DANTULURI NARAYANA RAJU COLLEGE (A)::BHIMAVARAM

M.A.ECONOMICS

II SEMESTER PAPER - II

MACRO ECONOMIC ANALYSIS - II

STUDY MATERIAL

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PAPER–II

MACROECONOMICANALYSIS-II

Module1: SupplyofMoney:

Financial intermediation- mechanistic model of bank deposit determination; RBI Approach to Money Supply; Determinants of Money supply; High power money and money multiplier; budget deficits and money supply; money supply and open economy; control of money supply.

Module2:Post–Keynesian Demand for Money:

Post-Keynesian approaches to demand for money-Patinkin and the Real balance Effect, Approaches of Baumol and Tobin; Friedman and the modern quantity theory: Crisis inKeynesian economics and the revival of monetarism.

Module3:TheoryofInflation:

Classical, Keynesian and Monetarist approaches to inflation; Structuralist theory of inflation; Philips curve analysis-short run and long run Philips curve; Samuelson and Solow-the natural rate ofunemployment hypothesis; Tobin's modified Philips curve; Adaptiveexpectations and rational expectations; Policies to control inflation.

Module4:BusinessCyclesand NewClassicalMacroEconomics:

Theories of Schumpeter, Kaldor, Samuelson and Hicks, Goodwin's model; Control of business cycles-relative efficacy of monetary and fiscal policies- Nature of International Business Cycles.

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. Macroeconomic analysis ,Edward shapiro,S.Chand publishing.
3. Macroeconomic theory, M.l.Jingon,vrindapublication,NewDelhi.

References:

1. Branson,W.A.(1989),MacroeconomicTheoryandPolicy,(3rdEdition),Harperand 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. Advanced macro economics, K.R. Gupta, Atlantic publishers&distributors Pvt.ltd.

MODEL PAPER

DANTULURI NARAYANA RAJU COLLEGE (A)::BHIMAVARAM

P.G. Department of Economics

M.A. Degree ExaminationSemester-II

Paper-II: MACROECONOMICANALYSIS-II

Time: 3Hours. **Max.Marks:75**

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

SECTION –A

1. (a).Explain the functions performed by financial intermediaries?

(Or)

(b). Explain the RBI approach to money supply?

2. (a).Explain the approaches of Baumol and Tobin?

(Or)

(b). Briefly explain the Friedman and the modern quantity theory?

3. (a).Explain the Monetarist approaches to inflation

(Or)

(b). Explain the Tobin's modified Philips curve.

4. (a).Discuss the Hicksan Theory of Business Cycles. (Or)
(b). Explain the nature of International Business cycles.

SECTION -B

Brieflyexplain below concepts

5. Money supply and open economy
6. Highpower money
7. Patinkin balance Effect
8. Samuelson model
9. Philips curve.
10. Policiesto control inflation
11. Rational expectations
12. Kaldors'stheory.

UNIT –I

THE SUPPLY OF MONEY

Definitions of money supply:

The supply of money is a stock at a particular point of time, though it conveys the idea of a flow over time. The term 'the supply of money' is synonymous with such terms as 'money stock', 'stock of money', 'money supply' and 'quantity of money'. The supply of money at any moment is the total amount of money in the economy. There are three alternative views regarding the definition or measures of money supply. The most common view is associated with the traditional and Keynesian thinking which stresses the medium of exchange function of money. According to this view, money supply is defined as currency with the public and demand deposits with commercial banks. Demand deposits are savings and current accounts of depositors in a commercial bank. They are the liquid form of money because depositors can draw cheques for any amount lying in their accounts and the bank has to make immediate payment on demand. Demand deposits with commercial banks plus currency with the public are together denoted as M_1, the money supply.

This is regarded as a narrower definition of the money supply.

The second definition is broader and is associated with the modern quantity theorists headed by Friedman. Friedman defines the money supply at any moment of time as "literally the number of dollars people are carrying around in their pockets, the number of dollars they have to their credit at banks or dollars they have to their credit at banks in the form of demand deposits, and also commercial bank time deposits." Time deposits are fixed deposits of customers in a commercial bank. Such deposits earn a fixed rate of interest varying with the time period for which the amount is deposited. Money can be withdrawn before the expiry of that period by paying a penal rate of interest to the bank. So time deposits possess liquidity and are included in the money supply by Friedman. Thus this definition includes M_1 plus time deposits of commercial banks in the supply of money. This wider definition is characterized as M_2 in America and M_3 in Britain and India. It stresses the store of value function of money or what Friedman says, 'a temporary abode of purchasing power'.

The third definition is the broadest and is associated with Gurley and Shaw.[1] They include in the supply of money, M_2 plus deposits of savings banks, building societies, loan associations, and deposits of other credit and financial institutions.

The choice between these alternative definitions of the money supply depends on two considerations: *One*, "a particular choice of definition may facilitate or blur the analysis of the various motives for holding cash;"[2] and *two* from the point of view of monetary policy an appropriate definition should include the area over which the monetary authorities can have direct influence. If these two criteria are applied, none of the three definitions is wholly satisfactory.

The first definition of money supply may be analytically better because M_1 is a sure medium of exchange. But M_1 is an inferior store of value because it earns no rate of interest, as is earned by time deposits. Further, the central bank can have control over a narrower area if only demand deposits are included in the money supply.

The second definition that includes time deposits (M_2) in the supply of money is less satisfactory analytically because "in a highly developed financial structure, it is important to consider separately the motives for holding means of payment and time deposits." Unlike demand deposits, time deposits are not a perfect liquid form of money. This is because the amount lying in them can be withdrawn immediately by cheques. Normally, it cannot be withdrawn before the due date of expiry of deposit. In case a depositor wants his money earlier, he has to give a notice to the bank which allows the withdrawal after charging a penal interest rate from the depositor. Thus time deposits lack perfect liquidity and cannot be included in the money supply. But this definition is more appropriate from the point of view of monetary policy because the central bank can exercise control over a wider area that includes both demand and time deposits held by commercial banks.

The third definition of money supply that includes M_2 plus deposits of non-bank financial institutions is unsatisfactory on both the criteria. Firstly, they do not serve the medium of exchange function of money.

Secondly, they almost remain outside the area of control of the central bank. The only advantage they possess is that they are highly liquid store of value. Despite this merit, deposits of non-bank financial institutions are not included in the definition of money supply.

DETERMINANTS OF MONEY SUPPLY:

There are two theories of the determination of the money supply. According to the *first view*, the money supply is determined exogenously by the central bank. The *second view* holds that the money supply is determined endogenously by changes in the economic activity which affect people's desire to hold currency relative to deposits, the rate of interest, etc.

Thus the determinants of money supply are both exogenous and endogenous which can be

described broadly as: the minimum cash reserve ratio, the level of bank reserves, and the desire of the people to hold currency relative to deposits. The last two determinants together are called the *monetary base* or *high powered money*.

1. The Required Reserve Ratio

The required reserve ratio (or the minimum cash reserve ratio or the reserve deposit ratio) is an important determinant of the money supply. An increase in the required reserve ratio reduces the supply of money with commercial banks and a decrease in required reserve ratio increases the money supply. The *RRr* is the ratio of cash to current and time deposit liabilities which is determined by law. Every commercial bank is required to keep a certain percentage of these liabilities in the form of deposits with the central bank of the country. But notes or cash held by commercial banks in their tills are not included in the minimum required reserve ratio.

But the short-term assets along with cash are regarded as the liquid assets of a commercial bank. In India the statutory liquidity ratio (SLR) has been fixed by law as an additional measure to determine the money supply. The SLR is called secondary reserve ratio in other countries while the required reserve ratio is referred to as the primary ratio. The raising of the SLR has the effect of reducing the money supply with commercial banks for lending purposes, and the lowering of the SLR tends in increase the money supply with banks for advances.

2. The Level of Bank Reserves

The level of bank reserves is another determinant of the money supply. Commercial bank reserves consist of reserves on deposits with the central bank and currency in their tills or vaults. It is the central bank of the country that influences the reserves of commercial banks in order to determine the supply of money. The central bank requires all commercial banks to hold reserves equal to a fixed percentage of both time and demand deposits. These are legal minimum or required reserves. Required reserves (*RR*) are determined by the required reserve ratio (*RRr*) and the level of deposits (D) of a commercial bank: $RR=RRr \times D$. If deposits amount to Rs 80 lakhs and required reserve ratio is 20 percent, then the required reserves will be 20% × 80=Rs 16 lakhs. If the reserve ratio is reduced to 10 per cent, the required reserves will also be reduced to Rs 8 lakhs. Thus the higher the reserve ratio, the higher the required reserves to be kept by a bank, and vice versa. But it is the excess reserves (*ER*) which are important for the determination of the money supply. Excess reserves are the difference between total reserves (*TR*) and required reserves (*RR*): ER=TR-RR. If total reserves are Rs 80 lakhs and required reserves are Rs 16 lakhs, then the excess reserves are

Rs 64 lakhs (Rs 80 - 16 lakhs). When required reserves are reduced to Rs 8 lakhs, the excess reserves increase to Rs 72 lakhs. It is the excess reserves of a commercial bank which influence the size of its deposit liabilities. A commercial bank advances loans equal to its excess reserves which are an important component of the money supply. To determine the supply of money with a commercial bank, the central bank influences its reserves by adopting open market operations and discount rate policy.

Open market operations refer to the purchase and sale of government securities and other types of assets like bills, securities, bonds, etc., both government and private in the open market. When the central bank buys or sells securities in the open market, the level of bank reserves expands or contracts. The purchase of securities by the central bank is paid for with cheques to the holders of securities who, in turn, deposit them in commercial banks thereby increasing the level of bank reserves. The opposite is the case when the central bank sells securities to the public and banks who make payments to the central bank through cash and cheques thereby reducing the level of bank reserves.

The discount rate policy affects the money supply by influencing the cost and supply of bank credit to commercial banks. The discount rate, known as the bank rate in India, is the interest rate at which commercial banks borrow from the central bank. A high discount rate means that commercial banks get less amount by selling securities to the central bank. The commercial banks, in turn, raise their lending rates to the public thereby making advances dearer for them. Thus there will be contraction of credit and the level of commercial bank reserves. Opposite is the case when the bank rate is lowered. It tends to expand credit and consequently bank reserves.

It should be noted that commercial bank reserves are affected significantly only when open market operations and discount rate policy supplement each other. Otherwise, their effectiveness as determinants of bank reserves and consequently of money supply is limited.

3. Public's Desire to Hold Currency and Deposits

People's desire to hold currency (or cash) relative to deposits in commercial banks also determines the money supply. If people are in the habit of keeping less in cash and more in deposits with the commercial banks, the money supply will be large. This is because banks can create more money with larger deposits. On the contrary, if people do not have banking habits and prefer to keep their money holdings in cash, credit creation by banks will be less and the money supply will be at a low level.

4. High-Powered Money

The current practice is to explain the determinants of money supply in terms of the monetary base or high-powered money. High-powered money is the sum of commercial bank reserves and currency (notes and coins) held by the public. High-powered money is the base for the expansion of bank deposits and creation of the money supply. The supply of money varies directly with changes in the monetary base, and inversely with the currency and reserve ratios.

5. Other Factors

Money supply is a function not only of the high-powered money determined by the monetary authorities, but of interest rates, income and other factors. The latter factors change the proportion of money balances that the public holds as cash. Changes in business activity can change the behaviour of banks and the public and thus affect the money supply. Hence the money supply is not only an exogenous controllable item but also an endogenously determined item.

Conclusion

We have discussed above the factors which determine money supply through the creation of bank credit. But money supply and bank credit are indirectly related to each other. When the money supply increases, a part of it is saved in banks depending upon the depositors' propensity to save. These savings become deposits of commercial banks who, in turn, lend after meeting the statutory reserve requirements. Thus with every increase in the money supply, the bank credit goes up. But it may not happen in exactly the same proportion due to the following factors:

(a) The marginal propensity to save does not remain constant. It varies from time to time depending on changes in income levels, prices, and subjective factors.

(b) Banks may also create more or less credit due to the operation of leakages in the credit creation process.

(c) The velocity of circulation of money also affects the money supply. If the velocity of money circulation increases, the bank credit may nor fall even after a decrease in the money supply. The central bank has little control over the velocity of money which may adversely affect bank credit.

HIGH-POWERED MONEY AND THE MONEY MULTIPLIER:

The current practice is to explain the determinants of money supply in terms of the monetary base or high-powered money. High -powered money is the sum of commercial bank reserves and currency (notes and coins) held by the public. High-powered money is the base for the expansion of bank deposits and creation of the money supply. The supply of money varies directly with changes in the monetary base, and inversely with the currency and reserve ratios.

The use of high-powered money consists of the demand of commercial banks for the legal limit or required reserves with the central bank and excess reserves and the demand of the public for currency. Thus high- powered money $H=C+RR+ER$ where C represents currency, *RR* the required reserves and *ER* the excess reserves.

A commercial bank's required reserves depend upon its deposits. But a bank usually holds reserves in excess of its required reserves. In fact, banks do not advance loans up to the legal limits but precisely less than that. This is to meet unanticipated cash withdrawals or adverse clearing balances. Hence the need arises for maintaining excess reserves by them. The money supply is thus determined by the required reserve ratio and the excess reserve ratio of commercial banks. The required reserve ration (*RRr*) is the ratio of required reserves to to deposits (*RR/D*), and the excess reserve ratio (*ERr*) is the ratio or excess reserves to deposits (*ER/D*).

Currency held by the public is another component of high-powered money. The demand for currency by the public is expressed as a proportion of bank deposits. Thus the currency ratio $Cr=C/D$, where *C* is the currency and *D* deposits. The currency ratio is influenced by such factors as changes in income levels of the people, the use of credit instruments by the public, and uncertainties in economic activity.

The formal relation between money supply and high-powered money can be stated in the form of equations as under:

The money supply (*M*) consists of deposits of commercial banks (*D*) and currency (*C*) held by the public. Thus the supply of money

$$M=D+C \qquad ...(1)$$

High-powered money (*H*) (or monetary base) consists of currency held by the public (*C*) plus required reserves (*RR*) and excess reserves (*ER*) of commercial banks. Thus high-powered money

$$H=C+RR+ER \qquad ...(2)$$

The relation between *M* and *H* can be expressed as the ratio of *M* to *H*. So divide equation (1) by (2):

$$\frac{M}{H}=\frac{D+C}{C+RR+ER} \qquad ...(3)$$

Divide the numerator and denominator of the right hand side of equation (3) by *D*:

$$\frac{M}{H}=\frac{\frac{D}{D}+\frac{C}{D}}{\frac{C}{D}+\frac{RR}{D}+\frac{ER}{D}}$$

or

$$\frac{M}{H}=\frac{1+\frac{C}{D}}{\frac{C}{D}+\frac{RR}{D}+\frac{ER}{D}} \qquad ...(4)$$

By substituting *Cr* for *C*/*D*, *RRr* for *RR*/*D* and *ERr* for *ER*/*D*, equation (4) becomes

$$\frac{M}{H}=\frac{1+Cr}{Cr+RRr+ERr} \qquad ...(5)$$

Thus high-powered money

$$H=\frac{Cr+RRr+ERr}{1+Cr}\times M \qquad ...(6)$$

And money suply

$$M=\frac{1+Cr}{Cr+RRr+ERr}\times H \qquad ..(7)$$

Equation (7) defines money supply in terms of high-powered money. It expresses the money supply in terms of four determinants, *H*, *Cr*, *RRr*, and *ERr*. The equation states that the higher the supply of high powered money, the higher the money supply. Further, the lower the currency ratio (*Cr*), the reserve ration (*RRr*), and the excess reserve ratio (*ERr*), the higher the money supply, and vice versa.

The relation between money supply and high-powered money is illustrated in Figure 1. The horizontal curve *Hs* shows the given sup shows the demand for high-powered money ass represents equation (6). The slope of (*Cr*+*RRr*+*ERr*)/(1+*Cr*). Given *Cr*, *RRr*, *Err* and money supply is *OM*. If the money supply is la demand for high-powered money. On the contr less demand for high-powered money If there *RRr* or *ERr*, there would be an increase in th

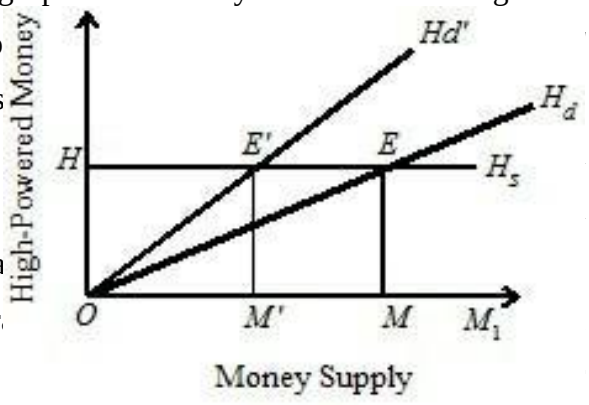


Fig. 1

shown by the *Hd'* curve in Figure 1 where the increase in the demand for high-powered money leads to decline in the money supply to *OM '*. The quotient of equation (7) is the money multiplier *m*. Thus

$$m = \frac{1+Cr}{CR+RRr+ERr} \qquad ...(8)$$

Now the relation between money supply and high-powered money of equation (7) becomes

$$M = mH \qquad ...(9)$$

Equation (9) expresses money supply as a function of m and *H*. In other words, the money supply is determined by high powered money (*H*) and the money multiplier (*m*). The size of the money multiplier is determined by the currency ratio (*Cr*) of the public, the required reserve ratio (*RRr*) at the central bank, and the excess reserve ratio (*ERr*) of commercial banks. The lower these ratios are, the larger the money multiplier is. If *m* is fairly stable, the central bank can manipulate the money supply (*M*) by manipulating *H*. The central bank can do so by open market operations. But the stability of *m* depends upon the stability of the currency ratio and the reserve ratios *RRr* and *ERr*. Or, it depends upon off-setting changes in *RRr* and *ERr* ratios. Since these ratios and currency with the public are liable to change, the money multiplier is quite volatile in the short run.

Given the division of high-powered money between currency held by the public, the required reserves at the central bank, and the excess reserves of

commercial banks, the money supply varies inversely with *Cr*, *RRr* and *ERr*. But the supply of money varies directly with changes in the high-powered money. This is shown in Figure 2. An increase in the supply of high-powered money by ΔH shifts the *Hs* curve upward to *Hs'*. At *E*, the demand and supply of high-powered money are in equilibrium and money supply is *OM*. With the increase in the supply of high-powered money to *Hs*', the supply of money also increases to *OM* at the new equilibrium po operation of the money multiplier. With the increase in the supply increases by ΔM. An increase in the high-powered

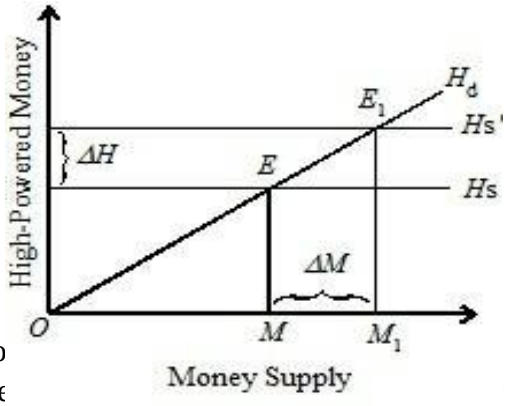


Fig. 2

of Re1Some economists do not take into consideration excess reserves in determining high-powered money and consequently the money supply. But the monetarists give more importance to excess reserves. According to them, due to uncertainties prevailing in banking operations as in business, banks always keep excess reserves. The amount of excess reserves depends upon the interaction of two types of costs: the cost of holding excess reserves, and the cost generated by deficiency in excess reserves. The first cost is in terms of the market rate of interest at which excess reserves are maintained. The second cost in in terms of the bank rate which is a sort of penalty to be paid to the central bank for failure to maintain the legal required reserve ratio by the commercial bank. The excess reserve ratio varies inversely with the market rate of interest and direcly with the bank rate. Since the money supply is inversely related to the excess reserve ratio, decline in the excess reserve ratio of banks tends to increase the money supply and vice versa. Thus the money supply is determined by the high-powered money, the currency ratio, the required reserve ratio and the market rate of interest and the bank rate.

The monetary base or high-powered money is directly controllable by the central bank. It is the ultimate base of the nation's money supply. Of course, the money multiplier times the high-powered money always equals the money supply, *i.e*. *M=mH*. This formulation tells us how much new money will be created by the banking system for a given increase in the high-powered money. The monetary policy of the central bank affects excess reserves and the high-powered money identically. Suppose the central bank makes open market purchases. This raises the high-powered money in the form of excess reserves of banks. An increase in money supply that results from it comes from the banking system which creates new money on the baiss of its newly acquired excess reserves. Thus this concept tells us that the monetary authorities can control the money supply through changing the high-powered money or the money multiplier.

MEASURES OF MONEY SUPPLY IN INDIA:

There are four measures of money supply in India which are denoted by M_1, M_2, M_3, and M_4. This classification was introduced by the Reserve Bank of India (RBI) in April 1977. Prior to this till March 1968, RBI published only one measure of the money supply, M or M_1, defined as currency and demand deposits with the public. This was in keeping with the traditional and Keynesian views of the narrow measure of the money supply. From April 1968, RBI also started publishing another measure of the money supply which it called Aggregate Monetary Resources (AMR). This included M_1 *plus* time deposits of banks held by the public. This was a broad measure of money supply which was in line with Friedman's view. But since April 1977, RBI has been publishing data on four measures of the money supply which are discussed as under:

M_1. The first measure of money supply is M_1 which consists of :

(i) Currency with the public which includes notes and coins of all denominations in circulation excluding cash on hand with banks:

(ii) demand deposits with commercial and cooperative banks, excluding inter-bank deposits; and

(iii) 'other deposits' with RBI which include current deposits of foreign central banks, financial institutions and quasi-financial institutions such as IDBI, IFCI, etc, other than of banks, IMF, IBRD, etc. RBI characterises M_1 as *narrow money*.

M_2. The second measure of money supply is M_2 which consists of M_1 *plus* post office savings bank deposits. Since savings bank deposits of commercial and cooperative banks are included in the money supply, it is essential to include post office savings bank deposits. The majority of people in rural and urban India have preference for post office deposits from the safety viewpoint than bank deposits.

M_3. The third measure of money supply in India is M_3 which consists of M_1 *plus* time deposits with commercial and cooperative banks, excluding inter-bank time deposits. RBI calls M_3 as *broad money*.

M_4. The fourth measure of money supply is M_4 which consists of M_3 *plus* total post office deposits comprising time deposits and demand deposits as well. This is the *broadest* measure of money supply.

Of the four inter-related measures of money supply for which RBI publishes data, it is M_3 which is of special significance. It is M_3 which is taken into account in formulating macroeconomic objectives of the economy every year. Since M_1 is narrow money and includes only demand deposits of banks alongwith currency held by the public, it overlooks the importance of time deposits in policy making. That is why, RBI prefers M_3 which includes total deposits of banks and currency with the public in credit budgeting for its credit policy. It is on the estimates of increase in M_3 that the effects of money supply on prices and growth of national income are estimated.

In fact M_3 is an empirical measure of money supply in India, as is the practice in developed countries. The Chakravarty Committee also recommended the use of M_3 for monetary targeting without any reason.

MONEY SUPPLY AND LIQUIDITY

Of the four measures of money supply in India, M_1 which consists of currency with the public and demand deposits with commercial and cooperative banks, is the most liquid form of money. Currency consists of notes, rupee coins, two rupee coins, five rupee coins and small coins, and cash on hand with banks, are the most liquid assets. Demand deposits are savings bank accounts and current accounts in banks from which depositors can withdraw cheques by any amount lying in their accounts. Thus like currency, demand deposits are the most liquid and possess the medium of exchange function of money.

A liquid asset is one which is easily spendable, and transferable at face value anywhere and at any time. It can be turned into the generally acceptable medium of exchange quickly without any risk of loss. The phrase 'without risk of loss' refers to the currency unit (Rs, $ or £) and not to real purchasing power. Government bonds, time deposits (also known as savings deposits which are different from savings bank deposits), shares, real estate, etc. are 'frozen' assets which can be sold or exchanged for money on short notice only. They are thus less liquid than money.

M_2 consists of M_1 *plus* post office savings bank deposits. In India, the majority of people in rural and urban areas prefer to keep their cash in post office savings bank deposits from the safety viewpoint because they think that post offices are government owned and mananged. With the nationalisation of 20 commercial banks and opening of their branches in almost all rural areas of the country, the distinction between post office savings bank deposits and commercial savings bank deposits has disappeared. Still the majority of rual people being illiterate, they prefer post offices to banks even by force of habit.

The inclusion of post office savings bank deposits in M_1 is meant to measure the increase in total money supply which affects the evonomy. But post office savings bank deposits are less liquid than currency and demand deposits because they cannot be easily withdrawn. There are no chequing facilities in post offices, except in metropolitan cities and that too in main post offices. The depositors have to undergo a cumbersome process of cash withdrawals in post offices.

M_3 includes M_1 plus time deposits (also known as savings deposits in developed countries) with commercial banks and cooperative banks. This is broad money which stresses the store of value function of money alongwith the medium of exchange function. Time deposits with banks are less liquid than currency and demand deposits because they are held for a fixed time period at a fixed rate of interest. The total money deposited in this account can be withdrawn before the expiry of full period by paying a penal interest rate to the bank. So time deposits do possess liquidity but less than demand deposits.

The fourth measure of money supply is M_4 which includes M_3 *plus* total post office deposits comprising time deposits and savings bank deposits. They tend to increase the money supply in the country manifold. But these total post office deposits are less liquid than total bank deposits for the reasons already given in the case of M_2.

If deposits with non-bank financial institutions such as mutual savings banks, building societies, insurance companies, loan associations and other credit and financial institutions are also included along with total post office deposits in M_3 the total money supply would be many times more than what is ordinarily defined as M_1. And if such assets as shares, bonds, government securities, etc. are also included in the supply of money, it would be difficult to measure the money stock in the country.

Taking all such assets vis-a-vis money, they differ in the degree of liquidity. Since *currency* is easily spendable and transferable, and has more stability in value, it possesses the highest degree of liquidity. *Demand deposits* of banks are also as liquid as currency because they are chequing accounts and easily serve as medium of exchange. But demand deposits of post offices do not possess the same degree of liquidity as bank deposits. *Time deposits* of banks, post offices and of other non-bank financial institutions are less liquid than demand deposits because they cannot be easily tranferred to depositors in the form of cash and spent. They serve more as a store of value. So far as *shares* of corporations are concerned, they are also less liquid because they take more time to be sold and transferred. They involve cost in the act of tranferability in the form of brokerage or commission. They cannot be easily converted into cash and spent. Hence they possess less liquidity than demand deposits. *Bonds* of companies also possess less liquidity because they can be converted into cash after the expiry of the bond maturity period. But they are transferable and earn higher interest return. *Government securities* are issued in the name of initial purchasers and, as such, are non-marketable, because they cannot be sold to someone else. So they are not liquid. On the other hand, money market mutual fund shares, post office savings bonds and national savings certificates possess the advantage of being cashable though they are also non-transferable. They can be returned for repayment of principal plus a fixed amount

interest after a short waiting period before the actual maturity date. They are thus as liquid as fixed deposits of banks and post offices.

It is on account these reasons that economists prefer M_1 as the measure of money supply because among all the assets, currency and demand deposits possess the highest degree of liquidity. However, for practical purposes in policy formulation and for empirical studies, governments and researchers use M_3 as the measure of money supply which is less liquid than M_2.

But *how does a change in money supply affect liquidity* ? A change in the money supply affects liquidity by bringing changes or readjustments in the portfolio holdings of the assets of the people. This depends on the effect of money supply on aggregate spending. If people decide to spend the increased money supply in purchasing such assets as shares and debentures, there will be less money available in liquid form with the public. If the stock market is bullish, people may convert assets in their portfolios in buying more shares. On the other hand, if there is uncertainty in the stock market , people may hold the increased money supply in bank deposits or invest it in real estate if they expect property prices to rise. But it is the monetary authority that influences money supply in the economy by following "easy" or "tight" monetary policy. It does so by controlling aggregate spending and thereby influencing business activity, output and employment. But the monetary authority is not always successful in controlling spending by increasing or decreasing the money supply and hence liquidity. This is because the central bank has little control over the velocity of circulation of money, non-bank financial intermediaries, business expectations, time lags in monetary policy, etc. It is, therefore, very difficult to predict the effects of changes in money supply on liquidity.

DERIVATION OF MONEY MULTIPLIERS:

We have explained above the derivation of the money multiplier and its relation with high-powered money. But the total money supply is usually measured not in terms of M but as M_1, M_2, and M_3. Therefore, the derivation of money multipliers of these three measures M_1, M_2, and M_3 of the total money supply and the relation of each with the high powered money are shown below in the form of equations.

First, take M_1. In M_1 measure of money supply are included the demand deposits of commercial banks (D) and currency with the public (C). Thus money supply

$$M_1 = D+C \qquad \ldots(1)$$

In the high-powered money (or monetary base) are included the required reserves of commercial banks (RR) *plus* currency with the public (C). Thus high-powered money

$$H = RR+C \qquad \ldots(2)$$

$$\frac{M_1}{H} = \frac{D + C}{RR + C}$$

By dividing equation (1) by equation (2), the ratio of M_1 to H can be expressed as

Dividing the right hand side of the above equation by D,

$$\frac{M_1}{H} = \frac{\frac{D}{D} + \frac{C}{D}}{\frac{RR}{D} + \frac{C}{D}}$$

or $$\frac{M_1}{H} = \frac{1 + \frac{C}{D}}{\frac{RR}{D} + \frac{C}{D}}$$

By substituting Cr for C/D and Rr for RR/D, the equation becomes

$$\frac{M_1}{H} = \frac{1 + Cr}{Rr + Cr}$$

$$m_1 = \frac{1 + Cr}{Rr + Cr} \times H$$

The higher the value of m_1 multiplier, the lower will be the reserve ratio (Rr) and currency-deposit ratio (Cr).

M_2 is defined as M_1 *plus* time deposits (TD). Thus

$$M_2 = D + C + TD \qquad \text{....(3)}$$

In high-powered money are included required reserves (RR), the excess reserves of commercial banks (ER) *plus* currency held by the public (C). So

$$H = RR + Er + C \qquad \text{...(4)}$$

In order to find out the ratio of M_2 to H, divide equation (3) by equation (4),

$$\frac{M_2}{H} = \frac{D + C + TD}{RR + ER + C}$$

Dividing the right hand side of the above equation by D,

$$\frac{M_2}{H} = \frac{\frac{D}{D} + \frac{C}{D} + \frac{TD}{D}}{\frac{RR}{D} + \frac{ER}{D} + \frac{C}{D}}$$

By substituting *Cr* for *C*/*D*, *Td* for *TD*/*D*, *RRr* for *RR*/*D* and *Er* for *ER*/*D*,

$$\frac{M_2}{H} = \frac{1 + Cr + Td}{Rr + Er + Cr}$$

Or $$m_2 = \frac{1 + Cr + Td}{Rr + Er + Cr} \times H$$

The value of m_2 multiplier is higher than that of m_1 multiplier because it leads to greater increase in the monetary base (H). The higher the value of m_2 multiplier, the lower will be the rates of *Cr*, *Rr* and *Er*.

M_3 includes M_2 *plus* deposits of non-bank financial institutions (*Dn*) and a portion of deposits of these institutions which remains with banks (*Rp*). Thus the deposits of these institutions are taken as *RpDn* which are related to the reserve ratio of commercial banks (*Rr*). Thus

$$M_3 = D + RpDn + Dn + Cr\ (D + Dn) \qquad ...(5)$$

And the monetary base will be determined as :

$$H = Rr\ (D + RpDn) + Cr(D + Dn) \qquad ...(6)$$
$$Rr = RR/D \text{ or } R = Rr\ (D)$$
$$Cr = C/D \text{ or } C = Cr\ (D)$$

To find out the ratio of M_3 and H, divide equation (5) by equation (6),

$$\frac{M_3}{H} = \frac{D + RpDn + Dn + Cr(D + Dn)}{Rr(D + RpDn) + Cr(D + Dn)}$$

Or $$\frac{M_3}{H} = \frac{D + Dn(Rp + 1) + Cr(D + Dn)}{Rr(D + RpDn) + Cr(D + Dn)}$$

Dividing the right hand side of the above equation by *D*.

$$\frac{M_3}{H} = \frac{1 + \frac{Dn}{D}(Rp + 1) + Cr\left(1 + \frac{Dn}{D}\right)}{Rr\left(1 + Rp\frac{Dn}{D}\right) + Cr\left(1 + \frac{Dn}{D}\right)}$$

$$= \frac{1 + \frac{Dn}{D}Rp + \frac{Dn}{D} + Cr + Cr \times \frac{Dn}{D}}{Rr + Rr.Rp.\frac{Dn}{D} + Cr \times \frac{Dn}{D}}$$

$$= \frac{1 + Cr + \frac{Dn}{D}Rp + \frac{Dn}{D} + Cr \times \frac{Dn}{D}}{Rr + Cr + Rr.Rp.\frac{Dn}{D} + Cr \times \frac{Dn}{D}}$$

$$= \frac{1 + Cr + \frac{Dn}{D}(Rp + 1 + Cr)}{Rr + Cr + \frac{Dn}{D}(Rp + 1 + Cr)}$$

By substituting *d* for *Dn*/*D*, the equation becomes

$$\frac{M_3}{H} = \frac{1 + Cr + (1 + Rp + Cr)d}{Rr + Cr + (Rr.Rp + Cr)d}$$

Or $$m_3 = \frac{1 + Cr + (1 + Rp + Cr)d}{Rr + Cr + (Rr.Rp + Cr)d} \times \mathrm{H}$$

where m_3 is the money multiplier whose valve is higher than m_2 multiplier.

EXERCISES

1. Explain the various components of the money supply.
2. Discuss the determinants of the money supply. Should time deposits be included under the supply of money ?
3. Discuss the various measures of the money supply adopted by the Reserve Bank of India. How do they differ from those adopted by

developed countries?

4. Of the various measures of money supply which possess more liquidity and why?
5. Explain the determinants of high-powered money.
6. Discuss the relation between money supply and high-powered money.
7. Write a note on the money multiplier.

UNIT –II

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

$$Md = kPY$$

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.

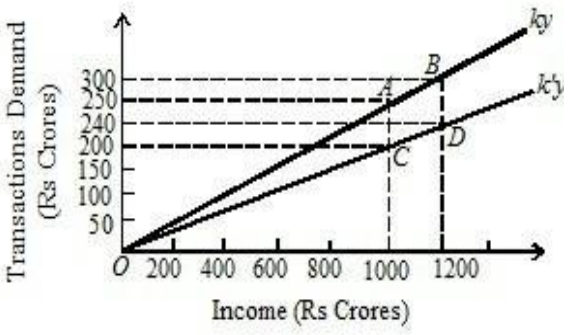


Fig. 1

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 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."[8]

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.

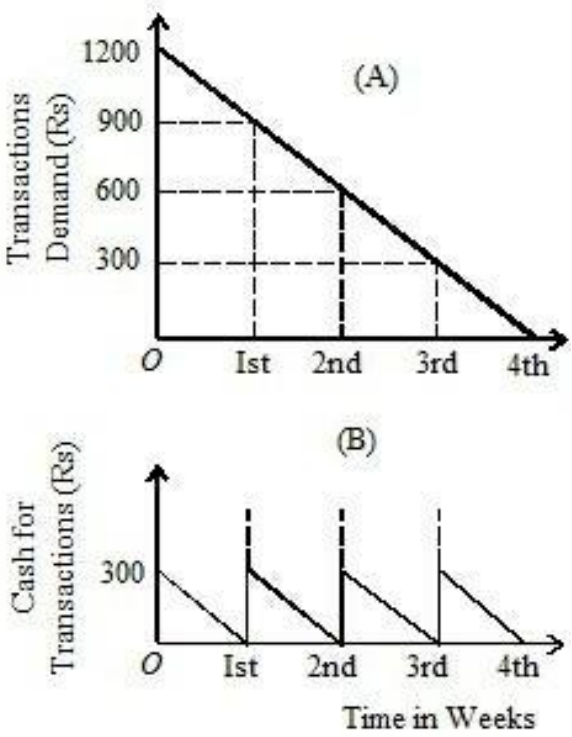


Fig. 2

The modern view is that the transactions deman interest rates which can be expressed as

$L_T = f(Y,r)$.

This relationship between income and interest for the economy as a whole is illustrated in Fig 1200 crores and k=1/4,

This is shown as Y_1 curve in Figure 3. If the income level rises to Rs 1600 crores, the transactions demand also increases to Rs 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 ra ;h to attract some amount of transactions balances into sec curve shows that at still higher rates, the transaction dem 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.

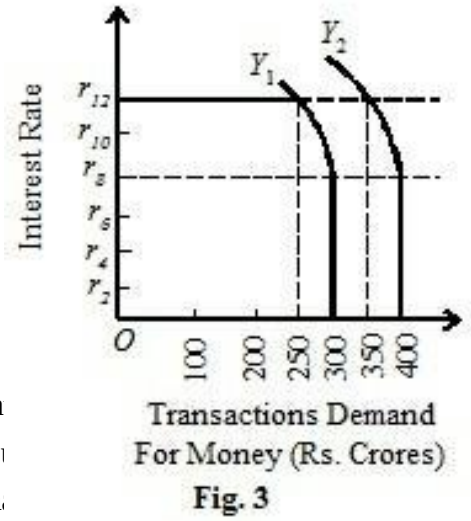


Fig. 3

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.

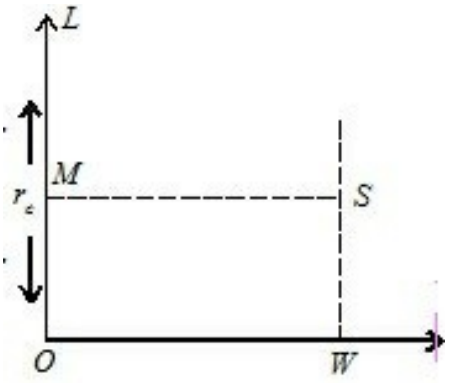
This can be worked out with the help of the equation, $V = \frac{R}{r}$

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 against the interest yield. He, therefore, converts his entire *OW* in the figure. This relationship between an individual and the current rate



Speculative Demand for Money

Fig. 4

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

3. Keynes expressed the amount held under these two motives (M_1) as a function (L_1) of the level of income (Y), $M_1=L_1(Y)$. By making it a function of interest rate (r), it can be written as $M_1= L_1(Y,r)$.

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 zer holdings in bonds because they believe that the interest interest falls to say, r_8 the speculative demand for money is OS. With a further fa OS_1. But at a very low rate of interest r_2, the LS 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.

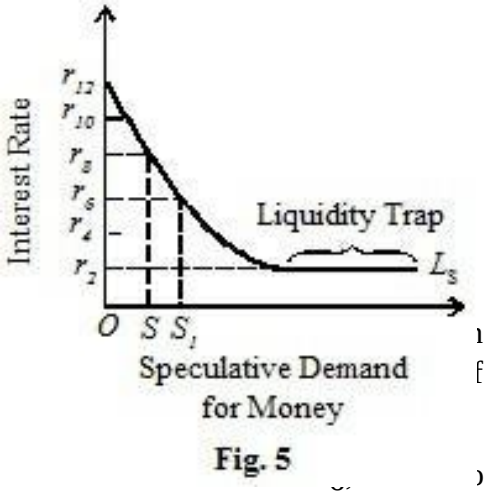


Fig. 5

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 r_2, 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.

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4. F. Modigliani, "Liquidity Preference and the Theory of Interest and Money," *Economica* January 1944.

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

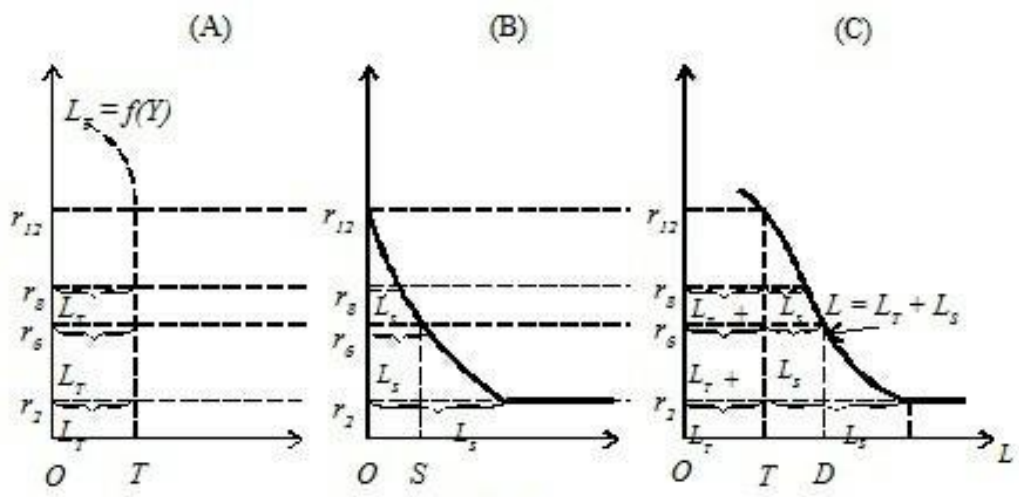

Fig. 6

an inverse function of the rate of interest. For instance, at r_6 rate of interest it is *OS* and as the rate of interest falls to r_2, the *Ls* curve becomes perfectly elastic. Panel (C) shows the total demand curve for money *L* which is a lateral summation of L_T and L_S curves : $L=L_T+L_S$. For example, at r_6 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 r_2 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.

*Adapted from Edward shapiro,*op,cit.,*

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 1/3*t* (4 months) and the other (half) bonds carry maturity of 2/3*t* (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 (1/2*K*) received from the sale of bonds.

Given these assumptions, the firm buys bonds with 2/3*K* ($800) of its income at time *t*=0 and keeps 1/3*K* ($400) in cash, as shown in the figure. At time 1/3*t*, the first half of the bonds purchased ($400) mature which it sells for cash until time 2/3*t*. At time 2/3*t*, 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.

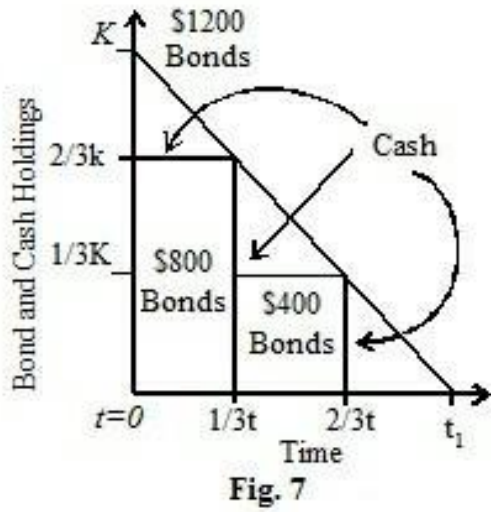

Fig. 7

Now the problem is how to hold assets by a firm, ' bonds that can be owned as well as cash, and given exchanging bonds for cash."

The solution of this problem requires minimising the cost of holding cash balances over the year. The holding of cash balances consists 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.

$$M_D = \frac{1}{2}\sqrt{\frac{2bY}{r}}.P \quad \ldots(3)$$

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.

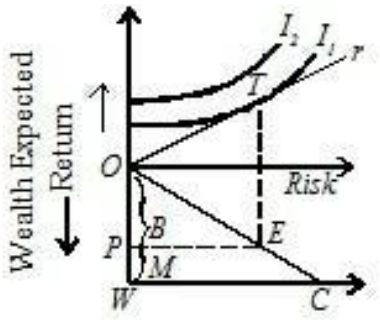

Fig. 8

Thus the risk averter diversifies his total wealth *OW* by putt
keeping in cash. That is why he is called a diversifier. He is n
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 $OB1$ bonds and $B1W$ money. As the rate of interest increases, from r_1 to $r2$ and $r3$, risk averters hold successively more bonds $OB2$ and $OB3$ and reduce money to $B2W$ and $B3W$ in their portfolios. The figure also shows that as the rate of interest increases by equal increments from $r1$, to $r2$ to $r3$,

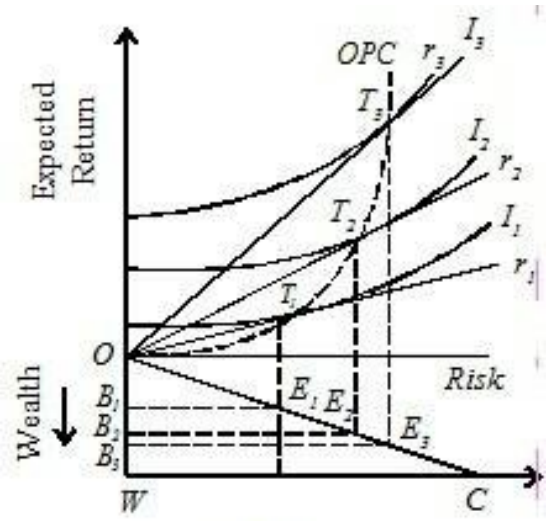

Fig. 9

risk averters hold bonds by decreasing increments, $B2B3<B2B1<OB1$. 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.

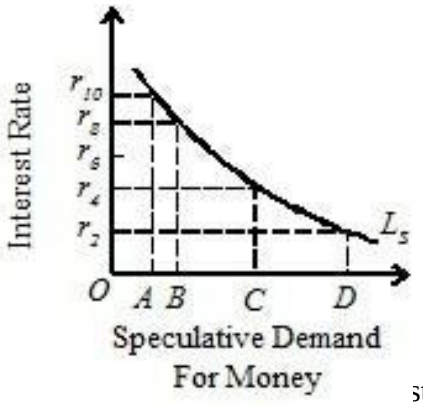

Fig. 10

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 mone st rates and inversely related to interest rates and his the y 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."

EXERCISES

1. What are the motives for holding cash balances according to Keynes ? Give the modifications made by modern economists.
2. Analyse the inventory theory approach to the transactions demand for money. What is its relationship with the rate of interest ?
3. Discuss the portfolio selection approach to the speculative demand for money. How is it superior to Keynes's liquidity preference approach?
4. Is liquidity preference satisfying the speculative demand for money alone which is interest elastic, or other liquidity preferences also ?

Give reasons for your answer.

5. Bring out the relationship between money and interest.

INFLATION AND DEFLATION

INTRODUCTION

Inflation is a highly controversial term which has undergone modification since it was first defined by the neo-classical economists. They meant by it a galloping rise in prices as a result of the excessive increase in the quantity of money. They regarded inflation "as a destroying disease born out of lack of monetary control whose results undermined the rules of business, creating havoc in markets and financial ruin of even the prudent."[1]

But Keynes in his *General Theory* allayed all such fears. He did not believe like the neo-classicists that there was always full employment in the economy which resulted in hyper-inflation with increases in the quantity of money. According to him, there being underemployment in the economy, an increase in the money supply leads to increase in aggregate demand, output and employment. Starting from a depression, as the money supply increases, output at first rises proportionately. But as aggregate demand, output and employment rise further, diminishing returns start and certain bottlenecks appear and prices start rising. This process continues till the full employment level is reached. The rise in the price level during this period is known as *bottleneck inflation* or "semi- inflation". If the money supply increases beyond the full employment level, output ceases to rise and prices rise in proportion with the money supply. This is true inflation, according to Keynes.

Keynes's analysis is subjected to two main drawbacks. *First*, it lays emphasis on demand as the cause of inflation, and neglects the cost side of inflation. *Second*, it ignores the possibility that a price rise may lead to further increase in aggregate demand which may, in trun, lead to further rise in prices.

However, the types of inflation during the Second World War, in the immediate post-war period, till the middle of the 1950s were on the Keynesian model based on his theory of excess demand. "In the latter 1950s, in the United States, unemployment was higher than it had been in the immediate post-war period, and yet prices still seemed to be rising, at the same time, the war time fears of postwar recession had belatedly been replaced by serious concern about the problem of inflation. The result was a prolonged debate...On the one side of the debate was the 'cost-push' school of thought, which maintained that there was no excess demand...On the other side was the "demand-pull" school...Later, in the United States, there developed a third school of thought, associated with the name of Charles Schultz, which advanced the sectoral 'demand-shift theory' of inflation...While the debate over cost-push versus demand-pull was raging in the United States, a new and very interesting approach to the problem of inflation and anit-inflationary policy was developed by
A.W. Phillips."[2]

In the present chapter, we shall study all theories mentiond here, besides Keynes's thoery of the inflationary gap. But before we analyse them, it is instructive to know about the meaning

of inflation.

MEANING OF INFLATION

To the neo-classicals and their followers at the University of Chicago, inflation is fundamentally a monetary phenomenon. In the words of Friedman, "*Inflation is always and everywhere a monetary phenomenon...and can be produced only by a more rapid increase in the quantity of money than output.*"[3] But economists do not agree that money supply alone is the cause of inflation. As pointed out by Hicks, "Our present troubles are not of a monetary character." Economists, therefore, define inflation in terms of a continuous rise in prices. Johnson defines "inflation as a sustained rise"[4] in prices. Brooman defines it as "a continuing increase in the general price level."[5] Shapiro also defines inflation in a similar vein "*as a persistent and appreciable rise in the general level of prices*."[6] Dernberg and McDougall are more explicit when they write that "the term usually refers to a continuing rise in prices as measured by an index such as the consumer price index (CPI) or by the implicit price deflator for gross national product."[7]

However, it is essential to understand that a sustained rise in prices may be of various magnitudes. Accordingly, different names have been given to inflation depending upon the rate of rise in prices.

1. Creeping Inflation. When the rise in prices is very slow like that of a snail or creeper, it is called creeping inflation. In terms of speed, a sustained rise in prices of annual increase of less than 3 per cent per annum is characterised as creeping inflation. Such an increase in prices is regarded safe and essential for economic growth.

2.Walking or Trotting Inflation. When prices rise moderately and the annual inflation rate is a single digit. In other words, the rate of rise in prices is in the intermediate range of 3 to 7 per cent annum or less than 10 per cent. Inflation at this rate is a warning signal for the government to control it before it turns into running inflation.

3. Running Inflation. When prices rise rapidly like the running of a horse at a rate of speed of 10 to 20 per cent per annum, it is called running inflation. Such an Inflation affects the poor and middle classes adversely. Its control requires strong monetary and fiscal measures, otherwise it leads

to hyperinflation.

4. Hyperinflation. When prices rise very fast at double or triple digit rates from more than 20 to 100 per cent per annum or more, it is usually called *runaway* or *galloping* inflation. It is also characterised as hyperinflation by certain economists. In reality, hyperinflation is a situation when the rate of inflation becomes immeasurable and absolutely uncontrollable. Prices rise many times every day. Such a situation brings a total collapse of monetary system because of the continuous fall in the purchasing power of money.

The speed with which prices tend to rise is illustrated in Figure 1. The curve *C* shows creeping inflation when within a period of ten years the price level has been shown to have risen by ab by more than 50 a rise of about 1(when prices rose

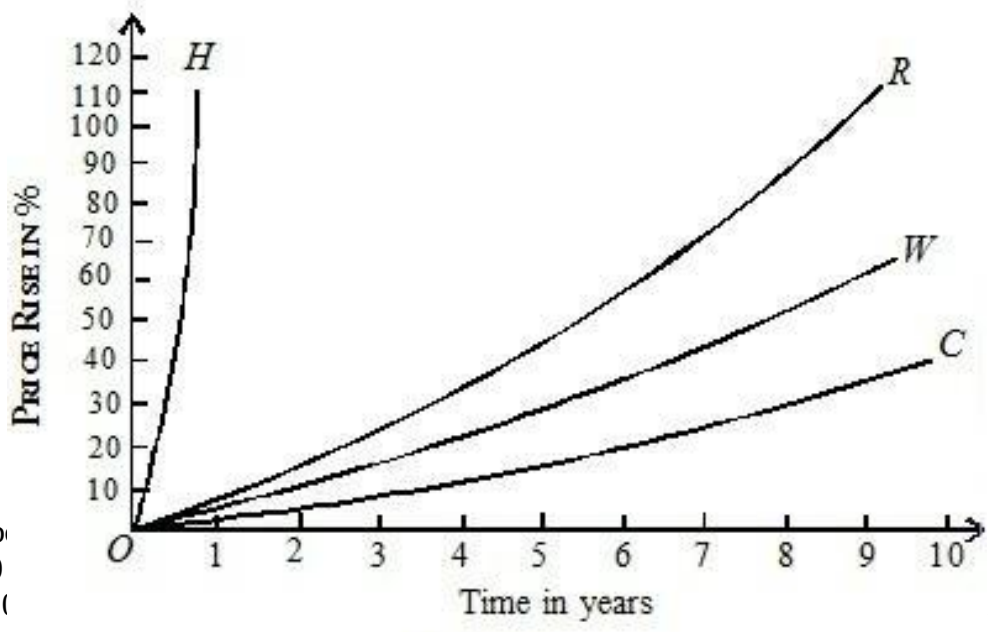

Fig. 1.

THE INFLATIONARY GAP

In his pamphlet *How to Pay for the War* published in 1940, Keynes explained the concept of the inflationary gap. It differs from his views on inflation given in the *General Theory*. In the *General Theory*, he started with underemployment equilibrium. But in *How to Pay for the War*, he began with a situation of full employment in the economy. He defind an inflationary gap as an excess of planned expenditure over the available output at pre-inflation or base prices. According to Lipsey, "The inflationary gap is the amount by which aggregate expenditure would exceed aggregate output at the full employment level of income." The classical economists explained inflation as mainly due to increase in the quantity of money, given the level of full employment. Keynes, on the other hand, ascribed it to the excess of expenditure over income at the full employment level. The larger the aggregate expenditure, the larger the gap and the more rapid the inflation. Given a constant average propensity to save, rising money incomes at full employment level would lead to an excess of demand over supply and to a consequent inflationary gap. Thus Keynes used the concept of the inflationary gap to show the main determinants that cause an inflationary rise of prices.

The inflationary gap is explained with the help of the following example:

Suppose the gross national product at pre-inflation prices is Rs. 200 crores.Of this Rs. 80 crores is spent by the Government. Thus Rs. 120 (Rs. 200-80) crores worth of output is available to the public for consumption at pre-inflation prices. But the gross national income

at current prices at full employment level is Rs. 250 crores. Suppose the government taxes away Rs. 60 crores, leaving Rs. 190 crores as disposable income. Thus Rs. 190 crores is the amount to be spent on the available output worth Rs. 120 crores. thereby creating an inflationary gap of Rs. 70 crores.

This inflationary gap model is illustrated as under :

1.Gross National Income at current prices	Rs. 250 Cr. =
2.Taxes	= Rs. 60 Cr.
3.Disposable Income	= Rs. 190 Cr.
4.GNP at pre-inflation prices	= Rs. 200 Cr.
5.Government expenditure	= Rs. 80 Cr.
6.Output available for consumption at pre-inflation prices	= Rs. 120 Cr.
Inflationary gap (Item 3-6)	= Rs. 70 Cr.

In reality, the entire disposable income of Rs. 190 Crores is not spent and a part of it is saved. If, say, 20 per cent (Rs. 38 croes) of it is saved, then Rs. 152 crores (Rs. 190-Rs. 38 crores) would be left to create demand for goods worth Rs. 120 crores. Thus the actual inflationary gap would be Rs. 32 (Rs. 152-120) crores instead of Rs. 70 crores.

The inflationary gap is shown diagrammatically in Figure 2 where Y_F is the full employment level of income, 45° line represents aggregate supply *AS* and *C+1+G* line the desired level of consumption, investment and government expenditure (or aggregate demand curve). The economy's aggregate demand curve (*C+1+G*) = *AD* intersects the 45 per cent line (*A* than the full employment income lev

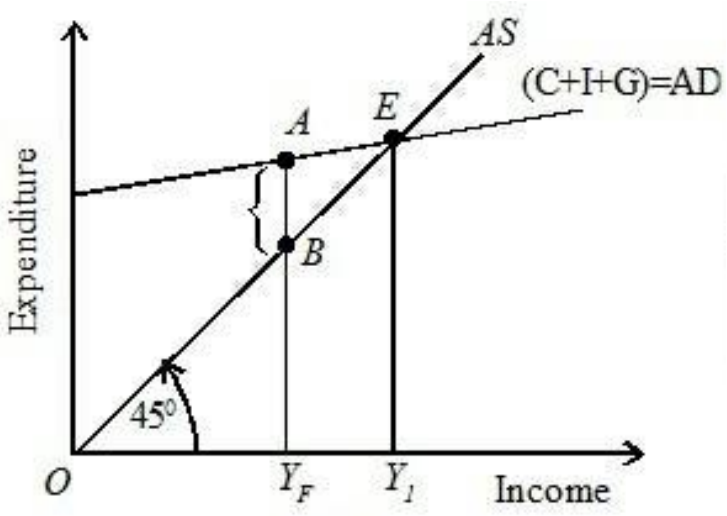

Fig. 2.

exceeds the aggregate supply (Y_FB) at the full employment income level is the inflationary gap. This is *AB* in the figure. The excess volume of total pending when resources are fully employed creates inflationary pressures. Thus the inflationary gap leads to inflationary pressures. in the economy which are the result of excess aggregate demand.

How can the inflationary gap be wiped out ?

The inflationary gap can be wiped out by increase in savings so that the aggregate demand is reduced. But this may lead to deflationary tendencies.

Another solution is a raise the value of available output to match the disposable income. As aggregate demand increases, businessmen hire more labour to expand output. But there being full employment at the current money wage, they offer higher money wages to induce more workers to work for them. As there is already full employment, the increase in money wages leads to proportionate rise in prices. Moreover, output cannot be increased during the short run because factors are already fully employed. So the inflationary gap can he closed by increasing taxes and reducing expenditure. Monetary policy can also be used to decrease the money stock. But Keynes was not in favour of monetary measures to control inflationary pressures within the economy.

Its Criticisms

The concept of inflationary gap has been criticised by Friedman[8], Koopmans[9], Salant[10], and other economists.

1. The analysis of inflationary gap is based on the assumption that full employment prices are flexible upward. In other words, they respond to excess demand in the market for goods. It also assumes that money wages are sticky when prices are rising., but the share of profits in GNP increases. So this concept is related to excess-demand inflation in which there is profit inflation. This has led to the mixing up of demand and cost inflations.

2. Bent Hansen criticises Keynes for confining the inflationary gap to the goods market only and neglecting the role of the factor market. According to him, an inflationary gap is the result of excess demand in the goods market as well as in the factor market.[11]

3. The inflationary gap is a static analysis. But the inflationary phenomena are dynamic. To make them dynamic, Keynes himself suggested the intorduction of time lags concerning receipts and expenditures of income. Koopmans has developed relationships between eggs and the rate of price increase per unit of time. He has shown with the help of spending lags and wage-adjustment lags that the speed of inflation becomes smaller, that is the inflationary gap is narrowed.

4. Holzman has criticised Keynes for applying the multiplier technique to a full employment situation. According to him, the multiplier technique is not adequate in periods of full employment and inflation. It abstracts from changes in the distribution of income. In a full employment situation, the share of one group in the national output can only be increased at the expense of another.[12]

5. Another weakness of the inflationary-gap analysis is that it is related to flow concepts, such as current income, expenditure, consumption, and saving. In fact, the increase in prices at the full employment level is not confined to prices of current goods alone. But they also affect the prices of goods already produced. Further, the disposable income which is the difference between current income and taxes, may include idle balances from the income of previous periods.

Its Importance

Despite these criticisms the concept of inflationary gap has proved to be of much importance in explaining rising prices at full employment level and policy measures in controlling inflation.

It tells that the rise in prices, once the level of full employment is attained, is due to excess demand generated by increased expenditures. But the output cannot be increased because all resources are fully employed in the economy. This leads to inflation. The larger the expenditure, the larger the gap and more rapid the inflation.

As a policy measure, it suggests reduction in aggregate demand to control inflation. For this, the best course is to have a surplus budget by raising taxes. It also favours saving incentives to reduce consumption

expenditure. “The analysis of the inflationary gap in terms of such aggregate as national income, investment outlays and consumption expenditures clearly reveals what determines public policy with respect to taxes, public expenditures, savings campaigns, credit control, wage adjustment—in short, all the conceivable anti-inflationary measures affecting the propensities to consume, to save and to invest which together determine the general price level.”[13]

DEMAND-PULL OR MONETARY THEORIES OF INFLATION

Demand-pull inflation or excess demand inflation is the traditional and most common type of inflation. It takes place when aggregate demand is rising while the available supply of goods is becoming less. Goods may be in short supply either because resources are fully utilised or production cannot be increased rapidly to meet the increasing demand. As a result, prices begin to rise in response to a situation often decribed as “too much money chasing too few goods.”

There are two principal theories about the demand-pull inflation that of the monetarists and the Keynesians. We shall also discuss a third one propounded by the Danish economist, Bent Hansen.*

1. Monetarist View or Monetary Theory of Inflation

The monetarists emphasise the role of money as the principal cause of demand-pull inflation. They contend that inflation is always a monetary phenomenon. Its earliest explanation is to be found in the simple quantity theory of money. The monetarists employ the familiar indentity of Fisher’s Equation of Exchange.

$$MV = PQ$$

where M is the money supply, V is the velocity of money, P is the price level, and Q is the level of real output.

Assuming V and Q as constant, the price level (P) varies proportionately with the supply of money (M). With flexible wages, the economy was

believed to operate at full employment level. The labour force, the capital stock, and technology also changed only slowly over time. Consequently, the amount of money spent did not affect the level of real output so that a doubling of the quantity of money would result simply in doubling the price level. Until prices had risen by this proportion, individuals and firms would have excess cash which they would spend, leading to rise in prices. So inflation proceeds at the same rate at which the money supply expands. In this analysis the aggregate supply is assumed to be fixed and there is always full employment in the economy. Naturally, when the money supply increases it creates more demand for goods but the supply of goods cannot be increased due to the full employment of resources. This leads to rise in prices. But it is a continuous and prolonged rise in the money supply that will lead to true inflation.

This classical theory of inflation is explained in Fig. 3 where the quantity of money is taken on horizontal line and the price level on vertical line. When the quantity of money is *OM*, the price level is *OP*. When the quantity of money is doubled to OM_2 the price level is also doubled to P_2. Further, when the quantity of money is increased four-fold to M_4, the price level also increases by four times to P_4. This relationship is expressed by the curve $P = f(M)$ from the origin at 45°.

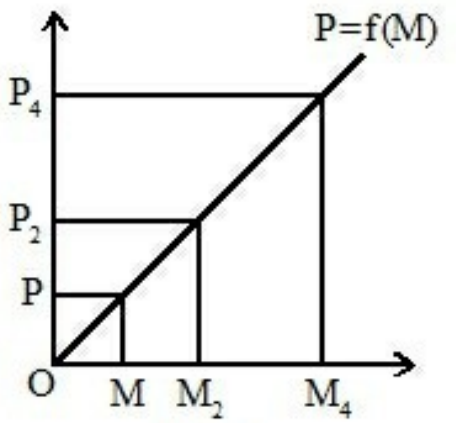

Fig. 3.

Friedman's View

Modern quantity theorists led by Friedman hold that "inflation is always and everywhere a monetary phenomenon that arises from a more rapid expansion in the quantity of money than in total output." He argues that

changes in the quantity of money will work through to cause changes in nominal income. Inflation everywhere is based on an increased demand for goods and services as people try to spend their cash balances. Since the demand for money is fairly stable, this excess spending is the outcome of a rise in the nominal quantity of money supplied to the economy. So inflation is always a monetary phenomenon.

Next Friedman discusses whether an increase in money supply will go first into output or prices. Initially, when there is monetary expansion, the nominal income of the people increases. Its immediate effect will be to increase the demand for labour. Workers will settle for higher wages. Input costs and prices will rise. Profit margins will be reduced and the prices of products will increase. In the begining, people do not expect prices to continue rising. They regard the price rise as temporary and expect prices to fall later on. Consequently, they tend to increase their money holdings and the price rise is less than the rise in nominal money supply. Gradually people tend to readjust their money holdings. Price then rise more than in proportion to the money supply. The precise rate at which prices rise for a given rate of increase in the money supply depends on such factors as past price behaviour,

current changes in the structure al

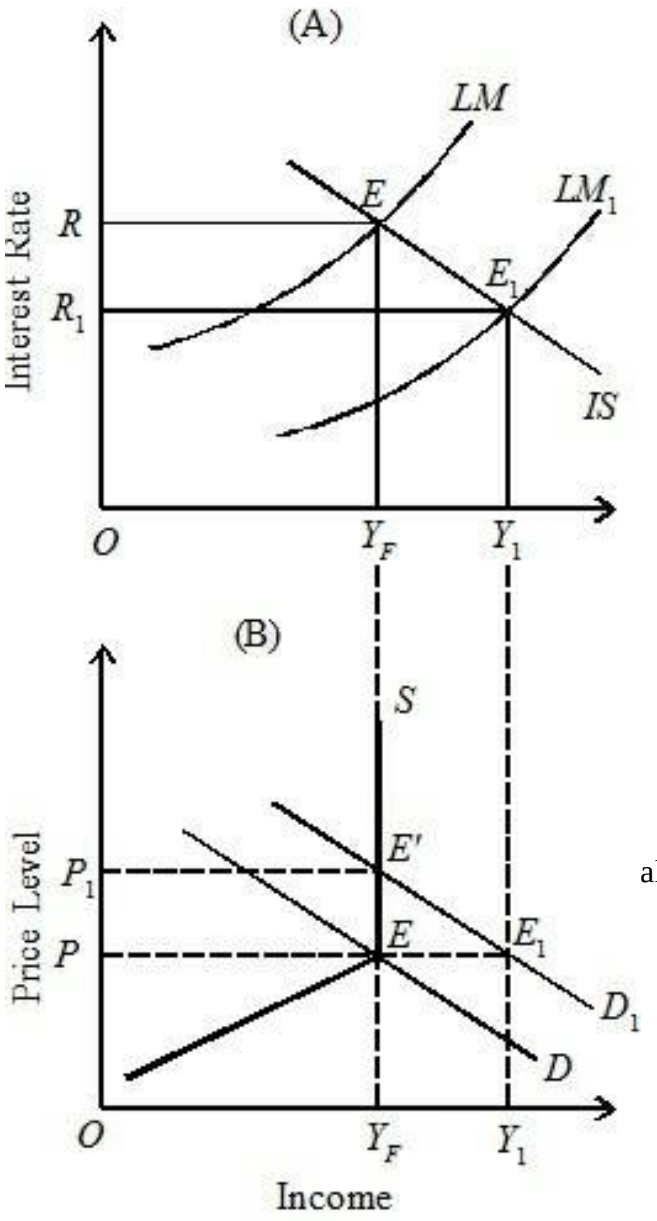

Fig. 4.

policy. Thus, according to Friedman, the monetary expansion works through output before inflation starts.

The quantity theory version of the demand-pull inflation is illustrated diagrammatically in Figure 4 (A) & (B). Suppose the money supply is increased at a given price level *P* as determined by *D* and *S* curves in Panel (B) of the figure. The initial full employment situation at this price level is shown by the intersection of IS and *LM* curves at *E* in Panel (A) of the figure where *R* is the interest rate and Y_F is the full employment level of income. Now with the increase in the quantity of money, the *LM* curve shifts rightward to LM_1 and intersects the *IS* curve at E_1 such that the equilibrium level of income rises to Y_1 and the rate of interest is lowered to R_1. As the aggregate supply is assumed fixed, there is no change in the position of the *IS* curve.

Consequently, the aggregate demand rises which shifts the *D* curve to the right to D_1 and thus excess demand is created equivalent to EE_1 ($=Y_FY_1$) in Panel (B) of the figure. This raises the price level, the aggregate supply being fixed, as shown by the vertical portion of the supply curve *S*. The rise in the price level reduces the real value of the money supply so that the LM_1 curve shifts to the left to *LM*. Excess demand will not be eliminated until aggregate demand curve D_1 cuts the aggregate supply curve *S* at *E'*. This means a higher price level P_1 in Panel (B) and return to the original equilibrium position *E* in the upper Panel of the figure where the *IS* curve cuts the *LM* curve. The "result, then is self-limiting, and the price level rises in exact proportion to the real value of the money supply to its original value."[14]

2. Keynes' Theory of Demand-Pull Inflation

Keynes and his followers emphasise the incease in aggregate demand as the source of demand-pull inflation. There may be more than one source of demand. Consumers want more goods and services for consumption purposes. Businessmen want more inputs for investment. Government demands more goods and services to meet civil and military requirements of the country. Thus the aggregate demand comprises consumption,

investment and government expenditures. When the value of aggregate demand exceeds the value of aggregate supply at the full employment level, the inflationary gap arises. The larger the gap between aggregate demand and aggregate supply, the more rapid the inflation. Given a constant average propensity to save, rising money incomes at the full employment level would lead to an excess of aggregate demand over aggregate supply and to a consequent inflationary gap. Thus Keynes used the notion of the inflationary gap to show an inflationary rise in prices.

The Keynesian theory is based on a short-run analysis in which prices are assumed to be fixed. In fact, prices are determined by non-monetary forces. On the other hand, output is assumed to be more variable which is determined largely by changes in investment spending. The Keynesian chain of causation between changes in nominal money income and in prices is an indirect one through the rate of interest. When the quantity of money increases, its first effect is on the rate of interest which tends to fall. A fall in the interest rate would, in turn, increase investment which would raise aggregate demand. A rise in aggregate demand would first affect only output and not prices so long as there are unemployed resoures. But a sudden large increase in the aggregate demand would encounter bottlenecks when resources are still unemployed.

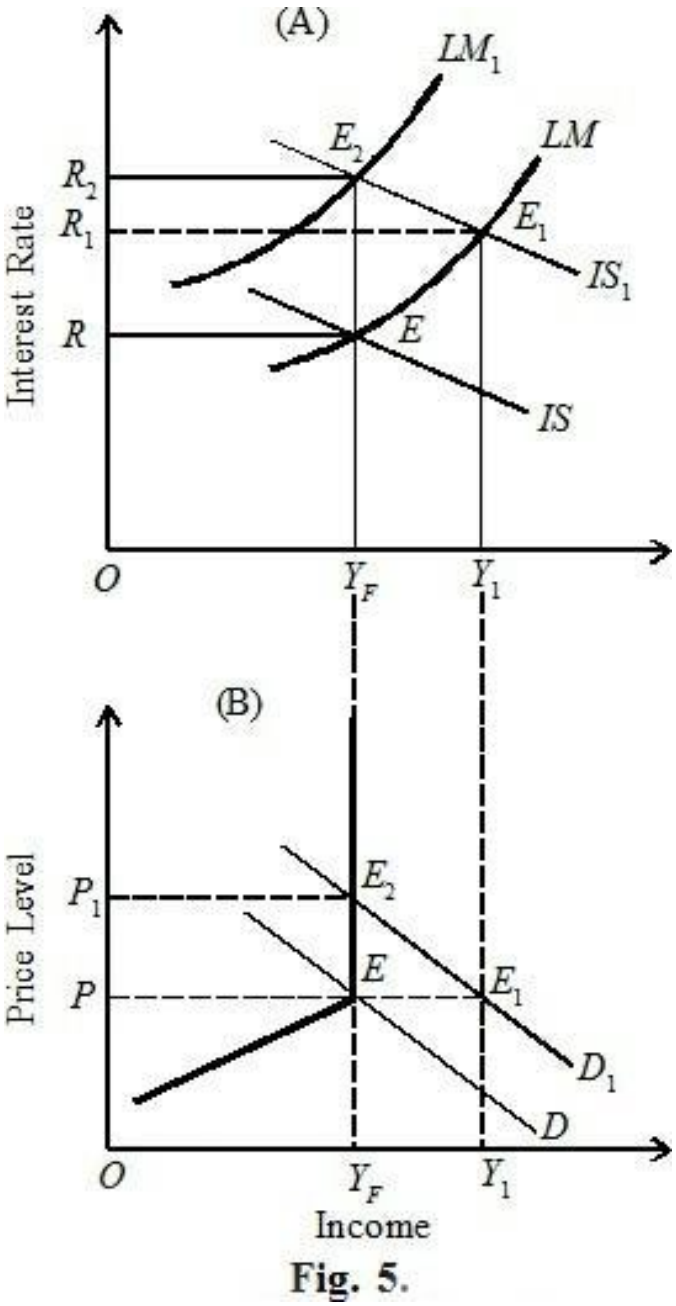

Fig. 5.

The supply of some factors might become inelastic or others might be in short supply and non-substitutable. This would lead to increase in marginal costs and hence in prices. Accordingly prices would rise above average unit cost and profits would increase rapidly which, in turn, would bid up wages owing to trade union pressures. Diminishing returns might also set in some industries. As full employment in reached, the elasticity of supply of output falls to zero and prices rise without any increase in output. Any further increase in expenditure would lead to excess demand and to more than proportional increase in prices. Thus, in the Keynesian view so long as there in unemployment, all the change in income is in output, and once there is full employment, all is in prices.

The Keynesian theory of demand-pull inflation is explained diagrammatically in Figure 5 (A) and (B). Suppose the economy is in equilibrium at E where the IS and LM curves intersect with full employment income level Y_F and interest rate R, as shown in Panel (A) of the figure. Corresponding to this situation, the price level is P in Panel (B). Now the government increases its expenditure. This shifts the IS curve rightward to IS_1 and intersects the LM curve at E_1 when the level of income and the interest rate rise to Y_1 and R_1 respectively. The increase in government expenditure implies an increase in aggregate demand which is shown by the upward shift of the D curve to D_1 in the lower Panel (B) of the figure. This creates excess demand to the extent of EE_1 ($=Y_FY_1$) at the initial price level P. Excess demand tends to raise the price level, as aggregate supply of output cannot be increased after the full employment level. As the price level rises, the real value of money supply falls. This shifts the LM curve to the left to LM_1 such that it cuts the IS_1 curve at E_2 where equilibrium is established at the full employment level of income Y_F, but at a higher interest rate R_2 (in Panel A) and a higher price level P_1 (in Panel B).

Thus the excess demand caused by the rise in government expenditure eliminates itself by changes in the real value of money.

3. Bent Hansen's Excess Demand Model

The Danish economist Bent Hansen[15] has presented an explicit dynamic excess demand model of inflation which incorporates two separate price levels, one for the goods market and other for the factor (labour) market.

Its Assumptions

His dynamic model for demand inflation is based on the following assumptions:

1. There is perfect competition in both the goods market and the factor market.

2. Price at the moment will persist in the future.

3. Only one commodity is produced with the help of only one variable factor, labour services.

4. The quantity of labour services per unit of time is a given magnitude.

5. There is a fixed actual level of employment and consequently of output which is full employment.

The Model

Given these assumptions, the model is explained in terms of Figure 6. The vertical axis measures the price-wage ratio P/W (inverse of the real wage). The aggregate real income or output is measured along the horizontal axis. S is the supply curve of planned production, $S=F(P/W)$. It varies positively with P/W such that the higher the price is relative to the wage rate, the less is the demand for consumer goods, $D=F(P/W)$. D is the demand curve of planned demand which has an inverse relationship with P/W such that the higher price is relative to the wage rate the larger is the planned production. The vertical line Q is the full employment output level Q_F and Q=constant.

The horizontal difference between the curve D and Q is the "quantitative

inflationary gap in the goods markets". Such a gap exists at all price-wage ratios below (P/W) in the figure. The horizontal difference between the curves S and Q is the index for the factor-gap." *Thus* ($D–Q$) *is the goods gap and* ($S–Q$) *is the factor gap.*

Suppose the two curves D and S intersect to the right of the full employment level of output at point E. This happens if there is monetary pressure of inflation because otherwise it would not be possible with given P/W to have a positive inflationary gap in the goods markets and positive factor-gap simultaneously. A monetary pressure of inflation exists only when P/W is between P/W_1 and P/W_4. When $P/W>P/W_1$, the inflationary gap in the goods-market is greater than zero; and when $P/W<P/W_4$ both
the index for the factor-gap and the factor-gap are negative. Next Hansen

introduces two dynamical equations :

$$dp/dt = f\,(D–Q \qquad \textit{...(1)}$$

$$dw/dt = F\,(S–Q \qquad \textit{...(2)}$$

where dp/dt is the speed of the rise in the price level, and dw/dt is the speed of the rise in the wage rate.

When ($D–Q$) is zero, dp/dt = 0; and when ($S–Q$) is zero, dw/dt = O. This is a static equilibrium system. When the two gaps are positive, the rates of price and wage changes are also positive.

It follows that when both the excess demand for goods ($D–Q$) and the excess demand for factors ($S–Q$) are positive, both price and wage-rate will rise. Each will be a quasi-equilibrium position which is stable in the sense that whatever price-wage relation is started, there will be forces at work which tend to bring the system back to the quasi-equilibrium position.

The quasi-equilibrium system is given by

$$Q = \text{Constant} \qquad S = F(P/W) \qquad D = f(P/W)$$

and $$P/W = \frac{f(D-Q)}{F(S-Q)}$$

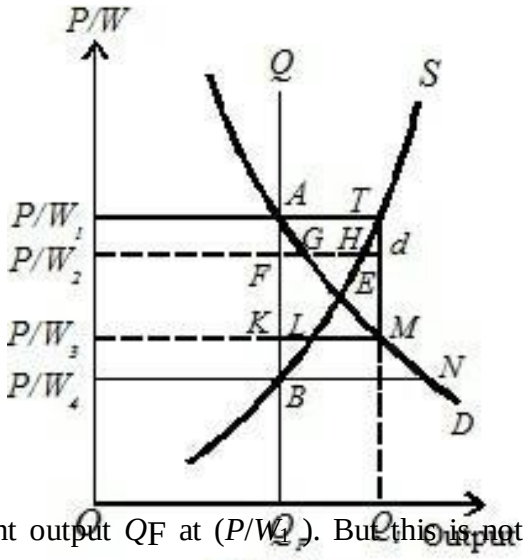

Fig. 6.

Let us take the figure where the curves *S* and *D* intersect at point *E*, to the right of the full employment level of output Q_F. Since point *E* cannot be achieved, an initial unstable equilibrium occurs at point *A* where the price-wage ratio is (P/W_1). In this situation, there is no goods gap and goods prices do not rise because planned demand (*D*) equals full employment output (Q_F) at *A*. But there is a large factor gap at point *T* so that wages rise rapidly. This is because planned production Q_1 exceeds the full employment output Q_F at (P/W_1). But this is not possible because Q_1 output is more than the full employment output Q_F. Consequently, there is excess demand for labour which leads to labour shortages and to rise in the wage rate. Thus *P*/*W* falls. When the price-wage ratio falls, an excess demand for goods (goods gap) begins to appear and that for factors (factor gap) simultaneously decreases. Suppose P/W_1 falls to P/W_2. At P/W_2, the goods gap *FG* is smaller than the factor gap *FH* which means that the small goods gap produces a slow rise in prices and the larger factor gap produces a higher rise in wage rate. This will lead to a further fall in wage-price ratio to P/W_3. At P/W_3, the factor gap is reduced to *KL* and the goods gap is raised to *KM*, thereby leading to a slower rise in wage rate and more rapid rise in prices respectively. This retards the fall in the wage-price ratio. In this way, the price-wage ratio will fall, increasing slowly to a level where the goods gap corresponds to the factor gap. This means that the precentage rise of wage rate per unit time is equal to the percentage rise of the price per unit time. Similar reasoning will apply if we start from P/W_4 where the large goods gap *BN* and zero factor gap would raise prices and hence the wage-price ratio. A key determinant of the level of price-wage ratio is the

flexibility of wage-rate and prices relative to each other. The more flexible are prices relative to wages, the closer is the value of price-wage ratio to $P/W1$.

Between P/W_1 and P/W_4, there is some quasi-equilibrium at which both prices and wage-rates move together. The quasi-equilibrium is not a static equilibrium but a dynamic one, since both prices and wage rates rise
without interruption and the relevant gaps are not zero. "The actual speed
of the inflation to quasi-equilibrium will depend on the absolute sensitivity of wage and price change to the size of the relevant gaps. If both are relatively volatile, inflation will be rapid; if both are relatively sluggish, inflation will be slower." The more rigid prices are relative to wages, the closer is the value of price-wage ratio to P/W_4.

To conclude, Hensen's excess demand model of inflation points toward the sources of inflationary pressures and the actual process of inflation in the economy. But, according to Ackley, it fails to specify the rate at which inflation will occur. It is an elegant but perhaps rather empty analysis of demand inflation.

COST-PUSH INFLATION

Cost-push inflation is caused by wage increases enforced by unions and profit increases by employers. The type of inflation has not been a new phenomenon and was found even during the medieval period.[16] But it was revived in the 1950s and again in the 1970s as the principal cause of inflation. It also came to be known as the "*New Inflation*."[17] Cost-push inflation is caused by wage-push and profit-push to prices.

The basic cause of cost-push inflation is the rise in money wages more rapidly than the productivity of labour. In advanced countries, trade unions are very powerful. They press employers to grant wage increases considerably in excess of increases in the productivity of labour, thereby raising the cost of production of commodities. Employers, in turn, raise

prices of their products. Higher wages enable workers to buy as much as before, in spite of higher prices. On the other hand, the increase in prices induces unions to demand still higher wages. In this way, the wage-cost spiral continues, thereby leading to cost-push or wage-push inflation.

Cost-push inflation may be further aggravated by upward adjustment of wages to compensate for rise in the cost of living index. This is usually done in either of the two ways. *First*, unions include an "escalator clause" in contracts with employers, whereby money wage rates are adjusted upward each time the cost of living index increases by some specified number of percentage points. *Second*, in case where union contracts do not have an escalator clause, the cost of living index is used as the basis for negotiating larger wage increases at the time of fresh contract settlements.

Again, a few sectors of the economy may be affected by money wage increases and prices of their products may be rising. In many cases, their products are used as inputs for the production of commodities in other sectors. As a result, production costs of other sectors will rise and thereby push up the prices of their products. Thus wage-push inflation in a few sectors of the economy may soon lead to inflationary rise in prices in the entire economy.

Further, an increase in the price of domestically produced or imported raw materials may lead to cost-push inflation. Since raw materials are used as inputs by the manufacturers of finished goods, they enter into the cost of production of the latter. Thus a continuous rise in the prices of raw materials tends to set off a cost-price-wage spiral.

Another cause of cost-push inflation is *proft-push inflation*. Oligopolist and monopolist firms raise the prices of their products to offset the rise in labour and production costs so as to earn higher profits. There being imperfect competition in the case of such firms, they are able to "administer prices" of their products. "In an economy in which so called administered prices abound, there is at least the possibility that these prices may be administered upward faster than costs in an attempt to earn greater profits. To the extent such a process is widespread profit-push inflation will result."[18] Profit-push inflation is, therefore, also called *administered-price theory of inflation* or *price-push inflation* or *sellers*'

inflation or *market-power inflation.*

But there are certain limitations on the power of firms to raise their profits. They cannot raise their selling prices to increase their profit- margins if the demand for their products is stable. Moreover, firms are reluctant to increase their profits every time unions are successful in raising wages. This is beause profits of a firm depend not only on price but on sales and unit costs as well, and the latter depend in part on prices charged. So firms cannot raise their profits becuase their motives are different from unions. *Lastly*, profits form only a small fraction of the price of the product and a once-for-all increase in profits is not likely to have much impact on prices. Economists, therefore, do not give much importance to profit-push inflation as an explanation of cost-push inflation.

Cost-push inflation is illustrated in Fig

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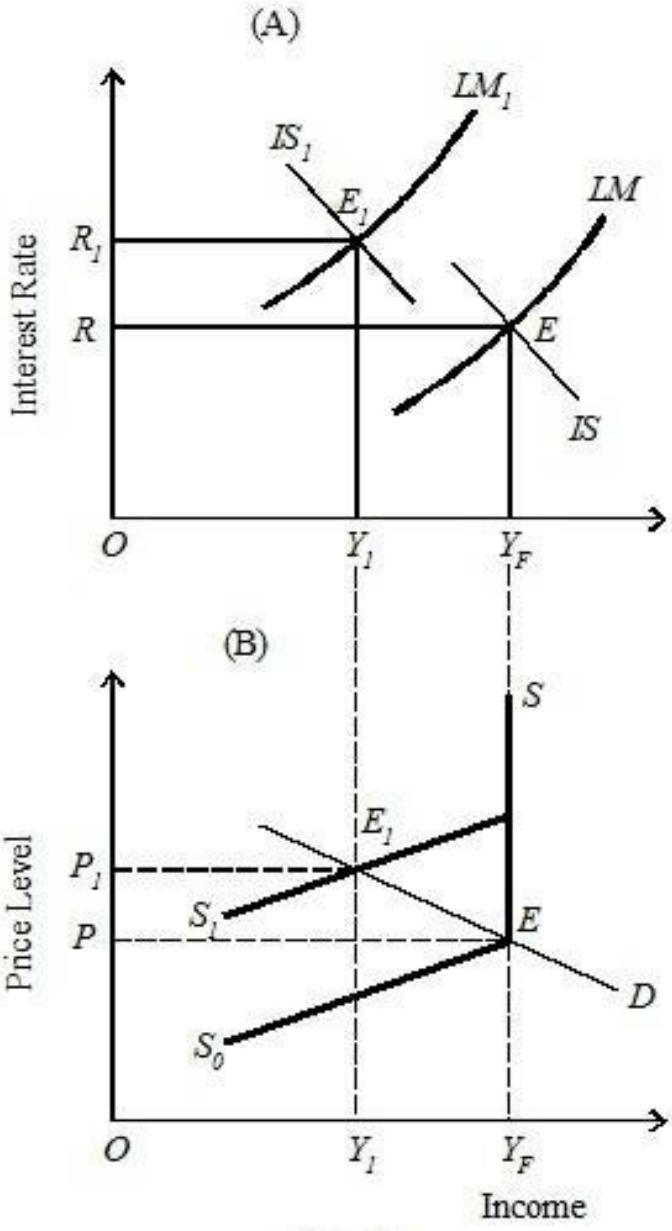

Fig. 7.

money wages. Consequently, the equilibrium position shifts from E to E_1 reflecting rise in the price level from P to P_1 and fall in output, employment and income from Y_F to Y_1 level.

Now consider the upper Panel (A) of the figure. As the price level rises, the *LM* curve shifts to the left to LM_1 because with the increase in the price level to P_1 the real value of the money supply falls. Similarly, the *IS* curve shifts to the left to IS_1 because with the increase in the price level, the demand for consumer goods falls due to the Pigou effect. Accordingly, the equilibrium position of the economy shifts from E to E_1 where the interest rate increases from R to R_1 and the output, employment and income levels fall from the full employment level of Y_F to Y_1.

Its Criticisms

The cost-push theory has been criticised on three issues.

First, cost-push inflation is associated with unemployment. So the monetary authority is in a fix because to control inflation it will have to tolerate unemployment.

Second, if the government is committed to a policy of full employment, it will have to tolerate wage increases by unions, and hence inflation.

Lastly, if the government tries to increase aggregate demand during periods of unemployment, it may lead to increase in wages by trade union action instead of raising output and employment.

DEMAND-PULL VERSUS COST-PUSH INFLATION

There has been a lot of controversy among economists over the issue

whether inflation is the consequence of demand-pull or cost-push. According to F. Machlup, "The distinction between cost-push and demand-pull inflation is unworkable, irrelevant or even meaningless."

However, the debate between demand-pull and cost-push inflation arises mainly from the difference between the policy recommendations on the two views. Recommendations on demand-pull inflation are related to monetary and fiscal measures which lead to a higher level of unemployment. On the other hand, recommendations on cost-push aim at controlling inflation without unemployment through administrative controls on price increases and incomes policy.

Machlup argues that the controversial issue is partly who is to be blamed for inflation and partly what policies should be pursued to aviod a persistent increase in prices. If demand-pull is the cause of inflation then the government is blamed for overspending and taxing little, and the central bank is blamed for keeping interest rates too low and for expansion of too much credit. On the other hand, if cost-push is the cause of inflation then trade unions are blamed for excessive wage increases, industry is blamed for granting them, big firms for raising administered prices of materials and goods to earn higher profits and government is blamed for not persuading or forcing unions and industry from raising their wages and profits. But trade unions reject the wage-push theory because they would not like to be blamed for inflation. They also reject the demand-pull view because that would prevent the use of monetary and fiscal measures to increase employment. Thus they hold only big firms responsible for inflationary rise in prices through administered prices. But there is no conclusive proof that the profit margins and profit rates of firms have been increasing year after year.

Machlup further points out that there is a group of economists who holds that cost-push is no cause of inflation, "because, without an increase in purchasing power and demand, cost increases would lead to unemployment." On the other hand, there is another group of economists who believes that demand-pull is no cause of inflation, it takes a cost-push

to produce it.

Thus it is difficult to distinguish demand-pull from cost-push inflation in practice and it is easy to say that inflation has been caused by cost-push when, in fact, demand-pull may be the cause. As pointed out by Samuelson and Solow, "The trouble is that we have no normal initial standard from which to measure, no price level which has always existed to which every one has adjusted."[20] It is also suggested that identification of demand-pull or cost-push inflation can be made with reference to timing. If prices increase first, it is a demand-pull inflation, and if wages increase follow, it is a cost-push inflation.

Like Machlup, Johnson regards the issue of demand-pull versus cost-push as "largely a spurious one." He assigns three reasons for this, *First*, the proponents of the two theories fail to investigate the monetary assumptions on which the theories are based. Neither the demand-pull nor the cost-push theory can generate a sustained inflation unless monetary policy followed by the monetary theory is taken into consideration under varying circumstances. The two theories are, therefore, not independent and self-contained. The *second* reason is based on differences between the two theories about their definitions of full employment. If full employment is defined as a situation when the demand for goods is just sufficient to prevent from rising or falling, then it is a case of demand-pull inflation which is associated with excess demand for goods and labour. Full employment here means overfull employment. On the other hand, if full employment is defined as the level of unemployment at which the percentage of the unemployment just equals the number of persons seeking jobs, then inflation is caused by forces other than excess demand. Such forces cause cost-push inflation. In the *third* place, it is extremely difficult to devise a test capable of determining whether a particular inflation is of the demand-pull or cost-push type.[21]

We may conclude with Lipsey :"Debate continues on the balance between demand and cost as forces causing inflation in the contermporary inflationary climate. The debate is important because the policy implications of different causes of inflation are different, and different target variables need to be controlled, according to the cause. Until the

causes of inflation are fully understood, there will be debate about policies."[22]

MIXED DEMAND-PULL COST-PUSH INFLATION

Some economists do not accept this dichotomy that inflation is either demand-pull or cost-push. They hold that the actual inflationary process contains some elements of both. In fact, excess demand and cost-push forces operate simultaneously and interdependently in an inflationary process. Thus inflation is mixed demand-pull and cost-push when price level changes reflect upward shifts in both aggregate demand and supply functions.

But it does not mean that both demand-pull and cost-push inflations may start simultaneously. In fact, an inflationary process may begin with either excess demand or wage-push. The timing in each case may be different. In demand-pull inflation, price increases may precede wage increases, while it may be the other way round in the case of cost-push inflation. So price increases may start with either of the two forces, but the inflationary process cannot be sustained in the absence of the other forces.

Suppose an inflationary process begins with excess demand with no cost- push forces at work. Excess demand will raise prices which will in due course pull up money wages. But the rise in money wages is not the result of cost-push forces. Such a mixed inflation will lead to sustained rise in prices. This is illustrated in Figure 8. The initial equilibrium is at Y_F level of full employment income determined by aggregate demand D_0 and aggregate supply S_0S curves at A. The price level is P_0 with increase in aggregate demand from D_0 to D_1 and D_2 given the vertical portion of the supply curve S_0S, prices rise from P_0 to P_2 to P_5 , the inflationary path being A, B and C. This sustained increase in prices has also been the result of the increase in money wage rates due to increase in aggregate demand at the full employment level. When prices rise, producers are

encouraged to increase output as their profits rise with increased aggregate demand. They, therefore, raise the demand for labour thereby increasing money wages which further lead to increase in demand for goods and services. So long as the demand for output continues to raise money incomes, inflationary pressures will continue.

Consider an inflationary process that may begin from the supply side due to increase in money wage rates. This will raise prices every time there is a wage-push. But the rise in prices will not be sustained if there is no increase in demand. This is illustrated in Fig. 8 where given the aggregate demand curve D_O, a wage-push shifts the supply curve S_O to S_1. The new equilibrium is at E. This raises the price level from P_O to P_1 and lowers output and employment to Y_2 below the full employm the supply curve to S_2, and the new equi thereby raising the price level further to P_3 and also reducing output and employment to Y_1. In the absence of increase in aggregate demand, this cost-push inflationary process will not be a sustained one and will sooner or later come to an end.

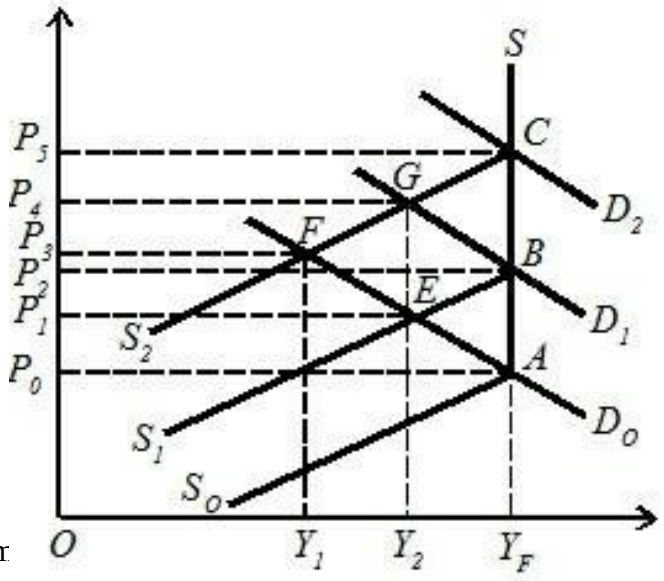

Fig. 8

The cost-push inflationary process will be self-sustaining only if every wage-push is accompanied by a corresponding increase in aggregate demand. Since every cost-push is accompained by a fall in output and employment along with a price increase, it is likely that the government

will adopt expansionary monetary and fiscal policies in order to check the fall in output and employment. In this way, cost-push will lead to a sustained inflationary process because the government will try to achieve full employment by raising aggregate demand which will, in turn, lead to further wage-push and so on. Such a situation is again explained with the help of Figure 8. Suppose there is a wage-push at *E* which shifts the supply curve from S_1 to S_2 and equilibrium is established at *F* with the

demand curve D_O. The price level rises to P_3 and the level to employment is reduced to Y_1.

When due to an expansionary monetary and fiscal policy, aggregate demand increases to D_1, the new equilibrium position is at *G* where the price level rises to P_4 and the level of employment rises to Y_2. A further increase in demand shifts the aggregate demand curve upward to

D_2 , such that equilibrium is attained at point *C* where the price level rises

to P_5 and the economy attains the full employment level Y_F. Thus a wage- push accompanied by an increase in aggregate demand through expansionary monetary and fiscal policies traces out a ratchet-like inflationary parth from *A* to *E* to *F* to *G* and to *C*.

SECTORAL OR DEMAND-SHIFT INFLATION

Sectoral or demand-shift inflation is associated with the name of Charles Schulz[23] who in a paper, pointed out that the price increases from 1955-57 were caused by neither demand-pull nor cost-push but by sectoral shifts in demand. Schultz advanced his thesis with reference to the American economy but it has now been generalised in the case of modern industrial economies.

Schultz begins his theory by pointing out that prices and wages are flexible upward in response to excess demand but they are rigid downward. Even if the aggregate demand is not excessive, excess demand in some sectors of the economy and deficient demand in other sectors will still lead to a rise in the general price level. This is because prices do not fall in the deficient-demand sectors, there being downward rigidity of prices. But prices rise in the excess-demand sectors and remain constant in the other sectors. The net effect is an overall rise in the price level.

Moreover, increase in prices in excess-demand industries (or sectors) can spread to deficient-demand industries through the prices of materials and the wages of labour. Excess demand in particular industries will lead to a general rise in the price of intermediate materials, supplies and components. These rising prices of materials will spread to demand- deficient industries which use them as inputs. They will, therefore, raise the prices of their products in order to protect their profit margins.

Not only this, wages will also be bid up in excess demand industries, and wages in demand-deficient industries will follow the rising trend. Because if wages in the latter industries are not raised, they will lead to dissatisfaction among workers, thereby leading to inefficiency and fall in productivity. Thus rising wage rates, originating in the excess demand industries, spread throughout the economy.

The spread of wage increases from excess demand industries to other parts of the economy increases the rise in the price of semi-manufactured materials and components. Other things remaining the same, the influence of increasing costs will be larger at the final stages of production. Thus producers of finished goods will face a general rise in the level of costs, thereby leading to rising prices. This may happen even in case of those industries which do not have excess demand for the products.

Another reason for demand-shift inflation in modern industrial economies is increase in the relative importance of *overhead costs*. This increase is due to two factors. *First*, there is an increase in overhead staff at the expense of production workers. According to Schultz, automation of production methods, instrumentation of control functions, mechanisation of office and accounting procedures, self-regulating materials, handling equipments, etc. lead to the growth of professional and semi-professional personnel in supervising, operating and maintenance roles. Similarly, the growth of formal research and development (R&D) as a separate function not only alters the production processes but also the composition of the labour force required to service them. These developments lead to the decline in the ratio of production workers to technical and supervisory staff in industries.

The *second* reason for the rise in overhead costs is that the ratio of

relatively short-lived equipment to long-lived plant rises substantially. As a result, depreciation as a proportion of total cost increases. The ultimate effect of an increasing proportion of overhead costs in the total cost is to make average costs more sensitive to variations in output. The distinguishing characteristic of the demand-shift inflation is a continued investment boom in the face of stable aggregate output. All industries expand their capacity and their employment of overhead personnel yet only a few enjoy a concomitant rise in sales. So producers facing shrinking profit margins try to recover a part of their rising costs in higher prices.

Thus demand-shift inflationary process "arises initially out of excess demand in particular industries. But it results in a general price rise only because of the downward rigidities and cost-oriented nature of prices and wages. It is not characterized by an autonomous upward push of costs nor by an aggregate excess demand. Indeed its basic nature is that it cannot be understood in terms of aggregates alone. Such inflation is the necessary result of sharp changes in the composition of demand, given the structure of prices and wages in the economy."

This theory was evolved by Schultz to examine the nature of the gradual inflation to which the American economy had been subjected during the period 1955-57. It has since been generalised in the case of modren industrial economies.

Its Criticisms

Johnson has criticised this theory for two reasons.

First, empirical evidence has failed to confirm Schultz's proposition that sectoral price increases are explained by upward shifts of demand.

Second, it suffers from the same defects as the two rival theories of demand-pull and cost-push, it seeks to challenge. That is, its "failure to investigate the monetary preconditions for inflation, and imprecision respecting the definitions of full employment and general excess demand."

STRUCTURAL INFLATION

The structuralist school of South America stresses structural rigidities as the principal cause of inflation in such developing countries as Argentina, Brazil, and Chile, Of course, this type of inflation is also to be found in other developing countries.

The structuralists hold the view that inflation is necessary with growth. According to this view, as the economy develops, rigidities arise which lead to structural inflation. In the initial phase, there are increases in non- agricultural incomes accompanied by high growth rate of population that tend to increase the demand for goods. In fact, the pressure of population growth and rising urban incomes would tend to raise through a chain reaction mechanism, *first* the prices of agricultural goods, *second*, the general price level, and *third*, wages. Let us analyse them.

1. Agricultural Goods. As the demand for agricultural goods rises, their domestic supply being inelastic, the prices of agricultural goods rise. The output of these goods does not increase when their prices rise because their production is inelasitc due to a defective system of land tenure and other rigidities in the form of lack of irrigation, finance, storage and marketing facilities, and bad harvests. To prevent the continuous rise in agricultural products, especially foods products, they can be imported. But it is not possible to import them in large quantities due to foreign exchange constraint. Moreover, the prices of imported products are relatively higher than their domestic prices. This tends to raise the price level further within the economy.

2. Wage Increases. When the prices of food products rise, wage earners press for increase in wage rates to compensate for the fall in their real incomes. But wages and/or D.A. are linked to the cost of living index. They are, therefore, raised whenever the cost of living index rises above an agreed point which further increases the demand for goods and a further rise in their prices.

The effect of increase in the wage rates on prices in illustrated in Figure 9. When wage rates rise, the aggregate demand for goods increases from D_1 to D_2. But the aggregate supply falls due to increase in labour costs which results in the shifting of aggregate supply curve from S_1S to S_2S. Since the production of goods is inelastic due to structural rigidities after a point, the supply curve is shown as vertical from point E_1 onward. The initial equilibrium is at E_1 where the curves D_1 and S_1 intersect at the output le

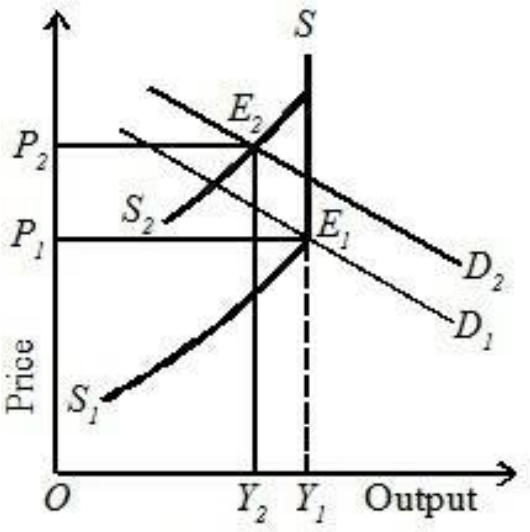

Fig. 9

supply falls due to increase in labour costs, the supply curve shifts from S_1 to S_2 and it intersects the demand curve D_2 at E_2 and production falls from OY_1 to OY_2 and the price level rises from OP_1 to OP_2.

3. Import Substitution. Another cause of structural inflation is that the rate of export growth in a developing economy is slow and unstable which is inadequate to support the required growth rate of the economy. The sluggish growth rate of exports and the foreign exchange constraint lead to the adoption of the policy of industrialisation based on import substitution. Such a policy necessitates the use of protective measures which, in turn, tend to raise the prices of industrial products, and incomes in the non- agricultrural sectors, thereby leading to further rise in prices. Moreover, this policy leads to a cost-push rise in prices because of the rise in prices of imported materials and equipment, and protective measures. The policy of import substitution also tends to be inflationary because of the relative inefficiency of the new industries during the "learning" period. The secular deterioration in the terms of trade of primary products of developing countries further limits the growth of income from exports which often leads to the exchange rate devaluation.

4. Tax System. The nature of the tax systems and budgetary processes also help in accentuating the inflationary trends in such economies. The

tax system has low inflation elasticities which means that when prices rise, the real vlaue of taxes falls. Often taxes are fixed in money terms or they are raised slowly to adjust for price rises. Moreover, it often takes long time to collect taxes with the result that by the time they are paid by assessees, their real value is less to the exchequer. On the other hand, planned expenditures on projects are often not incurred on schedule due to various supply bottlenecks with the result that when prices rise, the money value of expenditures rises proportionately. As a result of fall in the real value of tax collections and rise in money value of expenditures, governments have to adopt larger fiscal deficits which further accentuate inflationary pressures.

5. Money Supply. So far as the money supply is concerned, it automatically expands when prices rise in a developing country. As prices rise, firms need larger funds from banks. And the government needs more money to finance larger deficits in order to meet its expanding expenditure and wages of its employees. For this, it borrows from the central bank which leads to monetary expansion and to a further rise in the rate of inflation.

Thus structural inflation may result from supply inelasticities leading to rise in agricultural prices, costs of import substitutes, deterioration of the terms of trade and exchange rate devaluation.

Its Criticisms

The basic weaknesses in the structural arguments have been :

First, no separation is made between autonomous structural rigidities and induced rigidities resulting from price and exchange controls or mismanagement of government intervention.

Second, the sluggishness in the export growth is not really structural but the result of failure to exploit export opportunities because of overvalued exchange rates.

MARKUP INFLATION

The theory of markup inflation is mainly associated with Prof. Ackley, though formal models have also been presented by Holzman and Duesenberry independently of each other.[24] We analyse below Ackley's simplified version of the markup inflation.

The analysis is based on the assumption that both wages and prices are "administered" and are settled by workers and business firms. Firms fix administrative prices for their goods by adding to their direct material and labour costs, and some standard markup which covers profit.* Labour also seeks wages on the basis of a fixed markup over its cost of living.

This model of inflation can lead to either a stable, a rising, or a falling price level depending on the markups which firms and workers respectively use. If either or both use a percentage markup, the inflation will progress faster than if either or both fix the markups in money terms. If each participant fixes prices on the basis of prices he pays, the inflation will be high and of long duration. If one firm raises its prices in order to maintain its desired markup, the costs of other firms are raised which, in turn, raise their prices and this process of raising costs and prices will spread to other firms in an endless chain. When consumers buy such goods whose prices are rising, their cost of living rises. This causes wage costs to rise, thereby increasing the inflationary spiral. However, the inflationary spiral may come to a halt, if there is a gradual improvement in the efficiency and productivity of labour. A rise in efficiency and productivity means that there is a rise in wage rates or prices of materials leading to a smaller rise in labour and material costs. But stability in prices may not come if firms and workers appropriate the gains of rising productivity by increasing their markups. If each participant increases its markup by 100 per cent of the gains of productivity increase, the inflationary spiral might continue indefinitely.

According to Ackley, the markup can be based on either historical experience or expectations of future costs and prices. Moreover, the size of the markup applied by firms and workers is a function of the pressure of demand felt in the economy. When the demand is moderate, the markups may by applied to historically experienced costs and prices, and the price rise may be slow. But when demand is intense, the markups are

based on anticipations of future costs, and prices rise rapidly. Thus there can be no inflation without some change in the size of the markup.

This theory can also be applied to cost-push and demand-pull models of inflation. If firms and workers believe that their markups are lower than the required costs and prices, regardless of the state of aggregate demand, they will increase the size of their markups. Under such a situation, costs and prices rise in an inflationary spiral. This is similar to the cost-push inflation. On the other hand, if firms and workers raise the markups due to increase in demand, markup pricing is related to demand-pull inflation.

To conclude with Ackley, "Inflation might start from an initial autonomous increase either in business and labour markups. Or it might start from an increase in aggregate demand and which first and most directly affected some of the flexible market-determined prices. But however it starts, the process involves the interaction of demand and market elements."

The markup inflation can be controlled by the usual monetary and fiscal tools in order to restrict the demand for goods and increase productivity. Ackley also suggests wage-and-price guidelines or an incomes policy to be administered by a national wage-and-price commission.

Its Criticisms

Ackley's theory suffers from two weaknesses:

First, the theory gives a very limited explanation of the cause of inflation, especially the motives which compel workers and firms to fix higher markups in the absence of demand conditions.

Second, it suffers from the implication that once inflation starts, it is likely to continue indefinitely when costs and prices rise in a spiral.

OPEN AND SUPPRESSED INFLATION

Inflation is often open and suppressed.

Inflation is open when "markets for goods or factors of production are allowed to function freely, setting prices of goods and factors without normal interference by the authorities." Thus open inflation is the result of the uninterrupted operation of the market mechanism. There are no checks or controls on the distribution of commodities by the government. Increase in demand and shortage of supplies persists which tend to lead to open inflation. Unchecked open inflation ultimately leads to hyper- inflation.

Suppressed Inflation. On the contrary when the government imposes physical and monetary controls to check open inflation, it is known as repressed or suppressed inflation. The market mechanism is not allowed to function normally by the use of licensing, price controls and rationing in order to suppress extensive rise in prices. According to Friedman, governments themselves are often producers and sellers of wide range of commodities and they want to keep their own prices low by price restrictions and controls. This leads to the breakdown of the free price system.

Further, suppressed inflation also results when efforts are made to increase domestic production and reduce import demand by tariffs, import restrictions, limits on foreign loans, voluntary import agreements, etc. So long as such controls exist, the present demand is postponed and there is

diversion of demand from controlled to uncontrolled commodities. But as soon as these controls are removed, there is open inflation.

Its Effects

Suppressed inflation adversely affects the economy.

(1) When the distribution of commodities is controlled, the prices of uncontrolled commodities rise very high. Suppressed inflation reduces the incentive to work because people do not get the commodities which they want to have.

(2) Controlled distribution of goods also leads to malallocation of resources. This results in the diversion of productive resources from essential to non-essential industries.

(3) Frictions increase in the labour market when high inflation is associated with higher unemployment.

(4) Suppressed inflation leads to black marketing, corruption, hoarding and profiteering. It invites extra-legal powers of control.

(5) It reduces the prospect of anti-inflationary policy being tried at all.

THE PHILLIPS CURVE : THE RELATION BETWEEN UNEMPLOYMENT AND INFLATION

The Phillips curve examines the relationship between the rate of unemployment and the rate of money wage changes. Known after the British economist A.W. Phillips[25] who first identified it, it expresses an inverse relationship between the rate of unemployment and the rate of increase in money wages. Basing his analysis on data for the United Kingdom, Phillips derived the empirical relationship that when unemployment is high, the rate of increase in money wage rates is low. This is because "workers are reluctant to offer their services at less than the prevailing rates when the demand for labour is low and unemployment is high so that wage rates fall very slowly." On the other hand, when unemployment is low, the rate of increase in money wage rates is high. This is because, "when the demand for labour is high and there are very few unemployed we should expect employers to bid wage rates up quite rapidly."

The second factor which influences this inverse relationship between money wage rate and unemployment is the nature of business activity. In a period of rising business activity when unemployment falls with increasing demand for labour, the employers will bid up wages.

Conversely in a period of falling business activity when demand for labour is decreasing and unemployment is rising, employers will be reluctant to grant wage increases. Rather, they will reduce wages. But workers and unions will be reluctant to accept wage cuts during such periods. Consequently, employers are forced to dismiss workers, thereby leading to high rate of unemployment. Thus when the labour market is depressed, a small reduction in wages would lead to large increase in unemployment. Phillips concluded on the basis of the above arguments that the relation between rates of unemployment and a change of money wages would be highly non-linear when shown on a diagram. Such a curve is called the Phillips curve.

The *PC* curve in Figure 10 is the Phillips curve which relates precentage change in money wage rate (*W*) on the vertical axis with the rate of unemployment (*U*) on the horizontal axis. The curve is convex to the origin which shows that the percentage change in money wages rises with decrease in the employment rate. In the figure, when the money wage rate is 2 per cent, the unemployme the unemployment rate is change in money wage and high the unempl

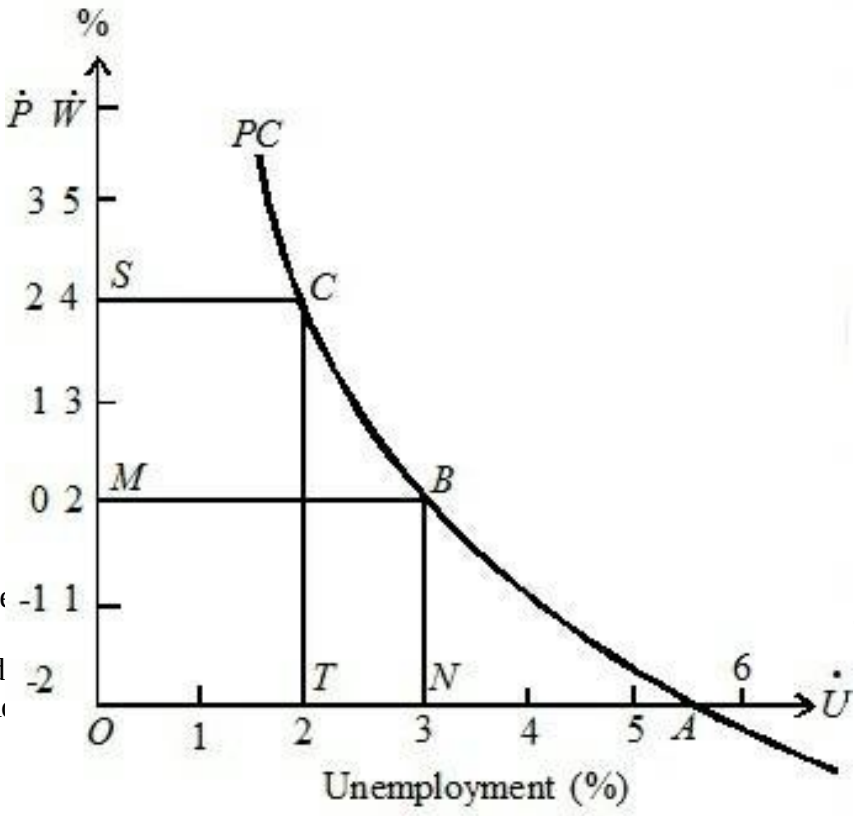

Fig. 10

The original Phillips curve was an observed statistical relation which was explained theoretically by Lipsey as resulting from the behaviour of labour market in disequilibrium through excess demand.[26]

Several economists have extended the Phillips curve analysis to the trade- off between the rate of unemployment and the rate of change in the level of prices or inflation rate by assuming that prices would change whenever wages rose more rapidly than labour productivity. If the rate of increase in money wage rates is higher than the growth rate of labour productivity, prices will rise and vice versa. But prices do not rise if labour productivity increases at the same rate as money wage rates rise.

This trade-off between the inflation rate and unemployment rate is explained in Figure 10 where the inflation rate $(\dot{P})$ is taken alongwith the rate of change in money wages $(\dot{W})$. Suppose labour productivity rises by 2 per cent per year and if money wages also increase by 2 per cent, the price level would remain constant. Thus point B on the *PC* curve corresponding to percentage change in money wages (*M*) and unemployment rate of 3 per cent (*N*) equals zero (*O*) per cent inflation rate $(\dot{P})$ on the vertical axis.* Now assume that the economy is operating at point *B*. If now, aggregate demand is increased, this lowers the unemployment rate to *OT* (2%) and raises the wage rate to *OS* (4%) per year. If labour productivity continues to grow at 2 per cent per annum, the price level will also rise at the rate of 2 per cent per annum at *OS* in the figure. The economy operates at point C. With the movement of the economy from *B* to *C*, unemployment falls to *T* (2%). If points *B* and *C* are connected, they trace out a Phillips curve *PC*.

Thus a money wage rate increase which is in excess of labour productivity leads to inflation. To keep wage increase to the level of labour productivity (*OM*) in order to avoid inflation. *ON* rate of unemployment will have to be tolerated.

The shape of the *PC* curve further suggests that when the unemployment rate is less than 5 per cent (that is, to the left of point *A*), the demand for labour is more than the supply and this tends to increase money wage rates. On the other hand, when the unemployment rate is more than 5½

per cent (to the right of point *A*), the supply of labour is more than the demand which tends to lower wage rates. The implication is that the wage rates will be stable at the unemployment rate *OA* which is equal to 5½ per cent per annum.

Friedman's View : The Long-Run Phillips Curve

Economists have criticised and in certain cases modified the Phillips curve. They argue that the Phillips curve relates to the short run and it does not remain stable. It shifts with changes in expectations of inflation. In the long run, there is no trade-off between inflation and unemployment. These views have been expounded by Friedman and Phelps[27] in what has come to be known as the "accelerationist" or the "adaptive expectations" hypothesis.

According to Friedman, there is no need to assume a stable downward sloping Phillips curve to explain the trade-off between inflation and unemployment. In fact, this relation is a short-run phenomenon. But there are certain variables which cause the Phillips curve to shift over time and the most important of them is the expected rate of inflation. So long as there is discrepancy between the expected rate and the actual rate of inflation, the downward sloping Phillips curve will be found. But when this discrepancy is removed over the long run, the Phillips curve becomes vertical.

In order to explain this, Friedman introduces the concept of the *natural rate of unemployment*. In represents the rate of unemployment at which the economy normally settles because of its structural imperfections. It is the unemployment rate below which the inflation rate increases, and above which the inflation rate decreases. At this rate, there is neither a tendency for the inflation rate to increase or decrease. Thus the natural

rate of unemployment is defined as the rate of unemployment at which the actual rate of inflation equals the expected rate of inflation. It is thus an *equilibrium* rate of unemployment toward which the economy moves in the long run. In the long run, the Phillips curve is a vertical line at the natural rate of unemployment.

This natural or equilibrium unemployment rate is not fixed for all times. Rather, it is determined by a number of structural characteristics of the labour and commodity markets within the economy. These may be minimum wage laws, inadequate employment information, deficiencies in manpower training, costs of labour mobility, and other market imperfections.But what causes the Phillips curve to shift over time is the expected rate of inflation. This refers to the extent the labour correctly forecasts inflation and can adjust wages to the forecast. Suppose the economy is experiencing a mild rate unemployment (*N*) of 3 per cent. At point 11, people expect this rate of inflation to continue in the future. Now assume programme to raise aggregate demand in The increase in aggregate demand will rai

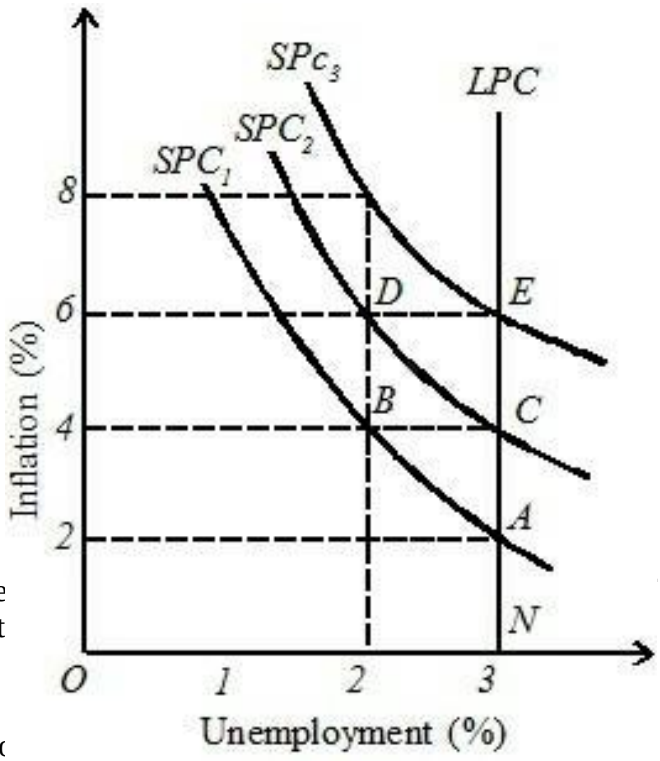

Fig. 11

the unemployment rate of 2 per cent. When the actual inflation rate (4 per cent) is greater than the expected inflation rate (2 per cent), the economy moves from point A to B along the SPC_1 curve and the unemployment rate temporarily falls to 2 per cent. This is achieved because the labour has been deceived. It expected the inflation rate of 2 per cent and based their

wage demands on this rate. But the workers eventually begin to realise that the actual rate of inflation is 4 per cent which now becomes their expected rate of inflation. Once this happens the short-run Phillips curve SPC_1 shifts to the right to SPC_2. Now workers demand increase in money

wages to meet the higher expected rate of inflation of 4 per cent. They demand higher wages because they consider the present money wages to be inadequate in real terms. In other words, they want to keep up with higher prices and to eliminate fall in real wages. As a result, real labour costs will rise, firms will discharge workers and unemployment will rise from *B* (2%) to *C* (3%) with the shifting of the SPC_1 curve to SPC_2. At

point *C*, the natural rate of unemployment is re-established at a higher rate of both the actual and expected inflation (4%).

If the government is determined to maintain the level of unemployment at 2 per cent, it can do so only at the cost of higher rates of inflation. From point *C*, unemployment once again can be reduced to 2 per cent via increase in aggregate demand along the SPC_2 curve until we arrive at

point *D*. With 2 per cent unemployment and 6 per cent inflation at point *D*, the expected rate of inflation for workers is 4 per cent. As soon as they adjust their expectations to the new situation of 6 per cent inflation, the short-run Phillips curve shifts up again to SPC_3, and the unemployment

will rise back to its natural level of 3 per cent at point *E*. If points A, *C* and *E* are connected, they trace out a vertical long-run Phillips curve *LPC* at the natural rate of unemployment. On this curve, there is no trade-off between unemployment and inflation. Rather, any one of several rates of inflation at points *A*, *C* and *E* is compatible with the natural unemployment rate of 3 per cent. Any reduction in unemployment rate below its natural rate will be associated with an accelerating and ultimately explosive inflation. But this is only possible temporarily so long as workers overestimate or underestimate the inflation rate. In the long-run, the economy is bound to establish at the natural unemployment rate.

There is, therefore, no trade-off between unemployment and inflation except in the short run. This is because inflationary expectations are revised according to what has happened to inflation in the past. So when the actual rate of inflation, say, rises to 4 per cent in Figure 11, workers continue to expect 2 per cent inflation for a while and only in the long run they revise their expectations upward to 4 per cent. Since they adapt themselves to the expectations, it is called the *adaptive expections hypothesis*. According to this hypothesis, the expected rate of inflation always lags behind the actual rate. But if the actual rate remains constant, the expected rate would ultimately become equal to it. This leads to the conclusion that a short-run trade off exists between unemployment and inflation, but there is no long run trade-off between the two unless a continuously rising inflation rate is tolerated.

Its Criticisms

The accelerationist hypothesis of Friedman has been criticised on the following grounds :

1. The vertical long-run Phillips curve relates to steady rate of inflation. But this is not a correct view because the economy is always passing through a series of disequilibrium positions with little tendency to approach a steady state. In such a situation, expectations may be disappointed year after year.

2. Friedman does not give a new theory of how expectations are formed that would be free from theoretical and statistical bias. This makes his position unclear.

3. The vertical long-run Phillips curve implies that all expectations are satisfied and that people correctly anticipate the future inflation rates. Critics point out that people do not anticipate inflation rates correctly, particularly when some prices are almost certain to rise faster than others. There are bound to be disequilibria between supply and demand caused by uncertainty about the future and that is bound to increase the rate of

unemployment. Far from curing unemployment, a dose of inflation is likely to make it worse.

4. In one of his writings Friedman himself accepts the possibility that the long-run Phillips curve might not just be vertical, but could be positively sloped with increasing doses of inflation leading to increasing unemployment.

5. Some economists have argued that wage rates have not increased at a high rate of unemployment.

6. It is believed that workers have a money illusion. They are more concerned with the increase in their money wage rates than real wage rates.

7. Some economists regard the natural rate of unemployment as a mere abstraction because Friedman has not tried to define it in concrete terms.

8. Saul Hyman has estimated that the long-run Phillips curve is not vertical but is negatively sloped. According to Hyman, the unemployment rate can be permanently reduced if we are prepared to accept an increase in inflation rate.

Tobin's View

James Tobin[28] in his presidential address before the American Economic Association in 1971 proposed a compromise between the negatively sloping and vertical Phillips curves. Tobin believes that there is a Phillips curve within limits. But as the economy expands and employment grows, the curve becomes even more fragile and vanishes until it becomes vertical at some critically low rate of unemployment. Thus Tobin's

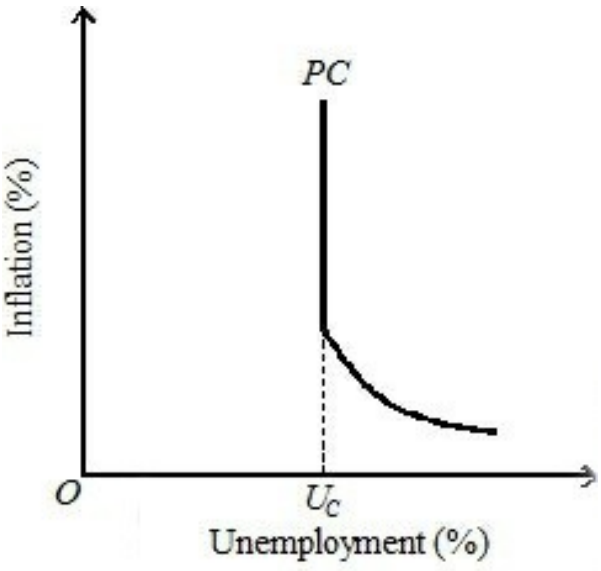

Fig. 12

Phillips curve is kinked-shaped, a part like a normal Phillips curve and the rest vertical, as shown in Figure 12. In the figure *Uc* is the critical rate of unemployment at which the Phillips curve becomes vertical where there is no trade-off between unemployment and inflation. According to Tobin, the vertical portion of the curve is not due to increase in the demand for more wages but emerges from imperfections of the labour market. At the *Uc* level, it is not possible to provide more employment because the job seekers have wrong skills or wrong age or sex or are in the wrong place. Regarding the normal portion of the Phillips curve which is negatively sloping, wages are sticky downward because labourers resist a decline in their relative wages. For Tobin, there is a wage-change floor in excess supply situations. In the range of relatively high unemployment to the right of *Uc* in the figure, as aggregate demand and inflation increase and involuntary unemployment is reduced, wage-floor markets gradually diminish. When all sectors of the labour market are above the wage floor, the level of critically low rate of unemployment Uc is reached.

Solow's View

Like Tobin, Robert Solow[29] does not believe that the Phillips curve is vertical at all rates of inflation. According to him, the curve is vertical at positive rates of inflation and is horizontal at negative rates of inflation, as shown in Figure 13. The basis of the Phillips curve *LPC* of the figure is that wages are sticky downward even in the face of heavy unemployment or deflation. But at a particular level of unemployment when the demand for labour increases, wages rise in the face of expected
inflation. But since the Phillips curve *LPC* be
unemployment, there is no trade-off b

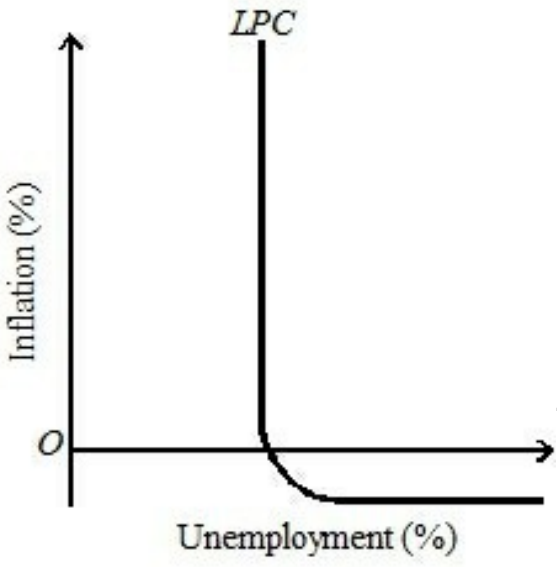

Fig. 13

Conclusion. The vertical Phillips curve has been accepted by the majority of economists. They agree that at unemployment rate of about 4 per cent, the Phillips curve becomes vertical and the trade-off between unemployment and inflation disappears. It is impossible to reduce unemployment below this level because of market imperfections.

RATIONAL EXPECTATIONS AND LONG-RUN PHILLIPS CURVE

In the Friedman-Phelps acceleration hypothesis of the Phillips curve, there is a short-run trade-off between unemployment and inflation but no long- run trade-off exists. The reason is that inflationary expectations are based on past behaviour of inflation which cannot be predicted accurately. Therefore, there is always an observed error so that the expected rate of inflation always lags behind the actual rate. But the expected rate of inflation is revised in accordance with the first period's experience of inflation by adding on some proportion of the observed error in the previous period so that the expected rate of inflation adjusts toward the actual rate.

Economists belonging to the rational expectations (Ratex) school have denied the possibility of any trade-off between inflation and unemployment even during the long run. According to them, the assumption implicit in Friedman's version that price expectations are formed mainly on the basis of the experience of past inflation is unrealistic. When people base their price expectations on this assumption, they are irrational. If they think like this during a period of rising prices, they will find that they were wrong. But rational people will not commit this mistake. Rather, they will use all available information to forecast future inflation more accurately.

The rational expectations idea is explained in Figure 14 in relation to the Phillips curve. Suppose the unemployment rate is 3 per cent in the economy and the inflation rate is 2 per cent. We start at point *A* on the SPC_1 curve. In order to reduce unemployment, the government increases

the rate of money supply so as to stimulate the economy. Prices start rising. According to the Ratex hypothesis, firms have better information about prices in their own industry than about the general level of prices. They mistakenly think that the increase in prices is due to the increase in the demand for their products. As a result, they employ more workers in order to increase output. In this way, they reduce unemployment. The workers also mistake the rise in prices as related to their own industry. But wages rise as the demand for labour increases and workers th increase in real wages. Thus the economy mo *SPC*$_1$ from point *A* to *B*. But soon workers and firms find that the increase in price Firms find that their costs have increased. Worl due to the rise in the inflation rate to 4 per cent

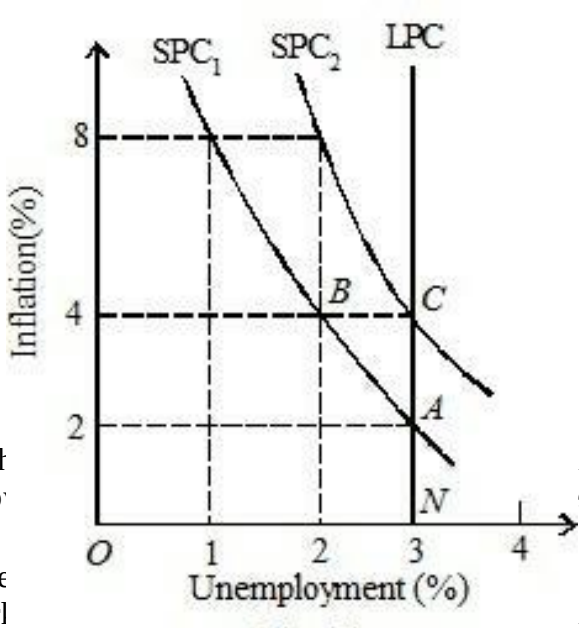

Fig. 14

the economy finds itself at the higher inflation rate due to government's monetary policy. As a result, it moves from point *B* to point *C* on the *SPC*$_2$ curve where the unemployment rate is 3 per cent which is the same before the government adopted an expansionary monetary policy.

When the government again tries to reduce unemployment by increasing the money supply, it cannot fool workers and firms who will now watch the movements of prices and costs in the economy. If firms expect higher costs with higher prices for their products, they are not likely to increase their production, as happened in the case of the *SPC*$_1$ curve. So far as workers are concerned, labour unions will demand higher wages to keep pace with prices moving up in the economy. When the government continues an expansionary monetary (or fiscal) policy, firms and workers get accustomed to it.They build their experience into their expectations. So when the government again adopts such a policy, firms raise prices of

their products to nullify the expected inflation so that there is no effect on production and employment. Similarly, workers demand higher wages in expectation of inflation and firms do not offer more jobs. In other words, firms and workers build expectations into their price policies and wage agreements so that there is no possibility for the actual rate of unempolyment to differ from the natural rate even during the short run.

POLICY IMPLICATIONS OF THE PHILLIPS CURVE

The Phillips curve has important policy implications. It suggests the extent to which monetary and fiscal policies can be used to control inflation without high levels of unemployment. In other words, it provides a guideline to the authorities about the rate of inflation which can be tolerated with a given level of unemployment. For this purpose, it is important to know the exact position of the Phillips curve. If the curve is PC_1 as in Figure 15,

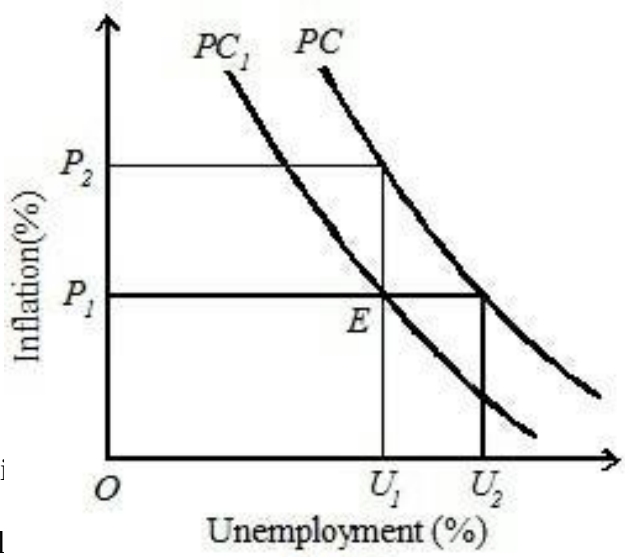

Fig. 15

where the labour productivity and the wage and price stability would be possible. Agai employment and price stability as consistent inflation can be traded-off for a low level Phillips curve is *PC* as in the figure, it su between price stability and more unemployment. Thus by observing the position of the Phillips curve, the authorities can decide about the nature of monetary and fiscal policies to be adopted. For instance, if the authorities find that the inflation rate P_2 is incompatible

with the unemployment rate U_1 of Figure 15, they would adopt such monetary and fiscal policies as to shift the Phillips curve *PC* to the left in the position of PC_1 curve. This will give a better trade-off between a lower inflation rate P_1 with the small level of unemployment U_1.

While explaining the natural rate of unemployment, Friedman pointed out that the only scope of public policy in influencing the level of unemployment lies in the short run in keeping with the position of the Phillips curve. He ruled out the possibility of influencing the long-run rate of unemployment because of the vertical Phillips curve.

According to him, the trade-off between unemployment and inflation does not exist and has never existed. However rapid the inflation might be, unemployment always tends to fall back to its natural rate which is not some irreducible minimum of unemployment. It can be lowered by removing obstacles in the labour market by reducing frictions. Therefore, public policy should improve the institutional structure to make the labour market responsive to changing patterns of demand. Moreover, some level of unemployment must be accepted as natural because of the existence of large number of part-time workers, unemployment compensation and other institutional factors.

Another implication is that unemployment is not a fitting aim for monetary expansion, according to Friedman. Therefore, employment above the natural rate can be reached at the cost of accelerating inflation, if monetary policy is adopted. In his words, "A little inflation will provide a boost at first—like a small dose of a drug for a new addict—but then it takes more and more inflation to provide the boost, just it takes a bigger and bigger dose of a drug to give a hardened addict a high." Thus if the government wants to have a genuine full employment level at the natural rate, it must not use monetary policy to remove institutional restraints, restrictive practices, barriers to mobility, trade union coercion and similar obstacles to both the workers and the employers.

But economists do not agree with Friedman. They suggest that it is possible to reduce the natural rate of unemployment through labour market policies, whereby labour market can be made more efficient. So

the natural rate of unemployment can be reduced by shifting the long-run vertical Phillips curve to the left.

But the policy implications of the Phillips curve are not so simple as they appear. The authorities are faced with certain constraints concerning the decision with regard to the rate of inflation that may be compatible with a particular rate of unemployment. Thus the problem of trade-off between inflation and unemployment is one of choice under constraints. This is illustrated in Figure 16. The

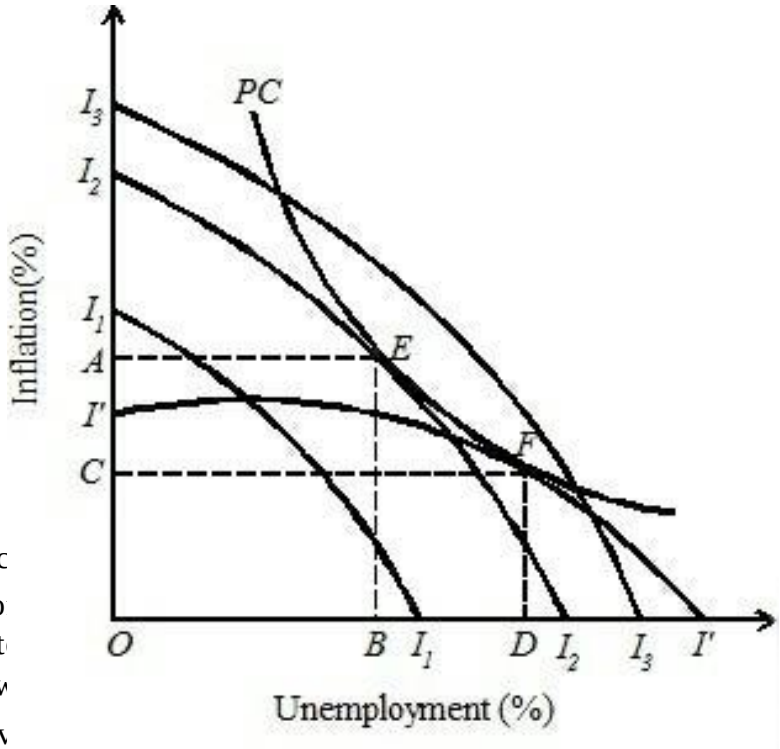

Fig. 16

constraints are a given Phillips c

I"I" representing the choice o

indifference curves are concave t

origin because if the authorities w

have higher inflation and vice-v

represents a higher level of publi

welfare than I_2I_2 curve. This is because any point on the lower curve represents a lower rate of unemployment and inflation than on a higher curve. The optimum trade-off point is *E* where the indifference curve I_1I_1 is tangent to the Phillips curve *PC* and where the trade-off is between *OA* rate of inflation and *OB* rate of unemployment. If, however, the public authorities adopt such monetary and fiscal policies whereby they want to have less inflation and more unemployment, the indifference curve becomes *1'1'*. This curve *I'I'* is tangent to the Phillips curve *PC* at *F* and the trade-off becomes *OC* of

inflation and *OD* of unemployment.

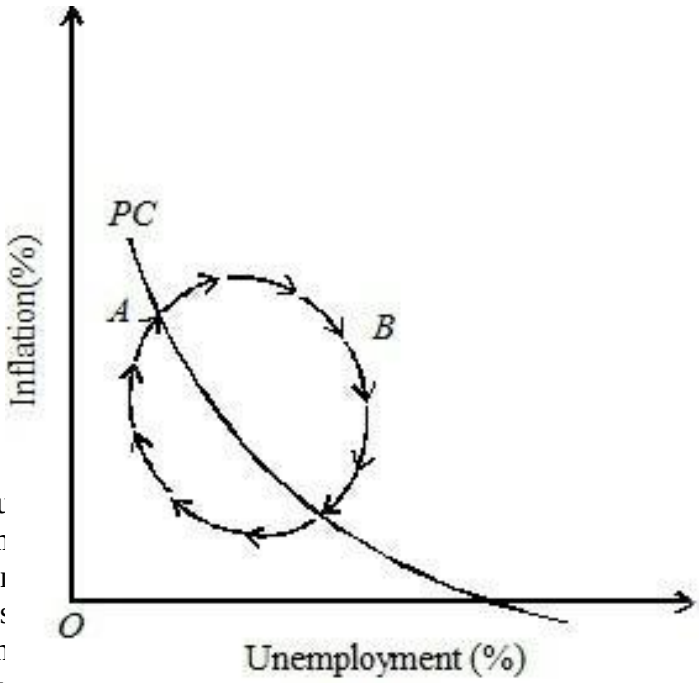

Fig. 17

It has been suggested by certain economists that there is a loop or orbit about the Phillips curve based on observed values of inflation and unemployment. This is illustrated in Figure 17. In the early expansion phase of the business cycle, the unemployment-inflation loop involves rising output with reduced inflation. This is due to demand-pull following an expansionary monetary or fiscal policy. In this phase of the cycle, the nomal relationship between inflation and u maintained. It is shown by the mover when the rate of unemployment falls ai continues to increase, inflationary press Phillips curve at point A. A tight mor But the expectations of increase in pr maintained at the previous rate. So une This is revealed by the upper portion of the loop to the right of the Phillips curve. However, when excess demand is controlled and output increases, the rate of inflation starts falling from point B along with fall in the rate of unemployment. Thus we find that the conclusion of the Phillips curve holds in the early phase of the business cycle due to an expansionary monetary or fiscal policy. But in the downward phase the trade-off between inflation and unemployment goes contrary to the Phillips curve.

Johnson doubts about the applicability of the Phillips curve to the formulation of economic policy on two grounds. "On the one hand, the

curve represents only a statistical description of the mechanics of adjustment in the labour market, resting on a simple model of economic dynamics with little general and well-tested monetary theory behind it. On the other hand, it describes the behaviour of the labour market in a combination of periods of economic fluctuation and varying rates of inflation, conditions which presumably influenced the behaviour of the labour market itself, so that it may reasonably be doubted whether the curve would continue to hold its shape if an attempt were made by economic policy to pin the economy down to a point on it."[30]

STAGFLATION

Stagflation is a new term which has been added to economic literature in the 1970s. The word "stagflation" is the combination of stag *plus* flation, taking 'stag' from stagnation and 'flation' from inflation. Thus it is a paradoxical situation where the economy experiences stagnation or unemployment alongwith a high rate of inflation. It is, therefore, also called *inflationary recession*. The level of stagflation is measured in the US by the "discomfort index" which is a combination of the unemployment rate and the inflation rate measured by the price deflator for GNP.

One of the principal causes of stagflation has been restriction in the aggregate supply. When aggregate supply is reduced, there is a fall in output and employment and the price level rises. A reduction in aggregate supply may be due to a restriction in labour supply. The restriction in labour supply, in turn, may be caused by a rise in money wages on account of strong unions or by a rise in the legal minimum wage rate, or by increased tax rates which reduce work-effort on the part of workers.

When wages rise, firms are forced to reduce production and employment. Consequently, there is fall in real income and consumer expenditure. Since the decline in consumption will be less than the fall in real income, there will be excess demand in the commodity market which will push up the price level. The rise in the price level, in turn, reduces output and employment in the following three ways: (a) It reduces the real quantity of money, raises interest rates and brings a fall in investment expenditure. (b)

The rise in the price level reduces the real value of cash balances with the government and the private sector via the Pigou effect which reduces their consumption expenditure. (c) The rise in prices of domestic goods makes exports dearer for foreigners and make foreign goods relatively more attractive to domestic consumers, thereby adversely affecting domestic output and employment.

Another cause of restriction in aggregate supply is the increase in indirect taxes by central, state and local governments. When indirect taxes are increased, they raise costs and prices and reduce output and employment. Moreover, when the government increases taxes, it leads to the transfer of real purchasing power from the people to the government. As a result, aggregate demand falls, and output and employment are adversely affected. If, however, the government increases its expenditure equal to the increase in tax revenue, it would raise the price level further due to increase in additional demand.

Often, economies impose direct controls as a means of controlling inflation. But when such controls are removed, decontrolled sectors raise prices of their products with the result that wages rise and the wage-price spiral spreads to the entire economy. This, in turn, advesely affects production and employment through a decline in the real quantity of money, rise in interest rates, fall in investment via the Pigou effect, and exports becoming dearer and imports attractive. They contribute to stagflation.

Restriction on aggregate supply may also be caused by external factors such as rise in the world prices of foodgrains and crude oil prices. In all these cases, the domestic price level is raised by outside forces. When international prices of foodgrains and crude oil rise, they lead to the outflow of purchasing power away from domestic consumers. They accentuate inflation, raise wages and prices. As a result, the real quantity of money declines, interest rates rise and investment declines via the Pigou effect, making exports dearer and imports attractive, and domestic output and employment decline. They lead to stagflation.

The phenomenon of stagflation is illustrated in Fig. 18 where employment is measured on the horizontal axis and the price level on the vertical axis.

The initial equilibrium is at *E* where the demand curve *D* intersects the supply curve S and the price level is *OP* and the employment level is *ON*. When the aggregate supply is reduced due to any of the factors mentioned above, the supply curve *S* shifts to the left at S_1. The new

equilibrium is at E_1 where S_1 intersects the *D* curve. Now the price level rises from *OP* to OP_1

and the level of employment declines from *ON* to ON_1.

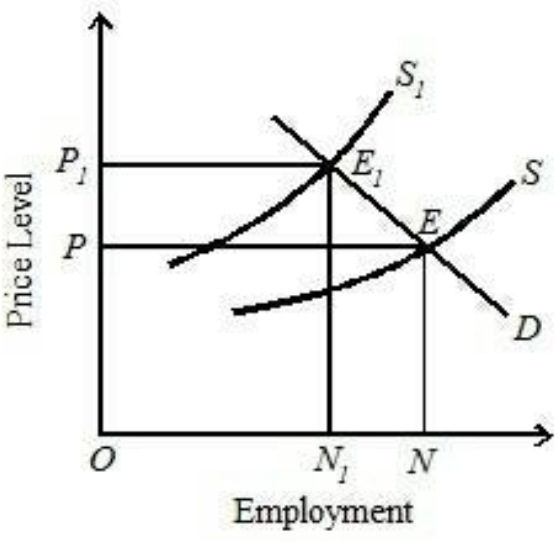

Fig. 18

Measures to Control Stagflation

We have observed above that it is inflation that leads to stagflation. The US experience shows that if stagflation is controlled either by restrictive or expansionary measures, it will increase. Suppose restrictive demand managed monetary and fiscal measures are adopted, they tend to lower aggregate demand so that the new demand curve D_1 cuts the

supply curve S_1 at point *E'*

at the old price level *OP* in Fig 19. *ON'* and at the same time lowers the increase

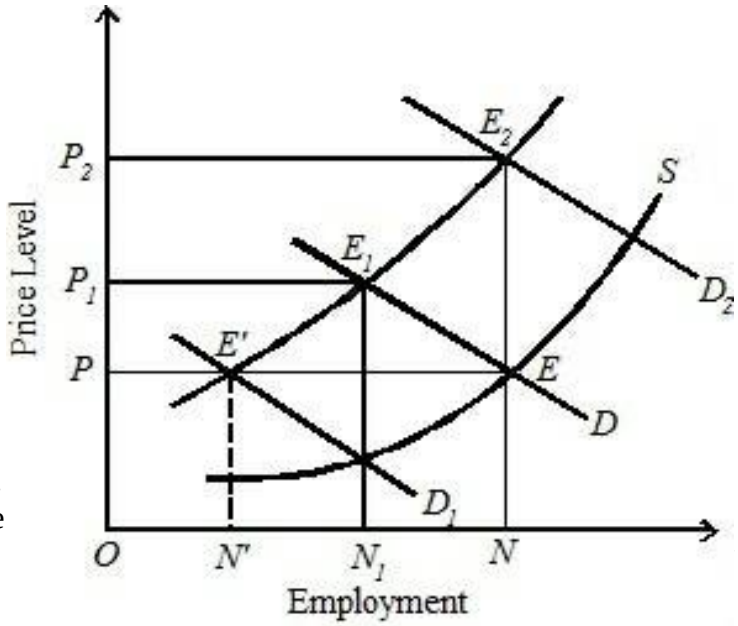

Fig. 19

N_1N' and reduces inflation by P_1P. Thus it fails to control stagflation. On the other hand, if expansionary demand managed monetary and fiscal policies are adopted, they will raise the aggregate demand so that the new

demand curve D_2 cuts the supply curve S_1 at E_2 at the old employment

level ON. This raises employment from ON_1 to ON but increases the price level to OP_2. Thus such a policy also fails to control stagflation because it
generates more inflation combined with higher employment. Economists, therefore, suggest other measures which slow inflation and maintain higher employment.

First, minimum wages should not be raised at all.

Second, *tax-based income* policies should be started. These policies are different for individual and business firms. In the case of individuals, target rates of wage and price inflation are based on some reasonable economic forecast of inflation. Persons who accept wage increases below the target rates are rewarded with tax credits. Those who insist on wage increases above the target rates are levied a penalty tax. Similar is the case with business firms. Firms which keep wages down to the target rates are rewarded with a reduction in their business income tax. On the other hand, those who permit wage increases above the target rates are charged a penalty tax in addition to business income tax.

Third, there is need to introduce *income policies*. One of the important planks of the income policies is to link the increase of money wages to productivity increase. Thus the rate of increase of money wages should be limited to the overall rate of productivity increase. Further, prices should be reduced in those industries having above-average productivity growth. On the other hand, prices should be raised in industries where productivity is increasing less than the national average rate. Prices should be kept stable in industries where productivity is increasing at the national average rate. But such policies are difficult to implement in the case of an open country. If import prices of food and other consumer products rise, they tend to raise the domestic price level. This makes it difficult for unions to stick to wage agreements.

Fourth, the best policy measure is to reduce *personal and business taxes*

because they tend to reduce labour costs and raise demand for labour. Similarly, sales tax and excise duties should be reduced in order to prevent the price level from rising. To encourage state and local government to reduce state and local sales and excise taxes, the central government should sanction additional grants-in-aid to them.

Thus to combat stagflation, a vast spectrum of policy measures is needed.

CAUSES OF INFLATION

Inflation is caused when aggregate demand exceeds aggregate supply of goods and services. We analyse the factors which lead to increase in demand and shortage of supply.

Factors Affecting Demand

Both Keynesians and monetarists believe that inflation is caused by increase in aggregate demand. They point toward the following factors which raise it.

1. Increase in Money Supply. Inflation is caused by an increase in the supply of money which leads to increase in aggregate demand. The higher the growth rate of the nominal money supply, the higher is the rate of inflation. Modern quantity theorists do not believe that true inflation starts after the full employment level. This view is realistic because all advanced countries are faced with high levels of unemployment and high rates of inflation.

2. Increase in Disposable Income. When the disposable income of the people increases, it raises their demand for goods and services. Disposable income may increase with the rise in national income or reduction in taxes or reduction in the saving of the people.

3. Increase in Public Expenditure. Government activities have been expanding much with the result that government expenditure has also been increasing at a phenomenal rate, thereby raising aggregate demand for goods and services. Governments of both developed and developing

countries are providing more facilities under public utilities and social services, and also nationalising industries and starting public enterprises with the result that they help in increasing aggregate demand.

4. Increase in Consumer Spending. The demand for goods and services increases when consumer expenditure increases. Consumers may spend more due to conspicuous consumption or demonstration effect. They may also spend more when they are given credit facilities to buy goods on hire- purchase and instalment basis.

***5.* Cheap Monetary Policy.** Cheap monetary policy or the policy of credit expansion also leads to increase in the money supply which raises the demand for goods and services in the economy. When credit expands, it raises the money income of the borrowers which, in turn, raises aggregate demand relative to supply, thereby leading to inflation. This is also known as *credit-induced inflation.*

6. Deficit Financing. In order to meet its mounting expenses, the government resorts to deficit financing by borrowing from the public and even by printing more notes. This raises aggregate demand in relation to aggregate supply, thereby leading to inflationary rise in prices. This is also known as *deficit-induced* inflation.

7. Expansion of the Private Sector. The expansion of the private sector also tends to raise the aggregate demand. For huge investments increase employment and income, thereby creating more demand for goods and services. But it takes time for the output to enter the market. This leads to rise in prices.

8. Black Money. The existence of black money in all countries due to corruption, tax evasion etc. increases the aggregate demand. People spend such unearned money extravagantly, thereby creating unnecessary demand for commodities. This tends to raise the price level further.

9. Repayment of Public Debt. Whenever the government repays its past internal debt to the public, it leads to increase in the money supply with the public. This tends to raise the aggregate demand for goods and services and to rise in prices.

10. Increase in Exports. When the demand for domestically produced goods increases in foreign countries, this raises the earnings of industries producing export commodities. These, in turn, create more demand for goods and services within the economy, thereby leading to rise in the price level.

Factors Affecting Supply

There are also certain factors which operate on the opposite side and tend to reduce the aggregate supply. Some of the factors are as follows :

1. Shortage of Factors of Production. One of the important causes affecting the supplies of goods is the shortage of such factors as labour, raw materials, power supply, capital, etc. They lead to excess capacity and reduction in industrial production, thereby raising prices.

2. Industrial Disputes. In countries where trade unions are powerful, they also help in curtailing production. Trade unions resort to strikes and if they happen to be unreasonable from the employers' viewpoint and are prolonged, they force the employers to declare lock-outs. In both cases. industiral production falls, thereby reducing supplies of goods. If the unions succeed in raising money wages of their members to a very high level than the productivity of labour, this also tends to reduce production and supplies of goods. Thus they tend to raise prices.

3. Natural Calamities. Drought or floods is a factor which adversely affects the supplies of agricultural products. The latter, in turn, create shortages of food products and raw materials, thereby helping inflationary pressures.

4. Artificial Scarcities. Artificial scarcities are created by hoarders and speculators who indulge in black marketing. Thus they are instrumental in reducing supplies of goods and raising their prices.

5. Increase in Exports. When the country produces more goods for export than for domestic consumption, this creates shortages of goods in the domestic market. This leads to inflation in the economy.

6. Lop-sided Production. If the stress is on the production of comfort, luxury, or basic products to the neglect of essential consumer goods in the country, this creates shortages or consumer goods. This again causes inflation.

7. Law of Diminishing Returns. If industries in the country are using old machines and outmoded methods of production, the law of diminishing returns operates. This raises cost per unit of production, thereby raising the prices of products.

8. International Factors. In modern times, inflation is a worldwide phenomenon. When prices rise in major industrial countries, their effects spread to almost all countries with which they have trade relations. Often the rise in the price of a basic raw material like petrol in the international market leads to rise in the prices of all related commodities in a country.

MEASURES TO CONTROL INFLATION

We have studied above that inflation is caused by the failure of aggregate supply to equal the increase in aggregate demand. Inflation can, therefore, be controlled by increasing the supplies of goods and services and reducing money incomes in order to control aggregate demand. The various methods are usually grouped under three heads: monetary meausres, fiscal measures and other measures.

Monetary Measures

Monetary measures aim at reducing money incomes.

(a) Credit Control. One of the important monetary measures is *monetary policy*. The central bank of the country adopts a number of methods to control the quantity and quality of credit. For this purpose, it raises the bank rates, sells securities in the open market, raises the reserve ratio, and adopts a number of selective credit control measures, such as raising margin requirements and regulating consumer credit.

Monetary policy may not be effective in controlling inflation, if inflation

is due to cost-push factors. Monetary policy can only be helpful in controlling inflation due to demand-pull factors.

(b) Demonetisation of Currency. However, one of the monetary measures is to demonetise currency of higher denominations. Such a measures is usually adopted when there is abundance of black money in the country.

(c) Issue of New Currency. The most extreme monetary measure is the issue of new currency in place of the old currency. Under this system, one new note is exchanged for a number of notes of the old currency. The value of bank deposits is also fixed accordingly. Such a measure is adopted when there is an excessive issue of notes and there is hyperinflation in the country. It is a very effective measure. But is inequitable for its hurts the small depositors the most.

Fiscal Measures

Monetary policy alone is incapable of controlling inflation. It should, therefore, be supplemented by fiscal measures. Fiscal measures are highly effective for controlling government expenditure, personal consumption expenditure, and private and public investment. The principal fiscal measures are the following :

(a) Reduction in Unnecessary Expenditure. The government should reduce unnecessary expenditure on non-development activities in order to curb inflation. This will also put a check on private expenditure which is dependent upon government demand for goods and services. But it is not easy to cut government expenditure. Though this measure is always welcome but it becomes difficult to distinguish between essential and non- essential expenditure. Therefore, this measure should be supplemented by taxation.

(b) Increase in Taxes. To cut personal consumption expenditure, the rates of personal, corporate and commodity taxes should be raised and even new taxes should be levied, but the rates of taxes should not be so high as to discourage saving, investment and production. Rather, the tax system should provide larger incentives to those who save, invest and produce

more. Further, to bring more revenue into the tax-net, the government should penalise the tax evaders by imposing heavy fines. Such measures are bound to be effective in controlling inflation. To increase the supply of goods within the country, the government should reduce import duties and increase export duties.

(c) Increase in Savings. Another measure is to increase savings on the part of the people. This will tend to reduce disposable income with the people, and hence personal consumption expenditure. But due to the rising cost of living, people are not in a position to save much voluntarily. Keynes, therefore, advocated compulsory savings or what he called 'deferred payment' where the saver gets his money back after some years. For this purpose, the government should float public loans carrying high rates of interest, start saving schemes with prize money, or lottery for long periods, etc. It should also introduce compulsory provident fund, provident fund-cum-pension schemes, etc. All such measures increase savings and are likely to be effective in controlling inflation.

(d) Surplus Budgets. An important measure is to adopt anti-inflationary budgetary policy. For this purpose, the government should give up deficit financing and instead have surplus budgets. It means collecting more in revenues and spending less.

(e) Public Debt. At the same time, it should stop repayment of public debt and postpone it to some future date till inflationary pressures are controlled within the economy. Instead, the government should borrow more to reduce money supply with the public.

Like monetary measures, fiscal measures alone cannot help in controlling inflation. They should be supplemented by monetary, non-monetary and non-fiscal measures.

Other Measures

The other types of measures are those which aim at increasing aggregate supply and reducing aggregate demand directly.

(a) To Increase Production. The following measures should be adopted

to increase production: (i) One of the foremost measures to control inflation is to increase the production of essential consumer goods like food, clothing, kerosene oil, sugar, vegetable oils, etc. (ii) If there is need, raw materials for such products may be imported on preferential basis to increase the production of essential commodities. (iii) Efforts should also be made to increase productivity. For this purpose, industrial peace should be maintained through agreements with trade unions, binding them not to resort to strikes for some time. (iv) The policy of rationalisation of industries should be adopted as a long-term measure. Rationalisation increases productivity and production of industries through the use of brain, brawn and bullion. (v) All possible help in the form of latest technology, raw materials, financial help, subsidies, etc. shold be provided to different consumer goods sectors to increase production.

(b) Rational Wage Policy. Another important measure is to adopt a rational wage and income policy. Under hyperinflation, there is a wage- price spiral. To control this, the government should freeze wages, incomes, profits, dividends, bonus, etc. But such a drastic measure can only be adopted for a short period as it is likely to antagonise both workers and industrialists. Therefore, the best course is to link increase in wages to increase in productivity. This will have a dual effect. It will control wages and at the same time increase productivity, and hence raise production of goods in the economy.

(c) Price Control. Price control and rationing is another measure of direct control to check inflation. Price control means fixing an upper limit for the prices of essential consumer goods. They are the maximum prices fixed by law and anybody charging more than these prices is punished by law. But it is difficult to administer price control.

(d) Rationing. Rationing aims at distributing consumption of scarce goods so as to make them available to a large number of consumers. It is applied to essential consumer goods such as wheat, rice, sugar, kerosene oil, etc. It is meant to stabilise the prices of necessaries and assure distributive justice. But it is very inconvenient for consumers because it leads to queues, artificial shortages, corruption and black marketing. Keynes did not favour rationing for it "involves a great deal of waste, both

of resources and of employment."

Conclusion. From the various monetary, fiscal and other measures discussed above, it becomes clear that to control inflation, the government should adopt all measures simultaneously. Inflation is like a hydra-headed monster which should be fought by using all the weapons at the command of the government.

EFFECTS OF INFLATION*

Inflation affects different people differently. This is because of the fall in the value of money. When price rises or the value of money falls, some groups of the society gain, some lose and some stand in-between. Broadly speaking. there are two economic groups in every society, the fixed income group and the flexible income group. People belonging to the first group lose and those belonging to the second group gain. The reason is that the price movements in the case of different goods, services, assets, etc. are not uniform. When there is inflation, most prices are rising, but the rates of increase of individual prices differ much. Prices of some goods and services rise faster, of others slowly and of still others remain unchanged. We discuss below the effects of inflation on redistribution of income and wealth, production, and on the society as a whole.

1. Effects on Redistribution of Income and Wealth

There are two ways to measure the effects of inflation on the redistribution of income and wealth in a society. *First*, on the basis of the change in the real value of such factor incomes as wages, salaries, rents, interest, dividends and profits. *Second*, on the basis of the size distribution of income over time as a result of inflation. i.e. whether the incomes of the rich have increased and that of the middle and poor classes have declined with inflation. Inflation brings about shifts in the distribution of real income from those whose money incomes are relatively inflexible to those whose money incomes are relatively flexible.

The poor and middle classes suffer because their wages and salaries are more or less fixed but the prices of commodities continue to rise. They become more impoverished. On the other hand, businessmen, industrialists, traders, real estate holders, speculators, and others with variable incomes gain during rising prices. The latter category of persons become rich at the cost of the former group. There is unjustified transfer of income and wealth from the poor to the rich. As a result, the rich roll in wealth and indulge in conspicuous consumption, while the poor and middle classes live in abject misery and poverty.

But which income group of society gains or loses from inflation depends on who anticipates inflation and who does not. Those who correctly anticipate inflation, they can adjust their present earnings, buying, borrowing, and lending activities against the loss of income and wealth due to inflation. They, therefore, do nor get hurt by the inflation. Failure to anticipate inflation correctly leads to redistribution of income and wealth. In practice, all persons are unable to anticipate and predict the rate of inflation correctly so that they cannot adjust their economic behaviour accordingly. As a result, some persons gain while others lose. The net result is redistibution of income and wealth. The effects of inflation on different groups of society are discussed below.

(1) Debtors and Creditors. During periods of rising prices, debtors gain and creditors lose. When prices rise, the value of money falls. Though debtors return the same amount of money, but they pay less in terms of goods and services. This is because the value of money is less than when they borrowed the money. Thus the burden of the debt is reduced and debtors gain. On the other hand, creditors lose. Although they get back the same amount of money which they lent, they receive less in real terms because the value of money falls. Thus inflation brings about a redistribution of real wealth in favour of debtors at the cost of creditors.

(2) Salaried Persons. Salaried workers such as clerks, teachers, and other white collar persons lose when there is inflation. The reason is that their salaries are slow to adjust when prices are rising.

(3) Wage Earners. Wage earners may gain or lose depending upon the speed with which their wages adjust to rising prices. If their unions are strong, they may get their wages linked to the cost of living index. In this way, they may be able to protect themselves from the bad effects of inflation. But the problem is that there is often a time lag between the raising of wages by employees and the rise in prices. So workers lose because by the time wages are raised, the cost of living index may have increased further. But where the unions have entered into contractual wages for a fixed period, the workers lose when prices continue to rise during the period of contract. On the whole, the wage earners are in the same position as the white collar persons.

(4) Fixed Income Group. The recipients of transfer payments such as pensions, unemployment insurance, social security, etc. and recipients of interest and rent live on fixed incomes. Pensioners get fixed pensions. Similarly the rentier class consisting of interest and rent receivers get fixed payments. The same is the case with the holders of fixed interest bearing securities, debentures and deposits. All such persons lose because they receive fixed payments, while the value of money continues to fall with rising prices. Among these groups, the recipients of transfer payments belong to the lower income group and the rentier class to the upper income group. Inflation redistributes income from these two groups toward the middle income group comprising traders and businessmen.

(5) Equity Holders or Investors. Persons who hold shares or stocks of companies gain during inflation. For when prices are rising, business activities expand which increase profits of companies. As profits increase, dividends on equities also increase at a faster rate than prices. But those who invest in debentures, securities, bonds, etc. which carry a fixed interest rate lose during inflation because they receive a fixed sum while the purchasing power is falling.

(6) Businessmen. Businessmen of all types, such as producers, traders and real estate holders gain during periods of rising prices. Take producers first. When prices are rising, the value of their inventories (goods in stock) rise in the same proportion. So they profit more when they sell their stored commodities. The same is the case with traders in the short run. But producers profit more in another way. Their costs do not rise to the extent of the rise in the prices of their goods. This is because prices of raw

materials and other inputs and wages do not rise immediately to the level of the price rise. The holders of real estates also profit during inflation because the prices of landed property increase much faster than the general price level.

(7) Agriculturists. Agriculturists are of three types, landlords, peasant proprietors, and landless agricultural workers. Landlords lose during rising prices becaused they get fixed rents. But peasant proprietors who own and cultivate their farms gain. Prices of farm products increase more than the cost of production. For prices of inputs and land revenue do not rise to the same extent as the rise in the prices of farm products. On the other hand, the landless agricultural workers are hit hard by rising prices. Their wages are not raised by the farm owners, because trade unionism is absent among them. But the prices of consumer goods rise rapidly. So landless agricultural workers are losers.

(8) Government. The government as a debtor gains at the expense of households who are its prinicipal creditors. This is because interest rates on government bonds are fixed and are not raised to offset expected rise in prices. The government, in turn, levies less taxes to service and retire its debt. With inflation, even the real value of taxes is reduced. Thus redistribution of wealth in favour of the government accrues as a benefit to the tax-payers. Since the tax-payers of the government are high-income groups, they are also the creditors of the government because it is they who hold government bonds. As creditors, the real value of their assets decline and as tax-payers, the real value of their liabilities also declines during inflation. The extent to which they will be gainers or losers on the whole is a very complicated calculation.

Conclusion. Thus inflation redistributes income from wage earners and fixed income groups to profit recipients, and from creditors to debtors. So far as wealth redistibutions are concerned, the very poor and the very rich are more likely to lose than middle income groups. This is because the poor hold what little wealth they have in monetary form and have few debts, whereas the very rich hold a substantial part of their wealth in bonds and have relatively few debts. On the other hand, the middle income groups are likely to be heavily in debt and hold some wealth in common stocks as well as in real assets.

2. Effects on Production

When prices start rising production is encouraged. Producers earn wind- fall profits in the future. They invest more in anticipation of higher profits in the future. This tends to increase employment, production and income. But this is only possible up to the full employment level. Further increase in investment beyond this level will lead to severe inflationary pressures within the economy because prices rise more than production as the resources are fully employed. So inflation adversely affects production after the level of full employment. The adverse effects of inflation on production are discussed below.

(1) Misallocation of Resources. Inflation causes misallocation of resources when producers divert resources from the production of essential to non-essential goods from which they expect higher profits.

(2) Changes in the System of Transactions. Inflation leads to changes in transactions pattern of producers. They hold a smaller stock of real money holdings against unexpected contingencies than before. They devote more time and attention to converting money into inventories or other financial or real assets. It means that time and energy are diverted from

the production of goods and services and some resources are used wastefully.

(3) Reduction in Production. Inflation adversely affects the volume of production because the expectation of rising prices alongwith rising costs of inputs bring uncertainty. This reduces production.

(4) Fall in Quality. Continuous rise in prices creates a seller's market. In such a situation, producers produce and sell sub-standard commodities in order to earn higher profits. They also indulge in adulteration of commodities.

(5) Hoarding and Blackmarketing. To profit more from rising prices, producers hoard stocks of their commodities. Consequently, an artificial scarcity of commodities is created in the market. Then the producers sell their products in the black market which increases inflationary pressures.

(6) Reduction in Saving. When prices rise rapidly, the propensity to save declines because more money is needed to buy goods and services than before. Reduced saving adversely affects investment and capital formation. As a result, production is hindered.

(7) Hinders Foreign Capital. Inflation hinders the inflow of foreign capital because the rising costs of materials and other inputs make foreign investment less profitable.

(8) Encourages Speculation. Rapidly rising prices create uncertainty among producers who indulge in speculative activities in order to make quick profits. Instead of engaging themselves in productive activities, they speculate in various types of raw materials required in production.

3. Other Effects

Inflation leads to a number of other effects which are discussed as under:

(1) Government. Inflation affects the government in various ways. It helps the government in financing its activities through inflationary finance. As the money incomes of the people increase, government collects that in the form of taxes on incomes and commodities. So the revenues of the government increase during rising prices. Moreover, the real burden of the public debt decreases when prices are rising. But the government expenses also increase with rising production costs of public projects and enterprises and increase in administrative expenses as prices and wages rise. On the whole, the government gains under inflation because rising wages and profits spread an illusion of prosperity within the country.

(2) Balance of Payments. Inflation involves the sacrificing of the advantages of international specialisation and division of labour. It affects adversely the balance of payments of a country. When prices rise more rapidly in the home country than in foreign countries, domestic products become costlier compared to foreign products. This tends to increase imports and reduce exports, thereby making the balance of payments unfavourable for the country. This happens only when the country follows a fixed exchange rate policy. But there is no adverse impact on the

balance of payments if the country is on the flexible exchange rate system.

(3) Exchange Rate. When prices rise more rapidly in the home country than in foreign countries, it lowers the exchange rate in relation to foreign currencies.

(4) Collapse of the Monetary System. If hyperinflation persists and the value of money countinues to fall many times in a day, it ultimately leads to the collapse of the monetary system, as happened in Germany after World War 1.

(5) Social. Inflation is socially harmful. By widening the gulf between the rich and the poor, rising prices create discontentment among the masses. Pressed by the rising cost of living, workers resort to strikes which lead to loss in production. Lured by profits, people resort to hoarding, blackmarketing, adulteration, manufacture of substandard commodities, speculation, etc. Corruption spreads in every walk of life. All this reduces the efficiency of the economy.

(6) Political. Rising prices also encourage agitations and protests by political parties opposed to the government. And if they gather momentum and become unhandy they may bring the downfall of the government. Many governments have been sacrificed at the alter of inflation.

INFLATION AS A TAX

Inflation operates like a tax when redistribution results in goods and services being transferred to the government from the poeple. If falls heavily on those least able to pay. When the government issues more money to finance its budget deficit, to repay its past debt and to meet its rising demand for goods and services during inflation, it acts as a tax on the people and it transfers purchasing power to the govenment. High inflation rates decrease the purchasing power of money with the poeple and discourage them from holding money. The rate of inflation is the rate of inflation tax. The inflation tax is defined as the decline in purchasing power of money due to inflation. It is calculated as :

$$M \times \frac{i}{(1+i)}$$

Where M is the average money at year-ending and year-beginnning and i is the decimal inflation rate measured by the change in consumer price index (*CPI*). The formula tells that the period for which prices rise by i, each money unit loses $i/(1+i)$ of its purchasing power.

Inflation as a tax on holding real money balances is explained in terms of Figure 20, where the level of real money balances is measured on the horizontal axis and the interest rate on the vertical axis. Suppose the government issues money to finance its budget deficit which will raise the price level and cause the real money stock to fall. Assuming that the initial price level is stable, and the level of real income is constant, the money interest rate (i) is equal to the real interest rate (r). We begin the analysis by further assuming zero expected rate of inflation which is equ the demand for real money balances as curve LL_1. If the money interest rate consistent with the stable price level is hold is (M/P). If the expected rate of in of real cash balances falls from (M/P) to $(M/P)_1$. This means tha rate of inflation to be $E\%$ (i-r_1), everybody desiring to reduce his real cash balances will purchase physical assets and stocks of consumer and other goods, and the price level will rise in the

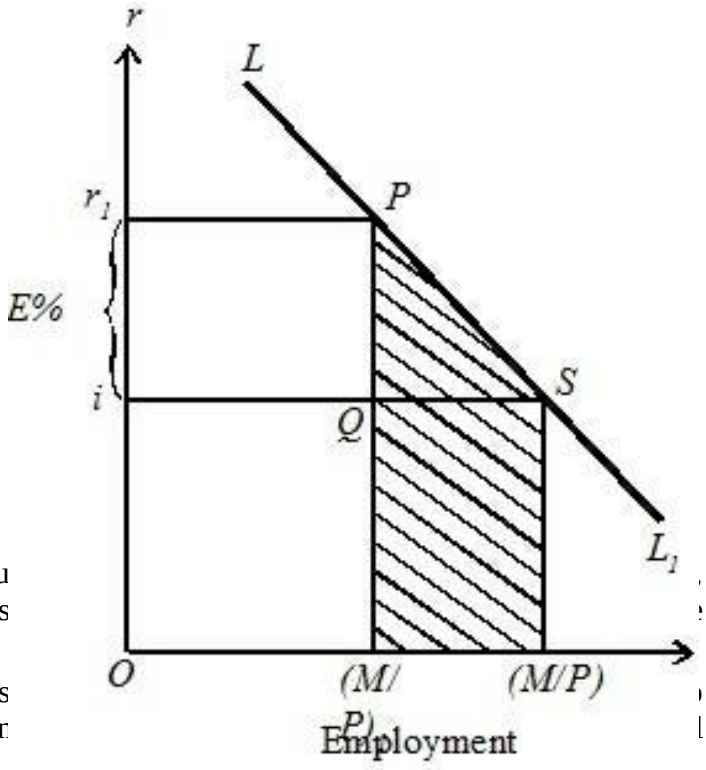

Fig. 20

proportion $(M/P)/(M/P)_1$. The proceeds of the tax in real terms are equal to the rectangle r_1 *PQ i* which is the inflation tax revenue to the

government. The tax base is the amount of real money held by the public which is $(M/P)_1$ (= iQ), and the tax rate is the inflation rate ($i–r_1$)

As a result of high inflation rate, the asset holders pay the inflation tax by losing purchasing power on their money holdings. The government as the issuer of money collects the tax in the form of a reduction in the real value of its liabilities. When the government pays interest on these liabilities, it returns some of the tax to holders of money. In practice, central banks do not pay so much interest as to offset the tax on the money issued by them. They pay no interest on currency and usually pay an interest rate on reserves below the market rate.

COSTS OF INFLATION

The costs of inflation may be economic or social loss arising from the effects of inflation. Assuming that people hold only non-interest bearing money in the form of currency issued by the government and demand deposits of banks, the costs of inflation refer to the loss in real money balances held by individuals and businesses. Since money does not bear a rate of interest, the opportunity cost of holding money rises with the inflation rate which, in turn, reduces the demand for real money balances.

Individuals and business enterprises hold cash balances because they yield utility to them. At a higher rate of inflation, they find the purchasing power of the money balances diminishing. In other words, they find that they require more real money balances than before when there is inflation. The costs of inflation arise when they try to change their existing system of transactions or payments to adjust to a smaller stock of real cash holdings. Individuals or households visit the markets more frequently to buy goods. Business enterprises visit banks more often, increase the frequency of ordering inventories, devote more time and attention in converting money into inventories or financial and real assets. Thus the change in the transactions or payments patterns of individuals and business enterprises require more time and energy then before. It leads to

the diversion of resources from productive to unproductive uses when they are required to visit markets and banks more frequently, maintain excessive inventories of consumer and producer goods, etc. When the real money balances with the people are reduced due to higher expected rate of inflation, their peace of mind is also disturbed. Thus "the ultimate social cost of anticipated inflation is the wasteful use of resources to economise holdings of currency and other non-interest bearing means of payment."

Another social cost of inflation is in terms of the Phillips curve analysis. When inflation starts and is expected to continue, any attmept to reduce its rate of increase will lead to more unemployment. Increase in unemployment is a loss to the economy in terms of the goods and services which cannot be produced because people available for employment are not used.

The majority of economists also regard the redistributive effects of inflation as the cost of inflation.*

The social cost of inflation can be measured in terms of Figure 20. The curve LL_1 is the demand curve for real cash balances which can be interpreted as the *MP* (utility) curve of real cash balances. When the rate
of inflation is zero, the real interest rate is equal to the money interest rate
at *i*. The demand for real cash balanaces is (M/P). The area under the demand curve LL_1 over a given segment of the horizontal axis measures the flow of productivity (utility) from the indicated quantity of real money
balances. When inflation increases at the expected rate of $E\%$ $(i–r_1)$ the
interest rate rises from i to r_1 and the demand for real cash balances falls to $(M/P)_1$. This reduction in real cash balances by $(M/P)–(M/P)_1$ is the social cost of inflation which is measured by the shaded area $(M/P)_1$ *PS*
(M/P). This area "measures the aggregate loss of productivity (utility) resulting from the destruction of real cash balances which occurs when prices rise initially at the announcement that there will be an inflation. The further rise of prices representing the inflation itself is merely sufficient to keep real balances at their new low level and so guarantee that this loss of productivity (utility) will continue as long as the inflation does."

DEFLATION

The opposite of inflation is deflation. It is "a state in which the value of money is rising i.e. prices are falling." It is usually associated with falling activity and employment. As pointed out by Coulborn, "Involuntary unemployment is the hall-mark of deflation." Deflation is caused when prices are falling more than proportionately to the output of goods and services in the economy as a result of decrease in the money supply.

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* May be discussed briefly from the previous section.

Sometimes, deflation is confused with *disinflation*. Deflation is a situation when prices fall along with reduction in output and employment. Disinflation, on the other hand, is a situation when prices are reduced deliberately but output and employment remain unaffected. According to Coulborn, "A lowering of prices, income, and expenditures, when they would be beneficial, would be disinflation."

Effects of Deflation

The effects of deflation are the reverse of inflaton.** Deflation affects different groups differently. Persons with fixed incomes such as workers, white collar salaried workers, pensioners, the rentier class, etc. gain because the value of money rises with falling prices. On the other hand, all types of producers such as industrialists and farmers lose with falling prices. Traders and equity holders also lose. Thus deflation affects adversely the distribution of income and wealth. When prices are falling, the purchasing power is increasing. So the lower, middle, and other classes with low incomes gain. On the other hand, businessmen, industrialists, traders, real estate holders, and others with variable incomes are hit hard and their profits decline with deflation. But this does not mean that there is improvement in income distribution. Rather, the low income groups suffer more because of the fall in employment and income. So both the better off and the worse off feel discontented under deflation.

Deflation also affects production adversely. With falling prices, production falls because income and employment are also declining and

the aggregate demand is on the decline. Commodities start accumulating. Profits fall. Small firms close down. Unemployment spreads. This vicious cricle of fall in demand, production, employment, income and aggregate demand leads to a depression.

The government also suffer under deflation. Revenues from direct and indirect taxes decline. The real burden of public debt increases. Development of the economy suffers because the government is unable to increase public expenditure.

COMPARISON BETWEN INFLATION AND DEFLATION

Of the two—inflation and deflation—which is better than the other. Of course, both are equally bad in their effects on the society. But inflation is the lesser evil. As pointed out by Keynes, "Inflation is unjust, deflation is inexpedient. Of the two deflation is worse. Inflation brings about rising prices and redistribution of income in favour of the better-off classes. On the other hand, deflation leads to fall in output, employment and income. Of all the evils in a capitalist society, unemployment leading to poverty is the worst. We discuss below why Keynes regarded inflation as unjust and deflation inexpedient.

** For a detailed account write just on the basis of arguments opposite to that given under "Effects of Inflation".

Inflation is unjust because it widens the gulf between the rich and the poor. It makes the rich richer at the cost of the poor. On the other hand, the poor are made poorer. The poor and low income classes suffer because their wages and salaries do not rise to the extent prices rise. It becomes difficult for them to make both ends meet with rising prices of consumer goods. On the other hand, businessmen, traders, industrialists, real estate holders, speculators, etc. gain because their profits and incomes increase much more than the rise in prices. So they are not affected by the fall in purchasing power when prices are rising. Thus it leads to inequalities of income and wealth.

When the government resorts to deficit financing to meet its rising

expenditure during inflationary pressures, it increases the demand for goods and services. This deprives the people of the use of essential goods, thereby creating shortages and hardships for the common man.

Again, inflation is unjust because persons who save are losers in the long run. When prices are rising, the value of money is falling. Since savers are mostly the low and middle income groups who save for a varietyof reasons, they are the losers. Their savings lying in deposits are reduced automatically in real terms as inflationary pressures increase.

Inflation is unjust because it is socially harmful. People are lured to amass wealth by unscrupulous means. They, therefore, resort to hoarding, black- marketing, adulteration, manufature of sub-standard commodities, speculation, etc. Corruption spreads in every walk of life. All this reduces the efficiency of the economy.

Deflation, on the other hand, is *inexpedient* because it reduces national income, output and employment. While inflation takes away half the bread of the poor, deflation impoverishes them by taking away the whole of it.

Deflation leads to mass unemployment because fall in production, prices and profits force producers and businessmen to close down their enterprises.

Deflation is also inexpedient because falling prices lead to depression. All economic activities are stagnant. Factories are locked out. Trade and business are at a standstill. There is glut of commodities in all types of markets for goods and services. Even a bumper agricultural crop brings poverty to the peasantry. It is a situation of poverty in the midst of plenty.

Again, once the downward movement of prices begins, the economy plunges into a depression. But the downward movement of the economy is much faster as compared to the upward movement in a cycle. This makes depression of a much longer period. Consequently, people suffer a lot and the economy also remains in a state of stagnation for long.

It is on these grounds that inflation is unjust and deflation is inexpedient.

Keynes pointed out that, “it is not necessary that we weigh one evil against the other. It is easier to agree that both are evils to be shunned.” Still he preferred inflation as the lesser of the two evils. This is because inflation increases national output, employment and income, whereas deflation reduces national income and brings the economy backward to a state of depression. Again inflation is better than deflation because when it occurs the economy is already in a situation of full employment. On the other hand, there is always unemployment under deflation. And unemployment leading to poverty are the two scourges of mankind. Again inflation is a lesser evil than deflation. It redistibutes income and wealth in favour of the rich. But deflation is a greater evil. Though it redistributes income in favour of the low income groups, yet it fails to benefit them because they are unemployed and have little income during deflation. In fact, they are reduced to paupers. It is also easier to control inflation than deflation through appropriate monetary, fiscal, and direct control measures. But to control deflation is a very difficult thing because of the presence of pessimism among producers and businessmen. So far as the increase in inequalities of income and wealth under inflation is concerned, it can be reduced by larger expenditure on social services by the government. The government is in a better position to improve the conditions of the masses under inflation than under deflation due to its larger spending capacity. Moreover, so long as inflation is mild, it helps the economy to grow. It is only when inflation takes the shape of hyperinflation that it is dangerous. Still its effects on the economy may not be so injurious as under deflation.

CONTROL OF DEFLATION

Deflation can be controlled by adopting monetary and fiscal measures in just the opposite manner to control inflation. However, we discuss these measures in brief.

Monetary Policy

To control deflation, the central bank can increase the reserves of commercial banks through a cheap money policy. They can do so by buying securities and reducing the interest rate. As a result, their ability to

extend credit facilities to borrowers increases. But the experience of the Great Depression tells us that in a serious depression when there is pessimism among businessmen, the success of such a policy is practically nil. In such a situation, banks are helpless in bringing about a revival. Since business activity is almost at a stand still, businessmen do not have any inclination to borrow to build up inventories even when the rate of interest is very low. Rather, they want to reduce their inventories by repaying loans already drawn from the banks. Moreover, the question of borrowing for long-term capital needs does not arise during deflation when the business activity is already at a very low level. The same is the case with consumers who faced with unemployment and reduced incomes do not like to purchase any durable goods through bank loans. Thus all that the banks can do is to make credit available but they cannot force businessmen and consumers to accept it. In the 1930s, very low interest rates and the piling up of unused reserves with the banks did not have any significant impact on the depressed economies of the world. Thus the success of monetary policy in controlling deflation is severely limited.

Fiscal Policy

Fiscal policy through increase in public expenditure and reduction in taxes tends to raise national income, employment, output, and prices. An increase in public expenditure during deflation increases the aggregate demand for goods and services and leads to a large increase in income via the multiplier process, while a reduction in taxes has the effect of raising disposable income thereby increasing consumption and investment expenditures of the poeple. The government should increase its expenditure through deficit budgeting and reduction in taxes. The public expenditure includes expenditure on such public works as roads, canals, dams, parks, schools, hospitals and other buildings, etc. and on such relief measures as unemployment insurance, pensions, etc. Expenditure on public works creates demand for the products of private construction industries and helps in reviving them while expenditure on relief measures stimulates the demand for consumer goods industries. Reduction in such taxes as corporate profits tax, income tax, and excise taxes tends to leave more income for spending and investment. Borrowing by the government to finance budget deficits utilises idle money lying with banks and

financial institutions for investment purposes. But the effectiveness of public expenditure primarily depends upon the public works programme, its importance in the economic system, the volume and nature of public works and their planning and timing.

EXERCISES

1. Give a critical asessment of any one theory of inflation and give reasons for selecting this particular theory.
2. What is inflationary-gap? Examine the usefulness of this concept of analysing a process of inflation.
3. Distinguish between demand-pull and cost-push inflation. How have these two views on inflation beeen reconciled?
4. "The distinciton between cost-push and demand-pull inflation is unworkable, irrelevant and even meaningless." Do you agree with this view. Give reasons in support of your answer.
5. Discuss the theory of structural inflation.
6. Is inflation a purely monetary or purely non-monetary or an institutional phenomenon? Write in the context of a developed country.
7. Discuss the theory of the Phillips curve and bring out its apparent policy implications.
8. How does the Phillips curve expalin the trade-off between unemployment and inflation? Discuss its policy implications.
9. Explain the phenomenon of stagflation. Suggest measures to control it.
10. "Inflation is unjust and deflation is inexpedient." Discuss.
11. What is inflation? Explain its economic effects on different people.
12. Discuss the causes of inflation.How can it be controlled?
13. Explain Bent Hansen's Excess Demand Inflation Theory.
14. Explain Friedman's accelerationist hypothesis.
15. Discuss Friedman's view about the Phillips curve.
16. Explain the views of Tobin and Solow with regard to the Phillips curve.
17. Write notes on : Open and Suppressed Inflation, Markup Inflation, Stagflation, Sectoral Inflation, Inflation as a Tax, Costs of Inflation.

UNIT-IV

BUSINESS CYCLES

MEANING

Business cycle or trade cycle is a part of the capitalist system. It refers to the phenomenon of cyclical booms and depressions. In a business cycle, there are wave-like fluctuations in aggregate employment, income, output and price level. The term business cycle has been defined in various ways by different economists. Prof. Haberler's definition is very simple: "The business cycle in the general sense may be defined as an alternation of periods of prosperity and depression of good and bad trade." Keynes' definition in his *Treatise of Money* is more explicit : "A trade cycle is composed of periods of good trade characterised by rising prices and low unemployment percentage, altering with periods of bad trade characterised by falling prices and high unemployment percentages." Gordon's definition is precise: "Business cycles consist of recurring alternation of expansion and contraction in aggregate economic activity, the alternating movements in each direction being self-reinforcing and prevading virtually, all parts of the economy." The most acceptable definition is by Estey: "Cyclical fluctuations are characterised by alternating waves of expansion and contraction. They do not have a fixed rhythm, but they are cycles in that the phases of contraction and expansion recur frequently and in fairly similar patterns."[1]

TYPES OF BUSINESS CYCLES

Business cycles are usually classified as under :

(1) The Short Kitchin Cycle. It is also known as the minor cycle which is of approximately 40 months duration. It is famous after the name of the British economist Joseph Kitchin, who made a distinction between a major and a minor cycle in 1923. He came to the conclusion on the basic of his research that a major cycle is composed of two or three minor cycles of 40 months.

(2) The Long Jugler Cycle. This cycle is also known as the major cycle. It is defined "as the fluctuation of business activity between successive crises." In 1862 Clement Jugler, French economist showed that periods of prosperity, crisis and liquidation followed each other always in the same order. Later economists have come to the conclusion that a Jugler cycle's duration is on the average nine and a half years.

(3) The Very Long Kondratieff Cycle. In 1925, N.D. Kondratieff, the Russian economist, came to the conclusion that there are longer waves of cycles of more than 50 years duration, made of six Jugler cycles. A very long cycles has come to be known as the Kondratieff wave.

(4) Building Cycles. Another type of cycle relates to the construction of buildings which is of fairly regular duration. Its duration is twice that of the major cycles and is on an average of 18 years' duration. Such cycles are associated with the names of Warren and Pearson.

(5) Kuznets Cycle. Simon Kuznets, propounded a new type of cycle, the secular swing of 16-22 years which is so pronounced that it dwarfs the 7 to 11 years cycle into relative insignificance. This has come to be known as the Kuznets Cycle.

CHARACTERISTICS OF BUSINESS CYCLES

Business cycles possess the following characteristics :

1. Cyclical fluctuations are wave-like movements.

2. Fluctuations are recurrent in nature.

3. They are non-periodic or irregular. In other words, the peaks and

troughs do not occur at regular intervals.

4. They occur in such aggregate variables as output, income, employment and prices.

5. These variables move at about the same time in the same direction but at different rates.

6. The durable goods industries experience relatively wide fluctuations in output and employment but relatively small fluctuations in prices. On the other hand, nondurable goods industries experience relatively wide fluctuations in prices but relatively small fluctuations in output and employment.

7. Business cycles are not seasonal fluctuations such as upswings in retail trade during Diwali or Christmas.

8. They are not secular trends such as long-run growth or decline in economic activity.

9. Upswings and downswings are cumulative in their effects.

Thus business cycles are recurrent fluctuations in aggregate employment, income, output and price level.

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1. J.A. Estey, *Business Cycles*, 1956.

PHASES OF A BUSINESS CYCLE

A typical cycle is generally divided into four phases : (1) expansion or prosperity or the upswing; (2) recession or upper-turning point; (3) contraction or depression or downswing; and (4) revival or recovery or lower-turning point. These phases are recurrent and uniform in the case of different cycles. But no phase has definite periodicity or time interval. As pointed out by Pigou, cycles may not be twins but they are of the same family. Like families they have *common* characteristics that are capable of description. Starting at the trough or low point, a cycle passes through a

recovery and prosperity phase, rises to a peak, declines through a recession and depression phase and reaches a trough. This is shown in Figure 1 where *E* is the equilibrium position. We describe below these characteristics of a business cycle.

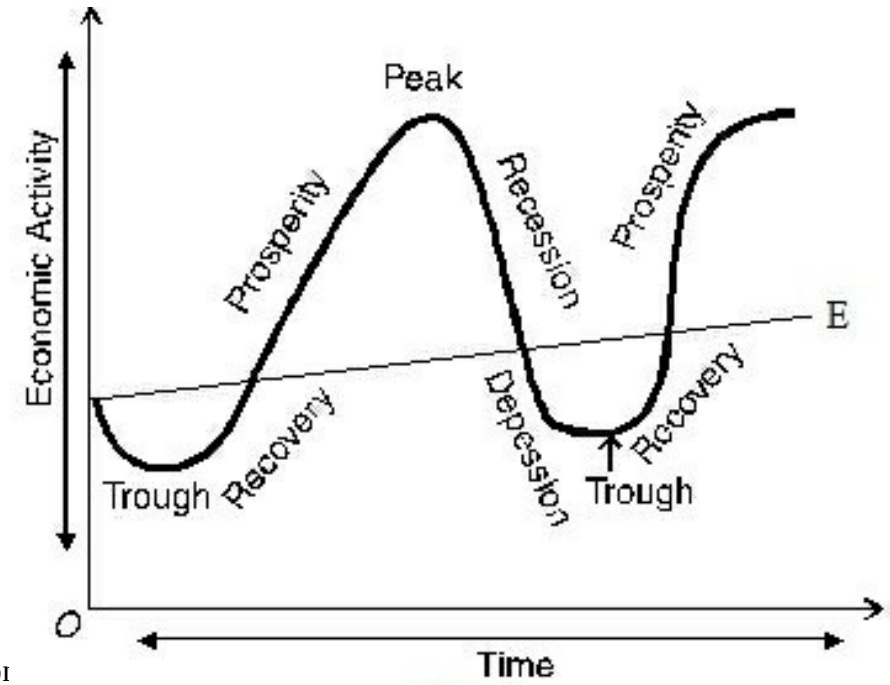

Fig. 1

Recovery

We start from a situation the lower-turning point endogenous forces. Suppose the semi-durable goods wear out which necessitate their replacement in the economy. It leads to increased demand. To meet this increased demand, investment and employment increase. Industry begins to revive. Revival also starts in related capital goods industries. Once begun, the process of revival becomes cumulative. As a result, the levels of employment, income and output rise steadily in the economy. In the early stages of the revival phase, there is considerable *excess* or *idle* capacity in the economy so that output increases without a proportionate increase in total costs. But as time goes on, output becomes less elastic; bottlenecks appear with rising costs, deliveries are more difficult and plants may have to be expanded. Under these conditions, prices rise. Profits increase. Business expectations improve. Optimism prevails. Investment is encouraged which tends to raise the demand for bank loans. It leads to credit expansion. Thus the cumulative process of increase in investment, employment, output, income and prices feeds upon itself and becomes self-reinforcing.

Ultimately, revival enters the prosperity phase.

Prosperity

In the prosperity phase, demand, output, employment and income are at a high level. They tend to raise prices. But wages, salaries, interest rates, rentals and taxes do not rise in proportion to the rise in prices. The gap between prices and costs increases the margin of profit. The increase of profit and the prospect of its continuance commonly cause a rapid rise in stock market values. The economy is engulfed in waves of optimism. Larger profit expectations further increase investment which is helped by liberal bank credit. Such investments are mostly in fixed capital, plant, equipment and machinery. They lead to considerable expansion in economic activity by increasing the demand for consumer goods and further raising the price level. This encourages retailers, wholesalers and manufacturers to add to inventories. In this way, the expansionary process becomes cumulative and self-reinforcing until the economy reaches a very high level of production, known as the *peak* or *boom*.

The peak or prosperity may lead the economy to over full employment and to inflationary rise in prices. It is a symptom of the end of the prosperity phase and the beginning of the recession. The seeds of recession are contained in the boom in the form of strains in the economic structure which act as brakes to the expansionary path. They are : (*i*) scarcities of labour, raw materials, etc. leading to rise in costs relative to prices; (*ii*) rise in the rate of interest due to scarcity of capital; and (*iii*) failure of consumption to rise due to rising prices and stable propensity to consume when incomes increase. The first factor brings a decline in profit margins. The second makes investments costly and along with the first, lowers business expectations. The third factor leads to the piling up of inventories indicating that sales (or consumption) lag behind production. These forces become cumulative and self-reinforcing. Entrepreneurs, businessmen and traders become over cautious and over optimism gives way to pessimism. This is the beginning of the upper turning point.

Recession

Recession starts when there is a downward descend from the ‘peak’ which

is of a short duration. It marks the turning period during which the forces that make for contraction finally win over the forces of expansion. Its outward signs are liquidation in the stock market, strain in the banking system and some liquidation of bank loans, and the beginning of the decline of prices. As a result, profit margins decline further because costs start overtaking prices. Some firms close down. Others reduce production and try to sell out accumulated stocks. Investment, employment, income and demand decline. This process becomes cumulative.

Recession may be mild or severe. The latter might lead to a sudden explosive situation emanating from the banking system or the stock exchange, and a *panic* or *crisis* occurs. "When a crisis, and more particularly a panic, does occur, it seems to be associated with a collapse of confidence and sudden demands for liquidity. This crisis of nerves may itself be occasioned by some spectacular and unexpected failure. A firm or a bank, or a corporation announces its inability to meet its debts. This announcement weakens other firms and banks at a time when ominous signs of distress are appearing in the economic structure; moreover, it sets off a wave of fright that culminates in a general run on financial institutions"...Such was the experience of the United States in 1873, in 1893, in 1907 and recently in 2008. In the words of M.W. Lee, "A recession, once started, tends to build upon itself much as forest fire, once under way, tends to create its own draft and give internal impetus to its destructive ability."[2]

Depression

Recession merges into depression when there is a general decline in economic activity. There is considerable reduction in the production of goods and services, employment, income, demand and prices. The general decline in economic activity leads to a fall in bank deposits. Credit expansion stops because the business community is not willing to borrow. Bank rate falls considerably. According to Professor Estey, "This fall in active purchasing power is the fundamental background of the fall in prices, that despite the general reduction of output, characterises the depression." Thus a depression is characterised by mass unemployment; general fall in prices, profits, wages, interest rate, consumption,

expenditure, investment, bank deposits and loans; factories close down; and construction of all types of capital goods, buildings, etc. comes to a standstill. These forces are cumulative and self-reinforcing and the economy is at the *trough*.

The trough or depression may be short-lived or it may continue at the bottom for considerable time. But sooner or later limiting forces are set in motion which ultimately tend to bring the contraction phase to end and pave the way for the revival. A cycle is thus complete.

CAUSES OF BUSINESS CYCLES

During the last several hundred years, philosophers, economists, stock brokers and men in the street have tried to give various causes of business cycles. Some attribute them to monetary and non-monetary factors while others to psychological factors. Samuelson attributes business cycles to external and internal factors which we explain below.

External Factors

The external factors emphasise the causes of business cycles in the fluctuations of something outside the economic system. Such external factors are sunspots, wars, revolutions, political events, gold discoveries, growth rate of population, migrations, discoveries and innovations. These outside factors change the level of national income by affecting either the investment or consumption component of aggregate demand. For example, a drought that destroys many crops due to sunspots may reduce the quantity of goods produced in the country and adversely affect both consumption and investment. An innovation by opening the door to new markets, raw materials, products and production processes encourages new investments in plant and equipment. Inventions of railroads, electricity, telephone, automobiles, TVs, computers, etc. have led to the burst of investments in both capital and consumer goods from time to time. Discoveries of gold, oil and natural resources have led to large scale investments. Similarly, population expansion and migrations are the causes of huge investments in both housing and other infrastructure and consumer durables. All the above noted external factors have been

responsible for booms in business cycles from time to time.

Internal Factors

The internal factors relate to "mechanisms within the economic system itself which will give rise to self-generating business cycles, so that every expansion will breed recession and contraction, and every contraction will in turn breed revival and expansion, in a quasi-regular, repeating, never- ending chain."[3] Haberler divides the internal factors into monetary and non-monetary which we briefly explain.

1. Bank Credit. Hawtrey, Friedman and other monetarists regard business cycles as "a purely monetary phenomenon". According to Hawtrey, cyclical fluctuations are caused by expansion and contraction of bank credit. These in, turn, lead to changes in the demand for money on the part of producers and traders. Bank credit is the principal means of payment. Credit is expanded or reduced by the banks by lowering or raising the rate of interest or by purchasing and selling of securities to traders. This increases or decreases the supply of money in the economy. An increase in the money supply brings about prosperity and a decrease in the money supply leads to depression.

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2. M.W. Lee, *Economic Fluctuations*, 1955.

2. Over-Saving or Under-Consumption. According to economists like Hobson, Foster and Douglas, business cycles are caused by oversaving or under-consumption. They argue that wide disparities of income and wealth lead to depression in the country. The rich people are not able to spend their entire income. So they save more and invest more in producing consumer goods. On the other hand, the poor people have low incomes or wages. As a result, their demand for consumer goods is low which means that there is under-consumption. According to Hobson, oversaving leads to production of consumer goods in large quantities and to a boom. But under-consumption on the part of the workers due to low wages brings a fall in the demand for consumer goods. Stocks pile up at the current level of prices. These, in turn, lead to a fall in the prices of consumer goods and in the income of the producers. As a result,

depression sets in.

3. Over-Investment. Hayek, Spiethoff, Cassel and Robertson find the root cause of business cycles in over-investment. According to Hayek, it is bank loans which lead to over-investment in capital goods industries relative to consumer goods industries that ultimately brings depression in the economy. When the total money supply exceeds the amount of voluntary savings, it leads to increase in the investment activity and ultimately to a boom. But banks cannot continue to give credit for long due to the shortage of voluntary savings. As a result, production will decline which will bring about a depression. Thus it is over-investment in the capital goods industries which is the cause of a boom and a depression.

4. Competition. According to Chapman, the main cause of business cycles is the existence of competition in an economy which leads to over- production and ultimately to a crisis (depression). Under competitive conditions, firms produce in anticipation of demand. The profit motive attracts new firms. Production increases and boom starts. Competition and profits lead to overproduction and glut of commodities in the market and to fall in prices. On the other hand, the race to produce more and profit more on the part of producers increases the demand for factors of production. Competition among producers to hire more factors raises their prices. Thus costs rise which raise the prices of products. Demand falls and there is glut of commodities which eventually leads to fall in prices and to a depression.

5. Psychological Causes. According to Pigou, the alternating waves of "over optimism" and "over pessimism" are the sole causes of the industrial fluctuations. He traces cyclical fluctuations to the tendency of businessmen to react excessively to the changing conditions of the economy. It is this tendency that causes alternating periods of over- production and under-production. Errors of optimism and pessimism are interacting forces. As soon as the business community discovers that it has made an error of optimism, it tries to correct it by making errors of pessimism. Each phase of the cycle produces a state of psychology which produces forces that bring about reversal of that psychology and in turn

another reversal. These alternating waves of over-optimism (over- production) and over-pessimism (under-production), as a result of these reversals, are the main causes of business cycles.

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3. P.A. Samuelson, *Economics*, p. 293

6. Innovations. According to Schumpeter, innovations in the structure of an economy are the source of economic fluctuations. To him, "the cause of depression is prosperity." The boom consists in the carrying out of innovations in the industrial and commercial fields. The cyclical upswing is set in motion when an innovator starts making investment in his innovation of a new product. This enables him to make profit. Soon other enrepreneurs adopt this new product in "swarm-like clusters". Innovations in one field induce innovations in related fields. There is large increase in the output of new products. Consequently, money incomes and prices rise and help to create a cumulative expansion in the economy. Overoptimism adds further to the boom. When there is glut of new products in the market, their prices fall, and profit margins of entrepreneurs are reduced. Banks ask for repayment of loans. The quantity of money is reduced and prices fall further. Some entrepreneurs cut down production and others are forced into liquidation. Thus the economy enters into depression.

7. Marginal Efficiency of Capital (MEC). According to Keynes, the cycle consists primarily of fluctuations in the rate of investment. And fluctuations in the rate of investment are caused mainly by fluctuations in the MEC. The MEC depends on the supply price of capital assets and their prospective yield. The supply price of capital assets being stable in the short-run, the MEC is determined by the prospective yield of capital assets. The prospective yield, in turn, depends on business expectations. Fluctuations in the rate of investment are also caused by fluctuations in the rate of interest. But it is fluctuations in the MEC which are the principal cause of cyclical fluctuations.

Conclusion. To conclude with Samuelson, business cycles are caused both by external and internal factors. The economic system responds to fluctuations in external factors according to its internal factors, and vice versa.

EFFECTS OF BUSINESS CYCLES

Business cycles have both good and bad effects depending upon whether the economy is passing through a phase of prosperity or depression.

In the *prosperity* phase, "the real income consumed, real income produced and the level of employment are high or rising and there are no idle or unemployed workers or very few of either." There is general increase in economic activity : aggregate output, demand, employment and income are at a high level. Prices are rising. Profits are increasing. Stock markets are rapidly reaching new heights. Investments are increasing with liberal bank credit. This entire process is cumulative and self-reinforcing.

But different sections of the society are affected differently during the prosperity phase. The landless, factory and agricultural workers and middle classes suffer because their wages and salaries are more or less fixed but the prices of commodities rise continuously. They become more poor. On the other hand, businessmen, traders, industrialists, real estate holders, speculators, landlords, shareholders and others with variable incomes gain. Thus the rich become richer and the poor poorer.

The social effects are also bad. Lured by profit, there is hoarding, black- marketing, adulteration, production of substandard goods, speculation, etc. Corruption spreads in every walk of life.

When the economy is nearing the *full employment level* of resources, the ill-effects on production start appearing. Rising prices of raw materials and increase in wages raise costs of production. As a result, profit margins decline. There is rise in interest rates due to scarcity of capital which makes investment costly. These two factors lower business expectations. Lastly, the demand for consumer goods does not rise due to inflationary rise in prices. This leads to piling up of inventories (stocks) with producers and traders. Thus sales lag behind production. There is decline is prices. Producers, businessmen and traders become pessimists and the recession starts.

During *recession*, profit margins decline further because costs start rising

more than prices. Some firms close down. Others reduce production and try to sell accumulated stocks. Investment, output, employment, income, demand and prices decline further. This process becomes cumulative and recession merges into depression.

During a *depression*, there is mass unemployment. Prices, profits and wages are at their lowest levels. Demand for goods and services is the minimum. Investment, bank deposits and bank loans are negligible. Construction of all types of capital goods, buidlings, etc. is at a standstill. There is mass unemployment in the economy. The government revenues from direct and indirect taxes decline. The real burden of the debt increases. The economic development of the country suffers.

THEORIES OF BUSINESS CYCLES

In fact, the causes of business cycles given above are based on the theories of business cycles propounded by economists from time to time. We discuss some of the important theories as under.

1. Hawtrey's Monetary Theory

According to Prof. R.G. Hawtrey,[4] "The trade cycle is a purely monetary phenomenon." It is changes in the flow of monetary demand on the part of businessmen that lead to prosperity and depression in the economy. He opines that non-monetary factors like strikes, floods, earthquakes, droughts, wars, etc. may at best cause a partial depression, but not a general depression. In actuality, cyclical fluctuations are caused by expansion and contraction of bank credit which, in turn, lead to variations in the flow of monetary demand on the part of producers and traders. Bank credit is the principal means of payment in the present times. Credit is expanded or reduced by the banking system by lowering or raising the rate of interest or by purchasing or selling securities to merchants. This increases or decreases the flow of money in the economy and thus brings about prosperity or depression.

The *expansion phase* of the trade cycle starts when banks increase credit facilities. They are provided by reducing the lending rate of interest and

by purchasing securities. These encourage borrowings on the part of merchants and producers. This is because they are very sensitive to changes in the rate of interest. So when credit becomes cheap, they borrow from banks in order to increase their stocks or inventories. For this, they place larger orders with producers who, in turn, employ more factors of production to meet the increasing demand. Consequently, money incomes of the owners of factors of production increase, thereby increasing expenditure on goods. The merchants find their stocks being exhausted. They place more orders with producers. This leads to further increase in productive activity, income, outlay, and demand, and a further depletion of stocks of merchants. According to Hawtrey, "Increased activity means increased demand, and increased demand means increased activity. A vicious circle is set up, a cumulative expansion of productive activity."

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4. R.G. Hawtrey, *Trade and Credit*, 1928

As the cumulative process of expansion continues, producers quote higher and higher prices. Higher prices induce traders to borrow more in order to hold still larger stocks of goods so as to earn more profits. Thus optimism encourages borrowing, borrowing increases sales, and sales raise optimism.

According to Hawtrey, prosperity cannot continue limitlessly. It comes to an end when banks stop credit expansion. Banks refuse to lend further because their cash funds are depleted and the money in circulation is absorbed in the form of cash holdings by consumers. Another factor is the export of gold to other countries when imports exceed exports as a result of high prices of domestic goods. These factors force the banks to raise interest rates and refuse to lend. Rather, they ask the business community to repay their loans. This starts the recessionary phase.

In order to repay bank loans, businessmen start selling their stocks. This sets the process of falling prices. They also cancel orders with producers. The latter curtail their productive activities due to fall in demand. These, in turn, lead to reduction in the demand for factors of production. There is unemployment. Incomes fall. Falling demand, prices and incomes are the

signals for depression. Unable to repay bank loans, some firms go into liquidation, thus forcing banks to contract credit further. Thus the entire process becomes cumulative and the economy is forced into depression.

According to Hawtrey, the *process of recovery* is very slow and halting. As *depression* continues, traders repay bank loans by selling their stocks at whatever prices they can. As a result, money flows into the reserves of banks and funds increase with banks. Even though the bank rate is very low, there is "credit deadlock" which prevents businessmen to borrow from banks due to pessimism in economic activity. This deadlock can be broken by following a cheap money policy by the central bank which will ultimately bring about recovery in the economy.

Its Criticisms

Monetarists like Friedman have supported Hawtrey's theory. But the majority of economists have criticised him for over-emphasising monetary factors to the neglect of non-monetary factors in explaining cyclical fluctuations. Some of the points of criticism are discussed below.

(1) Credit not the Cause of Cycle. None can deny that expansion of credit leads to the expansion of business activity. But Hawtrey believes that an expansion of credit leads to a boom. This is not correct because the former is not the cause of the latter. As pointed out by Pigou, "Variations in the bank money supply is a part of the business cycle, it is not the cause of it." At the bottom of the depression, credit is easily available. Even then, it fails to bring a revival. Similarly, contraction of credit cannot bring about a depression. At best, it can create conditions for that. Thus expansion or contraction of credit cannot originate either boom or depression in the economy.

(2) Money Supply cannot Continue a Boom or Delay a Depression. Haberler has criticised Hawtrey for "his contention that the reason for the breakdown of the boom is always a monetary one and that prosperity could be prolonged and depression stayed off indefinitely if the money suply were inexhaustible."[5] But the fact is that even if the supply of money is inexhaustible in the country, neither prosperity can be continued indefinitely nor depression can be delayed idefinitely.

(3) Traders do not Depend Only on Bank Credit. Hamberg[6] has criticised Hawtrey for the role assigned to wholesalers in his analysis. The kingpin in Hawtrey's theory is the trader or the wholesaler who gets credit from banks and starts the upturn or vice-versa. In actuality, traders do not depend exclusively on bank credit but they finance business through their own accumulated funds and borrowing from private sources.

(4) Traders do not React to changes in Interest Rates. Further, Hamberg also does not agree with Hawtrey that traders react to changes in interest rates. According to Hamberg, traders are likely to react favourably to a reduction in the interest rate only if they think that the reduction is permanent. But they do not react favourably during the depression phase because traders expect a further reduction every time the interest rate is reduced. On the other hand, if traders finance their stocks with their own funds, interest rate changes will have little effect on their purchases.

(5) Factors other than Interest Rate More Important. It is an exaggeration to say that the decisions of traders regarding accumulation or depletion of stocks are solely governed by changes in interest rate. As a matter of fact, factors other than the rate of interest are more important in influencing such decisions. They are business expectations, price changes, cost of storage, etc.

(6) Inventory Investments do not Produce True Cycles. Hamberg further points out that in Hawtrey's theory cumulative movements in economic activity are the result of changes in stocks of goods. But fluctuations in inventroy investment can at best produce minor cycles which are not cycles in the true sense of the term.

(7) Does not Explain Periodicity of Cycle. The theory also fails to explain the periodicity of the cyle.

(8) Ignores Non-Monetary Factors. Hawtrey's theory is incomplete because it emphasises only monetary factors and totally ignores such non- monetary factors as innovations, capital stock, multiplier-accelerator interaction, etc.

2. Hayek's Monetary Over-Investment Theory

F.A. Hayek formulated his monetary over-investment theory of trade cycle. He explained his theory on the basis of Wicksell's distinction between the natural interest rate and the market interest rate. The natural rate of interest is that rate at which the demand for loanable funds equals the supply of voluntary savings. On the other hand, the market rate of interest is the money rate which prevails in the market and is determined by the demand and supply of money. According to Hayek, so long as the natural rate of interest equals the market rate of interest, the economy remains in the state of equilibrium and full employment . Trade cycles in the economy are caused by inequality between market and natural interest rates. When the market interest rate is less than the nautral rate, there is prosperity in the economy. On the contrary, when the market interest rate is more than the natural rate, the economy is in depression.

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5. G. Haberler, *Business Cycles*, pp. 27-28.

6. D. Hamberg, *Business Cycles*, 1937.

According to this thoery, prosperity begins when the market rate of interest is less than the natural rate of interest. In such a situation, the demand for investment funds is more than the supply of available savings. The demand for investment funds is met by the increase in the supply of money. As a result, the interest rate falls. Low interest rate induces producers to get more loans from banks. The producers get more loans to invest for the production of more capital goods. They adopt capital- intensive methods for producing more of capital goods. As a result, production costs fall and profits increase. The production process becomes very lengthy with the adoption of capital-intensive methods. This has the effect of increasing the prices of capital goods in comparison to consumer goods. There being full employment in the economy, they transfer factors of the production from consumer goods sector to capital goods sector. Consequently, the production of consumer goods falls, their prices increase and their consumption decreases. Forced savings increase with the fall in consumption which are invested for the production of capital goods. This leads to increase in their production. On the other hand, with increase in the prices of consumer goods, their producers earn more profits. Induced by high profits, they try to produce more. For this, they

pay higher remuneration to factors of production in comparison with the producers of capital goods. There being competition between the two sectors, prices of factors and prices in the economy continue to rise. This leads to the atmosphere of prosperity in the country and monetary over- investment on factors spreads the boom.

According to Hayek, when the prices of factors are rising continously, the rise in production costs bring fall in profits of producers. The producers of capital goods invest less in the expectation of loss in the future. Consequently, the natural interest rate falls. Simultaneously, banks impose restrictions on giving loans to them. With low profits and reduction in loans, producers reduce the production of capital goods and adopt labour- intensive production processes. There is less investment in capital goods. Production process being small and labour-intensive, the demand for money is reduced, which increases the market interest rate which is more than the natural interest rate. Producers transfer the factors from the production of capital goods to that of consumer goods. But more factors cannot be used in the consumer goods sector as compared to the capital goods sector. This leads to fall in the prices of factors and resources become unemployed. Thus, with the continuous reduction in the prices of goods and factors in the economy, a long period of depression and unemployment begins.

According to Hayek, when the fall in prices comes to an end during depression, banks begin to raise the supply of money which reduces the market interest rate below the natural interest rate. This encourages investment and the process of revival begins in the economy.

Its Criticisms

The monetary over-investment theory of Hayek has been criticised on the following counts:

(1) Narrow Assumption of Full Employment. This theory is based on the assumption of full employment according to which capital goods are produced by reducing consumer goods. In reality, there is no full employment of resources. If resources remain unutilised, the expansion of both the capital goods sector and consumer goods sector may occur

simultaneously. In such a situation, there is no need of transferring resources from one sector to the other.

(2) Unrealistic Assumption of Equilibrium. The assumption of this theory that in the beginning savings and investment are in equilibrium in the economy and the banking system destroys this equilibrium is unrealistic. This is because the equilibrium may deviate due to both internal and external reasons.

(3) Interest Rate not the only Determinant. Hayek assumes changes in the rate of interest as the cause of fluctuations in the economy. This is not correct because besides changes in the rate of interest, the expectations of profit, innovation, invention, etc. also affect trade cycles.

(4) Undue Importance to Forced Savings. Prof. Strigl has criticised this theory for giving undue importance to forced savings. According to him, when people with fixed incomes reduce their consumption with the increase in prices and the high income groups also reduce their consumption to the same extent, savings will not be forced but voluntary.

(5) Investment does not fall with Increase in Consumer Goods. Hayek argues that with the production of consumer goods and the increase in profits from them, investment falls in capital goods. This is not correct. According to Keynes, the marginal productivity of capital increases with the increase in profits of consumer goods. As a result, investment in capital goods also increases and does not fall.

6. Incomplete Theory. Hayek's theory is incomplete because it does not explain the various phases of trade cycle.

3. Schumpeter's Innovations Theory

The innovations theory of trade cycles is associated with the name of Joseph Schumpeter.[7] According to Schumpeter, innovations in the structure of an economy are the source of economic fluctuations. Trade cycles are the outcome of economic development in a capitalist society. Schumpeter accepts Juglar's statement that "the cause of depression is prosperity," and then gives his own view about the originating cause of

the cycle.

Schumpeter's approach involves the development of his model into two stages. The first stage deals with the initial impact of innovation and the second stage follows through reactions to the original impact of innovation.

The first approximation starts with the economic system in equilibrium with every factor fully employed. Every firm is in equilibrium and producing efficiently with its costs equal to its receipts. Product prices are equal to both average and marginal costs. Profits and interest rates are zero. There are no savings and investments. This equilibrium is characterised by Schumpeter as the "circular flow" which continues to repeat itself in the same manner year after year, similar to the circulation of the blood in an animal organism. In the circular flow, the same products are produced every year in the same manner.

Schumpeter's theory starts with the breaking up of the circular flow by an innovation in the form of a new product by an entrepreneur for earning profit.

By innovation Schumpeter means "such changes in the production of goods as cannot be affected by infinitesimal steps or variations on the margin." An innovation may consist of : (1) the introduction of a new product; (2) the introduction of a new method of production; (3) the opening up of a new market; (4) the conquest of a new source of raw materials or semi-manufactured goods; and (5) the carrying out of the new organisations of an industry. Innovations are not inventions. According to Schumpeter, there is nothing that can explain that inventions occur in a cyclical manner. It is the introduction of a new product and the continual improvements in the existing ones that are the principal causes of business cycles.

Schumpeter assigns the role of an innovator not to the capitalist but to an entrepreneur. The entrepreneur is not a man of ordinary ability but one who introduces something entirely new. He does not provide funds but directs their use.

To perform his economic function, the entrepreneur requires two things: first, the existence of technical knowledge in order to produce new products, and second, the power of disposal over the factors of production in the form of bank credit. According to Schumpeter, a reservoir of untapped technical knowledge exists in a capitalist society which he can make use of. Therefore, credit is essential for breaking the circular flow.

The innovating entrepreneur is financed by expansion of bank credit. Since investment in an innovation is risky, he must pay interest on it. With his newly acquired funds, the innovator starts bidding away resources from other industries. Money incomes increase. Prices begin to rise, thereby stimulating further investment. The new innovation starts producing goods and there is an increased flow of goods in the economy. Consequently, supply exceeds demand. Prices and cost of production of goods start declining until recession sets in. Because of the low prices of goods, producers are not willing to expand production. During this period of recession, credit, prices and interest rate decline but total output is likely to average larger than in the preceding prosperity.

Thus Schumpeter's first approximation consists of a two-phase cycle. The economy starts at the equilibrium state, rises to a peak and then starts downward into a recession and continues till the new equilibrium is reached. This new equilibrium will be at a higher level of income than the initial equilibrium because of the innovation which started the cycle. This is shown as the “Primary Wave” in Figure 2.

The second approximation of Schumpeter follows through the reaction of the impact of original innovation. Once the original innovation becomes successful and profitable, other entrepreneurs follow it in "swarm-like clusters." Innovation in one field induces innovations in related fields. Consequently, money incomes and prices rise and help to create a cumulative expansion throughout the economy. With the increase in the purchasing power of consumers, the demand for the products of old industries increases in relation to supply. Prices rise further. Profits increase and old industries expand by borrowing from the banks. It induces a *secondary* wave of credit inflation which is superimposed on the primary wave of innovation. Overoptimism and speculation add further to

the boom. After a period of gestation, the new products start appearing in the market displacing the old products and enforcing a process of liquidation, readjustment and absorption.

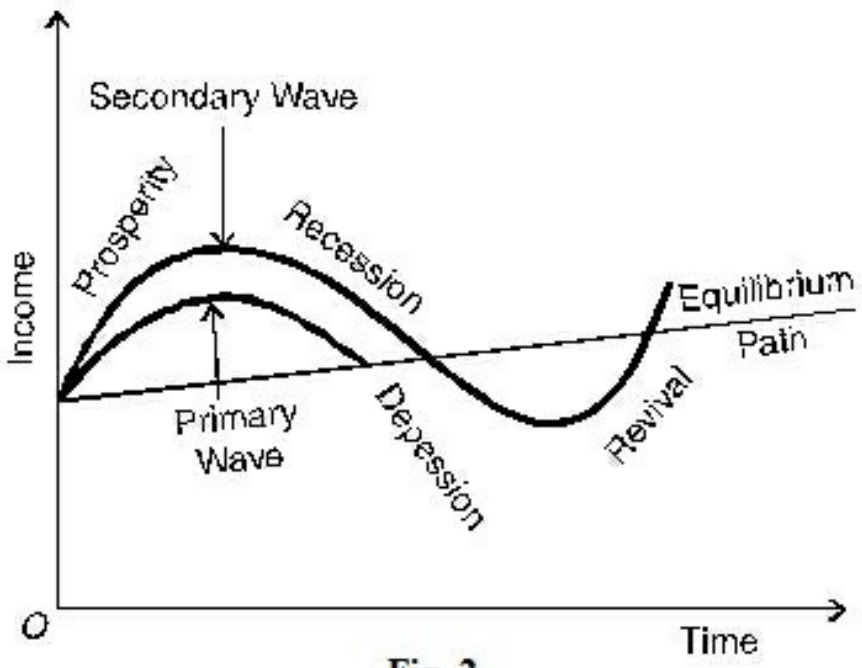

Fig. 2

The demand for the old products is decreased. Their prices fall. The old firms contract output and start repaying bank loans fall. Profits decline. Unc and eventually comes to an end. Depression sets in, and the painful process of readjustment to the "point of previous neighbourhood of equilibrium" begins. Ultimately, the natural forces of recovery bring about a revival.

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7. J.A. Schumpeter, *Business Cycles*, 1939.

Schumpeter believes in the existence of Kondratieff long wave of upswings and downswings in economic activity. Each long wave upswing is brought about by an innovation which leads to abundance of goods for the masses. Once the upswing ends, the long wave downswing begins.

Thus the second approximation of Schumpeter's theory of trade cycle develops into a four phase cycle with the recession which was the second phase in the first approximation continuing downward to give the depression phase. This extension of cycle is followed by a period of revival which continues till the equilibrium level is reached. This is shown as the "Secondary Wave" in Figure 2.

Its Criticisms

Schumpeter's treatment of the different phases and turning points of the cycle is novel and different from all other economists. But it is not free from certain criticisms.

(1) Innovator not Necessary for Innovations. Schumpeter's analysis is based on the innovator. Such persons were to be found in the 18th and 19th centuries who made innovations. But now all innovations form part of the functions of joint stock companies. Innovations are regarded as the routine of industrial concerns and do not require an innovator as such.

(2) Innovations not the Only Cause of Cycles. Schumpeter's contention that cyclical fluctuations are due to innovations is not correct. As a matter of fact, trade cycles may be due to psychological, natural or financial causes.

(3) Bank Credit not the Only Source of Funds. Schumpeter gives too much importance to bank credit in his theory. Bank credit may be important in the short run when industrial concerns get credit facilities from banks. But in the long run when the need for capital funds is much greater, bank credit is insufficient. For this, business houses have to float fresh shares and debentures in the capital market. Schumpeter's theory is weak in that it does not take these factors into consideration.

(4) Innovation financed through Voluntary Savings does not produce a Cycle. Critics point out that if an innovation is financed through voluntary savings or internal funds, there will not be an inflationary rise in prices. Consequently, in an underemployed economy an innovation financed through voluntary savings might not generate a cycle.

(5) Full Employment Assumption Unrealistic. Schumpeter's analysis is based on the unrealistic assumption of full employment of resources to begin with. But the fact is that at the time of revival, the resources are unemployed. Thus the introduction of an innovation may not lead to the withdrawal of labour and other resources from old industries. Thus the competitive impact of an innovation would not increase costs and prices. Since full employment is an exception rather than the rule. Thus

Schumpeter's theory is not a correct explanation of trade cycles.

4. The Psychological Theory

The psychological theory of business cycle has been mainly developed by Prof. A.C. Pigou.[8] This theory attempts to explain the phenomenon of business cycle on the basis of changes in the psychology of industrialists and businessmen. The tendency of the business class is to react excessively to the changing conditions of the economy that are mainly responsible for cyclical fluctuations.

According to Pigou, expectations originate from some real factors such as good harvests, wars, natural calamities, industrial disputes, innovations, etc. But he attributes the causes of business cycle into two categories : (a) inpulses and (b) conditions. *Impulses* refer to those causes which set a process in motion. The *conditions*, on the other hand, are the vehicles through which the process passes and upon which the impulses act. These conditions are the decision making centres which, in turn, shift the levels of economic activities and bring necessary changes in their compositions. They include monetary institutions, market structures, trade unions, etc.

Pigou divides impulses into two parts : (*i*) The expectations held by businessmen, and (*ii*) the actual economic resources owned by them. The expectations depend upon the psychology of businessmen and on their control over resources. But expectations which correspond to actual changes in the economy and are realised, they do not generate cyclical fluctuations.

According to Pigou, it is only when expectations are devoid of their realistic basis, there may be error in forecasting. Such type of expectations cause disturbances in the economy and result in waves of optimism and pessimism. Such “errors in forecasting” may be due to : (*i*) the deviation of actual demand from anticipated demand on the part of consumers; (*ii*) the continual and unpredictable change in the values of economic variables, and (iii) the existence of time lags on account of gestation periods.

Once an error of forecasting occurs in any sector of the economy, it

spreads in the same directions. Once this “impulse” starts acting on the “conditions”, it feeds upon itself. According to Pigou, this is because there is a certain measure of psychological interdependence. In other words, the expectations of optimism or pessimism on the part of businessmen strengthen the building up of further expectations of the same type. When businessmen have a feeling of optimism about the future prospects of business, it would increase the demand for investment resources and inter- industry relations would induce businessmen in other industries to be optimist. Consequently, there is the emergence of boom conditions in the economy.

Pigou opines that the wave of optimism is replaced by pessimism on account of time lags in production. Being over optimistic, some producers make the mistake of over investing in goods. When the goods start coming into the market in large quantities, it is not possible to sell them at remunerative prices. As a result, inventories accumulate. A wave of pessimism starts which spreads to other sectors of the economy. This leads to the emergence of slump in the country. To Pigou, *the lower turning point* starts when inventories are depleted and the "bolder spirit of industry" helps to revive expectations. As a result, the rays of optimism spread slowly and revival starts which leads to boom and so on.

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8. A.C. Pigou, *Industrial Fuctuations,* 1929.

Thus according to this theory, booms and slumps are due to alternative waves of optimism and pessimism on the part of businessmen and industrialists.

Its Criticisms

The psychology theory has been criticised for the following reasons:

1. This is not a theory of business cycles in the true sense because it fails to explain the different phases of a business cycle.

2. It fails to explain the periodicity of a business cycle.

3. It neglects the role of various exogenous and monetary factors which

influence business expectations.

4. The theory does not explain fully the causes that give rise 'to waves of optimism and pessimism' in the business world.

5. The theory fails to explain the reason for deficiency of demand when goods start entering the market in larger quantities. Moreover, it does not explain as to why the deficiency of demand overtakes the flow of goods in the market.

5. The Cobweb Theory

The cobweb theory of business cycles was propounded in 1930 independently by Professors H. Schultz of America, J. Tinbergen of the Netherlands and U.Ricci of Italy. But it was Prof. N. Kaldor of Cambridge University, England, who used the name Cobweb Theorem because the pattern of movements of prices and outputs resembled a cobweb.

The cobweb model is used to explain the dynamics of demand, supply and price over long periods of time. There are many perishable agricultural commodities whose prices and outputs are determined over long periods and they show cyclical movements. As prices move up and down in cycles, quantities produced also seem to move up and down in a counter- cyclical manner. Such cycles in commodity prices and outputs are explained in terms of the cobweb model, so called because the diagrams look like cobwebs.

Suppose the production process spreads over two periods: current and previous. Production in the current period is assumed to be determined by decisions made in the previous period. Thus the current output reflects a production decision made by the producer during the previous period. This decision is in response to the price that he *expects* to rule during the current period when the crop is available for sale. But he expects that the price that would be established during the current period would equal the price during the previous period.

The cobweb theory analyses the movements of prices and outputs when supply is wholly determined by prices in the previous period. In order to

find out the conditions for converging, diverging or constant cycles, one has to look first at the slope of the demand curve and then of the supply curve. If the slope of the demand curve is numerically smaller than the slope of the supply curve, the price will converge towards equilibrium. Conversely, if the slope of the demand curve is numerically greater than the slope of supply curve, the price will diverge from equilibrium. If the slope of the demand curve is numerically the same as that of the supply curve, the price will oscillate around its equilibrium value.

Its Assumptions

The cobweb theory is based on the following assumptions:

(1) The current year's (*t*) supply depends upon the last (previous) year's (*t*–1) decisions regarding output level. Hence current output is influenced by last year's price, *i.e*. P (*t*–1).

(2) The current period or year is divided into sub-periods of a week or fortnight.

(3) The parameters determining the supply function have constant values over a series of periods.

(4) Current demand (D_t) for the commodity is a function of current price (P_t).

(5) The price expected to rule in the current period is the actual price in the last year.

(6) The commodity under consideration is perishable and can be stored only for one year.

(7) Both supply and demand functions are linear.

The Theory

There are three types of cobwebs: (1) Convergent; (2) Divergent; and (3) Continuous. They are explained as under:

1. Convergent Cobweb. Under this formulation of the *cobweb theorem*, the supply function is $S_t = S(t-1)$ and the demand function is $D_t = D(P_t)$. The market equilibrium will be when the quantity supplied equals the quantity demanded: $S_t = D_t$. In any market in which producers' current supply is in response to the price during the last year, equilibrium can be established only through a series of adjustments that take place over several consecutive periods.

Let us take potato growers who produce only one crop a year. They decide about how many potatoes they will grow this year on the assumption that the price of potatoes this year will equal the price in the last year. The market demand and supply curves for potatoes are represented by *D* and *S* curves respectively in Figure 3. The price in the last year was *OP* and the producers decide the equilibrium output *OQ* this year. But the potato crop is damaged due to a blight so that their current ouput is OQ_1 which is smaller than the equilibrium output *OQ*. T period. In the next period, the potato gro higher price OP_1 (=Q_1b). But this is more than the equilibrium quantity *OQ* lower the price to OP_2 (=Q_2d) and thus producers whereby they will reduce supply to OQ_3 in the third period. But this quantity is less than the equilibrium quantity *OQ*. Price will, therefore, rise to OP_3 (=$Q_3 f$) which, in turn, will encourage producers to produce *OQ* quantity. Ultimately, the equilibrium will be established at point *g* where *D* and *S* curves intersect.

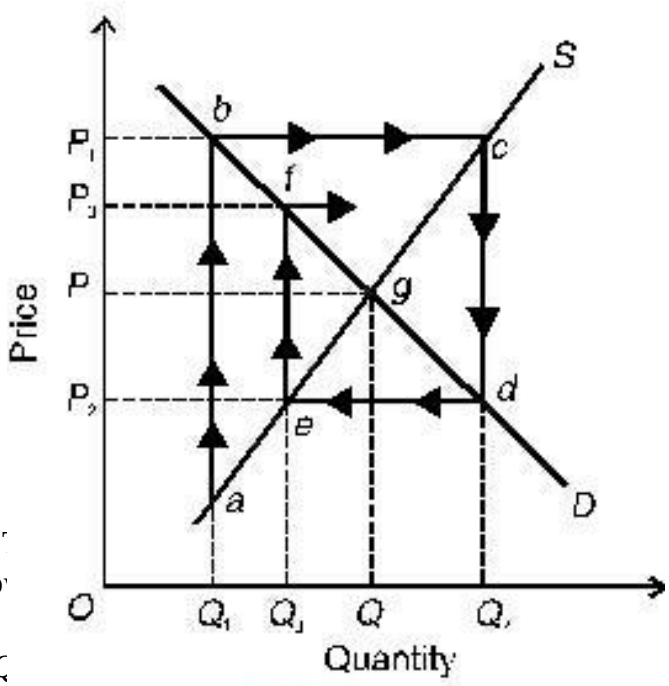

Fig. 3

The series of adjustments just described trace out a cobweb pattern *a*, *b*, *c*,

d, *e* and *f* which converge towards the point of market equilibrium *g* when period-to-period changes in price and quantity have been reduced to zero. The cobweb is convergent.

(2) Divergent Cobweb. But there may be an *unstable* cobweb when price and quantity changes move away from the equilibrium position. This is illustrated in Figure 4. Suppose from the initial price-quantity equilibrium situation of *OP* and *OQ*, there is a temporary disturbance that causes output to fall to OQ_1. This raises the price to OP_1 ($=Q_1a$). The increased

price, in turn, raises output to OQ_2 which is more than the equilibrium output *OQ*. Consequently, the price falls to OP_2. But at this price the demand (OQ_2) exceeds the supply (OQ_3). As a result, the price shoots up to OP_3 ($=Q_3e$) and the adjustment of producers to this price leads farther

away from the equilibrium. This is an explosive situation and the equilibrium position is unstable. The cobweb is divergent.

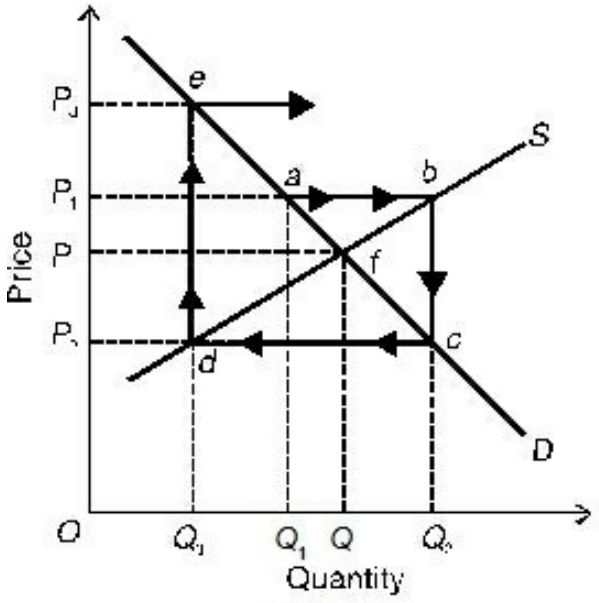

Fig. 4

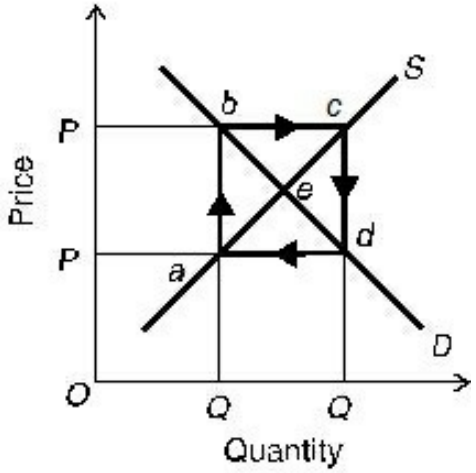

Fig. 5

(3) Continuous Cobweb. The cobweb may be of constant amplitude with perpetually oscillating prices and quantities, as shown in Figure 5. Suppose that the price in the current year is *OP*. Thus the quantity to be supplied is going to be OQ_1. But in order to sell this output, the price that

it will fetch in the next period will be OP_1. But at this price, the demand

OQ_1 is more than the supply OQ which will again raise the price to OP (=Qb). In this way, prices and quantities will move in a circle with oscillations of constant amplitude around the equilibrium point e.

Its Criticisms

The analysis of the cobweb theory is based upon very restrictive assumptions which make its applicability doubtful.

1. Not Realistic. It is not realistic to assume that the demand and supply conditions remain unchanged over the previous and current periods so that the demand and supply curves do not change (or shift). In reality, they are bound to change with considerable divergences between the actual and expected prices. Suppose the price is so low that some producers incur heavy losses. As a result, the number of sellers is reduced which changes the position of the supply curve. It is also possible that the expected price may be quite different from the estimated price. As a result, the cobweb may not develop properly on the basis of unchanged demand and supply curves. Thus demand, supply and price relations that lead to different cobwebs have little real applicability.

2. Output not Determined by Price. The thoery assumes that the output is determined by the price only. In reality, the agricultural output in particular is determined by several other factors also, such as weather, seeds, fertilizer, technology, etc.

3. Divergent Cobweb Impossible. Critics hold that divergent cobweb is impossible. It is obvious from Fig. 4 that once the equilibrium is upset, the cobweb cycle goes on diverging for an indefinite period which leads to an explosive situation. It is impossible.

4. Continuous Cobweb Impractical. Critics point out that continuous cobweb is impractical because it cannot continue indefinitely. This is because producers incur more loss than profit from it. This is explained by Fig. 5. If a farmer produces OQ output, he receives total revenue $OQbP$ whereas his total cost is $OQaP_1$ and his net profit is $PbaP_1$. When the

output is OQ_1, total revenue is OQ_1dP_1 while the total cost is OQ_1cP.

Thus, he incurs P_1dcP total loss. Hence, in the case of continuous cobweb cycle, the producers have to face alternative years of profit and loss, but losses always exceed profit. Therefore, this cycle is impractical.

5. Not a Theory. In reality, cobweb is not a business cycle theory because it only explains fluctuations in the agricultural sector. So it is not used in explaining business cycles.

Implications

The cobweb model is an oversimplification of the real price determination process. But it supplies new information to the market participants about the market behaviour which they can incorporate into their decisions. The cobweb model is not merely an adjustment process of the market equilibrium but it also predicts unobservable events. Its significance lies in the demand, supply and price behaviour of agricultural commodities. Expectations about future conditions have an important influence on current prices. If there are boom conditions in the country, the farmers expect higher prices of their crops and increase their supplies in the market. But in the event of crop failures, the supplies of agricultural commodities will be reduced. In such a situation, the government may exempt farmers from agricultural taxes and even provide interest free loans to tide over the crisis. On the contrary, a bumper crop may lower the prices of agricultural crops by increasing their supplies more than their demand. In such a situation, the government may give subsidies to farmers or procure agricultural products at minimum support prices from the farmers.

6. Keynes's Theory

The Keynesian theory of the trade cycle is an integral part of his theory of income, output and employment. Trade cycles are periodic fluctuations of income, output and employment. Keynes regards the trade cycle as mainly due to "a cyclical change in the marginal efficiency of capital, though complicated and often aggravated by associated changes in the other significant short-period variables of the economic system."

According to Keynes, the principal cause of depression and

unemployment is the lack of aggregate demand. Revival can be brought about by raising aggregate demand which, in turn, can be raised by increasing consumption and/or investment. Since consumption is stable during the short-run, revival is possible by increasing investment. Similarly, the main cause of the downturn is reduction in investment. Thus in the Keynesian explanation of the trade cycle, "the cycle consists primarily of fluctuations in the rate of investment. And fluctuations in the rate of investment are caused mainly by fluctuations in the marginal efficiency of capital." The MEC (marginal efficiency of capital) depends on the supply price of capital assets and their prospective yield. Since the supply price of capital assets is stable in the short-run, the MEC is determined by the prospective yield of capital assets, which, in turn, depends on business expectations. Fluctuations in the rate of investment are also caused by fluctuations in the rate of interest. But Keynes gives more importance to fluctuations in the MEC as the principal cause of cyclical fluctuations.

To explain the course of the Keynesian cycle, we start with the *expansion phase*. During the expansion phase, the MEC is high. Businessmen are optimistic. There is rapid increase in the rate of investment. Consequently, output, employment and income increase. Every increase in investment leads to a multiple increase in income via the multiplier effect. This cumulative process of rising investment, income and employment continues till the boom is reached.

As the *boom* progresses, there is a tendency for the MEC to fall due to two reasons. *First*, as more capital goods are being produced steadily, the current yield on them declines. *Second*, at the same time the current costs of new capital goods rise due to shortages and bottlenecks of materials and labour.

During the *downturn*, investment falls due to a fall in the MEC and rise in the rate of interest. This leads to a cumulative decline in employment and income via the reverse operation of the multiplier. Further, the fall in the MEC may shift the consumption function downward thereby hastening the depression. Keynes attaches more importance to the sudden collapse of the MEC than to a rise in the rate of interest as an explanation of the

downturn of the cycle leading to the crisis and the depression.

Unlike the sudden collapse of the economic system, the *revival* takes time. It depends on factors which bring about the recovery of the MEC. "The time which must elapse before recovery begins, depends partly upon the magnitude of the *normal rate of growth of the economy* and partly upon *the length of life of capital goods*. The shorter the length of life of durable assets, the shorter the depression. And also, the more rapid the *rate of growth*, the shorter the depression." Another factor which governs the duration of depression is the "carrying costs of surplus stocks." According to Keynes, the carrying cost of surplus stocks during the depression is seldom less than 10 per cent per annum. So for a few years, disinvestment in stocks will continue till the surplus stocks are exhausted. Optimism takes the place of pessimism. The MEC increases. Fresh investment starts taking place. Revival has started.

Its Criticisms

Keynes's theory of the trade cycle is superior to the earlier theories because "it is more than a theory of the business cycle in the sense that it offers a general explanation of the level of employment, quite independently of the cyclical nature of changes in employment."[9] However, critics are not lacking in pointing out its weakness.

(1) Overemphasis on the Role of Expectations. Keynes has been criticised for his analysis of business cycle based on expectations. In fact, he overemphasised the role of expectations in influencing the MEC. According to Hart, Keynes relied on "convention" for forecasting changes in business expectations. The reliance on the conventional hypothesis makes Keynes' concept of expectations superfluous and unrealistic.

(2) Psychological Theory. Keynes considers the trade cycle as mainly due to fluctations in the MEC. The MEC, in turn, determines the rate of investment. And investment decisions, depend upon the psychology of businessmen or producers. Thus Keynes' theory is not much different from Pigou's psychological theory of the trade cycle.

(3) Explanation of Crisis Wrong. Keynes attributes the downturn to the

sudden collapse in the MEC. Accroding to Hazlitt, the term MEC being vague and ambiguous, "Keynes' explanation of the crisis of the marginal efficiency of capital is either a useless truism or an obvious error."

(4) Incomplete Theory. Another weakness of Keynes' theory of the trade cycle is that some of its variables such as expectations, MEC and investment cannot explain the different phases of the cycle. In the words of Dillard, "It is less than a complete theory of the business cycle because it makes no attempt to give a detailed account of the various phases of the cycle."

(5) Not Based on Empirical Data. Saulnier criticises Keynes's for lacking in factual proof. According to him, Keynes makes no attempt to test any of his deductions with facts. Dillard also points toward this defect when he writes that Keynes "does not examine closely the empirical data of cyclical fluctuations."

(6) One-Sided Theory. One of the serious omissions of Keynes's theory of the trade cycle is the acceleration principle. This made his theory one- sided because his explanation centres round the principle of multiplier. As pointed out by Sir John Hicks, "The theory of acceleration and the theory of multiplier are two sides of the theory of fluctuations, just as the theory of demand and the theory of supply are the two sides of the theory of value."

7. Samuelson's Model of Business Cycle

Prof. Samuelson[10] constructed a multiplier-accelerator model assuming one period lag and different values for the *MPC* (α) and the accelerator (β) that result in changes in the level of income pertaining to five different types of fluctuations.

The Samuelson model is

$$Y_t = G_t + C_t + I_t \qquad ...(1)$$

where Y_t is national income *Y* at time t which is the sum of government

expenditure G_t , consumption expenditure C_t and induced investment I_t.

$$C_t = \alpha Y_{t-1} \quad (1)$$

$$I_t = \beta(C_t - C_{t-1}) \quad (2)$$

Substituting equation (2) in (3) we have,

$$I_t = \beta(\alpha Y_{t-1} - \alpha Y_{t-2}) \quad (3)$$

$$I_t = \alpha\beta Y_{t-1} - \alpha\beta Y_{t-2}$$

$$= \alpha\beta(G_t + I_{t-1} + I_{t-2})$$

...(2)**

1

...(3)

Substituting equations (2), (4) and (5)

in (1) we have

...(4)

...(5)

$$Y_t = 1 + \alpha Y_{t-1} + \beta\alpha Y_{t-1} - \beta\alpha Y_{t-2} \quad ...(6)$$

$$= 1 + \alpha(Y_{t-1} + \beta Y_{t-1}) - \beta\alpha Y_{t-2}$$

$$= 1 + \alpha(1+\beta)\, Y_{t-1} - \beta\alpha Y_{t-2} \quad ...(7)$$

According to Samuelson, "If we know the national income for two periods, the national income for the following period can be simply derived by taking a weighted sum. The weights depend, of course, upon the values chosen for the marginal propensity to consume and for the *relation* (i.e.accelerator)". Assuming the value of the marginal propensity to consume to be greater than zero and less than one ($0 < \alpha < 1$) and of the accelerator greater than zero ($\beta > 0$), Samuelson explains five types of cyclical fluctuations which are summarised in the Table 1.

9. Dudley Dillard, *op.cit.*, p. 267.

Table 1. Samuelson's Interaction Model

Case	*Values*	*Behaviour of the Cycle*

1	$\alpha = .5, \beta = 0$	Cycleless Path
2	$\alpha = .5, \beta = 1$	Damped Fluctuations
3	$\alpha = .5, \beta = 2$	Fluctuations of Constant Amplitude
4	$\alpha = .5, \beta = 3$	Explosive Cycles
5	$\alpha = .5, \beta = 4$	Cycleless Explosive Path

Case 1 : Samuelson's case 1 shows a cycleless path because it is based only on the multiplier effect, the accelerator playing no part in it. This is shown in Fig. 6 (A).

Case 2 shows a damped cyclical path fluctuating around the static multiplier level and gradually subsiding to that level, as shown in Fig. 6 (B).

Case 3 depicts cycles of constant amplitude repeating themselves around the multiplier level. This case is depicted in Fig. 6 (C).

Case 4 reveals anti-damped or explosive cycles, see Fig. 6 (D).

Case 5 relates to a cycleless explosive upward path eventually approaching a compound interest rate of growth, as shown in Fig. 6 (E).

Of the five cases explained above, only three cases 2, 3 and 4 are cyclical in nature. But they can be reduced to two because case 3 pertaining to cycles of constant amplitude has not been experienced. So far as case 2 of damped cycles is concerned these cycles have been occurring irregularly in a milder form over last half century. Generally, cycles in the post-World War II period have been relatively damped compared to those in the inter-World War II period. They are the result of “such disturbances— which may be called erratic shocks— arising from exogenous factors, such as wars, changes in crops, inventions and so on ‘which’ might be expected to come alongwith fair persistence." But it is not possible to measure their magnitude.

Case 4 of explosive cycles has not been found in the past, its absence being the result of endogenous economic factors that limit the swings. Hicks has, however, built a model of the trade cycle assuming values that

would make for explosive cycles kept in check by ceilings and floors.

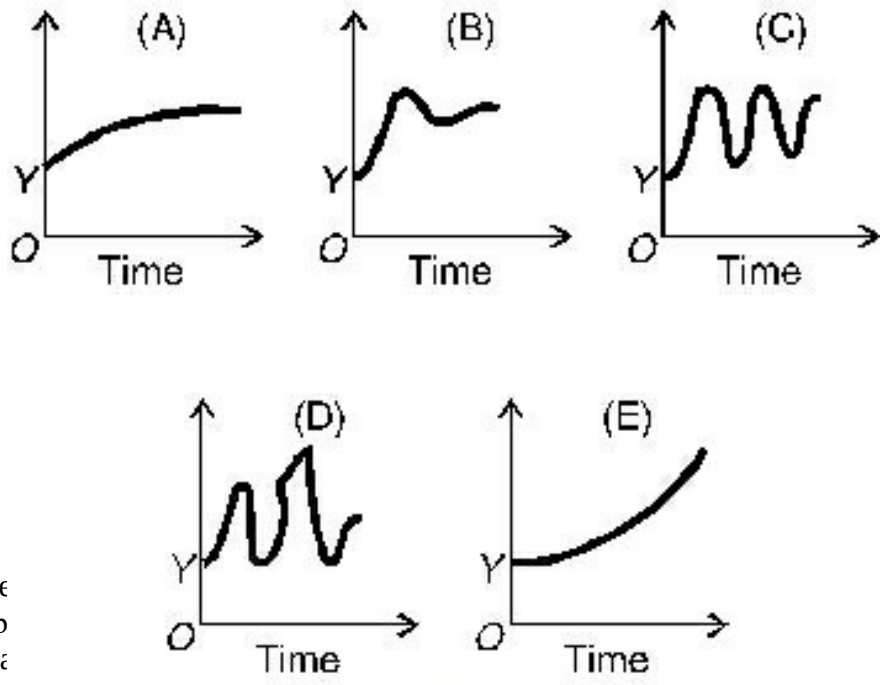

Fig. 6

Critical Appraisal of the Model

The interaction of the multiplier and the accelerator has the merit of raising national income at a much faster rate than by either the multiplier or the accelerator alone. It serve a guide to stabilisation p the multiplier analysis ba than one) that the acceler a helpful guide to busi together produce cyclical fluctuations. The greater the value of the accelerator (p), the greater is the chance of an explosive cycle. The greater the value of the multiplier, the greater the chance of a cycleless path.

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10. Paul A. Samuelson, "Interactions between the Multiplier Analysis and Principle of Acceleration," *R.E.S.*, May 1939.

** Consumption in period t is regarded as a function of the previous period (t–1).

Limitations

Despite these apparent uses of the multiplier-accelerator interaction, this analysis has its limitations:

(1) Samuelson is silent about the length of the period in the different cycles explained by him.

(2) This model assumes that the marginal propensity to consume (α) and the accelerator (β) are constants, but in reality they change with the level of income so that this is applicable only to the study of small fluctuations.

(3) The cycles explained in this model oscillate about a stationary level in a trendless economy. This is not realistic because an economy is not trendless but it is in a process of growth. This has led Hicks to formulate his theory of the trade cycle in a growing economy.

(4) According to Duesenberry, it presents a mechanical explanation of the trade cycle because it is based on the multiplier-accelerator interaction in rigid form.

(5) It ignores the effects of monetary changes upon business cycles.

8. Hicks's Theory of Business Cycle

J.R. Hicks in his book *A Contribution to the Theory of the Trade Cycle* builds his theory of business cycle around the principle of the multiplier- accelerator interaction. To him, "the theory of the acceleration and the theory of the multiplier are the two sides of the theory of fluctuations." Unlike Samuelson's model, it is concerned with the problem of *growth* and of a moving equilibrium.

Ingredients of the Theory

The ingredients of Hicks's theory of trade cycle are warranted rate of growth, consumption function, autonomous investment, an induced investment function, and multiplier-accelerator relation.

The warranted rate of growth is the rate which will sustain itself. It is consistent with saving-investment equilibrium. The economy is said to be growing at the warranted rate when real investment and real saving are taking place at the same rate. According to Hicks, it is the multiplier- accelerator interaction which weaves the path of economic fluctuations

around the warranted growth rate.

The consumption function takes the form $C_t = \alpha Y_{t-1}$. Consumption in period *t* is regarded as a function of income (*Y*) of the previous period (*t*– 1). Thus consumption lags behind income, and the multiplier is treated as a lagged relation.

The autonomous investment is independent of changes in the level of output. Hence it is not related to the growth of the economy.

The induced investment, on the other hand, is dependent on changes in the level of output. Hence it is a function of the growth rate of the economy. In the Hicksian theory, the accelerator is based on induced investment which alongwith the multiplier brings about an *upturn*. The accelerator is defined by Hicks as the ratio of induced investment to the increase in income. Given *constant* values of the multiplier and the accelerator, it is the 'leverage effect' that is responsible for economic fluctuations.

Assumptions of the Theory

The Hicksian theory of trade cycle is based on the following assumptions:

(1) Hicks assumes a progressive economy in which autonomous investment increases at a constant rate so that the system remains in a moving equilibrium.

(2) The saving and investment coefficients are disturbed overtime in such a way that an upward displacement from equilibrium path leads to a lagged movement away from equilibrium.

(3) Hicks assumes *constant* values for the multiplier and the accelerator.

(4) The economy cannot expand beyond the full employment level of output. Thus "the full employment ceiling" acts as a direct restraint on the upward expansion of the economy.

(5) The working of the accelerator in the downswing provides an *indirect* restraint on the downward movement of the economy. The rate of

decrease in the accelerator is limited by the rate of depreciation in the downswing.

(6) The relation between the multiplier and accelerator is treated in a lagged manner, since consumption and induced investment are assumed to operate with a time lag.

(7) It is assumed that the average capital-output ratio (v) is greater than unity and that gross investment does not fall below zero. Thus the cycles are inherently explosive but are contained by ceilings and floors of the economy.

The Hicksian Theory

Hicks explains his theory of the trade cycle in terms of Fig. 7. Line *AA* shows the path of *autonomous* investment growing at a constant rate. *EE* is the equilibrium level of output which depends on *AA* and is deduced from it by the application of the multiplier accelerator interaction to it. Line *FF* is the full employment ceiling level above the equilibrium path *EE* and is growing at the constant rate of autonomous investment. *LL* is the lower equilibrium path of output representing the floor or 'slump equilibrium line'.

Hicks begins from a cycleless situation P_O on the equilibrium path *EE* when an increase in the rate of autonomous investment leads to an upward movement in income. As a result, the growth of output and income propelled by the combined operation of the multiplier and accelerator moves the economy on to the upward expansion path from P_0 to P_1. According to Hicks, this *upswing* phase relates to the *standard* cycle which will lead to an *explosive* situation because of the given values of the multiplier and the accelerator. But this does not happen because of the upper limit or ceiling set by the full employment level *FF*. Hicks writes in this connection: “I shall follow Keynes in assuming that there is some point at which output becomes inelastic in response to an increase in effective demand.” Thus certain bottlenecks of supply emerge which prevent output from reaching the peak and instead encounter the ceiling at P_1.

When the economy hits the full employment ceiling at P_1, it will creep along the ceiling for a period of time to P_2 and the downward swing will not start immediately. The economy will move along the ceiling from P_1 to P_2 depending upon the time period of the investment lag. The greate ceiling path. Since income cycle, there is a decreased keep the economy at the ce

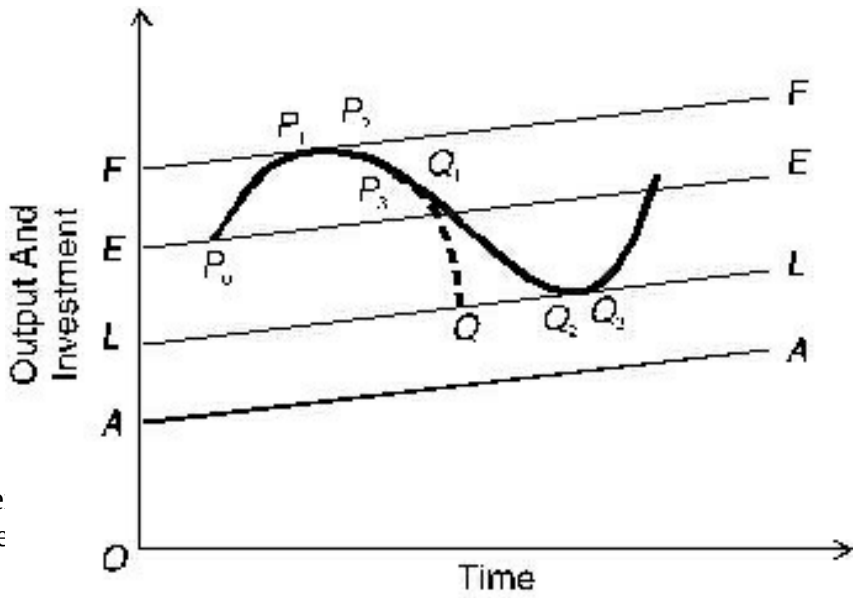

Fig. 7

During the *downswing*, "the multiplier-accelerator mechanism sets in reverse, falling investment reducing income, reduced income reducing investment, and so on, progressively. If the accelerator worked continuously, output would plunge downward below the equilibrium level *EE*, and because of explosive tendencies, to a greater extent than it rose above it." The fall in output in this case might be a steep one, as shown by P_2 P_3 Q. But in the downswing, the accelerator does not work so swiftly as in the upswing. If the slump is severe, induced investment will quickly fall to zero and the value of the accelerator becomes zero. The rate of decrease in investment is limited by the rate of depreciation. Thus the total amount of investment in the economy is equal to autonomous investment *minus* the constant rate of depreciation. Since autonomous investment is taking place, the fall in output is much gradual and the slump much longer than the boom, as indicated by $Q1Q2$. At $Q2$, the slump reaches the bottom or floor provided by the *LL* line. The economy does not turn upward

immediately from Q_2 but will move along the slump equilibrium line to

Q_3 because of the existence of excess capacity in the economy. Finally, when all excess capacity is exhausted, autonomous investment will cause income to rise which will in turn lead to an increase in induced investment

so that the accelerator is triggered off which alongwith the multiplier

moves the economy toward the ceiling again. It is in this way that the cyclical process will be repeated in the economy.

Its Criticisms

The Hicksian theory of the business cycle has been severely criticised by Duesenberry, Smithies and others on the following grounds:

1. Value of Multiplier not Constant. Hicks's model assumes that the value of the multiplier remains constant during the different phases of the trade cycle. This is based on the Keynesian stable consumption function. But this is not a realistic assumption, as Friedman has proved on the basis of empirical evidence that the marginal propensity to consume does not remain stable in relation to cyclical changes in income. Thus the value of the multiplier changes with different phases of the cycle.

2. Value of Accelerator not Constant. Hicks has also been criticised for assuming a constant value of the accelerator during the different phases of the cycle. The constancy of the accelerator presupposes a constant capital- output ratio. These are unrealistic assumptions because the capital-output ratio is itself subject to change due to technological factors, the nature and composition of investment, the gestation period of capital goods, etc. Lundberg, therefore, suggests that the assumption of constancy in accelerator should be abandoned for a realistic approach to the understanding of trade cycles.[11]

3. Autonomous Investment not Continuous. Hicks assumes that autonomous investment continues throughout the different phases of the cycle at a steady pace. This is unrealistic because financial crisis in a slump may reduce autonomous investment below its normal level. Further, it is also possible, as pointed out by Schumpeter, that autonomous investment may itself be subject to fluctuations due to a technological

innovation.

4. Growth not Dependent only on changes in Autonomous Investment. Another weakness of the Hicksian model is that growth is made dependent upon changes in autonomous investment. It is a burst of autonomous investment from the equilibrium path that leads to growth. According to Prof. Smithies,[12] the source of growth should lie within the system. In imputing growth to an unexplained extraneous factor, Hicks has failed to provide a complete explanation of the cycle.

5. Distinction Between Autonomous and Induced Investment not Feasible. Critics like Duesenberry[13] and Lundberg point out that Hicks's distinction between autonomous and induced investment is not feasible in practice. As pointed out by Lundberg, every investment is autonomous in the short run and a major amount of autonomous investment becomes induced in the long run. It is also possible that part of a particular investment may be autonomous and a part induced, as in the case of machinery. Hence this distinction between autonomous and induced investment is of doubtful validity in practice.

6. Ceiling Fails to Explain adequately the onset of Depression. Hicks has been criticised for his explanation of the ceiling or the upper limit of the cycle. According to Duesenberry, the ceilling fails to explain adequately the onset of depression. It may at best check growth and not cause a depression. Shortage of resources cannot bring a sudden decline in investment and thus cause a depression. The recession of 1953-54 in America was not caused by shortage of resources. Further, as admitted by Hicks himself, depression may start even before reaching the full employment ceiling due to monetary factors.

7. Explanation of Floor and Lower Turning Point not Convincing. Hicks's explanation of the floor and of the lower turning point is not convincing. According to Hicks, it is autonomous investment that brings a gradual movement towards the floor and it is again increase in autonomous investment at the bottom that leads to the lower turning point. Harrod doubts the contention that autonomous investment would be increasing at the bottom of the depression. Depression may retard rather

than encourage autonomous investment. Further, Hicks's contention that revival would start with the exhaustion of excess capacity has not been proved by empirical evidence. Rendings Fels's study of the American business cycles in the 19th century has revealed that the revival was not due to the exhaustion of excess capacity. Rather in certain cases, revival started even when there was excess capacity.

8. Full Employment level not Independent of Output Path. Another criticism levelled against Hicks's model is that the full employment ceiling. As defined by Hicks, it is independent of the path of output. According to Dernburg and McDougall, the full employment level depends on the magnitude of the resources that are available to the country. The capital stock is one of the resources. When the capital stock is increasing during any period, the ceiling is raised. "Since the rate at which output increases determines the rate at which capital stock changes, the ceiling level of output will differ depending on the time path of output."

9. Explosive Cycle not Realistic. Hicks assumes in his model that the average capital-output ratio (v) is greater than unity for a time lag of one year or less. Thus explosive cycles are inherent in his model. But empirical evidence shows that the response of investment to a change in output (v) is spread over many periods. As a result, there have been damped cycles rather than explosive cycles.

10. Mechanical Explanation of Trade Cycle. Another serious limitation of the theory is that it presents a mechanical explanation of the trade cycle. This is because the theory is based on the multiplier-accelerator interaction in rigid form, according to Kaldor and Duesenberry. Thus it is a mechanical sort of explanation in which human judgement, business expectations and decisions play little or no part. Investment plays a leading role based on formula rather than on judgement.

11. Contraction Phase not Longer than Expansion Phase. Hicks has been criticised for asserting that the contraction phase is longer than expansion phase of trade cycle. But the actual behaviour of the postwar cycles has shown that the expansionary phase of the business cycle is much longer than the contractionary phase.

Conclusion. Despite these apparent weaknesses of the Hicksian model, it is superior to all the earlier theories in satisfactorily explaining the turning points of the business cycle. To conclude with Dernburg and McDougall, "The Hicks's model serves as a useful framework of analysis which, with modification, yields a fairly good picture of cyclical fluctuation within a framework of growth. It serves especially to emphasise that in a capitalist economy characterised by substantial amounts of durable equipment, a period of contraction inevitably follows expansion. Hicks's model also pinpoints the fact that in the absence of technical progress and other powerful growth factors, the economy will tend to languish in depression for long periods of time." The model is at best suggestive.

9. Goodwin's Trade Cycle Model

Goodwin[14] presents a non-linear model of trade cycle as against Hicks' linear model.

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11. E. Lunberg, "*The Stability Growth*," *J.E.P.*, No. 8, 1958.

12. A Smithies, "Economic Fluctuations and Growth" *Econometrica*, Jan. 1957.

13. J.B. Duesenberry, *Business Cycles and Economic Growth*, 1958.

Features of the Model

The main features of Goodwin's model are :

(a) A linear consumption function $C = \alpha Y + C_0$ where α = consumption- income ratio, C_0=autonomous consumption.

(b) Net investment (I) is equal to the rate of change in capital stock which is the result of adjustment between actual capital, K and desired capital, $\overline{K}$ and $\overline{K} = \beta Y + \alpha$ where β is the accelerator.

(c) Desired capital $\overline{K}$ is proportional to output, Y.

(d) Net investment changes due to a change in output which in turn, changes the level of desired capital. As a result, the accelerator which is

non-linear brings a change in output via net investment. Goodwin

shows three possibilities for net investment :

(1) When $\overline{K}$>*K*, there will be increase in the rate of net investment which will shift the economy to full capacity output for capital goods industries.

(2) When $\overline{K}$= *K*, this situation is maintained by meeting the replacement demand and by keeping net investment as zero, *i.e.*, *I* = O.

(3) When *K*> $\overline{K}$, the adjustment takes place with the scrappage rate, K_2.

Cyclical Path

To explain the cyclical path of Goodwin's model, we start with *K*= situation where the $\overline{K}$ equilibrium level of output $Y = \frac{1}{1-\alpha}$ (C_0 + *I*) and *I* = *a*

is the technological growth factor. These take the system along an equilibrium path. This path is similar to the Hicksian line *EE*. The Hicksian path relates to a steady increase in autonomous investment while Goodwin's path relates to a rise in desired capital resulting from a continuous technical change. Any divergence from this equilibrium path will not bring the economy toward it and there will be continuous fluctuations around it.

Take $\overline{K}$>*K*, the desired capital stock being more than the actual capital, investment increases and the propelling forces of multiplier and accelerator will push the system in the upward direction. During this phase of expansion, given the constant rate of depreciation, net investment increases in proportion to the change in output. As the accelerator of Goodwin's model is non-linear, the increase in net investment is not related to the increase in output but to the difference between the actual

capital stock (K) and the desired capital stock ($\overline{K}$). This difference is determined by the rate of change in output. This investment relationship being continuous, investment is immediately pushed to the extreme

position. Thus expansion reaches a situation where $I = \frac{dk}{dt} = K_1$, the rate of

capital goods capacity output. This restricts the increase in output and the accelerator becomes discontinuous. During the expansion phase $\overline{K} > K$ but at the peak $K = \overline{K}$ which is due to a decline in the rate of autonomous investment.

Once the desired capital $\overline{K}$ exceeds the actual capital stock K, the desired capital will be equal to the scrappage or replacement rate K_2. This leads

to a fall in the desired capital $\overline{K}$ and in the rate of autonomous investment. Thus the contraction path of the system starts.

During the contraction phase when $K > \overline{K}$, gap between the two is to be met by the scrappage rate K_2. Simultaneously, the desired capital continues to rise by the technological growth factor. The gap between K and $\overline{K}$ is being closed by the gradual elimination of excess capacity

through failure to replace and the steady occurrence of capital-using

innovations. In this way, the contraction path pushes the economic system to the lowest extreme point of $I = -K_2$.

When the economy reaches the lower turning point of $K = \overline{K}$, the level of desired capital $\overline{K}$ is to be raised. This is possible by stimulating the constant technical growth factor. When $\overline{K} > K$, the expansion again starts. So long as the technical progress continues, the economy cannot remain at the lower turning point. In fact, fast technical progress will expand the economy soon. As against, the Hicksian model, the Goodwin's cycle does not creep along the floor or the ceiling level. Rather, it jumps from these levels. Both boom and recession bring contraction and recovery of their own. If the growth factor does not exist in technological change, there will be no autonomous investment in the capital stock. Consequently, the

economy will remain stuck in the contraction phase for a long time instead of expanding. Because it takes more time for capital to depreciate than in capital formation. In such a situation there will be one-sided formation of trade cycles, as shown in Figure 8. In the beginning of the expansion phase, $\overline{K}$ increases to *OA* level and *K* also rises and equals it. When $K=\overline{K}$, contraction or downswing starts, $\overline{K}$ is reduced to *OB* level and *K* also declines and equals $\overline{K}$. There being no technological change in the growth factor, it takes more time for features of the Goodwin cycle in figure 8.

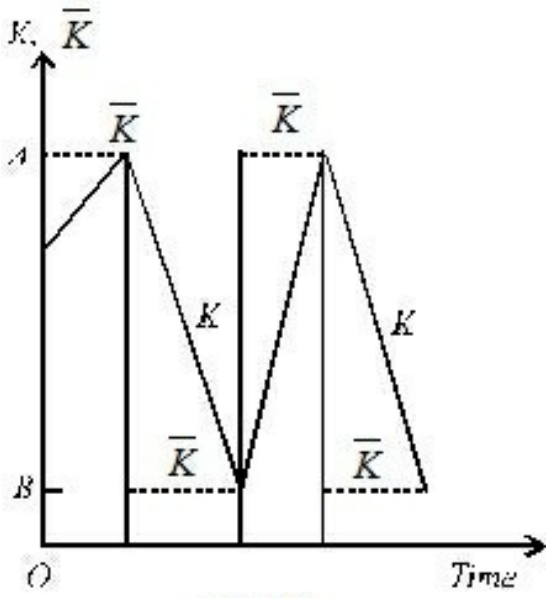

Fig. 8

(1) In the expansion phase, $\overline{K}>K$ and in the contraction phase, $K>\overline{K}$.

(2) At the peak of each cycle, the common level of $\overline{K}$ is *OA* which is smaller than the *OB* level of $\overline{K}$ at the trough and shows more time for *K* to equal $\overline{K}$. This is clear from the dotted horizontal lines at *OA* level in the upper portion and the dotted horizontal lines at *OB* level in the lower portion of Figure 8.

On the other hand, if the growth factor for technological progress is included, $\overline{K}$ continues to increase with each cycle and it takes long time for *K* to equal $\overline{K}$ in the expansion phase. When the downswing starts, there being no growth factor the contraction phase becomes shorter. Thus the presence and absence of technological growth factor make the subsequent peaks and troughs at the higher level than the earlier peaks and troughs in the Goodwin cycle. These are shown as upper and lower dotted lines in Figure 9.

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14. R.M. Goodwin, "The Non-Linear Accelerator and the Persistence of Business Cycles", *Econometrica*, Jan. 1951.

In the figure *aa* line shows the technological growth factor which is similar to the Hicksian *EE* line where $K=\overline{K}=a$. The upper and lower limits of $\overline{K}$ have been shown by the dotted lines. *P* represents peaks and *T* as troughs where $K=\overline{K}$. The contraction paths *PT* become shorter than the expansion paths, *TP*.

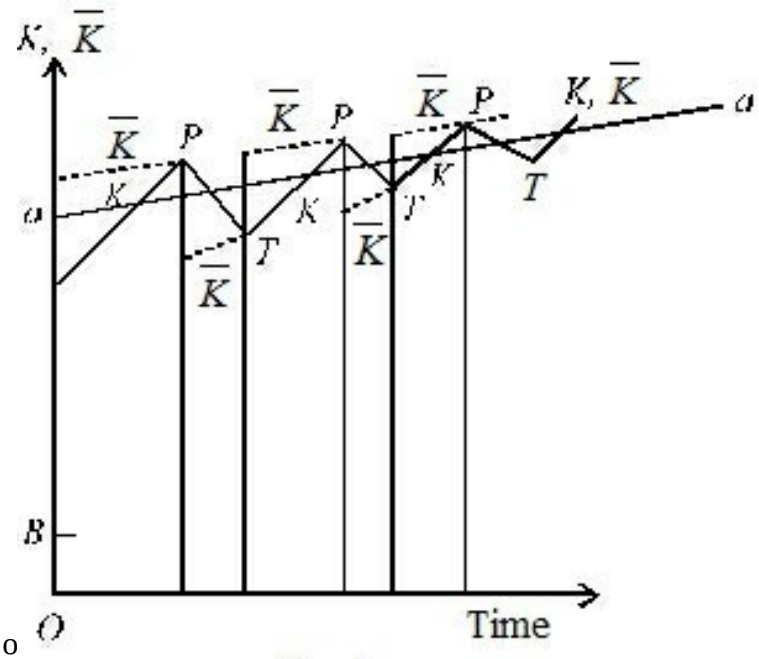

Fig. 9

Its Criticisms

The following are the weaknesses o

1. Unrealistic. The Goodwin model is unrealistic on two counts. *First*, it shows that the recessionary phase is longer than the expansionary phase of the cycle, as shown in Figure 9. *Second*, the desired stock of capital becomes constant at the peak, as shown by the dotted lines in Figure 9.

2. Empirically Wrong. The Goodwin model shows that when the economy reaches the peak and the trough, it at once takes a downturn and upturn respectively. This is empirically wrong because both recession and recovery are slow processes. As Hicks has also pointed out that the economy creeps along the upper and lower ceilings.

Conclusion. Despite these limitations, according to Prof. Allen, "The advantage of Goodwin's model is that the non-linear element is built in; the resulting oscillation maintains itself without any dependence on outside factors or on particular initial (or historical) conditions."[15]

Differences between Goodwin and Hicks Models

Goodwin's model is different from Hicks' model on the following points :

1. The Hicksian model shows only how cycles take place. But Goodwin's model traces the time path of a realistic cycle.

2. The Hicks model is linear which becomes non-linear when the ceiling and floor of a cycle meet. But Goodwin's model is throughout non-linear.

3. Hicks combines growth and cycles in his model and keeps growth dependant on autonomous investment. According to Goodwin, growth depends on technological change which continuously increases the productive capacity of the economy.

4. The equilibrium path *EE* of Hicks is based on continuous increase in autonomous investment. But Goodwin's growth path *aa* is based on the increase in desired capital $\overline{K}$ which is the result of continuous technological changes.

10. Friedman's Theory of Business Cycles*

Friedman and Schwartz[16] have argued on the basis of US historical data that business cycles are mostly monetary in origin. It is the money stock itself that shows a consistent cyclical behaviour which is closely related to the cyclical movements in economic activity at large. About the causal relation between the money stock and economic activity, they make the following generalisations: (i) changes in economic activity have always been accompanied by changes in the money stock; (ii) there have not been major changes in the money stock that have not been accompanied by changes in economic activity; and (iii) changes in the stock of money have been attributed to a specific variety of exogenous factors rather than to changes in economic activity. Thus changes in the money stock are a consequence as well as independent cause of changes in economic activity. But once they occur, they will, in turn, produce still further effects on economic activity. There is also much evidence that during business cycles the money stock plays largely an independent role.

In one of his earlier writings, Friedman emphasises that the concept of lag is related to the business cycle. These cycles are mostly monetary in origin. A monetary change effects different economic magnitudes, some of which adjust faster than others which cause distortions in economis

activity, thereby giving rise to the business cycles. Thus it can be said in Fisher's words that the cycle is largely a "dance of the dollar".

Major US historical economic fluctuations include inflationary and deep depression cycles. According to Friedman and Schwartz, the empirical evidence justifies the generalisations noted above. These show that the stock of money has displayed a systematic cyclical pattern over the decades. The money stock generally reaches its peak before the 'reference' peak of the cycles. Similarly, it reaches its trough before the 'reference' trough. One of their estimates of the lag between turning points in the growth of the money stock and in the level of economic activity reveals that during the seven cycles between 1927 and 1970, peaks in the rate of change in the money stock precede reference cycle peaks (in economic activity series) before downturns by 20 months on an average, and troughs in the rate of change of the money stock precede reference troughs by about 11 months on an average before upturns. The lag of economic activity appears to be greater for peaks than for troughs. There has been strong secular changes in the money stock over these decades. On the other hand, in deep depression cycles, there has been a greater fall in money stock. But in mild depressions, there has been a reduction in the growth rate of the money stock rather than any actual fall.

The usual cycle consists of a contraction phase in which economic activity declines to trough of the cycle, followed by expansion and reaching the peak of the cycle. These cycles are superimposed over a long run secular growth path, *GP*, as shown in Figure 10.

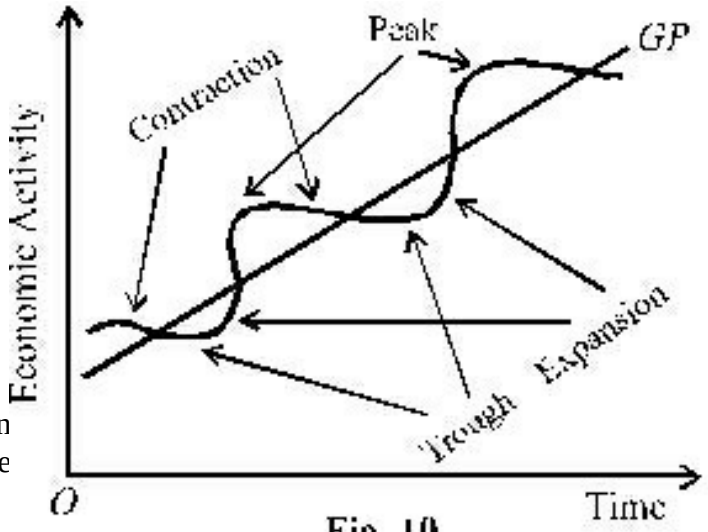

Fig. 10

On the basis of the above analysis, Friedman and Schwartz point toward two proposition money stock are necessary and sufficie

appreciable changes in growth rate of economic activity or money income. *Second*, this is true both for long secular changes and also for changes over periods roughly the length of business cycles.

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15. R.G.D. Allen, *Mathematical Economics*, 1969

They further observe that a *secular change* in the gowth rate of the money stock leading to longer period changes in money income are reflected mainly in different price behaviour rather than in different growth rates of output. On the other hand, a short period change in the growth rate of money stock also exerts a substantial influence on the growth rate of *output*. The greater stability of the "money multiplier" in contrast to the Keynesian investment multiplier has led Friedman and Schwartz to come to the above conclusion. According to them, substantial expansions in the quantity of money over short periods have been a major proximate source of the accompanying inflation of prices. Substantial contractions in the quantity of money over shorter periods have been a major factor in producing severe economic contractions. Cyclical variations in the quantity of money may well be an important element in the ordinary mild business cycle.

Next, Friedman and Schwartz explain the *mechanism* which brings about monetary changes leading to the business cycles. They begin their explanation of the transmission mechnaism with a state of moving equilibrium in which real per capita income, the stock of money, and the price level are changing at constant annual rates. Suppose the central bank increases the stock of money in the market by open market operations by purchasing securities. The non-bank sellers and commercial banks will try to readjust their portfolios. The commercial banks will create more money with increase in their reserves, thereby transmitting the increase in high- powered stock of money. On the other hand, the non-bank holders of cash will seek to purchase other categories of securities such as high-risk fixed coupons, equities, real property, etc. This will bid up prices of such assets. As the process continues, the initial impacts will spread throughout the economy. The increased demand for assets will spread sooner or later affecting equities, houses, durable producer goods, durable consumer goods, etc. All these will bid up the prices of assets and of both producer

and consumer goods. People will tend to consume more services, such as renting houses rather than purchasing them. This will tend to raise service prices. These effects will raise interest rates on the whole range of assets. Ultimately, expenditures rise on all directions without any change in interest rates at all. "Interest rates and asset prices may simply be conduit through which monetary change is transmitted to expenditures without being altered at all, just as a greater inflow into a tank may, after an interval, simply increase the rate of outflow without altering the level of the tank itself." All these forces operate simultaneously and there are cyclical fluctuations.

This explanation of the transmission mechanism fits with the empirical observations of business cycles. Initially, the rise in the growth rate of the money stock occurs early in the contraction phase. Its first impact is on the financial markets where first bonds, then equities and only later on payments for real resources will be affected. The financial markets tend to revive well before the trough. This is what has happened historically.

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* This theory is also known as *Money and Business Cycles Theory*.

16. M. Friedman and A.W.Schwartz, "Money and Business Cycles", *R.E.S.*, (Supplement), 1963.

The dynamic process of transition from one equilibrium path to another involves a cyclical adjustment process. *Exogenous fluctuations* in the money stock will lead to fluctuations in the demand for goods and services. In addition, there may be an endogenous cycle. A rise in demand raises prices. If there is a lag in the adjustment of real money balances to the new price level, the initial portfolio adjustment will tend to overshoot. The initial rise in demand will thus be followed by a fall in demand. The result will be a damped cycle.

According to Friedman, the *lag* plays an important role in business cycles. The amplitude of economic fluctuations depends: *First*, on the amplitude, time pattern, number and independence of the disturbances affecting the economic system. *Second*, on the reaction mechanism of the economic system to the disturbances. The lag may be long because the effects of monetary disturbances are distributed over an extended period. A long lag may mean a larger damping of disturbances than a short lag. Hence there

is a smaller amplitude of resulting fluctuations. The lags in economic activity behind peaks and troughs in the rate of change of the money stock are not uniform. Friedman concludes on the basis of empirical evidence that lags involving changes in the rate of the money stock that affect the level of economic activity are both long and variable.

Its Criticisms

Economists have criticised Friedman's theory of money and business cycles on the following grounds:

(1) Monetary Changes not the Only Cause of Changes in Economic Activity. Friedman argues that it is monetary changes that cause changes in economic activity. But critics point out that the direction of causation is just the opposite of it. It is changes in the level of business activity which cause changes in the growth rate of the money stock.

(2) Monetary Changes not the Main Cause of Business Cycles. According to this theory, monetary changes are the main cause of business cycles. But in reality, business cycles are the result of the other exogenous factors like innovations. Monetary changes may be one among other factors, and not the only factor.

(3) Time Lag of Peaks and Troughs not Long and Variable. According to Friedman, the time lag of peaks and troughs in the rate of change of the money stock relative to economic changes in business cycles is both long and variable. Prof. Culbertson regards this evidence as faulty for two reasons: *First*, it relates turning points in one series in the money stock to turning points in economic activity. *Second*, it implies that monetary change has been an exogenous variable and that causation runs only from monetary change to economic change. In fact, causation also has run in other direction.

Despite these criticisms, it cannot be denied that one of the important causes of business cycles is "a dance of the dollar."

11. Kaldor's Model of the Trade Cycle

Nicholas Kaldor[17] built a model of the trade cycle based on the Keynesian terminology of saving and investment. He showed that the cycle is the result of pressures that push the economy toward the equality of ex-ante (anticipated, expected or planned) saving and investment. In fact, it is the difference between ex-ante saving and investment that leads to a cycle.

Kaldor shows the stability and instability co and *S* are nor level of incor case there is

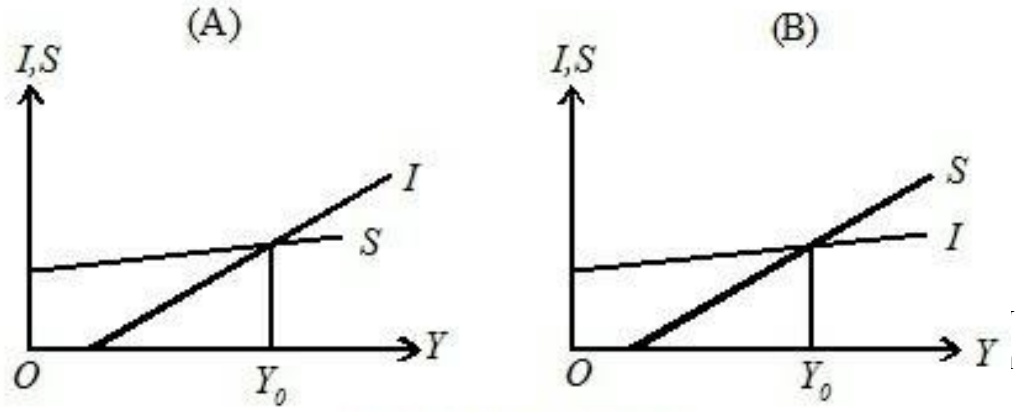

Fig. 11 (A) and (B)

unstable equilibrium position beyond Y_0 because such a situation will lead to limitless expansion, to full employment and hyper-inflation. On the other hand, if $S>I$, it means a downward movement to the left of Y_0 which will lead to zero output and employment and to collapse of the economy as shown in Panel (B) of the figure. Kaldor discards linear saving and investment functions because they fail to produce a cycle. Instead, be adopts non-linear saving and investment functions.

A non-linear investment function *I* is shown in Figure 12. As the economy moves into the expansion phase, shown by the movement from the left along the *I* curve, the curve is almost flat. It means that there is excess capacity at a low level of income and the net investment is zero. But "when expansion gets under way, the negative effect of accumulated capital is a more powerful influence for investment decisions than the higher levels of output and profit. In the opposite case of a high level of

income when the economy moves into the contraction phase, the *I* curve is again flat and the net investment is small "because rising costs of construction, increasing costs and increasing difficulty of borrowing will dissuade entrepreneurs from expanding still faster." This slows down the rate of increase in output. It means that the existing capital stock and the capacity are more than the current output. This leads to decline in further investment. Thus income falls and the cumulative effect is that the economy moves into the contraction phase.

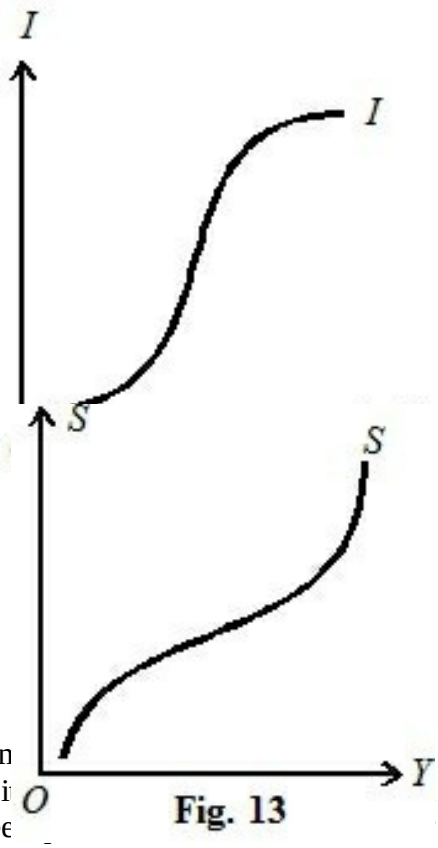

Fig. 13

Similarly, a non-linear saving function is shown in Figure 13. At very low levels of income, saving is much reduced and may even be negative. So during the expansion phase, the *MPS* is large. At normal levels of income, saving will increase at a smaller rate. This is shown by the middle range of the *S* curve. But at very high income levels, saving will be absolutely large and people will save a large proportion of their income.

The cycle is visible when the non-linear saving and investn as in Figure 14. The figure shows multiple equilibria at posi *B* are stable positions and *C* an unstable position. Betwee position *A*, *I* is greater than *S*. This will lead to the rise in income level. Between positions *A* and *C* and above *B* position, *S* is greater than *I*. This will lead to the fall in income.

But *A* and *B* are stable positions only in the short run. It is only in the long run that they become unstable and the path of the cycle is visible. For this, Kaldor introduces the capital stock as another variable that affects the relationship between saving and investment. He takes both saving and

investment as functions of income and capital stock so that

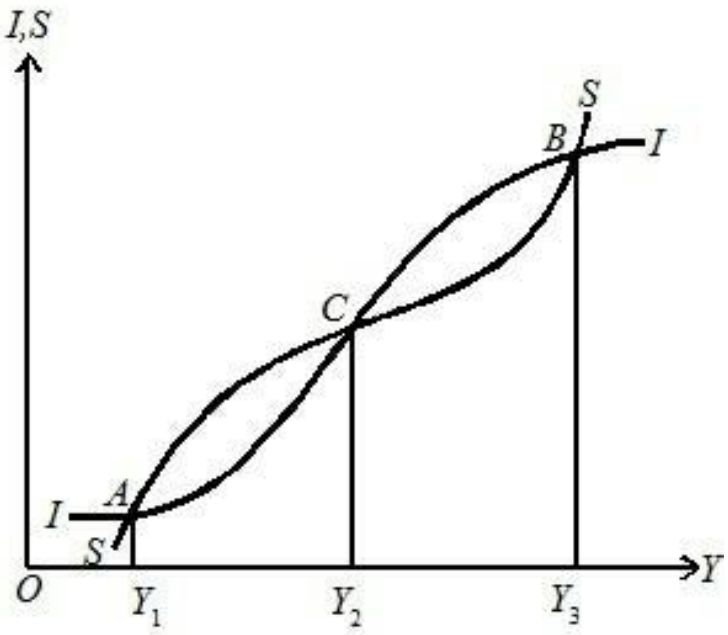

Fig. 14

$$S = f(Y, K)$$
$$I = f(Y, K)$$

$$\text{and} \quad \frac{dS}{dY} > 0 \quad , \quad \frac{dS}{dK} > 0$$

$$\frac{dI}{dY} > 0 \quad , \quad \frac{dI}{dK} < 0$$

and $\frac{dI}{dY} > \frac{dS}{dY}$, that is *MPI* is greater than

MPS over the expansion or contraction phase of the cycle.

The above relationships show that both *S* and *I* vary positively with *Y;* while *S v*aries directly with *K,* and *I* varies inversely with *K.* The rela- tionship *MPI* > *MPS* shows the instability of the economy which will move it either toward expansion or contraction. In terms of Figure14, positions *A* and *B* are *"switch points"* in the long run. They are the points at which the economy alters its direction either toward expansion or contraction. Point *C* is unstable in both directions. It is only when points *C* and *B* come closer, the expansion phase of the cycle starts. When they are joined, expansion stops and contraction begins. On the contrary, when *C*

and *A* come closer contraction starts. When they are joined, contraction stops and expansion begins.

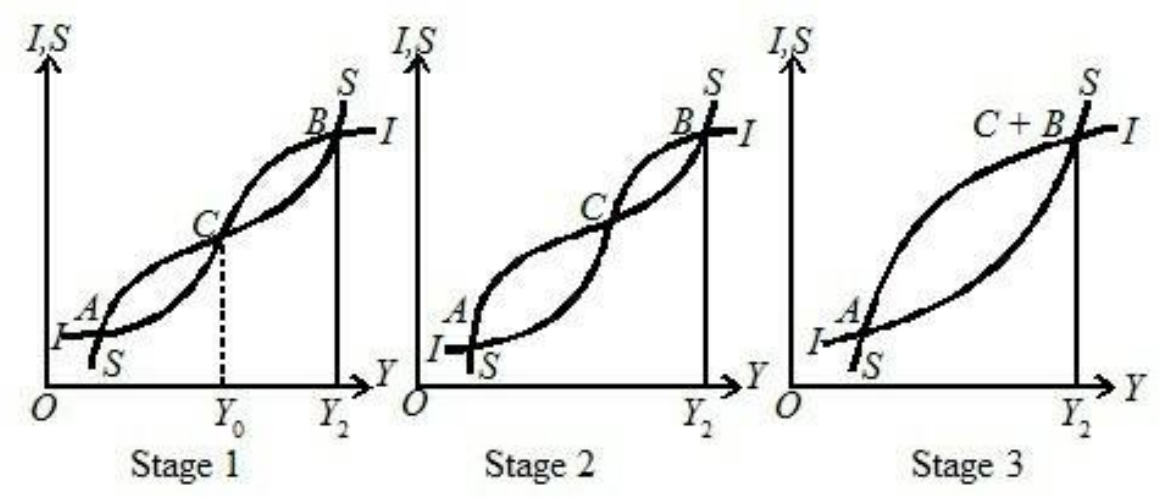

Fig. 15

Expansion Phase. Kaldor shows the expansion phase of his trade cycle in three stages, as shown in Figure 15. Starting from position Y_0 in figure stage 1 (which is the same as Figure 13), suppose the economy is in
equilibrium at point C. But this is the point of unstable equilibrium. An
upward displacement shows that $I>S$ which leads to the economy towards the expansion path. As the rate of invesment is high, the economy's capital stock increases at a rapid rate. But as the capital stock increases, the MEC declines and investment curve shifts downward At the same time as the economy's capital stock increases, it raises the income of the economy thereby raising its saving. Thus the saving curve shifts upward. So a downward shift of the investment curve *I* and upward shift of the saving curve *S* bring the point *C* nearer to *B,* as shown in figure stage 2. This process of the downward shifting of the *I* curve and upward shifting of the *S* curve continues till the two curves are tangential and points *C* and *B* coincide, as shown in figure stage 3. But at this position $S>I$ in both directions. So this is an unstable equilibrium position in the downward direction. This leads to the downward movement of the economy till point *A* is reached in stage 3.

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17. "A Model of the Trade Cycle", *E.J.*, March, 1940.

Contraction Phase. The contraction of the trade cycle is also shown in three stages, as in Figure 16. We start from position Y_1 corresponding to point *A* in stage 4 of the figure. It is the point of short-run stable
equilibrium but at a very low income level. But over the long run at such a
low level of income, the capital stock decreases due to excess capacity and the investment curve *I* shifts upward. Simultaneously, saving falls which shifts the saving curve downward. Thus the shifting of the *I* curve upward and of the *S* curve downward bring positions *A* and *C* nearer, as shown in stage 5. This process will continue gradually till *I* and *S* curves arc tangential and positions *A* and *C* coincide, as in stage *6* figure. But this *A+C* position at Y_1 income level is unstable in the upward direction
because $I>S$. This will lead to an expansionary process till the economy reaches the higher level of income Y_2 at point *B*. From *B*, the *I* and *S* curves gradually reach the positions shown in stage 1 of Figure 15, and
again the cyclical process starts. Thus Kaldor's cyclical process is self-
generating.

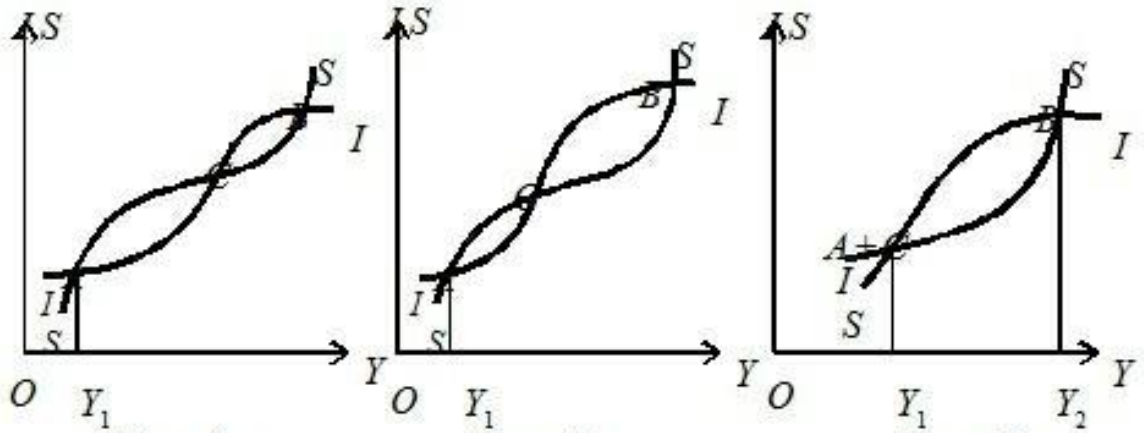

Fig. 16

According to Kaldor, the forces which bring about the lower turning point are not so certain at the higher level. "A boom left to itself, is certain to come to an end; but the depression might get into a position of stationariness, and remain there until external changes (the discovery of new inventions or of the opening up of new markets) come to the rescue."

Further, cycles in the Kaldor model are not necessarily of the same length and duration. Neither are expansions and contractions necessarily

symmetrical. In fact, these depend upon the slopes of the *I* and *S* curves and the rate at which they shift in each phase of the cycle.

Kaldor neither uses the acceleration principle nor the monetary factors in explaining his theory of the trade cycle. At the same time, he demonstrates how a cycle could exist in the absence of any growth factor.

MEASURES TO CONTROL BUSINESS CYCLES OR STABILISATION POLICIES

Various measures have been suggested and put into practice from time to time to control fluctuations in an economy. They aim at stabilising economic activity so as to avoid the ill-effects of a boom and a depression. The following three measures are adopted for this purpose.

1. Monetary Policy

Monetary policy as a method to control business fluctuations is operated by the central bank of a country. The central bank adopts a number of methods to control the quantity and quality of credit. To control the expansion of money supply during a *boom*, it raises its bank rate, sells securities in the open market, raises the reserve ratio, and adopts a number of selective credit control measures such as raising margin requirements and regulating consumer credit. Thus the central bank adopts a *dear money policy*. Borrowings by business and trade become dearer, difficult and selective. Efforts are made to control excess money supply in the economy.

To control a *recession or depression*, the central bank follows an *easy* or *cheap* monetary policy by increasing the reserves of commercial banks. It reduces the bank rate and interest rates of banks. It buys securities in the open market. It lowers margin requirements on loans and encourages banks to lend more to consumers, businessmen, traders, etc.

Limitations of Monetary Policy

But monetary policy is not so effective as to control a boom and a

depression. If the boom is due to cost-push factors, it may not be effective in controlling inflation, aggregate demand, output, income and employment. So far as depression is concerned, the experience of the Great Depression of 1930s tells us that when there is pessimism among businessmen, the success of monetary policy is practically nil. In such a situation, they do not have any inclination to borrow even when the interest rate is very low. Similarly, consumers who are faced with reduced incomes and unemployment cut down their consumption expenditure. Neither the central bank nor the commercial banks are able to induce businessmen and consumers to raise the aggregate demand. Thus the success of monetary policy to control economic fluctuations is severely limited.

2. Fiscal Policy

Monetary policy alone is not capable of controlling business cycles. It should, therefore, be supplemented by compensatory fiscal policy. Fiscal measures are highly effective for controlling excessive government expenditure, personal consumption expenditure, and private and public investment during a boom. On the other hand, they help in increasing government expenditure, personal consumption expenditure and private and public investment during a depression.

Policy during Boom. The following measures are adopted during a boom. During a boom, the government tries to *reduce unnecessary expenditure* on non-development activities in order to reduce its demand for goods and services. This also puts a check on private expenditure which is dependent on the government demand for goods and services. But it is difficult to cut government expenditure. Moreover, it is not possible to distinguish between essential and non-essential government expenditure. Therefore, this measure is supplemented by taxation.

To cut personal expenditure, the government *raises* the *rates* of personal, corporate and commodity taxes.

The government also follows the policy of having a *surplus budget* when the government revenues exceed expenditures. This is done by increasing the tax rates or reduction in government expenditure or both. This tends to

reduce income and aggregate demand through the reverse operation of the multiplier.

Another fiscal measure which is usually adopted is to *borrow* more from the public which has the effect of reducing the money supply with the public. Further, the repayment of public debt should be stopped and postponed to some future date when the economy stabilises.

Policy during Depression. During a depression, the government increases public expenditure, reduces taxes and adopts a budget deficit policy. These measures tend to raise aggregate demand, output, income, employment and prices. An increase in public expenditure increases the aggregate demand for goods and services and leads to increase in income via the multiplier. The public expenditure is made on such public works as roads, canals, dams, parks, schools, hospitals and other construction works. They create demand for labour and the products of private construction industries and helps in reviving them. The government also increases its expenditure on such relief measures as unemployment insurance, and other social security measures in order to stimulate the demand for consumer goods industries. Borrowing by the government to finance budget deficits utilises idle money lying with the banks and financial institutions for investment purposes.

Conclusion. The effectiveness of anti-cyclical fiscal policy depends upon proper timing of policy action and the nature and volume of public works and their planning.

3. Direct Controls

The aim of direct controls is to ensure proper allocation of resources for the purpose of price stability. They are meant to affect strategic points of the economy. They affect particular consumers and producers. They are in the form of rationing, licensing, price and wage controls, export duties, exchange controls, quotas, monopoly control, etc. They are more effective in overcoming bottlenecks and shortages arising from inflationary pressures. Their success depends on the existence of an efficient and honest administration. Otherwise, they lead to black marketing, corruption, long queues, speculation, etc. Therefore, they should be

resorted to only in emergencies like war, crop failures and hyper-inflation.

Conclusions

Of the various instruments of stabilisation policy, no single method is sufficient to control cyclical fluctuations. Therefore, all methods should be used simultaneously. This is because monetary policy is easy to apply but less effective while fiscal measures and direct controls are difficult to operate but are more effective. Since cyclical fluctuations are inherent in the capitalist system, they cannot be eliminated completely. Some fluctuations may be beneficial for economic growth and others may be undesirable. Stabilisation policy should, therefore, control undesirable fluctuations. We conclude with Keynes, "The right remedy for the trade cycles is not to be found in abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us permanently in a quasi-boom."

SELECTED READINGS

J.A.Estey, *Business Cycles*.

G.Haberler, *Prosperity and Depression*.

J.A.Schumpeter, *Business Cycles*, 1939.

D. Hamberg, *Business Cycles*, 1937.

S. Bober, The *Economics of Cycles and Growth*, 1968.

EXERCISES

1. What do you mean by a business cycle ? Explain its various phases.
2. Give the meaning, phases and effects of a business cycle.
3. Discuss critically the view that "the trade cycle is purely monetary phenomenon."
4. Critically examine Schumpeter's theory of innovations as the explanation of cyclical fluctuations.

5. Discuss the view that trade cycle is mainly due to fluctuations in the marginal efficiency of capital.
6. Discuss critically Samuelson's model of trade cycles.
7. Show that the interaction of the multiplier and accelerator provides a satisfactory explanation of the trade cycle.
8. Critically discuss the Hicksian theory of the trade cycle.
9. Explain Kaldor's model of the trade cycle.
10. Discuss Goodwin's model of the trade cycle and compare it with Hicks model.
11. Discuss Friedman's monetary theory of the trade cycle.
12. What is a business cycle ? Explain its characteristics. How can a business cycle be controlled