value is assumed to be positive and less than unity which means that when income increases the whole of

it is not spent on consumption. On the contrary, when income falls, consumption expenditure does not decline in the same proportion and never becomes zero. The Keynesian hypothesis that the marginal propensity to consume is positive but less than unity($O < \Delta C/\Delta Y < 1$) is of great analytical and practical significance. Besides telling us thatconsumption is an increasing function of income and it increases by less than the increment of income, this hypothesis helps in explaining "(*a*) the theoretical possibility of general over production or 'underemployment equilibrium,' and also (*b*) the relative stability of a highly developed industrial economy. For it is implied that the gap between income and consumption at all high levels of income is too wide to be easily filled by investment with the possible consequence that the economy may fluctuate around an underemployment equilibrium."[4] Thus the economic significance of the *MPC* lies in filling the gap between income and consumption through planned investment to maintain the desired level of income. Further, its importance lies in the multiplier theory. Th higher the *MPC*, the higher the multiplier and vice versa. The *MPC* is low in the case of the rich people and high in the case of the poor. This accounts for high *MPC* in underdeveloped countries and low in advanced countries.

KEYNES'S PSYCHOLOGICAL LAW OF CONSUMPTION

Keynes propounded the fundamental psychological law of consumption which forms the basis of the consumption function. He wrote, "The fundamental psychological law upon which we are entitled to depend with great confidence both *a prior* from our knowledge of human nature and from the detailed facts of experience, is 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." The law implies that there is a tendency on the part of the people to spend on consumption less than the full increment of income.

Propositions of the Law:

This law has three related propositions:

(1) When income increases, consumption expenditure also increases but by a smaller amount. The reason is that as income increases, our wants are satisfied side by side, so that the need to spend more on consumer goods diminishes. It does not mean that the consumption expenditure falls with the increase in income. In fact, the consumption expenditure increases

with increase in income but less than proportionately.

(2) The increased income will be divided in some proportion between consumption expenditure and saving. This follows from the above proposition because when the whole of increased income is not spent on consumption, the remaining is saved. In this way, consumption and saving move together.

(3) Increase in income always leads to an increase in both consumption and saving. This means that increased income is unlikely to lead either to fall in consumption or saving than before. This is based on the above propositions because as income increases consumption also increases but by a smaller amount than before which leads to an increase in saving. Thus with increased income both consumption and saving increase.

The three propositions of the law can be explained with the help of the following Table III.

TABLE III

(Rs Crores)

Income (Y)	*Consumption (C)*	*Savings (S=Y—C)*
0	20	—20
60	70	—10
120	120	0
180	170	10
240	220	20
300	270	30
360	320	40

Proposition (1) : Income increases by Rs 60 crores and the increase in consumption is by Rs 50 crores. The consumption expenditure is, however, increasing with increase in income, *i.e.*, Rs 170, 220, 270 and 320 crores against Rs 180, 240, 300 and 360 crores respectively.

Proposition (2) : The increased income of Rs 60 crores in each case is divided in some proportion between consumption and saving(*i.e.*, Rs 50 crores and Rs 10 crores).

Proposition (3) : As income increases from Rs 120 to 180, 240, 300 and 360 crores, consumption also increases from Rs 120 to 170, 220, 270, 320

crores, along with increase in saving from Rs 0 to 10, 20, 30 and 40 crores respectively. With increase in income neither consumption nor saving have fallen.

Diagrammatically, the three propositions are explained in Figure 3. Here, income is measured horizontally and consumption and saving are measured on the vertical axis. *C* is the consumption function curve and 45° line represents income. *Proposition* (1): When income increases from OY_0 to OY_1 consumption also increases from BY_0 to C_1Y_1 but the increase in consumption is less than the increase in income, *i.e.*, $C_1Y_1 < A_1Y_1 (=OY_1)$ by A_1C_1. *Proposition* (2): When income increases to OY_1 and OY_2, it is divided in some proportion between consumption C_1Y_1 and C_2Y_2 and saving A_1C_1 and A_2C_2 respectively. *Proposition* (3): Increases in income to OY_1 and OY_2 lead to increased consumption $C_2Y_2 > C_1Y_1$ and increased saving $A_2C_2 > A_1C_1$ than before. It is clear from the widening area below the *C* curve and saving gap between 45° line and *C* curve.

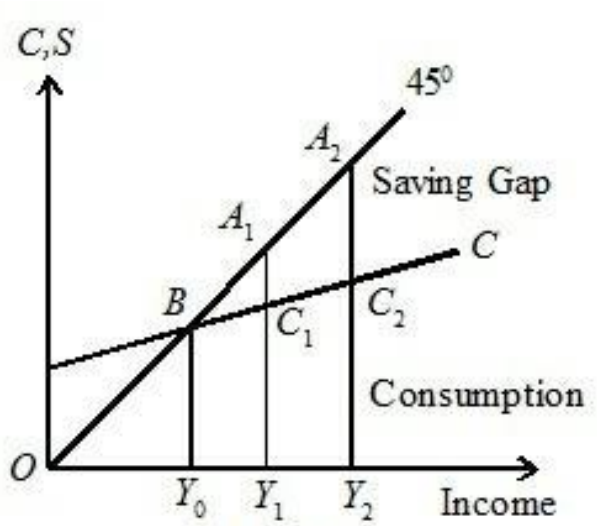


Fig. 3.

Its Assumptions:

Keynes's Law is based on the following assumptions:

1. It assumes a Constant Psychological and Institutional Complex. This law is based on the assumption that the psychological and institutional complexes influencing consumption expenditure remain constant. Such complexes are income distribution, tastes, habits, social customs, price movements, population growth, etc. In the short run, they do not change and consumption depends on income alone. The constancy of these complexes is the fundamental cause of the stable consumption function.

2. It assumes the Existence of Normal Conditions. The law holds good under normal conditions. If, however, the economy is faced with

abnormal and extraordinary circumstances like war, revolution or hyperinflation, the law will not operate. People may spend the whole of increased income on consumption.

3. It assumes the Existence of a Laissez-faire Capitalist Economy. The law operates in a rich capitalist economy where there is no government intervention. People should be free to spend increased income. In the case of regulation of private enterprise and consumption expenditures by the state, the law breaks down. Thus the law is inoperative in socialist or state controlled and regulated economies.

Professor Kurihara opines that "Keynes's law based on these assumptions may be regarded as a rough approximation to the actual macro-behaviour of free consumers in the normal short period."[6]

IMPLICATIONS OF KEYNES'S LAW (OR IMPORTANCE OF THE CONSUMPTION FUNCTION)

Keynes's psychological law has important implications which in fact point towards the importance of the consumption function7 because the latter is based on the former. The following are its implications:

Invalidates Say's Law. Say's Law states that supply creates its own demand. Therefore, there cannot be general overproduction or general unemployment. Keynes's psychological law invalidates Say's Law because as income increases, consumption also increases but by a smaller amount. In other words, all that is produced (income) is not taken off the market (spent), as income increases. Thus supply fails to create its own demand. Rather it exceeds demand and leads to general overproduction and glut of commodities in the market. As a result, producers stop production and there is mass unemployment.

1. Need for State Intervention. As a corollary to the above, the psychological law highlights the need for state intervention. Say's Law is based on the existence of *laissez-faire* policy and its refutation implies that the economic system is not self-adjusting. So when consumption does not increase by the full increment of income and consequently there is general overproduction and mass unemployment, the necessity of state intervention arises in the economy to avert general overproduction and unemployment through public policy.

2. Crucial Importance of Investment. Keynes's psychological law stresses the vital point that people fail to spend on consumption the full

increment of income. This tendency creates a gap between income and consumption which can only be filled by either increaed investment or consumption. If either of them fail to rise, output and employment will inevitably fall. Since the consumption function is stable in the short-run, the gap between income and consumption can only be filled by an increase in investment. Thus the psychological law emphasises the crucial role of investment in Keynes's theory. It is the inadequacy of investment which results in unemployment and logically, the remedy to overcome unemployment is increase in investment.

3. Existence of Underemployment Equilibrium. Keynes's notion of underemployment equilibrium is also based on the psychological law of consumption. The point of effective demand which determines the equilibrium level of employment is not of full employment but of underemployment because consumers do not spend the full increment of their income on consumption and there remains a deficiency in aggregate demand. Full employment equilibrium level can, however, be reached if the state increases investment to match the gap between income and consumption.

4. Declining Tendency of the Marginal Efficiency of Capital. The psychological law also points towards the tendency of declining marginal efficiency of capital in a *laissez-faire* economy. When income increases and consumption does not increase to the same extent, there is a fall in demand for consumer goods. This results in glut of commondities in the market. The producers will reduce production which will, in turn, bring a decline in the demand for capital goods and hence in the expected rate of profit and business expectations. It implies a decline in the marginal efficiency of capital. It is not possible to arrest this process of declining tendency of marginal efficiency of capital unless th propensity to consume rises. But such a possibility can exist only in the long run when the psychological law of consumption does not hold good.

6. Danger of Permanent Over-saving or Under-investment Gap. Keynes's psychological law points out that there is always a danger of an over-saving or under-investment gap appearing in the capitalist economy because as people become rich the gap between income and consumption widens. This long-run tendency of increase in saving and fall in investment is characterised as secular stagnation. When people are rich, their propensity to consume is low and they save more. This implies low demand which leads to decline in investment. Thus the tendency is for

secular stagnation in the economy.

7. Unique Nature of Income Propagation. The fact that the entire increased income is not spent on consumption explains the multiplier theory. The multiplier theory or the process of income propagation tells that when an initial injection of investment is made in the economy, it leads to smaller successive increments of income. This is due to the fact that people do not spend their full increment of income on consumption. In fact, the value of multiplier is derived from the marginal propensity to consume, *i.e.*, Multiplier = 1—1/*MPC*. The higher the *MPC*, the higher the value of the multiplier, and vice versa.

8. Explanation of the Turning Points of the Business Cycles. This law explains the turning points of a business cycle. Before the economy reaches the full employment level, the downturn starts because people fail to spend the full increment of their income on consumption. This leads to fall in demand, overproduction, unemployment and decline in the marginal efficiency of capital. Panel (A) of Figure 4 shows this downturn movement. When income increases above the breakeven point by Y_1Y_2, consumption expenditure increases by a smaller amount C_1C_2, $C_1C_2 < Y_1Y_2$. Before the economy reaches the full-employment income level Y_F, the downturn will start because the gap between 45° line and *C* curve continues to widen.

Conversely, the upturn in the economy starts before it reaches the stage of complete depression because when income falls, consumption also falls but by less than the fall in income. People

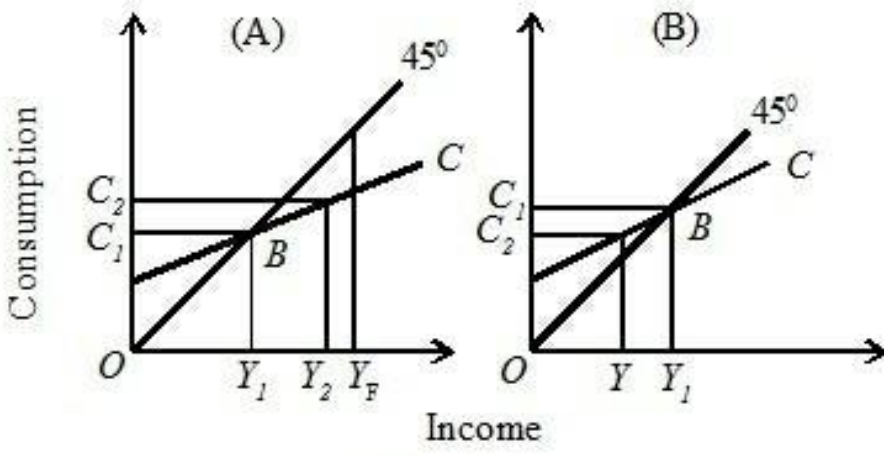


Fig. 4.

continue to buy consumer goods even when their income falls. So when the excess stock of commodities is exhausted in the community during a depression, the existence of consumer expenditure on goods leads to revival. This is best explained with the help of Panel (B) where below the breakeven point *B*, the *C* curve is above the 45° income line. The fact that the consumption function curve *C* is above the income line shows that revival will start before income falls to zero. This is because the fall in consumption C_1C_2 is less than the fall in income Y_1Y.

DETERMINANTS OF THE CONSUMPTION FUNCTION

Keynes mentions two principal factors which influence the consumption function and determine its slope and position.

They are (i) the subjective factors, and (ii) the objective factors.

The subjective factors are endogenous or internal to the economic system. They include psychological characteristics of human nature, social practices and institutions and social arrangements. They "are unlikely to undergo a material change over a short period of time except in abnormal or revolutionary circumstances." They, therefore, determine the slope and position of the *C* curve which is fairly stable in the short-run.

The objective factors are exogenous or external to the economic system. They may, therefore, undergo rapid changes and may cause marked shifts in the consumption function (*i.e.*, the C curve).

The subjective and objective factors are discussed below.

Subjective Factors

Keynes's subjective factors basically underlie and determine the form (*i.e.*, slope and position) of the consumption function. As already noted above, the subjective factors are the psychological characteristics of human nature, social practices and institutions, especially the behaviour patterns of business concerns with respect to wage and dividend payments and retained earnings, and social arrangements affecting the distribution of income. There are two motives of subjective factors: individual and business.

1. Individual Motives. First, there are eight motives "which lead individuals to refrain from spending out of their incomes." They are :

(i) the desire to build reserves for unforeseen contingencies;

(ii) the desire to provide for anticipated future needs, *i.e.*, old age, sickness, etc.;

(iii) the desire to enjoy and enlarged future income by way of interest and appreciation; the desire to enjoy a gradually increasing expenditure in

order to improve the standard of living;
(iv) the desire to enjoy a sense of independence and power to do things;
(v) the desire to secure a "*masse de manoeuver*" to carry out speculative or business projects;
(vi) the desire to bequeath a fortune;
(vii) the desire to satisfy a pure miserly instinct.

2. Business Motives. The subjective factors are also influenced by the behaviour of business corporations and governments. Keynes lists four motives for accumulation on their part:
(i) *enterprise*, the desire to do big things and to expand;
(ii) *liquidity*, the desire to meet emergencies and difficulties successfully;
(iii) *income raise*, the desire to secure large income and to show successful management;
(iv) *financial prudence*, the desire to provide adequate financial resources against depreciation and obsolescence, and to discharge debt.

These factors remain constant during the short-run and keep the consumption fuction stable.

Objective Factors

The following objective factors are given by Keynes.

Changes in the Wage Level. If the wage rate rises, the consumption function shifts upward. The workers having a high propensity to consume spend more out of their increased income and this tends to shift the *C* curve upward. If, however, the rise in the wage rate is accompanied by a more than proportionate rise in the price level, the real wage rate will fall and it will tend to shift the *C* curve downward. A cut in the wage rate will also reduce the consumption function of the community due to a fall in income, employmnet and output. This will shift the curve downward.

1. Windfall Gains or Losses. Unexpected changes in the stock market leading to gains or losses tend to shift the consumption function upward or downward. For instance, the phenomenal windfall gains due to the stock-market boom in the American economy after 1925 led to a rise in the consumption spending of the stock-holders by roughly in proportion to the increased income and as a result the consumption function shifted upward. Similarly, unexpected losses in the stock market lead to the downward shifting of the *C* curve.

2. Changes in the Fiscal Policy. Changes in fiscal policy in the form of taxation and public expenditure affect the consumption function. Heavy commodity taxation adversely affect the consumption function by

reducing the disposable income of the people. This is what actually happened during the Second World War when the consumption function shifted downward due to heavy indirect taxation, rationing and price controls. On the other hand, the policy of progressive taxation along with that of public expenditure on welfare programmes tends to shift the consumption function upward by altering the distribution of income.

3. Changes in Expectations. Changes in future expectations also affect the propensity to consume. If a war is expected in the near future, people start hoarding durable and semi-durable commodities in anticipation of future scarcity and rising prices. As a result, people buy much in excess of their current needs and the consumption function shifts upward. On the contrary, if it is expected that prices are likely to fall in the future, people would buy only those things which are very essential. It will lead to a fall in consumption demand and to a downward shift of the consumption function.

4. Changes in the Rate of Interest. Substantial changes in the market rate of interest may influence the consumption function indirectly. There are several ways in which the rate of interest may affect the consumption function. A rise in rate of interest will lead to a fall in the price of bonds, thereby tending to discourage the propensity to consume of the bond-holders.

5. Financial Policies of Corporations—Financial policies of corporations with regard to income retention, dividend payments and reinvestments tend to affect the consumption function in several ways. If corporations keep more money in the form of reserves, dividend payments to shareholders will be less, this will have the effect of reducing the income of the shareholders and the consumption function will shift downward

6. Holding of Liquid Assets. The amount of liquid assets in the form of cash balances, savings and government bonds in the hands of consumers also influence the consumption function. If people hold larger liquid assets they will have a tendency to spend more out of their current income and the propensity to consume will move upward, and vice versa. Pigou was of the view that with a cut in money wage, prices fall and the real value of such assets increases. This tends to shift the consumption function upward. This is called the "Pigou Effect."

The Distribution of Income. The distribution of income in the community also determines the shape of the consumption function. If there are large

disparities in income distribution between the rich and the poor, the consumption function is low because the rich have a low propensity to consume and the poor with a very low income are unable to spend more on consumption. If through progressive taxation and other fiscal measures, the inequalities of income and wealth are reduced, the consumption function will shift upward because with the increase in the income of the poor their consumption expenditure will increase more than the reduction in the expenditure of the rich. "Moreover, if the distribution of income is significantly altered for political or humanitarian reasons, consumer habits themselves may undergo such changes as to cause the position or shape of the entire consumption function to vary perceptibly."

Attitude toward Saving. The consumption function is also influenced by people's attitude toward saving. If they value future consumption more than present consumption, they will tend to save more and the consumption function will shift downward. This tendency may be reinforced by the state through compulsory life insurance, provident fund and other social insurance schemes to keep the consumption function low. In a high-saving economy, the consumption function is low.

Duesenberry Hypothesis. James Duesenberry has propounded a relative income hypothesis affecting the consumption function. The first part of this hypothesis relates to the 'demonstration effect.' There is a tendency in human beings not only to keep up with the Joneses but also to surpass the Joneses, that is, the tendency is to strive constantly toward a higher consumption level and to emulate the consumption patterns of one's rich neighbours and even to surpass them. Thus consumption preferences are interdependent. The second part is the 'past peak of income' hypothesis which explains the short-run fluctuations in consumption. Once the community reaches a particular income level and standard of living, it is reluctant to come down to a lower level of consumption during a recession. Consumption is sustained by the reduction in current saving and vice versa. So there is no shift in the consumption function during the short-run. There is simply an upward- downward movement on the same consumption function when income rises or falls during the short-run.

We may conclude with Professor Hansen "that except for quite abnormal or revolutionary changes in certain *objective* factors...shifts in the 'propensity to consume out of a given income' are not likely to be of more than secondary importance."

MEASURES TO RAISE THE PROPENSITY TO CONSUME

The propensity to consume remains stable during the short-run due to the existence of certain psychological and institutional factors in the society. But "employment can only increase *pari passu* with an increase in investment; unless, indeed, there is a change in the propensity to consume," as pointed out by Keynes. Therefore, it is significant to study the measures which tend to raise the propensity to consume.

1. Income Redistribution. Redistribution of income in favour of the poor tends to raise the propensity to consume because the marginal propensity to consume of the low income groups is high in comparison to the rich. Therefore, the propensity to consume can be raised by transferring income and wealth from the rich to the poor. This can be done by the state through its taxation and public spending policies. By imposing progressive taxes on incomes, expenditures, estates, capital gains, etc., the state is able to mobilise larger revenues for providing more facilities to the poor. But care should be taken that such taxation should not adversely affect investment. Secondly, the state can increase the income of the poor through a judicious public expenditure programme. By starting public works, it is in a position to increase income by providing larger employment opportunities to the unemployed. The provision for free education., free mid-day meals, free health services, low-rent housing, etc. indirectly helps in increasing the income of the workers and tends to raise their consumption expenditure. Such social expenditures by the state also increase the efficiency of the workers which, in turn, leads to a rise in their wages.

2. Increased Wages. If wages are raised, they will have a direct effect in shifting the consumption fuction upward. But a policy of high wages adversely affects the level of employment in the economy for it is not possible to raise the marginal revenue productivity of labour in the short-run. If wages are raised in such a situation, costs will rise in the absence of increase in the marginal revenue productivity of labour and the economy is likely to experience unemployment. Therefore, the long-run wage policy should be such that wages increase *pari passu* with increase in labour productivity. This will tend to raise the level of consumption in the economy.

3. Social Security Measures. Social security measures tend to raise the consumption function in the long-run. Provisions for unemployment relief, medical facilities, old age pension, etc. remove future uncertainties and the tendency to save is reduced on the part of the people. The state should, therefore, provide larger social security measures to raise the propensity to consume of the people. Unemployment relief and old age pensions tend to maintain a high consumption expenditure even during a depression and thus help bring revival in the economy. So social security measures tend to raise the consumption function both in periods of prosperity and depression.

4. Credit Facilities. Cheap and easy credit facilities help in shifting the consumption function upward. When loans are easily and cheaply available to the people, they buy more durable consumer goods like scooters, televisions, refrigerators, etc. This tends to raise the propensity to consume. To purchase these things on instalment basis or on hire-purchase system produces the same effect. Thus credit facilities in various ways help raise the propensity to consume of durable consumer goods.

5. Advertisement. Advertisement is one of the most significant ways to raise the propensity to consume in modern times. Advertisement and propaganda through the various media of radio, television, cinema, newspaper, etc. make the consumers familiar with the uses of products. The consumers are attracted toward them and they tend to buy them. This raises their propensity to consume.

6. Development of the Means of Transport. Well developed means of transport also tend to shift the consumption function upward. The movement of goods from the maufacturing centres to the different parts of the country becomes easy. The size of the market expands. The prices may also fall due to the reduction of transport costs. Things are available to the people in their respective towns. All this has the tendency to raise the consumption function.

7. Urbanisation. As a corollary to the above, urbanisation helps raise the propensity to consume. When urbanisation takes place, people move from the rural to the urban areas. They are enamoured by new articles and inluenced by the demonstration effect. This tends to shift the consumption function upward. Thus the state should follow the policy of deliberate urbanisation for the purpose of raising the consumption function.

THEORY OF THE CONSUMPTION FUNCTION

INTRODUCTION

In the previous chapter, we studied Keynes' consumption function. Economists after Keynes verified his consumption function in a number of empirical studies. Their findings have led to a few new theories or hypotheses of consumption.

Keynes' consumption function: the absolute income hypothesis

Keynes in his *General Theory* postulated that aggregate consumption is a function of aggregate current disposable income. The relation between consumption and income is based on his Fundamental Psychological Law of Consumption which states that when income increases consumption expenditure also increases but by a smaller amount.

The Keynesian consumption function is written as

$C = a + cY \qquad a > 0, \qquad 0 < c < 1$

where a is the intercept, a constant which measures consumption at a zero level of disposal income; c is the marginal propensity to consume (MPC); and Y is the disposal income.

The above relation that consumption is a function of current disposable income whether linear or non-linear, is called the absolute income hypothesis.

This consumption function has the following properties:

1. As income increases, average propensity to consume ($APC = C/Y$) falls.
2. The marginal propensity to consume (MPC) is positive but less than unity ($0 < c < 1$) so that higher income leads to higher consumption.
3. The consumption expenditure increases (or decreases) with increase (or decrease) in income but non-proportionally. This non-proportional consumption function implies that in the short-run average and marginal propensities do not coincide ($APC > MPC$).
4. This consumption function is stable both in the short-run and the long-run.

This consumption function is explained in Fig. 1 where $C = a + cY$ is the consumption function. At point E on the C curve the income level is OY_1. At this point, $APC > MPC$ where $APC =$

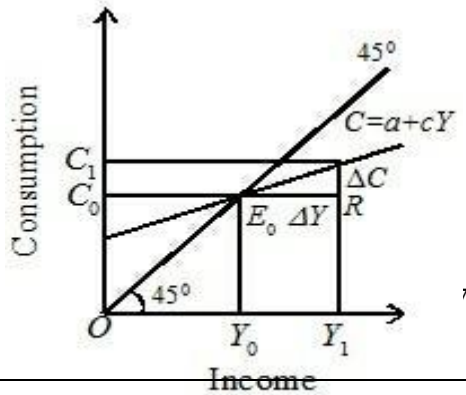


Fig 1

OC_1/OY_1 and $MPC = \Delta C/\Delta Y = ER/RE_O$.

This shows disproportional consumption function. The intercept *a* shows the level of consumption corresponding to a zero level of income. At income level OY_0 where the curve *C* intersects the 45° line, point E_0 represents *APC* ($=OC_0/OY_0$).

Below the income level OY_0, consumption is more than income. In this range, $APC > 1$. Above the income level OY_0, consumption increases less than proportionately with income so that *APC* declines and it is less than one.

Empirical Studies

Keynes put forth this hypothesis on the basis of "knowledge of human nature" 'and "delailed facts of experience". His followers in a number of empirical studies based on cross-section budget figures and short-run time series data in the late 1930s and mid-1940s confirmed his hypothesis. They found that families with higher income levels consumed more which confirms that MPC is greater than zero ($c>0$), but by less than the increase in income ($c<1$). They also found that families with higher income levels saved more and so consumed a smaller proportion of income which confirms that APC falls as income rises.

THE CONSUMPTION PUZZLE

Keynes' assertion that the APC falls as income rises led some Keynesians to formulate the secular stagnation thesis around 1940. According to these economists, as incomes grew in the economy, households would save more and consume less. As a result, aggregate demand would fall short of output. If the government spending was not increased at a faster rate than income, the economy would lapse into stagnation. But after World War II, the American economy experienced inflation rather than stagnation even when the government expenditures were reduced below 1941 level in constant dollars. The Keynesian consumption function had been proved wrong. This was due to the conversion of government bonds into liquid assets after the War by the households in order to meet their pent up demand for consumer goods.

In 1946, Kuznets studied the consumption and income data for the United States during the period 1869-1938 and estimated the consumption function for this period as 0.9.[1] Further, he arrived at two conclusions: *one*, over the long-run, on the average, the *APC* did not show any downward trend so that the *MPC* equalled the *APC* as income increased along a long-run trend. This means that the consumption function is a

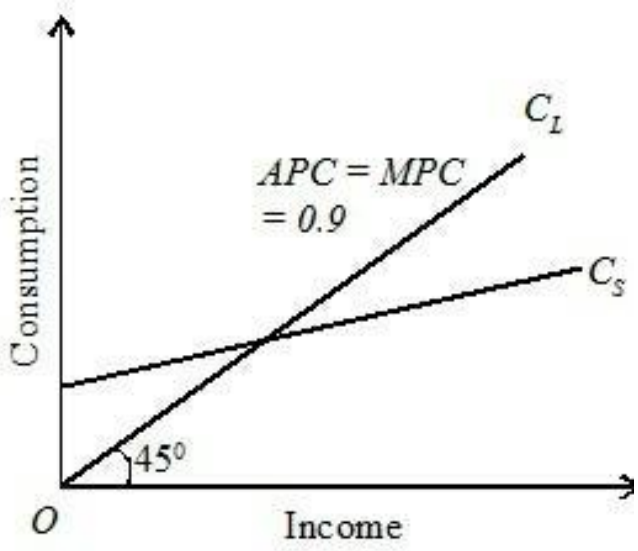


Fig 2

straight line through the origin, as shown by the C_L line in Fig. 2, and *two*, the years in which the *APC* was below the long-run average were boom periods, and the years in which the *APC* was above the long-run average were of slump periods. This implies that in the short-run as income changes over the business cycle, the *MPC* is less than the *APC*, as shown by the *Cs* curve in Fig. 2

These findings were later verified by Goldsmith in 1955 who found the long-run consumption function to be stable at 0.87.[2] Thus these two studies revealed that for the short-run time series, the consumption function is non-proportional because *APC* > *MPC* and for the long-run time series, the consumption function is proportional, *APC* = *MPC*.

The failure of the secular stagnation hypothesis and the findings of Kuznets and Goldsmith were a puzzle to the economists which is known as the *consumption puzzle*. Figure 2 illustrates this puzzle where there are two consumption functions. *Cs* is the Keynesian consumption function which is non-proportionl (*APC* > *MPC*) and based on the short-run time series data. C_L is the long-run proportional consumption function (*APC* = *MPC*) based on long-run time series data. Over the years, economists have been engaged in solving this puzzle by reconciling the two consumption functions.

We study below a few important theories which try to reconcile the two consumption functions.

THE DRIFT THEORY OF CONSUMPTION

One of the first attempts to reconcile the short-run and long-run consumption functions was by Arhur Smithies[3] and James Tobin[4]. They tested Keynes' absolute income hypothesis in separate studies and came to the conclusion that the short-run relationship between consumption and income is non-proportional but the time series data show the long-run

relationship to be proportional.

The latter consumption-income behaviour results through an upward shift or "drift" in the short-run non-proportional consumption function due to factors other than income. Smithies and Tobin discuss the following factors:

1. Asset Holdings. Tobin introduced asset holdings in the budget studies of negro and white families to test this hypothesis. He came to the conclusion that the increase in the asset holdings of families tends to increase their propensity to consume thereby leading to an upward shift in their consumption function.

2. New Products. Since the end of the Second World War, a variety of new household consumer goods have come into existence at a rapid rate. The introduction of new products tends to shift the consumption function upward.

3. Urbanisation. Since the post-War period, there has been an increased tendency toward urbanisation. This movement of population from rural to urban areas has tended to shift the consumption function upward because the propensity to consume of the urban wage earners is higher than that of the farm workers.

4. Age Distribution. There has been a continuous increase in the percentage of old people in the total population over the long-run. Though the old people do not earn but they do consume commodities. Consequently, the increase in their numbers has tended to shift the consumption function upward.

5. Decline in Saving Motive. The growth of social security system which makes automatic saving and guarantees income during illness. Unemployment disability and old age has increased the propensity to consume.

6. Consumer Credit. The increasing availability and convenience of short-term consumer credit shifts the consumption function upward. The greater ease of buying consumer goods with credit cards, debit cards, use

of ATMs and cheques, and availability of installment buying causes an upward shift in the consumption function.

7. Expectation of Income Increasing . Average real wages of workers have increased and they expect them to rise in the future. These cause an upward shift in the consumption function. Those who expect higher future earnings tend to reduce their savings or even borrow to increase their present consumption.

The consumption drift theory is explained in Fig. 3 where C_L is the long-run consumption function which shows the proportional relationship between consumption and income as we move along it. C_{S1} and C_{S2} are the short-run consumption functions which cut the long-run consumption function C_L at points A and B. But due to the factors mentioned above, they tend to "drift" upward from point A to point B along the C_L curve. Each point such as A and B on the C_L curve represents an average of all the values of factors included in the corresponding short-run functions, C_{S1} and C_{S2} respectively and the long-run function, C_L, connecting all the average values. But the movement along the dotted portion of the short-run consumption functions, C_{S1} and C_{S2}, would cause consumption not to increase in proportion to the increase in income.

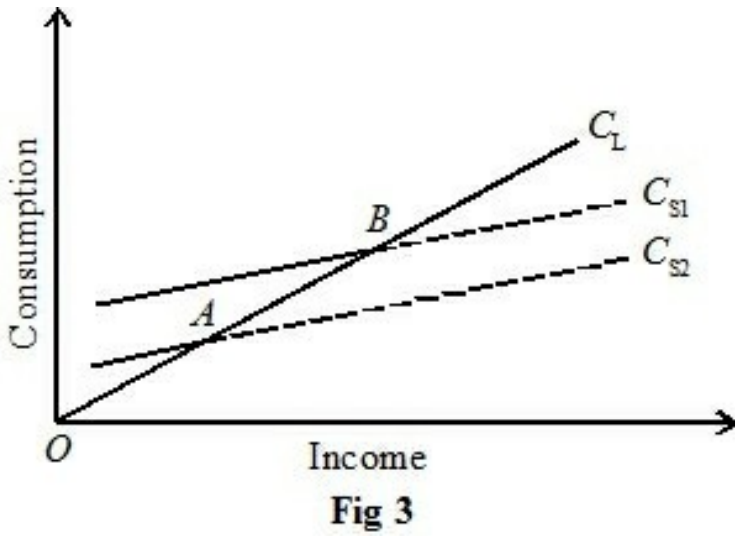


Fig 3

Its Criticisms

The great merit of this theory is that it lays stress on factors other than in income which affect the consumer behaviour. In this sense, it represents a major advance in the theory of the consumption function. However, it has its shortcomings.

1. The theory does not tell the rate of upward drift along the C_L curve. It appears to be a matter of chance.

2. It is just a coincidence if the factors explained above cause the consumption function to increase proportionately with increase in income so that the average of the values in the short-run consumption function equals a fixed proportion of income.

3. According to Duesenberry, all the factors mentioned as causes of the upward shift are not likely to have sufficient force to change the consumption-savings relationship to such an extent as to cause the drift.

4. Duesenberry also points out that many of the factors such as decline in saving motive would lead to a secular fall in the consumption function. Such saving plans as life insurance and pension programs tend to increase savings and decrease the consumption function. Moreover, people want more supplementary savings to meet post-retirement needs which tend to decrease their current consumption*.

THE RELATIVE INCOME HYPOTHESIS

The relative income hypothesis of James Duesenberry[5] is based on the rejection of the two fundamental assumptions of the consumption theory of Keynes. Duesenberry states that (1) every individual's consumption behaviour is not independent but *interdependent* of the behaviour of every other individual, and (2) that consumption relations are irreversible and not reversible in time.

In formulating his theory of the consumption function, Duesenberry

writes: "A real understanding of the problem of consumer behaviour must begin with a full recongnition of the social character of consumption patterns." By the "social character of consumption paterns" he means the tendency in human beings not only "to keep up with the Joneses" but also to surpass the Joneses. Joneses refers to rich neighbours. In other words, the tendency is to strive constantly toward a higher consumption level and to emulate the consumption patterns of one's rich neighbours and associates. Thus consumers' preferences are interdependent. It is, however, differences in *relative incomes* that determine the consumption expenditures in a community. A rich person will have a lower *APC* because he will need a smaller portion of his income to maintain his consumption pattern. On the other hand, a relatively poor man will have a higher *APC* because he tries to keep up with the consumption standards of his neighbours or associates. This provides the explanation of the constancy of the long-run *APC* because lower and higher *APCs* would balance out in the aggregate. Thus even if the absolute size of income in a country *increases*, the *APC* for the economy as a whole at the higher absolute level of income would be constant. But when income decreases, consumption does not fall in the same proportion because of the *Ratchet Effect*.

The Ratchet Effect

The second part of the Duesenberry theory is the "past peak of income" hypothesis which explains the short-run fluctuations in the consumption function and refutes the Keynesian assumption that consumption relations are reversible. The hypothesis states that during a period of prosperity, consumption will increase and gradually adjust itself to a higher level. Once people reach a particular peak income level and become accustomed to this standard of living, they are not prepared to reduce their consumption pattern during a recession. As income falls, consumption declines but proportionately *less* than the decrease in income because the consumer dissaves to sustain consumption. On the other hand, when income increases during the recovery period, consumption rises gradually with a rapid increase in saving. Economists call this the *Ratchet Effect*.

Duesenberry combines his two related hypothesis in the following form:

$$\frac{C_t}{Y_t} = a - c\frac{Y_t}{Y_o}$$

where C and Y are consumption and income respectively, t refers to the current period and the subscript (o) refers to the previous peak, a is a constant relating to the positive autonomous consumption and c is the consumption function. In this equation, the consumption-income ratio in the current period (C_t/Y_t) is regarded as function of Y_t/Y_o, that is, the ratio of current income to the previous peak income. If this ratio is constant, as in periods of steadily rising income, the current consumption income ratio is constant. During recession when current income (Y_t) falls below the previous peak income (Y_O), the current consumption income ratio (C_t/Y_t) will increase.

The relative income hypothesis is explained graphically in Fig. 4 where C_L is the long-run consumption function and C_{S1} and C_{S2} are the short-run consumption functions. Suppose income is at the peak level of OY_1 where E_1Y_1 is consumption . Now income falls to OY_0. Since people are used to the standard of living at the OY_1 level of income, they will not reduce their consumption to E_0Y_0 level, but reduce it as little as possible by reducing their current saving. Thus they move backward along the C_{S1} curve to point C_1 and be at C_1Y_0 level of consumption. When the period of recovery starts, income rises to the previous peak level of OY_1. But consumption increases slowly from C_1 to E_1 along the C_{S1} curve because consumers will just restore their previous level of savings. If income continues to increase to OY_2 level, consumers will move upward along the

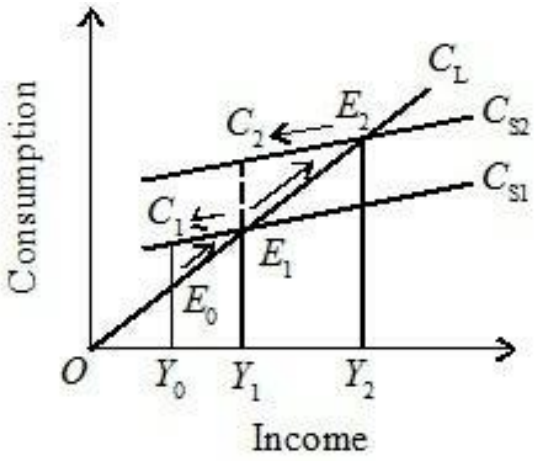


Fig 4

C_L curve from E_1 to E_2 on the new short-run consumption function C_{S2}. If another recession occurs at OY_2 level of income, consumption will decline along the C_{S2} consumption function toward C_2 point and income will be reduced to OY_1 level. But during recovery over the long-run, consumption will rise along the steeper C_L path till it reaches the short-run consumption function C_{S2}. This is because when income increases beyond its present level OY_1, the APC becomes constant over the long-run. The short-run consumption function shifts upward from Cs_1 to Cs_2 but consumers move along the C_L curve from E_1 to E_2. But when income falls, consumers move backward from E_2 to C_2 on the Cs_2 curve. These upward and downward movements from C_1 and C_2 points along the C_L curve give the

appearance of a ratchet. This is the *rachet effect*. The short-run consumption function ratchets upward when income increases in the long run but it *does not shift down* to the earlier level when income declines. Thus the ratchet effect will develop *whenever* there is a cyclical decline or recovery in income.

Its Criticisms

Although the Duesenberry theory reconciles the apparent contradictions between budget studies and short-term and long-term time series studies, yet it is not without its deficiencies.

1. No Proportional Increase in Consumption. The relative income hypothesis assumes a proportional increase in income and consumption. But increases in income along the full employment level do not always lead to proportional increases in the consumption.

2. No Direct Relation between Consumption and Income. This hypothesis assumes the relation between consumption and income to be direct. But this has not been borne out by experience. Recessions do not always lead to decline in consumption, as was the case during the recessions of 1948-49 and 1974-75.

3. Distribution of Income not Unchanged. This theory is based on the assumption that the distribution of income remains almost unchanged with

the change in the aggregate level of income. If with increases in income, a redistribution occurs towards greater equality, the APC of all persons belonging to the relatively poor and relatively rich families will tend to be reduced. Thus the consumption function will not shift upward from C_{S1} to C_{S2} when income increases.

4. Reversible Consumer Behaviour. According to Micheal Evants, "The consumer behaviour is slowly reversible over time, instead of being truly ireversible. Then previous peak income would have less effect on current consumption, the greater the elapsed time from the last peak."[6] Even if we know how a consumer spent his previous peak income, it is not possible to know how he would spend it now.

5. Neglects Other Factors. This hypothesis is based on the assumption that changes in consumer's expenditure are related to his previous peak income. The theory is weak in that it neglects other factors that influence consumer spending such as asset holdings, urbanisation, changes in age-composition, the appearance of new consumer goods, etc.

6. Consumer Preferences do not Depend on Others. Another unrealistic assumption of the theory is that consumer preferences are interdependent whereby a consumer's expenditure is related to the consumption patterns of his rich neighbour. But this may not always be true. George Katona's[7] empirical study has revealed that expectations and attitudes play an important role in consumer spending. According to him, income expectations based on levels of aspirations and the attitudes toward asset holdings affect consumer spending behaviour more than the demonstration effect.

7. Reverse Lightning Bolt Effect. Smith and Jackson have criticised Duesenbery's empirical evidence that the recovery in income after recession is not caused by ratchet effect. Rather, the consumption experience of consumer is similar to the reverse lightning bolt effect. That is why the consumer gradually increases his consumption due to his inconsistent habit stability with the increase in his income after recession. This is shown is Fig.5 where the levels of consumption with the increments in income have been shown by arrows as reverse lightning bolt

takes place.

6. Micheal K. Evans, *Macroeconomic Activity*, 1969

7. George Katona, *Psychological Analysis of Economic Behaviour*, 1963

8. M. Friedman, *A Theory of Consumption Function*, 1957

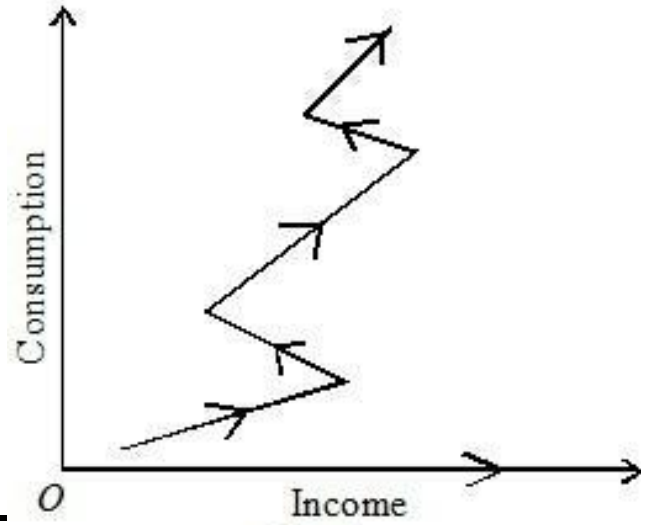


Fig 5

THE PERMANENT INCOME HYPOTHESIS

Another solution to the apparent contradiction between the proportional long-run and non-proportional short-run consumption function is Friedman's[8] permanent income hypothesis. Friedman rejects the use of "current income" as the determinant of consumption expenditure and instead divides both consumption and income into "permanent" and "transitory" components, so that

$$Ym \text{ or } Y = Y_P + Y_t \qquad ...(1)$$

and $$C = C_P + C_t \qquad ...(2)$$

where *p* refers to permanent, *t* refers to transitory, *Y* to income and *C* to consumption.

Permanent income is defined as "the amount a consumer unit could consume (or believes that it could) while maintaining its wealth intact." It is the main income of a family unit which in turn depends on its time-horizon and farsightedness. "It includes non-human wealth that it owns, the personal attributes of earners in the unit...the attributes of the economic activity of the earners such as the occupation followed, the location of economic activity, and so on."

Y being the consumer's measured income or current income, it can be larger or smaller than his permanent income in any period. Such differences between measured and permanent income are due to the transitory component of income (Y_t). Transitory income may rise or fall with windfall gains or losses and cyclical variations. If the transitory income is *positive* due to a windfall gain, the measured income will rise above the permanent income. If the transitory income is *negative* due to theft, the measured income falls below the permanent income. The transitory income can also be *zero* in which case measured income equals permanent income.

Permanent consumption is defined as "the value of the services that it is planned to consume during the period in question." Measured consumption is also divided into permanent consumption (C_p) and transitory consumption (C_t). Measured consumption (or current consumption) may deviate from or equal permanent consumption depending on whether the transitory consumption is positive, negative or zero, Permanent consumption (C_p) is a multiple (k) of permanent income, Y_p .

$$C_P = kY_P$$

and $k = f(r, w, u)$

Therefore, ...(3)

$$C_P = k(r, w, u)\, Y_P$$

where k is a function of the rate of interest (r), the ratio of property and non-property income to total wealth or national wealth (w), and the consumer's propensity to consume (u). This equation tells that over the long period consumption increases in proportion to the change in Y_P. This is attributable to a constant k ($=C_p/Y_p$) which is independent of the size of income. Thus k is the permanent and average propensity to consume and *APC = MPC*.

Friedman analyses the offsetting forces which lead to this result. To take the rate of interest (r), there has been a secular decline in it since the

1920s. This tends to raise the value of *k*. But there has been a long-run decline in the ratio of property and non-property income to national wealth (*w*) which tends to reduce the value of *k*. The propensity to consume has been influenced by three factors. *First*, there has been a sharp decline in the farm population which has tended to increase consumption with urbanisation. This has led to increase of *k*. *Second*, there has been a sharp decline in the size of families. It has led to increase in saving and reduction in consumption thereby reducing the value of *k*. *Third*, larger provision by the state for social security. This has reduced the need for keeping more in savings. It has increased the tendency to consume more resulting in the rise in the value of *k*. The overall effect of these off-setting forces is to raise consumption in proportion to the change in the permanent income component.

Therefore, there is a proportional relation between permanent income and consumption,

$$C_p = kY_p \qquad ...(4)$$

where *k* is the coefficient of proportionality in which *APC* and *MPC* are endogenous and it depends upon the above mentioned factors. In other words, it is that proportion of fixed income which is consumed. Now take permanent income which is based on time series. Friedman believes that permanent income depends partly on current income and partly on previous period's income. This can be measured as

$$Y_{pt} = aY_t + (1-a)\, Y_{t-1} \qquad ...(5)$$

where Y_{pt} = permanent income in the current period, Y_t = current income in the current period, $Y_{t\text{-}1}$ = previous period's income, a = ratio of change in income between current period (t) and previous period (t–1).

This equation tells that permanent income is the sum of current period's income (Y_t) and previous periods income (Y_{t-1}) and the ratio of income

change between the two (*a*). If the current income increases at once, there will be small increase in permanent income. For the permanent income to

increase, income will have to be raised continuously for many years. Then only people will think that it has increased.

By integrating equations (4) and (5), short-run and long-run consumption function can be explained as

$$C_t = kY_{pt} = kaY_t + k\,(1–a)Y_{t\text{-}1} \qquad ...(6)$$

where C_t = current period consumption, ka = short-run *MPC*, k = long-run

MPC and $k\,(1–a)\,Y_{t\text{-}1}$ is the intercept of short-run consumption function.

According to Friedman, k and ka are different from one another and $k > ka$. Further, $k = 1$ and $ka = 0$

Equation (6) tells that consumption depends both on previous income and current income. Previous income is important for consumption because it helps in forecasting the future income of people.

Its Assumptions

Given these, Friedman gives a series of assumptions concerning the relationships between permanent and transitory components of income and consumption.

1. There is no correlation between transitory income and permanent income.
2. There is no correlation between permanent and transitory consumption.
3. There is no correlation between transitory consumption and transitory income.
4. Only differences in permanent income affect consumption systematically.

Explanation of the Theory

These assumptions give the explanation of the cross-section results of

Friedman's theory that the short-run consumption function is linear and non-proportional, *ie*. *APC* > *MPC* and the long-run consumption function is linear and proportional, *ie*. *APC* = *MPC*.

Figure 6 explains the permanent income hypothesis of Friedman where C_L is the long-run consumption function which represents the long-run proportional relationship between consumption and income of an individual where *APC* = *MPC*. C_S is the non-proportional short-run consumption function where measured income includes both permanent and transitory components. At *OY* income level where C_S and C_L curves coincide at point *E*, permanent income and measured income are identical and so are permanent and measured consumption as shown by *YE*. At point *E*, the transitory factors are non-existent. If the consumer's income increases to OY_1, he will increase his consumption consistent with the rise in his income. For this, he will move along the C_S curve to E_2 where his measured income in the short-run is OY_1 and measured consumption is Y_1E_2. The reason for this movement from *E* to E_2 is that during the short-run the consumer does not expect the rise in income to be permanent, so *APC* falls as income increases. But if the OY_1 income level becomes permanent, the consumer will also increase his consumption permanently. Now his short-run consumption function will shift upward from C_S to C_{S1} and intersect the long-run consumption function C_L at point E_1. Thus the consumer will consume Y_1E_1 at OY_1 income level. Since he knows that the increase in his income OY_1 is permanent, he will adjust his consumption Y_1E_1 accordingly on the long-run consumption

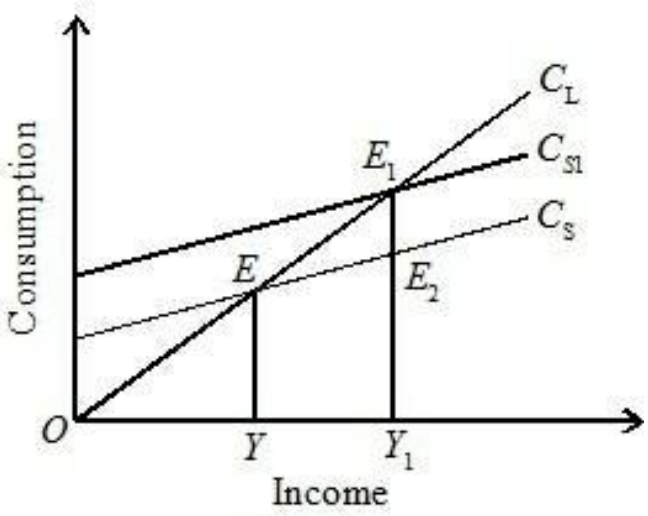


Fig 6

function C_L at E_1 where $APC = MPC$

Its Criticisms

This theory has been criticised on the following counts:

1. Correlation between Temporary Income and Consumption. Friedman's assumption that there is no correlation between transitory components of consumption and income is unrealistic. This assumption implies that with the increase or decrease in the measured income of the household, there is neither any increase or decrease in his consumption, because he either saves or dissaves accordingly. But this is contrary to actual consumer behaviour. A person who has a windfall gain does not deposit the entire amount in his bank account but enjoys the whole or part of it on his current consumption. Similarly, a person who has lost his purse would definitely cut or postpone his present consumption rather than rush to the bank to withdraw the same amount of money to meet his requirements.

2. APC of all Income Groups not Equal. Friedman's hypothesis states that the APC of all families, whether rich or poor, is the same in the long-run. But this is against the ordinary observed behaviour of households. It is an established fact that low-income families do not have the capacities to save the same fraction of their incomes as the high income families. This is not only due to their meagre incomes but their tendency to prefer present consumption to future consumption in order to meet their unfulfilled wants. Therefore, the consumption of low-income families is higher relative to their incomes while the saving of high-income families is higher relative to their incomes. Even in the case of persons at the same level of permanent income, the level of saving differs and so does consumption.

3. Use of Various terms Confusing. Friedman's use of the terms "permanent", "transitory", and "measured" have tended to confuse the theory. The concept of measured income improperly mixes together permanent and transitory income on the one hand, and permanent and transitory consumption on the other.

4. No Distinction between Human and Non-human Wealth. Another weakness of the permanent income hypothesis is that Friedman does not make any distinction between human and non-human wealth and includes income from both in a single term in the empirical analysis of his theory.

Conclusion. Despite these weaknesses, "it can be fairly said", according to Micheal Evans, "that the evidence supports this theory *and that* Friedman's formulation has reshaped and redirected much of the research on the consumption function."

THE LIFE CYCLE HYPOTHESIS

Ando and Modigliani have formulated a consumption function which is known as the Life Cycle Hypothesis. According to this hypothesis, consumption is a function of lifetime expected income of the consumer. The consumption of the individual consumer depends on the resources available to him, the rate of return on capital, the spending plan, and the age at which the plan is made. The present value of his resources includes income from assets or wealth or property and from *current and expected* labour income. Thus his total resources consist of his income and wealth.

Its Assumptions

The life cycle hypothesis is based on the following assumptions:

1. There is no change in the price level during the life of the consumer.
2. The rate of interest paid on assets is zero.
3. The consumer does not inherit any assets and his net assets are the result of his own savings.
4. His current savings result in future consumption.
5. He intends to consume his total lifetime earnings plus current assets.
6. He does not plan any bequests.

Its Explanation

Given these assumptions, the aim of the consumer is to maximise his utility over his lifetime which will, in turn, depend on the total resources available to him during his lifetime. Given the life-span of an individual, his consumption is proportional to these resources. But the proportion of resources that the consumer plans

to spend will depend on whether the spending plan is formulated during the early or later year of his life. As a rule, an individual's average income i his life and also at the end of his life. his life, he has little assets (wealth) a income is low. It is, however, in the both from assets and labour, is high. the individual throughout his life increasing, shown as the CC_1 curve i individual consumer's income strea

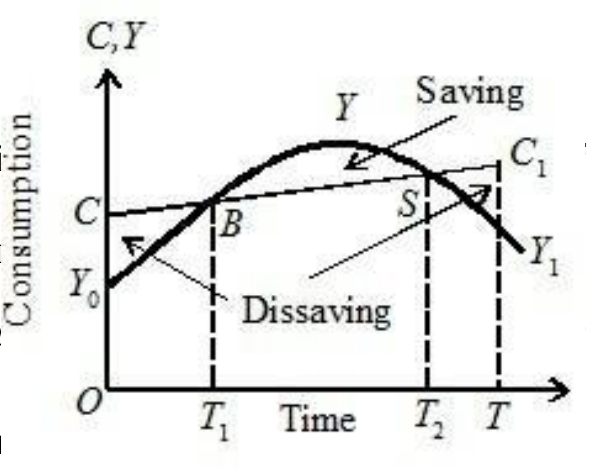


Fig 7

early period of his life represented by T_1 in the figure., he borrows or dissaves CY_0B amount of money to keep his consumption level CB which is almost constant. In the middle years of his life represented by T_1T_2, he saves BSY amount to repay his debt and for the future. In the last years of his life represented by T_2T, he dissaves SC_1Y_1 amount.According to this theory*, consumption is a function of lifetime expected income of the consumer which depends on his resources. In some resources, his current income (Y_t); present value of his future expected labour income (Y^e_{Lt}) and present value of assets (A_t) are included.

The consumption function can be expressed as :

$$C_t = f(V_t)$$

where V_t =

total

resources at

time *t*. and

$V_t = f(Y_t +$

...(1)

...(2)

By substituting equation (2) in (1) and making (2) linear and weighted average of different income groups, the aggregate consumption function is

$$C_t = \alpha_1 Y_t + \alpha_2 Y^e_L + \alpha_3 A_t \qquad ...(3)$$

where α_1 = *MPC* of current income, α_2 = *MPC* of expected labour income; and α_3 = *MPC* of assets or wealth.

Now *APC* is

$$\frac{C_t}{Y_t}\alpha_1 + \alpha_2 \frac{Y^e_L}{Y_t} + \alpha_3 \frac{A_t}{Y_t}$$

APC is constant in the long-run because a portion of labour income in current income and the ratio of total assets to current income are constant when the economy grows.

On the basis of the life cycle hypothesis, Ando and Modigliani made a number of studies in order to formulate the short-run and long-run consumption functions. A cross-section study revealed that more persons in the low-income groups were at *low* income level because they were at the end period of their lives. Thus their *APC* was high. On the other hand, more than average persons belonging to the high-income groups were at *high* income levels because they were in the middle years of their lives. Thus their *APC* was relatively low. On the whole, the *APC* was falling as income rose thereby showing *APC*> *MPC*. The observed data for the U.S. revealed the *APC* to be constant at 0.7 over the long-run.

The Ando-Modigliani short-run consumption function is shown by the C_S curve in Fig. 8. At any given point of time, the C_S curve can be considered as a constant and during short-run income fluctuation, when wealth remains fairly constant, it looks like the Keynesian consumption function.

But its intercept will change as a result of accumulation of wealth (assets) through savings As wealth increases overtime, the non-

proportional short-run consumption fur trace out the long-run proportional cor consumption function is C_L, showing a along the trend. It is a straight line passi constant over time because the share of the ratio of wealth (assets) to total inc grows along the trend.

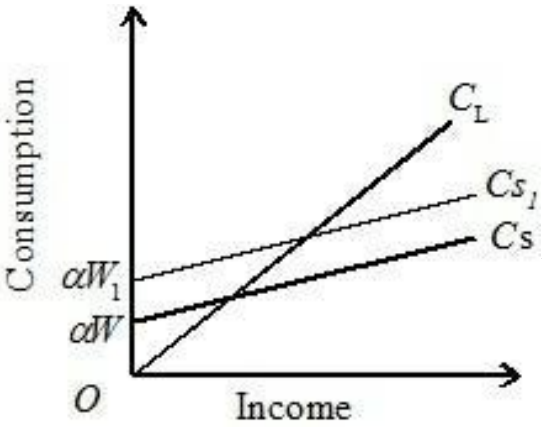


Fig 8

Its Implications

1. The life cycle hypothesis solves the *consumption puzzle*. According to this hypothesis, the short-run consumption function would be non-proportional as in the short-run time series estimates. Its intercept (αW in Fig. 8) measures the effect of wealth and the life cycle consumption function looks like the Keynesian consumption function as C_S in the figure But it holds only in the short run when wealth is constant. As wealth grows (αW_1), this consumption function shifts upward as $CS1$. The shifting of the CS to $CS1$ traces out the long-run consumption function, C_L. This is consistent with the evidence from long-run time series data that the long-run consumption function is proportional. The slope of the C_L curve shows that the average propensity to consume does not fall as income increases. In this way, Audo-Modigliani solved the consumption puzzle.

2. The life cycle hypothesis reveals that *savings change over the life time* of a consumer. If a consumer starts his life in adulthood with no wealth, he will save and accumulate wealth during his working years. But during retirement, he will dissave and run down his wealth. Thus the life cycle hypothesis implies that the consumer wants smooth and uninterrupted consumption over his lifetime. During working years, he saves and when retires, he dissaves.

3. The life cycle hypothesis also implies that a *high-income family*

consumes a *smaller proportion* of *his income* than a low-income family. In its peak earning years, (shown as portion BSY in Fig. 7), its income is more than its consumption and its APC is the lowest. But in the case of a low-income family and a retiree family, the APC is high.

Its Criticisms

The life cycle hypothesis is not free from certain criticisms.

1. Plan for Lifetime Consumption Unrealistic. The contention of Audo and Modigliani that a consumer plans his consumption over his lifetime is unrealistic because a consumer concentrates more on the present rather than on the future which is uncertain.

2. Consumption not directly related to Assets. The life cycle hypothesis pre-supposes that consumption is directly related to the assets of an individual. As assets increase, his consumption increases and vice versa. This is also unwarranted because an individual may reduce his consumption to have larger assets.

3. Consumption depends on Attitude. Consumption depends upon one's attitude towards life. Given the same income and assets, one person may consume more than the other.

4. Consumer not Rational and Knowledgeable. This hypothesis assumes that the consumer is rational and has full knowledge about his income and future litetime. This is unrealistic because no consumer is fully rational and knowledgeable.

5. Estimation of Variables not Possible. This theory depends on many variables such as current income, value of assets, future expected labour income, etc., the estimation of so many variables is very difficult and not possible.

6. Liquidity Constraints. This hypothesis fails to recognise the existence of liquidity constraints for a consumer. Even if he possesses a definite and conscious vision of future income, he may have little opportunity for borowing in the capital market on the basis of expected future income. As a result, consumption may response more to changes in current income than predicted on the basis of the life cycle hypothesis.

Conclusion. Despite these, the life cycle hypothesis is superior to the other hypotheses on consumption function because it includes not only wealth as a variable in the consumption function but also explains why

APC > *MPC* in the short-run and *APC* is constant in the long-run.

THE PRINCIPLE OF ACCELERATION

The principle of acceleration is based on the fact that the demand for capital goods is derived from the demand for consumer goods which the former help to produce. The acceleration principle explains the process by which an increase (or decrease) in the demand for consumption goods leads to an increase (or decrease) in investment on capital goods. According to Kurilara, "The accelerator coefficient is the ratio between induced investment and an initial change in consumption expenditure."

Symbolically, $v = \Delta I / \Delta C$ or $\Delta I = v \Delta C$ where v is the accelerator coefficient, ΔI is net change in investment and ΔC is the net change in consumption expenditure. If the increase in consumption expenditure of Rs 10 crores leads to an increase in investment of Rs 30 crores, the accelerator coefficient is 3.

This version of the acceleration principle has been more broadly interpreted by Hicks as the ratio of induced investment to changes in output it calls forth. Thus the accelerator v is equal to $\Delta I/\Delta Y$ or the capital-output ratio. It depends on the relevant change in output (ΔY) and the change in investment (ΔI). It shows that the demand for capital goods is not derived from consumer goods alone but from any *direct* demand of national output.

In an economy, the required stock of capital depends on the change in the demand for output. Any change in output will lead to a change in the capital stock. This change equals v times the change in output. Thus $\Delta I = v \Delta Y$, where v is the accelerator. If a machine has a value of Rs 4 crores and produces output worth Rs 1 crore, then the value of v is 4. An entrepreneur who wishes to increase his output by Rs 1 crores every year must invest Rs 4 crores on this machine. This equally applies to an economy where if the value of the accelerator is greater than one, more capital is required per unit of output so that the increase in net investment is greater than the increase in output that causes it. Gross investment in the economy will equal replacement investment *plus* net investment. Assuming replacement investment *(i.e.,* replacement demand for machines due to obsolescence and depreciation) to be constant, gross investment will vary with the level of investment corresponding to each level of output.

The acceleration principle can be expressed in the form of the following

equation.[2]

$$I_{gt} = v\,(Y_t - Y_{t-1}) + R$$

$$= v\,\Delta Y_t + R$$

where I_{gt} is gross investment in period t, v is the accelerator, Y_t is the national output in period t, Y_{t-1} is the national output in the previous period $(t—1)$, and R is the replacement investment.

The equation tells that gross investment during period t depends on the change in output (Y) from period t — 1 to period t *multiplied* by the accelerator (v) *plus* replacement investment R.

In order to arrive at net investment (In), R must be deducted from both sides of the equation so that net investment in period t is

$$I_{nt} = v\,(Y_t - Y_{t-1})$$

$$= v\,\Delta Y_t$$

If $Y_t > Y_{t-1}$ net investment is positive during period t. On the other hand, if $Y_t < Y_{t-1}$, net investment is negative or there is disinvestment in period t.

Operation of the Acceleration Principle

The working of the acceleration principle is explained in Table I

Table I: Operation of the Acceleration Principle : v = 4

Period in Years	*Total Output (Y)*	*Required Capital*	*Replacement Investment (R)*	+	*Net Investment (I_n)*	=	*Gross Investment (I_g)*
(1)	(2)	(3)	(4)		(5)		(6)
t	100	400	40		0		40
t+l	100	400	40		0		40
t+2	105	420	40		20		60
t+3	115	460	40		40		80
t+4	130	520	40		60		100
t+5	140	560	40		40		80
t+6	145	580	40		20		60

t+8	130	520	40	—40	0
t+9	125	600	40	—20	20

The table traces changes in total output, capital stock, net investment and gross investment over ten time periods. Assuming the value of the acceleration v=4, the required capital stock in each period is 4 times the corresponding output of that period, as shown in column (3). The replacement investment is assumed to be equal to 10 per cent of the capital stock in period *t*, shown as 40 in each time period. Net investment in column (5) equals *v* times the change in output between one period and the preceding period. For example, net investment in period t+3=$v(y_{t+3} - Y_{t+2})$, or 40=4(115—105). It means that given the accelerator of 4, the increase of 10 in the demand for final output leads to an increase of 40 in the demand for capital goods (machines). Accordingly the *total* demand for capital goods (machines) rises to 80 made up of 40 of replacement and 40 of net investment. Thus the table reveals that net investment depends on the change in total output, given the value of the accelerator. So long as the demand for final goods (output) rises net investment is positive. But when it falls net investment is negative. In the table, total output (column 2) increases at an increasing rate from period t+l to $t+4$ and so does net investment (column 5). Then it increases at a diminishing rate from period $t+5$ to $t+6$ and net investment declines from period t+7 to $t+9$, total output falls, and net investment becomes negative.

The acceleration principle is illustrated diagrammatically in Figure 1 where in the upper portion, total output curve *Y* increases at an increasing rate up to $t+4$ period, then at a decreasing rate up to period $t+6$. After this it starts diminishing. The curve I_n, in the lower part of the figure shows that the rising output leads to increased net investment upto $t+4$ period because output is increasing at an increasing rate. But when output increases at decreasing rate between $t+4$ and $t+6$ periods, net investment declines. When output starts declining in period $t+7$, net investment becomes negative. The curve I_g represents gross investment of the economy. Its behaviour is similar to the net investment curve. But there is one difference that gross investment is not negative and once it becomes

zero in period t+8, the curve I_g again starts rising. This is because despite

net investment being negative, the replacement investment is taking place at a uniform rate.

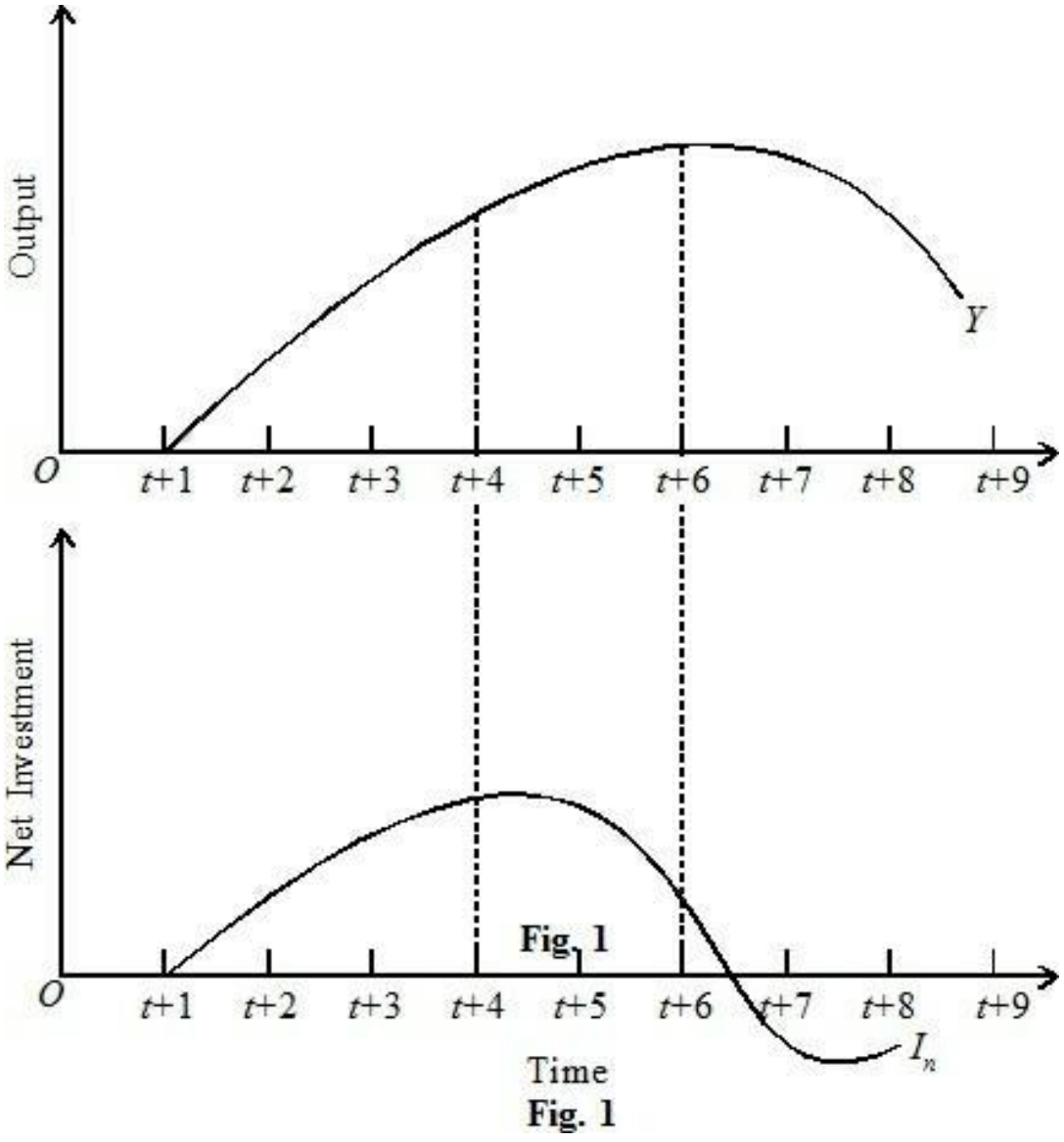


Fig. 1

Assumptions

The acceleration principle is based upon the following assumptions:

1. The acceleration principle assumes a constant capital-output ratio.
2. It assumes that resources are easily available.
3. It assumes that there is no excess or idle capacity in plants.

4. It is assumed that the increased demand is permanent.
5. It also assumes that there is elastic supply of credit and capital.
6. It further assumes that an increase in output immediately leads to a rise in net investment.

Criticisms:

The acceleration principle has been criticised by economists for its rigid assumptions which tend to limit its smooth working. The following are its limitations.

1. Capital-Output Ratio not Constant. The acceleration principle is based on a constant capital-output ratio. But this ratio does not remain constant in the modern dynamic world. Inventions and improvements in techniques of production are constantly taking place which lead to increase in output per unit of capital. Or, existing capital equipment may be worked more intensively. Moreover, change in the expectations of businessmen with regard to prices, wages, interest may affect future demand and vary the capital-output ratio. Thus the capital-output ratio does not remain constant but changes in the different phases of the trade cycle.

2. Resources not Elastic. The acceleration principle assumes that the resources should be elastic so that they are employed in the capital goods industries to enable them to expand. This is possible when there is unemployment in the economy. But once the economy reaches the full employment level, the capital goods industries fail to expand due to the non-availability of sufficient resources. This limits the working of the acceleration principle. So this principle will not apply in a recession where excess capacity is found.

3. Idle Capacity in Plants. The acceleration theory assumes that there is no unused (or idle) capacity in plants. But if some machines are not working to their full capacity and are lying idle, then an increase in the demand for consumer goods will not lead to the increased demand for new capital goods. In such a situation the acceleration principle will not work.

4. Difference between Required and Real Capital Stock. It assumes no difference between required and real capital stock. Even if it exists, it ends in one period. But if industries are already producing capital goods at full capacity, it is not possible to end the difference in one period.

5. Does not Explain Timing of Investment. The assumption of the existence of full capacity implies that increased demand for output immediately leads to induced investment. The acceleration principle, therefore, fails to explain the timing of investment. At best it explains the volume of investment. As a matter of fact, there may be a time lag before new investment can be generated. For instance, if the time lag is four years, the effect of new investment will not be felt in one year but in four years.

6. Does not consider Availability and Cost of Capital Goods. The timing of the acquisition of capital goods depends on their availability and cost, and the availability and cost of financing them. The theory does not consider these factors.

7. Acceleration Effect Zero for Installed Equipment. It is assumed that no increase in demand for consumer goods has been foreseen and provided for in previous capital investment. If by anticipating future demand, capital equipment has already been installed, it would not lead to induced investment and the acceleration effect will be zero.

8. Does not Work for Temporary Demand. This theory further assumes that the increased demand is permanent. In case the demand for consumer goods is expected to be temporary, the producers will refrain from investing in new capital goods. Instead they may meet the increased demand by working the existing capital equipment more intensely. So the acceleration will not materialise.

9. Supply of Credit not Elastic. The acceleration principle assumes an elastic supply of credit so that when there is induced investment as a result of induced consumption, cheap credit is easily available for investment in capital goods industries. If cheap credit is not available in sufficient quantities, the rate of interest will be high and investment in capital goods will be very low. Thus the acceleration will not work fully.

10. Neglects Profits as a Source of Internal Funds. This assumption further implies that firms resort to external sources of finance for investment purposes. But empirical evidence has shown that firms prefer internal sources of finance to external sources. The acceleration principle is weak in that it neglects profits as a source of internal finance. As a matter of fact, the level of profits is a major determinant of investment.

Conclusion. Despite these limitations, the principle of acceleration makes the process of income propagation clearer and more realistic than the multiplier theory. The multiplier shows the effect of a change in investment on income via consumption while the acceleration shows the effect of consumption or output on investment and income. Thus the acceleration explains volatile fluctuations in income and employment as a result of fluctuations in capital goods industries. But it can explain upper turning points better than lower turning points.

ACCELERATION THEORY THAT INVESTMENT

INTRODUCTION

In the earlier chapters, we discussed three theories of investment. First, the classical theory that investment is a function of the rate of interest. Second, the Keynesian theory that investment is a function of income and rate of interest. Third, the acceleration theory that investment is a function of the change in output or income.

THE ACCELERATOR THEORY OF INVESTMENT

The accelerator principle states that an increase in the rate of output of a firm will require a proportionate increase in its capital stock. The capital stock refers to the desired or optimum capital stock, K^*. Assuming that capital-output ratio is some fixed constant, v, the optimum capital stock is a constant proportion of output so that in any period t,

$$K_t^* = vY_t$$

where K_t^* is the optimal capital stock in period t, v (the acceleator) is a positive constant, and Y_t is output in period t.

Any change in ouput will lead to a change in the capital stock. Thus

$$K_t^* - K_{t-1}^* = v(Y_t - Y_{t-1})$$

and

$$I_{nt} = v\ (Y_t - Y_{t-1}) \qquad \left[\because I_{nt} = K_t^* - K_{t-1}^*\right]$$
$$= v\ \Delta Y_t$$

where $\Delta Y_t = Y_t - Y_{t-1}$ and I_{nt} is net investment.

This equation represents the *naive accelerator*.

In the above equation, the level of net investment is proportional to change in output. If the level of output remains constant ($\Delta Y = 0$), net investment would be zero. For net investment to be a positive constant, output must increase. This is illustrated in Figure 1 where in the upper portion, the total output curve Y increases at an increasing rate upto $t + 4$ period, then at a decreasing rate upto period $t + 6$. After this, it starts diminishing. The curve I_n in the lower part of the figure, shows that the rising output leads to increased net investment upto t+4 period because output is increasing at an increasing rate. But when ouput increases at a decreasing rate between t+4 and t+6 periods, net investment declines. When output starts declining in period t+7, net investment becomes negative. The above explanation is based on the assumption that there is symmetrical reaction for increases and decreases of output.

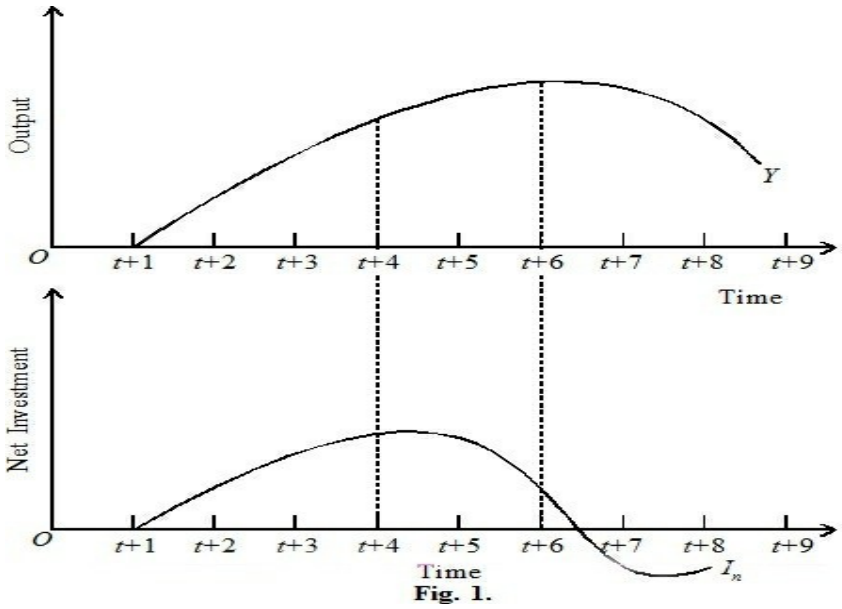


Fig. 1.

In the simple acceleration principle, the proportionality of the optimum capital stock to output is based on the assumption of fixed technical coefficients of production. This is illustrated in Figure 2 where Y and Y_1 are the two isoquants. The firm produces Y output with K^* optimal capital stock. If it wants to produce Y_1 output, it must increase its optimal capital stock to K^*_t. The ray OR shows constant returns to scale. It follows that if the firm wants to double its output, it must increase its optimal capital stock by two-fold.

Eckaus[1] has shown that under the assumption of constant returns to scale, if the factor-price ratios remain constant, the simple accelerator would be

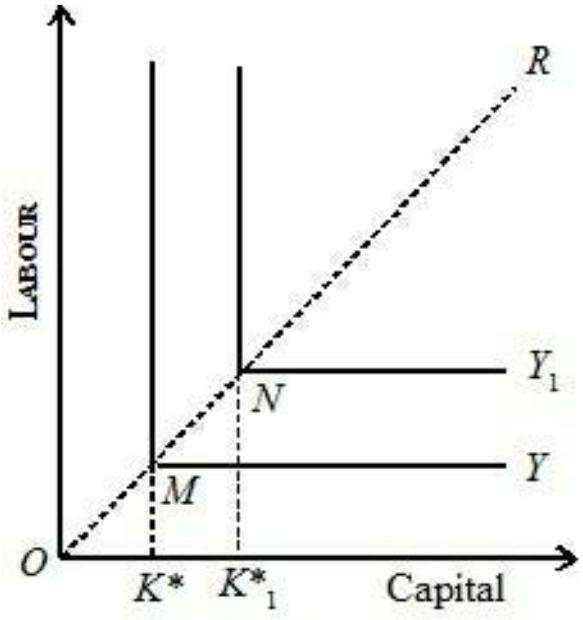


Fig. 2.

The line *OR* joining the points of tangency *e*, e_1, and e_2 is the firms's expansion path which shows investment to be proportional to the change in output when capital is optimally adjusted between the iosquants and isocosts.*

constant. Suppose the firm's production involves the use of only two factors, capital and labour whose factor-price ratios are constant. In Figure 3, *Y*, Y_1 and Y_2 are the firms's isoquants and *C*, C_1 and C_2 are the isocost lines which are parallel to each other, thereby showing constant costs. If the firm decides to increase its ouput from *Y* to Y_1, it will have to increase the units of labour from *L* to L_1 and of capital from *K** to K_1* and so on.

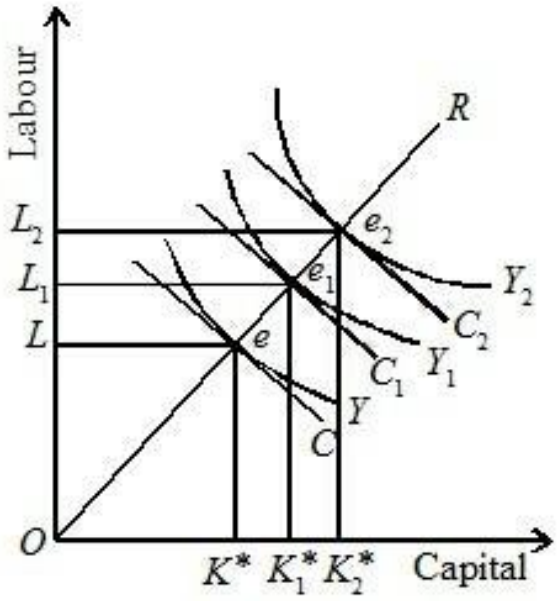


Fig. 3

THE FLEXIBLE ACCELERATOR THEORY OR LAGS IN INVESTMENT

The flexible accelerator theory removes one of the major weaknesses of the simple acceleration principle that the captal stock is optimally adjusted without any time lag. In the flexible accelerator, there are lags in the adjustment process between the level of output and the level of capital stock. This theory is also known as *the capital stock adjustment model.* The theory of flexible accelerator has been developed in various forms by Chenery[2], Goodwin,[3] Koyck[4] and Junankar. But the most accepted approach is by Koyck.

Junankar[5] has discussed the lags in the adjustment between output and capital stock. He explains them at the firm level and extends them to the aggregate level. Suppose there is an increase in the demand for output. To meet it, first the firm will use its inventories and then utilise its capital stock more intensively. If the increase in the demand for output is large and persists for some time, the firm would increase its demand for capital stock. This is the *decision-making lag*. There may be the *administrative lag* of ordering the capital. As capital is not easily available and in abundance in the financial capital market, there is the *financial lag* in raising finance to buy capital. Finally, there is the *delivery lag* between the ordering of capital and its delivery. Assuming "that different firms have different decision and delivery lags then in aggregate the effect of an increase in demand on the capital stock is distributed over time. This implies that the capital stock at time *t* is dependent on all the previous levels of output, i.e.

$$K_t = f(Y_t, Y_{t-1} \quad , Y_{t-n}).$$

This is illustrated in Figure 4 where initially in period t_0, there is a fixed relation between the capital stock and the level of output. When the demand for output increases, the capital stock increases gradually after the decision and delivery lags, as shown by the *K* curve, depending on the previous levels of output. The increase in output is shown by the curve *Y*. The dotted line *K** is the optimal capital stock which equals the actual capital stock *K* in period *t*.

Koyck's Approach

Koyck's approach to the flexible accelerator assumes that the actual capital stock depends on all past output levels with weights declining

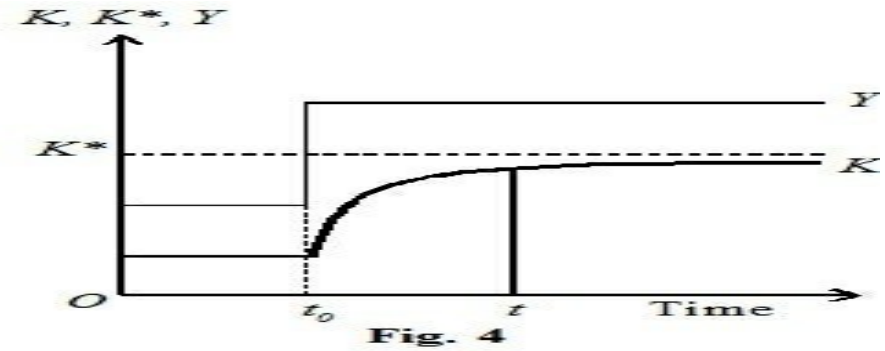


Fig. 4

geometrically. Accordingly,

or

$K_t = (1 - \lambda)\, vY_t + \lambda K_{t-1}$

..(4)

This process of rewriting equation (1) as equation (4) is called the *Koyck transformation.*

Net investment is the change in the stock of capital, $K_t - K_{t-1}$. Therefore, subtract K_{t-1} from both sides of the equation to get the expression net investment,

$$K_t - K_{t-1} = (1 - \lambda)\, vY_t + \lambda K_{t-1} - K_{t-1}$$

$$I_{nt} = (1 - \lambda)\, vY_t + K_{t-1}(\lambda - 1)$$

or $$I_{nt} = (1 - \lambda)\, vY_t - (1 - \lambda)\, K_{t-1} \quad \text{.....(5)}$$

The net investment $(K_t - K_{t-1})$ is called the *distributed lag accelerator* which is inversely related to the capital stock of the previous period and is positively related to the output level.

To convert net investment to gross investment, add depreciation (D_t) to both sides of equation (5),

$$I_{nt} + D_t = I_{gt} = (1 - \lambda)\, vY_t - (1 - \lambda)\, K_{t-1} + D_t$$

...(6)

Depreciation is assumed to be proportional to last year's capital stock and is estimated by $D_t = \delta K_{t-1}$. By adding this to equation (6), gross investment (I_{gt}) is

$$I_{gt} = (1 - \lambda)\, vY_t - (1 - \lambda)\, K_{t-1} + \delta K_{t-1}$$

$$= (1 - \lambda)\, vY_t - [(1 - \lambda) + \delta] K_{t-1}$$

$$= (1 - \lambda)\, vY_t - (1 - \lambda\delta)\, K_{t-1} \quad \text{...(7)}$$

This equation represents the *flexible accelerator* or the *stock adjustment principle*. This suggests that "net investment is some fraction of the difference between *planned* capital stock and *actual* capital stock in the

previous period...The coefficient $(1 - \lambda)$ tells us how rapidly the adjustment takes place. If $\lambda = 0$ [i.e. $(1 - \lambda) = 1$] then adjustment takes place in the unit period".

To conclude, the flexible accelerator is a very important contribution to the theory of investment which solves the problem of lags in investment demand. It not only incorporates the effects of lags but also of depreciation and excess capacity in the capital stock adjustment.

Its Comparison with Naive Accelerator

Since the flexible accelerator and naive accelerator are both accelerators, their long-run response of investment to a change in output will be similar. Let us consider a situation where output (Y) is rising at a decreasing rate and ultimately stops rising at a high level. In the case of the flexible accelerator, net investment will increase during several periods before the negative effect of the increased capital stock outweighs the positive effect of further increases in output and ultimately net investment will become zero. This is shown in Figure 5. On the other hand, in the case of the naive accelerator, net investment will be decreasing continuously and will also become zero, as shown in Figure 6. In both the accelerators, gross investment will be equal to depreciation.

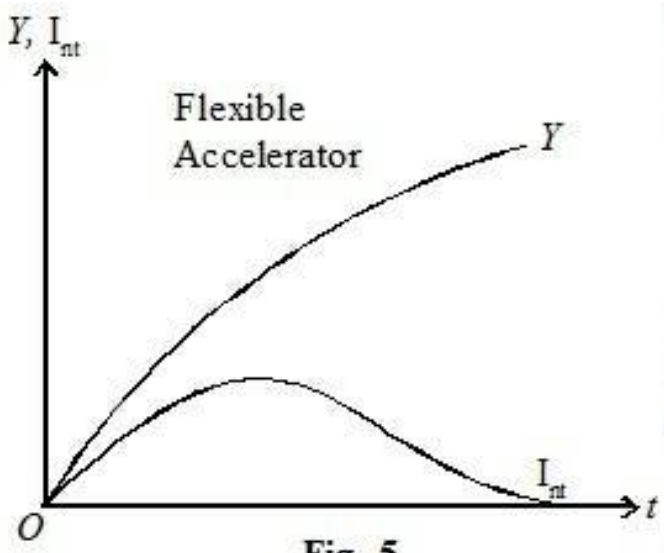


Fig. 5.

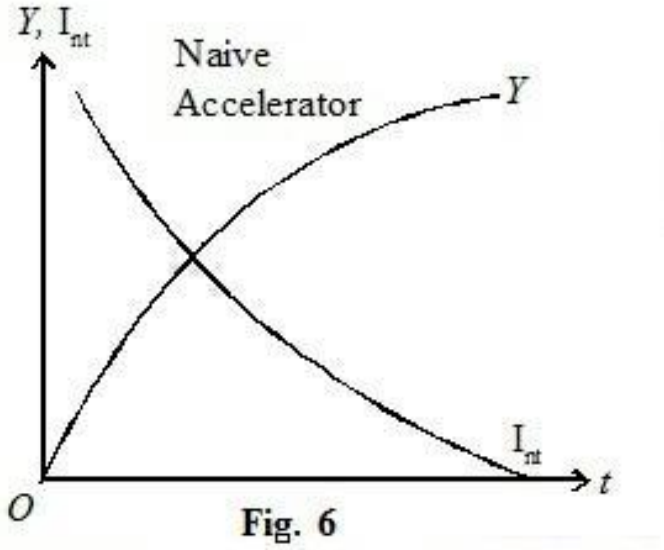


Fig. 6

UNIT –III

THE DEMAND FOR MONEY

INTRODUCTION

The demand for money arises from two important functions of money. The first is that money acts as a medium of exchange and the second is that it is a store of value. Thus individuals and businesses wish to hold money partly in cash and partly in the form of assets.

What explains changes in the demand for money ? There are two views on this issue. The first is the "scale" view which is related to the impact of the income or wealth level upon the demand for money. The demand for money is directly related to the income level. The higher the income level, the greater will be the demand for money. The second is the "substitution" view which is related to relative attractiveness of assets that can be substituted for money. According to this view, when alternative assets like bonds become unattractive due to fall in interest rates, people prefer to keep their assets in cash, and the demand for money increases, and vice versa. The scale and substitution view combined together have been used to explain the nature of the demand for money which has been split into the transactions demand, the precautionary demand and the speculative demand. There are three approaches to the demand for money: the classical, the Keynesian, and the post-Keynesian.*1* We discuss these approaches below.

THE CLASSICAL APPROACH:

The classical economists did not explicitly formulate demand for money theory but their views are inherent in the quantity theory of money. They emphasized the transactions demand for money in terms of the velocity of circulation of money. This is because money acts as a medium of exchange and facilitates the exchange of goods and services. In Fisher's

"Equation of Exchnage",

$$MV=PT$$

Where *M* is the total quantity of money, *V* is its velocity of circulation, *P* is the price level, and *T* is the total amount of goods and services exchanged for money.

The right hand side of this equation *PT* represents the demand for money which, in fact, "depends upon the value of the transactions to be undertaken in the economy, and is equal to a constant fraction of those transactions." *MV* represents the supply of money which is given and in equilibrium equals the demand for money. Thus the equation becomes

$$MV= PT$$

This transactions demand for money, in turn, is determined by the level of full employment income. This is because the classicists believed in Say's Law whereby supply created its own demand, assuming the full employment level of income. Thus the demand for money in Fisher's approach is a constant proportion of the level of transactions, which in turn, bears a constant relationship to the level of national income. Further, the demand for money is linked to the volume of trade going on in an economy at any time. Thus its underlying assumption is that people hold money to buy goods.

But people also hold money for other reasons, such as to earn interest and to provide against unforeseen events. It is, therefore, not possible to say that V will remain constant when *M* is changed. The most important thing about money in Fisher's theory is that it is transferable. But it does not explain fully why people hold money. It does not clarify whether to include as money such items as time deposits or savings deposits that are not immediately available to pay debts without first being converted into currency. It was the Cambridge cash balances approach which raised a further question: Why do people actually want to hold their assets in the form of money ? With larger incomes, people want to make larger volumes of transactions and that larger cash balances will, therefore, be demanded.

The Cambridge demand equation for money is

$$\boldsymbol{Md= kPY}$$

where *Md* is the demand for money which must equal the supply of

money (*Md=Ms*) in equilibrium in the economy. *k* is the fraction of the real money income (*PY*) which people wish to hold in cash and demand deposits or the ratio of money stock to income, *P* is the price level, and *Y* is the aggregate real income. This equation tells us that "other things being equal, the demand for money in normal terms would be proportional to the nominal level of income for each individual, and hence for the aggregate economy as well."

Its Critical Evaluation

This approach includes time and saving deposits and other convertible funds in the demand for money. It also stresses the importance of factors that make money more or less useful, such as the costs of holding it, uncertainty about the future and so on. But it says little about the nature of the relationship that one expects to prevail between its variables, and it does not say too much about which ones might be important.

One of its major criticisms arises from the neglect of store of value function of money. The classicists emphasized only the medium of exchange function of money which simply acted as a go-between to facilitate buying and selling. For them, money performed a *neutral* role in the economy. It was barren and would not multiply, if stored in the form of wealth. This was an erroneous view because money performed the "asset" function when it is transformed into other forms of assets like bills, equities, debentures, real assets (houses, cars, TVs, and so on), etc. Thus the neglect of the asset function of money was the major weakness of the classical approach to the demand for money which Keynes remedied.

THE KEYNESIAN APPROACH : LIQUIDITY PREFERENCE:

Keynes in his *General Theory* used a new term "liquidity preference" for the demand for money. Keynes suggested three motives which led to the demand for money in an economy:(1) the transactions demand, (2) the precautionary demand, and (3) the speculative demand.

The Transactions Demand for Money

The transactions demand for money arises from the medium of exchange function of money in making regular payments for goods and services. According to Keynes, it relates to "the need of cash for the current transactions of personal and business exchange." It is further

divided into income and business motives. The *income motive* is meant "to bridge the interval between the receipt of income and its disbursement." Similarly, the *business motive* is meant "to bridge the interval between the time of incurring business costs and that of the receipt of the sale proceeds." If the time between the incurring of expenditure and receipt of income is small, less cash will be held by the people for current transactions, and vice versa. There will, however, be changes in the transactions demand for money depending upon the expectations of income recipients and businessmen. They depend upon the level of income, the interest rate, the business turnover, the normal period between the receipt and disbursement of income, etc.

Given these factors, the transactions demand for money is a *direct proportional* and *positive function* of the level of income, and is expressed as

$$L_T = kY$$

where L_T is the transactions demand for money, k is the proportion of income which is kept for transactions purposes, and Y is the income.

This equation is illustrated in Figure 1 where the line kY represents a linear and proportional relation between transactions demand and the level of income. Assuming k=1/4 and income Rs 1000 crores, the demand for transactions balances would be Rs 250 crores, at point *A*. With the increase in income to Rs 1200 crores, the transactions demand would be Rs 300 crores at point *B* on the curve *kY*. If the transactions demand falls due to a change in the institutional and structural conditions of the economy, the value of *k* is reduced to say, 1/5, and the new transactions demand curve is *k'Y*. It shows that for income of Rs 1000 and 1200 crores, transactions balances would be Rs 200 and 240 crores at points *C* and *D* respectively in the figure. "Thus we conclude that

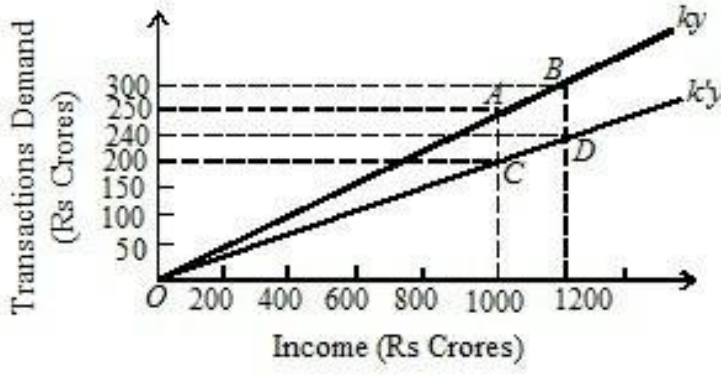


Fig. 1

the chief determinant of changes in the actual amount of the transactions balances held is changes in income. Changes in the transactions balances are the result of movements along a line like *kY* rather than changes in the slope of the line. In the equation, changes in transactions balances are the result of changes in *Y* rather than changes in *k*."[3]

Interest Rate and Transactions Demand. Regarding the rate of interest as the determinant of the transactions demand for money, Keynes made the L_T function *interest inelastic*. But he pointed out that the "demand for money in the active circulation is also to some extent a function of the rate of interest, since a higher rate of interest may lead to a more economical use of active balances."[4] "However, he did not stress the role of the rate of interest in this part of his analysis, and many of his popularizers ignored it altogether."[5] Two post-Keynesian economists William J. Baumol[6] and James Tobin[7] have shown that the rate of interst is an important determinant of transactions demand for money. The have also pointed out that the relationship between transactions demand for money and income is not linear and proportional. Rather, changes in income lead to proportionately smaller changes in transactions demand.

Transactions balances are held because income received once a month is not spent on the same day. In fact, an individual spreads his expenditure evenly over the month. Thus a portion of money meant for transactions purposes can be spent on short-term interest-yielding securities. It is possible to "put funds to work for a matter of days, weeks, or months in interest-bearing securities such as U.S. Treasury bills or commercial paper and other short-term money market instruments. The problem here is that there is a cost involved in buying and selling. One must weigh the financial cost and inconvenience of frequent entry to and exit from the market for securities against the apparent advantage of holding interest-bearing securities in place of idle transactions balances. Among other things, the cost per purchase and sale, the rate of interest, and the frequency of purchases and sales determine the profitability of switching from ideal transactions balances to earning assets. Nonetheless, with the cost per purchase and sale given, there is clearly some rate of interest at which it becomes profitable to switch what otherwise would be transactions balances into interest-bearing securities, even if the period for which these funds may be spared from transactions needs is measured

only in weeks. The higher the interest rate, the larger will be the fraction of any given amount of transactions balances that can be profitably diverted into securities.

The structure of cash and short-term bond holdings is shown in Figure 2 (A), (B) and (C). Suppose an individual receives Rs 1200 as income on the first of every month and spends it evenly over the month. The month has four weeks. His saving is zero. Accordingly, his transactions demand for money in each week is Rs 300. So he has Rs 900 idle money in the first week, Rs 600 in the second week, and Rs 300 in the third week. He will, therefore, convert this idle money into interest-bearing bonds, as illustrated in Panel (B) and (C) of Figure 2. He keeps and spends Rs 300 during the first week (shown in Panel B), and invests Rs 900 in interest-bearing bonds (shown in Panel C). On the first day of the second week, he sells bonds worth Rs. 300 to cover cash transactions of the second week and his bond holdings are reduced to Rs 600. Similarly, he will sell bonds worth Rs 300 in the beginning of the third week and keep the remaining bonds amounting to Rs 300 which he will sell on the first day of the fourth week to meet his expenses for the last week of the month. The amount of cash held for transactions purposes by the individual during each week is shown in saw-tooth pattern in Panel (B), and the bond holdings in each week are shown in blocks in Panel (C) of Figure 2.

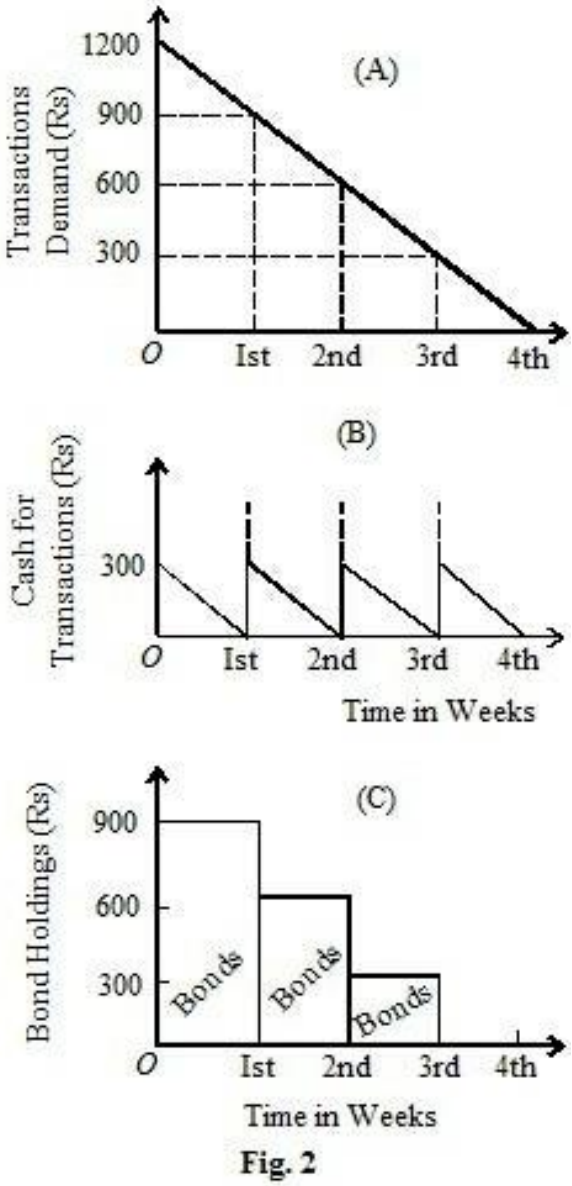


Fig. 2

The modern view is that the transacti[illegible] of both income and interest rates which can be expressed as

$$L_T = f(Y,r).$$

This relationship between income and interest rate and the transactions demand for money for the economy as a whole is illustrated in Figure 3. We saw above that $L_T = kY$. If Y=Rs 1200 crores and k=1/4, then L_T=Rs 300 crores.

This is shown as Y_1 curve in Figure 3. If 1600 crores, the transactions demand also inc 400 crores, given k=1/4. Consequently, the transactions demand curve shifts to Y_2. The transactions demand curves Y_1 and Y_2 are interest-inelastic so long as the rate of interest does not rise above r_8 per cent. As the rate of interest starts rising above r_8, the transactions demand for money becomes interest elastic. It indicates that "given the cost of switching into and out of securities, an interest rate above 8 per cent is sufficiently high to attract some amount of transactions balances into securities." The backward slope of the Y_1 curve shows that at still higher rates, the transaction demand for money declines. Thus when the rate of interest rises to r_{12}, the transactions demand declines to Rs 250 crores with an income level of Rs 1200 crores. Similarly, when the national income is Rs 1600 crores, the transactions demand would decline to Rs 350 crores at r_{12} interest rate. Thus the transactions demand for money varies *directly* with the level of income and *inversely* with the rate of interest.

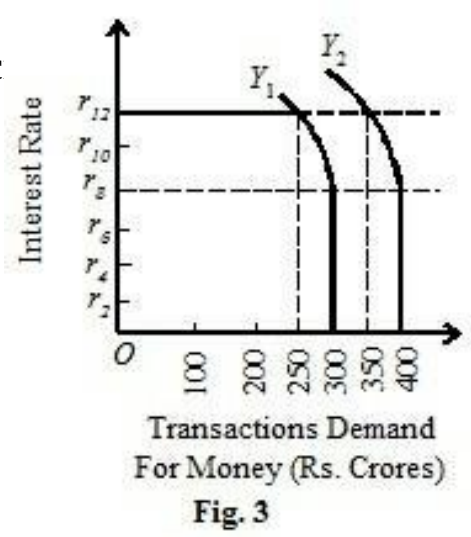


Fig. 3

The Precautionary Demand for Money

The precautionary motive relates to "the desire to provide for contingencies requiring sudden expenditures and for unforeseen opportunities of advantageous purchases." Both individuals and businessmen keep cash in reserve to meet unexpected needs. Individuals hold some cash to provide for illness, accidents, unemployment and other unforeseen contingencies. Similarly, businessmen keep cash in reserve to

tide over unfavourable conditions or to gain from unexpected deals. Therefore, "money held under the precautionary motive is rather like water kept in reserve in a water tank." The precautionary demand for money depends upon the level of income, business activities, opportunities for unexpected profitable deals, availability of cash, the cost of holding liquid assets in bank reserves, etc.

Keynes held that the precautionary demand for money, like transactions demand, was a function of the level of income. But the post-Keynesian economists believe that like transactions demand, it is inversely related to high interest rates. The transactions and precautionary demand for money will be unstable, particularly if the economy is not at full employment level and transactions are, therefore, less than the maximum, and are liable to fluctuate up or down. Since precuationary demand, like transactions demand is a function of income and interest rates, the demand for money for these two purposes is expressed in the single equation $LT = f(Y,r)$.[9] Thus the precautionary demand for money can also be explained diagrammatically in terms of Figures 2 and 3.

The Speculative Demand for Money

The speculative (or asset or liquidity preference) demand for money is "for securing profit from knowing better than the market what the future will bring forth".Individuals and businessmen having funds, after keeping enough for transactions and precautionary purposes, like to make a speculative gain by investing in bonds. Money held for speculative purposes is a liquid store of value which can be invested at an opportune moment in interest-bearing bonds or securities.

Bond prices and the rate of interest are *inversely* related to each other. Low bond prices are indicative of high interest rates, and high bond prices reflect low interest rates. A bond carries a fixed rate of interest. For instance, if a bond of the value of Rs 100 carries 4 per cent interest and the market rate of interest rises to 8 per cent, the value of this bond falls to Rs 50 in the market. If the market rate of interest falls to 2 per cent, the value of the bond will rise to Rs 200 in the market.

This can be worked out with the help of the equation, $V = \frac{R}{r}$

where V is the current market value of a bond, R is the annual return on the bond, and r is the rate of return currently earned or the market rate of interest. So a bond worth Rs 100 (V) and carrying a 4 per cent rate of

interest (r), gets an annual return (R) of Rs 4, that is, V=Rs 4/0.04=Rs100. When the market rate of interest rises to 8 per cent, then V=Rs

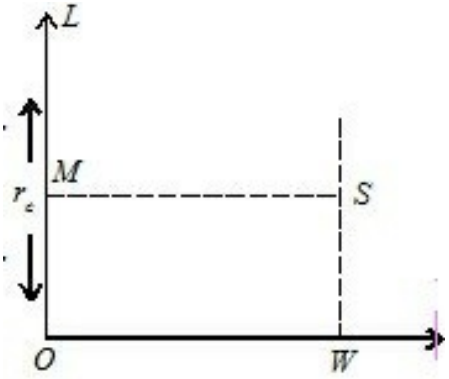
4/0.08=Rs50; when it falls to 2 per cent, then *V*=Rs 4/0.02=Rs 200.

Thus individuals and businessmen can gain by buying bonds worth Rs 100 each at the market price of Rs 50 each when the rate of interest is high (8 per cent), and sell them again when they are dearer (Rs 200 each when the rate of interest falls (to 2 per cent).

According to Keynes, it is expectations about changes in bond prices or in the current market rate of interest that determine the speculative demand for money. In explaining the speculative demand for money, Keynes had a normal or critical rate of interest (r_c) in mind. If the current rate of interest

(r) is above the "critical" rate of interest, businessmen expect it to fall and bond prices to rise. They will, therefore, buy bonds to sell them in future when their prices rise in order to gain thereby. At such times, the speculative demand for money would fall. Conversely, if the current rate of interest happens to be below the critical rate, businessmen expect it to rise and bond prices to fall. They will, therefore, sell bonds in the present if they have any, and the speculative demand for money would increase. Thus when $r>r_c$, an investor holds all his liquid assets in bonds, and when $r<r_c$ his entire holdings go into money. But when $r = r_c$, he becomes indifferent to hold bonds or money.

This relationship between an individual's demand for money and the rate of interest is shown in Figure 4 where the horizontal axis shows the individual's demand for money for speculative purposes and the current and critical interest rates on the vertical axis. The figure shows that when r is greater than r_c , the asset holder puts all his cash balances in bonds and his demand for money is zero. This is illustrated by the *LM* portion of the vertical axis. When r falls below r_c , the individual expects more capital losses on bonds as



Speculative Demand for Money

Fig. 4

against the interest yield. He, therefore, converts his entire holdings into money, as shown by *OW* in the figure. This relationship between an individual asset holder's demand for money and the current rate of interest

gives the discontinuous step demand for money curve *LMSW*.

For the economy as a whole the individual demand curve can be aggregated on this presumption that individual asset-holders differ in their critical rates r_c . It is a smooth curve which slopes downward from left to right, as shown in Figure 5.

Thus the speculative demand for money is a decreasing function of the rate of interest. The higher the rate of interest, the lower the speculative demand for moeny, and the lower the rate of interest, the higher the speculative demand for money. It can be expressed algebraically as $Ls = f(r)$, where *Ls* is the speculative demand for money and *r* is the rate of interest.[10] Geometrically, it is shows in Figure 5. The figure shows that at a very high rate of interest r_{12}, the speculative demand for money is zero and businessmen invest their cash holdings in bonds because they believe that the interest rate cannot rise further. As the rate of interest falls to say, r_8 the speculative demand for money is *OS*. With a further fall in the interest rate to r_6, it rises to OS_1. But at a very low rate of interest r_2, the L_S curve becomes perfectly elastic. This is know as the *liquidity trap* when people prefer to keep money in cash rather than invest in bonds and the speculative demand for money is infinitely elastic. Thus the shape of the *Ls* curve[11] shows that as the interest rate rises, the speculative demand for money declines, and with the fall in the interest rate, it increases. Thus the Keynesian speculative demand for money function is highly volatile, depending upon the behaviour of interest rates.

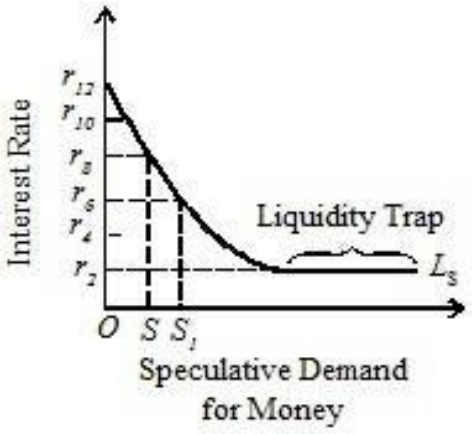


Fig. 5

NOTE ON LIQUIDITY TRAP

Keynes visualised conditions in which the speculative demand for money would be highly or even totally elastic so that changes in the quantity of money would be fully absorbed into speculative balances. This is the famous Keynesian liquidity trap. In this case, changes in the quantity of money have no effects at all on prices or income. According to Keynes, this is likely to happen when the market interest rate is very low so that yields on bonds, equities and other securities will also be low.

At a very low rate of interest, such as r2, in Figure 5, the Ls curve becomes perfectly elastic and the speculative demand for money is infinitely elastic. This portion of the Ls curve is known as the liquidity trap. At such a low rate, people prefer to keep money in cash rather than invest in bonds because purchasing bonds will mean a definite loss. People will not buy bonds so long as the interest rate remains at the low level and they will be waiting for the rate of interest to return to the "normal" level and bond prices to fall.

According to Keynes, as the rate of interest approaches zero, the risk of loss in holding bonds becomes greater. "When the price of bonds has been bid up so high that the rate of interest is, say, only 2 per cent or less, a very small decline in the price of bonds will wipe out the yield entirely and a slightly further decline would result in loss of the part of the principal." Thus the lower the interest rate, the smaller the earnings from bonds. Therefore, the greater the demand for cash holdings. Consequently, the Ls curve will become perfectly elastic.

Further, according to Keynes, "a long-term rate of interest of 2 per cent leaves more to fear than to hope, and offers, at the same time, a running yield which is only sufficient to offset a very small measure of fear." This makes the Ls curve "virtually absolute in the sense that almost everybody prefers cash to holding a debt which yields so low a rate of interest."

Prof. Modigliani believes that an infinitely elastic Ls curve is possible in a period of great uncertainty when price reductions are anticipated and the tendency to invest in bonds decreases, or if there prevails "a real scarcity of investment outlets that are profitable at rates of interest higher than the institutional minimum."12

Its Implications. The phenomenon of liquidity trap possesses certain important implications:

First, the monetary authority cannot influence the rate of interest even by following a cheap money policy. An increase in the quantity of money cannot lead to a further decline in the rate of interest in a liquidity trap situation.

Second, **the rate of interest cannot fall to zero.**

Third, the policy of a general wage cut cannot be efficacious in the face of a perfectly elastic liquidity preference curve, such as *Ls* in Figure 5. No doubt, a policy of general wage cut would lower wages and prices, and thus release money from transactions to speculative purpose, the rate of interest would remain unaffected because people would hold money due to the prevalent uncertainty in the money market.

Last, if new money is created, it instantly goes into speculative balances and is put into bank vaults or cash boxes instead of being invested. Thus there is no effect on income. Income can change without any change in the quantity of money. Thus monetary changes have a weak effect on economic activity under conditions of absolute liquidity preference.

The Total Demand for Money

According to Keynes, money held for transactions and precautionary purposes is primarily a function of the level of income, $L_T = f(Y)$, and the speculative demand for money is a function of the rate of interest, $Ls = f(r)$. Thus the total demand for money is a function of both income and the interest rate :

$$L_T + L_s = f(Y) + f(r)$$

$$L_T + L_s = f(Y) + f(r)$$

or $$L = f(Y) + f(r)$$

or $$L = f(Y, r)$$

where L represents the total demand for money.

Thus the total demand for money can be derived by the lateral summation of the demand function for transactions and precautionary purposes and the demand function for speculative purposes, as illustrated in Figure 6 (A), (B) and (C)*. Panel (A) of the Figure shows OT, the transactions and precautionary demand for money at Y level of income and different rates of interest. Panel (B) shows the speculative demand for money at various rates of interest. It is

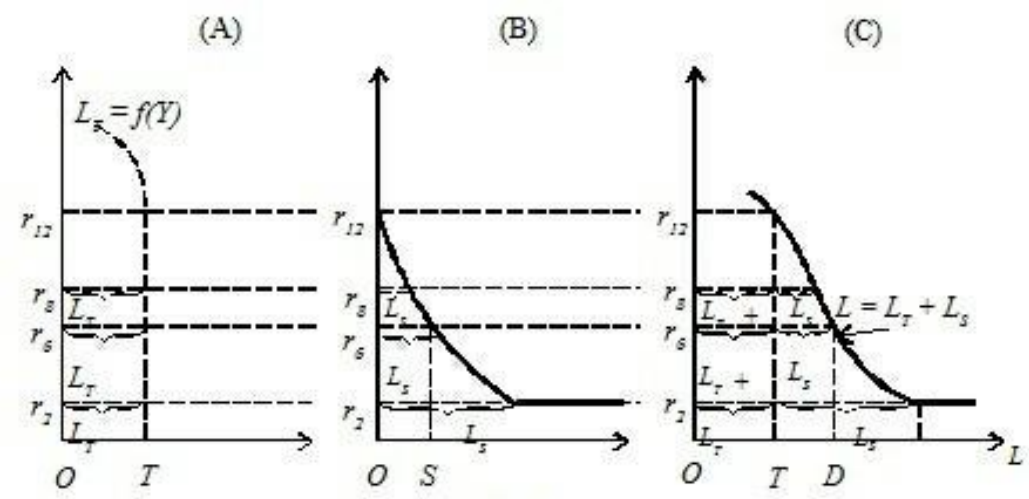


Fig. 6

an inverse function of the rate of interest. For instance, at r6 rate of interest it is OS and as the rate of interest falls to r2, the Ls curve becomes perfectly elastic. Panel (C) shows the total demand curve for money L which is a lateral summation of LT and LS curves : L=LT+LS. For example, at r6 rate of interest, the total demand for money is OD which is the sum of transactions and precautionary demand OT plus the speculative demand TD, OD=OT+TD, where TD = OS. At r2 interest rate, the total demand for money curve also becomes perfectly elastic, showing the position of liquidity trap.

THE POST-KEYNESIAN APPROACHES

Keynes believed that the transactions demand for money was primarily interest inelastic. Prof. Baumol has analysed the interest elasticity of the transactions demand for money on the basis of his inventory theroretical approach. Further, in the Keynesian analysis the speculative demand for money is analysed in relation to uncertainty in the market. Prof. Tobin has given an alternative theory which explains liquidity preference as behaviour towards risk. The two approaches to the liquidity preference theory are discussed below.

1. Baumol's Inventory Theoretic Approach[13]

William Baumol has made an important addition to the Keynesian transactions demand for money. Keynes regarded transactions demand for money as a function of the level of income, and the relationship between transactions demand and income as linear and proportional. Baumol shows that the relation between transactions demand and income is neither linear nor proportional. Rather, changes in income lead to less than proportionate changes in the transactions demand for money. Further, Keynes considered transactions demand as primarily interest inelastic. But Baumol analyses the interest elasticity of the transactions demand for money.

Its Assumptions

Baumol's theory is based on the following assumptions:

1. The transactions between money and bonds are transparent and occur in a steady stream.
2. The bond market is perfect where there is easy conversion of bonds into cash and vice versa.
3. There is a fixed cost in exchanging bonds for cash and vice versa.
4. The holding of cash involves interest cost and non-interest costs.
5. The interest cost (or rate of interest) is constant over the year.
6. The non-interest costs such as brokerage fee, mailing expenses, etc. are also fixed over the year.

The Theory

Given these assumptions, Baumol's analysis is based on the holding of an optimum inventory of money for transactions purposes by a firm or an individual. He writes: "A firm's cash balance can usually be interpreted as an inventory of money which its holder stands ready to exchange against purchase of labour, raw materials, etc." Cash balances are held because income and expenditure do not take place simultaneously. "But it is expensive to tie up large amounts of capital in the form of cash balances. For that money could otherwise be used profitably elsewhere in the firm or it could be invested profitably in securities." Thus the alternative to holding cash balances is bonds which earn interest. A firm would always try to keep minimum transactions balances in order to earn maximum interest from its assets. The higher the interest rate on bonds, the lesser the transactions balances which a firm holds.

Baumol assumes that a firm receives Y dollars once per time period, say a year, which are spent at a constant rate over the period. It is, therefore, always profitable for the firm to spend idle funds on buying bonds which can be sold when it needs cash for transactions purposes.

The structure of cash for holdings and bond holdings by a firm is shown in Figure 7. Suppose the firm has $ 1,200 which it has to spend every quarter at a constant rate over the year. Out of this, it keeps $ 400 in cash for transactions purposes and buys bonds with the remaining amount of $800. Half the bonds purchased carry maturity of $1/3t$ (4 months) and the other (half) bonds carry maturity of $2/3t$ (8 months). Further suppose that K is the sum received form the sale of bonds and the firm's average cash holdings equal half the sum ($1/2K$) received from the sale of bonds. Given these assumptions, the firm buys bonds with $2/3K$ ($800) of its income at time t=0 and keeps $1/3K$ ($400) in cash, as shown in the figure. At time $1/3t$, the first half of the bonds purchased ($400) mature which it sells for cash until time $2/3t$. At time $2/3t$, the remaining bonds mature which the firm sells for

transactions purposes until time t_1. At time t_1, when the year is over, the cash balance is zero and the firm is again ready for fresh receipts in the new year.

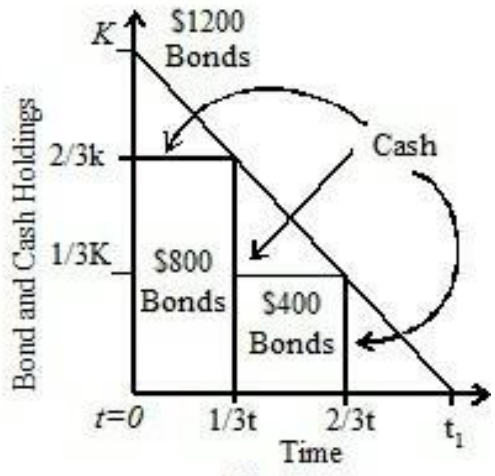


Fig. 7

Now the problem is how to hold asse exist interest-yielding bonds that can be ov that there is a fixed cost involved in exchar

The solution of this problem rec holding cash balances over the year. The h of interest cost and non-interest costs. Interest cost is in the nature of opportunity cost because when a firm holds cash balances for transactions purposes it forgoes interest income. On the other hand, non-interest costs include such items as brokerage fees, mailing expenses, book-keeping expenses, etc. for converting cash into bonds, and vice versa.

Thus whenever a firm holds money for transactions purposes, it incurs interest costs and brokerage fees (non-interest costs). Let r be the rate of interest which is assumed to be constant over the year and b the brokerage fee which is also assumed to be fixed. Assume that at the beginning of the year, Y is the income of the firm which is equal to the real value of the transactions performed by it, and K is the size of each cash withdrawal at intervals over the year when the bonds are sold. Thus Y/K is the number of withdrawals that occur over the year. The cost on brokerage fees during the year will equal $b(Y/K)$. Since the average cash withdrawal are $K/2$, the

interest cost of holding cash balances is $rK/2$. Then the total cost of making transactions, C, may be written in equation form as:

$$C = r\frac{K}{2} + b\frac{Y}{K} \qquad \ldots(1)$$

The optimal value of K is that which minimises the total inventory cost C. By differentiating C with respect to K, setting the derivative dC/dK equal to zero, and solving for C, we obtain

$$\frac{dC}{dK} = \frac{r}{2} + \frac{-bY}{K^2} = 0$$

or

$$\frac{r}{2} = \frac{bY}{K^2}$$

Multiplying both sides by $2K_2/r$, we obtain

$$K^2 = \frac{2bY}{r}$$

or

$$K = \sqrt{\frac{2bY}{r}} \qquad \ldots(2)$$

Equation (2) shows that if the brokerage fee increases, the number of withdrawals will decrease. In other words, the optimal cash balance will increase because the firm will invest less in bonds. On the other hand, if the rate of interest on bonds rises, the firm will find it profitable to invest in bonds and the optimal cash balance will be lower, and vice versa.

Baumol's analysis points toward another important fact about the behaviour of demand for transactions balances. When a firm or an individual purchases large number of bonds, it is left with small transactions balances and vice versa. But every purchase involves non-interest costs in the form of brokerage fee, mailing, etc. which the purchaser has to pay. He has, therefore, to balance the income to be forgone by making fewer bond purchases against the expenses to be incurred by making large bond purchases. This decision depends upon the rate of interest on bonds. The higher the rate of interest, the larger the expenses which a firm can abosrb in making bond purchases. A more

important factor which determines this decision is the amount of money involved in transactions because brokerage fees of buying and selling bonds are relatively fixed and do not change much in relation to the former. When the money involved in transactions is larger, the smaller will be the brokerage costs. "On a $ 1000 bond purchase, minimum brokerage fees can be costly. On a million dollar transaction they are negligible. Hence, the larger the total amounts involved, the less significant will be the brokerage costs, and the more frequent will be optimal withdrawals." This is because of the operation of economies of scale in cash management or use of money.

It implies that at higher levels of income, the average cost of transactions i.e. brokerage fees are lower. As income increases, the transactions demand for money also increases but by less than the increase in income. If income increases fourfold, optimal transactions balances only double. Since Baumol takes the income elasticity of demand for money to be one- half (1/2), the demand for money will not increase in the same proportion as the increase in income. This is because of the economies of scale that encourage larger investment in bonds when the amount of money involved in transactions is larger due to increase in income.

In this inventory theory of the demand for money, Baumol also emphasises that the demand for money is a demand for real balances. Since the value of average cash holdings over the year is $K/2$, the demand for real balances for transactions purposes becomes

$$\frac{M_D}{P} = \frac{K}{2} = \frac{1}{2}\sqrt{\frac{2bY}{r}}$$

where M_D is the demand for money and P is the price level.

Equation (3) shows that the demand for real transactions balances "is proportional to the square root of the volume of transactions and inversely proportional to the square root of the rate of interest."

It means that the relationship between changes in the price level and the

transactions demand for money is direct and proportional. The pattern of a firm's purchases remaining unchanged, the optimal cash balances (*Y*) will increase in exactly the same proportion as the price level (*P*). If the price level doubles, the money value of the firm's transactions will also double. When all prices double, brokerage fee (*b*) will also double "so that larger cash balances will become desirable in order to avoid investments and withdrawals and the brokerage costs which they incur." Thus the increase in the money value of transactions and in brokerage fees leads to a rise in the optimal demand for money in exactly the same proportion as the change in the price level. Thus Baumol's analysis of the demand for real balances implies that there is no money illusion in the demand for money for transactions purposes.

Its Superiority over the Classical and Keynesian Approaches

Baumol's inventory theoretic approach to the transactions demand for money is an improvement over the classical and Keynesian approaches.

1. The cash balances quantity theory of money assumed the relationship between the transactions demand and the level of income as linear and proportional. Baumol has shown that this relationship is not accurate. No doubt it is true the transactions demand increases with increase in income but it increases less than proportionately because of the economies of scale in cash management.
2. Baumol's theory also has the merit of demonstrating the interest elasticity of the transactions demand for money as against the Keynesian view that it is interest inelastic.
3. Baumol analyses the transactions demand for real balances thereby emphasising the absence of money illusion.
4. Baumol's inventory theoretic approach is superior to both the classical and Keynesian approaches because it integrates the transactions demand for money with the capital-theory approach by taking assets and their interest and non-interest costs into account.
5. Baumol's theory removes the dichotomy between transactions and

speculative demand for money of the Keynesian approach.

2. Tobin's Portfolio Selection Model: The Risk Aversion Theory of Liquidity Preference

James Tobin in his famous article "Liquidity Preference as Behaviour Towards Risk,"[14] formulated the risk aversion theory of liquidity preference based on portfolio selection. This theory removes two major defects of the Keynesian theory of liquidity preference. *One*, Keynes's liquidity preference function depends on the inelasticity of expectations of future interest rates; and *two*, individuals hold either money or bonds. Tobin has removed both the defects. His theory does not depend on the inelasticity of expectations of future interest rates but proceeds on the assumption that the expected value of capital gains or losses from holding interest-bearing assets is always zero. Moreover, it explains that an individual's portfolio holds both money and bonds rather than only one at a time.

Tobin starts his portfolio selection model of liquidity preference with this presumption that an individual asset holder has a portfolio of money and bonds. Money neither brings any return nor imposes any risk on him. But bonds yield interest and also bring income. However, income from bonds is uncertain because it involves a risk of capital losses or gains. The greater the investment in bonds, the greater is the risk of capital loss from them. An investor can bear this risk if he is compensated by an adequate return from bonds.

If g is the expected capital gain or loss, it is assumed that the investor bases his actions on his estimate of its probability distribution. It is further assumed that this probability distribution has an expected value of zero and is independent of the level of the current rate of interest, r, on bonds.

His portfolio consists of a proportion M of Money and B of bonds where both M and B add up to 1. They do not have any negative values. The return on portfolio R is

$$R = B\,(r+g) \text{ where } O \leq B \leq 1$$

Since *g* is a random variable with expected value zero, the expected return on the portfolio is

$$RE = \mu R = Br.$$

The risk attached to a portfolio is measured by the standard deviation of *R*, that is,σR.

Tobin describes three types of investors. The *first* category is of *risk lovers* who enjoy putting all their wealth into bonds to maximise risk. They accept risk of loss in exchange for the income they accept from bonds. They are like gamblers. The *second* category is of *plungers*. They will either put all their wealth into bonds or will keep it in cash. Thus plungers either go all the way, or not at all.

But the majority of investors belong to the *third* category. They are *risk averters* or *diversifiers*. Risk averters prefer to avoid the risk of loss which is associated with holding bonds rather than money. They are prepared to bear some additional risk only if they expect to receive some additional return on bonds, provided every increase in risk borne brings with it greater increase in returns. They will, therefore, diversify their portfolios, and hold both money and bonds. Although money neither brings any return nor any risk, yet it is the most liquid form of assets which can be used for buying bonds any time.

In order to find out risk averter's preference between risk and expected return, Tobin uses indifference curves having positive slopes indicating that the risk averter demands more expected returns in order to take more risk.

This is illustrated in Figure 8 where the horizontal axis measures risk (σR) and the vertical axis the expected returns ($\sigma\mu R$). The line *Or* is the budget line of the risk averter. It shows the combinations of risk and expected return on the basis of which he arranges his portfolio of wealth consisting of money and bonds. I_1 and I_2 are indifference curves. An indifference

curve shows that he is indifferent between all pairs of expected return and risk that lie on I_1 curve. Points on I_2 curve are preferred to those on I_1 curve. But the risk averter will achieve an equilibrium position between expected return and risk where his budget line is tangent to the indifference curve. It is point T on the budget line O_r and I_1 curve.

In the lower portion of the figure, the length of the vertical axis shows the wealth held by the risk averter in his portfolio consisting of money and bonds. The line *OC* shows risk as proportional to the share of the total portfolio held in bonds. Thus point *E* on this line drawn as perpendicular from point T determines the portfolio mix of money and bonds. It is *OP* of bonds shown as *B*, and *PW* of money shown as *M* in the figure.

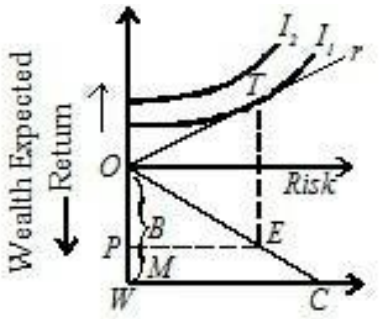


Fig. 8

Thus the risk averter diversifies his total wealth *OW* by putting partly in bonds and partly keeping in cash. That is why he is called a diversifier. He is not prepared to accept more risk unless he can also expect greater expected return. However, the risk averter possesses an intrinsic preference for liquidity which can be only offset by higher interest rates. The higher the interest rate, the lower the demand for money, and the higher the incentive to hold more bonds. On the contrary, the lower the interest rate, the higher the demand for money, and the lower the willingness to hold bonds. This is illustrated in Figure 9.

The slope of the budget line increases with the increase in the interest rate. This is shown by the budget line r_1 rotating upward to r_2 and r_3. Consequently, returns increase in relation to risk with increase in the interest rate, and the budget line touches higher indifferences curves. In Figure 9, budget lines r_1, r_2 and r_3 are tangents to I_1, I_2 and I_3 curves at points T_1, T_2 and T_3 respectively. These points trace out the optimum portfolio curve, *OPC*, in the figure which shows that as the tangency points move upward from left to right, both the expected return and risk increase.

These tangency points also determine the portfolio selection of risk averters as shown in the lower portion of Figure 9. When the rate of interest is r_1, they hold OB_1 bonds and B_1W money. As the rate of interest increases, from r_1 to r_2 and r_3, risk averters hold successively more bonds OB_2 and OB_3 and reduce money to B_2W and B_3W in their portfolios. The figure also shows that as the rate of interest increases by equal increments from r_1, to r_2 to r_3,

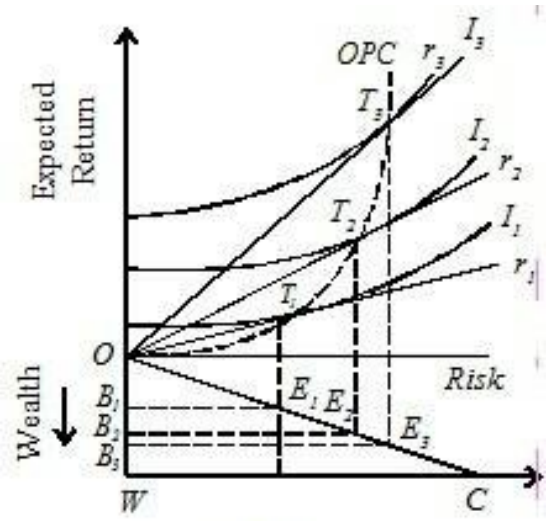


Fig. 9

risk averters hold bonds by decreasing increments, $B_2B_3<B_2B_1<OB_1$. This also means that the demand for money falls by smaller amounts, as the rate of interest increases. This is because the total wealth in the portfolio consists of bonds plus money.

The demand for money curve can thus be drawn on the basis of figure 9. This is depicted in Figure 10 as the *Ls* curve. The curve shows that when the rate of interest falls from a higher level, there is a smaller increase in the demand for money. For instance, when the interest rate falls from r_{10} to r_8, the demand for money increases by *AB* which is smaller than *OA*. This is because risk averters prefer to hold more bonds than money. But when the rate of interest falls at a lower level from r_4 to r_2, the increase in the demand for money is much larger. It is *CD* in Figure 10. This demand for money curve relates to the speculative demand for money and not to the aggregate demand for money.

Its Superiority over Keynesian Theory

Tobins' risk aversion theory of portfolio selection is superior to the Keynesian liquidity preference theory of speculative demand for money on the following counts:

First, Tobin's theory does not depend on inelasticity of expectations of

future interest rates, but proceeds from the assumption that the expected

value of capital gain or loss from holding interest-bearing assets is always zero. In this respect, Tobin regards his theory as a logically more satisfactory foundation for liquidity preference than the Keynesian theory.

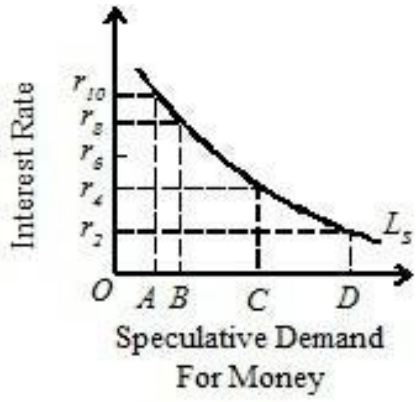


Fig. 10

Second, this theory is superior to Keynes's theory in that it explains that individuals hold diversified portfolios of bonds and money rather than either bonds or money.

Third, like Keynes, Tobin regards the demand for money as closely dependent on interest rates and inversely related to interest rates and his theory provides a basis for liquidity preference.

Fourth, Tobin is more realistic than Keynes in not discussing the perfect elasticity of demand for money (the liquidity trap) at very low rates of interest.

Fifth, according to David Laidler, the real importance of the portfolio theory lies in "not what it tells directly about the aggregate economy, but rather it represents an interesting approach to the problem of relating demand for money to the existence of uncertainty, an approach that probably has scope for considerable development in the future."

THEORIES OF INTEREST RATE

INTRODUCTION

This chapter discusses some of the important theories of interest rate such as the classical, the loanable funds, the Keynesian, and the modern theory of interest. Besides, certain issues like the natural and market rates of interest are also examined.

Of the theories discussed below, the Keynesian liquidity preference theory that determines the interest rate by the demand for and supply of money is a *stock* theory. It emphasises that the rate of interest is a purely monetary phenomenon. It is a *stock* analysis because it takes the supply of money as given during the short run. and determines the interest rate by liquidity preference or demand for money. On the otter hand, the loanable funds theory is a *flow* theory that determines the interest rate by the demand for and supply of loanable funds. It involves the linking of the interest rate with dissaving, investment and hoarding of funds on the demand side with saving, dishoardings and bank money on the supplyside. These are all flow variables. Hicks and Hansen have reconciled and synthesised these stock and flow theories in a general equilibrium framework and presented a determinate theory of interest rate in terms of the IS-LM formulation.

THE CLASSICAL THEORY OF INTEREST

According to the classical theory, rate of interest is determined by the supply of and demand for capital. The supply of capital is governed by the time preference and the demand for capital by the expected productivity of

capital. Both time preference and productivity of capital depend upon waiting or saving or thrift. The theory is, therefore, also known as the supply and demand theory of saving.

Demand Side. The demand for capital consists of the demand for productive and consumptive purposes. Ignoring the latter, capital is demanded by the investors because it is productive. But the productivity of capital is subject to the law of variable proportions. Additional units of capital are not as productive as the earlier units. A stage comes, when the employment of an additional unit of capital in the business is just worth while and no more. Suppose, an investor invests Rs.1,00,000 in a factory and expects, a yield of 20%. Another instalment of an equal amount would not be as productive as the first one and might bring him 15%. While a third instalment might yield 10%. If he has borrowed the money at 10%, he will not venture to invest more. For the rate of interest is just equal to the marginal productivity of capital to him. It shows that at a higher rate of interest, the demand for capital is low and it is high at a lower rate of interest. Thus the demand for capital is *inversely* related to the rate of interest, and the demand schedule for capital or investment curve slopes downward from left to right There, are, however, certain other factors which govern the demand for capital, such as the growth of population, technical progress, process of rationalization, the standard of living of the community, etc.

Supply Side. The supply of capital depends upon savings, rather upon the will to save and the power to save of the community. Some people save irrespective of the rate of the interest. They would continue to save even if the rate of interest were zero. There are others who save because the current rate of interest is just enough to induce them to save. They would reduce their savings if the rate of interest fell below this level. Still there are the potential savers who would be induced to save if the rate of interest were raised. To the last two categories of savers, saving involves a sacrifice,

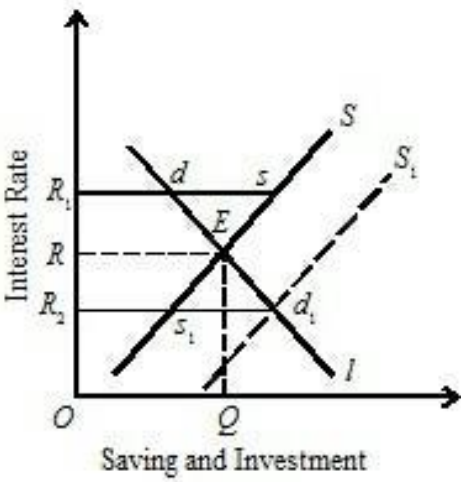


Fig. 1

abstinence or waiting when they forgo present consumption in order to earn interest. The higher the rate of interest, the larger will be the community savings and the more will be the supply of funds. The supply curve of capital or the saving curve thus moves upward to the right

Determination. Assuming the level of income to be given, the rate of interest is determined by the interaction of the demand curve and the supply curve of saving. This is shown in Figure 1 where *I* and *S* curves intersect at *E* which is the equilibrium point when *OQ* quantity of capital is demanded and supplied at *R* rate of interest. If at any time the rate of interest rises above *R,* the demand for investment funds will fall and the supply of savings will increase. Since the supply of savings is more than the demand *($R_1s > R_1 d$),* the rate of interest will come down to the equilibrium level *OR.* The opposite will be the case if the rate of interest falls to R_2. The demand for investment funds is greater than the supply of savings *($R_2d_1 > R_2s_1$)* rate of interest will rise to *R.* The ultimate situation is one of equality between saving and investment brought about by the equilibrium or the *natural* rate of interest. If at any time people become thrifty and save more than *OQ,* the rate of interest would fall below *R* because the demand for capital remains the same. This is shown by the downward shift of the saving curve to S_1, where it intersects the *I* curve at d_1 and the rate of interest falls to R_2 At the lower rate of interest, people will save less but the demand for investment funds will increase which will tend to raise the rate of interest to the equilibrium level *R.*

Its Criticisms

The 'pure' or the *real* theory of interest of the classicals, as enunciated by Marshall and Pigou, has been severely criticised by Keynes.

(1) Income not Constant but Variable. One of the serious defects of the classical theory is that it assumes the level of income to be given, and regards interest as an equilibrating mechanism between the demand for investible funds and the supply of funds through savings. According to Keynes, income is a variable and not a constant and the equality between saving and investment is brought about by changes in income and not by variations in the rate of interest.

(2) Saving-Investment Schedules not Independent. In this theory the two determinants of interest rate, the demand and supply curves of saving are treated as independent of one another. It means that if there is change in demand, the demand curve for savings can shift up or below the I curve without causing a change in the supply curve. But according to Keynes, the two curves are not independent of one another. If, for instance, an invention shifts the investment curve upward, income will rise and it will lead to higher savings and thus shift the supply curve too. Similarly, a shift in the supply curve will bring a change in the demand curve.

(3) Neglects the Effects of Investment on Income. The classical theory neglects the effect of investment on the level of income. A rise in the rate of interest, for instance, will bring a decline in investment by making it less profitable. This will mean decline in output, employment and income. The latter will, in turn, lead to reduced savings, a fact contrary to the classical assertion that saving is a direct function of the rate of interest. On the other hand, a low rate of interest encourages investment activity, increases output, employment, income and savings. But Keynes does not believe that investment depends on the rate of interest. It depends on the marginal efficiency of capital. Even if the rate of interest were to fall to zero, Keynes argues, investment will not take place if business expectations for profits are at a low level, as is the case in depression.

(4) Indeterminate Theory. Since savings depend upon the level of income, it is not possible to know the rate of interest unless the income level is known beforehand. And the income level itself cannot be known without already knowing the rate of interest. A lower rate of interest will increase investment, output, employment, income and savings. So, for each income level a separate saving curve will have to be drawn. This is all circular reasoning and offers no solution to the problem of interest. That is why Keynes characterised the classical theory of interest as indeterminate.

Neglects other Sources of Savings. The propounders of this theory include savings out of current income in the supply schedule of savings which makes it inadequate. Considering the supply of capital to be interst- elastic, people might lend their past savings with the rise in the rate of

interest and so increase the supply of capital. Similarly, bank credit is an important source of the supply of capital. Banks lend more during periods of slow business activity. The classical theory remains incomplete when it neglects these factors in the supply schedule of capital.

THE LOANABLE FUNDS THEORY OF INTEREST

The neo-classical or the loanable funds theory explains the determination of interest in terms of demand and supply of loanable funds or credit.

According to this theory, the rate of interest is the price of credit, which is determined by the demand and supply for loanable funds. In the words of Prof. Lerner, it is the price which equates the supply of 'credit', or saving *plus* the net increase in the amount of money in a period, to the demand for 'credit', or investment *plus* net hoarding "in the period." Let us analyse the forces behind the demand and supply of loanable funds.

Demand for Loanable Funds. The demand for loanable funds has primarily three sources *i.e.,* government, businessmen and consumers who need them for purposes of investment, hoarding and consumption. The government borrows funds for constructing public works or for war preparations. The businessmen borrow for the purchase of capital goods and for starting investment projects. Such borrowings are interest elastic and depend mostly on the expected rate of profit as compared with the rate of interest. The demand for loanable funds on the part of consumers is for the purchase of durable consumer goods like scooters, houses, etc. Individual borrowings are also interest elastic. The tendency to borrow is more at a lower rate of interest than at a higher rate in order to enjoy their consumption soon. Since this demand for funds is mostly met out of past savings or through *dis-saving,* it is represented by the curve *Ds* in Figure 2. The demand curve for *investment funds,* both for the government and the businessmen is shown as curve *I.* It slopes downward showing that less funds are borrowed at a higher rate and more at a lower rate of interest. *Lastly,* funds are demanded for the purpose of *hoarding* them in liquid form or as idle cash. They are also interest elastic and are shown by the curve *H.* The lateral summation of these curves *H, Ds* and *I* gives us

the aggregate demand curve for loanable funds ΣD.

Supply of Loanable Funds. The supply of loanable funds comes from savings, dishoardings and bank credit. Private, individual and corporate savings are the main source of savings. Though personal savings depend upon the income level, yet taking the level of income as given they are regarded as interest elastic. The higher the rate of interest, the greater will be the inducement to save and *vice versa.*

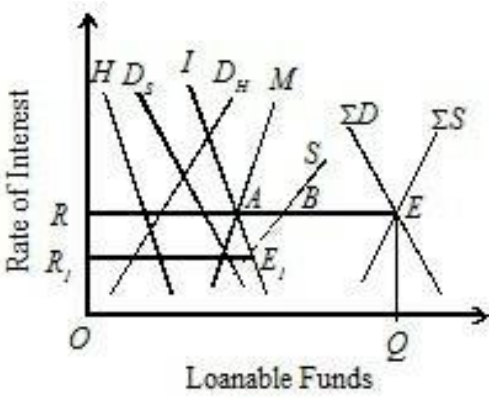


Fig. 2

Corporate savings are the undistributed profits of a firm which also depend on the current rate of interest to some extent. If the interest rate is high, it will act as a deterrent to borrowing and thus encourage savings. *Savings* are indicated as curve *S* in the Figure 2. The second source is the volume of funds coming out of hoards or being added to them. *Dishoarding* may represent not only purchase of old assets or securities from others out of idle cash balances of one's own funds for net investment or for consumption in purchases in excess of net disposable income. Such funds are directly related to the rate of interest. The higher the interest rate the larger the funds that will be coming out of hoards and *vice* versa. These funds are represented by the curve D_H. Lastly, there is the *bank credit* as an important source of the supply of loanable funds. Bank credit or money is also interest elastic to some extent. More funds are lent at a higher than at a lower rate of interest. Bank credit is shown as the curve *M.* If these curves D_H, *M* and *S* are laterally added up, we have the aggregate supply curve *ΣS* of loanable funds.

The total demand curve for loanable funds *ΣD* and the total supply curve of loanable funds *ΣS* intersect at *E* and give *OR* rate of interest. At this rate *OQ* amount of funds are borrowed and lent.

Its Criticisms

According to Prof. Robertson, the loanable funds theory is a "commonsense explanation" of the determination of the rate of interest. But this theory is also not free from certain defects.

(1) Equilibrium Rate reflects Unstable Equilibrium. The demand and supply schedules for loanable funds determine the equilibrium rate of interest *OR* which does not equate each component on the supply side with the corresponding component on the demand side. Thus the equilibrium rate *OR* reflects unstable equilibrium. For stable equilibrium, it is essential that *ex ante* (planned) investment must equal *ex-ante* savings at the equilibrium rate *OR.* In the figure, *ex-ante* savings *S* exceed *ex-ante* investment *I* by *AB.* They are equal at point E_1 but at a lower rate OR_1 which is the natural rate of interest.

(2) Indeterminate Theory. Prof. Hansen asserts that the loanable funds theory like the classical and the Keynesian theories of interest is indeterminate. The supply curve of loanable funds is composed of savings, dishoardings and bank money. But since savings vary with past income and the new money and activated balances with the current income, it follows that the total supply curve of loanable funds also varies with income. Thus the loanable funds theory is indeterminate unless the income level is already known.[1]

(3) Cash Balances not Elastic. The loanable funds theory states that the supply of loanable funds can be increased by releasing cash balances of savings and decreased by absorbing cash balances into savings. This implies that the cash balances are fairly elastic. But this does not seem to be a correct view because the total cash balances available with the community are fixed and equal the total supply of money at any time. Whenever there are variations in the cash balances, they are in fact in the velocity of circulation of money rather than in the amount of cash balances with the community.

(4) **Savings not Interest Elastic.** The theory over-emphasises the influence of the rate of interest on savings. It regards savings as interest elastic. Generally speaking, people save not to earn rate of interest but to satisfy precautionary motive. So savings are interest *inelastic.*

(5) Not correct to combine Real and Monetary Factors. The loanable funds theory has been criticised for combining monetary factors with real factors. It is not correct to combine real factors like saving and investment

with monetary factors like bank credit and dishoarding without bringing in changes in the level of income. This makes the theory unrealistic.

Its Superiority over the Classical Theory

Despite these weaknesses, the loanable funds theory is better and more realistic than the classical theory on a number of counts.

1. The classical theory is a real theory of interest and neglects monetary influences on interest. With the inclusion of real as well as monetary factors, the loanable funds theory becomes superior to the classical theory.
2. The classicists neglect the role of bank credit as a constituent of money supply influencing the rate of interest which is an important factor in the loanable funds theory.

KEYNES'S LIQUIDITY PREFERENCE THEORY OF INTEREST

Keynes defines the rate of interest as the reward of not hoarding but the reward for parting with liquidity for the specified period. It "is not the 'price' which brings into equilibrium the demand for resources to invest with the readiness to abstain from consumption. It is the 'price' which equilibrates the desire to hold wealth in the form of cash with the available quantity of cash."[2] In other words, the rate of interest, in the Keynesian sense, is determined by the demand for and the supply of money. This theory is, therefore, charaterised as the monetary theory of interest, as

distinct from the real theory of the classicals.

Supply of Money. Of the two determinants of the rate of interest, the supply of money refers to the total quantity of money in the country for all purposes at any time. Though the supply of money is a function of the rate of interest to a degree, yet it is considered to be fixed by the monetary authorities, that is, the supply curve of money is taken as perfectly inelastic.

Demand for Money. For the second determinant, the demand for money, Keynes coined a new term "liquidity preference" by which his theory of interest is commonly known. Liquidity preference is the desire to hold cash. The money in cash "lulls our disquietude" and the rate of interest which is demanded in exchange for it is a "measure of the degree of our disquietude." The rate of interest, in Keynes words, is the "premium which has to be offered to induce people to hold the wealth in some form other than hoarded money." The higher the liquidity preference,the higher will be the rate of interest that will have to be paid to the holders of cash to induce them to part with their liquid assets. The lower the liquidity preference, the lower will be the rate of interest that will be paid to the cash-holders. According to Keynes, there are three motives behind the desire of the people to hold liquid cash: (1) the transaction motive, (2) the precautionary motive, and (3) the speculative motive.

Transactions Motive. The transactions motive relates to "the need of cash for the current transactions of personal and business exchanges." It is further divided into the income and business motives. The *income motive* is meant to bridge the interval between the receipt of income and its disbursement," and similarly, the *business motive* as "the interval between the time of incurring business costs and that of the receipt of the sale proceeds." If the time between the incurring of expenditure and receipt of income is small, less cash will be held by the people for current transactions, and vice versa. There will however be changes in the transactions demand for money depending upon the expectations of the income, of recipients and businessmen. They depend upon the level of income, employment and prices, the business turnover, the normal period between the receipt and disbursement of income, the amount of salary or

income, and on the possibility of getting a loan

Precautionary Motive. The precautionary motive relates to "the desire to provide for contingencies requiring sudden expenditures and for unforeseen opportunities of advantageous purchases." Both individuals and businessmen keep cash in reserve to meet unexpected needs. Individuals hold some cash to provide for illness, accidents, unemployment and other unforeseen contingencies. Similarly businessmen keep cash in reserve to tide over unfavourable conditions or to gain from unexpected deals. Money held under the precautionary motive is rather like water kept in reserve in a water tank. The precautionary demand for money depends upon the level of income, and business activity, opportunities for unexpected profitable deals, availability of cash, the cost of holding liquid assets in bank reserves, etc.

Keynes holds that the transactions and precautionary motives are relatively *interest inelastic,* but are highly *income elastic.* The amount of money held under these two motives (M_1) is a function (L_1) of the level of income (Y) and is expressed as $M_1=L_1(Y)$.

Speculative Motive. Money held under the speculative motive is for "securing profit from knowing better than the market what the future will bring forth." Individuals and businessmen have funds, after keeping enough for transactions and precautionary purposes and like to gain by investing in bonds. Money held for speculative purposes is a liquid store of value which can be invested at an opportune moment in interest-bearing bonds or securities. Bond prices and the rate of interest are inversely related to each other. Low bond prices are indicative of high interest rates, and high bond prices reflect low interest rates. A bond carries a fixed rate of interest. For instance, if a bond of the value of Rs 100 carries 4% interest and the market rate of interest rises to 8%, the value of this bond falls to Rs 50 in the market. If the market rate of interest falls to 2%, the value of the bond will rise to Rs 200 in the market. Thus individuals and businessmen can gain by buying bonds worth Rs 100 each at the market rate of Rs 50 each when the rate of interest is high (8%), and sell them

again when they are dearer (Rs 200 each) when the rate of interest falls (to 2%).,

According to Keynes, it is expectations about changes in bond prices or in the current market rate of interest that determine the speculative demand for money. The speculative demand for money is a decreasing function of the rate of interest. The higher the rate of interest, the lower the speculative demand for money, and lower the rate of interest, the higher the speculative demand for money. Algebraically, Keynes expressed the speculative demand for money as $M_2=L_2(r)$ where L_2 is the speculative demand for money and *r* is the rate of interest. Geometrically, it is a smooth curve which slopes downward from left to right, as shown in Figure 3 .

But at a very low rate if interest, such as 2% the speculative demand for money becomes perfectly elastic. This portion of the curve is known as the *liquidity trap.* At a very low rate of interest, people prefer to keep money in cash rather than invest in bonds because purchasing bonds will mean a definite loss.

Total Demand of Money

If the total liquid money is denoted by *M*, the transactions plus precautionary motive by M_1 and the speculative motive for holding by M_2, then$M=M_1+M_2$. Since $M_1 = L_1(Y)$ and$M_2=L_2(r)$, the total liquidity preference function is expressed as $M=L(Y,r)$. M_1 is circulating or active money and M_2 is idle, or passive money. Though M_1 is a function of income and M_2 of the rate of interest, yet they cannot be held in water-tight compartments. Even M_1 is interest elastic at high interest rates. If there is increased demand for M_1 it can be met by transferring funds from idle balances, M_2. Prof. Haberler distinguishes between liquidity preference in the narrower sense and liquidity preference in the wider sense. The former is the demand for idle balances, M_2 and is called "liquidity preference proper", and the latter is the total liquidity demand *(M or* M_1+M_2). Given the level of income at high interest rates, liquidity preference refers to the total demand for money (M_1+M_2) and at low

interest rates the demand for speculative motive *(M_2)*alone.

Determination of the Rate of Interest. We have analysed the factors behind the supply and demand for money. The rate of interest, like the price of any product or service, is determined at a level where the demand for money equals the available supply of money. In Figure 3, the vertical line Q_1M represents the supply of money and *L* is the total demand for money curve. Both intersect at *E* where the *equilibrium rate* of interest *R* is established. If there is any deviation from this equilibrium position, an adjustment will take place via the rate of interest, and the equilibrium level *E* is re-established. E_1 is the position of unstable equilibrium where the supply of money *OM* is greater than the demand for moneyOM_1.Consequently, the rate of interest will start declining from R_1, till the equilibrium rate of interest *R* is reached. Similarly at R_2 level of interest rate, the demand for money OM_2 is greater than the supply of money *OM.* As a result, the rate of interest R_2 will start rising till it reaches the equilibrium rate *R.*

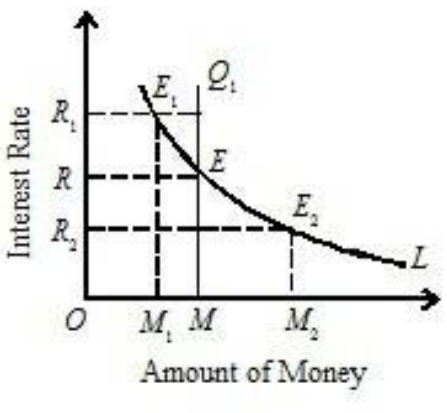


Fig. 3

If the *supply of money* is increased by the monetary authorities, but the liquidity preference curve *L* remains the same, the rate of interest will fall. This is illustrated in Figure 4. Given the *L* curve, the supply of money curve being *QM,* the rate of interest is R_5. With the increase in the supply of money from *QM* to O_1M_1 and Q_2M_2, the rate of interest falls from R_3 to R_2.

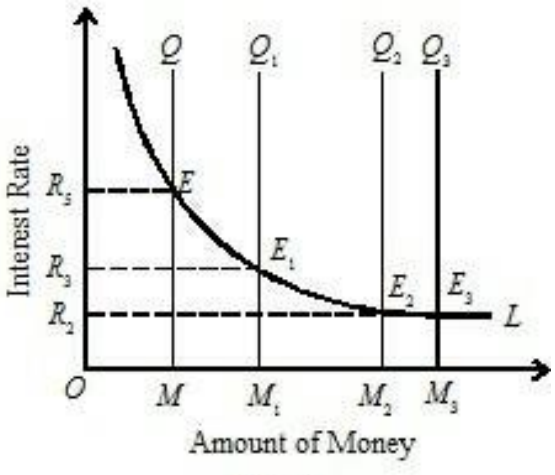


Fig. 4

But any further increase in the supply of money has no effect on the rate of interest because the liquidity

preference curve L is perfectly elastic at R_2 rate of interest. So when the

supply of money increases to Q_3M_3, the rate of interest remains stationary at R_2 corresponding to the equilibrium point E_3. This is Keynes "Liquidity Trap".

If the demand for money increases and the liquidity preference carve shifts upward, given the supply of money, the rate of interest rises. This is shown in Figure 5. Given the supply of money curve *QM* when the *L* curve shifts upward, the new equilibrium point is E_1 which determines R_6 interest rate. This rate of interest is higher than R_4 interest rate at the equilibrium point *E*. If with the increase in the liquidity preference, the supply of money also increases in the same proportion to Q_1M_1 there will be no change in the rate of interest R_4, except that the new equilibrium point is E_2. Thus the theory explains that the rate of interest is determined at a point where the liquidity preference curve equals the supply of money curve.

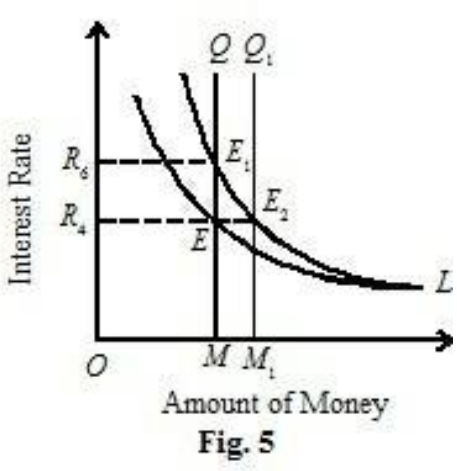


Fig. 5

Its Criticisms

The Keynesian theory of interest has been severely criticised by Hansen, Roberston, Knight, Hazlitt, Hutt and others. It has been variously characterized as "a college bursar's theory", "at best an inadequate and at worst a misleading account, and "preclassical, mercantilist, and man-in-the-street economics."

(1) College Bursar's Theory. One of the fallacies of the Keynesian analysis is that the demand for money is mainly associated with the liquidity preference for the speculative motive to which the rate of interest is brought directly into touch. The theory presumes the existence of a number of wealthy and shrewd persons who will hold more money by selling bonds when the rate of interest falls and hold less cash but more bonds in the case of rise in the interest rate. But Robertson does not regard bonds as the only alternative to money, as a use for resources both by the

individual and the entrepreneur. And a theory of money which insists on working everything through the bond market is a *College Bursar's theory* and seems to be lacking in realism and comprehensiveness.

(2) Inadequate and Misleading Theory. The theory tells us nothing as to what determines the normal rate and therefore, given the degree of divergence, the actual rate of interest. The actual rate of interest cannot be described consistently as measuring the cost of the uncertainty of risk involved in holding bonds rather than money. If there were no uncertainty at all, the actual rate would simply stand at a certain definite level below the normal rate. It is for these reasons that Robertson regards the liquidity preference theory "is at best an inadequate and at worst a misleading account."

(3) Falls into Methodological Fallacy. Just as the rate of interest is explained as the price for parting with liquidity, similarly the price of eggs or any other commodity can be explained by the relative preference for them. But there is a vital difference. A change in the quantity of money would tend to change the price of the good in the same proportion, but not the price of bonds beyond a temporary disturbance. In fact, there is no functional relationship between the price level and any rate of interest while discussing the influence of speculation on the interest rate on loans. As a result, no monetary change has any direct or permanent effect on the rate of interest. Thus the Keynesian theory falls into *"methodological fallacy"* by assuming a definite functional relationship between the quantity of money and the rate of interest.

(4) Money as a Store of Wealth is Barren. Keynes holds that only money held for speculative purposes is fruitful for it brings interest as a reward, while money as a store of wealth is barren. This is a mistaken notion. As pointed out by W.H. Hutt, money "is as productive as all other assets, and productive in exactly the same sense. The demand for money assets is a demand for productive resources.

(5) Inconsistent Theory. Knight criticised Keynes's theory in view of the facts which are directly contrary to what the theory calls for. Hazlitt also discusses this point without giving credit to Knight. According to the Keynesian theory, the rate of interest should be the highest at the bottom

of the depression because the liquidity preference is the strongest at that time due to falling prices. A large reward will have to be paid to induce wealth-holders to part with their cash. But the facts are just the opposite. Short-term interest rates are the lowest in a depression because investment opportunities are temporarily closed and the lenders have no outlets to part with their cash. Contrariwise, the Keynesian short-term interest rates should be lowest during the peak of the boom because people would be investing their money rather than keep it in cash. The liquidity preference being the lowest, a very small reward would be required to partake with it. But in reality, the rate of interest is the highest at the peak of a boom. Thus the theory is inconsistent with facts.

(6) Saving Essential for Liquidity. Keynes regards the rate of interest as the reward for parting with liquidity and not a return merely for saving or waiting as such. Saving is necessary for obtaining funds to be invested at interest. In Viner's words "Without saving there can be no liquidity to surrender. The rate of interest is the return for saving without liquidity."

(7) Liquidity not Essential for Interest Rate. Even the term liquidity preference is neither helpful nor necessary in explaining the nature of interest. It is more confusing and less illuminating. It is not only vague but is also self-contradictory. For, as pointed out by Hazlitt, "If a man is holding his funds in the form of time deposits or short-term treasury bills, he is being paid interest on them , therefore he is getting interest and "liquidity" too. What becomes, then, of Keynes's theory that interest is the "reward" for parting with liquidity ?"

(8) Wrong Notion of Liquidity Trap. Keynes's notion of the "Liquidity Trap" is also wrong. In reality, the liquidity preference schedule may be perfectly *inelastic* rather than elastic at a low rate of interest. We know that during a depression all expectations are extremely pessimistic. It is, therefore, not correct to argue that expectations with regard to the rate of interest will be that it will go up.

(9) Ignores Real Factors. The greatest fallacy in Keynes's analysis is that he ignores the influence of real factors in determining the interest rate. He regards the interest rate as a purely monetary phenomenon and thus merely returns "to the pre-classical assumption of the mercantilists and to

what has always been the assumption of the man in the street." According to Hazlitt, "Keynes made no new contribution. He merely muddled shallow waters *and* the kind of *interest* theory represented by *him* is pre-classical, mercantilistic and man in the street economics."

(10) Indeterminate Theory. The Keynesian theory, like the classical theory of interest, is *indeterminate.* Keynes asserts that the liquidity preference and the quantity of money determine the rate of interest. But this is not correct because a new liquidity preference curve will have to be drawn at each level of income. Therefore, unless the income level is already known, the demand and supply curves of money cannot tell us what the rate of interest will be. Thus, according to Prof. Hansen, "Keynes's criticism of the classical theory applies equally to his own theory."

(11) Incomplete Theory. Hicks, Somers, Lerner, Hansen and others opine that the rate of interest alongwith the level of income is determined by four factors: (i) the investment demand function *(MEC), (ii)* The saving function (or the consumption function), *(iii)* the liquidity preference function, and (iv) the quantity of money function. Though all these elements are found in the Keynesian analysis, yet Keynes does not bring them in his interest rate theory. He takes only the last two elements and ignores the first two, thus Keynes fails to provide an integrated and determinate theory of interest.

(12) Confusion regarding Relation between Interest Rate and Quantity of Money. There is confusion in Keynes's analysis about the relation between rate of interest and amount of money. On the one hand, he says that the demand for money is inversely dependent on the rate of interest, and on the other, that the equilibrium rate of interest is inversely dependent upon the amount of money. Throughout his analysis, Keynes does not make any distinction between the two propositions and often uses them in an identical manner This is a fundamental error in Keynes's analysis for the former relation holds true for an individual and the latter for the market.

Conclusion. The Keynesian theory of interest is not only indeterminate, but is also an inadequate explanation of the determination of the rate of

interest. It treats the interest rate as a purely monetary phenomenon and by neglecting the real factors makes the theory narrow and unrealistic.

Its Superiority over the Loanable Funds Theory

Despite these criticisms of the Keynesian theory, it is considered superior to the loanable funds theory on the following counts:

(1) The Keynesian theory is a *stock* analysis. It is a statement about stocks or quantities of money at a point of time, while the loanable funds theory is a statement about certain *flows* or quantities of money per time period. It is this treatment of stocks and flows of money that leads to a fixed supply of money in the Keynesian analysis, and a variable supply of money in the loanable funds theory. Since the quantity of money is fixed at a point of time, economists prefer the stock approach to the rate of interest. Thus the liquidity preference theory becomes superior to the loanable funds theory.

(2) The liquidity preference theory is more realistic than the loanable funds theory because it is more akin to the behaviour of interest rate in the business world. It clearly spells out the various motives for holding money, and the relation between business, expectations and the rate of interest.

(3) All the variables in the loanable funds theory like saving, investment, hoarding, dishoarding are in terms of partial equilibrium analysis while the demand for and supply of money in the Keynesian system have been treated as a part of the general determinate system. So the loanable funds theory fails to fit in a general determinate system.

(4} In the loanable funds theory, saving and investment are redundant and the rate of interest can be determined by $H+D_S$ and $M+D_H$ whereas in the Keynesian theory savings are interest inelastic and investment funds depend upon the money supply. The Keynesian theory is thus superior to the loanable funds theory of interest.

Despite these apparent differences and the superiority of one over the other, there have been three attempts to prove that the two theories of the

interest rate are two ways of looking at the same mechanism. "Like the frugal horse-man who brought only one spur because when one side of the horse went ahead, the other would follow, we could get along with only one of the approaches to the interest rate," as pointed out by a supporter of these views of Hicks, Lerner, Fellner and Somers. Dr. Klein who has critically analysed these attempts at reconciliation of the two theories comes to the conclusion that if only the two theories are explained in terms of stock analysis that they will come to the same thing. Since the loanable funds version is a flow analysis of the interest rate determination, it cannot be reconciled with the liquidity preference theory.[3]

INDETERMINACY OF THE CLASSICAL, THE LOANABLE FUNDS AND THE KEYNESIAN THEORIES OF INTEREST

Keynes criticised the classical theory of interest for being *indeterminate* because it failed to relate the rate of interest with the income level. To Hansen, "Keynes's criticism of the classical theory applies equally to his own theory and to the loanable funds theory." We illustrate the indeterminate nature of these theories

In the *classical* formulation, since savings depend upon the level of income, it is not possible to know the rate of interest unless the income level is known beforehand. And the income level cannot be known without already knowing the rate of interest. A lower rate of interest will increase investment, output, employment, income and savings. So, for each income level a separate supply curve will have to be drawn.

The same reasoning applies to the *loanable funds* formulation of the rate of interest. The supply schedule of loanable funds is composed of savings, dishoarding and bank money supply. Since savings vary with past income and the new money and activated balances with the current income, it follows that the total supply schedule of loanable funds also varies with income. Thus this theory is *indeterminate* unless the income level is already known. The indeterminate nature of both the theories is explained with the help of Figure 6. All that the classical formulation gives us is a *family* of saving schedules, and the loanable funds formulation a *family* of investment schedules at various income levels relating them to different

interest rates. We take saving and investment (or demand and supply of loanable funds) on the X-axis and the rate of interest on the vertical axis. The savings schedules (for both the formulations) are shown as S_1Y_1 and S_2Y_2 and *II* is the investment demand schedule. When income is Y_2 , given the investment demand schedule and *II*, and the savings schedule S_2Y_2,savings equal investment at interest rate *r*. Similarly when income is Y_1, the savings schedule S_1Y_1 equals the investment demand schedule *II* at interest r_t. These equilibrium positions tell us about the various levels of income associated with different rates of interest, but not about the rate of interest itself. They show that interest is a function of savings, investment and the level of income. Unless the level of income is known, it is not possible to determine the rate of interest. Hence the classical and the loanable funds theories of interest rate are *indeterminate.*

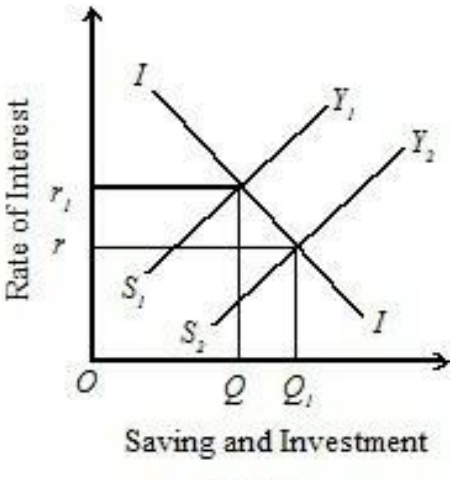


Fig. 6

The *Keynesian* theory of interest rate is also indeterminate because the liquidity preference schedule is not related to the level of income. Unless the income level is known beforehand, the demand and supply curves of money cannot tell us what the rate of interest will be. All that the Keynesian formulation provides us is a *family* of liquidity preference schedules at various income levels relating them to different interest rates. In Figure 7, a *family* of liquidity preference schedules *LY, L_tY_1* and and L_2Y_2 is drawn at various income levels. A perfectly inelastic money supply curve *QM* is drawn on the assumption that the supply of money is fixed by the monetary authority. If Y is the income level, the liquidity preference schedule *LY*

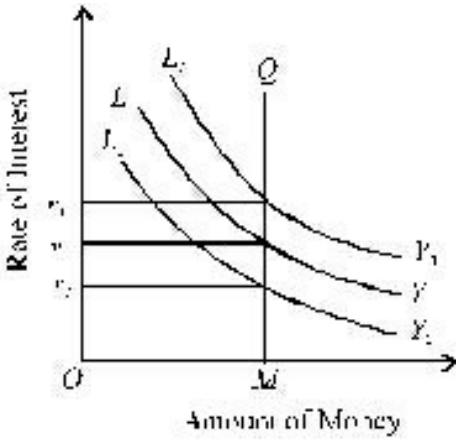


Fig. 7

equals the money supply schedule *QM* at interest rate *r*. If the income level rises to Y_1, the liquidity preference schedule also shifts upward to L_1M_t and equals the *QM* curve at the interest rate *r*. If income falls to Y_2 level, the liquidity preference curve shifts to L_2Y_2 and equals *QM* curve, at the interest rate r_2. Thus the Kenesian theory simply relates different income levels to various interest rates, but does not show what the rate of interest will be. Hence it is an *indeterminate* theory.

MODERN THEORY OF INTEREST

We have seen above that no single theory of interest rate is adequate and determinate. An adequate theory to be determinate must take into consideration both the real and monetary factors that influence the interest rate. Hicks has utilized the Keynesian tools in a method of presentation which shows that productivity, thrift, liquidity preference and money supply are all necessary elements in a comprehensive and determinate interest theory. According to Hansen, "An equilibrium condition is reached when the desired volume of cash balances equals the quantity of money, when the marginal efficiency of capital is equal to the rate of interest and finally, when the volume of investment is equal to the normal or desired volume of saving. And these factors are inter-related."[4] Thus in the modern theory of interest rate, saving, investment, liquidity preference and the quantity of money are integrated at various levels of income for a synthesis of the loanable funds theory with the liquidity preference theory.

The four variables of the two formulations have been combined to construct two new curves, the *IS* curve representing *flow* variable of the loanable funds formulation (or the real factors of the classical theory) and the *LM* curve representing the *stock* variables of liquidity preference formulation.The equilibrium between *IS* and *LM* curves provides a *determinate* solution.

The IS Curve

The *IS* curve has been derived from the loanable funds formulation. It is a curve which explains the relationship between a family of saving

schedules and investment schedules. In other wards, this curve shows the equality of saving and investment at various combinations of the levels of income and the rates of interest. In Figure 8 (A), the saving curve *S* in relation to income is drawn in a fixed position, since the influence of interest on saving is assumed to be negligible. The saving curve shows that saving increases as income increases, viz., saving is an *increasing* function of income. Investment, on the other hand, depends on the rate of interest and the level of income. Given a level of interest rates, the level of investment rises with the level of income. At a 5 per cent rate of interest, the investment curve is I_2 . If the rate of interest is reduced to 4 per cent, the investment curve will shift upward to I_3. The rate of investment will have to be raised to reduce the marginal efficiency of capital to equality with the lower rate of interest. Thus the investment curve I_3 shows more investment at every level of income. Similarly when the interest rate is raised to 6 per cent, the investment curve will shift downward to I_1. The reduction in the rate of investment is essential to raise the marginal efficiency of capital to equality with the higher interest rate. In Figure 8 (B), just below Figure 8 (A), we derive the *IS* curve by marking the level of income at various interest rates. Each point on this *IS* curve represents a level of income at which saving equals investment at various interest rates. The rate of interest is represented on the vertical axis and the level of income on the horizontal axis. If the rate of interest is 6 per cent, the *S* curve intersects the I curve at E_t which determines OY_1 income. From this income level which equals Rs 100 crores we draw a dashed line downward to intersect the extended line from 6 per cent at point A. At interest rate 5 per cent, the *S* curve intersects the I_2 curve at E_2 so as to determine OY_2 income (Rs 200 crores). In the lower Figure 8 (B),

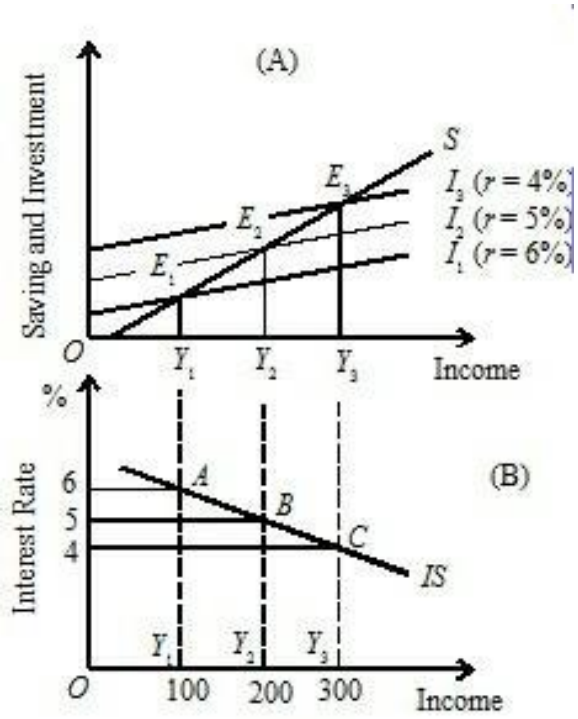


Fig. 8

the point *B* corresponds to 5 per cent interest rate and Rs 200 crores income level. Similarly, the point *C* corresponds to the equilibrium of *S* and I_3 at 4 per cent interest rate. By connecting these points *A, B* and *C* with a line, we get the *IS* curve. The *IS* curve slopes *downward from* left to right because as the interest rate falls, investment increases and so does income.

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1. A.H. Hansen, *Monetary Theory and Fiscal Policy,* p. 71

The LM Curve

The *LM* curve shows all combinations of interest rates and levels of income at which the demand for and supply of money are equal. The *LM* curve is derived from the Keynesian formulation of liquidity preference schedules of supply of money. A family of liquidity preference curves L_tY_1,L_2Y_2 and L_3Y_3 is drawn at income levels of Rs 100 crores, Rs 200 crores and Rs 300 crores respectively in Figure 9 (A). These curves together with the perfectly inelastic money supply curve *MQ* give us the *LM* curve. The *LM* curve consists of a series of points, each point representing an *interest-income* level at which the demand for money *(L)* equals the supply of money (M). If the income Level is Y_1 (Rs 100 crores), the demand for money (L_1Y_1) equals the money supply *(QM)* at interest rate OR_1. At the Y_2 (Rs 200 crores.) income level, the L_2Y_2 and the *QM* curves equal at OR_2 interest rate. Similarly at the Y_3 (Rs 300 crores) income level, the L_3Y_3 and *QM* curves equal at OR_3 interest rate. The supply of money, the

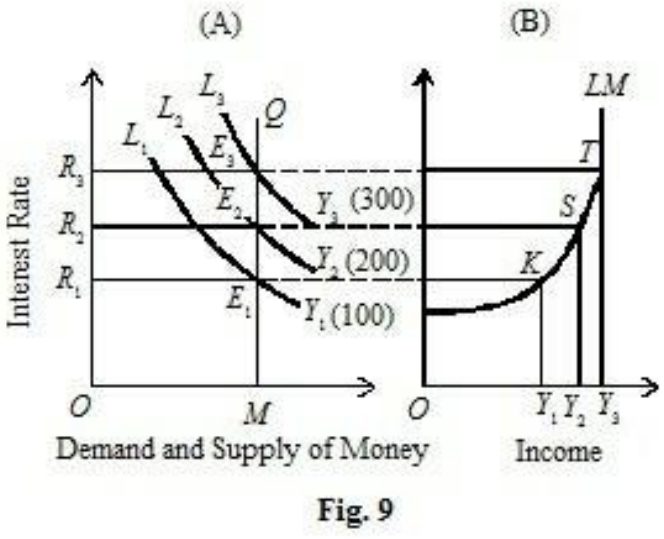

Fig. 9

liquidity preference, the level of income and the rate of interest provide data for the *LM* curve shown in Figure 9 (B). Suppose the level of income

is Y_1 (Rs 100 crores), as $_s^t$ marked out on the income axis in Figure 9 (B). The income of Rs. 100 crores generates ^{In}a demand for money represented by the liquidity preference curve L_1Y_1 . From the point E_1 where the L_IY_I curve intersects the *MQ* curve, extends a dashed line horizontally to the right so as to meet the line drawn upward from Y_1 at *K* in Figure 9 (B).

Points *S* and *T* can also be determined in a similar manner. By connecting these points *K*, *S* and *T* with a line, we get the *LM* curve. This curve relates different income levels to various interest rates, but it does not show what the rate of interest will be.

The *LM* curve slopes *upward* from left to right because given the quantity of money, an increasing preference for liquidity manifests itself in a higher rate of interest. It also becomes gradually *perfectly inelastic* shown as the vertical portion from *T* above on the *LM* curve in Panel (B) of Figure 9. This is because at higher income levels the demand for transaction and precautionary motives increases so that little is left to satisfy the demand for speculative motive out of a given supply of money. We may also note that at the extreme left the *LM* curve is *perfectly elastic* in relation to the rate of interest. This is shown as the horizontal portion of the *LM* curve which starts from the vertical axis in Panel (B) of Figure 9. With the decline in the level of income, the demand for transactions and precautionary motives also declines. Thus a larger amount is available in the form of idle balances but it does not lead to the lowering of the interest rate because we have reached the limit to which the rate of interest will fall. This lower limit to which the rate of interest will fall is the Keynesian *liquidity trap* already explained above in Keynes's theory of interest.

Determination of the Rate of Interest

The *IS* and *LM* curves relate to income levels and interest rates. Taken by themselves they cannot tell us either about the level of income or the rate of interest. It is only their intersection that determines the rate of interest. This is illustrated in Figure 10 where the *LM* and *IS* curves intersect at point E and *OR* rate of interest is determined corresponding to the income level *OY*. The income level and the interest rate lead to simultaneous equilibrium in the *real* (saving-investment) market and the *money* (demand and supply of money) market. This general equilibrium position

persists at a point of time. If there is any deviation from this equilibrium position, certain forces will act and react in such a. manner that the equilibrium will be restored. At the income level OY_t the rate of interest in the real market is Y_1B and it is Y_1A in the money market. When the former rate is higher than the latter rate ($Y_1B > Y_1A$), the businessmen will borrow at a lower rate from the money market and invest the borrowed funds at a higher rate in the capital market. This will tend to raise the level of income to *OY* via the investment multiplier and the equilibrium level of *OR* interest rate will be reached. On the other hand, at the income level OY_2 the rate of interest in the real market is less than the interest rate in the money market *($Y_2C < Y_2D$).* In this situation, the businessmen will try to discharge debts in the money market rather than invest in the capital market. As a result, investment will fall and reduce income by the multiplier to *OY* and the equilibrium rate of interest *OR* will be established,

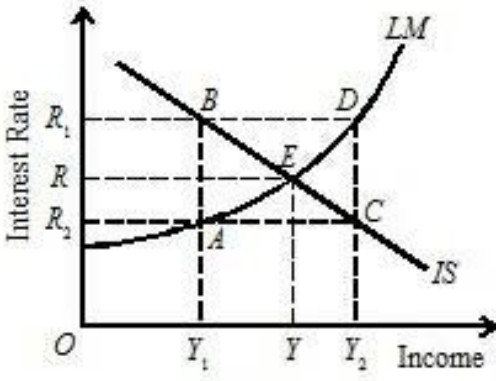

Fig. 10

Shifts or changes in the *IS* curve or the *LM* curve or in both change the equilibrium position and the rate of interest is determined accordingly. These are illustrated in Figure 11. Let *IS* and *LM* be the original curves. They intersect at *E* where *OR* interest rate is determined at *OY* income level. If the investment demand schedule shifts upward, or the saving schedule shifts downward, the curve *IS* would shift to the right as IS_1 curve. Given the *LM* curve, equilibrium will take place at E_1. The rate of interest would be OR_1 and the income level OY_1. If the quantity of money is increased or the liquidity preference cruve is lowered, the *LM* curve would shift to the rights as LM_1. It intersects IS_1

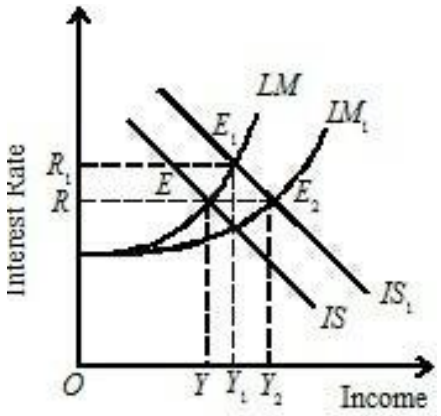

Fig. 11

curve at point E_2. The new equilibrium rate of interest is *OR* and the income level is OY_2. *Thus with a given LM curve, when the IS curve shifts to the right income increases and along with it the rate of interest also rises. Given the IS curve, when the LM curve shifts to the right, income increases but the rate of interest falls. The Hicks-Hansen analysis is thus an integrated and determinate theory of interest in which the two determinates, the IS and LM curves, based on productivity, thrift, liquidity preference and the supply of money, all play their parts in the determination of the rate of interest.*

Its Criticisms

Despite its merits, the Hicks.-Hansen theory of interest rate is not free from certain weaknesses.

1. Static Theory. It is a static theory that explains the short-run behaviour of the economy. Thus it fails to explain how the economy behaves in the long run.

2. Interest Rate not Flexible. The theory is based on the assumption that the interest rate is flexible and varies with changes in *LM* or/and *IS* curves. But it may not always happen if the interest rate happens to be rigid because the adjustment mechanism will not take place.

3. Investment not Interest Elastic. The theory assumes that investment is interest elastic. But if investment is interest inelastic, as is generally the case in practice, then the Hicks-Hansen theory does not hold good.

4. Highly Artificial. According to Don Patinkin, the Hicks-Hansen theory is highly artificial and oversimplified because it divides the economy into real and monetary sectors. In reality, the real and monetary sectors of the economy are so interrelated and interdependent that they act and react on each other.

5. Closed Model. According to Prof. Rowan, the Hicks-Hansen theory is a closed model which does not take into consideration the effect of international trade. This restricts its usefulness for the study of policy problems.

6. Price Level Exogenous Variable. The price level is treated as an exogenous variable in this model. This is unrealistic because price changes play an important role in the determination of income and interest rates in an economy.
Despite these weaknesses, this theory does not undermine the utility *of* the *IS-LM* technique in explaining the determination of interest rate in an economy.

This chapter integrates money, interest and income into a general equilibrium model of product and money markets in the Hicks-Hansen [1] diagrammatic framework, known as the *IS-LM* model. The term *IS* is the shorthand expression of the equality of investment and saving which represents the product market equilibrium. On the other hand, the term *LM* is the shorthand expression of the equality of money demand (*L*) and money supply (*M*) and represents the money market equilibrium.

In order to analyse the general equilibrium of product and money markets, it is instructive to study the derivation of the IS and LM functions and their slopes for the understanding of the effectiveness of monetary and fiscal policies.

The product market equilibrium

The product market is in equilibrium when desired saving and investment are equal. Saving is a direct function of the level of income,

$$S = f(Y) \qquad \ldots(1)$$

Investment is a decreasing function of the interest rate,

$$I = f(r) \qquad \ldots(2)$$

From (1) and (2), we have $S=I$.

The *IS* schedule reflects the equilibrium of the product market. It shows the combinations of interest rate and income levels where saving-investment equality takes place so that the product market of the economy is in equilibrium. It is also known as the "*real sector*" equilibrium.

Deriving the IS curve

The derivation of the *IS* curve is shown in Figure 1. In Panel (A) of this figure, the saving curve *S* in relation to income is drawn in a fixed position on the Keynesian assumption that the rate of interest has little effect on saving. The saving curve shows that saving increases as income increases, viz., saving is an *increasing* function of income. Investment, on the other hand, depends on the rate of interest and the level of income. Given a level of interest rate, the level of investment rises with the level of income. At a 5 per cent rate of interest, the investment curve is I_2 . If the rate of interest is reduced to 4 per cent, the investment curve will shift upward to I_3 . The rate of investment will have to be raised to reduce the marginal efficiency of capital to equality with the lower rate of interest. Thus the

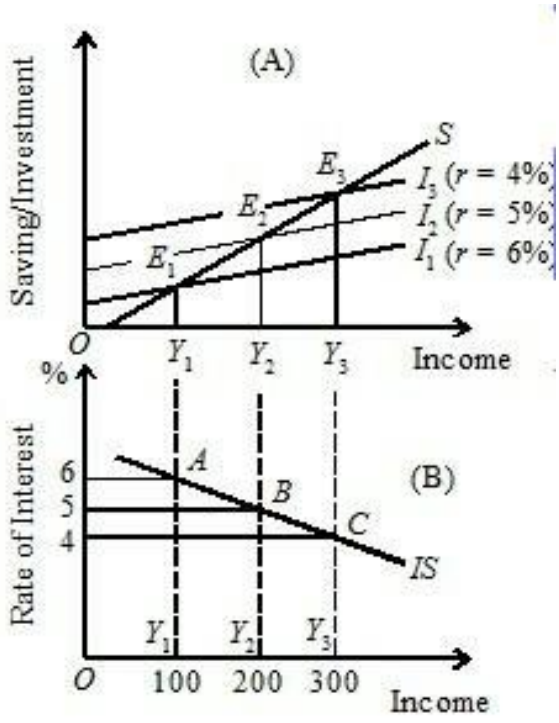

Fig. 1

investment curve I3 shows more invesment at every level of income. Similarly when the rate of interest is raised to 6 per cent, the investment curve will shift downward to I1 . The reduction in the rate of investment is essential to raise the marginal efficiency of capital to equal the higher interest rate. In Panel (B) we drive the IS curve by marking the level of income at various interest rates. Each point on this IS curve represents a level of income at which saving equals investment at various interest rates. The rate of interest is represented on the vertical axis and the level of income on the horizontal axis. If the rate of interest is 6 per cent, the S curve intersects the I1 curve at E1 in Panel (A) which determines OY1 income. From this income level which equals Rs 100 crores we draw a dashed line downward to intersect the extended line from 6 per cent at point A in Panel (B). At interest rate 5 per cent, the S curve intersects the I2 curve at E2 so as to determine OY2 income (Rs 200 crores). In the lower figure, the point B corresponds to 5 per cent interest rate and Rs 200 crores income level. Similarly, the point C corresponds to the equilibrium of S and I3 at 4 per cent interest rate. By connecting these points A, B and C with a line, we get the IS curve. The IS curve in Figure 1(B) slopes downward from left to right because as the interest rate falls, investment increases and so do income and saving. In other words, there is a negative relationship between income and interest rate in the real sector of the economy.

The Slope of the IS Curve:

This negative slope of the IS curve reflects the increase in investment and income as the rate of interest falls. The slope of the IS curve depends on two factors: first , the sensitiveness (elasticity) of investment and saving to changes in the interest rate, and second, on the size of the multiplier.If investment is very sensitive to the rate of interest, the IS curve is very flat. This is shown by the segment AB of the IS curve in Figure 2 where a small fall in the rate of interest from R1 to R2 leads to a large increase in investment and consequently in saving via proportionately large rise in income from Y1 to Y2. The IS curve is interest elastic in the AB segment of the IS curve.

On the other hand, if investment is not very sensitive to the rate of interest, the *IS* curve is relatively *steep*. In terms of Figure 2, when the rate of interest falls more from R_2 to R_3, the increase in investment is small and so do saving and income increase by a relatively smaller amount Y_2Y_3. The *BC* segment of the *IS* curve is *less interest elastic*. Any further fall in the rate of interest from R_3 will lead to no change in income because the *IS* curve is vertical in that range. It is *interest inelastic*.

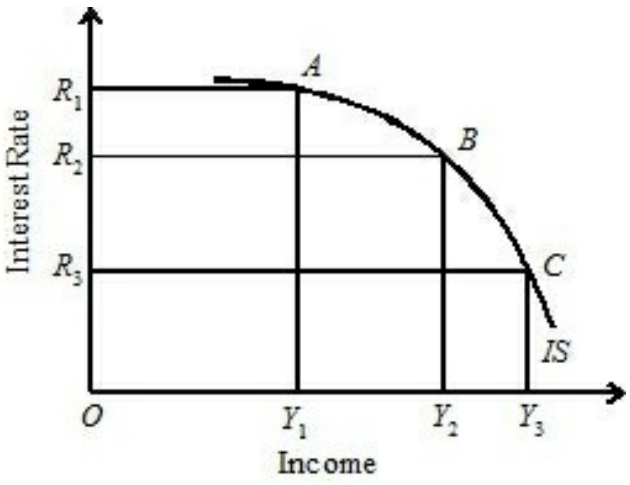

Fig. 2

The shape of the IS curve also depends upon the size of the multiplier. If the size of the multiplier is large, the larger is the effect on income of a rise in investment and fall in saving. Thus income is more sensitive to changes in the interest rate and the IS curve is flatter.

Shifts in the IS curve:

The IS function shifts to the right with a reduction in saving. Reduction in saving may be the result of one or more factors leading to increase in consumption. Consumers may like to buy a new product even by reducing saving. The community's wealth may increase due to government's policy and the wealth holders do not like to save the same amount than before. Consumers may start buying more in anticipation of shortages or price rise thereby reducing saving.

The *IS* function also shifts to the right by an autonomous increase in investment. The increase in investment may result from expectations of higher profits in the future, or from innovation, or from expectations concerning increase in the future demand for the product, or from a rise of optimism in general. Moreover, government's expenditure and tax policies have the effect of shifting the *IS* function.

In all these cases, the *IS* function will shift to the right, equal to the decrease in the supply of saving *times* the multiplier or the increase in the investment *times* the multiplier. With the increase in the autonomous investment (or reduction in saving), the *IS* curve shifts from IS_1 to IS_2 and the new equilibrium is established at point E_2 which indicates a higher level of income Y_2 at a higher interest rate R_2, as shown in Figure 3.

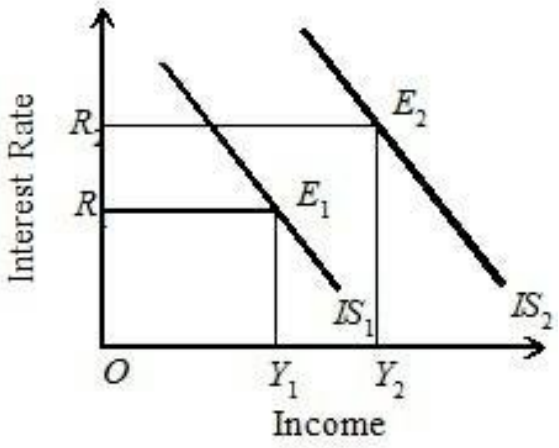

Fig. 3

In the opposite case when investment falls or saving increases, the *IS* function will shift to the left and the equilibrium will be established at a lower level of income and interest rate. This situation can be explained by assuming IS_2, as the original curve.

The money market equilibrium:

The money market is in equilibrium when the demand and supply of money are equal. Denoting L for money demand and M for money supply, the money market is in equilibrium when L=M. The demand for money L=LT+LS where LT is the transactions demand for money which is a direct function of the level of income, LT=f(Y). Ls is the speculative demand for money which is a decreasing function of the rate of interest, LS=f(r). Thus in money market equilibrium, M=LT (Y)+LS (r).

Deriving the LM Curve:

The *LM* curve shows all combinations of interest rate and levels of income at which the demand for and supply of money are equal. In other words, the *LM* schedule shows the combinations of interest rates and levels of income where the demand for money (*L*) and the supply of money (*M*) are equal such that the money market is in equilibrium.

The *LM* curve is derived from the Keynesian formulation of liquidity preference schedules and the schedule of supply of money. A family of liquidity preference curves L_1Y_1, L_2Y_2 and L_3Y_3 is drawn at income levels of Rs 100 crores, Rs 200 crores and Rs 300 crores respectively in Figure 4 (A). These curves together with the perfectly inelastic money supply curve *MQ* give us the *LM* curve. The *LM* curve consists of a series of points, each point representing an interest-income level at which the demand for money (*L*) equals the supply of money (*M*). If the income level is Y_1 (Rs 100 crores), the demand for money (L_1Y_1) equals the money supply (*QM*) at interest rate R_1. At the Y_2 (Rs 200 crores) income level, the L_2Y_2 and the *QM* curves equal at R_2 interest rate. Similarly at the Y_3 (Rs 300 crores) income level, the L_3Y_3 and *QM* curves at R_3 interest rate. The supply of money, the liquidity preference, the level of income and the rate of interest provide data for the *LM* curve shown in Figure 4(B).

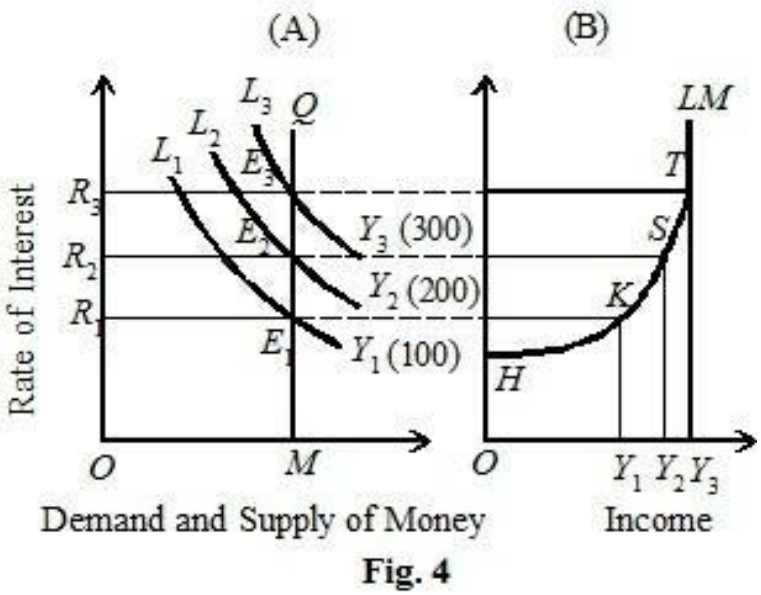

Fig. 4

Suppose the level of income is Y_1 as marked out on the income axis in Figure 4(B). The income of Rs 100 crores generates a demand for money represented by the liquidity preference curve L_1Y_1. From the point E_1 where the L_1Y_1 curve intersects the *MQ* curve, extend a dashed line horizontally to the right so as to meet the line drawn upward from Y_1 and *K* in Figure 4(B). Points *S* and *T* can also be determined in similar manner. By connecting these points *K*, *S* and *T*, we get the *LM* curve. This curve relates different income levels to various interest rates.

The slope of the lm curve:

The LM curve slopes upward from left to right because given the supply

of money, an increase in the level of income increases the demand for money which leads to higher rate of interest. This, in turn, reduces the demand for money and thus keeps the demand for money equal to the supply of money. The smaller the responsiveness of the demand for money to income, and the larger the responsiveness of the demand for money to the rate of interest, the flatter will be the LM curve. This means that a given change in income has a smaller effect on the interest rate.

The *LM* curve is steeper, if a given change in income has a larger effect on the rate of interest. In this situation, the responsiveness of the demand for money to income is larger and is smaller for the interest rate. If the demand for money is *insensitive* to the interest rate, the *LM* curve is *vertical* that is, it is *perfectly inelastic*. This is shown in Panel (B) of Figure 4 as the portion from *T* above on the *LM* curve. In this case, a large change in the interest rate is accompanied by almost no change in the level of income to maintain money market equilibrium. If the demand for money is *very sensitive* to the rate of interest, the *LM* curve is *horizontal*. This is shown by the portion of *LM* curve which starts from *H* on the vertical axis in Panel (B) of Figure 4. The *LM* curve is *perfectly elastic* in relation to the rate of interest. In other words, a small change in the interest rate is accompanied by a large change in the level of income to maintain the money market equilibrium. This portion of the *LM* curve at the extreme left is equivalent to the Keynesian liquidity trap, already explained in the Keynes's theory of interest.

Shifts in the LM Curve:

The LM function shifts to the right with the increase in the money supply, given the demand for money, or due to the decrease in the demand for money, given the supply of money. If the central bank follows an expansionary monetary policy, it will buy securities in the open market. As a result, the money supply with the public increases for both transactions and speculative purposes. This shifts the LM curve to the right.

A decrease in the demand for money means a reduction in the quantity of balances demanded at each level of income and interest rate. Such a decrease in the demand for money balances creates an excess of the

money supplied over the money demanded. This is equivalent to an increase in money supply in the economy which has the effect of shifting the *LM* curve to the right.

This is depicted in Figure 5. With the increase in the money supply, the LM_1 curve shifts to the right as LM_2 which moves the economy to a new equilibrium point E_2. The increase in the money supply brings down the interest rate to R_2 in the money market. This, in turn, increases investment thereby raising the level of income to Y_2.

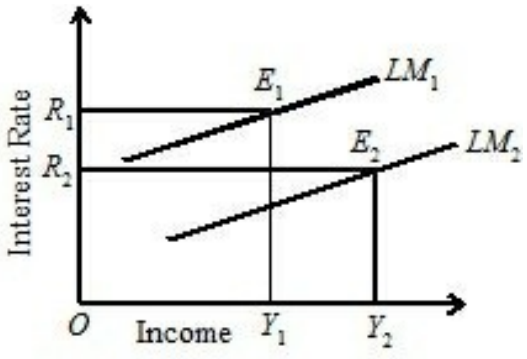

Fig. 5

Contrariwise, a decrease in the money supply, or an increase in the demand for money will shift the *LM* function to the left such that a new equilibrium is established at a higher interest rate and lower income level. This case can be explained by assuming LM_2 as the original curve.

GENERAL EQUILIBRIUM OF PRODUCT AND MONEY MARKET

So far we have analysed the conditions that have to be satisfied for the general equilibrium of the product and money markets in terms of the *IS* and *LM* functions. Now we study how these markets are brought into simultaneous equilibrium. It is only when the equilibrium pairs of interest rate and income of the *IS* curve equal the equilibrium pairs of interest rate and income of the *LM* curve that the general equilibrium is established. In other words, when there is a single pair of interest rate and income level in the product and money markets that the two markets are in equilibrium.

Such an equilibrium position is shown in Figure 6 where the *IS* and *LM* curves intersect each other at point *E* relating *Y* level of income to *R* interest rate. This pair of income level and interest rate leads to simultaneous equilibrium in the real or goods (saving-investment) market and the money (demand and supply of money) market. This general equilibrium position persists at a point of time, given the price level. If

there is any deviation from this equilibrium position, certain forces will act and react in such a manner that the equilibrium will be restored.

Consider point *A* on the *LM* curve where the money market is in equilibrium at Y_1 income level and R_2 interest rate. But the product market is not in equilibrium. In the product market, the interest rate R_2 is lower. The product market can be in equilibrium at Y_1 income level only at a higher interest rate R_1 corresponding to point *B* on the *IS* curve. Consequently at point *A*, there is excess of investment over saving since point *A* lies to the left of the *IS* curve. The excess of *I* over *S* indicates excess demand for goods which raises the level of income. As the level of income rises, the need for transactions purposes increases. In order to have more money for transactions purposes, people sell bonds. This tends to raise the interest rate. This moves the *LM* curve from point *A* upward to point *E* where a combination of higher interest rate *R* and higher income level *Y* exists. On the other hand, rising interest rate reduces investment and an increasing income raises saving. This helps to bring about the equality of *I* and *S* at point *E* where the general equilibrium is re-established by the equality of *IS* and *LM*.

Now consider point *C* on the *IS* curve in Figure 6 where the product market is in equilibrium at R_2 interest rate and Y_2 income level. The money market is not in equilibrium. It can be in equilibrium at Y_2 income level only at a higher interest rate R_1 corresponding to point *D* on the *LM* curve. At point *C*, the demand for money (*L*) is greater than the supply of money (*M*) because point *C* reflects lower rate of interest R_2 than is required for the equality of *L* and *M*. Thus there is excess demand for money at R_2 interest rate. The excess demand for money leads people to sell bonds but there is less demand for bonds which tends to raise the interest rate. When the rate of interest begins to rise, the product market is thrown into disequilibrium because investment falls. Falling investment leads to falling income which in turn reduces saving. This process

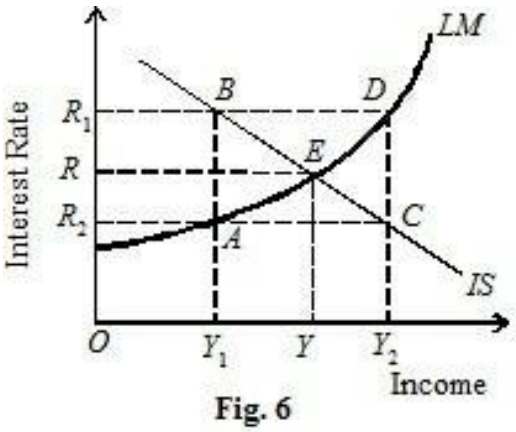

Fig. 6

ultimately brings the equilibrium of the product market when $I=S$ at point E. On the other hand, falling income reduces the transactions demand for money and ultimately brings about the equality of LM at point E where the equilibrium is re-established by the equality IS and LM curves, at R interest rate and Y income level.

CHANGES IN GENERAL EQUILIBRIUM

The general equilibrium of the product and money markets discussed above is based on the static equilibrium analysis. It started from a point of disequilibrium and again reached the equilibrium point of the equality of IS and LM functions. But the general equilibrium combination of Y income level and R rate of interest may change either due to a shift in the IS function or the LM function, or by both the functions shifting simultaneously. The IS function may shift due to changes in the saving function or the investment function. The shifts in the LM function may be caused by changes in the money supply or liquidity preference.

The shifting of the IS curve to the right and the consequent equilibrium with the given LM curve is illustrated in Figure 7. With the increase in the autonomous investment (or reduction in saving), the IS curve moves from IS to IS_1 and the new equilibrium is established at point E_1 which indicates a higher level of income Y_1 at a higher interest rate R_1. If the interest rate had not increased but remained at R level, the increse in investment would have raised income from Y to Y_2 level. But this much increase in income would not take place. This is because with the increase in income, the demand for money for transactions purposes will raise the interest rate to R_1 level where the IS and LM functions intersect at point E_1. Thus the expansionary effect of increase in investment is dampened by the rise in the interest rate and the income rises by less than the full multiplier.

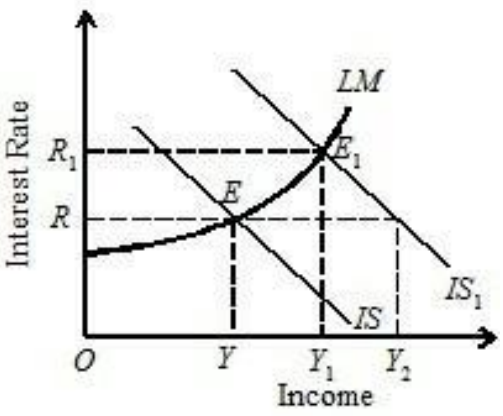

Fig. 7

In the opposite case when investment falls or saving increases, the *IS* function will shift to the left and the equilibrium will be established at a lower level of income and interest rate. This situation has not been depicted in Figure 7.

With the increase in the money supply, the *LM* curve shifts to the right as LM_1 which moves the economy to a new equilibrium point E_1 where the *IS* curve intersects the *LM* curve in Figure 8. The increase in the money supply brings down the interest rate R_1 in the money market. This, in turn, increases investment thereby raising the level of income to Y_1. Thus the effect of the increase in money supply is to shift the *LM* function to the right and a new equilibrium is established at a lower interest rate and higher income level. But how much income will rise as a result of an increase in the money supply depends on (1) how much the interest rate falls which in turn depends on the elasticity of speculative demand for money, and (2) how much investment rises as a result of any given fall in the interest rate which in turn depends on the interest-elasticity of investment demand function.

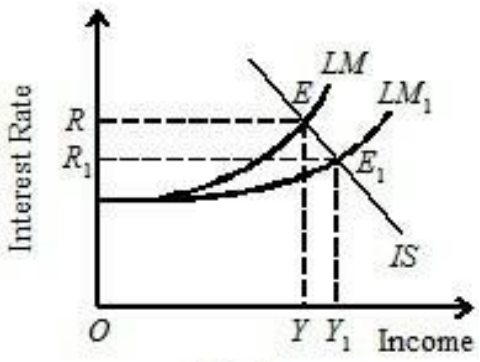

Fig. 8

Contrariwise, a decrease in the money supply or an increase in the demand for money will shift the *LM* function to the left such that a new equilibrium is established at a higher interest rate and lower income level. This case has not been depicted in Figure 8.

Simultaneous Shifts in the *IS* and *LM* functions

We have seen above that with the increase in investment when the *IS* curve shifts to the right, both the rate of interest and the level of the income tend to rise, given the *LM* curve. On the other hand, when an increase in money supply shifts the *LM* curve to the right, it lowers the rate of interest and raises the income level, given the *IS* curve.

Now suppose both the *IS* and *LM* curves shift to the right simultaneously

as a result of the increase in investment and money supply respectively. How will these *expansionary fiscal and monetary policies* affect the level of income and the rate of interest ? This is illustrated in Figure 9 where the increase in investment shifts the *IS* curve to IS_1 and the increase in the money supply shifts the *LM* curve to LM_1. Consequently, the new equilibrium position is E_1 where the IS_1 and LM_1 curves intersect. The rate of interest remains at the old level R_1 but the income increases from *Y* to Y_2. Given the money supply with no change in the *LM* curve, an increase in investment would raise both income and the rate of interest. This is shown in the figure when the IS_1 curve intersects the *LM* curve at E_2 and the interest rate rises to R_2 and income to Y_1. But the rise in income is slowed down because of the rise in the interest rate. If the money supply increases by so much as to prevent the rise in the interest rate, the increase in income will be equal to the full expansionary effect of the rise in investment. This is depicted in the figure by the shifting of the *LM* curve to the right as LM_1 which intersects the IS_1 curve at E_1. The income increases to Y_2 but the rate of interest remains at the same level R_1. So there has been full income-expansionary effect of the increase in investment as a result of the simultaneous increase in money supply by just the amount necessary to prevent the rise in the interest rate.

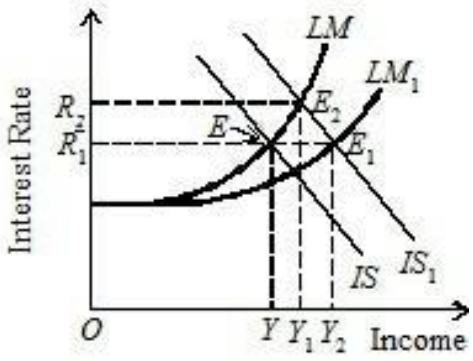

Fig. 9

Table I summarises the causes and directions of shifts in the *IS* and *LM* curves.

Table I : Causes and Directions of Shifts in IS and LM curves

Cause	*Curve*	*Direction*
Increase in investment or consumption	*IS*	Right
Decrease in investment or increase in savings	*IS*	left
Increase in money supply or decrease in money demand	*LM*	left

Decrease in money supply or increase in money demand	*LM*	right

EXERCISES

1. Use IS-LM framework to explain the joint determination of the rate of interest and the level of income.
2. Use the IS-LM framework to analyse the effects of an autonomous increase in investment.
3. Derive an IS and LM curve. Give their properties. [Hint: Explain their slopes and shifts.]
4. Use the IS-LM technique to analyse the effects of simultaneous increase in autonomous investment and money supply.

EXTENSIONS OF IS-LM MODEL

INTRODUCTION

In the previous chapter, we studied the determination of equilibrium levels of national income and interest rate with the help of *IS-LM* curves. This chapter analyses the effects of changes in monetary and fiscal policies by the government by using the *IS-LM* curve model. We also extend the *IS-LM* model to study the effects of flexible prices and labour market on equilibrium levels of national income and interest rate.

EFFECTS OF CHANGES IN MONETARY AND FISCAL POLICIES BY THE GOVERNMENT

The equilibrium levels of national income and interest rate are shown by the intersection of the *IS* and *LM* curves. When the government changes its monetary policy or fiscal policy, either the *LM* curve or the *IS* curve shifts and the equilibrium levels also change. In the *IS-LM* model, monetary policy is represented by the *LM* curve and fiscal policy by the *IS* curve.

Effects of Changes in Monetary Policy

In the *IS-LM* model, monetary policy is represented by the *LM* curve. Suppose the government adopts an expansionary monetary policy to control deflation in the economy. For this, it increases the money supply through its central bank. The increase in the money supply is shown by shifting the *LM* curve to the right as LM_1 curve in Fig. 1. When the money

supply increases, the interest falls, given the price level. The fall in the interest rate increases investment demand which causes the income to rise. This in turn, increases consumption demand. The fall in the interest rate and the rise in income jointly increase the aggregate demand and national income. As a result, a new equilibrium is established in the *IS-LM* model with lower interest rate and higher income levels.

This is illustrated in Fig. 1 where the initial equilibrium point *E* is at interest rate or and income level *OY*. An increase in the money supply shifts in *LM* curve to the right to LM_1. It intersects the given *IS* curve at point E_1 which shows the new equilibrium with fall in the interest rate from *OR* to OR_1 and rise in the national income from *OY* to OY_1. On the other hand if the government wants to control inflation, it reduces the money supply which shifts the *LM* curve to the left. As a result, a new equilibrium point will be established at higher interest rate and lower national income level. This will be due to the effects of reduction in the money supply when the interest rate rises, aggregate demand falls and national income declines.

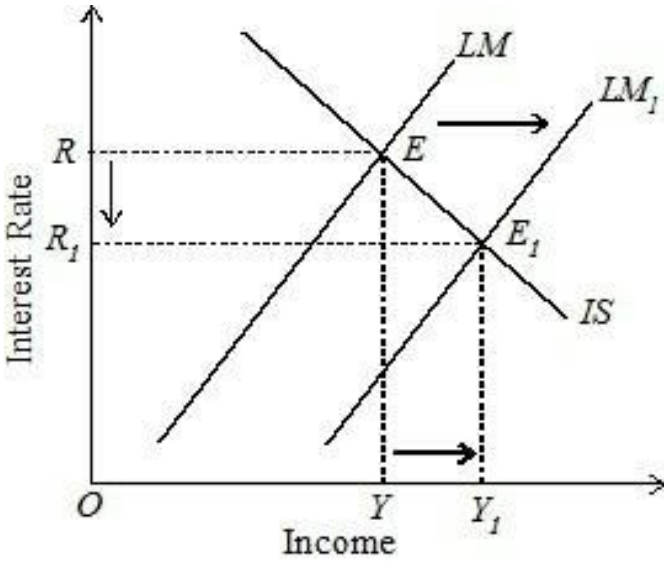

Fig. 1

EFFECTS OF CHANGES IN FISCAL POLICY

The effects of changes in fiscal policy are related to government expenditure and taxes which are shown by shifts in the *IS* curve. They are explained in the case of an expansionary fiscal policy.

1. Increase in Government Expenditure

Suppose there is depression in the economy and the government wants to raise the level of employment and income. For this, it increases its

expenditure which raises aggregate demand both directly as government demand rises and indirectly when consumer expenditure increases with rise in employment and income of the people. As income rises, the transactions demand for money increases. The money supply being fixed, the increase in transactions demand leads to reduction in the speculative (bonds) demand for money. This causes the interest rate to rise. Thus with the increase in public expenditure the equilibrium levels of income and interest rate rise.

This is illustrated in Fig. 2 where the initial equilibrium point is *E* at *OR* interest rate and *OY* income level. The increase in government expenditure shifts the *IS* curve to the right to IS_1 which intersects the given *LM* curve at point E_1. This results in rise in the interest rate from *OR* to OR_1 and of the national income from *OY* to OY_1. The figure shows that the horizontal distance by which the *IS* curve shifts when government expenditure increases

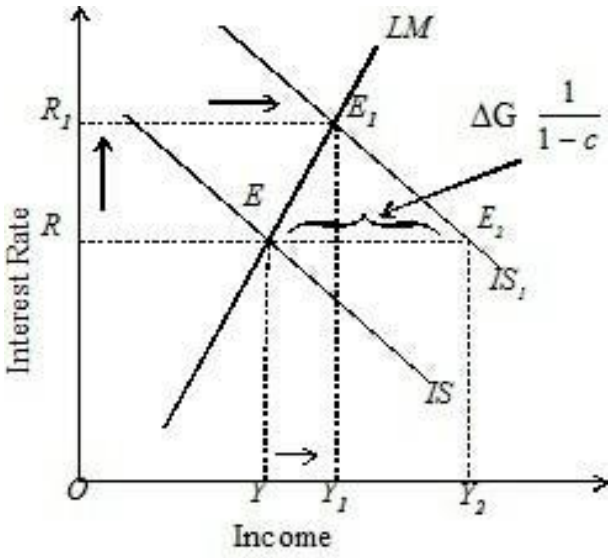

Fig. 2

is equal to $\Delta G \frac{1}{1-c}$, where ΔG is increase in governement expenditure and (1/1–*c*) is the multiplier in the Keynesian model. This leads to increase in equilibrium income from *OY* to OY_2. But in the *IS-LM* model, income rises to OY_1 which is less than OY_2. This is because in the *IS-LM* model when the interest rate rises with the increase in government expenditure, it causes *crowding out* (decline) in some private investment.

The opposite will be the effects of a decrease in government expenditure when there is inflation in the economy and the government adopts contractionary fiscal policy.

2. Reduction in Taxes

We now explain the effects of reduction in taxes in the case of

expansionary fiscal policy. A reduction in taxes raises the disposable income and increases consumption of the people. As income increases, the demand for money also rises and the demand for bonds declines. This leads to rise in interest rate. Thus the equilibrium levels of income and interest rate rise.

Figure 3 illustrates that a reduction in taxes ($-\Delta T$) shifts the *IS* curve to the right to IS_1. Income increases from *OY* to OY_1 and the interest rate rises from *OR* to OR_1. The figure also shows that the horizontal distance by which the *IS* curve shifts with increase in taxes which is equal to $-\Delta T \left[\frac{c}{1-c}\right]$, is the tax multiplier in the Keynesian model. This leads to the rise in income by EE_2 ($=YY_2$) at the initial interest rate *OR*. But in the *IS-LM* model, the cut in taxes causes the interest rate to rise to OR_1 which reduces investment. As a result, the rise in income by YY_1 is less than YY_2. This is because in the Keynesian model, investment is assumed to be fixed.

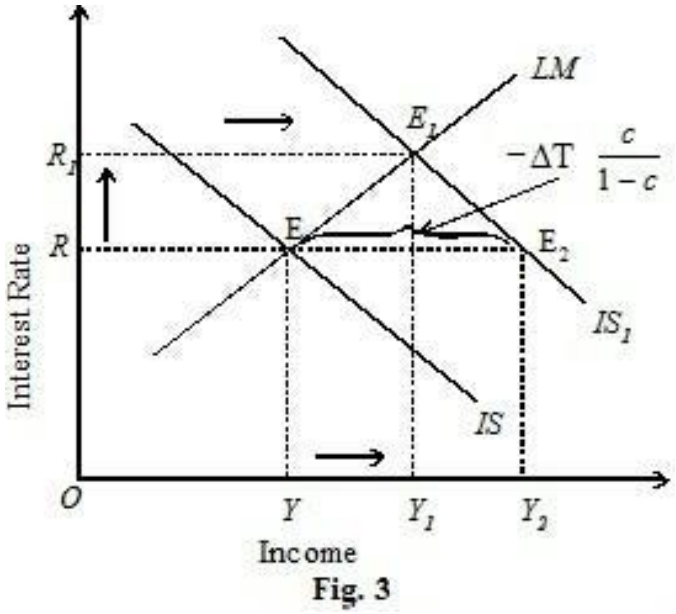

Fig. 3

In the opposite case of increase in taxes both income and interest rate will decline in contractionary fiscal policy.

MONETARY-FISCAL POLICY MIX

We have been above that both monetary and fiscal policies affect income. But their effects on the interest rate and investment are different. When expansionary monetary policy is adopted, the interest rate declines and investment increases. But in expansionary fiscal policy, when government expenditure is increased or taxes are cut, interest rate rises and investment declines. To keep the interest rate low and to encourage investment, the

government adopts a monetary-fiscal mix of an *accommodating monetary policy* alongwith an expansionary fiscal policy in which the increase in money supply will prevent the interest rate from rising and thus offset the crowding out of private investment. This is illustrated in Fig. 4 where the initial equilibrium is at point *E* where the *IS* and *LM* curves intersect and determine *OR* interest rate and *OY* income level. With the increase in government expenditure or tax cut, the *IS* curve shifts to the right as IS_1 curve. It cuts the *LM* curve at point E_1 and the new equilibrium interest rate is OR_1 and income level is OY_1. But the increase in interest rate leads to the crowding out of some private investment. To prevent this crowding out, the government adopts an accommodating monetary policy in which the money supply is increased sufficiently so that the *LM* curve shifts far enough to the right to LM_1 curve. It cuts the IS_1 curve at point E_2, the interest rate remains at the original level OR but income rises to OY_2. Thus this monetary-fiscal mix has raised the income level with the interest rate remining or *OR* level.

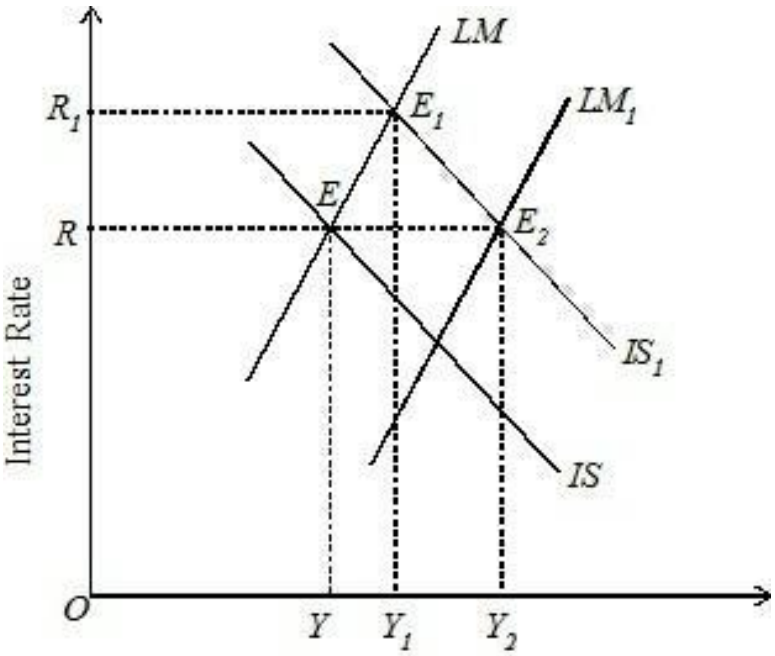

Fig. 4

IS-LM MODEL WITH LABOUR MARKET AND FLEXIBLE PRICES

The *IS-LM* model with labour market and flexible prices explains the determination of interest rate, price level and employment, output and income. It is a *three-sector model* in which goods, money and labour markets are in equilibrium. The entire analysis presents a synthesis of the Keynesian and classical systems based on the interaction of the aggregate

demand and aggregate supply curves which are derived from the *IS* and *LM* curves.

The Keynesian system is based on demand-determined output in which prices and wages are fixed, given the usual upward sloping supply curve to the right. On the other side, the neo-classical system is based on supply-determined output in which prices and wages are *flexible*, given a vertical supply curve.

In the analysis that follows, the aggregate demand (*AD*) curve is derived from the *IS* and *LM* curves. The *AD* curve is common to both the neo-classical and Keynesian systems of the model. The main difference lies in the shapes of the neo-classical and Keynesian aggregate supply (*AS*) curves. The derivation of the new-classical and Keynesian *AS* curves from the *IS* and *LM* curves is not possible. So the respective shapes of the *AS* curves are taken alongwith the *AD* curve to explain the two systems. Finally, the upward sloping *AS* curve to the right is taken to analyse the synthesis of the two systems in terms of the *IS* and *LM* model.

The Aggregate Demand Curve (AD)

The *AD* curve is drawn by plotting each equilibrium level of income (output) that is associated with each price level. All points on the *AD* curve represent the equilibrium of the product (goods) market and the money market.

In this analysis, all vriables like investment, government spending, saving and taxes of the product market are assumed fixed and are, therefore, not affected by a change in the price level. So a change in the price level does not shift the IS curve. In the case of the *LM* curve, the variables are the real money supply and a constant money demand curve. So with the change in the price level, the real money supply (*M/P*) changes which shifts the *LM* curve and produces a new equilibrium level of income with the *IS* curve. Plotting income against the given price level, gives one point of the *AD* curve.

The derivation of the *AD* curve is shown in Fig. 5 where in Panel (A) the initial equilibrium is at point E_2 with income *OY* and interest rate OR_2

when the *IS* curve intersects the LM_2 curve. Plotting *Y* against the price level OP_2 in Panel (A) of the figure gives the point *A*. Thus the income level at which the *IS* and *LM* curves intersect for a given price level is a point on the *AD* curve. *A* fall in the price level to OP_1, shifts the LM_2 curve to the right to LM_1 in Panel (A). The new equilibrium is at E_1 with income OY_1 and and interest rate OR_1. Plotting Y_1 against P_1 in Panel (B), gives the point *B*. A further fall in the price to *OP* shifts the LM_1 curve to the right to *LM* which increases equilibrium income to OY_2. Plotting Y_2 against *P* in Panel (B) yields the point *C*. By joining the points *A*, *B* and *C*, we trace the aggregate demand curve *AD*.

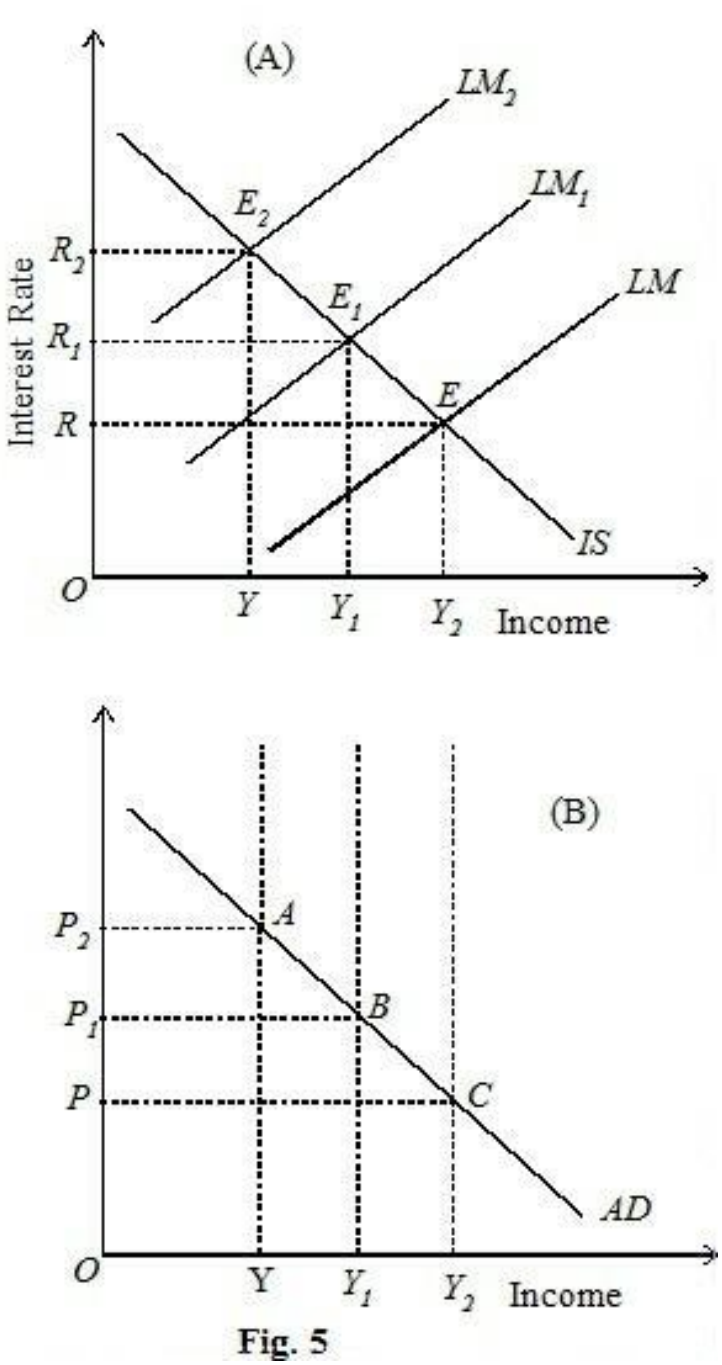

Fig. 5

The *AD* curve is negatively sloped because a fall in the price level increases the real money supply which leads to an excess supply of real money balances. With excess money supply, people buy bonds which raise bond prices and reduce interest rate. As a result of reduction in interest rate, investment increases which, in turn, increases output and income.

IS-LM Model with Flexible Wages and Prices : The Neo-Classical Analysis

We explain the *IS-LM* model with flexible wages and prices based on the neo-classical theory of employment, income and output. In this analysis, the Keynesian aggregate demand curve is combined with the neo-classical aggregate supply curve.

The Aggregate Supply Curve (AS)

The neo-classical *AS* curve is vertical as shown in Panel (C) of Fig.6 because of the following assumptions:

1. Wages and prices are fully flexible.

2. There is perfect information about market prices on the part of market participants. Both the employers of labour and workers know the money wage rate in the labour market and how much commodities the real wage rate (*W/P*) can buy.

3. The economy is always at its full employment income and output level.

4. The labour market is characterised by market-clearing which means that the equilibrium real wage is established at the full employment level.

5. Monetary and fiscal policy affect prices but not the aggregate level of output and employment.

Given these assumptions, the *AS* curve is derived from the demand for labour and supply of labour curves along with the aggregate demand function, as shown in Fig. 6.

Panel (A) of the figure shows labour market equilibrium at point *E* where the supply of labour curve, S_L equals the demand curve for labour curve, D_L which establish the equilibrium real wage rate *W/P*. This leads to the full employment equilibrium level, ON_F. As prices and wages are fully flexible, the real wage rate is also fully flexible. This means that the

labour market is always in equilibrium. Any excess supply of labour or demand for labour will instantaneously bid the real wage rate back to the equilibrium level. The aggregate production function. $Y=f(N,K,T)$ in Panel (B) shows the level of output OY at the full employment level ON_F. Since the level of full employment is unaffected by changes in prices, therefore the level of output is also independent of price changes. Consequently, the AS is vertical at the level of full-employment output OY_F in Panel (C) of the figure. To show the adjustment mechanism beginning from labour market equilibrium in Panel (A), a fall in the price level from OP to OP_1 with a given money wage rate would increase the real wage rate from W/P to W/P_1 . This would reduce the demand for labour thereby causing excess supply of labour by ds. The unemployed workers would bid down the money wage rate until the real wage rate is restored to its equilibrium level, W/P and the excess supply of labour is eliminated. Thus any change in the price level is immediately reflecte maintain equilibrium real wage rate,

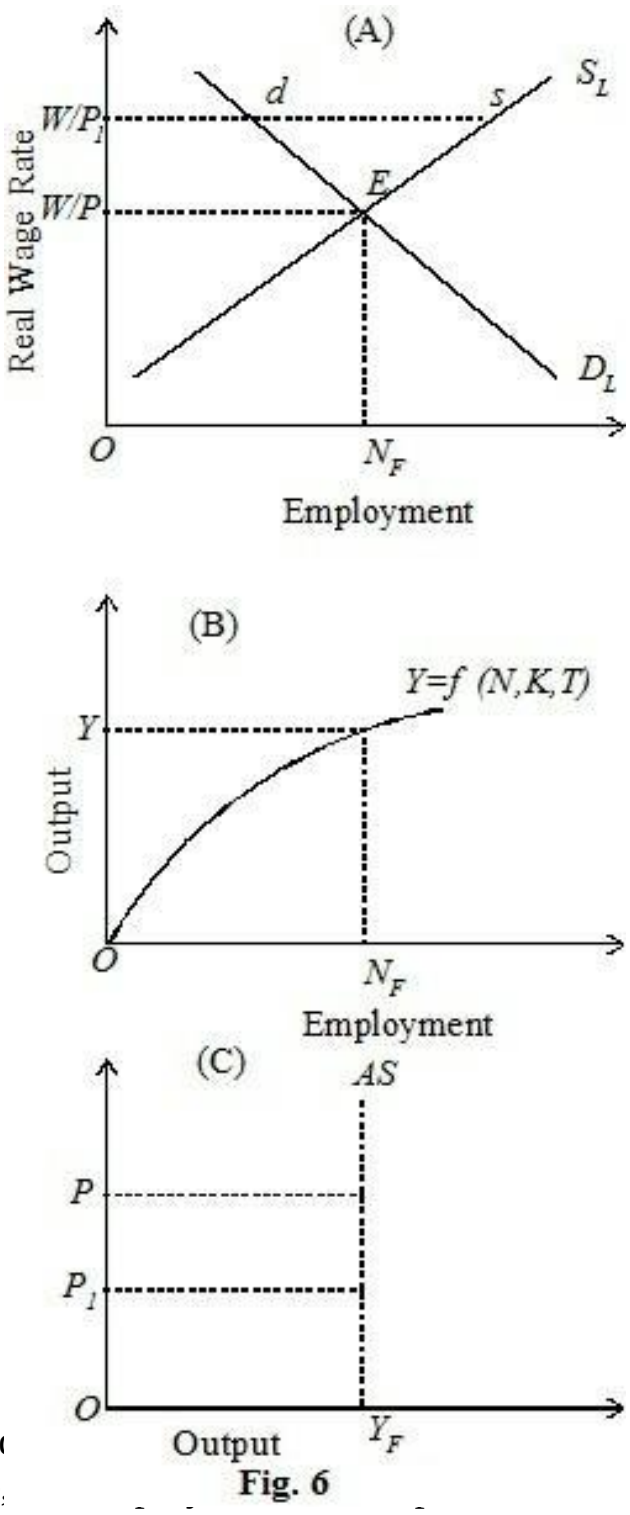

Fig. 6

The Complete Neo-Classical Model

Figure 7 depicts full equilibrium in the neo-classical model at point *E* where the *AD* curve intersects the *AS* curve. At this point, output is at its full employment level OY_F and the equilibrium price level is *OP*. With flexible money wages and prices, the real wage rate always adjusts to maintain full employment in the labour market. Given this labour, firms produce full employment output OY_F. The aggregate demand curve *AD* shows points at which money demand equals money supply and planned spending on goods equals output produced. The equilibrium price level *OP* clears the markets for labour, goods and money. The labour market is in equilibrium on the *AS* curve. The money market clears on the *AD* curve alongwith the equality of aggregate demand for goods with the actual output of goods. Thus in the neo-classical model, the markets for labour, money and goods are simultaneously in equilibrium at point *E*.

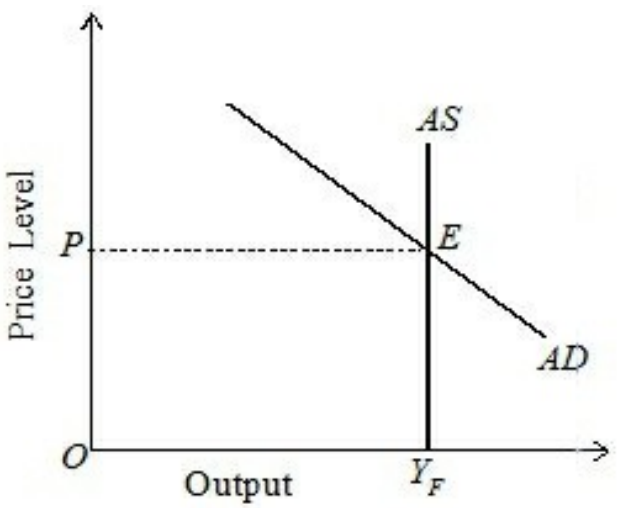

Fig. 7

Effect of Monetary Policy in the Neo-Classical Model

The effect of monetary policy on employment and output in the neo-classical system is explained in terms of the *IS-LM* model in Fig. 8. Suppose the economy is in equilibrium at point *E* where the *LM* curve intersects the *IS* curve with OR_1 interest rate and OY_F full employment income level in Panel (A). Panel (B) of the figure shows the equality of the *AD* and *AS* curves at point. *A* which determines OP_1 price with OY_F aggregate output in the economy.

An increase in the money supply shifts the LM_1 curve to the right to LM_2. The new equilibrium point is E_1 with lower interest rate OR_2 and higher income OY_1. The increase in the money supply and reduction in interest rate increase the aggregate demand which shifts the *AD* curve to the right to AD_1 in Panel (B). At the initial price level OP_1, the output increases to

OY_1. But point C on the AD_1 curve does not show the equilibrium price level which is at point B where the AD_1 curve intersects the vertical AS curve at the higher price level OP_2. The rise in the price level reduces the real money supply (M/P) which shifts the LM_2 curve to the left to LM_1 and the interest rate rises to OR_1 and the full employment equilibrium level of income and output is established at OY_F.

Let us understand the process through which the economy adjusts instantaneously in the neo-classical model from point E to E_1 in Panel (A) when the money supply is increased, and the price level is OP_1 in Panel (B). An increase in the money supply shifts the LM_1 curve to LM_2 and lowers the interest rate from OR_1 to OR_2. This increases the aggregate demand which shifts the AD curve to AD_1. But aggregate demand exceeds full employment output by (Y_F–Y_1) which the firms can supply at the initial price level OP_1. The excess demand for goods bids the price level to OP_2. High price level reduces the real

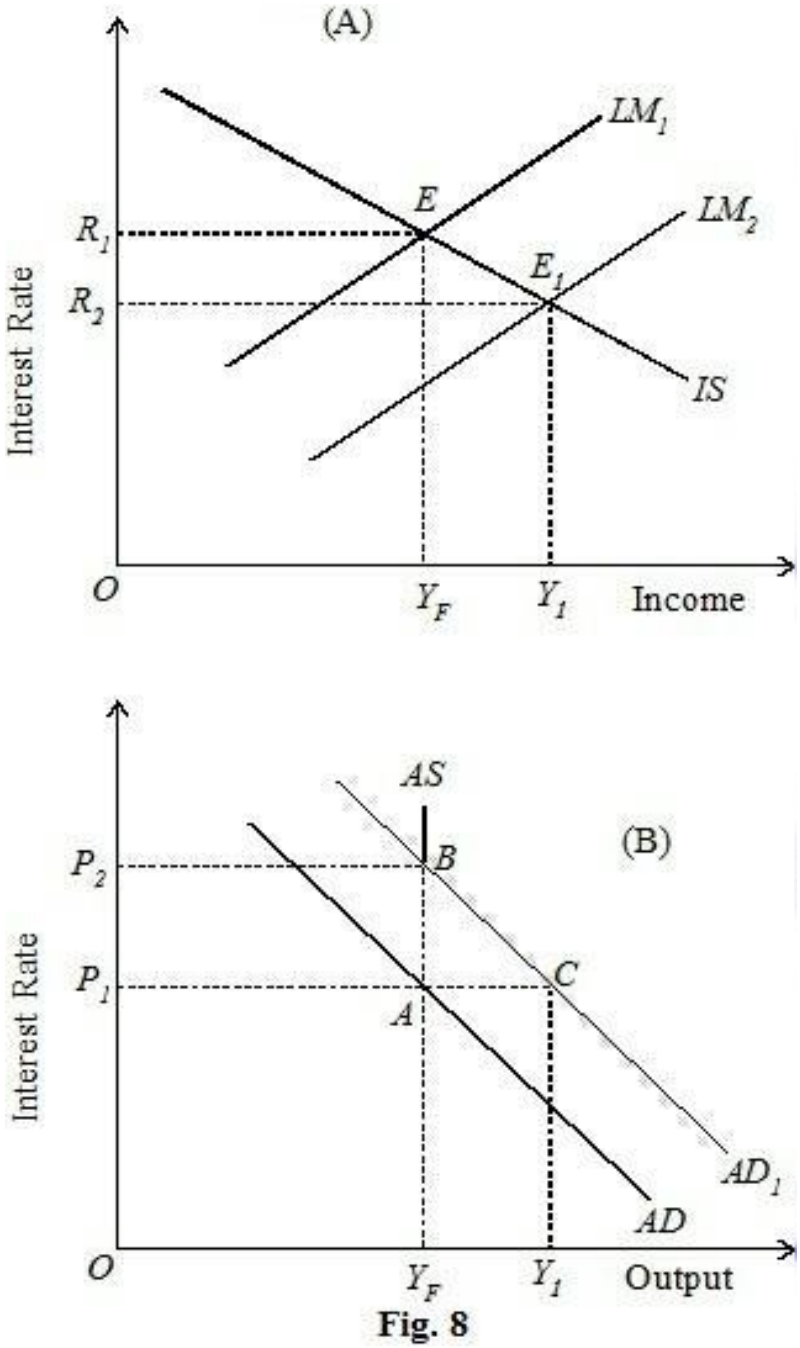

Fig. 8

money supply. As a result the *LM* curve and the interest rate return to their original levels LM_1 and OR_1 respectively and the economy is again at the full- employment income and output level OY_F.

In the labour market, high money wage rate matches the increase in the price level, thereby maintaining the real wage rate at its original level. Thus in the neo-classical model with full wage-price flexibility, a change in the money supply leads to an equal proportionate change in the money wage rate and the price level but without any change in income and output which remain at the full employment level.

Effect of Fiscal Policy in the Neo-Classical Model

Fig. 9 explains the effect of fiscal policy in the neo-classical model. An expansionary fiscal policy in the form of increase in government spending (or reduction in taxes) shifts the *IS* curve upward to the right from IS_1 to IS_2, given the *LM* curve, as shown in Panel (A). The effect of fiscal expansion is to increase aggregate demand which is shown by the shift in the *AD* curve upward to the right to AD_1 in Panel (B). At the initial price level OP_1, output increases to OY_1, more than the full employment output OY_F. But firms want to supply the full employment output OY_F. So there is excess demand for goods by *AC* (Y_F–Y_1). This bids up the price level until excess demand is eliminated at point *B* on the vertical *AS* curve at the higher price level OP_2. Given the money supply, the rise in the price level reduces the real money supply, raises the interest rate to OR_2 and reduces private expenditure on consumption and investment. Thus when an increase in government spending crowds out an equal amount of private expenditure, the IS_2 curve shifts leftward to IS_1 and the initial equilibrium level *E* is re-established so that the aggregate demand remains at the full employment level OY_F at the higher price level OP_2.

IS-LM Model in the Keynesian Analysis with Flexible Prices and Fixed Money Wages

The Keynesian model assumes that the money wage rate is not flexible

rather it is sticky downward in the short run. Therefore, workers are willing to accept a cut in their real wage rate by an increase in the general price level. Keynes argued that workers are prepared to work at the current money wage rate, even if their real wage rate is lowered by the increase in the price level. This is due to the existence of "money illusion" : they attach more importance to their money wage rate than to their real wage rate. In fact, they resist cut in their money wage rate but do not have the same resistance to a cut in real wage rate resulting from increase in the price level.

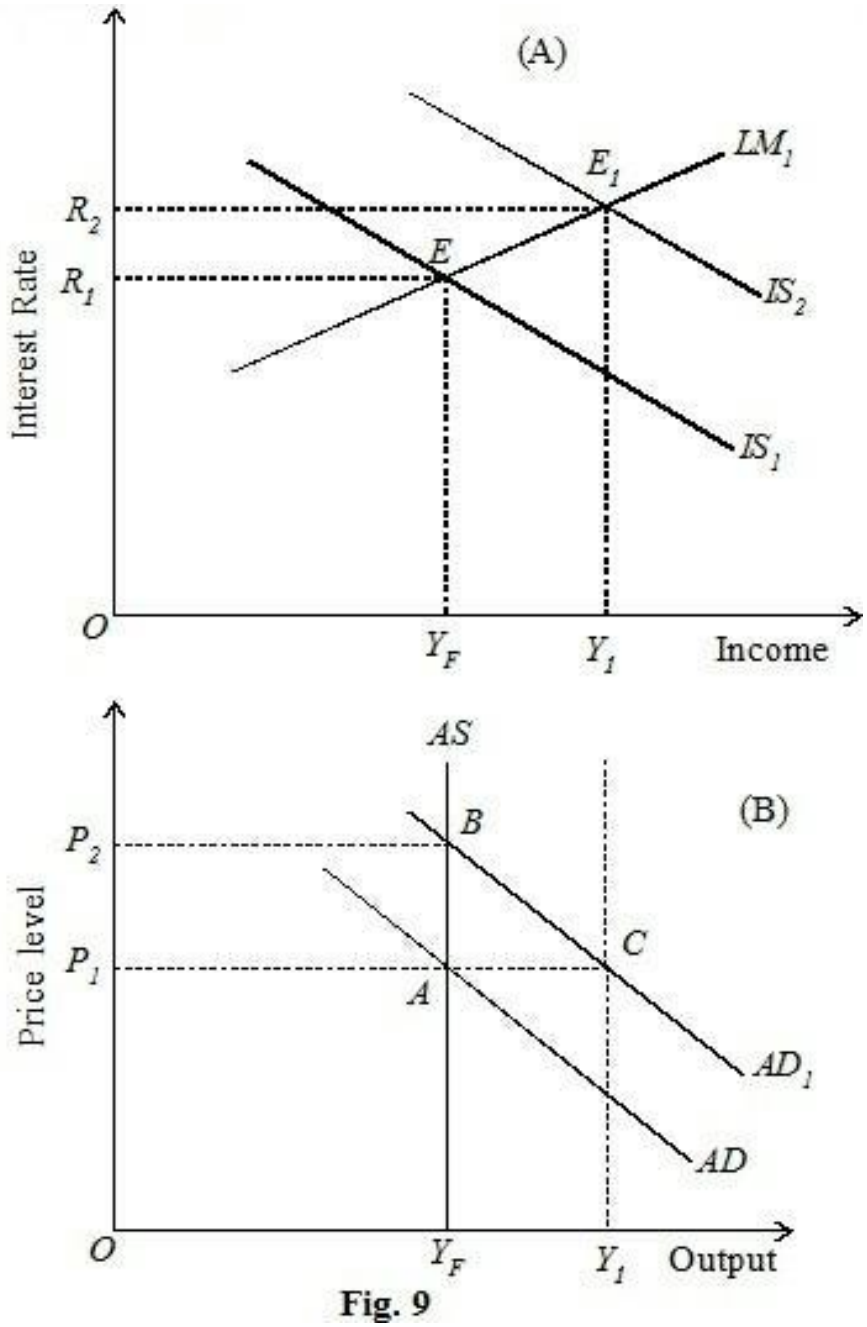

Fig. 9

Before discussing the complete Keynesian approach in terms of the *IS-LM* framework, it is essential to derive the Keynesian aggregate supply curve.

The Aggregate Supply Curve

Given a fixed money wage rate and flexible prices, the derivation of the aggregate supply curve, *AS* is shown in Fig. 10. Panel (A) of the figure depicts the determination of labour market equilibrium at point *E* when the demand for labour curve D_L intersects the supply of labour curve S_L at the market-clearing equilibrium real wage rate W/P_2. Starting movements of the real wage rate above point *E* and along the upper side of the D_L curve, when the price level is *OP* in Panel (C), the real wage corresponding to it is *W*/*P*. At this wage rate, *ON* workers are employed and the output supplied via the production function *f* (*N*,*K*,*T*) shown in Panel (B) is *OY*. As the price level rises to OP_1, the real wage rate

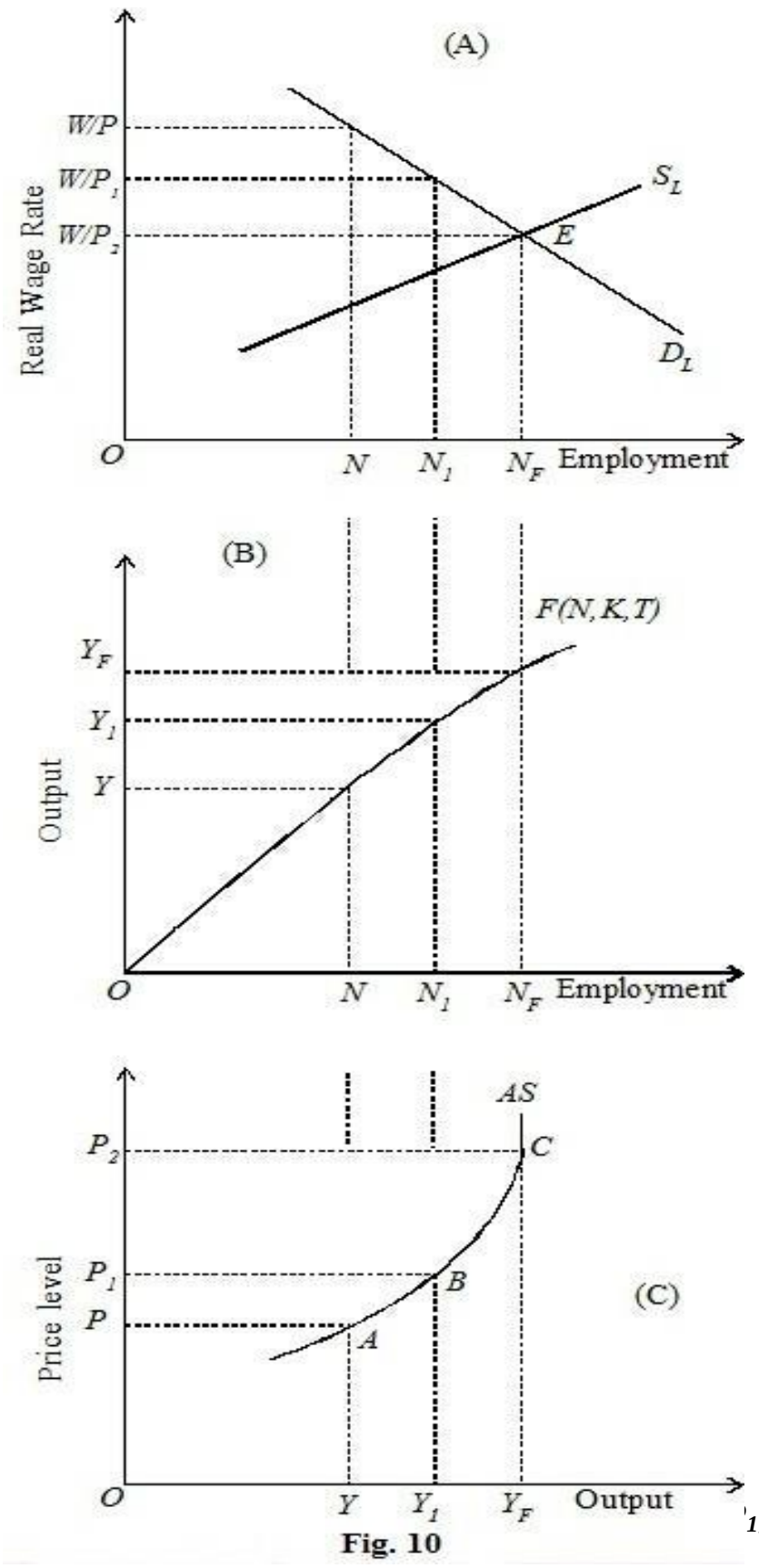

Fig. 10

thereby increasing employment to ON_1 due to money-illusion, and output to OY_1. Further rise in the price level to OP_2, increases employment to the market-clearing level ON_F and output to full employment level OY_F. The curve shown in Panel (C) which plots the price levels against the corresponding output levels at *A, B* and *C* trace the aggregate supply curve *AS*. The Keynesian *AS* curve which slopes upward from left the right is shown vertical beyond point *C* like the neo-classical *AS* curve. This is because with the rise in the price level, the output continues to rise up to the full employment level which is consistent with labour market clearing. But beyound this level, any further rise in the price level will have no effect on employment and output.

Thus the Keynesian *AS* curve represents a synthesis of the neo-classical supply curve and Keynes' aggregate supply curve. In the shortrun, the Keynesian *AS* curve is upward sloping like an ordinary supply curve because there is always underemployment in the economy. But in the longrun, the *AS* curve becomes vertical (from point C as in Fig. 11) when there is full employment in the economy.

The Complete Keynesian Model

The Keynesian system is presented in Fig. 11 where the *AD* curve (derived in Fig. 5) and the *AS* curve (derived in Fig. 10) determine the general price level and aggregate employment, output and income when the economy is in general equilibrium. In the Keynesian system, as money wages are constant, involumtary unemployment exists. Therefore, unlike the neo-classical *AS* curve which is vertical, the Keynesian *AS* curve is not vertical

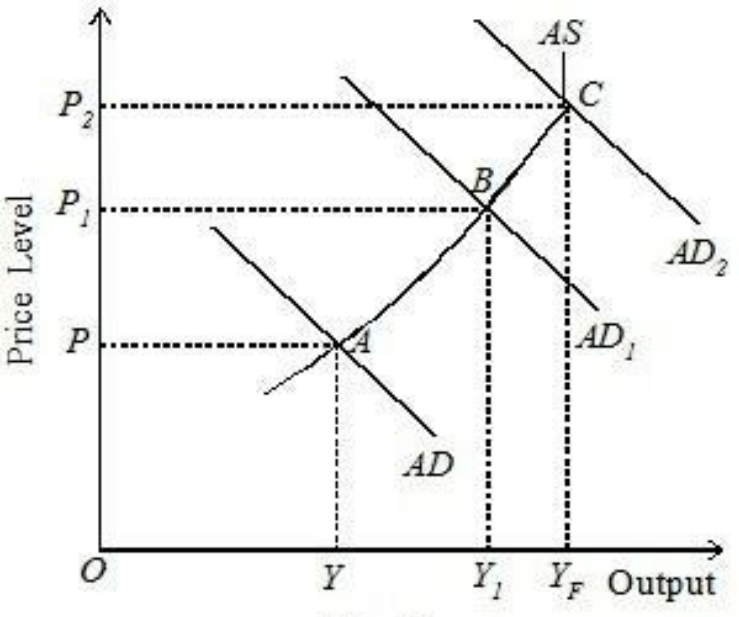

Fig. 11

until the full employment level is reached. To increase employment, the Keynesians suggest increase in aggregate demand which affects the price level and aggregate output and income. In Fig. 11 equilibrium occurs at point *A* when the *AS* and *AD*curves intersect at the price level *OP* and output level *OY*. When the *AD* curve shifts upward to AD_1, the price level rises to OP_1 and output level to OY_1. At this level, the actual output falls short of full employment output by $Y_1–Y_F$. If aggregate demand is increased sufficiently so that the AD_1 curve shifts to AD_2 curve which intersects the *AS* curve at point *C*, the price level would increase from OP_1 to OP_2 and the aggregate output would increase from OY_1 to the full employment level OY_F. Any further increase in aggregate demand would have no effect on aggregate output, employment and income, except raising the price level. This is because the demand for productive resources would exceed their available supplies at full employment.

In contrast, in the neo-classical system, the *AS* curve is a vertical straight line (see Fig. 3) which alongwith the Keynesian aggregate demand curve, *AD* determines only the equilibrium price level, *OP* and the level of full employment output OY_F. Any increase in aggregate demand would shift the *AD* curve upward to the right, thereby causing only increase in the price level at the same level of output OY_F.

Effect of Monetary Policy in the Keynesian System

The effect of monetary policy on employment, output and income in the Keynesian system is explained in Fig. 12 in terms of the IS-LM model when the price level is flexible and money wage rate is fixed. Suppose the economy is in equilibrium at point *E* where the *LM* curve intersects the *IS* curve with *OR* interest rate and *OY* employment and income level in Panel (A) of the figure. The equality of the *AD* curve and *AS* curve is depicted at point *A* in Panel (B) which determines *OP* price with *OY* aggregate output. An increase in the money supply to achieve full employment shifts the *LM* curve to the right to LM_2 which cuts the *IS* curve at point E_2 which

leads

to the full employment level of income, OY_F. This shifts the *AD* curve to the right to AD_2 and raises the price level from *OP* to OP_2. The increase in

the price level reduces the real money supply (M/P) which partially offsets the effects of the rise in the money supply so that the LM_2 curve shifts to the left to LM_1 and cuts the IS curve at E_1. Now the interest rate rises from OR_2 to OR_1 and the level of employment and income is OY_1 which is less than the full employment level OY_F. With the rise in interest rate, investment declines and the aggregate demand curve AD_2 shifts leftward to AD_1 with fall in the price level from OP_2 to OP_1 and output from OY_F to OY_1.

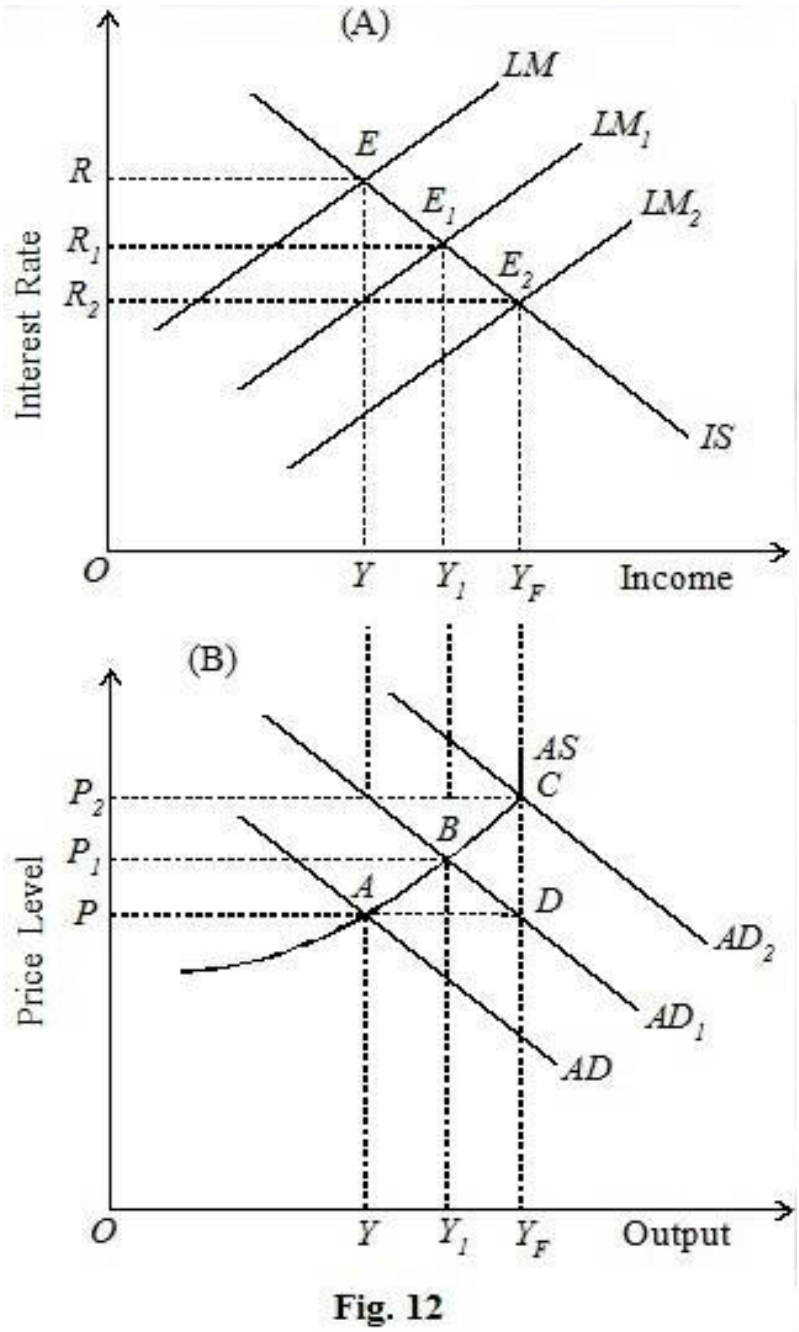

Fig. 12

However, the full employment level of output OY_F can also be achieved, if the price level remains constant at OP when the AD_1 curve intersects the AS curve at point D. But this is not possible under flexible prices and fixed money wage rate in the Keynesian system, because there is always underemployment equilibrium and monetary policy is less effective.

Effect of Fiscal Policy in the Keynesian Model

The effect of fiscal policy on employment, income and output in the Keynesian system is explained in Fig. 13 in terms of the *IS-LM* model when the price level is flexible and money wage rate is fixed. Suppose the government follows an expansionary fiscal policy by increasing investment or reduction in taxes to attain full employment in the economy. Initially, the economy is in equilibrium at point *E* where the *IS* curve cuts the *LM* curve with *OR* interest rate, *OY* income level and *OP* price level. As a result of increase in investment, the *IS* curve shifts upward to the right to IS_1 which intersects the *LM* curve at point E_2 in

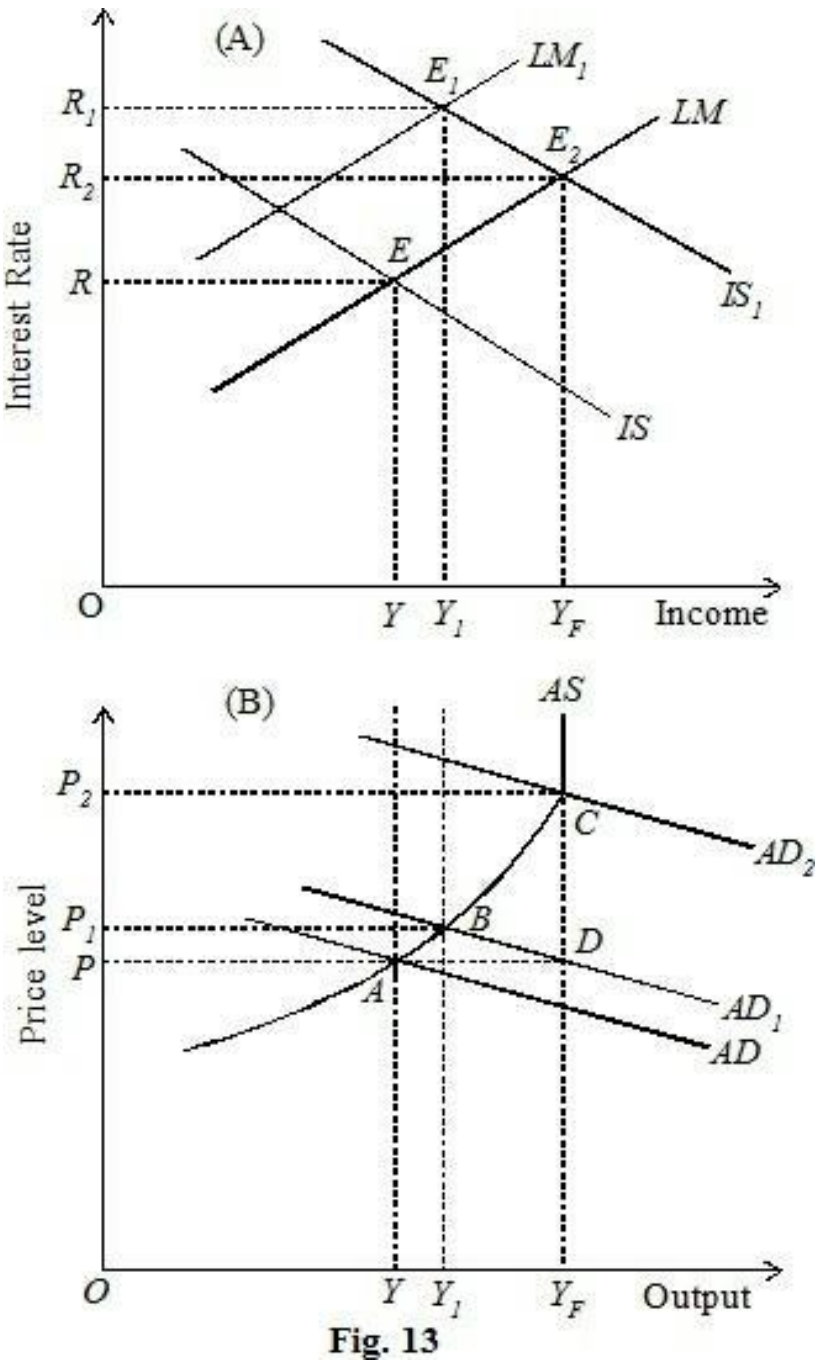

Fig. 13

Panel (A) of the figure. This raises the interest rate from *OR* to OR_2 and income from *OY* to the full employment level OY_F. The increase in investment is reflected in the shift of the aggregte demand curve from *AD* to AD_2 where it cuts the *AS* curve at point *C* and the price level rises from

OP in Panel (B) to OP_2 and output from *OY* to OY_F. The rise in the price level decreases the real money supply which shifts the *LM* curve upward

to the left to LM_1 and cuts the IS_1 curve at point E_1 thereby raising the interest rate from OR_2 to OR_1 and reducing the income level from OY_F to OY_1. The rise in the interest rate leads to the decline in aggregate demand which shifts the AD_2 curve downward to AD_1 which cuts the *AS* curve at point *B*. The price level falls from OP_2 to OP_1 and and output from OY_F to OY_1.

However, the full employment output level, OY_F can also be achieved if the price level is constant at *OP* and the AD_1 curve intesects the *AS* curve at point *D*, as shown in Panel (B) of the figure.

But this is not possible with flexible prices and fixed money wage rate in the Keynesian system because there is always underemployment equilibrium, and fiscal policy, like monetary policy, is less effective.

EXERCISES

1. Explain the effects of government monetary and fiscal policies within the IS-LM curve model.
2. Explain within the IS-LM curve model the effects of monetary and fiscal policies when wages and prices are flexible.
3. Explain within the IS-LM curve model the effects of monetary and fiscal policies when prices are flexible and wages are fixed.
4. Explain why the *AD* curve slopes downward in the IS-LM curve model.

5. Explain why the *AS* cure slopes upward in the IS-LM curve model.

EFFECTIVENESS OF MONETARY AND FISCAL POLICY

INTRODUCTION

The relative effectiveness of monetary and fiscal policy has been the subject of controversy among economists. The monetarists regard monetary policy more effective than fiscal policy for economic stabilisation. On the other hand, the Keynesians hold the opposite view. In between these two extreme views are the synthesists who advocate the middle path. Before we discuss them, we study the effectiveness of monetary and fiscal policy in terms of shape of the *IS* curve and the *LM* curve. The *IS* curve represents fiscal policy and the *LM* curve monetary policy.

MONETARY POLICY

The government influences investment, employment, output and income through monetary policy. This is done by increasing or decreasing the money supply by the monetary authority. When the money supply is increased, it is an expansionary monetary policy. This is shown by shifting the *LM* curve to the right. When the money supply is decreased, it is a contractionary monetary policy. This is shown by shifting the *LM* curve to the left.

Figure 1 illustrates an expansionary monetary policy with given *LM* and *IS* curves. Suppose the economy is in equilibrium at point *E* with *OY*

income and *OR* interest rate. An increase in the money supply by the monetary authority shifts the *LM* curve to the right to LM_1, given the *IS* curve. This reduces the interest rate from *OR* to OR_1 thereby increasing investment and national income. Thus the national income rises from *OY* to OY_1.

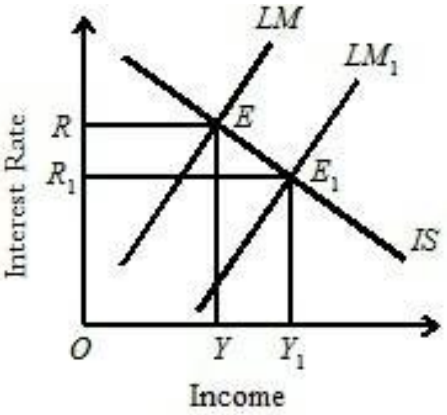

Fig. 1

But the

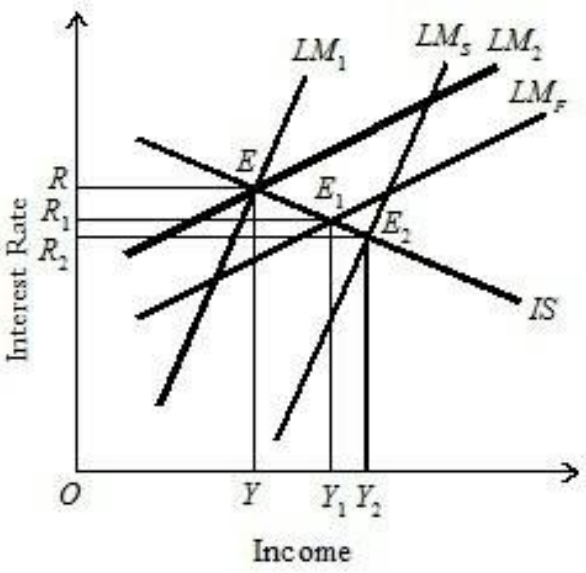

Fig. 2

relative effectiveness of monetary policy depends on the shape of the *LM* curve and the *IS* curve. *Monetary policy is more effective if the LM curve is steeper*. A steeper *LM* curve means that the demand for money is less interest elastic. The less interest elastic is the demand for money, the larger is the fall in interest rate when the money supply is increased. This is because when the demand for money is less elastic to a change in interest rate, an increase in the money supply is more powerful in the bringing about a large fall in interest rate. A large fall in the interest rate leads to a higher increase in investment and in national income. This is depicted in Figure2 where *E* is the original equilibrium position of the economy with *OR* interest rate and *OY* income. When the *steep* LM_1 curve shifts to the right to *LMs*, the new equilibrium is set at E_2. As a result, the interest rate falls from *OR* to OR_2 and income rises from *OY* to OY_2. On the other hand, *the flatter is the LM curve, the less effective is monetary*

policy. A flatter *LM* curve means that the demand for money is more interest elastic. The more interest elastic is the demand for money, the smaller is the fall in interest rate when the money supply is increased. A small fall in the interest rate leads to a smaller increase in investment and income. In Figure 2, E is the original equilibrium position with *OR* interest rate and *OY* income. When the flatter LM_2 curve shifts to the right to LM_F the new equilibrium is established at E_1 which produces OR_1 interest rate and OY_1 income level. In this case, the fall in interest rate to OR_1 is less than OR_2 of the steeper *LMs* curve and the increase in income OY_1 is also less than OY_2 of the steeper curve. This shows that monetary policy is less effective in the case of the flatter *LM* curve and more effective in the case of the steeper curve.

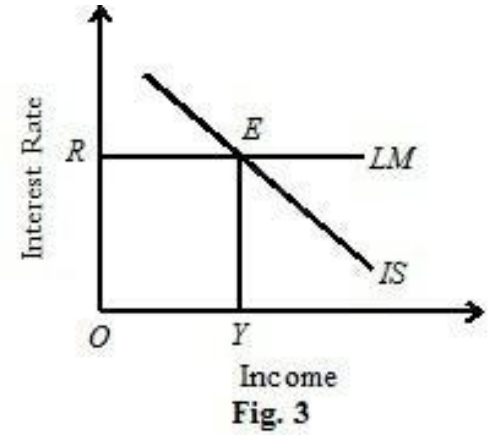

Fig. 3

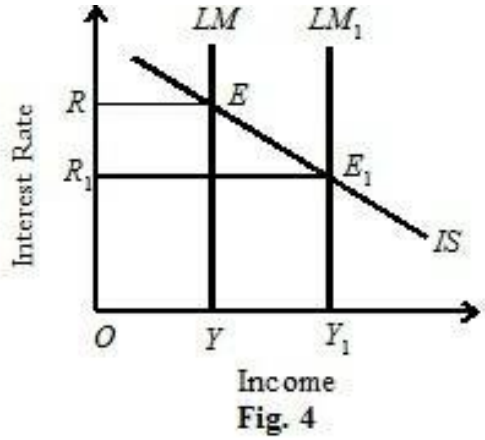

Fig. 4

If *the LM curve is horizontal, monetary policy is completely ineffective* because the demand for money is perfectly interest elastic. This is the case of "liquidity trap" shown in Figure 3, where the increase in the money supply has no effect on the interest rate *OR* and the income level *OY*. On the other hand, if *the LM curve is vertical, monetary policy is highly effective* because the demand for money is perfectly interest inelastic. Figure 4 shows that when the vertical *LM* curve shifts to the right to LM_1 with the increase in the money supply, the interest rate falls from *OR* to OR_1 which has no effect on the demand for money and the entire increase in the money supply has the effect of raising the income level from *OY* to

OY_1.

Now take the slope of the *IS* curve. *The flatter is the IS curve, the more effective is the monetary policy*. The flatter *IS* curve means that the investment expenditure is highly interest elastic. When an increase in the money supply lowers the interest rate even slightly, private investment also increases, by a large amount, thereby raising income much. This is depicted in Figure 5 where the original equilibrium is at point *E* with *OR* interest rate and *OY* income level. When the *LM* curve shifts to the right to LM_1 with the increase in money supply, it intersects the flatter curve IS_F at E_2 which produces OR_2 interest rate and OY_2 income. If we compare this equilibrium position E_2 with the E_1 position where the curve ISs is steeper, the interest rate OR_1 and the income level OY_1 are lower than the interest rate and income level of the flatter IS_F curve. This shows that when the money supply is increased, a small fall in the rate of interest leads to a large rise in private in-vestment which raises income more (by YY_2) with the flatter *IS* curve as compared to the steep *IS* curve (by YY_1) thus making monetary policy more effective.

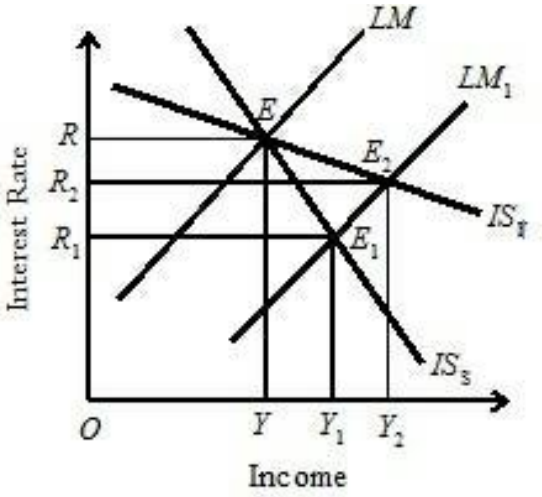

Fig. 5

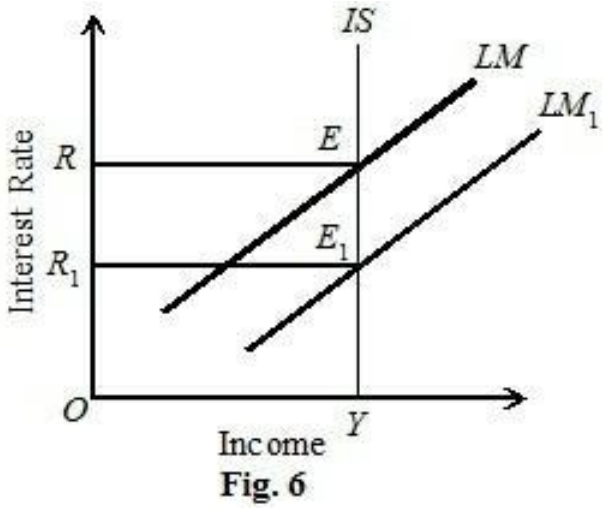

Fig. 6

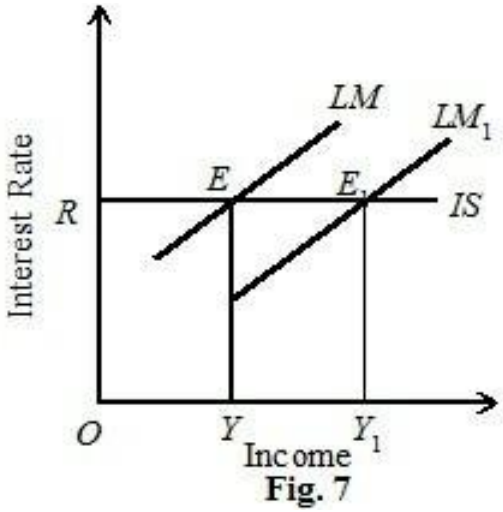

Fig. 7

If the *IS curve is vertical, monetary policy is completely ineffective*

because investment expenditure is completely interest inelastic. With the increase in the money supply, the *LM* curve shifts to the right to LM_1 in Figure 6, the interest rate falls from *OR* to OR_1 but investment being completely interest inelastic, the income remains unchanged at *OY*. On the other hand, if the *IS curve is horizontal, monetary policy is highly effective* because investment expenditure is perfectly interest elastic. Figure 7 shows that with the increase in the money supply, the *LM* curve shifts to LM_1. But even with no change in the interest rate *OR*, there is a large change in income from *OY* to OY_1. This makes monetary policy highly effective.

FISCAL POLICY

The government also influences investment, employment, output and income in the economy through fiscal policy. For an expansionary fiscal policy, the government increases its expenditure or/and reduces taxes. This shifts the *IS* curve to the right. The government follows a contractionary fiscal policy by reducing its expenditure or/and increasing taxes. This shifts the *IS* curve to the left.

Figure 8 illustrates an expansionary fiscal policy with given *IS* and *LM* curves. Suppose the economy is in equilibrium at point *E* with *OR* interest rate and *OY* income. An increase in government spending or a decrease in taxes shifts the *IS* curve upwards to IS_1 which intersects the *LM* curve at E_1. This raises the national income from *OY* to OY_1. The rise in the national income increases the demand for money, given the fixed money supply. This, in turn, raises the interest rate from *OR* to OR_1. The increase in the interest rate tends to reduce private investment expenditure at the same time when the government expenditure is being increased. If the interest rate had not changed with the increase in

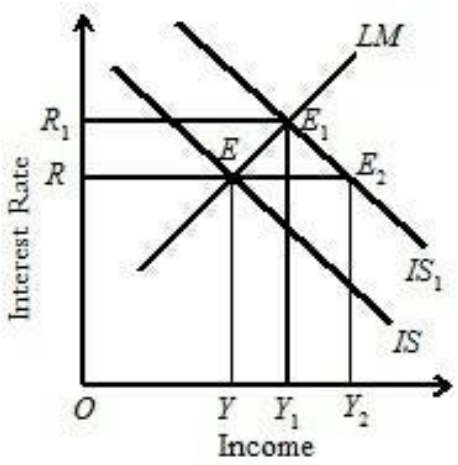

Fig. 8

government expenditure, income would have risen to OY_2 level. But the acutal increase in income has been less by Y_2Y_1 due to the increase in the interest rate to OR_1 which has reduced private investment expenditure. The opposite happens in a contractionary fiscal policy.

The relative effectiveness of fiscal policy depends on the slope of the *LM* curve and the *IS* curve. *Fiscal policy is more effective, the flatter is the LM curve*, and is *less effective when the LM curve is steeper*. When the *IS* curve shifts upwards to IS_1 with the increase in government expenditure, its impact on the national income is more with the flatter LM_F curve than with the steeper LM_S curve. This is shown in Figure 9 where the IS_1 curve intersects the flatter LM_F curve at point E_2 which produces OY_2 income and OR_2 interest rate.

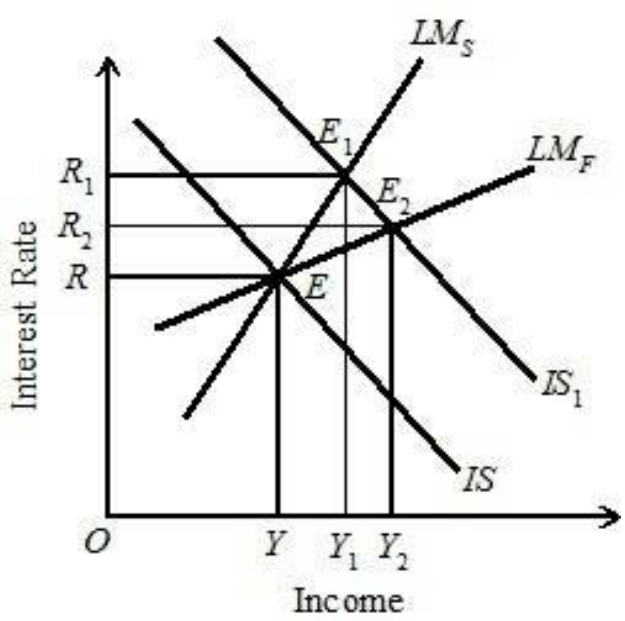

Fig. 9

On the other hand, it intersects the steeper LM_S curve at E_1 which determines OY_1 income and OR_1 interest rate. In the case of the steeper curve LM_S, the increase in income to OY_1 leads to a large rise in the demand for money which raises the interest rate to a very high level OR_1.

The large increase in the interest rate reduces private investment despite increase in government expenditure which ultimately brings a small rise in income OY_1. But in the case of the flatter curve LM_F, the rise in the interest rate to OR_2 is relatively small. Consequently, it reduces private investment to a lesser degree and its net effect on national income is relatively large. Thus the increase in national income with the flatter curve LM_F is more ($YY_2 > YY_1$) as compared with the steeper curve LM_S.

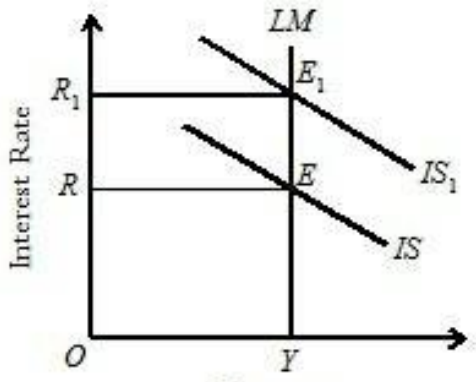

Fig. 10

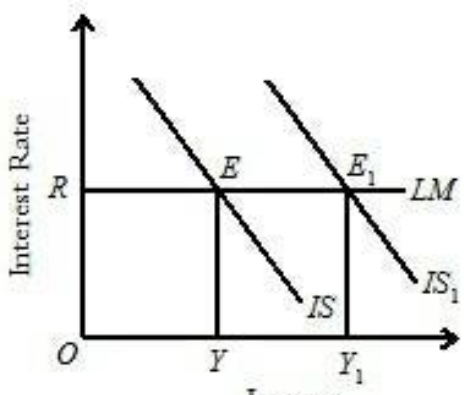

Fig. 11

Fiscal policy is completely ineffective, if the LM curve is vertical. It means that the demand for money is perfectly interest inelastic. This is shown in Figure 10 where the level of income remains unchanged. When the *IS* curve shifts upwards to IS_1, only the interest rate rises from *OR* to OR_1 and increase in government expenditure does not affect national income at all. It remains constant at *OY*. At the other extreme is the *perfectly horizontal LM curve* where *fiscal policy is fully effective*. This situation implies that the demand for money is perfectly interest elastic. This is shown in Figure 11 where the horizontal *LM* curve is intersected by the *IS* curve at *E* which produces *OR* interest rate and *OY* income. When the *IS* curve shifts to the right to IS_1 , income rises by the full multiplier of the increase in government expenditure. It rises to OY_1 but there is no change in interest rate.

Now take the slope of the *IS* curve. *The steeper is the IS curve, the more effective is fiscal policy. The flatter is the IS curve, the less effective is fiscal policy.* These two cases are illustrated in Figure 12 where *E* is the original equilibrium point with *OR* interest rate and *OY* income level. The increase in government expenditure shifts the flatter curve IS_1 to IS_F so that the new equilibrium with *LM* curve at point E_1 produces OR_1 interest rate and OY_1 income level. Similarly, the steeper curve IS_2 is shifted to IS_S with the increase in government expenditure and the new equilibrium with *LM* curve at point E_2 leads to OR_2 interest rate and OY_2 income level. The figure shows that the national income increases more with the shifting of

the steeper *IS* curve than in the case of the flatter *IS* curve. It rises by YY_2 in the case of the steeper curve IS_S and by YY_1 in the case of the flatter curve IS_F. This is because investment expenditure is less interest-elastic, when the *IS* curve is steeper. The increase in the interest rate to OR_2 reduces very little private investment with the result that the rise in income is greater. It is YY_2. On the other hand, the increase in income is smaller in the case of the flatter *IS* curve. It is YY_1. This is because investment expenditure is more interest-elastic. The increase in the interest rate to OR_1 reduces large private investment so that the rise in income is smaller. Thus fiscal policy is more effective, the steeper is the *IS* curve and is less effective in the case of the flatter *IS* curve.

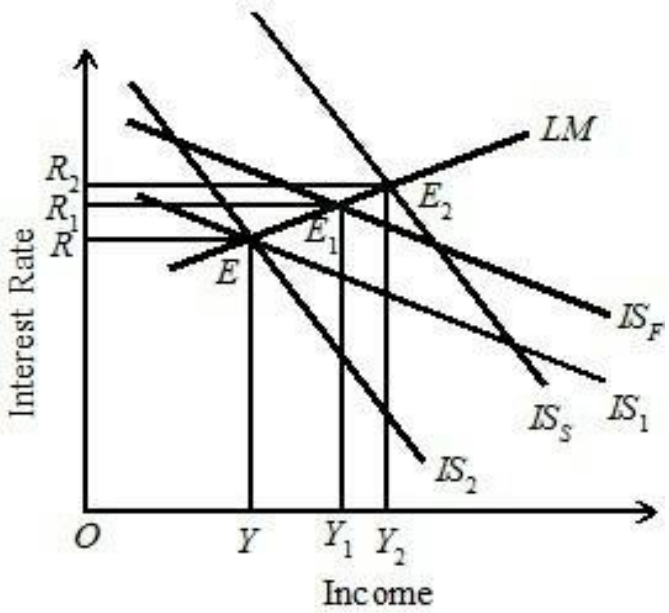

Fig. 12

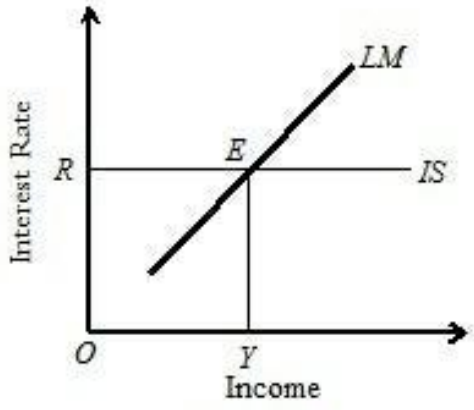

Fig. 13

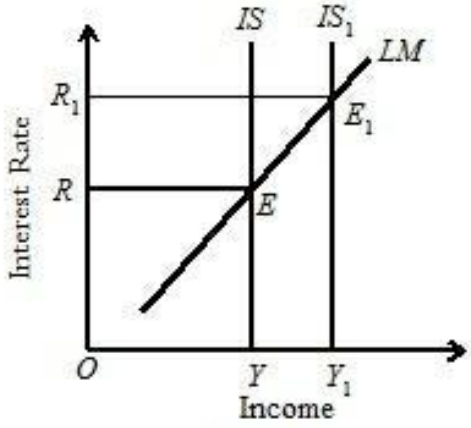

Fig. 14

Fiscal policy is completely ineffective, if the IS curve is horizontal. An horizontal *IS* curve means that investment expenditure is perfectly interest elastic. This is depicted in Figure 13 where *LM* curve intersects the *IS* curve at *E*. An increase in government expenditure has no effect on the

interest rate *OR* and hence on the income level *OY*. Such a situation is not likely to be in practice. On the other extreme is *the vertical IS curve which makes fiscal policy highly effective.* This is because government expenditure is perfectly interest inelastic. An increase in government expenditure shifts the *IS* curve to the right to IS_1, raises the interest rate to OR_1 and income to OY_1 by the full multiplier of the increase in government expenditure, as shown in Figure 14. This makes fiscal policy highly effective.

THE SYNTHESIST VIEW : THREE RANGE ANALYSIS

Economists have explained the effectiveness of monetary and fiscal policies in three ranges in order to reconcile the *extremes* of the Keynesian and monetarist (or classical) views. The *LM* curve slopes upward to the right and has three segments, as shown in Figure 15. Starting from the left it is perfectly elastic, from R_1 to *A*. This segment is known as "*the Keynesian range*", reflecting the "liquidity trap". At the other extreme to the right, the *LM* curve is perfectly inelastic, from *E* to LM_2. This segment of the curve is known as "*the classical range*," because the classicals believed that money is held only for transactions purposes and nothing is held for speculative purposes. In between these two segments of the curve is "*the intermediate range*". The Keynesian range represents the fiscalist or Keynesian view, the classical range the monetarist view, and the intermediate range the synthesist view.

We take expansionary monetary and fiscal policies in order to explain their effectiveness which depend upon the extent to which they affect the level of income and the rate of interest in the Keynesian, the classical and the intermediate ranges. They, in turn, are determined by the responsiveness of the demand for money to changes in the interest rate.

MONETARY POLICY

Monetary policy is explained in Figure 15 where the three-range *LM* curves LM_1 and LM_2 are shown with three *IS* curves. The LM_2 curve

emerges after an increase in the money supply.

The Keynesian Range

First, consider the Keynesian range where the *LM* curve is perfectly elastic. This is the Keynesian liquidity trap situation in which the *LM* curve is horizontal from R_1 to *A*, and the interest rate cannot fall below OR_1. An increase in the money supply shifts the *LM* curve from LM_1 to LM_2. This shift in the curve has no effect on the rate of interest. Consequently, investment is not affected at all so that the level of income remains unchanged at OY_1. This is because at a very low rate of interest such as OR_1 , people prefer to keep money in cash rather than in bonds (or securities) in the hope of converting it into bonds when the interest rate rises. Thus under the Keynesian assumption of the liquidity trap, the horizontal portion of the *LM* curve is not affected by an increase in the money supply. The *IS* curve intersects the *LM* curve in the flat range at A with little effect on the interest rate, investment and income. Monetary policy is, therefore, totally ineffective in the Keynesian range.

The Classical or Monetarist Range

Consider the classical range where *LM* curve is perfectly inelastic. In the classical range, the system is in equilibrium at *D* where the IS_3 curve intersects the LM_1 curve and the interest rate is OR_5 and income level OY_4. Suppose the central bank adopts an expansionary monetary policy whereby it increases the money supply by open market operations. The increase in money supply shifts the LM_1 curve to the right to LM_2 position. As a result, the income level increases from OY_4 to OY_5 and the interest rate falls from OR_5 to OR_4 when the IS_3 curve crosses the LM_2 curve at *E*.

The increase in the income level and fall in the interest rate as a result of the increase in the money supply is based on the classical assumption that money is primarily a medium of exchange. When the central bank buys securities in the market, the security prices are bid up and the rate of interest falls. The wealth holders then find other assets more attractive

than securities. They, therefore, invest the increased cash holdings in new or existing capital investments which, in turn, raise the level of income. But as long as wealth holders possess more money balances than are required for transactions purposes, they will continue to compete for earning assets. Consequently, the interest rate will continue to fall and investment will continue to rise until the excess money balances are absorbed in such transactions. Ultimately, the equilibrium level of income rises by the full amount of the increase in the money supply. Thus the monetary policy is highly effective in the classical range when the economy is at high levels of income and interest rate and utilises the entire increase in the money supply for transactions purposes thereby raising national income by the full increase in the money supply.

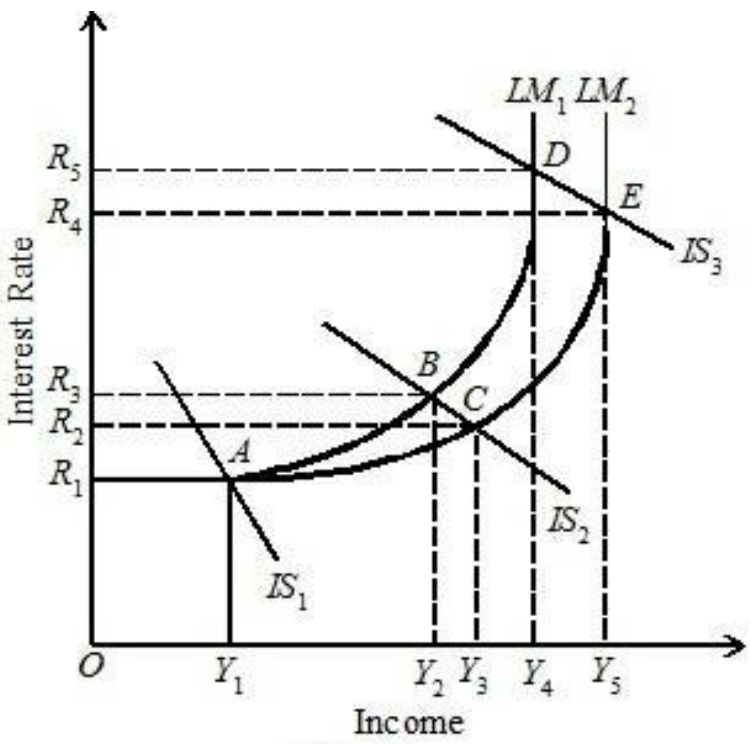

Fig. 15

The Intermediate Range

Now consider the intermediate range when the initial equilibrium is at *B* where the IS_2 curve intersects the LM_1 curve, and the income level is OY_2 and the interest rate is OR_3. The increase in the money supply shifts the LM_1 curve to LM_2 position. As a result, the new equilibrium is established at point *C* where the IS_2 curve crosses the LM_2 curve. It shows that with the increase in the money supply, the rate of interest falls from OR_3 to OR_2 and the income level rises from OY_2 to OY_3. In the intermediate range, the increase in income by Y_2Y_3 is less than that in the classical range, $(Y_2Y_3 < Y_4Y_5)$. This is because in the classical case the entire

increase in the money supply is absorbed for transactions purposes. But in the intermediate case, the increased money supply is partly absorbed for speculative purposes and partly for transactions purposes. That which is held for speculative purposes is not invested by wealth holders and remains with them in the form of idle balances. This has the effect of raising the income level by less than the increase in the money supply. Thus *in the intermediate range monetary policy is less effective than in the classical range.*

FISCAL POLICY

Fiscal policy is explained in Figure 16 in which the three range *LM* curve is taken along with six *IS* curves that arise after increase in government expenditure in the case of the Keynesian, intermediate and classical ranges.

The Keynesian Range

Consider first the Keynesian range when the initial equilibrium is at *A* where the IS_1 curve intersects the *LM* curve. Suppose the government expenditure is increased. This brings about new equilibrium at *B* where the IS_2 curve cuts the *LM* curve. Consequently, the income level rises from OY_1 to OY_2 with the interest rate unchanged at *OR*. The increase in income in the Keynesian case is equal to the full multiplier times the increase in government expenditure. This is because with fixed money supply at low levels of interest rate and income, there is lot of idle money with the wealth holders. This can be used to finance higher transactions without raising the interest rate. When the interest rate does not rise the level of investment remains the same as before and the increase in income is equal to the full multiplier times the increase in government expenditure. *Thus in the Keynesian range, the fiscal policy is very effective.*

The Classical or Monetarist Range

In the classical range, the *LM* curve is perfectly inelastic and the IS_5 curve

intersects it at *E* so that the interest rate is OR_3 and the income level is OY_5. When the government expenditure increases for an expansionary fiscal policy, the IS_5 curve shifts upward to IS_6. As a result, the IS_6 curve crosses the *LM* curve at *F* and the interest rate rises to OR_4 with income remaining unchanged at OY_5. This is because the classical case relates to a fully employed economy where the increase in government expenditure has the effect of raising the interest rate which reduces private investment. Since the increase in government expenditure exactly equals the reduction in the private investment, there is no effect on the level of income which remains constant at OY_5. Thus *fiscal policy is not at all effective in the classical range.*

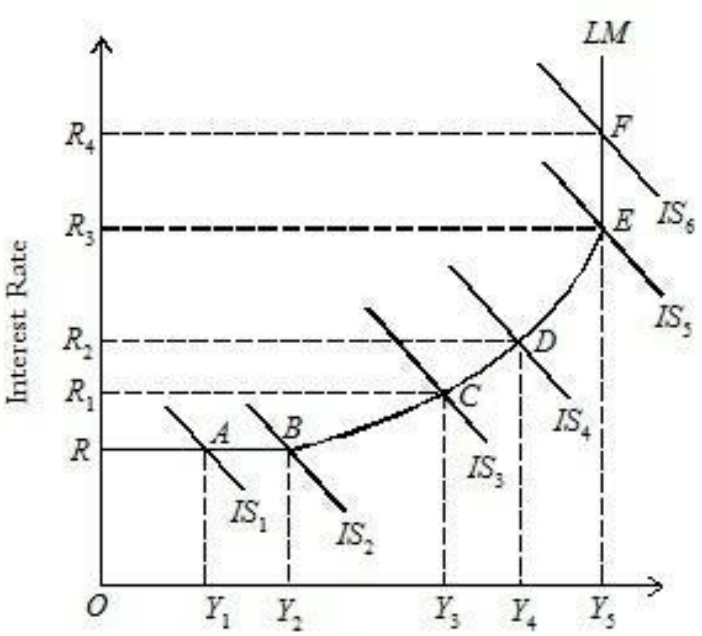

Fig. 16

The Intermediate Range

In the intermediate range, the initial equilibrium is at *C* where the IS_3 curve intersects the *LM* curve. Here OR_1 is the interest rate with OY_3 income level. With the increase in the government expenditure, the IS_3 curve shifts upward to the right to IS_4 and the new equilibrium between IS_4 and *LM* curves is established at point *D.* As a result, the increase in government expenditure raises the income level from OY_3 to OY_4 and the interest rate from OR_1 to OR_2. The increase in both the income level and the interest rate in the intermediate range is due to two reasons. *First*, the increase in income resulting from a rise in government expenditure occurs because additional money balances are available for transactions purposes. *Second*, given a fixed money supply, a part of available

transactions are

held as idle balances by wealth holders which raise the interest rate. As a result of the rise in the interest rate, investment falls and the *fiscal policy is not so effective as in the Keynesian range*. In general, fiscal policy will be more effective the closer equilibrium is to the Keynesian range and less effective the closer equilibrium is to the classical range.

Effects of Elasticities of *IS* Curve on Monetary and Fiscal Policies

The elasticities of the *IS* curve affect monetary and fiscal policies in a slightly different way. This is explained in terms of Figure 17. In the *Keynesian range, monetary policy is ineffective whether the IS curve is elastic or inelastic*. On the other hand, *fiscal policy is only effective when the IS curve is elastic or inelastic*. The elastic curve $IS_{\mathbf{F}}$ shifts to $IS_{\mathbf{F1}}$ and income rises from OY_1 to OY_2 in Figure 17. The same result follows in the case of the shifting of an inelastic *IS* curve (not shown in figure).

In the *classical range, fiscal policy is ineffective whether the IS curve is elastic* (*IS*F2) *or inelastic* ($IS_{\mathbf{S2}}$). *But monetary policy is effective under both the elastic and inelastic curves*. Income rises from OY_3 to OY_6 , as shown in Figure 17.

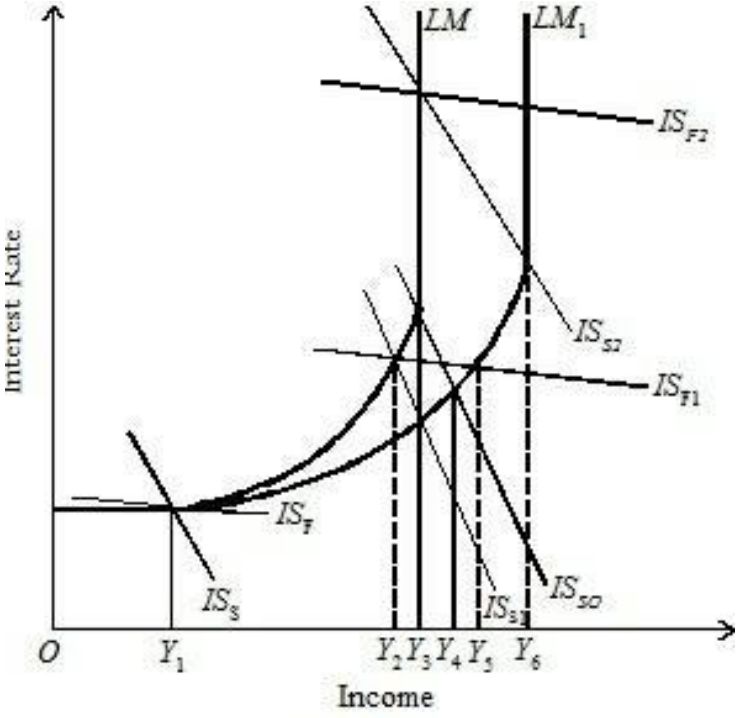

Fig. 17

In the intermediate range, *monetary policy* is *less* effective when the $IS_{\mathbf{S1}}$ curve is *inelastic* because the rise in income in this case is Y_2Y_3 whereas in the case of the *elastic* curve $IS_{\mathbf{F1}}$, it is *more effective*, the rise in income being $Y_2\ Y_5 (>Y_2Y_3)$. But *fiscal* policy is *more effective*, whether the *IS* curve is *elastic* or *inelastic*. The shifting of the inelastic curve $IS_{\mathbf{S1}}$ to IS_{SO} shows

the increase in income from OY_3 to OY_4.

Conclusion

The relative effectiveness of monetary and fiscal policy depends upon the shape of the *IS* and *LM* curves and the economy's initial position. If the economy is in the Keynesian range, monetary policy is ineffective and fiscal policy is highly effective. On the other hand, in the classical range, monetary policy is effective and fiscal policy is ineffective. But in the intermediate range both monetary and fiscal policies are effective. This case bridges the gap between the Keynesian and classical views. In this range, the elasticities of the *IS* and *LM* curves are neither highly interest elastic nor highly interest inelastic. In fact, in the intermediate range, the effectiveness of monetary and fiscal policies depends largely on the elasticities of the *IS* curve. If the *IS* curve is inelastic, fiscal policy is more effective than monetary policy. On the other hand, if the *IS* curve is elastic, monetary policy is more effective than fiscal policy. Thus for a complete effectiveness of both monetary and fiscal policies the best course is to have a monetary-fiscal mix.

MONETARY-FISCAL MIX

Consider a situation where an expansionary mix of monetary-fiscal policies is adopted to achieve full employment in the economy. This is illustrated in Figure 18 where the economy is in the initial situation at *A* on the basis of the interaction of IS_1 and LM_1 curves. This situation depicts OR_2 interest rate and OY_1 income level. Now an expansionary fiscal policy is adopted in the form of increase in government expenditure or decrease in taxes. This shifts the curve IS_1 to IS_2. This will have the effect of raising the interest rate further to OR_3 if an expansionary

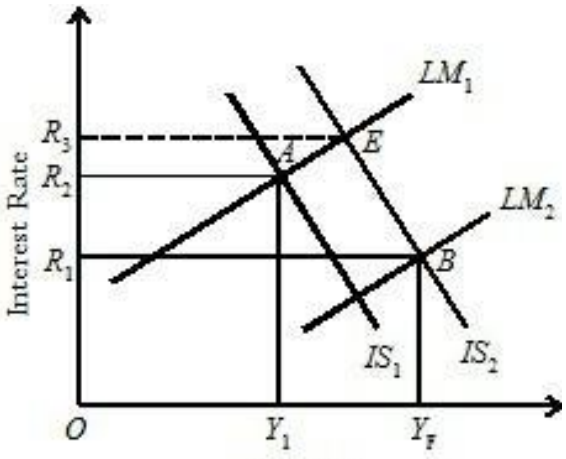

Fig. 18

monetary policy is not adopted simultaneously. So in order to reduce the interest rate and encourage investment for achieving full employment, the monetary authority increases the money supply through open market purchase of securities. This tends to shift the curve LM_1 to the right in the position of LM_2 curve. Now fiscal policy has led to the new IS_2 curve and monetary policy to the *LM2* curve. Both the curves intersect at *B* whereby the interest rate is lowered to OR_1 and the level of income rises to the full employment level OY_F.

Let us take another situation when the economy is at the full employment level of income OY_F where the *IS* curve intersects the *LM* curve at point *E* in Figure 19. But due to some reasons, the economy's growth rate has slowed down. In order to overcome this, more investment is required to be made in the economy. For this, the monetary authority increases the money supply which leads to the shifting of the curve *LM* to the right to LM_1. The

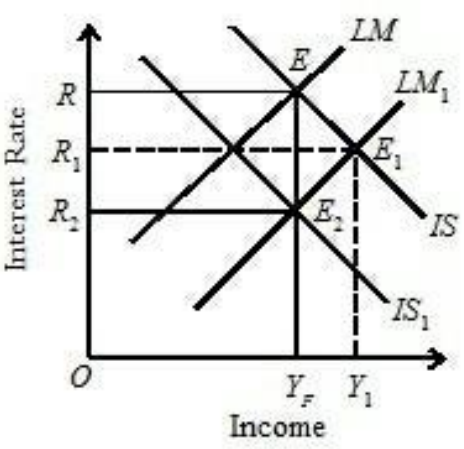

Fig. 19

LM_1 curve intersects the *IS* curve at point E_1 which lowers the interest rate to OR_1 and raises the income level to OY_1. But the rise in national income being higher than the full employment income level, this policy is inflationary. Therefore, the economy requires a change in the monetary-fiscal policy mix.

For this, the expansionary monetary policy should be combined with a restrictive fiscal policy. Accordingly, the government reduces its investment expenditure or/and increases taxes so that the *IS* curve shifts to the left to IS_1. Now the IS_1 curve intersects the LM_1 curve at point E_2 so that the new equilibrium is established at a lower interest rate OR_2 and income level OY_F which is the full employment income level. This level can be maintained by the present monetary-fiscal policy mix because the lower interest rate would keep large investment spending in the economy and reduced government expenditure or high taxes would control

inflation.

EXERCISES

1. Examine the effectiveness of monetary and fiscal policies in terms of the *IS* and *LM* functions.
2. Examine the extent of effectiveness of monetary and fiscal policies in counteracting recessionary forces.
3. How would you reconcile the extremes of the Keynesian and classical views on the effectiveness of monetary and fiscal policies ?
4. Explain the monetary-fiscal mix to achieve and maintain full employment.