STUDIES IN MONETARY ECONOMICS

Revised and Enlarged

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To

MY TEACHERS

PREFACE TO THE FIRST EDITION

It is with a fond hope of providing an introductory analysis of Monetary Economics for the easy understanding of the students that this book has been written. As a college teacher of fairly long experience, I have often felt that the students require at their primary stage of studies one single book in which they may get the contents of their studies. This is, perhaps, due to their lack of imagination and capacity of understanding all the theories interpreted in different ways by different writers in their respective books. There are many brilliant books on Monetary Economics and I beg to acknowledge my debt of gratitude to all the writers of these books. I have spared no pains to utilise these books to my best advantage, and have mentioned the names of these books at the foot-notes of different pages and at the end of each chapter so that the readers of this book may be encouraged to read all these masterly works. I am painfully aware of the fact that indigenous products fall far short of a respectable standard in presenting the different aspects of Monetary Economics which had revolutionary changes first in the hands of Keynes and later on in the works of great writers like Robertson, Hansen, Hicks, Klein, Samuelson and Patinkin. In course of writing this book particularly I have taken immense help from the book, "An Outline of Monetary Economics" written by A. C. L. Day, and the book, "Business Cycles" written by Hamberg. The book of A. C. L. Day has been prescribed as a text-book for the undergraduate students of the Calcutta University and I have simply tried to show the students how to follow this book with much profit. I hereby express my deep gratitude to the authors and the publishers of the above-mentioned books.

I still remember the lucid and literary exposition of the different aspects of Monetary Economics by my teachers, Prof. Panchanan Chakravarty (Professor and the Head of the Department of Economics of Jadavpur University, Calcutta) and Prof. Satyendranath Sen (the University Professor of Economics of Calcutta University), in my post-graduate class. My indebtedness to them is above all acknowledgments. My thanks are also due to my esteemed friend Sri Nandalal Mukherjee without whose constant pressure for expediting the writing of this book, this book would not have seen the light so soon. As a few printing mistakes have crept in, I have added a correction-slip at the end of the book. All suggestions for the improvement of this work in future will be accepted with all humility. I shall consider my labour amply recompensed if this book encourages a student or a general reader to know something more of Monetary Economics.

Jogamaya Devi College
Calcutta-26.
The 10th October, 1960

Subrata Gupta

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1

INTRODUCTION : SUBJECT-MATTER OF MONETARY ECONOMICS

The theory of money was discussed by the classical economists in the context of a full-employment economy. They would never think that money might distort the smooth operation of the "natural" laws of supply and demand. The classical economists could deny monetary phenomena as independent variables capable of affecting the functioning of the entire economy because they tacitly recognised the stability of the value of money. The necessity of a special theory of money for explaining the fluctuations in the general price level and their effects on the economic activity was not felt by them. Nevertheless a theory of money and general price found its place in economic theory.

The modern economists, however, contend that money is inherently an unstable element. Keynes has given us a theory of monetary equilibrium in which monetary variables like income, consumption, savings and investment are very important elements. Keynes points out that "the importance of money essentially flows from its being a link between the present and the future."[1]

It is very difficult to give a precise definition of the subject-matter of monetary economics. Monetary economics, in a broad sense, is concerned with income and with wealth, because almost all kinds of income are received in the form of money and because money is the most important means of holding wealth. Monetary expectations being capable of disturbing the functioning of the economic system, money has been rightly described as a link between the past and the present. As money is concerned with income, monetary adjustments play important part in initiating a process of income-generation and employment-creation. This is particularly true with advanced economies in conditions of less than full employment where we find that spending is more significant in ensuring stability of income and employment than saving. Monetary adjustments are also subject to the regulation by public authorities and in that respect, monetary

1. Keynes—General Theory of Employment, Interest and Money. P. 293

economics is closely linked up with public policy. But, like economic theories, "monetary economics does not furnish a body of settled conclusions immediately applicable to policy." Monetary economics also is primarily "a technique of thinking" which enables us to draw correct conclusions in finding out the means to the end of economic stability and growth.

The boundary lines of no field of knowledge can be drawn with precision, and this is particularly true of monetary economics. Money is an important concept in Keynesian economics. With respect to his General Theory of Employment, it may be less obvious, although in his book we find that money, along with interest, plays an important part in affecting the level of employment.

Monetary economics, according to the post-Keynesians, should concern itself with that part of economic theory which deals with the functioning of the economy as a dynamic whole. As Prof. Boulding has observed, "modern developments in macroeconomics are most closely associated with the work of Mr. J. M. Keynes." The post-Keynesians are thinking along the lines of marco-dynamic and secular analyses of the monetary phenomena.

Meaning of Macroeconomics—Macroeconomics deals with economic affairs "in the large"[1], *i.e.*, it concerns the over-all dimensions of economic life. It is that point of Economics which deals with the great aggregates and averages of the economic system rather than with particular items in it, and attempts to define these aggregates in a useful manner and to explain how they are related and determined. More specifically, macroeconomics concerns itself with such variables as the aggregate volume of the output of an economy, to the extent to which its resources are employed, with the size of the national income, with the "general price level".

Is a meaningful Macroeconomics possible ?

One part of the answer to the question whether a meaningful macroeconomic theory is possible lies in the fact that macroeconomic reasoning can take account of many limitations and relationships which are not applicable to individual elements[1]. For example, for any individual or group of individuals, income and expenditure on currently produced output will be obviously different ; but for the

1. Ackley—Macroeconomic Theory (M

economy as a whole income and expenditure (properly defined) can be always shown to be equal. This is a "macroeconomic truism". Exploration of the meaning and implications of these "macroeconomic truisms" comprises an important part of macroeconomic theory. Macroeconomics should also seek relationship among economic variables which express motivation and behaviour of the individuals comprising the society. Macroeconomic theory can meaningfully exist because it can rely upon the macroeconomic truisms; because the composition of many aggregates is either relatively stable or varies systematically with changes in the magnitude of the aggregates and because many of the variables which mainly explain the individual behaviour cancel out when dealing with the whole economy.

From the point of view of economic policy macroeconomics is extremely important. The main economic responsibilities of government lie in the regulation of the aggregates of the system—general prices, general outputs, the general volume of trade, and so on. Macroeconomic analysis has got, no doubt, some major limitations; but, the analysis becomes highly interesting when the aggregates are functionally related.

From the standpoint of policy significance of macroeconomic analysis the most suitable way of indicating the scope of this plan of studies in monetary economics is, therefore, to list the most important kinds of problem with which we shall be concerned. In the first place, we shall deal with the problems of the internal value of money, the motives for holding money and the determination of the rate of interest. Secondly, we shall study the basic functional relationships in the theory of income and employment. Thirdly, we shall examine the theories of business fluctuations. We shall then study the theory of inflation. Fourthly, we shall study the mechanism and the effects of different kinds of adjustments in exchange rates. Lastly, we shall study the functions of the different international monetary institutions, where we shall be chiefly concerned with international monetary economics.

2

MONEY—ITS SUPPLY AND DEMAND

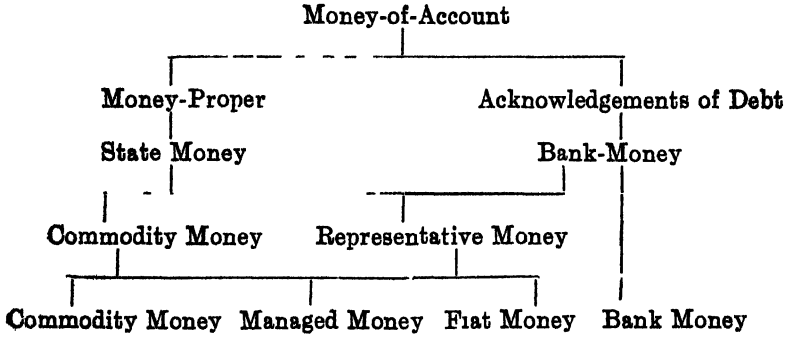
In determining the total supply of money, we should first of all make a thorough classification of money. Lord Keynes gives the following *classification of money*: Money itself, namely that by delivery of which debt-contracts and price-contracts are *discharged*, and in the shape of which a store of general purchasing power is *held*, derives its character from its relationship to the money-of-account, since the debts and prices must first have been expressed in terms of the latter. Debts, prices and general purchasing power are expressed through money-of-account[1]. So, money-of-account is the primary concept of a theory of Money. Money-proper in the full sense of the term can only exist in relation to a money-of-account. We may further distinguish between *money* and *money-of-account* by saying that the money-of-account is the *description* or *title* and the money is the *thing* which answers to the description. Money-of-Account must be *continuous*. With a change in name, the new unit must bear a definite relation to the old.

State-Money includes not only money which is itself compulsory legal-tender but also money which the State or the Central Bank undertakes to accept in payments to itself or to exchange for compulsory legal-tender money.

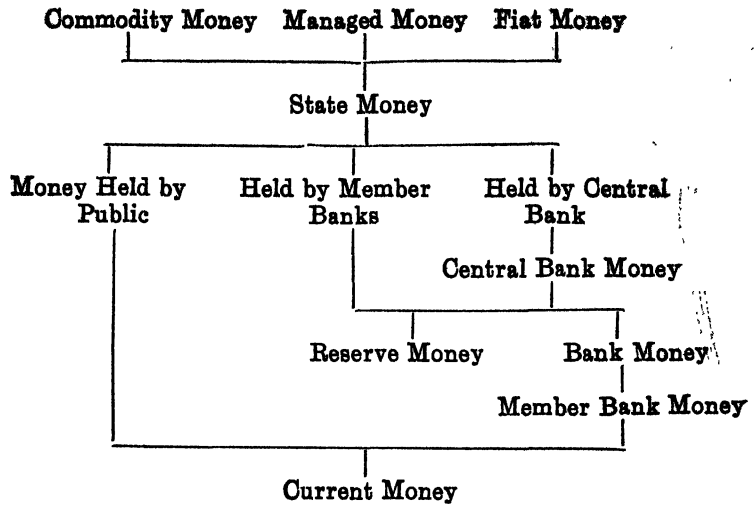
Bank-rates, and even *Central Bank Deposits* are included in State-Money, whilst *Bank-Money* which is non-legal-tender money is composed of Member Bank Deposits. State-Money can take any of the following forms, *Commodity Money*, *Fiat Money* and *Managed Money*, the last two being sub-species of money-proper which we may call *Representative Money*. *Commodity Money* is composed of the actual units of a commodity which is freely obtainable and non-monopolised. Its supply is governed by scarcity and cost of production. *Fiat Money* is also a representative (or token) money It is something the intrinsic value of the material substance of which is divorced from its monetary face value. This money is now generally made of paper except in the case of small denominations, which is created by the state.

[1] Keynes—A Treatise on Money vol. I (Macmillan, 1930) P. 3.

and which has no fixed value in terms of an objective standard. *Managed Money* is similar to Fiat Money, except that the State undertakes to manage the conditions of its issue in such a way that, by convertibility or otherwise, it shall have a determinate value in terms of an objective standard. Following Keynes, we can show the classification of money by the following chart :



One of the fundamental elements in the theory of money is the total quantity of money of all kinds in the hands of the public the aggregate of which is called *Current Money*. The typical modern Banking System has the Central Bank at its centre and the Member Banks. The total stock of State-Money is held partly by the Public, partly by the commercial banks and partly by the Central Bank. The State-Money held by the Central Bank constitutes its "reserve" against its deposits. These deposits we may call Central Bank-Money. All the Central Bank-Money is held by the Member Banks. This Central Bank-Money *plus* the State-Money held by the commercial banks makes up the reserves of the commercial banks, which they, in turn, hold against their deposits. These deposits constitute the Member Bank-Money in the hands of the Public, and make up, together with the State-Money (and Central Bank-Money, if any) held by the Public, the aggregate of Current Money. We can thus show these relationships in the following table :



Current Money again may be classified into three categories, viz., Income-Money, Business-Money and Savings-Money.

Bank Money : Now, let us analyse Bank-money which consists of various kinds of deposits. In the first place, we find *Income-deposits* which refer to deposits, replenished by individuals out of their personal incomes and employed by them to meet their personal expenditure and their personal savings. Cash in the hands of the workers and others having no bank accounts are also included in this category.

Business deposits are held by the business men for business purposes. Business men always keep a margin against contingencies in carrying on business transactions. The *Income-deposits* and the *Business-deposits* together make up what we may call the *cash-deposits*. Banks again have two kinds of deposits, viz., *demand-deposits* and *time-deposits*. Demand-deposits are withdrawable on demand while the time-deposits cannot be withdrawn before a specified period of time. *Cash-deposits* furnish the ready command over money which is required for the convenient transaction of current translation of current payments. By *overdraft* we mean an arrangement with the bank that an account may be in debit at any time up to an amount not exceeding an agreed figure, interest being paid not on the agreed maximum debit, but on the actual average debit.

The usual definition of money supply at the hands of the public

includes currency and demand deposits. But this definition does not take into account all kinds of time deposits.

Friedman[1] pleads for inclusion of time deposits. But it may not be always possible to include all kinds of time deposits in the supply of money. Keynes argues that a part of the overdraft facility should be included in money supply. But it is difficult to determine the total amount of unused overdraft facility. According to Gurley and Shaw[2] financial intermediaries also share total volume of all types of deposits and provide a part of money supply. This view has also been endorsed by the Radcliffe Committee.

DEMAND FOR MONEY

"Demand for money" would be defined in the earlier literature as the amount of money an individual wishes to acquire during a unit period by the net sale of goods and services. Thus, the concept of the demand for money relates, in this sense, to a period of time. Nowadays we refer the concept of demand for money to a point of time and define it as the amount of money an individual intends to hold during a given time[3]. An individual makes a plan for a certain period, at the end of which he intends to hold a certain amount of cash. This is demand for money with reference to the end of the planning period. The demand for money thus consists of the individual's balance at the beginning of the period plus or minus the sum which he acquires or spends during the unit period.

Why do people desire to hold money in the form of "hoards"? To quote Keynes, "why should anyone outside of a lunatic asylum wish to use money as a store of wealth"[4]? The answer given by Keynes is: fear and uncertainty regarding the future induce the people to hold money in the form of "hoards". Our desire to hold a part of our resources in the form of money is "a barometer of the

1. Friedman—Studies in the quantity Theory, First Article.
2. Gurley and Shaw—Money in a Theory of Finance.
3. Lutz—"The demand for Money".—International Economic Papers, Vol. II.
4. Keynes—'Article in Q. J. E. (1937) reprinted in Harris'—The New Economics P. 187

degree of our distrust of our own calculations and conventions concerning the future"[1],

Convenience and certainty are the two important characteristics of money on which the demand for holding money is based. Keynes mentions three reasons for holding money, *viz.*, (1) the transactions motive, (2) the precautionary motive and (3) the speculative motive.

The Transactions Motive

The transactions motive relates to the need for cash for the current transactions of personal and business exchanges. People desire to hold cash to cover the time-lag between the time when cash outlays are made and the time when more cash will be received. This reason for holding cash balances is applicable to private individuals as well as business firm. There is always a strong incentive to hold some money (either as cash or as deposits at a bank) to allow for this irregularity in carrying out transactions. The fear of being financially embarassed because of temporary illiquidity is of vital concern to businessmen. So, they are always vigilant regarding the maintenance of a certain amount of cash balances to cover the interval between the incurrence of business costs and the receipt of new cash from sales.

The transaction demand for money is governed by the factors like the level of national income, the price level, expectations about changes in price level, the frequence and regularity of receipts and payments in the community and the case of borrowing short term etc. The determinants of the "transactions" demand for cash balances are the same as those usually discussed in connection with the transactions velocity of money.

The transactions motive can again be looked at from the standpoints of two sets of individuals, viz. (a) consumers and (b) entrepreneurs. The consumer's demand for holding money is dependent on the size of his income and on the time-lag between the receipt of the various instalments. His demand for holding money can thus be classified as depending on the *income motive*. The entrepreneurs' demand for holding money is governed by what may be called *business motive*. The larger the turnover of business, the larger, in general, will be the amount of money needed to cover current expenses.

1. Ibid.

J. Tobin[1] and W. Baumol[2] explain the reasons for treating transactions demand as reflecting a rational choice. Baumol considers it as a problem in inventory theory. Tobin develops a theory of risk avoiding which has been shown to provide basis for the liquidity preference schedule sloping downward i.e., the inverse relationship between money holdings and interest rates. Both writers show that an economic unit starting with transaction balance to be spent evenly over a period of time and given the opportunity of investing idle balance at interest and withdrawing that when needed at a cost will carry a lower cash balance the lower the interest. Tobin and Baumol also show that the average cash balance held by the unit be higher the higher the initial balance.

Precautionary Motive

Another motive governing the demand for holding money is known as precautionary motive.[1] Emergencies are always arising in the everyday life of most people. So, it is necessary to maintain some amount of cash balance for facing certain eventualities in life. The money which people hold under this motive is devoted, broadly speaking, to fulfilling the function of a store of value. People hold a certain amount of money to provide for the danger of unemployment, sickness, accidents and other more uncertain perils. Money holdings for the precautionary motive vary significantly with the degree of uncertainty. The availability of short-term credit also plays an exceptionally strong role in the demand for precautionary balances by business firms. This is evident during severe slump.

Prof. A. G. Hart[3] has developed an interesting discussion of the precautionary motive involving the concept of the "Principle of Risks." Briefly, this principle indicates that the failure to maintain a margin of cash for emergencies may cause a chain reaction in the dire results that follow being "caught short of cash."

The precautionary motive for holding money can be combined

1. J. Tobin "The Interest elasticity of Transactions demand for cash". Review of Economics and Statistics. Aug, 1956. Also "Liquidity Preference as Behaviour towards Risk." R. E. Studies Feb. 1958.

2. Baumol, "The Transactions Demand for Cash, An Inventory theoretic Approach." Q. J. E., Feb. 1958.

3. A. G. Hart—Money, Debt and Economic Activity, P. P. 198-204.

with the transactions motive and regarded as varying directly with the level of national income.

Speculative Motive

People may, and do speculate about the future changes of all kinds of prices, by holding things whose prices they think are going to rise, and by being unwilling to hold things whose prices they think will fall. The speculation with which one is concerned here is speculation about future prices of claims (*i.e.*, securities) other than money. The speculative motive plays a fundamental role in Keynesian theory of employment. It is a basic element of the purely monetary theory of interest. Money held under the speculative motive constitutes a store of value which the holder intends to use for gambling, to make a speculative gain. According to Keynes, people will increase their holdings of *idle* cash balances, the lower the rate of interest. The demand for holding money governed by speculative motive may be described as a demand schedule, or curve which is negatively inclined (*i.e.*, it is a decreasing function of the rate of interest).

Liquidity Preference

These three motives, transactions, precautionary and speculative, between them, determine the demand for money or what Keynes calls 'liquidity preference'. It is possible to divide liquidity preference into two components, M_1 and M_2. If the demand for money is indicated by M, it is equal to M_1 plus M_2. M_1 indicates the demand for holding money which is a function of the level of income *i.e.*, which is governed by the transactions and the precautionary motives. M_2 indicates the demand for holding money which is a function of the rate of interest. So, symbolically, $M = M_1 + M_2$; $M_1 = f(Y)$, $M_2 = f(i)$.

We can, therefore, construct schedules of liquidity preference showing how much money the community would desire to hold at various income levels and various rates of interest. These schedules are given in fig. 1 (a & b).

The figure No. 1 (a) indicates the relationship between the amount of money (M) and the rate of interest (i). In this figure, the curve Y' shows the demand for holding money when income is Y' at various

rates of interest. Similarly, the curve Y″ shows the demand for holding money when income is Y″ at various rates of interest. The

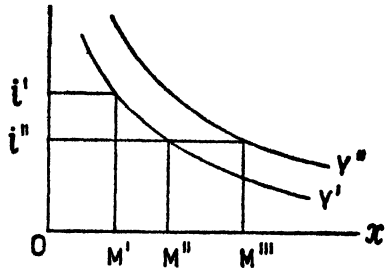


Fig. 1(a)

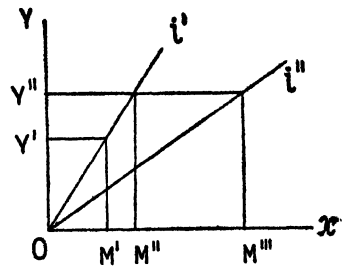


Fig. 1(b)

figure 1 (a) shows that at a given level of income, the community will hold more money when the rate of interest is low. When income is Y′ and the rate of interest is i′, the amount of money held by the community is OM′. When the interest falls to i'', the amount of money held increases from OM′ to OM″. If at this rate of interest the level of income increases to Y″, the amount of money held increases to OM‴.

In fig. 1 (b), the curve I′ shows how much money will be demanded when income is at various levels and the interest rate is i'. Similarly, the curve I″ indicates the demand for holding money at the same level of income when the rate of interest is lower at i''. If the rate of interest is given, this figure tells us that people are willing to hold more money the larger are their incomes. When the rate of interest is i' and the level of income is OY′, the amount of money held is OM′. When income rises to OY″, the amount of money demanded is OM″. These figures also show that given the level of income, more money will be held if the rate of interest falls. This is evident when with income OY″ and rate of interest i'', the amount of money held is OM‴.

Deflationary Motive

We can point out, apart from the three motives as referred to above, that there is another motive governing the demand for holding money which is known as deflationary motive. If it is hoped that prices of goods and services in general are likely to fall in terms of money, then people who want to buy goods and services but have

immediate demand for them would hold back from purchases until their demand is pressing, and hold money in the meantime.

Motives for holding money affected by changes in total wealth

Motives for holding money may also be affected by changes in the amount of total wealth. These changes can be analysed in two ways, viz., by changes in the money value of the claims and other assets held, and by additions to wealth arising out of saving. The first of these two is relatively unimportant. Other things remaining the same, a person will want to hold more money when his total wealth increases. Lower interest rates, *i.e.*, a rise in bond prices, are likely to lead to an increase in demand for money. The second effect cannot be analysed too easily. A person whose total wealth has increased because of an increase in the amount of saving is likely to want to increase the holdings of money he was keeping being guided by other motives. He may also want to hold more money for speculative purposes.

Friedman's analysis—View of the "Chicago School" of thought.

Friedman[1] argues that his theory is different from other quantity theory of money.

He does not go to establish any direct and proportional relationship between changes in money supply and changes in the price level. Nor does he go to analyse the three motives governing the demand for money. Thus, his position is different from that of Fisher and of Keynes. Changes in the stock of money is the core of his analysis. The following propositions have been advanced by him:

(i) Appreciable changes in the rate of growth of stocks of money are a necessary and sufficient condition for appreciable changes in the rate of growth of money income.

(ii) This is valid for both secular changes in income growth and also for changes over periods roughly equal to the length of the busines cycle.

Friedman argues that money stocks play an independent and important role in all major movements. Demand function of money, according to Friedman, is a function of wealth of the households or corporate organisations, W, relative prices Pr, tastes and preferences of the household U.

1. Friedman—Studies in the Quantity theory of Money, First article.

So, $D_m = f(W, P_r, U)$ ... ... (1)

Wealth is divisible into two parts, human wealth and non-human wealth ; the ratio between the two is almost constant since calculation of the first type of wealth is very difficult. Changes in the stock of money may be followed by rate of growth of output over short period. So, Friedman has not been in an position to reject the Keynesian theory totally. The three variables as cited above may change and the change in wealth may be reflected on income. So, the relation between demand for and stock of wealth may not be stable. The relative movements may offset one another. Friedman has not altogether overlooked the Keynesian system.

According to Friedman,

$Y = Y_p + Y_t$ ... ... (2)
$C = C_p + C_t$ ... ... (3)
$C_p = f(Y_p)$ ... ... (4)
$C_t = f(Y_t)$ ... ... (5)

Yp means permanent income and *Yt* means temporary income ; *Cp* means permanent consumption and *Ct* means temporary consumption.

It is difficult to accept the view that Friedman's analysis of income is better and more comprehensive than that of Keynes. Again, in the Friedman model, the inclusion of human wealth and the assumption of constant ratio between the human wealth to the total wealth have given rise to some complications, both theoretical and statistical in regard to the process of income generation. Friedman's analysis of the demand function of money becomes weak (i) if *W*, *Pr* and *U* are unstable, and (ii) if these variables are also important in determining the stock of money and per capita money balances, or (iii) if increases in the real stock of money lower the demand function of money under certain conditions so that real output remains unaffected. Empirically, Friedman's model has not yet provided any answer to these questions. However his analysis of the demand function of money has contributed a good deal to economic literature in this respect.

Further Analysis of Liquidity Preference

Keynes's analysis of liquidity preference or demand for money has been the foundation stone of his theory of interest.

In the terminology of Keynes's General Theory, the condition of equilibrium is $M=M_1+M_2=L_1(Y)+L_2(i)$, where M is total quantity of money (cash and demand deposits), M_1 is the quantity of transaction and precautionary money, M_2 is the quantity of speculative money, $L_1(Y)$ is the quantity of money demanded for the transaction and precautionary motives which is a function of the level of income, and $L_2(i)$ is the quantity of money demanded for the speculative motive which depends on the rate of interest. These two sources of demand for money being analysed, we may further simplify the equation in the form $M=L(i,y.)$, which indicates that the total quantity of money in existence at a point of time equals the quantity of money held which is a function of the rate of interest and the level of income

Of all the motives governing the demand for holding money the speculative demand for money is most important in determining the rate of interest. We may call the sum of new and reserve speculative demand for money the *curve of liquidity preference proper.* In the following figure DD' is the curve of liquidity preference proper. When we add the transactions demand for central bank money (which is a function of income) to the speculative demand, the curve DD' will shift to the right by the amount of the transactions demand.

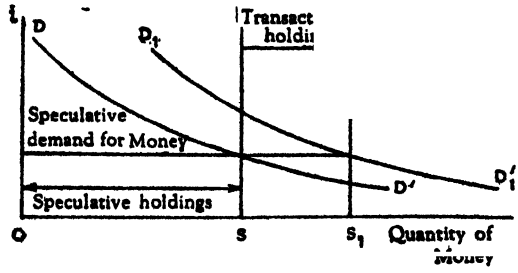


Fig. 2

The figure shows that the rate of interest is determined by the total liquidity preference in the private sector together with the total quantity of money. In this figure OS denotes speculative holdings and SS_1 denotes transactions holding. $D_1D'_1$ is the total liquidity preference curve.

The analysis of liquidity preference can be more exhaustively shown by the following diagram.

Let us consider a given liquidity preference situation at a certain level of income, Y. The liquidity preference curve corresponding to that level of income intersects the supply of money (M) curve at the point C. The rate of interest here is i_1, AB of the total quantity of money will be held as speculative balances and BC as transaction

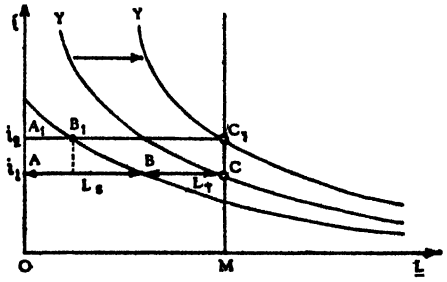


Fig. 3

balances. If now, the level of income rises, the liquidity preference proper, i.e., the speculative demand for money remains unchanged; but the transactions demand for money rises so that the total liquidity preference curve intersects the supply of money curve at C_1. The rate of interest here is i_2, and at this rate and with the increased total demand for money, the transactions in the private sector wish to keep only A_1B_1 for speculative purposes; and the difference between the previous and present speculative demand $(AB - A_1B_1)$ is made available for transactions purpose.

Liquidity Trap.

Keynesian Economics contends that there is a minimum level below which the rate of interest cannot fall. Rate of interest can never be zero since there must always be some positive demand for money. Monetary policy thus seems to be confronted with an absolute limitation on its powers to stimulate business activity. The critics have raised this particular aspect of the Keynesian system to a key position in Keynesian argument. The critics rationalized this limitation of monetary policy by abscribing a special shape to the demand curve for money. The demand for money curve has thus been assumed to become an indefinitely extending horizontal line at that minimum level at which "almost everyone prefers cash to holding a debt which yields so low a

rate of interest."[1] The liquidity preference curve is thus of the following shape :

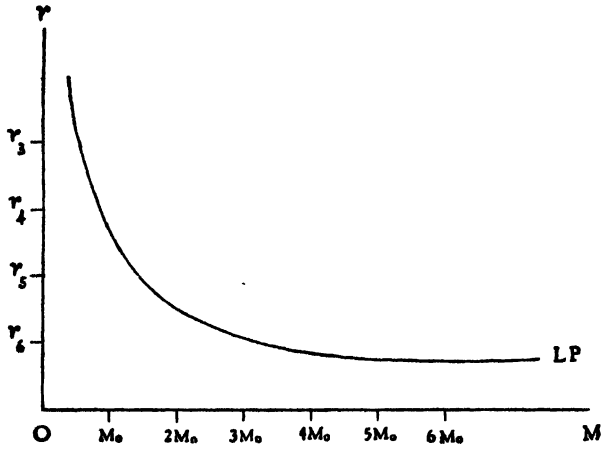


Fig. 4

This curve demonstrates that the rate of interest cannot be driven down below certain level.

Patinkin argues that this representation of the demand for money curve is incorrect. For when due consideration is taken

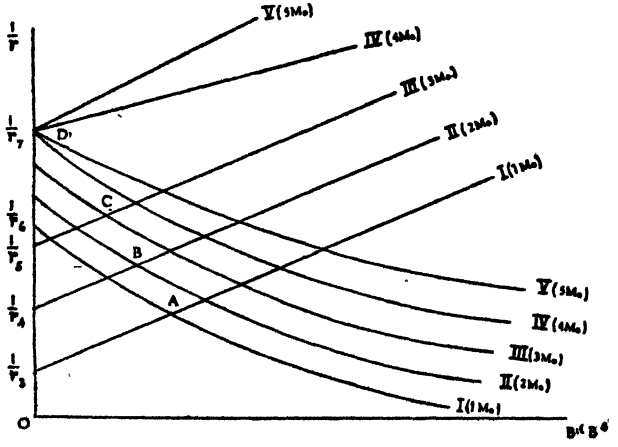


Fig. 5

of the individuals' planned behaviour in all markets, this curve must have its negative slope throughout. "The budget restraint

1. Keynes—General Theory P. 207

—together with the assumed impossibility of borrowing infinite amounts—makes it correspondingly impossible for the amount of money demanded to become infinite at any rate of interest."[1] Nevertheless there is a real limitation on the downward influence that monetary policy can exert on the rate of interest. But this limitation flows from the significance of the minimum rate in the bond market not from any alleged significance in the money market.

This figure shows that the successive increases in the amount of money from M_0 to $2M_0$, $3M_0$ and $4M_0$ shift the demand and supply curves from position I to II, III, and IV respectively. Thus, the diagram also reflects the initial additional assumption that as the demand curve for bonds shifts upwards, its intersection point with the vertical axis approaches the price $1/r_e$ as a limit. Bond prices increase resulting in a fall in interest rate. No matter how large the value of their initial money holding, individuals will always refuse to hold bonds at a rate of interest below r_e. At such low rates they will always prefer to hold money instead. On the whole it is unlikely that the real balance effect will be quite large except in a community where the cash balances are heavily concentrated in the hands of a few. The monetary expansion has reached a certain point—$4M_0$ in the above figure—the bond market will become inactive : no borrower will be willing to pay the minimum rate of interest on which the lenders insist. The situation has been demonstrated by the demand and supply curves of position V.

Patinkin does not accept the customary view about the shape of the demand for money curve. He imagines an economy in which there is no production and everybody is endowed with certain real income at the beginning of the week (which he consumes in full) and a certain money balance ; the sum of his real income and his money balance may be called his total resources. If all prices double, the real value of the cash balance of the individual has dropped by half and his total resources also have shrunk. Patinkin contends that the individual's demand for goods depends not only upon his real income but also upon the real value of his cash balance, that is, upon his total resources. If because of the doubling of prices, the real value of the individual's cash

1. Patinkin—Money, Interest and Prices, P. 245-46.

balance has dropped by half and his total resources have therefore shrunk the individual concerned will reduce his demand for goods so as to replenish his cash balances. He will simply try to re-establish the former proportion between his cash balance and his now curtailed total resources. His cash balance will not double. It follows that the demand for money as a function of its value has an elasticity smaller than unity. All this has happened in a week. But the process does not come to an end with the first week, But let us suppose, in the next week, when the individual is again endowed with the same real income in the form of goods he will have higher total resources because the real value of his cash balance is higher than that at the beginning of the previous week. Let us suppose that the individual again distributes his total resources between consumption and cash in the previous proportion. His real money balance and with it his total resources will again be higher in the second week than in the first week and if the individual goes in the same manner he will eventually again reach his initial equilibrium position, in which his cash holdings have their initial real value and he can consume his real income.

Thus it follows that "the individual demand curve for money does not have the shape of a rectangular hyperbola during the transition period from one equilibrium position to another but that in terms of comparative statics, it does have that shape as the older authors maintained".[1]

All money holdings in a stationary or steadily progressing society, as Lutz points out, are due to the transactions motive ; but money balances are not a fixed percentage of transactions, independent of the level of the rate of interest, as is often assumed following Keynes.

Of course, an individual may hold financial assets in the form of bonds or shares in stationary conditions, or may acquire new financial assets of this kind in such a society. In such a society, an individual's demand for money is a function of the price mechanism, the payments intervals and the level of the rate of interest.

The question of uncertainty about the future may influence the demand for holding money. So long as we regard expectations as certain, the preference as between money or other financial assets

1. Lutz—"The Demand for Money", International Economic Papers, vol. II, P. 143.

depends solely on whether the latter's yield offsets the cost and trouble of investing and disinvesting. If we have got uncertain expectations, money will be invested only if the anticipated yield covers not only the cost and trouble of investing and disinvesting, but also affects the danger of loss. An individual will hold his funds in that type of asset which promises him the highest yield.

Expectations of price changes also influence the demand for holding money. Let us assume that the price level is expected to rise, the individual holding money must then expect to lose on it, and money ceases to be an especially liquid asset. A tendency to reduce cash balances is likely to take place. Money claims also suffer when the value of money falls.

The Real Balance Effect.

We should in this context consider the *real balance effect* or the *Pigou effect* which amounts to a direct denial of the homogeneity postulate and the dichotomization assumption. The real balance effect is an essential piece of the machinery which seeks to produce equilibrium in the money market. People usually hold a constant-ratio between real income and the value of its cash holdings, i.e., when price increases, the household will be induced to raise his money holding by curtailing his consumption i.e., the household will maintain his real holding. According to Pigou if prices fall real value of cash-holdings rises ; but the household will then restore the previous ratio and so as to achieve it, the households will then reduce their money holding.

The classical theory did not introduce real-balance effect. The inclusion of the real-balance effect would make the theory related to the full employment level. At the equilibrium level $Md = Ms$.

Cash balance effect takes place irrespective of prices.

$Md = Ky$. K remains constant. Any change in y causes a change in Md until Md becomes equal to Ms. As Prof. Pigou points out, assets may be classified into two categories: monetary assets and real assets. An increase in prices will bring down the household's cash balances. There would be an increasing expenditure in the community. Cash balance effect comes into operation when money national income

...u effect operates when prices change. So these two

Patinkin's Model

Patinkin gives special stress on the real-balance effect in the commodity market. If the household's initial balances are for some reason increased above the level which he considers necessary, he will try to remedy this situation by raising his demand for various commodities, thereby increasing his planned expenditures, and thereby drawing down his balances. On the other hand, if the household's initial balances fall below the level he considers essential, he will try to remedy the situation by decreasing his demand for various commodities, thereby decreasing his planned expenditures, and thereby building up his balances.

In general, the real-balance effect is positive ; that is, an increase in real balances causes an increase in demand. But this need not always be the situation. In particular, a commodity which is inferior with respect to income is also inferior with respect to real-balance.[1] Keynes in his 'General Theory' practically ignores the real-balance effect that is generated by wage and price decline. Patinkin considers distributional effects as a result of a decline in prices. This is based upon the view that although there remains money illusion among the people, but there is generally absence of money illusion among the richer class.

Prof. Patinkin argues that apart from indeterminacy of the classical monetary theory, the classical value theory is based on the assumption that demand and supply of commodities depend only on relative value and not on the holdings of cash balances of the individuals. But in the classical monetary theory it is assumed that the demand and supplies of commodities would be dependent on the differences, if any, between the desired cash balances (Marshallian K) and the actual cash balances held by the households. Patinkin contends that the demands and supplies of commodities depend on the array of relative prices, real incomes and real balances

Patinkin criticises Keynes on the ground that the latter overlooks the real balance effect in the commodity market and restricts the direct influence of the real balance effect to the money market. Patinkin argues that his real-balance effect is identical with 'Pigou effect' "the latter being a bad terminological choice"[2]. But the critics

1. Patinkin—Money, Interest and Prices, P. 21.

have pointed attention to the two different meanings of the real balance effect—one is the cash balance effect which is related to the effect on the individual demand for commodities as a result of the difference between his desired cash balance and his actual balance, given no change in price level, absolute or relative. We are familiar with this in the Cambridge equation. The second meaning of the real-balance effect is that it is regarded as the asset-expenditure effect operating only when prices of commodities or prices of bonds and assets undergo change. The real balances of an individual may change if due to the operation of some exogenous factors his actual cash balances change, there being no change in price. Or, the real balances of an individual may change if prices and/or roles of interest change, the actual cash balances remaining the same. 'Pigou effect' is practically related to the second meaning while Patinkin has accepted one or the other interpretation in his analysis of the real-balance effect.

Apart from this definitional difficulties the next criticism of Patinkin's model of real-balances effect is that the real-balance effect is actually a short-lived phenomenon and it tends to vanish in long run.

It has been shown by Archibold and Lipsey[1] that in case there is a discrepancy between the desired cash balances and the actual cash balances, the holders of cash balances show a tendency to spend out of those balances or to refrain from further consumption of commodities until equilibrium between the two is restored. So, if we compare the positions of long-run equilibrium, we find that the effect of a change in the quantity of money dose not depend on its distribution among the different households, and consequently real balances can be dropped from the equations determining equilibrium. Even in the short run, the impact of the real balance effect in the consumer goods market is likely to be negligible. To what extent the household will buy more in response to a change in the real value of cash balances depends on the household's marginal propensity to consume, and since the marginal propensity to consume is less than unity, the impact on the demand for consumer goods can never be large enough to wipe out the effects of the price decline on employment and output. With *some money illusion* the real balance effect

1. Archibold and Lipsey—Review of Economic Studies 1952.

is likely to be very weak. To what extent there will be money illusion in the economy partly depends on the magnitude at price change and partly on the distribution of cash balances between the upper income group and the lower income group of the households. If the upper income group is in possession of the substantial amount of liquid assets, the degree of money illusion is likely to be relatively insignificant since the possessors of liquid assets have one less in number.

Is money neutral in its effects ?

An increase in the amount of money will affect the rate of interest if money is considered simply as a store of value. Patinkin argues that money in general remains neutral about its repercussions on the rates of interest. The Keynesian formulation that an increase in the supply of money, given the liquidity preference schedule, lowers the rates of interest has been regarded as a temporary affair by Patinkin. Patinkin accepts wage and price flexibility and so, a doubling of money supply may cause a doubling of wages and prices. If there is no money illusion, this may not operate. Patinkin's initial position is that an increase in money supply is distributed uniformly among all the people so that relative demand remains unaffected. Moreover, he assumes that the bond market is homogeneous so that all bonds are equally liquid. He further assumes the absence of open market operations. Given all these assumptions, money is neutral in its effects on interest rates.

Prof. Gurley and Shaw[1] consider the case of an economy consisting of money issued by the Government only, there being no bond issues or no speculative trading in such an economy. Provided in such an economy we find (i) no money illusion, (ii) wage-price flexibility, (iii) unity elasticity of price expectations and (iv) no redistribution effect, money supply is neutral in its impact on the relative prices of commodities and on the level of output and employment. Even if we consider the case of an advanced economy, the situation will remain the same provided there is only one kind of money and only one kind of bonds. Gurley and Shaw assume that at the second stage of development, there may be some sort of "inside" money, i.e., money based on purely private internal debt as against "outside" money i.e.,

1. Gurley and Shaw—Money in a Theroy or Finance.

money issued against an outside asset like gold or foreign exchange. The "inside" money implies that business firms issue perpetual bonds carrying fixed rates of interest and thus there is a bond market. These bonds are sold partly to the households and partly to the banks which issue money only against such bonds. Even if there is a bond market, in a country where all money is "inside" money, any change in the quantity of money will have a neutral effect on the relative prices and interest rates. An increase in money supply in that case will raise prices and wages proportionately.

If in an advanced economy we find both 'inside money and outside money,' money will cease to be neutral in its effects, according to Gurley and Shaw, on the real variables. This will hold good also in other economies which have a diversified list of securities and a more developed financial system. In such economies, an increase in the quantity of money will alter the pattern of distribution of assets in the portfolios of households in various ways. This will affect the pattern of asset holdings and consequently, the rates of interest will be affected. This will then influence the real variables.

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NATURE AND ROLE OF INTEREST

In this chapter we shall confine ourselves to the examination of Time Preference theory, the Keynesian theory of interest, the Loanable Funds theory of Interest, the problem of the reconcilation between these two theories of interest, the relationship between the short-term and the long-term rates of interest and the claim of interest to be a suitable and effective regulator of the pace of growth of the nation's wealth. First we shall discuss Time Preference theory of interest. Then, we shall consider the Keynesian theory of interest which is "a short-period equilibrium analysis of impure choice treating money in its full-blooded sense."[1]

Time Preference Theory of Interest

The time preference theory of interest is the neoclassical theory according to which the reason why interest must be paid is that people prefer current consumption to future consumption and will curtail their current consumption to make available saving for the purpose of investment if they receive a premium in the form of an interest payment.

The time-preference theory regards capital as a distinct factor of production the services of which *can be paid for if the marginal net* productivity of capital is positive. The net productivity of capital embodied in capital goods gives rise to interest payment. J. B. Clark in his, "*The Distribution of Wealth*" distinguished between capital and capital goods.

However, since it is assumed that individuals prefer current consumption to future consumption, and will only curtail their current consumption so that resources for investment may be released if they are paid some premium in the form of some interest, it follows that interest must be paid. This theory was developed by the great Austrian economist Eugen Von Bohm-Bawerk. The theory states that *interest is a reward for waiting* in the sense that interest is paid to individuals when they curtail their current

1. Shackle—Recent Theories concerning the Nature and Role of Interest. Economic journal June 1961. P. 211.

consumption and want for future consumption. This act of waiting would not have taken place if the people would not be assured of a premium in the form of interest and interest would not have been paid to them if they would not wait for future consumption.

According to Bohm-Bawerk interest arises out of a process of lending present income against the return of future income ; so individuals in the community are eager to pay a premium or agio on present income for the privilege of disposing of it as they see suitable for a period of time. Bohm-Bawerk refers to three "reasons" why people on the average prefer present to future goods discounting the future by paying a premium on present goods in (i) different circumstances of want and provision in the present and in the future, (ii) under estimation of the future, and (iii) the technical superiority of present over future goods. The first two of the above reasons create the demand for consumption loans while the third one influences production loans.

Positive time preference implies that the individuals prefer a present income over the same amount of future income despite the fact that these are available on the same terms. When there is positive time preference, there is positive rate of interest.

Bohm-Bawerk's three grounds taken together explain the *existence of interest in a stationary as much as in a dynamic economy.* In a stationary state the presence either of the second 'reason' or of the third 'reason' in combination with the second constitutes a necessary condition for the interest rate to be positive. The rate of interest is zero only (1) when the flow of income is constant through time, (2) when time preference is neutral, and (3) when the net product cannot be increased by postponing consumption to invest in production[1].

The interaction of the three reasons not only explains the existence of interest but also fixes the length of the average period of production that will yield the highest present value[2].

The waiting theorists unlike J. B. Clark always argued that the rate of interest cannot be zero even in a stationary economy. A zero interest rate would mean that there would be no reason to refrain from consuming capital. If capital has a zero net yield why should the investor devote resources to maintain it ? A positive rate of interest is needed to keep the stationary state stationary.

1. Blaug—Economic Theory in Retrospect. P. 157.
2. Ibid.

As Cassel said, interest is "*the price paid for waiting*," and in a stationary state it is a bait to keep people from consuming their capital rather than a reward for deferring present enjoyment. This argument is valid only *if people have positive time preference.*

Keynesian Theory of Interest

A purely monetary explanation of the rate of interest has been most uncompromisingly set forth by Keynes. According to Keynes, the equilibrium rate of interest is determined by an interaction of the liquidity preference schedule (or demand for money schedule) and the supply of money schedule. In the terminology of Keynes's General Theory, the condition of equilibrium is $M=M_1+M_2=L_1(Y)+L_2(i)$, where M is total quantity of money (cash and demand deposits), M_1 is the quantity of transaction and precautionary money, M_2 is the quantity of speculative money, L_1 (Y) is the quantity of money demanded for the transaction and precautionary motives which is a function of the level of income, and L_2 (i) is the quantity of money demanded for the speculative motive which depends on the rate of interest. These two sources of demand for money being analysed, we may further simplify the equation in the form $M=L(i,y.)$, which indicates that the total quantity of money in existence at a point of time equals the quantity of money held which is a function of the rate of interest and the level of income.

We have already examined the factors governing liquidity preference.

We are now in a position to draw the liquidity preference schedule in the following figure :—

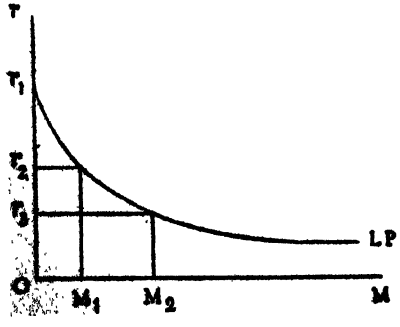
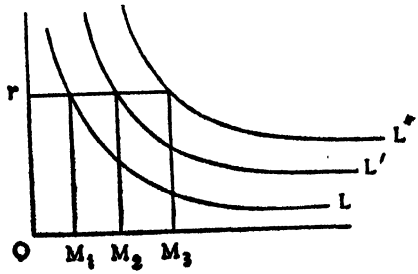


Fig. 6

In Fig. 6 the rate of interest is measured vertically and the quantity of money is measured horizontally. The LP (i, y) schedule represents the demand for money curve relating the interest and money variables to the level of income.

At the high rate of interest, r_3, people wish to hold OM_1 amount of money. As the

rate of interest falls and becomes r_3, the amount of money held increases from OM_1 to OM_2. The Fig. 7 shows that the amount of money demanded for liquidity purposes increases from OM_1 to OM_2 and from OM_2 to OM_3 as there is an upward shift of the liquidity function in accordance with changes in income even when the rate of interest is constant at r level.



ig. 7

The interaction of the liquidity preference schedule and the quantity of money schedule determines the rate of interest and this is shown in the Fig. 8. When the supply of money is OM_1, the initial equilibrium rate of interest is r_1 given by the interaction of the liquidity preference curve and the supply of money curve. As the liquidity preference curve has a downward shift, the amount of money remaining constant, the rate of interest falls to r_2.

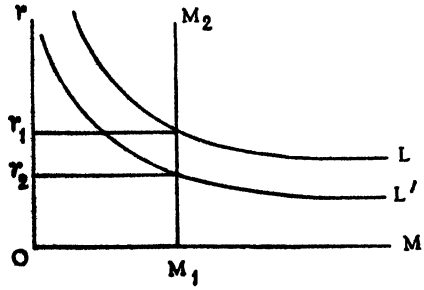


Fig. 8

Thus Keynes shows that the rate of interest is determined by the demand for and supply of money.

Criticisms of the Liquidity Preference Theory of Interest

Keynes criticised the classical theory of interest according to which the rate of interest would be determined by an interaction of the investment demand schedule and the saving schedule on the ground that it was indeterminate. Saving is a function of income, and unless we know the level of income the rate of interest is indeterminate.

Like the classical theory of interest, Keynesian theory is also indeterminate because the liquidity preference schedule will change

up and down with changes in the level of money incomes. If, however, we take account of the pure liquidity-preference schedule, it is, of course, independent of changes in the level of income and is thus free from the change of interdependence. But in that case also, the theory becomes indeterminate. We cannot know the amount of idle balances unless we know at the same time the amount of active balances and the latter depends on the level of money income. Thus in Keynesian theory also the demand for and the supply of money cannot determine the rate of interest unless we already know the level of money income.

Secondly, Keynesian theory also, like the productivity theory of interest, involves circular reasoning. Keynes has emphasised that speculators have some notion of what would be the rate of interest in future, and their demand for money to satisfy the liquidity motive will be determined by reference to this expected normal rate. As Robertson puts it,[1] "the rate of interest is what it is because it is expected to become other than it is. If it is not expected to become other than it is, there is nothing left to tell us what it is and why it is." Keynes has nowhere explained how this expected normal rate is to be determined. So, it seems that there is some truth in the Hicksian criticism that "Keynes left his theory of interest hanging by its own bootstrap."

To this it might be replied that statistical evidences reveal the fact that the yield on gilt-edged securities in the London money market has remained comparatively stable over long periods. The greater this stability, the more reason there is to expect that this rate will form the basis for the determination of the normal rate of interest in the minds of the speculators. If this is so, then thrift and productivity need not have to do anything with the determination of the rate of interest. Prof. Harrod[2] has tried to defend Keynes by introducing a distinction between factors which determine the existence of the rate of interest and those which determine the level of the interest rate. According to him, Keynes discussed only the latter leaving the existence of the rate of

1. Robertson—"Mr. Keynes and The Rate of Interest" *Essays in Monetary Economics.* Reprinted in the *Readings in the Theory of Income Distribution (P. 448) and Utility and all that.*

2. Harrod—Towards a Dynamic Economics, P. 67.

interest to be explained by other factors of which Prof. Robertson's productivity and thrift might be very important.

Thirdly, Prof. Robertson criticises the liquidity preference theory of interest on the ground that it ignores the roles of thrift and productivity of capital in determining the rate of interest. Keynesian theory places too much emphasis upon only one form (*i.e.*, money) in which assets can be held and Keynes oversimplifies the alternatives to which accumulated income can be invested. In the real world the alternatives are much more numerous, and demand and supply of every type of assets has just as much right to be considered as demand and supply of money. Factors underlying the decisions to save appear to be as important to the theory of interest-rate determination as are the decisions to hoard or dishoard. While the earlier theory was defective in neglecting the importance of idle balances, Keynes's theory has gone to an opposite and equally inadequate extreme in neglecting all other factors.

Fourthly, as regards the so-called "liquidity trap" at which demand for money is stated to be perfectly elastic, it has been argued that the schedule of the liquidity preference may actually prove to be inelastic at comparatively low rates of interest. At the bottom of a depression, all sorts of expectations are, in general, extremely pessimistic. It is not convincing to argue that the expectations with respect to the rate of interest should nevertheless be that it will rise.

Finally, one important difficulty with the Keynesian theory is that Keynes is not very clear as to the meaning that he attaches to money. Money, Keynes argues, is co-existent with bank deposits. But Keynesian theory never runs in terms of demand for and supply of credit. Moreover, the financial motive governing the demand for holding money as has been referred to by Keynes may influence the amount of cash balances.

Some economists including Prof. Robertson argue that the alternative to the liquidity preference theory is the loanable founds theory. But, Prof. Lerner has argued that the demand for loanable fund and the supply of loanable fund are interdependent schedules and as such the loanable funds theory also is indeterminate.

The problem of determining a determinate rate of interest is essentially dynamic and cannot be explained by reference to static

theories. Keynesian theory of interest is essentially static. Large number of factors are to be taken into account for the correctness of the theory of the determination of interest. Hence, Prof. Schumpeter[1] was of opinion that the determination of the rate of interest could only be made by a system of Walrasian equations taking into account the large number of interrelated factors.

Is the rate of interest a purely monetary phenomenon ?

The question which necessarily crops up in our mind after an analysis of the liquidity preference theory of interest is whether the rate of interest is a purely monetary phenomenon. In one sense, the rate of interest is by definition a monetary phenomenon since it is calculated in terms of money. But still the question remains, is the rate of interest determined by those "real factors", psychological and technological, that can be subsumed under the concepts of propensity to save and marginal efficiency of investment ? We can answer both questions affirmatively[2]. It can be still argued that the rate of interest is determined by savings and investment decisions and not by the demand and supply of money.

But Keynes contends that the rate of interest is a purely monetary phenomenon. Keynes first examines the argument of the loanable funds theorists that the rate of interest is determined by saving and investment decisions and then establishes his argument that interest rate is a purely monetary phenomenon. Keynes is at pains to rule out the possibility of the rate of interest being affected by the savings decisions. Keynes readily admits that "the intention to save may affect the willingness to become unliquid meanwhile. This factor should certainly be included in the list of motives affecting the state of liquidity preference.....But it is only one amongst many and in practice, one of the least importants"[3].

Having ruled out the effects of changes in savings on the rate of interest, the next question which should be considered in this context is whether changes in the volume of investment can alter the rate of

1. Schumpeter—Business Cycles, vol. 1, P. 78.
2. Modigliani—"Liquidity Preference and Theory of Interest and Money"—Readings in the Monetary Theory.
3. Keynes—The "Ex-Ante" theory of the rate of Interest. Economic Journal, 1937, P. 665.

interest, and if so, to what extent. Keynes in his *General Theory* argues that the rate of interest is determined by demand and supply of money and so changes in investment have got nothing to do with the determination of the rate of interest. But being seriously criticised by Robertson on the ground that he has not considered the role of marginal efficiency of investment in determining the rate of interest, Keynes has been compelled to modify his monetary theory of interest to some extent. Keynes is firm in his fundamental argument that the volume of investment, as such, does not determine or help to determine the rate of interest ; but a change in investment may indirectly affect the rate of interest through its effect on the liquidity preference schedule. If an increase in investment raises the liquidity pereference, the obvious effect, in the Keynesian system, will be an increase in the rate of interest provided the amount of money is given at any point of time.

Keynes assumes that as an impact effect of increased investment, the borrowing entrepreneurs' liquidity preference will increase so as to make provision for the financing of this investment. Keynes thus agrees that an increase in the volume of investment may raise the rate of interest by raising the liquidity preference or the borrowing entrepreneurs. This motive for holding more money out of a given stock of money has been called "financial motive"[1] or demand for finance" by Keynes. The significance of introducing the financial motive is not to deny that if investment rises, the rate of interest may rise. But it explains that the rate of interest will rise when an increase in the volume of investment will be associated with a rise in the demand for finance. Thus, the extent to which there will be an increase in the rate of interest because of an increase in the marginal efficiency of investment is uncertain. Investment may be of the same volume in two different cases—but if the effect on the financial motive for holding money is different, the effect on the rate of interest will also be different.

Thus, Keynes considers the role of the investment decisions in determining the rate of interest also in monetary terms. His basic contention that the rate interest is a purely monetary phenomenon remains unaltered.

1. Keynes's article in the Economic Journal, 1937, P. 147.

As against all arguments advanced by Keynes in support of his thesis, we can still say that productivity and thrift have very much to do with the rate of interest. A change in thrift will affect consumption function and thus influence the level of income and the level of income will in turn affect the liquidity preference and so the rate of interest. Again, an upward shift in the marginal efficiency of capital will affect the rate of interest through its effect on income, which in turn will influence the liquidity preference schedule and so the rate of interest.

Thus, we find that if only monetary factors are taken into consideration, some real factors which influence the productivity and thrift are being ignored. So, an adequate and complete theory of interest should take into account both monetary and real factors. It should be based on the investment demand function, the saving function (or conversely the consumption function), the liquidity preference function, and the quantity of money[1]. In Keynesian theory, these elements are involved but these have never been brought together in a comprehensive manner for the formulation of an adequate and integrated interest theory.

In his "Value and Capital", Hicks has developed what is probably "the most daring attempt at reducing the rate of interest to a purely monetary phenomenon"[2], when he says that the rate of interest is explained by the "imperfect moneyness of securities." According to Hicks, "the imperfect moneyness" of those bills which are not money is due to their lack of general acceptability : it is this lack of general acceptabitity which causes the trouble of investing in them[3] and this trouble of making transactious (i.e., of purchasing securities) explains the short term rate of interest. But Prof. Modigliani argues, "to say that different assets share in different degrees the quality of money-ness either has no meaning or it is based on confusian between liquidity and the properties of a medium of exchange."[4]

1. Hansen—A Guide to Keynes. P. 146-47
   Also see Hansen—Monetary Theory and Fiscal Policy. pp. 81-82.
2. Modiglinai's article in the Readings in thetMonetary Theory. p. 231,
3. Hicks—Value and Capital, p. 232.
4. Modigliani—article as referred to above, p. 235.

13—18 Loanable Funds Theory of Interest—Static Equilibrium Condition or Dynamic Equilibrium Condition ?

The significance of the Loanable Funds Theory in relation to the Liquidity Preference Theory has been a matter of great controversy. There have been different formulations of this theory and we shall examine each of these formulations. Let us first examine[1] how the net supply of and the net demand for loanable funds determine the rate of interest, and before doing it, let us first of all define the net supply of and the net demand for loanable fund.

The total supply of loanable funds comes from several sources. One source is saving, defined as gross saving less consumption loans ($Sy—C^2=S$). In addition to personal saving of individuals, a second source of loanable funds is the depreciation reserves and retained earnings set aside from current income by businesses. In the following figure the curve S, represents the aggregate of gross personal and business saving less consumption loans at various interest rates and a final equilibrium level of income. It does not, however, represent total amount of loanable funds. Apart from two types of savings that this curve takes into account, we should also consider the fact that at any given time the amount of money which the economic entities desire to hold as cost balances may not be equal to the total amount of money held.[2]

The difference between the amount of money which people want to hold in their balance and the amount they do hold may be defined as

$$H=(B_s+B_t+B_p)-M. \qquad (1)$$

There H represents the difference between the amount desired in the speculative balance and the amount actually held in the speculative balance, since, in the short run, both B_t and B_p are assumed to be independent of the rate of interest and to alter slowly, If H is *positive*, there will be *hoarding* and if H is *negative* there will be *dishoarding*.

The gap between the amount desired in speculative balances and the amount actually held can be met either by neutralising changes in the supply of money (ΔM) or by neutralising changes in saving.

1. Liebhafsky—The Nature of Price Theory. Pages 374-78.
2. Ibid. P. 375.

Assuming no change in the supply of money, the net supply of money, the net supply of loanable funds would consist of the difference between saving from current income and hoarding, or

$$S - H = S_L \quad (2)$$

S_L represents the supply of loanable fund. If there is any change in the supply of money the net supply of loanable fund is,

$$S - H + \Delta M = S_L .$$

Again, there may be the business saving and the savings of the credit-creating institutions.

The supply of loanable funds can be shown by the followin diagram :

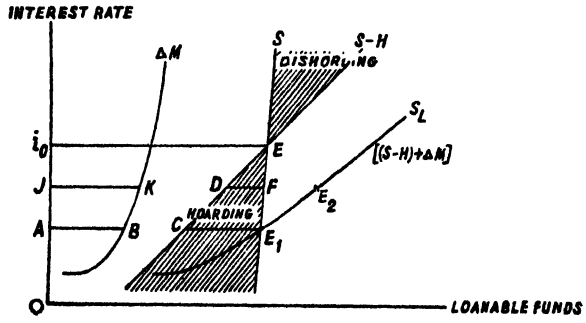


Fig. 9

At E we see that H is zero and that the supply of loanable fund is equal to the supply of savings, $S - H = S$; that is to say, the curves S and $S - H$, intersect at E. At E, H is negative and there is dishoarding. Below E, H is positive, and there is hoarding. The curve ΔM indicates the additions to the money supply, and the curve S_L is the sumtotal of

$$[(S - H) + \Delta M)].$$

Demand for loanable fund is made up of: (1) the investment or business demand for funds (1), which depends upon the prospective marginal net revenue productivity or investment of capital ; (2) the demand by governments for funds (L_0) which is motivated less by considerations related to the interest rate than by other considerations,—the government demand for loanable funds is probably relatively inelastic.

(3) Consumer's demand for loanable funds (L_c) both for short-term loans and for long-term loans and

(4) Speculative demand for loanable funds.

The aggregate of private investment demand (I) and the government demand for loans (L_g) thus produces the net demand for loanable funds,

$$\text{or} \quad 1+L_g=D_L \tag{4}$$

Let us now examine the "static" *Loanable Funds Theory* in the following diagram.

When the S_L curve and the D_L curve intersect at E_2, the rate of interest is i_2 and when the S_L curve and D_L curve intersect at E_1, the rate of interest is i_1.

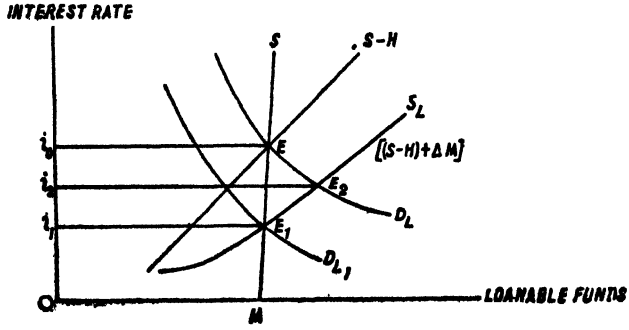


Fig. 10

Prof. Ackley[1] has argued that the orthodox loanable funds theory contains much confusion since *saving, investment and income are all flow concepts*, while *hoarding and dishoarding are stock concepts.* These magnitudes cannot be defined without reference to some time period. Accordingly, Ackley remarks that the loanable funds theory should be treated as a disequilibrium theory concerned with a dynamic analysis and not as a static theory. He finally observes that if the loanable funds is interpreted as a statement of static equilibrium conditions the theory contains few insights.

If we accept Ackley's argument, in the above diagram, it can be shown that at E_2, income is not in equilibrium.

Let us suppose, $Y=C+I+G$, (5)

where Y is income, C is consumption expenditure, I is investment

1. Ackley—Macroeconomic theory (New York, Macmillan) Pages 7.

expenditure and G is government expenditure. Similarly let us define income (Y) from the disposal point of view as

$$Y=C+S+T \quad (6)$$

where T represents taxes, S represents gross savings and C represents consumption.

Then, from the equations (5) and (6), it follows that $S+T=I+G$. (7)

Next let us define $G-T=Lg$, which states that government expenditure minus taxation is the amount of government borrowing :

Then we can say

$$S=I+G-T \quad (8)$$

$$=I+Lg \quad (9)$$

But the equation (4) has already stated that $I+Lg=D_L$

Thus, $D_L=S$ ... (10)

At the point E in diagram, $(S-H+\Delta M)=D_L$ ... (11)

or $S-H+\Delta M=I+L_g$ ... (12)

But in the equation (9) we find that $S=D_L+L_g$; therefore,

$$-H+\Delta M=0 \quad ... \quad (13)$$

Thus, if income is to be in equilibrium simultaneously with the supply of loanable funds equal to the demand for loanable funds, the aggregate of dishoarding and the change in the money supply must be equal to zero. Again, at the point E, the curve intersects the curve $S-H$. That is to say, ΔM is zero at that point. Obviously H also is zero at that point. The relevant supply curve here is $S-H$, and in this situation, E is the equilibrium position.

Ackley gives the following argument

$$H=(B_s+B_t+B_p)-M \quad ... \quad (14)$$

This equation we have already stated (equation 1). The condition of static monetary equilibrium also states that

$$M=B_p+B_t+B_p \quad ... \quad (15)$$

which implies that the amount of money held in balances must be equal to the amount the economic entities desire to hold in their balances.

If we compare the equations [14] and [15], we come to the conclusion that in the static monetary equilibrium position, H must be equal to zero, and since this is the case, it follows that ΔM must also be equal to zero. But since at E, H is not zero, ΔM is not

possible for a static monetary equilibrium to exist at E_1. So the equation (15) does not hold at E_1, Therefore if we choose E_1 as the equilibrium point we are actually explaining a dynamic disequilibrium situation.

Loanable Fund Theory of Interest.—Formulation of Robertson.

According to Robertson, the rate of interest is determined by demand for and supply of loanable funds during a given period of time. Supply of loanable funds is governed by (a) current savings effected during the period ; (b) "disentanglings", i.e., "savings which have been made in the past and are being currently released from embodiment either in fixed capital (buildings, instruments etc.) or in working capital (goods in process or store) and so becoming available for re-embodiment either in the same or in different forms", (e) "net dishoardings" and (d) net additional bank loans.

Demand for loanable funds is governed by the purposes for which these funds are required. Funds may be destined for expenditure on building up new increment of fixed or working capital, and on the maintenance or replacement of existing capital.

Funds may also be destined to be put into store and destined for expenditure on consumption.

Prof. Lerner observes that the demand and supply of loanable fund schedules are independent since both these schedules are related to the level of income. So, the rate of interest determined by demand and supply of loanable funds is indeterminate.

The rate of interest is the mechanism through which the demand for loanable fund is equated to the supply of loanable fund, i.e., through which the consumption and investment plans and the demand for idle balances are made consistent with each other. Since "current" planned savings and "disentanglings" of the supply of loanable fund and the factors influencing demand for lonable fund may be summed up, respectively, as planned gross savings and planned gross investment expenditures, the equation for the determination of the rate of interest according to the loanable funds theory may be simplified as :

Planned current gross savings + net decrease in the demand for idle money + net creation of new money = current planned gross investment.

Attempts to reconcile the Liquidity Preference Theory and the Loanable Funds Theory—Views of Lerner, Fellner and Somers.

Prof. Lerner[1] has attempted at securing a reconciliation between the liquidity preference theory of interest and the traditional loanable funds theory of interest and the result of this effort has been a modified version of the loanable funds theory. Prof. Haberler[2] also is in agreement with Lerner in this regard. Lerner and Haberler have defined supply of credit as saving *plus* the net increase in the amount of money during a period, and the demand for credit as investment *plus* the net hoarding during the period. They argue that rate of interest as determined by demand for and supply of credit thus defined will be fully consistent with the liquidity preference theory. This is found in the Fig. 11.

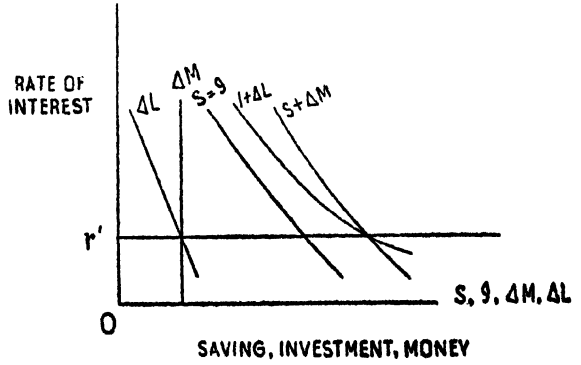


Fig. 11

The supply of loanable fund $(S+\Delta M)$ has been brought into equilibrium with demand for loanable fund $(1+\Delta L)$ at a given rate of interest (Or') during the current period. But this effort for ensuring a reconciliation between the liquidity preference theory and the loanable funds theory is also not satisfactory since it leaves the level of income out of account. Lerner's Proof of the equivalence of the liquidity preference and loanable funds theories was achieved only at the expense of total distortion of the latter. For, to establish the

1. Lerner—"Alternative Formulations of the Theory of Interest." Economic Journal, June 1938.

'New Economics' edited by Harris. Also *see* Lerner's article in the Review of Economics and Statistics, May 1944.

2. Haberler—Prosperity and Depression, P. 134.

identity of the two theories, he interpreted the two main components of the demand and supply of loanable funds, viz., savings and investment, in the *ex-post* sense in which they are always identical. This made nonsense of the Loanable Funds theory in which savings and investment must be defined in the *exante* sense.

Profs. Fellner and Somers[1] have handled this problem successfully but their definitions of supply and demand for loanable fund may not be acceptable to all. The demand for loanable funds, according to them, consists of three parts. *viz.*, (1) the demand for goods other than claims, (2) the demand by people for their own money, and (3) the demand for claims. Similarly, the supply of goods other than claims, (2) the supply by people of their own money and (3) the supply of claims. Then they argue that the supply of goods other than claims and the demand for goods other than claims are independent of the rate of interest and equal in any general equilibrium system. They also argue that demand by people for their own money is equal to the supply by people of their own money. With these two relations, it follows that at the interest rate at which the total supply of loanable fund (consisting of all three categories) equals the total demand (consisting of all the three categories) for loanable fund, demand and supply of claims are also equal. The rate of interest determined by this analysis is the same as determined by either the liquidity preference theory or the loanable funds theory.

Hoarding and Dishoarding in a Loanable Funds Analysis—Stock Analysis vs. Flow Analysis.

Many economists have tried to replace the stock analysis of the rate of interest by a flow analysis of the rate of interest. They have tried to incorporate Keynes' innovation regarding the speculative demand for money into a loanable funds framework of analysis. That is to say, they have tried to incorporate flows of speculative hoarding and dishoarding into the analysis of interest rate determination, along with (the flows of) saving, investment and money creation.

1. Fellner and Somers—Alternative Monetary Approaches to Interest Theory. Review of Economics and Statistics, p. 43.
Also see Klein—Keynesian Revolution, P. 121.

This has been shown in the following figures :—

In the Part A of Fig. 12, we find that at interest r_1 the demand for balances would fall short of the supply by BC. This is

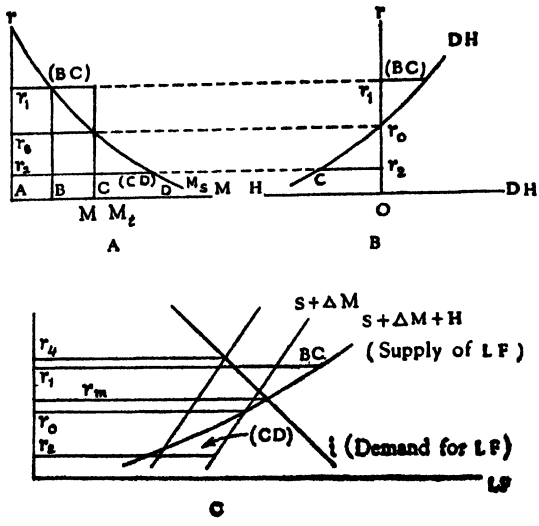


Fig. 12

why it is not an equilibrium : people would be holding idle balances in the amount of AC, but would wish to hold only AB. At r_2, also not an equilibrium, desired holdings AD would exceed actual holdings, AC, by an amount CD, since many would be afraid that security prices so high must be only a temporary condition. Part B of the diagram shows that there will be a hoarding of CD. At the rate of interest at r_0, we find no demand for hoarding.

Part C of the diagram shows a synthesis. S curve indicates saving ; $S+\Delta M$ curve indicates saving plus net money creation, while the $S+\Delta M+H$ curve indicates saving *plus* net money creation *plus* demand for hoarding. The *i* curve indicates the demand for loanable fund. The Part C of the diagram shows that at the rate of interest r, the additional source of loanable funds is in the amount of BC. At r_0, neither hoarding nor dishoarding occurs, so the total supply of loanable funds is $S+\Delta M$. At rates below r_2, there will be hoarding (or negative dishoarding) which must be subtracted from the supply of loanable funds (alternatively, it could be represented as demand for loanable funds) and that amount is indicated by CD.

The total supply, $S+\Delta M+DH$ is shown by the line rising to the right in this diagram.

Prof. Ackley argues that this sort of demonstration is "seriously misleading."[1] In the first place, while the part A of this diagram represents a stock analysis showing a stock of money and a demand for that stock, part B of the figure translates the difference between the actual versus a desired stock into flow. But this cannot be done without more information than is supplied by the theory about desired stocks. The rate of interest may be influenced by both the willingness to hoard or to dishoard and the willingness to save and invest. Secondly, this analysis has a disequilibrium character in that it assumes transactions demand for money to be given. In assuming transactions demand to be constant, we have assumed prices and outputs as given. Yet, at any rate of interest other than r_0, saving and investment would be unequal. Although Ackley does not object to a disequilibrium analysis which is the essence of dynamics, be raises the question, "if the rate of interest is, in fact, rm (as in the Part C of the figure) today, what will it be tomorrow?"[2] Thirdly, the difficulty with this analysis is with the realism of its assumptions. It has been implicitly assumed that the interest rate adjusts very rapidly, while income, output, and prices (which determine transactions demand) change only with a lag. If this were not so, we could not legitimately have held M_t as given while the interest rate adjust. Ackley finds "these dynamic assumptions exceedingly improbable and unrealistic." A correct and meaningful analysis of disequilibrium situations in loanable funds terms is possible, according to Ackley *particularly if it is a process analysis.*

Ackley concludes that equilibrium requires the rate of interest which makes (a) savers satisfied with that they are in fact saving, (b) investors satisfied with what they are in fact investing, and (c) wealth-holders satisfied with the decision that in fact exists of their portfolios between cash and bonds. A rate of interest consistent with any two of these, but not the third is not an equilibrium rate. "Perhaps the most serious shortcoming of the usual loanable

1. Ackley—Macroeconomic Theory, P. 203.
2. Ibid, P. 205.

funds analysis of the interest rate is that it implies that the determination of the interest rate can be discussed apart from the other macroeconomic variables and relationships that make up the complete model. Even if we assume certain lags, so that in *the very short run* the burden of adjustment falls only on the interest rate, a more complete analysis requires recognition of the interdependence of the interest rate, price level, income level and all the rest."[1]

Reconciliation of the Liquidity Preference theory of interest with the Loanable Funds theory

There have been different attempts to reconcile the liquidity preference theory with the loanable funds theory. According to Hicks, "Properly followed up, the liquidity preference theory and the loanable funds theory lead to the same results." Hicks argues that interest, like all other prices, is determined as a solution of a general equilibrium system of equations. He argues that one equation follows from all the rest and that it can be eliminated. Depending upon which equation one eliminates, one can be either a loanable funds theorist or a liquidity-preference theorist. Mr. Cliff Lloyd in his article, "The Equivalence of the Liquidity Preference and the Loanable Funds Theories and the New Stock-flow Analysis"[2] says, "In a consistent n-good system, two of the goods being bonds and money, if any n—1 excess demand equations are satisfied, the *n*th must also be satisfied, thus the *n*th may be dropped.....The loanable funds theory drops the money equation, the liquidity preference theory drops the bond equation, but the two are equivalent..... This is quite a simple and clear-cut proof, provided that each of the goods in the system is represented by only one excess demand equation, but... in an explicit stock-flow theory any stock-flow good will be represented by two excess demand equations". As Klein[3] points out, nothing has been proved by Hicks' argument. "It does not tell whether the rate of interest is the mechanism which allocates funds into idle hoards as opposed to earning assets or which brings the supply and demand for loans into equilibrium." If the supply of and demand for loanble funds is reduced to savings-investment equation it cannot

1. Ackley—Macroeconomic Theory, Pages 206-207.
2. Lloyd's article in the review of Economic Studies, June 1960.
3. Klein—Keynesian Revolution. p. 119.

fit in quite well with Keynesian conditions in relation to the determination of the rate of interest. Keynes considers the influence of saving on the rate of interest to be least important, and the influence of investment decisions on the rate of interest to be indirect *via* its effects on income and liquidity preference.

According to Prof, Hansen[1] the loanable funds formulation and the liquidity preference formulation, taken together, give us an adequate theory of the rate of interest. The loanable funds theory supplies us with a family of loanable funds schedules corresponding to

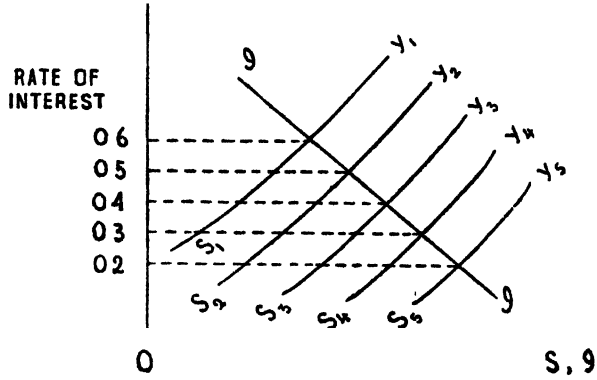


Fig. 13

various levels of income. These schedules along with the investment schedule give us the Hicksian IS curve. This is shown in Fig. 13 and Fig. 14.

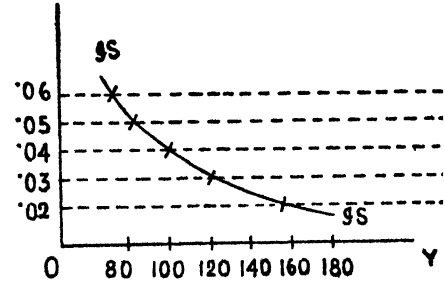


Fig. 14

In Fig. 13 we find a family of saving schedules, the investment demand curve being given, corresponding to the different levels of

1. For a good exposition of this reconciliation, see Hansen—A Guide to Keynes, Ch. 7.

income. These savings schedules along with the investment demand schedule give us the IS curve in Fig. 14. Similarly, from the liquidity preference formulation we find a family of liquidity preference schedules corresponding to different levels of income as in Fig. 15.

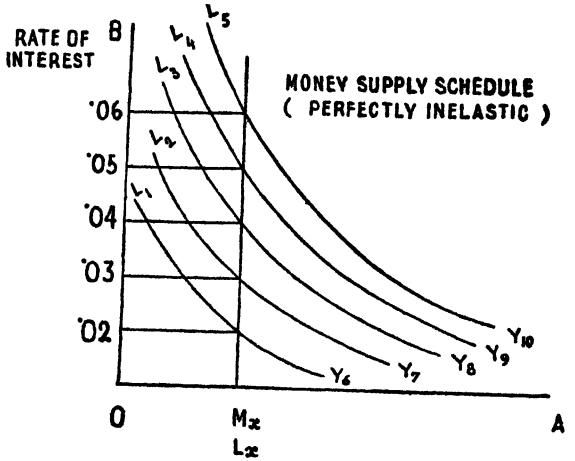


Fig. 15

These liquidity preference schedules along with the supply of money schedule give us Hicksian L curve (which Prof. Hansen[1] calls LM curve), as in Fig. 16.

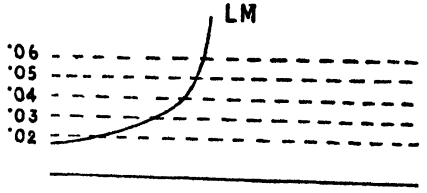


Fig. 16

Hicksian IS curve and the L curve (or the LM curve according to Hansen) are related to two variables, *viz.*, income and the rate of interest. These two schedules determine the level of income and rate of interest at the point of intersection as in Fig. 17.

At the points of intersection of these two schedules (1) saving and investment are in equilibrium, *i.e.*, the condition of the

1. Hansen—A Guide to Keynes, p. 174.

loanable funds theory is fulfilled and (2) demand for money is equal to supply of money, *i.e.*, the condition of the liquidity preference

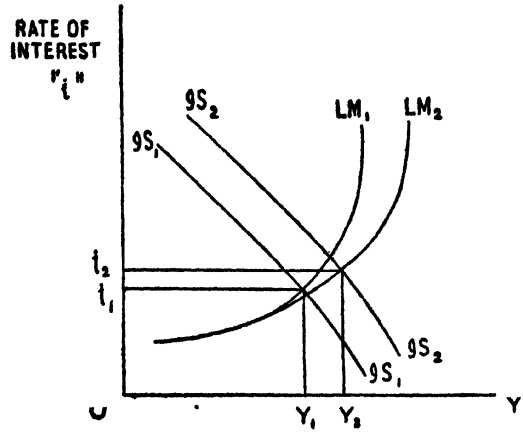


Fig. 17

theory is fulfilled. In the Fig. 17 shifts of both the IS and the LM curves have been shown. The upward shift of the IS curve from IS_1 to IS_2 may be due to either an increase in investment demand function or a downward shift in the saving function. Similarly, the shift of LM curve from LM_1 to LM_2 may be due to either an increase in the supply of money or a decrease in the liquidity preference schedule.

Thus, Prof. Hansen takes four elements into account in formulating an adequate theory of interest. These elements include (1) the investment demand function, (2) saving function, (3) the liquidity preference function and (4) quantity of money. Keynesian theory also involved all these elements, but, Keynes could not bring all these elements together in a comprehensive manner to formulate expressly an integrated interest theory[1]. With shifts in IS and LM curves, there will be a change in the rate of interest and that also will be an equilibrium rate of interest.

A.H. Leigh[2] has attempted at securing a reconciliation between these two theories. According to him, the rate of interest will be

1. S. C. Tsiang—Liquidity Preference and Loanable Funds Theories, Multiplier and velocity Analysis: a Synthesis" American Economic Review Sept. 1956,
2. A. H. Leigh's article in the *American Economic Review*, Sept. 1951.

determined at any time by the demand and supply of loanable funds (including money) taking into account all interrelated elements in the immediate preceding period of time. The rate of interest, according to this formulation, will be a moving equilibrium rate changing continuously over time, because of the changes in the supply and demand functions which immediately determined it.

S. C. Tsiang shows that the liquidity preference theory and the loanable funds theory of the determination of interest are identical in the sense that the two sets of demand and supply functions, i. e., the demand for and the supply of loanable funds and the demand for money to hold and the stock of money in existence, would determine the same rate of interest in all circumstances, if both sets of demand and supply functions are formulated, correctly in the ex-ante sense". Tsiang rejects the Walrasian system in this regard on the ground that it links interest no more intimately with money than with any of the other multifarious goods of the general equilibrium system.[1] To invoke the Walrasian Law in any attempt of reconciliation between these two theories is, says Tsiang, to use an *ex post* definition of the demand and supply of money.

Tsiang also criticises Fellner and Somers in the following way: "The total of the so-called 'supply of money', the main components of which are flows over time, does not necessarily equal the total stock of money in existence (which is the usual meaning of the supply of money in the liquidity preference theory) unless the period of time over which the flows of money expenditures are measured is so defined as to make these equal". It should be noted that Fellner and Somers define the supply of money as total money expenditure, on goods, services, bonds, or other claims plus the amount of money held unspent.

In conclusion, Tsiang says, "All the disagreements between the loanable funds and liquidity preference theories on practical issues seem to arise from the failure on the part of liquidity preference theorists themselves to perceive the dependence of the aggregate liquidity preference (or demand for money) function upon the consumption and investment functions".[2]

1. Shackle's article, "Recent Theories concerning the Nature and Role of Interest". The Economic Journal, June. 1961.

2. Tsiang's Article in the American Economic Review. Sept. 1956.

Effects of interest-rate changes on Saving and Investment

So far as the decisions of the household to save are concerned, we find two types of household which will be affected by changes in the rate of interest. Some people will tend to save more of a given income when the rate of interest is high than when the rate of interest is low. Another kind of household will not save more when the rate of interest is high. The households which plan to save more at a higher rate of interest are those who anticipate that they can earn a larger amount of income in future in return for a given amount of abstention from current consumption.

Keynes in his "Treatise on Money" argued that the rate of interest had the power to upset the balance between the volume of saving and investment, the effect on saving being often "quantitatively small in practice, especially over the short period."

The different views about the interest-elasticity of saving were expressed in the Report of the Patman Committee which may be classified into three schools.[1] The school led by Prof. Friedman believes that aggregate spending and hence, aggregate saving is interest-elastic. A second school led by Prof. Samuelson is skeptical about the interest-elasticity of spending or saving, and is impressed more with variability than with the constancy of monetary velocity. The third school led by R. V. Roosa contends that a high interest rate is effective much more in restricting the availability of credit than in increasing its cost. Prof. Friedman[2] points out that an increase in the rate of interest for raising the volume of savings is effective only when it is carried to the "extreme."

It is also plausible that if a household is saving to provide an income of a certain amount in the future, it will be necessary to save less per year when the rate of interest is high than when it is low.[3] Inspite of this possibility, it is most likely that an increase in the rate of interest will tend to promote savings. The influence of changes in the rate of interest on plans to save is, of course, less important than that of change in the level of income.

Let us now examine the effects of a change in the interest-rate

1. Tobin's article—Review of Economics and Statistics. May 1953.
2. Friedman's article—"Comments on Monetary Policy." Review of Economics and Statistics, Aug. 1951.
3. A. C. L. Day—Outline of Monetary Economics. P. 81.

on the plan to invest. Investments are of two types, *viz.*, investment in reproducible *fixed wealth*, such as buildings and machines, and investment in *stocks* of raw materials, goods in process and finished products. Plans by firms to invest in fixed wealth depend on the marginal efficiency of capital. Plans to invest also depend on opportunities for new investment arising from the appearance of new techniques of production. Marginal efficiency of capital also depends to some extent on the rate of interest which governs the supply price of capital. According to Keynes, the rate of interest may affect the level of investment. But it is less important than the marginal efficiency of capital as a determinant of investment. Apart from the annual interest charge to be paid for carrying out an investment, the cost of maintaining the machine and replacing it when it is worn out, or cost of repaying the debt as the machine wears out is also taken into consideration by the businessmen when they determine their plans to invest.

Again, it is rather doubtful whether changes in the rate of interest have very much effect on firms' plans to hold stocks. The level of investment in stocks of materials is largely influenced by the level of output and sales, and is unlikely to be influenced very much by relatively small changes in the rate of interest, *i.e.*, by small changes in the cost of carrying stocks.

We can say that, in all cases, there is some tendency for a higher rate of interest to discourage the plans to invest. Only in the case of relatively long-lived fixed capital will changes in the rate of interest show this effect considerably. Investment in short-lived equipment will be influenced relatively little by interest changes, and it can safely be assumed that investment in inventories is also influenced very little by normal changes in interest rates. The relationship between saving and investment plans and the rate of interest can be represented by the following diagram :

Savings and investment plans are measured along the horizontal axis and the rate of interest is measured vertically. With a fall in interest rate investment plans rise as shown by the II' curve. Out of a given amount of income (Y_1) savings plans at different levels of the interest rate might be those represented by the S, Y_1 curve ; at a rather higher level of income (Y_2) savings plans at different interest rates might be those represented by S_2Y_2, and so on. It is

clear that the possible equilibrium situation are those points where

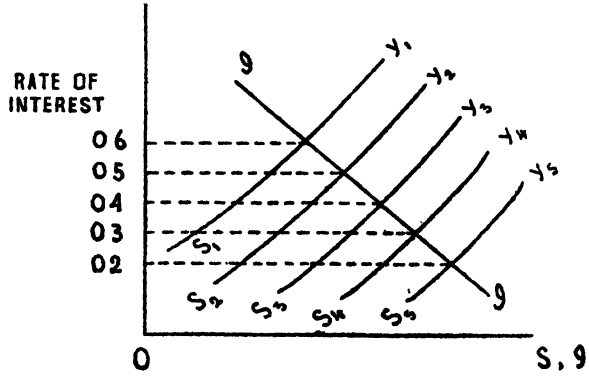


Fig. 18

savings and investment plans are consistent. Prof. Lutz[1] concludes that (i) short rates are unlikely to influence inventories ; (ii) long rates are unlikely to influence investment decisions in manufacturing industries ; (iii) under certain circumstances a change in the long-term interest rate may affect investment decisions in the case of public utilities including railroads and residential construction ; and (iv) changes in interest may affect the readiness of financial institutions to grant credit or to float bonds or stocks, "so that the interest-rate may influence the volume of investment even without changing the profit calculations of entrepreneurs". Mr. Ebersole[2] concludes after witnessing a number of instances that the interest rate is seldom considered as a factor in the entrepreneurial decisions of business to expand or contract, and is a controlling factor in a negligible number of instances." Prof. Hawtrey gives stress on the sensitiveness of inventories to the short-term rate of interest. Prof. Harrod[3] rejects the Hawtrey doctrine about the sensitiveness of inventories to the short-term rate of interest. Harrod thinks that though the demand for capital may eventually be more responsive than it is immediately to change in the rate of interest we should

1. Lutz—"The structure of Interest Rates"—Quarterly journal of Economics 1940-41. Reprinted in *Readings in the Theory of Income Distribution, A. E. A.*

1. See Sayer's article, "Rate of interest as a weapon of Economic Policy" in *Oxford Studies in Price Mechanism.*

2. Ibid.

not "expect a very great increase of capital outlay in the period immediately following a change in the long-term rate of interest". Prof. Robertson also thinks that since the changes in the rate of interest affect both savings and investment there is no wisdom in "putting the rate of interest in chains". He has, therefore, pleaded for "some sustained re-thinking in the academic circle".

Cheap Money Policy

The main arguments in favour of the healthy effects of a cheap money policy or of low interest rate policy on investment may be summarised as follows :

In the first place, a low and stable interest rate has a healthy effect on the capital market and thus it tends to encourage investment. Secondly, a low and stable interest rate policy facilitates capital formation. As has been pointed out by Lutz, a low interest rate policy is particularly effective in construction and public utilities. Thirdly, a low interest rate implies a low cost of borrowing. So, a low and stable interest rate policy encourages loan-financed public investment. Fourthly, to cope with the problems arising out of secular stagnation in advanced capitalistic society, a low interest rate policy is useful since it is instrumental in minimizing the secular tendency of savings to outrun investment. Since a low and stable interest rate policy is conducive to investment, it is useful in creating employment opportunities, and from this standpoint, it is more useful than a reduction in the wage rate. But doubts have been expressed by the modern economists as to the interest-elasticity of investment. It is the increased marginal efficiency of capital and not a cheap money policy which can initiate an accelerated process of investment. Moreover, low interest rate policy is not always desirable since it discourages thrift and reduces the interest-income of different financial institutions.

If Keynesian analysis of "*liquidity trap*" is accepted, the rate of interest cannot be lowered beyond certain limit. So it is a limitation of the cheap money policy in initiating an increase in investment by lowering the rate of interest indefinitely. As against this argument, we may say that it is not absolutely a low interest rate which is an incentive to investment, it is a lower interest rate which stimulates investment.

Prof. Sayers concludes that "the efficacy of the interest rate has changed and will go on changing continuously, some forces tending to dull its edge while others sharpen it. The debate on the *modus operandi* continues, but while it continues, the phenomenon itself is changing."[1]

Interaction of Income changes and Interest-rate changes when Interest-rate changes do not affect Savings and Investment Plans.

We have seen that interest rate changes have relatively small effects on saving and investment in certain circumstances. It is also possible that interest rate changes may not have any effect on saving and investment.

When there is an autonomous rise in the level of investment, the final equilibrium position will be one at which the level of income and the level of interest rates are both higher than before the change. At the new equilibrium level of income, investment plans must be equal to saving plans, and households must be willing to hold their wealth in the form of existing claims[2]. Neither investment plans nor saving plans at the new level of income are supposed to be influenced by interest-rate changes which are the new elements in the situation. The new level of income will be higher than the old level by the amount of autonomous rise in investment multiplied by the multiplier[3].

But a rise in the rate at which investment plans are being carried out leads to a rise in the rate of interest, because the firms which are making the additional investments issue more securities and the households have no immediate reason to alter their saving plans and so to purchase securities. If only the prices of securities fall, the households may hold extra securities, and in that case, some households make a switch from money to securities. This effect persists only when a discrepancy between planned investment and planned saving persists.

Secondly, if a firm is planning to increase its level of investment,

1. Sayers—"Interest rate as a weapon of economic policy", *Oxford Studies in Price Mechanism*.
2. A. C. L. Day—Outline of Monetary Economics. P. 84.
3. Ibid. P. 85.

it will have to take steps to increase its money holding so as to carry on increasing transactions even before new plans of investment are brought into operation. It can increase its money holding by issuing bonds to households who may switch from money to bonds if there is some rise in the rate of interest. This rise in interest rates is "finance-induced", and this rise in interest rates occurs a little before the firm actually starts spending additional investment.

Thirdly, when both households and firms find that they are carrying out more transactions than before because of the increase in the level of income induced by initial rise in investment, their demand for holding cash-balances increases. The needs of carrying out extra transactions can be satisfied by reducing the households' speculative holdings below the original level, which can be brought about by a permanent rise in the level of interest rates[1].

If the initiating disturbance is caused by a fall in the volume of savings, the effects are similar, except that there is no correlate for the 'finance-induced' rise in interest rate[2]. In the first place, a decline in the volume of savings implies a fall in plans to purchase bonds. The equilibrium in the security market is restored by a rise in the interest rates. This will hold good when there is a discrepancy between investment plans and saving plans.

Secondly, an increase in the level of income which is induced, through the multiplier process, by an increase in consumption is associated with increased transaction needs for money. This also ultimately leads to a rise in the rate of interest.

Thirdly, an increase in the level of income gives rise to an expectation that the interest rates will rise in near future. Most of the households will have then strong fear of a fall in bond prices; this will inevitably show a tendency to shift into holding money for speculative reasons which leads to a rise in the rate of interest.

Interactions of Income changes and Interest-rate changes when Interest-rate changes do affect Saving and Investment Plans.

We have seen that there are cases when interest-rate changes do affect the plans to invest and the plans to save. When this occurs,

1. A. C. L. Day—Outline of Monetary Economics, P. 86.
2. Ibid.

the equilibrium level of income that follows and increase in the level of investment will not be the same as when there are no such influences. Clearly if the inducement to invest and the propensity to save are affected by the changes in the rate of interest, the path that will be followed by the actual level of income will not be the same as that which would have been followed if the rate of interest would be constant[1].

Thus we find two-way relationship between income changes and interest-rate changes. As we have already noted in the preceding section, changes in the level of income affect the interest-rate through the effects of changing transactions demand to hold money. Now we find that interest-rate changes also affect the level of income through influencing the inducement to invest and the propensity to save of the firms and households respectively.

The higher the level of income, the larger is transactions demand for money, and so the higher is the rate of interest if the supply of money does not change. If, however, the rate of interest is higher, investment plans will be smaller and savings plans out of a given income will be larger. The equilibrium level of income will be determined when planned saving will be equal to planned investment at a conceivable level of the rate of interest. Again, the more savings plans and investment plans are interest-elastic, the less will be the rise in the level of income arising in the multiplier process following a rise in the level of investment plans.

The extreme position is found when the level of income is unchanged after a change in the level of investment or savings and where the new equilibrium only involves a change in the level of interest rates. This extreme position is found when savings and investment are highly interest-elastic and when the people are unwilling to change the form in which they hold their wealth inspite of changes in the interest-rates. If the people are reluctant to change the form in which they hold their assets, whatever change occurs in the rate of interest, there will be no change in the amount of available transactions balances. This implies that the level of income must be at the original level in the new equilibrium which is brought about by considerable changes in interest-rates to ensure

1. A. C. L. Day—Outline of Monetary Economics, P. 87.

savings-investment equality without there being any need for changes in the level of income.

The two-way linkage that exists between the level of income and the level of interest-rates is important for studying the implications of different monetary phenomena.

Interest Rates on Long-term and Short-term Securities

In the money market, we find different types of security and so, we can no longer talk of 'the' rate of interest. There are as many different rates of interest as there are different types of security. We shall now examine the relationship between the interest-rates on long-term and short-term securities.

The rates of interest on long-term securities must be consistent with rates of interest on short-term securities, in the sense that "there is no pressure upon wealth-holders or upon debtors to switch from one form of wealth or one form of debt to another."[1] This consistency rule implies that, generally speaking, forces which move one rate upwards or downwards will also tend to move the other in the same direction. A rise the short-term rate of interest will increase the attractiveness of short-term securities. The holders of long-term securities will then sell their long-term securities for purchasing the short-dated securities. Thus the prices of the long-term securities will then fall. The commercial banks and other financial institutions also will then meet their demand for liquidity by selling the long-term securities. The falling prices of long-term securities indicate a rise in the yields. Thus, the long-term rates of interest will ultimately rise as a consequence of an increase in the short-term rate of interest. Similarly, if circumstances are such that the long-term rate of interest tends to rise, the short-rate will also tend to rise. If the short-rate did not rise in these circumstances, both borrowers and lenders would switch between the two markets. Some borrowers would now be tempted to borrow at short-term and not at long-term because of the low cost of borrowing ; on the other hand, lenders would wait for their bills to mature and then use the cash they received to buy long-term securities for the sake of higher income which could be earned now. There would, therefore, be a large number of bills coming to market

1. A. C. L. Day—Outline of Monetary Economics, P. 95.

in which the number of buyers would be relatively small. The effect of this phenomenon would be a fall in the price of bills—in other words, a rise in the short-term rate of interest.

Although we find that a rise in one rate of interest is likely to cause a similar rise in another rate of interest, the magnitude of this movement is not the same in the two cases. Generally, the short-term interest-rate is found to be more volatile than the long-term rate. The reason is that changes in the levels of interest-rates do not usually indicate that the whole pattern of interest rates is going to alter by the same amount. But, if the market expects that the factors leading to a rise in interest-rates are likely to be permanent, prices of long-term securities will then adjust themselves to this new level of expectation and the long-term rate of interest will move as much as the short. In fact, it is possible for long-term rates of interest to rise by amounts appreciably greater than short-term rates, if the level of expectation about a generally rising trend in all rates of interest is too high. Again, if both the borrowers and the lenders are indifferent between borrowing or lending short or long, if the costs in or returns from the two markets are the same, then the average level of both the short-term and the long-term rates over a long period of time will remain more or less the same. But we cannot expect that good number of borrowers and lenders will remain indifferent between the two markets when the costs or returns are the same. Generally we find that there are more potential short-term lenders than borrowers and more potential long-term borrowers than lenders, when the levels of the long-term and the short-term rates of interest are the same. As a result, the average level of long rates tends to be rather higher than the average level of the short-term rates.

Although the fact that different people in the market hold different opinions about the course of the rates that may be expected to prevail in the future, still it is true that the long rate is the outcome of the whole pattern of expectations of the members of the market as to the future short rates during the time long-term security has to run.[1] That the long rate is more stable than the

1. Lutz.—"The structure of Interest Rates." Quarterly Journal of Economics, 1940-41. Reprinted in Readings in Theory of Income Distribution.

short-term rate of interest is such a familiar fact as to require no statistical proof.

The long-rate can also move contrariwise to the short-rate for a temporary period. The long rate may actually fall while the short rate rises, provided "the market" thinks future short-rates will be below the short-rate from which the rise starts, and *vice versa*[1]. But this does not happen very often. Generally we find that the long-term rate of interest is either entirely unaffected by changes in the short-rate or else it moves very slightly in the same direction as the latter.[2]

The analysis of the relationship between long and short rates has a bearing on many problems, practical as well as theoretical. Prof. Lutz[3] deals with only four of these problems.

In the first place, it has been found that a change in the short-rate will bring about a change in the long-rate only if a general conviction is created that the short-rate will remain low for a considerable time. Therefore, the monetary authority has to create such a conviction if it wants to bring down the long-term rate and to induce more borrowing so that investment can be encouraged. As Keynes argues, "*Any* level of interest which is accepted with sufficient conviction as *likely* to be durable *will* be durable".[4]

Secondly, the decision of an entrepreneur to borrow capital is dependent on a comparison of the marginal efficiency of capital with the rate of interest. The rate of interest with which the marginal efficiency of capital is to be compared depends upon the expectations and convictions about the movements of the short-term and the long-term rates of interest, and these expectations and convictions are always different. Consequently, the entrepreneurs will base their action with regard to investment on different rates. There is, therefore, no such thing as "the" interest rate which governs the decisions of "the" entrepreneurs with regard to investment.

Thirdly, we find a wide gap between the short and the long-rates which may exert a considerable influence on the amount of new

1. See article of Lutz as referred to in "*Readings in the Theory of Income Distribution*. P. 521.
2. Ibid.
3. Ibid, P. 525.
4. Keynes General Theory. P. 203.

borrowing that is undertaken. If the long-rate is above the short, which implies an expectation that the long-term rate will rise, borrowers will take advantage of the situation and try to borrow long. The lenders, among them the banks, however, have an opposite interest since they prefer shorter maturities in the situation. It may, therefore, be very difficult to float long-term securities. One way out of this difficulty would be for the borrowers to shorten the maturities. That is why, in January 1940, the British Treasury did float a Conversion Loan with only three to five years to run.

Lastly, the above analysis shows that the relationship between interest rates on different maturities is determined mainly by the expectations as to the future course of interest rates. According to the "Liquidity theory of interest", it is the degree of liquidity of securities with different maturities which determines the relationship.[1] But still we find that the short-term rate can be *above* long-term rate, a fact which does not seem to fit in quite well with the liquidity theory of interest.

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4

THE QUANTITY THEORY OF MONEY

A national currency has internal and external value. By internal value of the national currency we mean the purchasing capacity of that currency in terms of domestic goods and services. In the hands of the classical economists an explanation of general prices was regarded as a special case of 'general' economics. The theory of money and general prices which is directly concerned with the money economy as a whole was not treated by the classical economists with that attention which it deserved. The classical economists explained the theory of individual prices in familiar terms of supply and demand. The theory of general prices was, however, explained in vague terms of the quantity of money, velocity of money, etc. As Keynes observes, the economists found themselves "sometimes one side of the moon and sometimes on the other without knowing what route or journey connects them"[1]. Keynesian theory of money and prices shows that "route" connecting individual and general prices. The microeconomics of individual prices has now been really a special case of the macroeconomic theory of output and employment.

The internal value of money represents general purchasing power power or command over goods in general. There have been, from time to time, different explanations of the value of money.

The quantity theory of money which seeks to determine the value of money was for a long time the core of monetary economics. and is regarded as much by some people even to-day.

The Quantity Theory of Money

The quantity theory of money postulates a causal relationship between a change in the quantity of money and a change in the prices of goods. We can state it as follows :

$$P = f(M)$$

Here, P stands for the level of prices (measured by an index) and M stands for the quantity of money. If M rises, P rises.

The simplest form of the Quantity Theory for the explanation of the value of money is to be found in the writings of as early as the sixteenth century. In its crude form it states that price-level

varies in direct proportion to the supply of money. This may be expressed as P=KM where M stands for the quantity of money, P for the general price-level and K for constant proportionality. If for example, K is 4, the supply of money is four times the price-level. The validity of this naive quantity formulation depends on the tacit assumption of full-employment when the velocity of money is stable and the volume of goods and services to be purchased with money remains constant.

The *velocity of money was neglected by the quantity theories* since they did not consider the "store-of-value" function of money which facilitates the speculative motive governing the demand for holding money. The quantity theorists were pre-occupied with what are known as "transactions" and "precautionary" motives for holding money.

Yet, Knut Wicksell pointed out as early as 1898 that ".....among the 'things' that have to be supposed to remain 'equal' are some of the flimsiest and most intangible factors in the whole of economics—in patricular the velocity of circulation of money...It is consequently impossible to decide *a priori* whether the quantity theory is in *actual fact* true—in other words, whether prices and the quantity of money more together in practice."[1]

The assertion of the quantity theory must, of course, be understood in terms of a comparative-static analysis.[2] The theory states that if, given an initial equilibrium position, there is a change in the quantity of money, other things being equal, prices in the new equilibrium situation will be correspondingly higher or lower.

Since the quantity theory postulates a causal relationship between the quantity of money and prices, it must show that an increase in the quantity of money necessarily leads to excess demand in all markets. It must explain the way in which a change in the quantity of money affects effective demand and thus leads to a general change in prices. So, if *there is any causal relationship between changes in the quantity of money and changes in the price level, the relationship can be only an indirect one.*

In the words of Wicksell, "A general rise in prices is, therefore, only conceivable on the supposition that the general demand has for

1. Wicksell—Interest and Prices. London 1936. P. 42.
2. Schneider—Money, Income and Employment. P. 167.

some reason become, or is expected to become greater than the supply. .....Any theory of money worthy of the name must be able to show how and why the monetary or pecuniary demand for goods exceeds or falls short of the supply of goods in given conditions."[1]

We should note that *an excess of demand over supply in all markets is only a necessary condition and not a sufficient condition for generating a rise in* prices. Whether and to what extent, prices rise in response to excess demand clearly depends on the price elasticity of the supply of goods. If we find unchanged supply of goods with rising prices, i.e., if the supply of goods is completely inelastic as under full emlpoyment, an increase in effective demand leads solely to an increase in prices. If we find an increase in the supply of goods with constant prices, i.e., if there is perfectly elastic supply of goods in a situation when there is unused capacity at all stages of production, a rise in effective demand leads to an increase in production and supply at unchanged prices. Again, when we find that supply of goods is more or less elastic, i.e., when we find an increase in supply of goods with rising prices, an increase in effective demand leads to a rise in output and a simultaneous increase in prices. Thus we find that the *effect of an increase in effective demand an price depends entirely on the initial position of the economy.*[2]

Now, we should consider how a change in the quantity of money leads to a change in effective demand. Whether or not a change in the quantity of money will influence effective demand depends simply in the propensities to consume and invest, and on liquidity preference, whether or not an increase in effective demand will lead to an increase in the prices depends mainly on the conditions of employment prevailing in the country when the increase in demand taken place.[3]

The quantity theory of money states that a change in the quantity of money causes a rise in effective demand and hence a rise in prices. The theory does not, however, allow for the reverse relationship, i.e., a change in effective demand may influence the quantity of money. This is definitely an important omission.[4] The higher equilibrium

2. Knut Wicksell—Lectures on Political Economy, Vol. II. P. 859-60.
1. Schneider—Money, Income and Employment, P. 169.
3. Ibid, P. 169-70.
4. Ibid.

level of income requires a larger quantity of money, i.e., the higher level of income resulting from increased consumption and increased investment can be financed only if the banking system makes available a larger quantity of money for transactions purposes. In this case, the banking system has a passive role. The reason for the increase in the quantity of money is an increase in effective demand; the banking system in this case merely adjusts the quantity of money to what is required at the higher level of income. Here the causal relationship is first the reverse of that laid down in the quantity theory.

Again, in case the quantity of money is constant, effective demand and income can rise, but this may require a rise in the interest rate.

Quantity Equation

The quantity theory as explained above must not be identified with the equation of exchange. In terms of the *income-flow equation of exchange* we can express income velocity of circulation of money, v, as

$$\frac{Y}{M} = v \quad \ldots \qquad (2)$$

Here Y stands for national income, M stands for quantity of money, and v stands for the income velocity of circulation of money. We can ascertain the value of v if Y and M are known. Money income y, in a given period is, by definition, equal to the product of the real income, Y_r of the period and the price of the components of the real income as measured by a price index P. Therefore,

$$Y = Y_r \,.\, P. \quad \ldots \quad \ldots \quad (3)$$

we can now rewrite the equation No. (2)

$$\frac{Y_r \,.\, p}{M} = v \qquad (4)$$

$$\text{or,} \quad Y_r \,.\, p = M \,.\, v \quad \ldots \quad \ldots \quad (5)$$

This relation represents an identity which is always fulfilled, and is simply the definitional equation for the income velocity of circulation. This equation does not assert any causal relationship between a change in M and a change in p though the crude quantity theory assumed a causal relationship between the two. Income velocity of circulation of money can remain constant only when national income doubles as a result of doubling of the quantity of money. This is quite

unlikely in practice. As we have already stated, the national income is determined by the propensity to consume, the propensity to invest and liquidity preference. The income velocity of circulation of money is not an institutionally defined constant. Thus this equation gives stress on the static relation between the general price level and national income.

Is the Law of J. B. Say consistent with Quantity Theory ?—Don Patinkin has argued that Say's Law and the quantity theory are inconsistent, and that an economic model which includes them both is untenable. In short, the classical theory, which tried to include them both, committed a grave logical error. Patinkin points out that Say's Law depends on the proposition that goods are produced to exchange for other goods ; the quantities of other goods that can be received in exchange are what induces the producers to produce. That is, the supply and demand for each real commodity depend only on relative prices—what each commodity will buy of each other commodity. Assuming that goods are sold for money, the supply schedule for each good can be thought of as constituting a demand schedule for money. In the same manner, the demand schedule for each goods constitutes a supply schedule for money. Thus, at each possible (relative) price for each good, there will be either an excess supply of the good (*i.e.*, a net supply of money), an excess demand for the good (*i.e.* a net demand for money), or at one particular relative price, an exact balance of supply and demand (*i.e.*, neither a net supply of money nor a net demand for money). All these elements depend on relative prices and following Say, we should argue that aggregate net demand for money depends on relative prices. But the quantity theory points out that the demand for money depends on absolute prices and not on relative prices. The two, *i.e.*, Say's Law and Quantity Theory, are "obviously" inconsistent. It should also be noted that while the demand for money schedule implied by the supply and demand schedules for individual goods is expressed in flow terms, in the quantity theory demand is expressed in stock terms.

It has been argued that Patinkin has failed here to distinguish

1. Ackley—Macroeconomic Theory (Macmillan, 1961, P 121).
2. Ibid, P. 122.
3. Ibid P. 123.

between the implications of the two functions of money—as a unit of account, and as a medium of exchange. As a unit of account, absolute money prices have no relevance in a full-employment economy. "To recognise that money does have to calculate as a medium of exchange and to recognise that its quantity must be related to the price level is not to violate the assumption that money is not wanted for its own sake."

Following Oscar Lange,[1] Say's identity may be defined as follows : regardless of the prices and interest, individuals always plan to use all of their proceeds from the sale of commodities and bonds for the purpose of purchaing other commodities and bonds. To put in it another way, the individuals do never change the amount of money they hold ; its amount of excess demand is identically zero. Or, the aggregate value of the amounts of excess supply of commodities must always equal the value of the amount of demand for bonds ; individuals divert any reduced expenditures on commodities to the purchase of bonds, never to the building up of money balances. This assumption implies that equilibrium money prices are indeterminate. Thus, Say's identity is inconistent with the existence of a money economy with determinate prices.[2]

Fisher's Quantity Equation

Prof. Fisher's *transaction equation of exchange* is an improvement upon the crude exchange equation P=KM. The transaction equation of Fisher is generally expressed as $MV=PT$.

According to this theory, money supply has got a direct and proportional relationship with the general price level. M stands for the supply of money, V stands for velocity of money, P stands for the general price level and T stands for the number of transactions in a year. When V and T are constant, an increase in the quantity of of money, according to this version, leads to a proportional increase in the general price level. PT represents "transactions demand". That is to say, PT indicates that the individual holds cash only to make necessary transactions.

The equation that MV is equal to PT is *a truism* in the sense that the total amount of money paid by buyers (MV) equals the total

1. Oscar Lange—"Say's Law : A Restatement and criticism."—Studies in Mathematical Economics and Econometrics, (Chicago, 1942),
2. Patinkin—Money, Interest and Prices, Chapter VIII.

amount of money received by sellers (PT). So, the quantity theory of Fisher is an identity *i.e.*, a statement of a situation which is necessarily true, because of the way in which the terms used in it have been defined. *MV is aggregate expenditure* (quantity of money times its velocity) and *PT is aggregate receipt* (the volume of trade times the average price). It is a logical necessity that the aggregate receipt will be equal to aggregate expenditure.

In using this formulation for explaining causal relationship between the supply of money and the general price level, Fisher assumes 'V' to be constant and pays relatively little attention to changes in 'T'. The theory assumes that in a situation where we find inelastic supply of goods, *i.e.*, productive capacity is fully employed, an increase in the supply of money increases the purchasing power of the individuals who receive that increased amount of money and the increased purchasing power raises the demand in general for goods. The result is an increase in general price level to the extent to which there has been an increase in the quantity of money. If there would not be full employment, an increase in the supply of money would lead to further utilisation of hitherto unutilised resources and would raise the level of output thus neutralising the rising tendency of the price level. But, once the full employment has been attained, an increase in the quantity of money cannot raise the level of output further and it raises the price level corresponding to its own increase. This can be explained by the following figure.

In this figure, OX axis indicates the level of output and OY axis indicates the supply of money. With an increase in the supply of money, the level of output increases since in the absence of full employment, the unutilised resources have been utilised. The increase in output has been maximum at the point O' where full employment has been secured. Any further increase in the quantity of money along the O'Y' axis after full employment has been attained simply raises the price level to the corresponding extent.

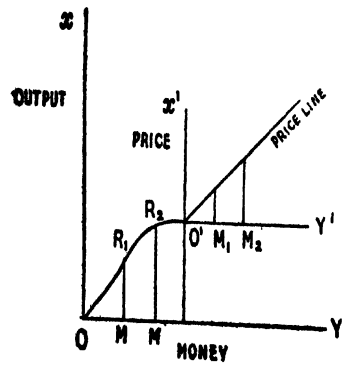

Fig. 19

That is why, the price line in the above diagram has created a 45° angle at the point o', when money supply increases from $O'M_1$ to M_2.

From this explanation, we come to the conclusion that in times of full employment, the quantity theory comes to its own although it is highly over-simplified in other respects.

Criticisms of the cash transaction equation

As has already been pointed out, Fisher's equation is a truism since PT (aggregate receipt) will be always equal to MV (aggregate expenditure).

One of the main over-simplifications of the cash transaction equation is that it ignores the speculative demand to hold money. Because of the speculative demand to hold money, the quantity of money changes without corresponding changes in the level of money income, or the money income may change without corresponding changes in the quantity of money, and the quantity theory of money ignores this phenomenon. Again, the ignorance of the speculative demand means that the relationship between the theories of the rate of interest and of the level of income through the demand for money has not been considered.

Secondly, another weakness of the traditional quantity theory of money is that it does not give adequate emphasis on the functional relationship between effective demand for goods and services and the national income. The theory assumes that effective demand varies closely with the quantity of money. But this is not necessarily true. The theory states that an increase in the quantity of money raises the effective demand and hence a rise in prices. The theory overlooks the fact that a change in effective demand may also influence the quantity of money. A higher level of income stimulated by increased consumption and increased investment can be financed only if the banking system adjusts the quantity of money to what is required at the higher level of income. National income being increased, excess effective demand is generated. National Income is dependent upon the propensity to consume, propensity to invest and the liquidity preference. Simply, an increase in quantity of money cannot lead to an increase in national income. So, effective demand need not necessarily rise when the central bank deliberately increases the quantity of money. The level of effective demand varies closely

with the level of income and not with the quantity of money. The value of money is a consequence of the total of incomes and not of the total quantity of money. Again the quantity theory also pays inadequate attention to the fact that the price level does not necessarily change in proportion to changes in effective demand.

Thirdly, Keynes in his 'Treatise on Money' points out that Fisher's 'price level' has no real significance. The first difficulty is what sort of average is 'P' and the second difficulty is what sort of aggregate is 'T'.

Fisher would say, Keynes thinks, that in order to get this average, proper weights should be given according to total amount of cash transactions. This average is neither Arithmetic nor Geometric average but the average determined by cash transactions. The amount of money that is spent (M V) is taken to be a basic factor for determining T and after determining PT, the amount of money which is spent is determined. There is, thus, a good deal of circular argument in Fisher's equation. There is no simple method of calculating P and T. This is an artificial aggregate. P is similarly an artificial average. 'P' is a hotch-potch price level. Broadly speaking, the quantity theory can state why an increase in money supply does lead to an increase in the general price level ; but it cannot state how it works. One of the basic objections to the quantity equation is that it cannot actually measure the purchasing power of money. By purchasing power of money we refer to transactions relating to the purchase of goods and services for the purpose of consumption, and this type of transactions is only a part of the aggregate transactions included in Fisher's equation.

Fourthly, income velocity of circulation of money has been assumed to be an institutionally given constant, and output has been assumed to be given at the full employment level. It is not proper to assume income velocity of circulation of money to be a constant element. The velocity of circulation of money, or 'V' of the equation, is the average number of money transfers among individual spenders during a given period of time. It includes monetary expenditures for all transactions. Velocity depends upon consumers' spending habits, practices with regard to the frequency of income disbursements, banking practices, and the general psychology. Income velocity of circulation of money can remain constant only when

national income doubles as a result of doubling of the quantity of money. This is quite unlikely in practice. With increase in ability to invest savings, velocity tends to fall. This ability again depends on expectations of profit in business, investment opportunities, interest rate, fiscal policy and many other factors. These elements are never constant. They vary with cyclical fluctuations in the level of income, output, employment and prices.

Fifthly, as Keynes points out in his "General theory", the quantity theory of money is artificially divorced from the general theory of value.[1]

The effect of changes in the quantity of money on prices is not direct and proportional as the older quantity theory would assume. Instead, we find "many a slip, twixt the cup and the lip." First, there is the relation between money and aggregate demand. Then there is the effect of changes in aggregate demand on output on the one hand and on prices on the other. Here we encounter elasticities of supply price at different levels of output. But this is not the whole thing. Account must also be taken of changes in wage rates, whether induced by changes in demand or autonomously determined by trade-union action and collective bargaining. The principal difficulty with the quantity theory is that it takes no consideration of the saving process. It cannot also explain why cyclical fluctuations in business take place. While the quantity theory gives emphasis on the behaviour of the Central Bank (which behaviour expresses itself in the quantity of money), the modern theory of money and prices formulated by Keynes gives emphasis on the behaviour of the community. For Keynesian Revolution, the theory of money and theory of value have become integrated into one theory. The changes in the general price level can be explained in terms of changes in wage rates (or, more comprehensively *factor cost*) and changes in the scale of output ; but these in turn are affected by changes in demand.

Lastly, the assumption of full employment for showing the validity of the theory itself is an over simplification. The total volume of spending remains proportional to total supply of money only in a full employment economy and in that economy general price level also

1. Keynes—General theory of Employment, Interest and Money p.p. 292—93.

remains proportional to the total volume of spending. But that is an over simplification of what actually is.

Thus, we find that the traditional quantity theory of money is highly oversimplified since it does not at all consider many factors which definitely play vital parts in initiating changes in the general price-level. But, we should remember that under high inflationary pressure and full employment, it comes to its own. At less than full employment, an increase in the supply of money may lead to fuller utilisation of unemployed or under-employed resources. So in that circumstance, both consumer goods and capital goods can be produced without general price increases. But once full employment is reached, any attempt to increase output of consumer goods involves the bidding up of factor prices, and a further increase in aggregate demand leads to a further increase in the general price-level instead of increasing the level of output (see Fig. 19). This results in an inflation and the quantity theory of money comes to its own in that situation.

An appraisal of the analysis given above establishes the fact that the quantity theory still remains as an inadequate guide to understanding of the reasons for price changes. "The most important conclusion we can derive from it is that big rises in the level of real or of money income are not possible unless there are more or less equal rises in the quantity of money; an inflation can always be brought to an end if the supply of money is limited. This is an important fact, but it is only a small part of the theory of inflation."[1]

The Cash-Balance Equation of Exchange

The cash-balance equation of exchange or "Cambridge" equation was developed by Marshall, Pigou, Robertson and Keynes. The Cambridge economists seek to analyse the causes why the people wish to hold the quantity of money they actually choose to hold and their analysis centres on the demand for money as the strategic explanatory variable. This equation states that total cash balances are equal to real national income over whose purchases cash balances are held in a given period. It can be stated as $M = PKT$, where M

1. A. C. L. Day—Outline of Monetary Economics, (Macmillan 1952) P. 252.
2. Ackley—Macroeconomic Theory (Macmillan, 1961) P. 123.
3. Keneth K. Kurihara,—Monetary Theory and Public Policy. P. 24.

stands for total cash balances including demand deposits ; K for the average length of time for which cash balances are held idle against total expenditure, or in other words, K simply represents the proportion of their annual income which residents of that country wish to hold in the form of money ; T stands for real national income and P for the average unit of price of T. Where the velocity of circulation of money is high, K is small, and *vice versa*. Thus K indicates the demand for money as a store of value. The Cambridge equation of exchange can also be stated as follows :—

$$M = KY$$

In this equation, M represents the quantity of money in existence in the country and Y represents the level of national income *i.e.*, the total of money incomes received by residents of the country. The symbol K simply represents the proportion of their annual income which residents of that country wish to hold in the form of money. The usefulness of the Cambridge version lies in that it can explain to some extent both short-run and long-run changes in the level of money income. In the short-run, there might be fluctuations in the level of income as a result of changes in the expectations of profit in business, and consequently in the changes in people's desire to hold money. In the long run, changes in the level of money income would be closely connected with changes in the quantity of total cash balances. But the Cambridge equation could not separate price changes and the changes in the level of output from the changes in the level of money income satisfactorily.

It has often been alleged that the "cash-balance" equation is merely the quantity theory in new algebraic dress. But Prof. Hansen[1] does not accept this view. He contends that in Cambridge version, sudden and rapid *shifts* in the desire of the public to hold money may profoundly affect prices even though the monetary authority successfully maintains a high stability in money supply. In the Marshallian analysis a shift in *K* may start an upward or downward movement. It is *K*, not *M*, that holds the stage.

The Cambridge equation also is highly over-simplified in not considering the speculative demand to hold money. It ignores one of the main causes why the total cash balance may change without corresponding changes in the level of money income or why money

1. Hansen—Monetary Theory and Fiscal Policy, P. 50.

income may change without corresponding changes in the total cash balance. Moreover, the ignorance of the speculative demand does not furnish any linkage between the theories of the rate of interest and of the level of income through the demand for money. This equation cannot also furnish a satisfactory explanation of the effects of variations in effective demand on the general price-level. Moreover, it further ignores the fact that the relationship between the changes in effective demand and the changes in the general price level is not proportional.

Inspite of these shortcomings, the cash-balance approach to the general price level is a definite improvement upon the cash-transaction approach. While the cash-transaction equation gives emphasis on the supply of money, the cash-balance approach brings to the fore the demand for holding money. The cash-balance approach partially links itself up with the general value theory, since it explains the value of money in terms of demand for and supply of money. This theory is also partially responsible for giving rise to the famous liquidity preference theory. But, "although the Cambridge version of the quantity theory represented a big advance on the Fisher version, it is not in itself an adequate monetary theory. Its weakness is that it is too simple to deal adequately with the complexities of the economic system."[1]

Keynes, who had once developed the cash-balance equation, later on abandoned that theory in the context of his general theory of employment. Keynesian theory of general price-level concentrates attention upon the *behaviour of the community.* Changes in the price level can, in the first instance, be explained in terms of changes in wage rates (or, more comprehensively, *factor cost)* and of changes in the scale of output ; but these in turn are affected by changes in output. In this analysis the relevant elasticities of prices in response to changes in aggregate demand, and the elasticity of aggregate demand in response to changes in the quantity of money should be taken into consideration.

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1. Schneider—Money Income and Employment.
2. Hart—Money, Debt and Economic Activity.

1. A. C. L. Day—Outline of Monetary Economics (Macmillan, 1957) P. 251.

3. Keynes—A Treatise on Money, vol. I.
4. Kurihara—Monetary Theory and Public Policy.
5. Crowther—An Outline of Money.
6. A. C.L. Day,—Outline of Monetary Economics.
7. The Quarterly Journal of Economics—1938 ; Article of Ellis on "Some Fundamentals in the theory of velocity". Reprinted in "Readings in the Monetary Theory".
8. Ackley—Macroeconomics Theory.
9. Patinkin—Money, Interest and Prices.
10. Marget—Theory of Prices.
11. Hansen—Monetary Theory and Fiscal Policy.

APPENDIX—I

AN APPRAISAL OF THE NEOCLASSICAL MONETARY THEORY[1]

Let us now, following Patinkin, take an appraisal of the neo-classical monetary theory. The term "neo-classical" is used in this context by Patinkin as a designation for that school of thought which organised monetary theory around a transactions or cash-balance type of equation, and which then used these equations to establish the classical quantity theory of money on a sound footing.

The cash-balance version of the neo-classical monetary theory is associated with the names of Marshall, Walras, Wicksell and Pigou. This version assumed that individuals wish to hold a certain proportion, K, of the real volume of their planned transactions, T, in the form of real money balances. The demand for these balances thus equals KT. Correspondingly, the demand for nominal money balances is KPT, where P stands for the price level of the commodities transaction. The equating of this demand to the supply of M, then produced the famous Cambridge equation, $M=KPT$. In the transactions version, the velocity of circulation, V, replaced its reciprocal K, to produce the equation of exchange, $MV=PT$.

The neo-classical thesis in this regard was :

(i) an increase in money supply leads to a change in the optimum

1. This is based on Patinkin's "A Critique of Neo-Calssical Monetary Theory" in his book, "Money, Interest and Prices."

relation between the level of money balances and the individual's expenditures. (ii) This change generates an increase in the planned volume of individual's expenditures (real-balance effect), and (iii) this increase pushes up the price level until it has risen in the same proportion as the amount of money.[1]

None of the earlier versions of the quantity theory recognised the real-balance effect in the fullest sense of the term. These versions more or less directly connected the increased *outflow* of money expenditures with increased *inflow* of money receipts. Again, the neo-classical equations suffer from the obvious limitation that they practically assign no specific role to the rate of interest. They fail to validate the classical proposition that a change in the supply of money leaves the rate of interest unaffected. Moreover, the Cambridge equation fails to provide a systematic dynamic analysis of the way in which the monetary increase generated real-balance effects in the commodity markets which shift the economy from its original equilibrium position to a new one. It is precisely this dynamic analysis which was not integrated into the Cambridge Cash-balance approach of Marshall, Pigou, Keynes and Robertson, with its deliberate emphasis on the money market. Thus, in its analysis of the inflationary impact of a monetary increase, the Cambridge theory was actually less illumed by the spark of 'volition' and individual behaviour than the Fisherine transactions theory whose "mechanicalism it was designed to correct."[2]

Another proposition of the neo-classical Cash-balance approach is that the demand for paper money has "uniform unitary elasticity." In Pigou's words, "an increase in the supply of legal tender ought always, since the elasticity of demand (for legal tender) is equal to unity, to raise prices in the proportion in which the supply has increased."[3]

Patinkin challenges this argument. According to him, the real balance effect makes it impossible for the demand for money to be of uniform unitary elasticity ; but an increase in the amount of money may, nevertheless, cause a proportionate increase in prices.[4]

1. Patinkin—Money, Interest and Prices (1957) P. 97.
2. Ibid—P. P. 100-101.
3. Pigou—Essays in Applied Economics, (1923). P. 195.
4. Ibid. P. 103.

Let us now examine the effects of a change in the quantity of money in terms of the *real* quantity of money. Once the nominal quantity of money is fixed, its real value varies in inverse proportion to the absolute price level. We can proceed as follows :

In the initial equilibrium position, the real quantity of money is just at that level which satisfies its transactions and precautionary requirements. A sudden increase in the nominal quantity of money enhances the real quantity above their equilibrium value thus setting an inflationary pressure into operation. The inflationary pressure again in its turn has a depressing impact upon the real quantity and it thus lessens the disequilibrating price rise itself. The economy cannot achieve a new equilibrium position until the absolute price level has increased sufficiently to reduce the real quantity of money to its initial level once again. The pricing process of the exchange economy may be divided into successive stages, viz., the real framework and the monetary framework. The real sector may be described by the excess-demand functions for commodities, and the monetary sector may be described by the excess-demand function for money. The former functions depend on relative prices while the latter depends on both relative prices and absolute price level. The fact that the demand functions in the real sector are inelastic to changes in the absolute price level has been referred to by Leontief as the "homogeneity postulate",[1] and it is said to denote absense of "money illusion."

But this dichotomy is unreal. The "homogeneity postulate" implies that the behaviour of the household in commodity markets is unaffected by the real value of its money balances. But empirical evidences in post-war years have established the fact that consumers' behaviour has actually been affected by their accumulated liquid assets. Reality shows that there cannot be a money economy without a "money illusion." Again, this dichotomy is involved in a basic internal contradiction. For, if the demand functions of the real sector have the property the dichotomy attributes to them, there cannot then be a second stage in which the absolute price level is determined. We can conclude that once the real and the monetary

1. Leontief's article "The Fundamental Assumption of Mr. Keynes' monetary Theory of unemployment. Q. J. I. 1936-37.

data of the economy have been determined, the equilibrium values of relative prices, the rate of interest, and the absolute price level are simultaneously determined by all the markets of the economy. It is not possible to isolate a subset of markets which are supposed to determine the equilibrium values of a subset of prices. In the *true* spirit of general equilibrium, "everything depends on everything else."

Let us now study the effects of a change in K (or inversely V of the equation of exchange, MV=PT). The classical notion was that an increase in K (or a decrease in V) would cause a decrease in P but leave T and the rate of interest unaffected. But the neo-classical theory points out that an increase in K creates automatic market forces which themselves generate the increased equilibrium amount of real balances desired by the community. An increase in K implies increase in individual's liquidity preference which, the supply of money being given, leads to an increase in the rate of interest. Increase in the rate of interest affects investment ; thus income is also affected and it affects T.

An increase in T leads to excess supplies in the commodity markets and a downward pressure on prices. But this change in P is not, in general, a proportionate one. In terms of the Cambridge equation the contention is that P and T are not independent ; that a change in T will affect K. An increase in T reduces K. Hence M=KPT can continue to be satisfied even though P does not change in inverse proportion to T.

Reference : Patinkin—Money, Interest and Prices.

APPENDIX—II

THE LIQUIDITY THEORY OF MONEY

The liquidity theory of money is of recent origin, The theory states that the causal relations existing between money and the volume of business activity or the general price level cannot be explained under modern conditions either by the quantity theory or by the so-called income theory of money. It is neither income nor the volume of money but *liquidity* which is the basic concept linking general business activity with monetary conditions.

The liquidity theory of money takes into account a wide concept of liquidity and rejects that narrow interpretation of liquidity which treats it simply to be the mere cash liquidity of banks. Otto Viet, the German economist, has proposed a concept of business liquidity which includes "accounts receivable, credits available, stocks in trade and other business and financial assets easily saleable." The overall liquidity position which is related to the spending and investment decisions of business people includes not only cash and stocks in trade but also potential credit lines from banks and other sources of money. The main feature of this new doctrine is *a shift from quantity or supply of money to the liquidity position of business as the main determinant of aggregate demand.*[1]

The exponents of the theory claim that this theory creates a new horizon in the application of monetary policy as a stabilization instrument. The aim of monetary policy is shown to be not the regulation of the supply of money but the control of the general liquidity position of business and of banks. For the purpose of monetary policy, what is important is not the study of the price index or ex-post statistics of the volume of money but an assessment of the general liquidity position, the general status of business confidence, profit expectations, hopes and moods etc."[2]

In Great Britain the report of the recent Radcliffe Committee has referred to the liquidity theory of money. The Radcliffe doctrine

1. Presidential address of Dr. S. K. Basu to the Forty-sixth All-India Economic Conference, Bombay. Reprinted in the Indian Economic Journal. Vol, XI, No. 3.

2. G. Schmolders, *Kyklos*, Vol. 13, 1960.

has contributed much to the rehabilitation of the monetary policy as an effective instrument for stabilishing the economy. The Radcliffe doctrine sterns from the hypothesis that both investment and consumption expenditures are interest-inelastic. Though the direct incentive effect of a change in the interest rate is small, there may take place what we may call a "*valuation effect.*" Changes in the interest rate may affect the capital value of the assets of the financial institutions and thus their balance sheets and thence their ability to lend. This is the effect which seems to have particularly influenced the well-known Radcliffe thesis: "A rise in rates makes some less willing to lend because capital values have fallen and others because their own interests are sticky. A fall in rates, on the other hand, strengthens balance sheets and encourages leaders to seek new business."

The real force of interest rate thus lies in its effects on the liquidity of the various groups of financial institutions which, in their turn, influence the liquidity of others. The economical factor in spending decisions is, therefore, liquidity in the wider sense, and not an immediate access to me. It is the structure of liquidity and not the quantity of money, which is the major determinant of the stream of aggregate effective demand. In the opinion of the Radcliffe Committee, the "center piece" of monetry action in the circumstances is not the supply of money, but the state of liquidity of the whole economy or else the structure of interest rates. Debt management policy is the principal channel through which the level and the structure of the interest rates have to be affected.

The Radcliffe approach deviates from the traditional approach which draws a sharp line of distinction between banks as creators of loanable funds, and non-banking financial intermediaries as brokers of loanable funds. The Radcliffe analysis draws our attention to the growth of the non-banking financial intermediaries and the problems that have been posed for monetary policy as a consequence.[1]

1. We have discussed in Chapter 6 the Gurley-Shaw Thesis and Aschheim's views regarding the effectiveness of monetary policy in the context of the growth of N. F. I.

References :

1. Report of the Radcliffe Committee.
2. Kaldor's article, "Radcliffe Report" in Review of Economics and Statistics, Feb. 1963. Dr. S. K. Basu.
3. Presidential Address to the All-India Economic Conference, Bombay, 1963, Reprinted in the Indian Economic Journal, March, 1964.
4. Alak Ghosh—Non-banking Financial Intermediaries and Monetary Policy in a Developing Economy.

APPENDIX—III

Money-Creation Multiplier

Money-creation multiplier deals with the relationships between the creation of money by a bank and the subsequent creation of credit on an expanding scale. The existence of this relationship follows from the fact that the means of payment are themselves claims.

(a) Creation of money on the basis of prior credit creation.
(b) Creation of money without prior credit creation.
(c) Money creation and simultaneous credit creation.
(d) Credit creation without money creation.

If each bank, independently, is to be able to create money as it likes, two conditions must be fulfilled :

(a) Credit granted to customers must never be in the form of cash ; (b) the banks must move in step. A single bank alone can never create money *ad libitum*. The "principle of movement in step" is derived from the assumption that all payments are made without using cash, and is valid only on this assumption. A commercial bank creates money by acquiring assets from economic subjects and paying for them with claims on itself which constitute money. Any cash which flows out of the banking system in the course of credit creation returns to it, and each bank is able to lend up to the limits of the increase in its lending potential. The multiple expansion of commercial bank money occurs on the basis of these assumptions.

Central Bank money can be created only by the central bank while commercial bank money only by the commercial banks. In a closed economy there are no limits to the central bank's power to create money, except such limits as the bank may set itself, or as may be prescribed for it by law.

The money-creation multiplier can be stated as follows :

Let ΔZ denote the excess reserves of the banking system, and r the minimum legal reserve ratio against current accounts. If we assume that there are no permanent leakages of cash from the banking system in the course of credit expansion, the banking system as a whole can, without recourse to the central bank, create new credit in the course of the multiple expansion of deposits to an amount ΔK_r, which is given by the equation :

$$\Delta K_r = \frac{\Delta Z}{r},$$

Given r and ΔZ, this equation gives the limit to which the banking system can actively create deposits. The equation shows that this limit depends on ΔZ, *i.e.*, on the excess reserves of the banking system, and on r, *i.e.*, the minimum legal reserve ratio, ΔK_r is directly proportional to ΔZ and inversely proportional to r.

Barring recourse to the central bank, an individual bank which has excess reserves of ΔZ can grant new credit only up to the amount of its excess reserves. The banking system as a whole can grant new credit up to an amount several times the size of ΔZ. On our assumptions the "money-creation multiplier" or "money-creation co-efficient" is equal to the reciprocal of the minimum reserve ratio.

Payments into the commercial banking system from the non-banking sector lead to the creation of commercial bank deposits, and payments into the non-banking sector from the commercial banks lead to the destruction of commercial bank deposits.

So far we have assumed that any cash which leaked out of the banking system in the course of credit extension returned to it. Let us now drop this assumption. Let us now assume that the non-banking sector wishes to increase its holdings of central bank notes in the course of a credit expansion. In this case there is a permanent leakage of cash from the banking system which puts

a brake on the amount of new credit extension by the banking system. This is shown below. Let ΔZ denote the excess reserves of the banking system, r the minimum reserve ratio $(o \angle r \angle 1)$ and c the fraction of new credits which debtors withdraw in notes and which remains in the non-banking sector $(o \angle c \angle 1)$. On these assumptions the limit to the expansion of credit by the banking system, ΔK_r, is given by

$$\Delta K_r = \frac{\Delta Z}{1-(1-r).(1-c)}.$$

or, $$\Delta K_r = \frac{\Delta Z}{r+c(1-r)}$$

This being the limit to credit expansion, we can modify it if we take into account an additional amount of cash $\Delta Z'$ which is the permanent drain of cash from the non-banking sector. The commercial banks acquire cash from the non-banking sector and in return incur current liabilities to the non-banking sector. The banks incur new current liabilities of $\Delta Z'$ in the course of passive deposit creation, against which they must keep minimum reserves of $r.\Delta Z'$. The ammount of cash which can serve as a basis for credit expansion is only $\Delta Z = (1-r).\Delta Z'$, so that the limit to credit expansion is now given by the equation :

$$\Delta K_r = \frac{(1-r).\Delta Z'}{r+c(1-r)}.$$

This modification does not alter the conclusions we drew from the earlier equation.

The money-creation multiplier can be stated in the following way :

$$\frac{1}{r+c(1-r)}$$

Given c, the multiplier declines with rising r, and given r, the multiplier declines with rising c.

A commercial bank requires central bank money to make payments resulting from its passive transactions. The fact that, in the course of its active and passive transactions the bank has to make payments in central bank money, *i.e.*, in a form of money,

which it cannot create, gives rise to a liquidity problem for the bank, both as regards its ability to meet current liabilities and as regards its ability to extend new credit.

In a mixed-money system, the limit to potential credit expansion by the banking system, barring recourse to the central bank, is determined solely by the size of excess reserves, by the minimum reserve ratio, and the payment habits in the non-banking sector expressed by the size of c in the above equation.

Reference :

Schneider—Money, Income and Employment.

5

THE THEORY OF INFLATION

A review of economists' writings during the First World War on the subject of inflation most of which would deal with the questions of inflation from the point of view of the stock of currency, the state of the security markets, and the level of interest rates, is enough to convince one that there has been a revolution in the subject of inflation economics. It is not possible to find an analysis during that period in terms of anticipated expenditures and available goods at a given price level. While the traditional explanation of inflation runs in terms of changes in the amount of money in circulation and changes in the stock of gold, the modern concepts of inflation are either *cost-push* or *demand-pull* inflation. The income-expenditure approach to inflation has replaced the quantity theory type of inflation. An increase in the quantity of money will not induce a rise in the general price-level if the effective demand generated by the increased money supply leads to an increase in the level of output and employment by putting the hitherto unemployed resources into use. If the effective demand continues to rise even after full employment has been realised, the general price-level will rise. Inflation is essentially a problem of excess demand situation. Let us analyse the nature of excess demand inflation and cost-push inflation.

The nature of inflation, as has already been pointed out, can be explained with reference to demand-pull and cost-push influences. Dynamic disequilibrium process as inflation is, it implies a steady increase in the price level over time due to these influences.

Excess demand Inflation.—Let us suppose that the fulll-employment level of output remains fixed at Y_0. General equilibrium is established at Y_0 and i_0 with price level P_0. An increase in the price level may now come about as a result of an increase in aggregate demand, which shifts the IS schedule to IS_1 ; the resulting

1. Dernburg & Mc Dougall—Macroeconomics (Mc Graw Hill 1960) Pages—203-204.

excess demand of $y_1 - y_0$ leads to a bidding up of prices so that the real value of the money supply shrinks and the LMP_0 schedule shifts

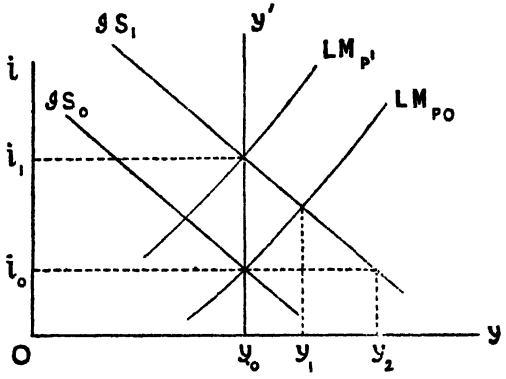

Fig. 20

to LMP', where general equilibrium is again established at the higher interest rate i_1 and higher price level P'.

Inflation is a dynamic disequilibrium process. It implies a steady increase in the price level over time. Thus excess-demand inflation implies that the IS and/or the LM schedules continue to shift upward over time so that excess demand for goods and services is perpetuated and general equilibrium is never established.

In the long run excess-demand inflation comes to an end if it is not nurtured by an expanding money supply. A too high rate of interest may make the demand for money inelastic with respect to the rate of inttrest. At this point there are no more speculative balances to be held ; all funds are then used for transaction purposes, and further increases in aggregate demand can then be financed only by a reduction in expenditure elsewhere in the economy or by an increase in the transactions velocity of money. Wartime financing provides a good example of the ingredients of excess-demand inflation,

Although inflation from excess demand may occur during a long investment boom, surely the important cases of demand inflation are the outcome of increased government expenditures, especially those associated with war or war preparations. Government programme of heavy investment in "social capital" particularly in a developing country seeking rapid economic development also creates strong inflationary pressure.

Cost-Push Inflation—Cost inflation has often been described as stemming from labour union pressure on wage rates. It is wage-cost inflation. We often find cost-push chase of wages after prices and prices after wages. Let us consider the IS−LM curves of the following figure.

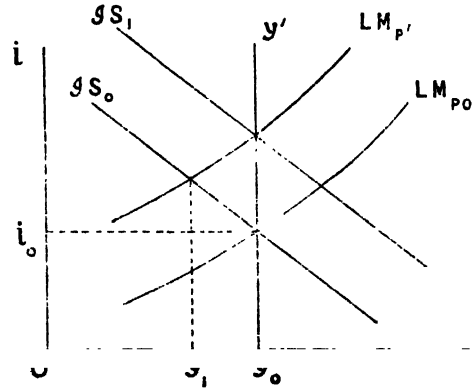

Fig. 21

General Equilibrium prevails at Y_0, i_0 and P_0. A price increase instigated autonomously by monopolistic business groups or as the result of wage pressure raises the price level to P′ and thus shifts LMP. schedule to LMP′. But at the new equilibrium between the IS and LM functions the level of output is below the full-employment level, and thus there will be pressure on wages and prices to return to their former level. It looks, then, as if a general wage-price increase will create a situation in which all the higher priced output will not be purchased, and this implies that cost-push inflation is not likely to be self-sustaining. Rising wage rates are not exclusively the product of an excess demand for labour.[1]

If we examine the nature of inflation, we find that it is a process of rising prices initiated by some changes which make it impossible to satisfy the whole of the demand that is forthcoming at the existing prices, and it is also propagated by the reactions of transactors to the initial rise in price so that further price rises are induced. But we should also remember that inflation is not necessarily a process of rising prices under all circumstances. This will be evident when a microeconomic analysis of repressed or

1. Ackley—Macroeconomic Theory (Macmillan 1961) P. 440.

'suppressed' inflation will be undertaken. A fully 'suppressed' inflation does not involve any price rise. It exists when government seeks to avoid the bad effects of inflationary pressures by interfering directly with the working of the price system through controls.

Machlup's analysis of demand-pull and cost-Push Inflation.

Prof. Machlup[1] describes two basic model sequences of consumer-price inflation as follows :

(A) **Demand-Pull Inflation :** Automatic expansions of demand (government spending, business spending, consumer spending) are followed by responsive (competitive) price and wage increases.

(B) **Cost-Push Inflation :** Aggressive increases of wage rates and/or material prices are followed by induced and/or supportive (compensatory) demand expansions.

Cost-Push models are relatively simple as long as they contain only a single impulse—either wage or price increases—with all sequential changes in the nature of adjustments.

(B—1) **"Pure" wage-push inflation :** Aggressive increases of wage rates are followed by induced and/or supportive demand expansions, and by responsive increases of material prices and other wage rates.

(B—2) **"Pure" price-push inflation :** Aggressive increases of material prices are followed by induced and/or supportive demand expansions, and by responsive increases of other material prices and wage rates.

Prof. Machlup[2] has mentioned three kinds of demand expansion : autonomous, induced, and supportive. Three kinds of cost increase : responsive, defensive, and aggressive.

Supportive demand expansions are engineered by monetary or fiscal policy designed to reduce the unemployment arising or threatening to arise from cost increases. For example, the central bank may reduce reserve requirements or create reserves in order to allow banks to extend loans, or the fiscal authorities may increase government expenditures in an attempt to expand effective demand and employment. Induced expansions of demand are direct consequences of a cost increase in that those who receive the

1. Machlup—The Review of Economics and Statistics, May, 1960.
2. Ibid.

increased cost prices or those who pay them will make larger disbursements than they would have made otherwise. *Autonomous demand expansions* would be the expansions which are not linked to previous or to expected cost increases. Similarly there are three kinds of cost increase : responsive, defensive and aggressive. If wage-rate increase takes place in response to excess demand, it is a case of *responsive cost increase.* Profit-induced and initiative wage increases as well as spontaneous increases may be called *aggressive* because they are designed to achieve a net advance in the real wage rate. A *defensive* increase merely restores real earnings which the group in question has long been enjoying. An aggressive increase raises real earnings above that level.

Mixed Demand-Cost Inflation.

Inflation usually originates from excess demand, but that excess demand need not be a general one. Under conditions of reasonably full employment but no excess demand for goods in general, there may be an increase in demand for a particular commodity or class of commodities, and that may even be associated with an equivalent reduction in demand for other commodities. The resulting demand-pressure on the particular industry producing the particular commodity or class of commodities will bid up its prices and profits. This will also induce the producers of that particular commodity to expand the level of their output.

The excess profits of the producers will provide a strong "target" for wage demands, which the particular producers may not be inclined to resist, particularly since their prices are rising and because they may thus maintain a good industrial relation. The rise in wages in one industry may induce the workers of other industries (where there is no excess demend) to demand higher wages. In this manner, generalised inflation is induced without any general excess demand, but as the result of excess demand in a sector of the economy. Here "cost" forces do not give rise to inflation, but they generalise it from the original locus.[1] Although inflation may be a mixed demand-cost one, the dichotomy between demand inflation (prices in general are *pulled* up by excess aggregate demand) and cost inflation (the

1. Ackley—Macroeconomic Theory (Macmillan 1961). P. 446.

average wage rate is pushed up without a general shortage of labour, and this leads to a rise in price).

But the dichotomy between demand and cost inflation appears difficult of application. The principal reason is that neither in the labour market nor in most commodity markets are wages or prices set in automatic response to the forces of supply and demand, rising when there is an excess of demand over supply. Instead, prices and wages are administered. It is, therefore, necessary to find a theoretical framework for the analysis of inflation assuming administered wages and prices[1]. In such an analysis, aggregate demand has definitely an important part to play. The usual wage-cost inflation analysis has the advantage that it realistically recognises that wage rates are administered factor prices; but, unrealistically, it is based on the tacit assumption that prices of commodities are market—determined rather than administered, or that this makes no difference. Again it also tends to ignore the fact that not only the prices follow wages but that wages also follow prices[2]. An adequate theory of inflation should take into account both these phenomena. So, we should examine an alternative theoretical approach which may provide a better insight into the nature of inflationary process.

Markup Inflation

A formal model of pure "*Markup inflation*" has been provided by Holzman and Duesenberry[3].

Let us suppose that all business firms have the practice of pricing the goods and services which they sell on the basis of some standard markup over their costs of direct materials and direct labour—this markup covering both overhead costs and profits[4]. Let us also assume productivity to be constant, and also that labourers are able to obtain increased wages in case there is an increase in the level of consumer prices. That is to say, labourers too fix the prices of the

1. Ackley—Macroeconomic Theory (Macmillan 1961). P. 451.
2. Ibid.
3. Holzman—"Income Determination in Open Inflation." *Review of Economics and Statistics*—May, 1950 and I. Duesenberry—"The Mechanics of Inflation." *Review of Economics and Statistics*—May, 1950.
4. Students will find an excellent treatment of Markup Inflation in Ackley's Macroeconomic Theory, Pages—452—45[illegible].

services they render on the basis of a fixed markup over its cost of living. It is now easy to note that this model can generate either a stable, a rising or a falling price level, depending on the markups which the business firms or the labourers respectively employ. Let us suppose that a wage level of Rs. 2/- leads to a price index of 106, and that a price index of 106 induces workers to seek and to get a wage of Rs. 2·50 nP., which in turn requires a price index of 112, a wage level of Rs. 2·87 nP. and so on. Thus, an endless upward spiral of wages and prices will ensue so long as these bases for setting wages and prices prevail. If the markup on one or both sides is a percentage markup, the inflation will proceed faster than if one or both of the markups is fixed in rupees and naye paise. If the markups applied by business firms and labourers are such as to produce an inflationary spiral, a gradual improvement of productivity, it is clear, may eventually bring the spiral to a halt. Thus, markup patterns which are initially inconsistent with stable prices can become consistent with stability through the growth of productivity. But this happy result will be lost if either the business firms or the labourers try to expand the markups to appropriate some of the gains of rising productivity.

The model is highly oversimplified. The hypothesis that most prices are set by markup over cost is often rejected as meaningless by economists. This analysis may not be useful as a starting point in an analysis of the structure of relative prices or in connection with problems of allocation of resources and distribution of income. Nevertheless, variations in markups have got some significance in an analysis of the inflationary pressure. Changes in price structure are associated with variations in markups and the variations in markups which labour unions and employers apply to the cost of living in setting wage rates are also associated with changes in the level of employment. From this standpoint, the markup analysis of inflation is an important tool in formulating economic policy. This analysis provides a framework which includes the elements both of the demand and of the cost analysis. Inflation may also start from an initial "autonomous" increase either in business or labour markups. Or it may start from an increase in aggregate demand.

1. Ackley—Macroeconomic Theory (Macmillan, 1961), P. 453.

Comparison of the Inflation theory and the theory of Multiplier.

We find some significant similarities and differences between the theory of inflation and the theory of the multiplier. In both cases, a rise in demand leads to rise in the level of income ; but while in the theory of inflation, the rise in the level of income is mainly due to a rise in prices, in the theory of multiplier, this rise in income is ensured by a rise in output. Secondly, in the multiplier analysis, the initial rise in output and income leads to further repercussions on income since it involves a rise in expenditure. The inflationary rise in prices also has further repercussions The rise in prices during an inflation makes some people gainers ; (*viz.*, the households who have got increased income) but the fixed income-earners become losers. But the expansionist effect of the multiplier may not, of course, make a person richer ; but it will not definitely make a person loser. Of course, many transactors will both gain and lose because of the inflationary pressure. They gain to the extent to which they are selling the goods prices of which have risen. They lose to the extent to which they are buying goods prices of which have risen. In some cases, these two effects may offset each other.

Here we find the first of three basic differences between the multiplier theory and theory of inflation. In the theory of multiplier, if prices remain constant and output changes, the sole motive force of the process of changes resulting from an initiating rise in expenditure is the fact that some people are gaining. Similarly, the sole motive force of the process of change resulting from an initiating fall in expenditure is the fact that some people are losing. In the theory of inflation, if output remains constant and prices rise, the motive force of the process is related to the fact that some people are gainers and some people are losers. A second difference between the two processes arises from the fact that *there is an asymmetry around the zone of full employment.*[1]

While the multiplier process is reversible, the inflationary process is not to any important extent reversible. An initiating increase in expenditure sets the multiplier process into operation and raises the level of output and employment around the zone of full employment ; similarly, initiating fall in expenditure may set the reverse multiplier

1. A. C. L. Day—Outline of Monetary Economics. P. 256.

process into operation *i.e.*, it leads, to a contraction in the level of income, output and employment. In the inflationary process, an initial rise in expenditure may lead to a process of rising prices, but a fall in expenditure at full employment does not lead to a process of falling prices. The third difference between these two processes is that there is complete certainty that the multiplier process comes to an end of its own accord because of the leakages. Of course, this argument applies only to simple multiplier process. Only in the extreme case when there is no leakage of additional income in the forms of saving or imports does the multiplier process go on indefinitely. The inflationary process, on the other hand, is frequently not self-limiting. If there is no intervention of external forces, it continues indefinitely.

Initiation of Inflation.

It has already been pointed out that inflation is essentially a problem of excess demand situation. An excess of demand over available supply may result from either a rise in effective demand or a reduction in available supply. Inflation may also start from an initial "autonomous" increase either in business or labour markups. In that case the inflationary process involves the interaction of demand and markup elements. There are two main ways ('demand-pull' and 'cost-push'), as we find, in which an inflationary process may be initiated ; they are changes in demand conditions and changes in costs or supply conditions, in each case either for goods or for services. Examples of likely initiating changes in demand conditions are increased investment by firms, and increased government expenditure on the basis of borrowing. Examples of this case are found when the supply conditions include a fall in productivity of labour along with constant money wages, the labourers refusing to work at the present money wages.

It has also been pointed out that the initial rise in prices may cause further rise in prices, because some transactors may react to the initial rise. These reactions are found in the adjustment of expenditure plans of the people to the changing circumstances. Again, people who are worse off in real terms may react defensively by refusing to accept the worsening in their situation.

The transactors may refuse to accept the effects of price rise on

the quantity of goods purchased. When prices rise, constant expenditure in terms of money implies that the quantity of goods purchased falls. On the other hand, if the quantity of goods purchased has to be kept constant, the volume of money expenditure increases. This increase in expenditure may be financed by increased borrowing, by running down accumulated surplus or by reducing saving. Households also may react defensively to the rise in prices and try to restore real income by raising selling prices. This they can do without any borrowing or drawing down resources. Thus we find two kinds of defensive reactions to an initial rise in prices. The first type of defensive reaction is in terms of maintaining real expenditure on the basis of increased borrowing, of drawing down accumulated surplus or of reduced saving. In the second case, real expenditure is restored by increasing selling prices. This leads to an increase in money incomes and consequently in money expenditures. One path operates solely on the side of demand for goods and services; the other path operates through the supply of goods and services.[1]

Inflationary Process.

The stage has now been set for an analysis of the inflationary process. We have seen that the inflationary process is initiated by a change in demand or supply conditions which has the consequence of a price rise or a rise in money incomes. This rise in price creates two types of reactions. The first reaction is passive in character. This passive reaction implies that people adjust their expenditure plans in response to changes in money income they receive or to changes in the prices of things they are to purchase. Another reaction to this rise in prices is known as defensive reaction. It implies that people who are worse off in real terms as a result of the price changes may have some defensive reactions so as to check the worsening in their situation.

If the rise in price is due to changes in demand conditions, the following reactions are to be found. In the first place, the additional demand is met by running down the level of stocks of finished output. The firms then react to this unplanned reduction in stocks by raising the price of each unit of final output. This equates the total money expenditure to the total value of output. In these circumstances,

1. A. C. L. Day—Outline of Monetary Economics, p. 263.

households also adjust their expenditure plans. The households find that although money income has increased and prices have increased, real incomes have remained unchanged. Households will then leave their plans for consumption and saving unchanged in real terms by planning to spend more in money terms. This again creates a reaction in the firms and they react by raising the price of each unit of output upto that extent where the total money expenditure will be again equal to the value of total output.

Thus we find that *rise in price in each stage leads to an increase in household incomes and so leads to an increase in money expenditure which in turn induces further price rises.*

This can be shown by the following diagram :—

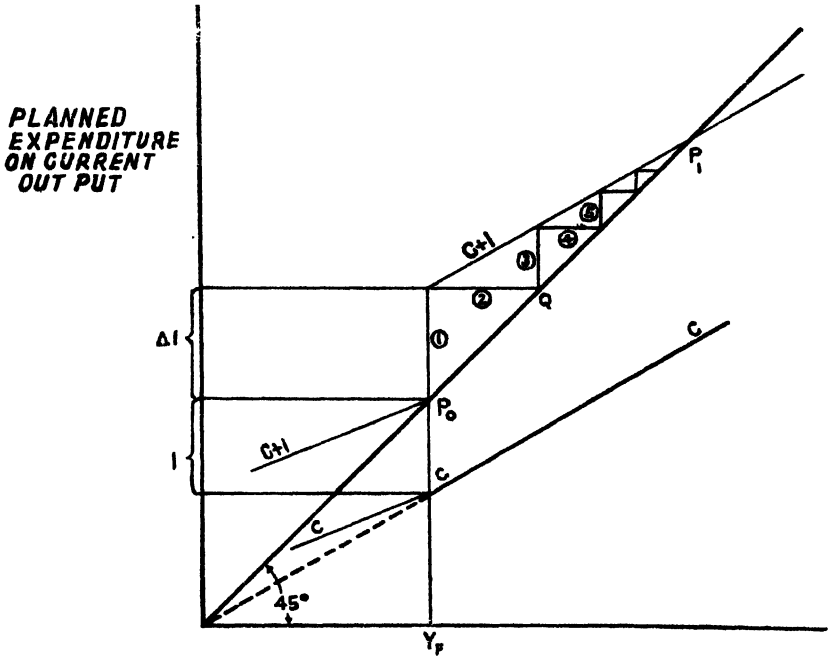

Fig. 22

The vertical axis indicates planned expenditure on current output and the horizontal axis indicates current money income or the value of current output. The only possible equilibrium here is on a 45° line through the origin. Here we start at a position of full employment (Y_F) beyond which output cannot be increased ; if planned

expenditure increases beyond this point, money income and the value of money output rise through price rises instead of rises in real income.

The slope of the CC line represents the marginal propensity to consume. The original equilibrium position is P_0. In the first week planned investment rises to the new higher level $(1+\Delta 1)$, and in the second week, firms raise the prices of their output so that money income and the money value of current output rise to Q. This is not, however, an equilibrium position even though it is on the 45° line, so that planned expenditure is equal to the value of current output. The reason why it is not an equilibrium position is that the consumption expenditure (CC) in money terms, has not increased along with the increase in money income. This failure is made up in the third week, when there is an increase in planned household expenditure determined by the increase in money income in the second week and by the slope of the CC line. This in turn leads to further rise in prices in the fourth week and so on, until a new equilibrium (P_1) has been reached when prices have increased in the same proportion as the original rise in the level of investment plans.

Defensive reactions in the inflationary process

Defensive reactions mean attempts to maintain real expenditure and real income. Most price increases and wage increases are defensive reactions. An increase in wage is justified by trade unions on the ground that it can compensate for loss in real income of the labourers. Similarly an increase in price is justified by the businessmen in terms of the maintenance of their real incomes in face of cost increases. Prices and wages may not increase in the same direction at the same time. Although the whole process of inflation is the result of excess of demand over supply, an individual firm or industry may see the situation as one of rising cost of raw materials, which it reacts by a defensive rise in its selling price. The true *explanation* of any rise in price is an excess of demand over supply ; the *justification* in the price increases may appear to be defensive reactions against rising cost. Successful defensive reactions are part of process of adjustment to an excess of demand over supply.[1] *Analysis in terms of defensive reactions helps our insight into the*

1. A. C. L. Day—Outline of Monetary Economics. P. 270.

detailed process of inflation whose basic cause is excess of demand over supply.[1] Inflation may also continue indefinitely because of the existence of effective and genuine defensive action. The process of inflation must continue as long as circumstances are such that at each stage there is a group (*e.g.*, a trade union or the government) which effectively refuses to adjust itself to the effect of price rises in the previous stage upon its real incomes and real expenditures. The situation takes a different turn when at least two groups try to restore their positions. As one group tries to restore its position by causing price rises, the other group reacts to it. The inflationary process continues so long as there is a struggle between two such groups. The inflationary process can also continue indefinitely even if there is only one group which reacts defensively. This happens when increase in money expenditure of the reacting group leads to an increase in money income of another passive group. In turn, the money expenditures of the passive group rise leading to a rise in the price-level. This again causes further defensive reactions of the active group.

The upshot of all that has been discussed above is that inflationary process must continue *as long as total planned demand for goods and services exceeds total planned supply at full employment.*

Development of the inflationary process

The inflationary process may be developed by some defensive reactions which influence either demand or supply conditions. It may also involve both demand and supply conditions.

The initiating cause of an inflationary process may be a change in demand conditions. The initiating causes may continue to operate as a defensive factor throughout the process, and other defensive reactions also may take the form of changes in demand conditions. Government expenditure based upon borrowing may be an initiating factor giving rise to an inflationary process. This may lead to a rise in price reaction to which from the demand side may be the maintenance of real expenditure. For the maintenance of real expenditure following the rise in prices money expenditures are to be increased. This in turn leads to further rise in prices which again gives rise to reactions on the part of the government for the maintenance of real

1. Ibid.

expenditure. Thus the process goes on. Again when these reactions are taking place, the people who are selling goods and services to the government and to the investors will find that their money incomes have increased. Their money expenditures will rise correspondingly contributing to the development of the inflationar y process.

Defensive reactions involving demand conditions may be shown by the following diagram.

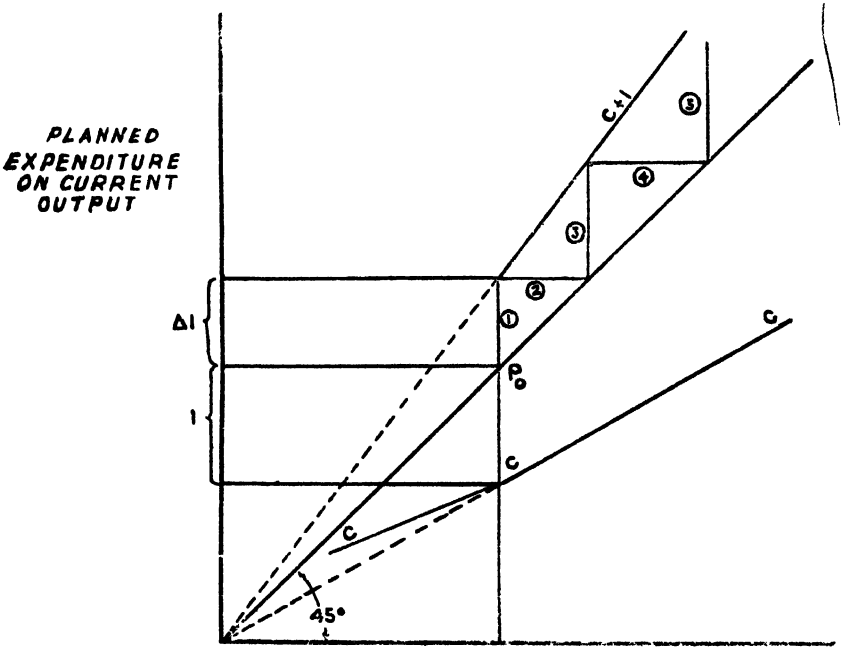

Fig. 23

The vertical axis in this diagram indicates planned expenditure on current output while the horizontal axis indicates current money income or the value of current output. This figure corresponds to the earlier figure of this chapter, with the difference that investment plans are raised each time prices rise in order to maintain real investment at the level $I+\Delta I$. This is indicated in the diagram by drawing the $C+I$ line as an extension of a line through the origin; the vertical distance between the CC line and $C+I$ line rises in proportion to rise in the price level. In these circumstances, no new equilibrium is possible ; prices rise steadily at a constant percentage rate.

The initiating cause of an inflationary process may also be a change in supply conditions. Defensive reactions may involve changes in supply conditions arising from an attempt by sellers of goods and services to maintain their real income. In these circumstances, all reactions in the minds of sellers are concerned with supply conditions. If there is a fall in productivity of labour, wage-rate remaining constant, the sellers will find increased cost of business or decline in profit, and this they will try to cover by raising the selling price of goods or services. Such price increases may be imposed without danger of causing excess of supply over demand, since the rise in prices involves an increase in money income of the producers. This leads to an increase in their money expenditures also contributing to the development of the inflationary process. Wage-earners, of course, receive a reduced level of income because with constant money wage, they find an increase in the selling prices of goods and service. If they are now unwilling to accept any reduction in their real wage, they will give pressure for higher money wages in order to cope with the situation arising out of rise in the selling prices of goods and services. Thus we find that the *wage-price spiral* continues. The initial fall in productivity of labour definitely shows that neither the profit-receivers nor the wage-earners will be ultimately gainers if this wage-price spiral continues. As long as no one will voluntarily accept loss, every one is made worse off by the effects of the process of rising prices.[1] The inevitable burden of this loss is imposed heavily on the groups who make weak as well as slow reactions.

Defensive reactions involving supply conditions are represented by the following diagram.

In this diagram the horizontal axis measures the wage level and the vertical axis measures the price level. Initially, W_0 and P_0 are the wage level and the price level respectively. Let us suppose that there has been a fall in the productivity of labour. For maintaining their real incomes, profit-receivers raise the prices of the goods they sell to P_1. Since money wages are unchanged, real wages have fallen sharply. The wage earners react to it by raising the wage rates until the ratio between wages and the prices is the

1. A. C. L. Day—Outline of Monetary Economics, p. 274.

same as it was initially. The wage reaction line in the diagram

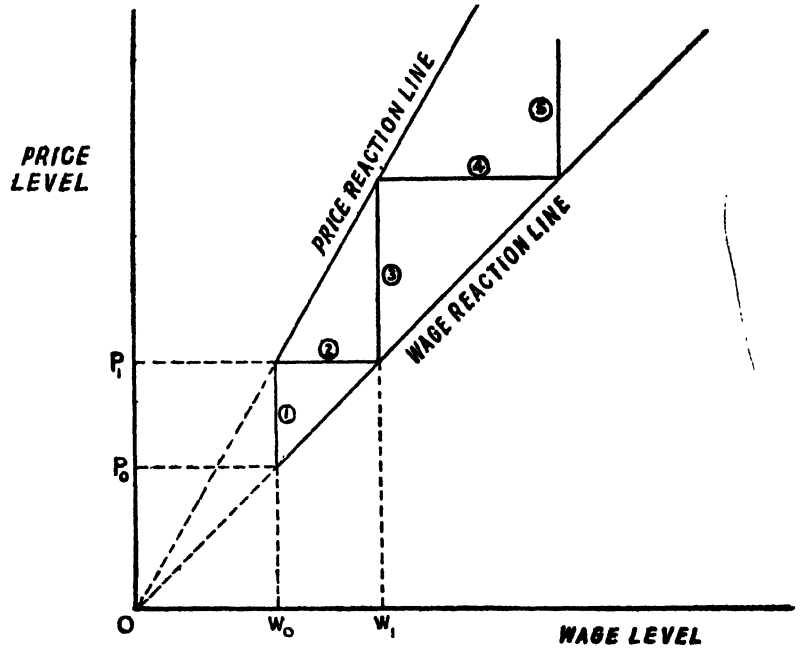

Fig. 24

shows various positions at which wages are in the original relationship to prices and where real wages are in the original level. In the second week, wages rise to W_1. But this in turn indicates that real profits have fallen, and so the businessmen react to this along the price reaction line. This line shows that prices are sufficiently high to neutralise the increased wages. Thus, the process goes on. This diagram shows that the price reaction line and the wage reaction line never meet, the price continuing to rise indefinitely. This is due to the fact that both groups of transactors react at the same speed.

But it is possible that one group will react more slowly than the other. If so, the slow reactor takes most of the inevitable burden of loss which is imposed by the rising prices. If the labour union is the weak reactor, the wage reaction line will not pass through the origin. This has been shown in the following diagram.

The diagram shows that wages rise by a smaller proportion than

prices at each round. Real profits also are restored at each round.

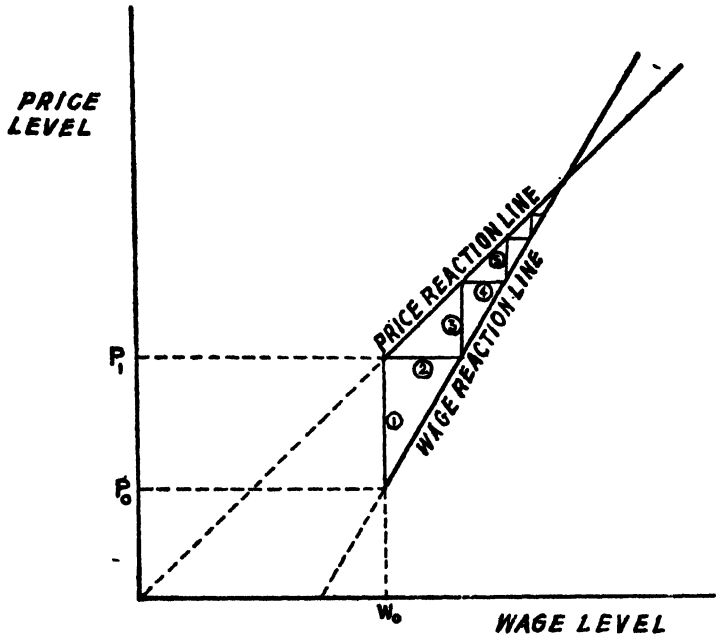

Fig. 25

The rise in wages and prices at each succeeding stage is smaller than at the preceding stage, and eventually equilibrium is reached.

Another initiating cause of the inflationary process may be one in which defensive reactions involve both demand and supply conditions in which one group tries to maintain real expenditure and the other tries to maintain its real income. If the initiating factor is a rise in demand, the rise in demand being a defensive factor since the transactor or group concerned is willing to maintain higher level of expenditure, and if this increased demand leads to some defensive reactions on the supply side, the inflationary process will continue. An example will make it clear. Let us suppose, the initiating rise in demand is due to an increase in government expenditure. This leads to price rises and decline in real incomes of the wage-earners and purchasers. The wage-earners then give pressure for higher money-wages. The producers are then compelled to raise the selling price of goods and services for meeting the

increased expenses of business. This affects the supply conditions. Again when the prices of raw materials rise, the government can maintain its demand in real terms only by increasing money-expenditures.

Nature of Suppressed or Repressed Inflation.

The analysis of the nature of suppressed inflation may be divided into two parts: the war problem and the post-war problem. Inflation in the war-time is the conscious policy of a government in its efforts to increase war output by transferring factors to war production in exchange for expending income. Direct controls are the most powerful weapons a government can employ to carry this out. Direct controls are imposed upon households to prevent them from buying as many currently produced goods and services as they would take to buy at existing prices and income levels. But, although, direct controls may prevent price rises at the present time, they may be causes for the piling up of the forces which will increase expansionary pressure in future. These sets of circumstances may be regarded as a condition of suppressed inflation. Repression of the economic effects of an open inflation increases the amount of savings in the economy since the money cannot be spent for purchasing goods and services. The public's demand is thereby curtailed and factors released can be transferred to increase war output. Repression does not remove the inflation; it only matures to allow inflation to affect economy through the price-level.[1] With repressed inflation of this kind, the longer the controls last, the larger becomes the pent-up demand. The pent-up demand may, in time, become so high that it may make the controls ineffective. Suppressed inflation than turns into ordinary price inflation.[2]

The first use of the word 'suppression' applies to the imposition of controls whose effect is a restriction of consumption with the result that there is a greater shift of factors from consumption to war production industries. So, while the first effect of 'suppression' implies *restriction* of consumption, the second effect of 'suppression' implies *diversion* of demand from one kind of output to another. Diversion of expenditure into such channels as cinema seats, toys,

1. H. K. Charlesworth—Economics of Repressed inflation, P. 90.
2. A. C. L. Day—Outline of Monetary Economics, p. 258.

books, beer and cigarettes may not be considered harmful since the output of these things can still be increased. It is also possible that demand may be diverted to the purchases of goods and services provided by those industries which have got excess capacity. Controls may also cause diversion of consumption expenditure to those channels where there may be some rise in prices.

In modern war economies, realization of the dangers of open inflation and the limitations of taxation and voluntary savings campaigns forces the introduction of direct controls, and repressed inflation becomes the means of increasing real savings in the economy. Repressed inflation is quite different from *Latent inflation.* Mr. Bernstein[1] describes the "vast accumulation of war savings which overhangs the factors, goods and markets" as a latent inflation as distinguished from repressed inflation which causes the saving.

Whereas the problem of war economy may be seen as a deliberate inflationary effect on the government's part, the post-war problem becomes exactly the reverse. The policy during post-war inflation is one which will not run the danger of becoming deflationary so as to give rise to a depression and unemployment. The problem then becomes one of limiting consumer's spending. Repressed inflation can accomplish it by curtailing consumption through the use of controls and the maintenance of rigid restrictions in investment market.[2] Similar to pent-up demand for consumer goods, a *deferred demand* for factor services also exists when inflationary forces are suppressed.

Another purpose for using controls so as to suppress inflation and divert demand may be noted. If it is found that the existing structure of the economy is inappropriate to the demands that are being placed on it, there should be sufficient provision for diversion of demand so that the bottleneck arising out of that situation may be properly dealt with.

We have seen that controls may be imposed either to *postpone* or to *divert* demand. These controls may, sometimes, fail to put an effective check to inflationary forces. There is a third sense in which the word, 'suppression' may be used. This is the case where suppression simply means prevention, there being no diversion of

1. E. M. Bernstein—"Latent Inflation, Problems and Policies".
2. I. M. F. Staff Papers, vol. 1. No. 1,'950. p.p. 1-16.

demand. Prevention by means of high taxation may be regarded as suppression. But prevention by means of curtailment of government expenditure is not a case of suppression.

Whether suppression is successful or not depends primarily upon the willingness of the people to accept the greatly increased savings forced on them by the controls. An investigation of suppressed inflation is, therefore, mainly an investigation of the operation of controls on the economy to determine how successfully they equate savings with investment demand for factor services without price increase.[1] There are two main purposes of controls[2], *e.g.*, (1) to force sufficient potential savings out of the economy in the goods market which together with other saving balance investment demand for factor services, and (2) to provide the means in the factor market whereby the economy can carry out its programme of planned investment. Therefore, the effectiveness of suppressed inflation is measured by the extent to which it can prevent general price increases and to which government's target of planned investment is accomplished.

The Speed of Inflation

Inflationary phenomena are highly dynamic. The more the factor price rises occur, the more likely are they to generate expectations of further increases and develop into an irresistiable, cumulative process. T. Koopmans[3] and, later, A. Smithies[4] have developed precise relations between the rate of price increase per unit of time and the significant lags on the basis of some specific models about the influence of lags on the inflationary process. It is seen from Koopmans' article[5] that for the general case "the relative rate of price increase is a fraction whose numerator is the governmental expenditures and whose denominator is made up of terms involving marginal propensity to consume, incomes, and time lags as factors. The longer becomes the spending lags and wage-adjustment lags, the larger becomes the denominator and the

1. Charlesworth—The Economics of Repressed Inflation, p. 21.
2. Charlesworth—Economics of Repressed Inflation, p. 96.
3. Koopman's article, "The Dynamics of Inflation." Review of Economic Statistics, vol. XXIV,1942, p. 53.
4 Article of Smithies, "The Behaviour of Money and National Income under Inflationary conditions", Quarterly Journal of Economics, Vol. LVII. 1942, p.113.

smaller becomes the speed of inflation. Smithies also points out that the lags in the inflationary process slows down the process of inflation.

We can conveniently distinguish five considerations in determining the speed of an inflationary process. They are : (i) the size of the initial impetus which sets the process going, (ii) the speed with which reactions are made to changes in prices and money income, (iii) magnitude of the defensive reactions which attempt to restore the original position and how far the attempts at restoration only go part of the way, (iv) the size of the groups which are reacting defensively in relation to the total size of the economy, and (v) the accounting methods adopted by firms in valuing their assets.

The size of the initial impetus which sets the inflationary process going implies the size of the price rise or wage rise. The larger size of this impetus implies that there will be greater reactions to price rises and wage rises. So, the magnitude of the initial impetus in the inflationary process is highly important in determining the speed of the process. Secondly, the relevant time lags are important in determining the speed of inflation. The shorter the interval that elapses before the reactions are made to changes in prices and money incomes, the greater is the speed of inflation.

The third influence governing the speed of inflation is the partial defensive reaction of the house-hold to the price rises and wage rises. When defensive reactions attempt only partially to restore the former level of real income or expenditure, the speed of inflation becomes relatively small.

Fourthly, some groups, *e.g.*, rentiers, pensioner, some salary-earners, etc,, may not be in a position to maintain their real income or real expenditure against the effects of price rises. These groups belong to the categories of fixed income-earners. The less there are of these goods, the greater will be the speed of inflation. Lastly, the speed of inflation also depends upon the accounting methods adopted by the firms for the valuation of their assets. If (as they are compelled to do in Britain by income tax law) they value their stock of capital assets at original cost in their accounts when prices are rising the profits that will be shown in their accounts, will be bigger than they are really earning. This will contribute to the speed of inflation.

Acceleration of Inflation

Acceleration of the speed of the inflationary process depends upon the reactions of various groups to the continued price rises and wage rises. This operates in three stages[1] : (i) by the ending of so-called 'money illusion', (ii) by making allowances to an increasing extent for future expected rises in prices, (iii) by taking advantage of the expected price rises. 'Money illusion' that may operate when relatively small price rises occurred after a period in which the value of money was relatively stable soon collapses when big price rises are experienced. "The brake which 'money illusion' puts on demand for goods and on demand for higher money incomes disintegrates as experience shows how illusory is an assumption of a constant value of money."[2] The second factor comes about because, as people become accustomed to the existence of a steady rise in prices, the speed of their defensive reactions increases. The third factor comes about when the reacting groups sustain the expectation that inflation will continue. Their defensive reactions then become of greater magnitude giving rise to what is known as hyperinflation as was found in Germany after the World War I, and in China, Greece, and Hungary after the World War II. Speculation about continuation of inflation becomes an active force ; anyone who holds stocks of goods can be fairly confident that he will secure a good money profit from the resale of his goods in future. This aggravates the pressure of demand, and this makes inflation faster and faster.

The acceleration of inflation may be so strong that it may continue indefinitely and prevent the situation from ever reaching a new equilibrium. This is due to the fact that the process of change itself induces further inflationary forces.

Ending of Inflation

An initiation can come to an end either because of a change in government policy or because its internal momentum shows a decline. As for the former, the Government may adopt monetary, fiscal and non-monetary measures for controlling inflation. We shall study these measures later on. As for the latter explanation which

1. A. C. L. Day—Outline of monetary Economics, p. 283.
2. A. C. L. Day—Outline of Monetary Economics, p. 284.

is more important than the former in this context, we find that inflation must come to an end if there is a passive group whose money income or money expenditure remains constant throughout the inflationary process, so that this real expenditure of this group is sufficiently reduced.[1] We should also consider the existence of other groups which react defensively *not fully but partially* to restore real income or real expenditure to the level enjoyed before price rises and wage rises occurred. Again, different people may have different marginal propensities to consume. If the redistribution of income between two groups leads to less spending, inflation will come to an end gradually ; if on the other hand, redistribution of income between two groups leads to increased spending (which is most likely), the speed of inflationary process will be accelerated. Finally, shortage of money, *i.e.*, a contraction of all investible funds, may lead to slowing down or ending of inflation.

The existence of passive groups which do not increase their money income or money expenditure creates some sort of "leakage" from the inflationary process.

We can consider a struggle for real income between profit and wage receivers, following a fall in productivity. If these are the only two groups of transactors in the economy, the struggle may continue indefinitely. If we introduce a passive group, whose money income does not increase, the process well come to an end. Similar to the effect of passive reactions is the effect of those reactions which are partially defensive, *i.e.*, which do not fully restore their real income and real expenditure. Again, in inflation if some weak reactors save a small proportion of their income while strong reactors save a large proportion, a redistribution of income towards the strong reactors reduces total demand and slows down inflation. A contraction in the quantity of money also, as has been argued above, can slow down inflation. If the quantity of money is restricted, interest rates will rise. Saving being interest-elastic, a rise in the rates of interest leads to an increase in saving. It also tends to reduce the level of investment by restricting the availability of credit and raising the cost of borrowing. Monetary policy, by itself, may fail to check inflation completely. For complete control of inflation,

1. A. C. L. Day—Outline of Monetary Economics, P. 276.

monetary policy should be supplemented by adequate Fiscal and Non-monetary policies.

Inflationary Gap

The term "inflationary gap" was first introduced in England in the budget speech of the Chancellor of the Exchequer in April, 1941. In 1948, Keynes in his book[1] "*How to pay for the War*" dealt with the inflation problem in very much the same way as did the later theorists.

The inflationary gap is the difference between what the population will try to consume out of their income and the amount available for consumption at pre-inflation prices.[1] It is *an excess of anticipated expenditures over available output at base prices*[2]. This is particularly evident during a war and a post-war boom. The problem during such phenomena is one of keeping expenditures down to the level of current output instead of allowing these expenditures to bid up the value of that output.

The inflationary gap may be shown by the following diagram.

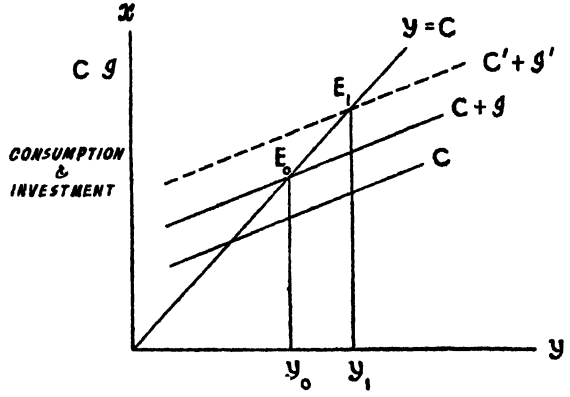

Fig. 26

In the above diagram, at E_0 the equilibrium level of income has been determined, the C+I curve, intersecting the 45, line at that point. Now if the government, the business firms and the consumers together want to spend for investment and consumption more than before, the C+I curve will shift upward to C'+I'. The

1. Klein—Keynesian Revolution, p. 155.
2. Kurihara—Monetary Theory and Public Policy.

$C'+I'$ curve intersects the 45° line at E_1. Yet the available output is E_0, Y_0 which is obviously smaller than income E_1Y_1 (or OY_1) by the vertical distance between the points E_0 and E'. This latter difference between what the economy would spend (E_1Y_1) and what it has available (E_0Y_0) is the inflationary gap.

According to Prof. Warburton, inflationary gap can be measured by the excess of the gross income-flow over (1) expenditures on consumers goods and capital goods, (2) taxes, (3) net purchase of securities and (4) reduction of indebtedness to banks. This can be characterised as cash-balance approach to the measurement of inflationary gap. The main reason advanced in favour of this approach is that the relationship of expenditures to total cash balances is more stable and easier to forecast than the relationship of income to consumption expenditures. But whatever the merits of this approach, it cannot tell us how much of the excess purchasing power is to be absorbed in higher taxation.

According to Prof. Pigou[1], the inflationary gap is to be measured by the excess of aggregate money demand over aggregate money cost in an immediate preceding period of time. There are two principal ways in which a gap may arise. It will do so if the supply of factors at work being given, aggregate money demand is raised as a result of government expenditures while private persons act as before. Secondly, the gap will arise if aggregate money costs are raised due to wage-rises not offset by increased productivity. This increase in aggregate money costs leads to a defensive reaction and thus there is an increased money demand. As a result an inflationary gap will arise since there is an excess of aggregate money income in the present period higher over aggregate money cost in the previous period. This analysis meets one of the objections raised by Prof. Turvey against the utility of the inflationary gap concept. According to him, the analysis of inflationary gap is inadequate because it fails to take account of inflation resulting from an autonomous increase in wage rates raising prices from cost side. But Pigou's analysis of inflationary gap has taken cost-inflation into account.

Bent Hansen[2] defines inflationary gap in three ways both in the

1. Pigou's article, Economic Journal, 1941
2. Bent Hansen—Theory of Inflation.

commodity market and the factor market. According to him, inflationary gap is : (i) an excess of planned purchase of commodities (or of factors) over the expected sales of commodities (or of factors), (ii) an exsess of optimum purchase of commodities (or of factors), over the available supply of commodities (or of factors) and (iii) an excess of active attempts to purchase commodities (or of factors) over the available supply of goods (or of factors). If our problem is to determine the extent to which demand must be curtailed so as to secure equilibrium, it will be necessary to calculate the gap in terms of difference between active attempts to purchase goods or factors and the value of the available supply of goods or factors. But when it is a question of deciding whether to give up price control and rationing of goods or factors or to give up the wages-price restraint policy, it is to the gap between optimum purchases and available supplies to which we must turn our attention. While the usual gap analysis is advanced on the basis of current flows of income, Hansen's analysis is based not only on the current flows of income but also the "financial resources" of the individuals. Thus his concept takes account of the pressure exerted by the presence of large amounts of idle balances.

The inflationary gap may also be explained with reference to Harrod's growth model. Thus if G (the actual rate of growth) is greater than G_w (the warranted rate of growth), then the volume of C (actual capital accumulation) must be less than Cr (the required capital accumulation for steady advance). This will lead to a deficiency of capital, the amount of desired capital goods will be greater than the actual amount of capital goods. This situation culminates in a chronic inflationary gap : desired investment would be greater than saving, and production would be less than aggregate demand. If on the other hand, G_w would be greater than G and Cr would be greater than C, there would be a deflationary gap.[1]

Inflation and Economic Development

It is characteristic of the underdeveloped countries that the resources they put into investment are generally a smaller proportion of their very much smaller national product than is true for the

1. See the chapter on "Growth Economics" of this book.

more highly developed countries. Because of the inadequacy of savings and the difficulty of directing them into productive investment, there is a strong inducement to raise the level of investment by expanding bank credit—that is, by inflation. The rationale of such a policy is that inflation acts on each of the elements essential to an increase in investment. By raising profits, inflation raises materially the return from investment and induces enterprises to expand the scale of their operations. The expansion of bank credit to businessmen provides them directly with the means of acquiring the initial resources for investment. At the same time, inflation transfers real income to a "saving" group, and the savings out of profits enable the entrepreneurs to maintain indefinitely a higher level of investment. Bernstein and Patel[1] consider this aspect with reference to actual experience of the underdeveloped countries and advocate that mild inflation may be actually conducive to economic development of an underdeveloped economy.

It is usually argued that serious inflationary pressure stands in the way of economic development. It distorts the stability of the economy. It may also adversely affect the balance of payments. Increased purchasing capacity of the consumers calls for increased imports from foreign countries, and this leads to a drain of foreign exchange reserves. Moreover, increased prices of exportable goods within the country may discourage the foreign importers to import their goods from the home country suffering from serious inflationary pressure. This also may lower the export earnings. But mild inflation may be conducive to economic growth since capital formation is promoted by the increased business activities of the entrepreneurs, lagging wages, and forced savings by the fixed income groups.[2] But the economists do not always agree on that point. Adler holds a compromising view in this regard. For him, "the best price level from the point of view of development objective differs from country to country ; it lies somewhere between the extremes of stability without development, and inflation without development."[3] He seems

1. For a brilliant analysis of this problem, see the article of Bernstein and I. G. Patel, "Inflation in relation to Economic Development." I. M. F. Staff Papers, Vol. II, 1951-52.

2. I. M. F. Staff Papers, Sept. 1952, Article of Bernstein and Patel.

3. John. H. Adler, "The Fiscal and Monetary Implications of Development Programmes." A. E. R. May, 1952.

to recommend some inflation with some development. But U. Tun Wai, of the I. M. F. points out the existence of a negative correlation between inflation and economic development in most cases. In a statistical study relating to sixteen underdeveloped countries, he has come up with the interest finding that "all countries surveyed except Mexico had more development in the period of less inflation than in the period of greater inflation."[1]

Even if mild inflation is conducive to capital formation, underdeveloped economies fail to maintain inflation at the "mild" level. With their automatic built-in-stabilizers and other fiscal and monetary instruments of policy, it is quite possible for advanced countries like U. S. A., U. K., West Germany etc. to keep inflation at mild level of 1·3 per cent per annum or so. But underdeveloped countries in the absence of sound central banking systems and an efficient tax administration, can hardly succeed in keeping inflation at the mild level.

Monetary measures for controlling inflation

The fluctuation of economic thought on the effectiveness of monetary policy is an interesting phenomenon by itself. The recent rediscovery of money in the post Second World War era has made the monetary theorists think anew of the scope of monetary policy as a measure for restoring economic stability.

Creation of money in the sense of the issue of currency is the function of central banks. Demand deposits of commercial banks are also included in money changes in money supply affect the economic variables such as prices, interest rate, liquidity, etc. which indicate the health of the economy. Money supply is to be regulated to ensure stability of the economy.

Monetary policy for controlling inflation is traditionally associated with a rise in the rate of interest. But apart from a rise in the rate of interest, monetary policy includes a wide variety of actions by central bank. In recent years, monetary policy has become broader in scope, and it has to include the following measures in order to cope with the changed conditions in the market : first, control over the surplus cash-balances in the hands of the public ; secondly,

3. U. Tun Wai—"The Relation between Inflation and Economic Development", I. M. F. Staff Papers Oct. 1959.

control over a shift from near-money assets to money ; thirdly control over the creation of new money through the foreign sector. The surplus cash-balances in the hands of the public can be neutralised or eliminated by withdrawing such money temporarily from circulation or by declaring a part of the excess money as worthless, replacing them as production and national income rise. With regard to the second, the monetary authorities can control the conversion of the near-money assets into money either by restricting the negotiability of these assets, or by the conversion of short-term debts in order to reduce the liquidity of the banking system or by the offer of higher rates of interest. Ultimately, of course, the efficacy of the last policy would depend on how far higher interest rates can influence the public's propensity to spend.

Bank rate is the main weapon of controlling the credit market. In general, higher rediscount rates increase the cost of borrowing for business and consumer spending and check excess activity based on borrowed funds. The cost of investment being raised and the availability of credit being restricted, the inflationary pressure is restricted to some extent. But large amount of short-term govt. securities held by commercial banks and non-bank holdings of short-term or redeemable govt. securities may fail to offset the inflationary pressure even when the rediscount rate is raised. Prof. Lerner argues, if a rise in the interest rate is to be effective it will have to be raised to 15 to 20 p.c. to offset the inflationary pressure *i.e.*, it should be carried to the extreme.

The extent to which the high rediscount rate policy can check inflation depends, first, on the magnitude of the inflationary pressure, *i. e.*, the volume of planned expenditure that must be frustrated and secondly, on the elasticities of investment and consumption expenditures with respect to change in the rate of interest.

The important varieties of monetary policy espoused to the Patman Committee in the U.S. may be classified into three schools[1]. The school led by Prof. Friedman believes that aggregate spending is interest-elastic. A second school led by Prof. Samuelson is skeptical about the interest-elasticity of spending and impressed more with the variability than with the constancy of monetary velocity. The

1. Tobin's article—Review of Economics and Statistics, Nov. 1953.

third school by R. V. Roosa contends that monetary controls work much more through restricting the availability of credit than through increasing its cost.

Reasons for limiting reliance on monetary restriction are associated with : (i) those connected with the public debts, and (ii) those which would have force even if public debts were "insulted".

Prof. Friedman[1] points out that there are two real objection to raising the bank rate.

First, monetary policy can be effective only if it is "extreme" and in that case it must go too far and produce a deflation. Secondly, monetary policy can be effective in preventing inflation but only at the cost of undesirable consequences in other directions. It has been alleged that higher rate of interest imposes a budgetary burden on the "Treasury and that once the rate of interest is raised, it is difficult to lower it at any time if it is required for preventing stagnation."

But these objections are unsatisfactory since everything depends upon the judgment of the monetary authorities concerned which should be relative to the magnitude of the problem. If a stagnation threatens, what is necessary is not a "low" rate of interest, but a "lower" rate of interest. Keynes, however, contends that it is not the interest-rate but the marginal efficiency of capital which is the main determinant of the investment function.

Monetary measures for controlling inflation also include open market sale of securities by the central bank. But open market sales policy, to be successful, must be associated with a rise in the rate of interest. Open market sales policy is rendered inoperative when the member banks approach the central bank for accommodation. As a lender of the last resort, the central bank then fails to ensure a proper harmony between its conflicting roles. Another condition of its success to be fulfilled is a stable cash reserves ratio.

Monetary policy also includes the qualitative and selective methods of credit control. The central bank may give instructions to the commercial bank for regulating their lending policies. Again,

1. "Comments on Monetary Policy". Review of Economics and Statistics, Aug. 1951.

the central bank may ask the commercial banks to introduce the system of maintaining margin requirements against any loan or advanced and to regulate consumer credit. These methods cannot check the overall inflationary pressure ; they can simply control the volume of credit in certain selected sectors.

A rise in reserve requirements is anti-inflationary in that it reduces the amount of demand deposits in the economic system and excess reserves of member banks which may lead to credit expansion. But this measure also has limited effectiveness when member banks have large excess reserves or ready excess to reserve funds, when large net inflow of gold tends to raise the reserves of banks or when the government preserves the policy of keeping interest rates low and stable.

Rediscovery of Monetary Policy—the contemporary views on its effectiveness

Ever since the Accord of 1951, monetary policy has been the major government weapon in the U. S. A., U. K. and India in the treatment of inflation and cyclical instability. Recently in a discussion of the controversial issues in recent monetary policy in the pages of the Review of Economics and Statistics, different eminent economists have expressed their opinions on the effectiveness of monetary policy.[1] For Prof. Hansen, the trouble with the monetary policy in the American context originated primarily in excessive rates of interest which tended to impair growth through adverse effects on investment. In a similar manner Prof. Samuelson has shown that the theory of the relation of the rate of interest and investment has run a complete cycle. The early classical and early Keynesian theory of the effectiveness of rises in rates on the amount of investment gave way to British market studies showing little response of investment to changing rates of interest, and to Keynes's later emphasis on uncertainty as being more potent than changes in rates in determining investment ; these in turn have given way to the current view that a rise of interest rate has

1. The Review of Economics and Statistics, August, 1960.
Participants in this discussion are:
Angell, Fellner, Hansen, Hart, Neisser, Roosa, Samuelson, W. L. Smith, W. Thomas, J. Tobin, S. Weintramb. The summary of the discussion has been prepared by Prof. Harris.

substantial effects on investment. So, Prof. Hansen thinks that a long-term low interest rate policy with treatment of any resultant inflationary pressures through fiscal policy will be more useful than the sole reliance on monetary policy only.

One cannot be sure of the effects of changes in the monetary supply. Creation of money does not necessarily mean an equal or predictable rise of spending. The additional money may be held, or spending may increase by more than the increase in money. In the view of Prof. Roosa[1], it is necessary to be cautious so long as the untapped resources of the financial intermediaries are still available for use. In the words of Samuelson[2], "with important cost-push forces assumed to be operating, there are many models in which it can be shown that some sacrifice in the requirement for price stability is needed if short-term and long-term growth are to be maximized and if average long-run unemployment is to be minimized, if optional allocation of resources as between different occupations is to be facilitated." Only wage policy and price policy alone are not the only obstacles to effective monetary policy. There is also the difficulty of influencing government spending through monetary policy and the effects of automatic stabilizers. There may be some major institutional factors restricting the effectiveness of monetary policy and other limitations on the areas of impact and on the possible general effectiveness of monetary policy, limitations so severe that they could not have been overcome except as an intolerably high price.[3] These limitations include the pressures from (a) excessive market power, whether of business firms or of unions, (b) substantial increases in the volume of consumer finance, at least in the short run, (c) the rising proportion of overhead costs to total costs, (d) shifts in the composition of aggregate demand even when the total is fairly constant, because of supply shortages and other bottlenecks, and (e) more generally the "escaping" sectors. General monetary controls are often limited by these factors.[4]

Keynes' General theory itself was not antagonistic towards monetary policy in general, although it did emphasize the possibility

1. Ibid—Roosa's article.
2. Ibid—Samuelson's article.
3. Ibid—Angell's article.
4. Ibid.

that a highly elastic liquidity preference schedule might render it impotent in time of severe depression.[1] But it is a fact that a plethora of money may fail to start a recovery if the monetary authorities are not assisted by the fiscal operations of the Government.

The recent growth of confidence in the effectiveness of monetary policy can be attributed, in part, to an extensive reconstruction of the theory on which it sets. The effects of changing interest rates on expenditures have been played down, while, on the other hand, the possibility that even relatively small changes in interest rates may have quite substantial effects on the supply of funds entering the money and capital markets has been emphasized. Or, as R. V. Roosa[2] puts it, attention has been focused on lenders and the effects of monetary policy on the terms on which they will make funds available. This increase in the sensitivity of the supply of funds has been attributed to the growing importance of the public debt and the expanded role played by the institutional investors in recent years.[1]

W. L. Smith[3] believes that "there has recently been a tendency to exaggerate the effectiveness of monetary policy and to gloss over its weaknesses." Smith considers "some of the arguments that have been advanced concerning the effects of monetary policy measures on the supply of funds emanating from financial institutions." After examining some of these arguments, Smith tries to show that "the growth and wide distribution of the public debt and the increased importance of large financial institutions have, in some respects at least, reduced rather than increased the potency of monetary policy."

The controversial issues raised by the eminent monetary theorists in the pages of the Review of Economics and Statistics (August, 1960) suggest that the group of writers headed by the financial experts of the Federal Reserve System emphasize the close substitutability

1. Keynes—General Theory of Employment, Interest and Money. P. 172-73.

2. R. V. Roosa—"Interest Rates and the Central Bank."—Money, Trade and Economic Growth: In Honour of J. H. Williams. (New York 1951), Pages 275-76, 279.

3. W. L. Smith—"On the effectiveness of Monetary Policy." A. E. R. Sept., 1956.

between money and bank credit. This school holds the view that bank credit and other forms of credit are perhaps better substitutes for money and, therefore, seeks to reject money in favour of the broader concept of the total amount of credit outstanding. What matters most in this context is the total amount of credit outstanding, the quantity of money exercising an influence only because bank credit is a component of total credit. But this type of analysis implies an unstable velocity function.

The Radcliffe-Sayers thesis gives emphasis on the idea that the supply of money is not the main lever of monetary action. The whole structure of interest rates, including the differential interest rate in operation due to the activities of the non-banking financial intermediaries, is of utmost importance. The structure of interest rates highlights the effects on the liquidity of the various groups of financial enterprises due to a change in the rate of interest which has directly or indirectly influenced the level of total demand.

There are two ways in which the level of total demand can be influenced by monetary actions. First, by changing the interest rate it is possible to induce a change in the incentive to hold stocks of commodities or purchase fixed capital goods. In the words of the Radcliffe Committee. "Whether it is short rates and commodity stocks or long rates and constructional works that are in question, the force of the argument depends on how important interest changes are in relation to other elements, among which risk is often prominent."[1] When the cost of borrowing changes, it has an impact on incentive to hoard stocks, and to purchase capital equipments. This has been characterised by the Radcliffe Committee as "interest incentive" effect, and the Committee is of the opinion that the impact of this incentive effect upon the decisions of business firms to hold stocks or to purchase capital equipments is more or less limited. Secondly, the level of total demand can also be influenced by a change in the interest rate via the liquidity conditions of financial institutions, business firms and people in general. The Committee gives stress on the regulation of the total liquidity of the system. The spending decisions, the Committee argues, depend on the supply of money lent on the general liquidity of the economy.

1. The Radcliffe Report, Para, 386.

The whole structure of interest rates here is important in so far as it affects the liquidity of the various groups of financial institutions which in turn affects the liquidity of others. But the concept of liquidity which it is difficult to measure, also implies a highly flexible, complex and unstable velocity function.[1]

Another school of thought led by Gurley and Shaw analyses the role of finance, particularly of the non-bank financial intermediaries, in course of economic development and have shown important implications of this analysis for monetary theory and policy. Gurley and Shaw[2] argue that real economic development is accompanied by a process of financial development in which primary securities gradually become differentiated and different types of financial intermediaries enter into the scene—of which commercial banks are but one variety. The main function of both the banking and non-banking types of financial institutions is to enable asset holders to possess primary securities indirectly in the more attractive forms of different types of financial claims issued by different categories of these intermediaries. Gurley and Shaw hold the view that *monetary policy simply aiming at controlling the 'quantity of money' or 'supply of money' cannot be fully effective.* When the whole structure of finance is taken into consideration and the activities of the non-bank financial intermediaries are fully recognised, monetary theory becomes more realistic and broad-based. The central bank's regulatory power should be extended to the non-bank financial intermediaries. While the Radcliffe-Sayers Thesis emphasizes the idea that spending decisions are not directly affected by interest rates and that they are solely dependent on the total liquidity of the system, in the Gurley-Shaw thesis the 'quantity of money' relevant for monetary theory and policy has to include the liabilities of non-bank financial intermediaries. The Radcliffe Committee argues that banks are important not because they create money but because they make loans. The non-bank financial intermediaries are important as purchasers of assets although they have lending function. It is of no use to control the money supply ; it will be fruitful to control bank advances by imposing an effective ceiling on

1. Alak Ghosh—Financial Intermediaries and Monetary Policy in a Developing Economy. (World Press, 1964), P. 17.

2. Gurley and Shaw—Money in a Theory of Finance.

the absolute total or advances of each bank or of all banks together and extending selective methods of credit control for regulating the lending of the non-bank financial intermediaries.[1] The Gurley-Shaw thesis, however, rejects the conventional dichotomy between commercial banks as creators of loanable funds and financial intermediaries as brokers of loanable funds. Gurley and Shaw argue that all types of financial intermediaries can create loanable funds.[2] So, the present methods of credit control, according to them, discriminate against banks in their competition with non-bank intermediaries. They also advocate the extension of central bank's power over the non-bank intermediaries. In fact, they hint at the idea of experimenting with the minimum reserve-requirement formula for the non-bank financial intermediaries in addition to the banks.[3]

Thus we find a vast welter of controversies over various aspects of monetary policy and its effectiveness. The controversies will, no doubt, continue to exist, and here we are reminded of the famous saying of Prof. Schumpeter : "Giving a car brakes may seem to slow it down, but actually cars go faster because they have brakes."

Fiscal policy for the control of inflation

A review of the forces governing inflationary pressure is essential before any fiscal policy is formulated for controlling inflation. As we have argued, there are two forces. *viz.*, *demand-pull influences* and *cost-push influences* governing inflationary pressure. While the two types of forces are inter-related and usually operate in conjunction with each other, they may occur separately. While the *demand-pull influence* is the manifestation of an excess of total spending over the current rate of output at prevailing prices, in situation in which full employment is attained, the cost-push influences tend to raise prices by increasing costs of production. Once the inflationary process starts, it becomes cumulative, the wages-price spiral being the most familiar manifestation of the cumulative process. Higher prices lead to demands for higher wages which in turn lead to still greater price increases and so on.

1. The Radcliffe Report, Paras 525-27.
2. Gurley and Shaw—Money in a Theory of Finance, P. 243.
3. Alak Ghosh—Financial Intermediaries and Monetary Policy in a Developing Economy. P. 21.

Fiscal policy for controlling inflation involves adjustments in Government expenditures, taxation, and borrowing and debt management policies. To combat inflation either of the two courses may be followed by the fiscal authorities :

(1) *Expenditure may be lowered relative to taxes.* Expenditures may be lowered when taxes are held constant or expenditures may be lowered while taxes are raised. (2) *Both Expenditures and taxes may be lowered by an equal amount.* The first of these courses creates a budgetary surplus (assuming that the budget was balanced before the action was taken). The second course keeps the budget balanced but at a lower level than before. Borrowing and debt management policies involve a close inter-relationship of governmental and central banking policy.

Fiscal policy for controlling inflation must aim at checking the growth of *demand-pull* and *cost-push* influences. It must seek to curtail the volume of spending in such a manner that costs of production are not increased. Since excessive aggregate spending is a primary cause of inflation, a reduction in gevernmental spending, which is one element in the total tends to lessen the inflationary pressures. Inflationary pressures can be lessened if light public construction of various types can be postponed. Subsidies given to those industries which have got "quick fruition lags" may raise the supply elasticity of goods ; so, if subsidies are used judiciously they may check inflationary pressures to some extent.

High taxation has a deflationary effect. Anti-inflationary effectiveness of taxation depends upon the types of taxes which comprise the tax structure. Taxes which seek to absorb the surplus cash-balances of the individuals or to check the private expenditures have got a deflationary effect. *Demand-shifting* and *demand-absorbing* excise duties tend to lessen inflationary pressures by discouraging the persons from buying particularly scarce commodities and by absorbing the surplus purchasing power that would otherwise be used for inflationary spending respectively. According to Colin Clark, if tax revenues exceed 25 per cent of national income, it will be inevitably inflationary.[1] His conclusions are based upon some

1. Colin Clark's article in Harper's Magazine. December 1950, pp. 67-69.

inconclusive statistical data in the post-World-War period and economic analysis. As a result of high taxation, Clark points out, incentives for further production will be impaired. Trade unions also will give pressures for higher wages and the employers will become less resistant to wage increases. The result will be a rise in the cost of production. Cost-push influences then will have the upperhand and there will be an inflationary pressure.

Pechman and Mayer[1] point out that the statistical evidence in this respect is very meagre. The actual effects are dependent upon *the type of tax structure, the purpose of government expenditure, the general reactions of the tax payers to high tax rates, the length of time the high rates have been in effect, the reaction of the people to the usefulness of the expenditures out of that tax revenue, the relationship of marginal to average tax rate, the length of time the high rates have been in effect,* and other factors. In one country the breaking point may be reached at 10 per cent, in another at 50 percent.

The higher the level of government expenditures, *i.e.* greater are the demand-pull influences, the greater is the likelihood that a budget surplus will be required to check inflation, unless governmental activities are of such character as to discourage private investment. To what extent a balanced budget will check inflation depends upon (a) the magnitude of the inflationary pressure, (b) the contractionary effect of the tax system, which, in turn, is dependent upon the types of taxes used and the effects which these taxes have upon spending and (c) the expansionary effect of the government expenditure programme, which, in turn is largely dependent upon the purposes for which the expenditures are made.

There is no particular magic about taxes, as compared to borrowing, that insures that the financing of all expenditures will then check inflation.[2] On the whole, of course, taxes are more deflationary than borrowing. But there are some types of taxes which are better than borrowing and there are some special cases in which taxation may be weaker than borrowing in controlling inflation.

1. Pechman and Mayer—"Mr. Colin Clark on the limits of taxation." Review of Economics and Statistics, August, 1952, pp. 232-42.

2. J. F. Due—Government Finances, Ch. 29, P, 473.

The extent to which borrowing can check inflationary pressure depends upon the sources of the funds as well as the types of securities used, the inducements given to buy and to hold securities, and the interest rate policies followed. The type of public borrowing which has a deflationary effect on money supply and the effective demand is one that absorbs purchasing power. Compulsory saving or the "deferred pay system" is a kind of effective anti-inflationary public borrowing. According to the deferred pay system, the consumers defer a part of their pay by purchasing savings certificates redeemable sometime after decline in the inflationary pressure.

Anti-inflationary debt management policy refers to the retirement of bank-held debt out of a budgetary surplus. Debt management policy is important for bringing about a co-ordination of the fiscal and the monetary policies for controlling inflation. If the retirement of bank-held government securities takes time, the banks will go on giving advances to its customers against the reserves of government securities or selling these securities on the open market thus neutralising the impact of all anti-inflationary policies. So retirement of bank-held government securities is important for controlling inflation and that can be done *out of a budgetary surplus*, and by refunding bank-held public debt by *sale of bank-ineligible bonds to non-bank investors.* For the success of debt management policy, a large and continuous budgetary surplus is necessary out of which maturing public debt can be retired. The second method of debt management, *i.e.*, refunding bank-held public debt by sale of bank-ineligible bonds to non-bank investors will not be effective if the non-bank investors are reluctant to give up spendable money for the purchase of government securities.

Whenever inflow of gold is deemed to be inflationary in effect, the government may decide to "*sterilize*" gold so as to prevent bank reserves from increasing along with acquisition of gold. The government sterilizes gold by *paying for gold purchases out of the proceeds of the sale of government securities deposited at member banks.* This policy is significant only for a country like the U. S. A. where we find large inflow of gold.

Overvaluation of a currency is sometimes anti-inflationary in

2. Ibid.

effect since it has got (a) a discouraging effect on exports and on domestic money income, (b) an encouraging effect on import and (c) a cheapening effect on the price of those foreign equipments and materials which enter into the domestic cost of production. By these effects overvaluation puts a check on the upward cost-price spiral. But to what extent overvaluation will be successful to ensure these effects depends upon the elasticity of foreign demand for exports and the elasticity of home demand for imports. If this elasticity is greater than unity. *i.e.*, if a slight overvaluation of the currency induces a great increase in the volume of imports and a fall in foreign demand for exports of the home country, overvaluation will be successful in keeping the rising price level in check. But it will have some unfavourable effect on the balance of payments position. Fiscal Policy cannot provide a remedy for income-inflation caused by wage-price spiral. For the success of a restrictive fiscal policy, an efficient administrative machinery is essential.

Monetary Controls vs. Fiscal Controls as stabilization instruments

There is some sort of overlapping of the boundaries between the monetary controls and fiscal controls. Government manipulation of the long-term bond market can be regarded either as a monetary or as a fiscal control. Monetary weapons can have a rapid but limited effect operating *mainly through changes in the availability of credit* ; they can also have a very slow but quite considerable effect, operating *through changes in the general level of long-term interest rates.*

It is true that a contraction in money supply can arrest a boom. Although monetary policy is useful for the delicate task of maintaining a situation of full employment without inflation, it fails to start a recovery on its own accord after a depression. Even in controlling the inflationary pressure, it should be supplemented by a suitable fiscal policy. In the case of debt management policy we have seen that retirement of debt held by commercial banks is essential for the success of monetary policy. The reason is that as long as commercial banks are "loaded" with government securities, they can always sell them on the open market for getting additional reserves ; the central banking controls then become ineffective. This is where fiscal policy comes to the rescue of monetary policy.

The two approaches, *i.e.*, monetary and fiscal controls, are complementary, and both have a part to play in any satisfactory control mechanism. Only monetary policy or fiscal policy in isolation is not enough for the control of inflation.

It is often argued that at low rates of interest amount of money available for investment is actually quite large and that when the accumulation of capital has brought the marginal productivity of capital down to the low levels, and with it, under constant price-level conditions, the money rate of interest, it becomes appropriate to abandon traditional monetary policy in favour of fiscal policy as a means of stabilizing the economy.[1] If conditions are such that the productivity of capital is high, as it may be, for instance, in underdeveloped countries, we may then have a sudden spate of capital-requiring innovations. In that case, it is appropriate to return to a more complete reliance on monetary policies and expect less from the Keynesian fiscal policies.

If the economy is operated at high-money interest rate where the monetary controls are applied with the end of stabilizing the economy in view, then fiscal policy can be used, within limits, to influence the rate of capital formation, when monetary policy is ineffective at a low-money rate of interest, fiscal policy must be used to stabilize the economy.

But there can be little doubt that a restrictive monetary policy, applied with sufficient vigour, can exert a potent restraint on aggregate expenditures. If the brakes are applied violently, however, serious disturbances in the market for long-term government and corporate securities are likely to result.

It has been said that the great advantage of monetary policy over fiscal policy is the superior administrative flexibility and the speed with which it can be adopted to changing circumstances. However, we should not neglect the importance of the lag relevant to any kind of economic stabilization programme. W. L. Smith considers three kinds of lag in the operation of monetary policy :[2]

1. William S. Vickrey—"Stability Through Inflation." Post-Keynesian Economics, edited by Kurihara, P. 97.

2. W. L. Smith "On the effectiveness of Monetary Policy." American Economic Review, Sept. 1956.

(a) the time that elapses between the need for action and recognition of the need, which may be called the *recognition lag* ; (b) the time that elapses between the recognition of a need for action and the actual taking of action, which may be called the *administrative lag* ; and (c) the time elapsing between the taking of action on the economic situation, which may be called the *operational lag.* For discretionary monetary and fiscal measures, the recognition lag is more or less independent of the particular measures used. The administrative lag is much shorter for monetary policy than for fiscal policy. The great advantage of fiscal policy is that it has a powerful impact on the income stream, whereas monetary policy's primary impact is on the asset structure and only through its effects on their structure does it indirectly and with some delay affect the income stream.[1]

The ideal situation, as Prof. Smith sees it, would be one in which both monetary and fiscal techniques had been developed to such a high degree of efficiency that the combination of the two to be employed in one situation could be decided on the basis of such considerations as the relative social priorities of additional consumption investment and government services, etc.

Monetary policy can successfully temper the essentially moderate fluctuations in economic activity that occur under normal conditions. But Smith contends that it would be a dangerous mistake to overrate its potency and to place major reliance on its stabilizing power to the neglect of fiscal policy. We should not let our enthusiasm for monetary policy distract us from the job of developing techniques of fiscal policy that will permit us to use its tools more effectively to moderate savings in economic activity.[2] At the same time, we should not be so complacently satisfied with the effectiveness of monetary controls that we make no effort for improving them or for devising better ones. The effectiveness of monetary policy would be considerably increased if we could devise more effective methods of controlling commercial bank lending. More thought may be given to the feasibility of adopting a variable secondary reserves requirements on assets rather than deposits.[3]

The limitations of monetary policy do not prevent it from being

1. Ibid. P. 606.
2. Ibid. P. 606.
3. Goldenweiser—American Monetary Policy (New York 1951), Page 59-60.

useful as an element in a general programme of attaining economic stability. Monetary policy is much more flexible than fiscal policy and is politically more acceptable since it gives rise neither to government deficits in depressions nor to tax increases in the periods of inflation.[1] Mild recession can probably be checked by interest-rate reductions, and mild inflations by general tightening of credit. But for mitigating cyclical fluctuation of severity, fiscal policy is a much more positive type of programme.[2]

But these two policies should be complementary. Let us suppose, we are in a position of under-employment equilibrium and that the money supply has increased. This will lead to an increase in the supply of asset money. Within some limits, this may be expected to reduce interest and raise investment. In the special Keynesian case, interest cannot continue to fall for ever ; the liquidity preference schedule becomes infinitely elastic, thus setting a floor to the rate of interest. In this special case, monetary policy is totally helpless and without hearing on either real or monetary magnitudes of the system.....Fiscal policy now has its day.[3]

We have already noted that Fiscal Policy also has its limitations. So the best course open to us is to integrate monetary controls with fiscal controls for achieving economic stability.

Non-monetary measures for the control of inflation

Non-monetary measures for the control of inflation include among others (a) output adjustment, (b) wage policy and (c) price control and rationing. Only these measures are not sufficient for checking inflationary pressure. For effective control of inflation, these should be supplemented by adequate monetary and fiscal measures. Increased production is definitely a basic solution to the problem of inflationary gap. But it is not very easy to raise the level of production immediately in response to excessive demand when the economy suffers from some bottlenecks. The wage policy during a period of inflation should be formulated in such a manner that wages rise *pari passu* with increases in the general productivity of the labourers.

1. Due—Government Finances.
2. Ibid.
3. Musgrave—The Theory of Public Finance, P. 415.

Price control and rationing can frustrate the excess of planned purchases of commodities and/or factors over the available supply of commodities and/or factors. The function of price control is to establish a legal ceiling beyond which the prices of particular commodities may not rise. Rationing also seeks to give pressure on the consumers for curtailing their demand. Direct controls may be particularly advantageous as weapons for controlling the economy, at least in countries where the people will ungrudgingly accept these controls. This matter of enforcement is an important one ; direct controls need a cumbersome administrative organization if they are to work. Direct controls have got the advantage of being operated in a discriminatory manner. Direct controls and rationing seek to divert consumption from those articles of consumption whose supply needs to be restricted for some special reasons. Keynes criticises rationing on the ground that it involves "a great deal of waste, both of resources and of enjoyment."[1] There are some strong economic arguments against direct controls. They tend to inhibit innovations, such as new technique.[2] They have got the likelihood of inducing speculation which may be destabilizing. Again, by putting pressures on one part of economy, direct controls cause increased strain in other parts. In fact, direct controls may lead to suppressed inflation.

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6

NEWLOOK MONETARY POLICY

The recent re-discovery of money has made the economists attach importance not only to the role of short-term public debt in regulating the working of monetary techniques of control, but also to the obligations of non-bank financial intermediaries. Thus the horizon of monetary policy has been widened and this has been mainly done by three distinct groups of writers. The first group of writers headed by the financial experts of the Federal Reserve System emphasize the loose substitutability between money and bank credit, and they go to the length of rejecting money in favour of the broader concept of the total amount of outstanding credit.[1] The second group of writers have been largely influenced by the *Report of the Committee* on *the Working of the Monetary System*, usually known as the Radcliffe Report in the name of the chairman of that Committee. The Radcliffe Committee deals with the policy implications of the Liquidity Theory of money and it has been further expounded by Prof. Sayers,[2] who was also a member of the Committee. The third group of writers headed by Gurley and Shaw give emphasis on there impact of monetary policy on the financial structure of the Economy.

Main issues of Monetary Policy as considered by the Radcliffe Committee

The objective of monetary action is to regulate the total demand for goods and services, but this cannot be achieved by regulating the quantity of money, meaning by "money" notes and bank deposits. The Radcliffe Committee rejects the view that if only the central bank keeps a tight control on the supply of money and "either keeps it fixed or allows it to increase only with the growing needs of a growing economy all will be well." The Committe would not go so far as to say that "the supply of money is an unimportant quantity' but they "view it as only part of the wider structure of liquidity in the economy."

1. "Controversial Issues in Recent Monetary Policy: A Symposium" Review of Economics and Statistics, 1960. See the views of all the writers.

2. Article of Sayers: "Monetary Thought and Monetary Policy in England." The Economic Journal, Dec. 1960.

The *haziness of the connection between the supply of money and the level of total demand lies in the impossibility of limiting the velocity of circulation.* In the words of the Committee, "we have not made more use of this concept because we cannot find any reason for supporting, or any experience in monetary history indicating, that there is any limit to the velocity of circulation : it is a statistical concept that tells us nothing directly of the motivation that influences the level of total demand."[2] An analysis of liquidity, on the other hand, directs attention to the behaviour and decisions that do directly influence the level of demand.

In the Radcliffe Committee Report, nowhere we find the clear explanation of the notion of the "over-all liquidity position" ; but it is clear from the argument in several places that it is meant to include easily realizable financial assets—deposits in the savings banks, shares in the building societies, bonds of relatively short maturity, etc.—as well as the "methods, moods and resources of financial institutions and other firms which are prepared (on terms) to finance other people's spending."[3]

The Radcliffe Committee rejects the view that central banking policy could be made more effective by substituting "for the traditional control of the supply of money" a complex of controls over an indefinitely wide range of financial institutions. This would be unwelcome not mainly because of the administrative burdens it would involve, but because the further growth of new financial institutions would allow the situation continually to slip from under the grip of the authorities. However, the Committee thinks that the over-all liquidity position can be controlled by action taken by the central bank to manipulate "the entire structure of interest rates" (as distinct from action confined to the short-end of the market) because "a movement of interest rates implies significant changes in the capital values of many assets held by financial institutions ; a rise in rates makes some less willing to lend because capital values have fallen, and others because their own interest structure is sticky. A fall in rates, on the other hand, strengthens

1. Radcliffe Report, Paragraphs 388-89.
2. Ibid, Paragraph 391.
3. Radcliffe Report, Paragraphs 389-392.

balance sheets and encourages lenders to seek new business."[1] It is for this reason, the Radcliffe Committee follows. Professor Kahn in insisting upon the structure of interest rates, rather than some notion of the "supply of money" as the "centerpiece of monetary action."[2] They do so not because they have any sanguine expectation concerning the incentive effect of changes in interest rates upon the willingness to invest or to save. They are skeptical of the effects of changes of interest rates upon the incentives to save and they have not been able to find that the credit squeeze of 1955-58 had "any marked effects on holding of stocks of commodities", whilst as regards long-term investment, the evidence suggested that any effect was "not on projects already in train but on capital projects in their earliest planning stages—implying an effect on spending not immediately but many months later."[3] Nonetheless, the manipulation of interest rates, extending over the whole ranges of the financial market should have some effect by creating a "diffused difficulty of borrowing" through its effect on the liquidity position of financial institutions of all kinds. Prof. Kaldor[4] argues that this is in apparent contradiction to their conclusion regarding the policy of the credit squeeze in the latter half of 1950's (which had substantial effects on long-term interest rates as well as short, apart from the quantitative control of bank credit) that "the obstructions to particular channels of finance had *no* effect on the pressure of total demand, but have made for much inefficiency in financial organisation."[5]

Accordingly, the main function of central bank policy, the Radcliffe Committee argues, should be not just the setting of the Bank rate or open market operations in the short end of the market, but the management of the national debt, which they regard as the "fundamental domestic task of the central bank." "It is not open to the monetary authorities to be neutral in their handling of the task. They must have, and must consciously exercise, a positive

1. Ibid, Paragraphs 393-394
2. Radcliffe Report, Paragraph 395.
3. Ibid, Paragraph 460.
4. Kaldor—"Radcliffe Report". Review of Economics and Statistics, Feb. 1960.
5. Radcliffe Report, Paragraph 469.

policy about interest rates, long as well as short, and about the relationship between them."[1]

In discussing the theory of debt management the Committee reveals, however, that in connection with the large and continuous re-financing operations of the Treasury handled by the Bank of England, the monetary authorities do already exert a much more powerful direct influence on the long-term bond market than is commonly realized. Their plea, one presumes, is, therefore, for a more conscious and deliberate attitudes in setting long-term interest rates at levels thought desirable on general economic considerations.

The implication of this major conclusion is greatly weakened by the Committee's repeated insistence that it does not regard a policy of deliberate variation in the level of long-term interest rates as at all desirable. According to the Committee, an argument for more effective use of the interest rate weapon is an argument for widely fluctuating rates, not just for movement in one direction. If the wide fluctuation could usefully be confined to short rates, the case might be strong. But the stocks of commodities being extremely insensitive to interest rates, and they being financed with long-term capital, it is at fixed capital that the rate of interest must strike if it is to have any direct impact, and for this purpose the longer rates are relevant. The Committee does not think it advisable to contemplate much larger savings than hitherto in long-term rates of interest since this is impracticable. A stronger and more universal objection to widely fluctuating rates of interest is that the intricate and highly developed network of financial institutions bases some of its strength on the existence of a large body of highly marketable government bonds whose market values are assumed to have a considerable measure of stability. Their capital and reserve strength would be regarded as gravely weakened if they did not usually hold large blocks of bonds of reasonably stable value.

But if this is so, what remains, Kaldor asks, of their contention that monetary policy is only effective through its effects on the liquidity (*i.e.*, the "reserve strength") of the financial institutions, and therefore manipulation of the structure of interest rates must be the "centerpiece of monetary action"? And how is it to be

1. Radcliffe Report, Paragraph 282.

reconciled with their claim that the "one positive recommendation" they are able to make is that the authorities "could make a more deliberate use of interest rates ?"

The Committee, however, clarifies its position later on, and argues that the "authorities should think of rates of interest and particularly long rates as relevant to the domestic economic situation. The authorities should not aim at complete stability of rates, but should take a view as to what the long-term economic situation demands and be prepared by all means in their power to influence markets in the required direction."[1] But the Committee does not explain, or even discuss, the question of how the "authorities" or anybody else can take a clear view of what kind of interest structure the long-term economic situation demands.

The conclusion that monetary policy should play a purely passive role in the (short-term) regulation of the economy is nowhere explicitly put, though the Report contains plenty of passages indicating that something like this was at the back of the committee's mind. Their whole review of the monetary policy of the late 1950's amounts to a severe condemnation, partly because of its jerkness, and partly because of its "directional effects", in concentrating its impact on the particular industries or firms, which is undesirable from the point of view of the economy. "We are driven to conclusion that the more conventional instruments have failed to keep the system in smooth balance.... ..It is removed from the smooth and widespread adjustment sometimes claimed as the virtue of monetary action ; this *is no gentle hand on the steering wheel that keeps a well-driven car in its right place on the Road.*"[2]

The Committee finally concludes that "monetary measures cannot alone be relied upon to keep in nice balance an economy subject to major strains from both without and within. Monetary measures can help, but that is all." The Committee is skeptical also of the effect of monetary measures on international capital movements and thus on the balance of payments position on which the Macmillan Report laid much emphasis, and looks to an enlargement of international reserves through reconstituted I. M. F. as a solution to short-period balance of payments crisis.

1. Radcliffe Report, Paragraph 472. Italics mine.
2. Radcliffe Report, Paragraph 498.

If monetary measures are not to be relied upon to maintain financial and economic stability, what is? The alternatives are direct controls or fiscal measures, but the Committee refuses to enter into the question how far these should be employed in preference to, or in combination with, monetary measures.

The Committee gives its reluctant blessing to the use of various "emergency measures" in "emergencies" (such as quantitative ceiling on bank advances and on variable minimum reserve requirements; control over new capital issues and over hire purchase credit) though the use of several of these controls in the recent "emergencies" was severely criticised in the Report for inappropriateness or inefficiency.

The Committee also throws some light on the velocity of circulation of money. The basis of the quantity theory, and of the whole "monetary" approach to economic policy which follows from it, is the belief that there is some "normal" velocity, firmly grounded in long-standing habits and conventions, which brings it about that changes in the *quantity* of money in circulation enforce corresponding variations in the *flow* of money expenditures. The Committee, on the other hand, believes that the velocity of money is a purely statistical concept of no causal significance, which varies automatically with changes in the quantity of money in relation to total expenditures. But the Committee does not deal with the matter in details. The emphasis on the "whole liquidity position" in contrast to the "money supply" must be puzzling to all those who believe that non-monetary financial institutions are merely channels in the investment of funds incapable of "creating" money or credit in the manner of the clearing banks whose deposits alone provide the media of payment. The Committee's whole position is in contrast to this view, and is evidently based on the assumption that financial institutions, whether or not they provide direct media of payment, do invariably create "liquidity"—since it is the peculiarity of all such institutions that their liabilities are considered as "liquid assets" by the lenders (*i.e.*, their depositors) whilst their assets are not treated as liquid liabilities by their borrowers. Hence, the growth of the non-banking financial institutions, by providing new substitutes for deposits with the clearing banks, has much the same effect as a spontaneous reduction in the desire to hold money. If this is so, the non-banking financial institutions also should be

controlled by the central bank when the commercial banks are to be controlled.

The Radcliffe doctrine has focussed attention on the entire complex of factors which make up the liquidity of the economy rather than on the money supply alone which is only an element in the whole complex. Nevertheless, the Radcliffe doctrine can be criticised on the following grounds :

In the first place, the Radcliffe Committee has not sought to define the concept of liquidity and has kept vague the relationship between liquidity and the factors governing spending decisions. Secondly, the Committee has given so much emphasis on the role of the liquidity effect that in its enthusiasm it has underestimated the importance of the supply of money in influencing the spending decisions. The Committee has not also contributed something new to the analysis of the liquidity effect, and the essence of its thought is to be found in Prof. Hicks's "Value and Capital."

Thirdly, the Committee does not provide us with a set of positive and simple recommendations which might guide monetary policy in future. Its words also are not final words on monetary policy. According to the Radcliffe doctrine there are two alternatives if monetary policy is to remain a major policy instrument. The first is to impose "liquidity controls" over a wide range of financial institutions and the second is to achieve a control through the exercise of the "liquidity effect" of changes in the rate of interest. The first alternative is considered to be administratively difficult while the latter policy is ruled out in practice since it may result in serious financial situation. That is to say, the Radcliffe doctrine makes monetary policy subordinated to fiscal policy in normal times and advocates the revival of monetary controls only in times of emergency. This argument can be accepted in all circumstances. In India, for example, both monetary policy and fiscal policy have been given equal status as stabilization instruments. The first alternative as referred to above can be implemented if the monetary authorities possess that much of vision and efficiency which is necessary for implementing it. Gurley and Shaw however, are in favour of extending the control of the central bank to the non-banking financial intermediaries so that 'liquidity controls' as

contemplated by the Radcliffe doctrine can be imposed over a wide range financial institutions.

Finally, according to Prof. E. V. Morgan, and other "traditionalists", it is incorrect to say that the velocity of circulation of money can be increased in the Radcliffe process even in the face of a stringent monetary policy followed by the monetary authorities. The Radcliffe type of credit expansion calls for the fulfilment of the following four conditions of which the first three conditions are never fulfilled :

(1) The non-banking financial institutions will be always ready to purchase any amount of security from the banks in need of cash for expanding loans in the face of a stringent monetary policy.

(2) The non-bank financial institutions accept deposits like banks so that the money given out by them to the banks come back again to the intermediates in the form of deposits so that the non-banking financial institutions' cash position is maintained.

(3) If near-money assets are sold by banks to the non-banking financial institutions, it does not result in a fall in the prices of near-money assets.

(4) The ratio of M to Y, *i.e.*, of money supply to national income should be high or there should be sufficient amount of idle money in the economy to be activised by the Radcliffe process.

The "traditionalists" contend that while the first three of the above-mentioned conditions are never fulfilled, the fourth condition, *i.e.*, the maintenance of a high ratio of money supply to national income was fulfilled only in the late forties of this century making the Radcliffe-type expansion possible ; but the position has much changed in the fifties when we found all-round revival of monetary policy.

Gurley-Shaw Thesis as compared with Radcliffe-Sayers Thesis

Gurley and Shaw, depending upon the empirical evidences of Mr. Raymond W. Goldsmith, contends that there has been a relative decline in importance of commercial banks because of the rise of the non-bank financial intermediaries in the mid-twentieth century and so the monetary policy of the central bank which affects only the commercial banks have been largely so injured.

Gurley and Shaw argue that the Keynesian liquidity-preference

model is inappropriate to financial aspects of growth analysis for two reasons.[1] First, it does not permit direct debt to accumulate and affect financial determinants of spending. Second, it admits only two kinds of financial asset, money and bonds, on the assumption that the stock, though not the location of bonds, is fixed. The model, Gurley and Shaw argue, is not hospitable to the financial intermediaries whose development in recent decades has diversified indirect finance and marked commercial banking as a declining industry. Briefly, the financial aspects of the Keynesian model ignore the long-period accumulation of securities and the secular institutionalisation of saving and investment.[2] According to Goldsmith the ratio of commercial bank assets to the total assets of the financial institution declined from 52·8% in 1900 to about 33·9% in 1952. But Aschheim points out, the ratio of the assets of the commercial banks to the total financial assets declined from about 50 % to above 33 % from 1900 to 1933, and from the period 1933 to 1952 the ratio has remained more or less stable at 33%. It is also to be noted that the *time deposit business* of the commercial banks has remarkably fallen, and this has led to a relative decline in the rate of over all growth of commercial banks relative to the non-banking financial intermediaries.

Previously Gurley and Shaw held the view that both the commercial banks and the non-banking financial intermediaries are the *brokers* of loanable funds. In their recent formulation[3], they have contended that both the commercial banks and the non-banking financial intermediaries are the creators of loanable funds. They have pointed out the following role of the non-banking financial intermediaries :—

(i) The non-bank financial intermediaries successfully compete with the commercial banks by offering higher interests on the deposits and they induce the public to withdraw a portion of their time deposits from the commercial banks and keep it with the non-banking financial institutions.

(ii) To the extent the bank reserves of the non-banking financial intermediaries increase with the growth of deposits with

1. Gurley and Shaw—"Financial Aspects of Development"—American Economic Review, Sept. 1955.
2. Ibid.
3. Gurley and Shaw—Money in a Theory of Finance.

them, the public's bank deposits go down, with the result that the total amount of deposits of commercial banks remain the same.

(iii) The non-banking financial intermediaries give loans to their customers on the basis of their reserves with the commercial banks, just as the commercial banks give loans to their customers on the basis of their reserves with the central bank.

(iv) As the non-banking financial intermediaries accept deposits from the people just like commercial banks, a part of the loans given by them comes back as deposits with them, and these are kept as reserves with the commercial banks. And, on the basis of these reserves, the non-banking financial intermediaries can give further loans to the people, a part of which comes banks to them. Thus we find a process of *money-creation multiplier* as it happens in the case of commercial banks.

In assessing the role of the non-banking financial institutions, Gurley and Shaw argue that "development of financial institutions, including non-bank intermediaries, is both a determined and a determining variable in the growth process."[1] Gurley-Shaw thesis, unlike the Radcliffe doctrine which emphasizes the idea that spending is affected by the total liquidity of the economy, states that quantity of money relevant for monetary theory and policy has to include the liabilities of non-banking financial intermediaries. Radcliffe doctrine attaches importance to the lending operations of the non-banking financial intermediaries and not to their creation of loanable fund. But Gurley-Shaw thesis gives emphasis on the role of these institutions as the creator or supplier of loanable fund. Radcliffe doctrine believes that the lending operations of these institutions can be controlled through changes in the level and structure of interest rates, while Gurley-Shaw thesis contemplates the extension of the central bank's regulatory instruments and toy with the idea of having a variable reserve ratio applied to the non-banking financial intermediaries like the hire-purchase finance companies. The Radcliffe-Sayers view is that the existence of a large supply of near-money assets is a complicating factor in a monetary control particularly when the monetary authorities are

1. Gurley and Shaw—"Financial Aspects of Economic Development"—A. E. R. Sept, 1955, p. 532.

busy in applying monetary policy to the control of one type of liquid asset (*e.g.*, money). While the Radcliffe Committee gives stress on the lending operations of the non-banking financial intermediaries, Prof. Sayers[1] makes the approach broader by giving emphasis on their borrowing activities. Whereas Profs. Gurley and Shaw seem to give a simple definition of money (the liabilities of banks excluding time deposits, with zero interest rate, or a fixed 'implicit interest rate'), Prof. Sayers does not try to give a workable definition of money for the sake of simplicity. While in Gurley-Shaw thesis, it is presumed that the adverse effects of the growth of non-banking financial institutions on the monetary controls may be neutralised in general by stiffer application of monetary controls, in the Radcliffe-Sayers analysis, monetary policy is to play any role in emergency only, normally it remaining subordinated to fiscal policy.

Although we find a fundamental difference between the relative approaches of Radcliffe-Sayers and Gurley and Shaw, it is evident that both these approaches have paved the way for the liquidity theory of money. The role of the non-banking financial intermediaries in the Gurley-Shaw thesis has increased the elasticity of the liquidity preference and undermined the restrictive efforts of the monetary authorities. The liquidity theory of money developed by both the approaches has eliminated a long gap in the theory of money created by the so-called quantity theory of money,—it has introduced "liquidity" as the 'missing link' between money and aggregate demand.

Aschheim's views

Prof. Aschheim has questioned the justification of depending too much on the empirical evidences of Goldsmith by Gurley and Shaw. He first raises the objection to Goldsmith's generalisation. He points out that the financial intermediaries were completely private in 1900. But soon after the depression 1929-30, we find a large number of government sponsored financial institutions. The government agencies can, and do, grow by their own decree. The assets of the commercial banks, Aschheim points out, as the ratio of the assets of the private financial agencies fell from 52·8 % in 1900

1. Sayers—Monetary Thought and Monetary Policy in England. Economic Journal, Dec. 196[illegible].

to only 44 % in 1952. Again, for the period 1933 to 1952, about one-third share of the bank assets in the total assets of the financial agencies has remained almost constant. Aschheim believes that the creation of credit by the non-banking financial institutions through a rise in the intermediaries' reserves with commercial banks and a fall in public's deposits with the banks will usually lead to a reduction in the bank lending. When the non-banking financial institutions will keep reserves with the banks they will keep it in the form of demand deposits which are withdrawable on demand. As a result, although the total deposits of the commercial banks will remain unchanged, the actual creation of deposits by banks will be contracted. Secondly, the non-banking financial intermediaries do not possess that much of capacity of making a multiple expansion of credit as is possessed by the commercial banks.

Thirdly, although the non-banking financial institutions carry on lending operations and thus create deposits, Aschheim points out that the deposit liabilities of these institutions cannot be used as means of payments while those of the commercial banks can be used as means of payments.

Fourthly, Aschheim does not agree with Gurley and Shaw that the growth of the non-banking financial intermediaries has sabotaged the cause of traditional monetary policy.

Lastly, Aschheim differs from Gurley and Shaw on the point of prescribing the rule that the non-banking financial intermediaries also should be required to maintain minimum reserves in the interest of the effectiveness of credit control policy of the central bank. Aschheim argues that empirical evidences suggest that it is in their time deposit operations in which the commercial banks are brokers rather than creators of loanable funds, that the American commercial banks are lagging. He also thinks that the Federal Reserve regulation has put the time deposit operations of member banks at a competitive disadvantage. He asserts that the higher the proportion of time deposits to total deposits of member banks of a given size group, the weaker the capital position of banks in that group. So, Aschheim concludes: "concern over the future capacity of commercial banks to foster economic growth, combined with reaffirmation of the conventional rationale of their regulation,

suggests not the extension or quantitative controls to other types of financial institutions but the freeing of time-deposits operations of commercial banks from regulatory suppression."

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2. Sayers—"Monetary Thought and Monetary Policy in England." —The Economic Journal, December, 1960.
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7

THE TRADE CYCLE

Business conditions never remain stable in a capitalist society. Economic prosperity is followed, late or soon, by economic depression. When national income and employment fall, prices and profits decline. The recovery may be fast or low. It may be incomplete or so strong as to lead to a new boom. The new boom may exist for a period creating enough employment opportunities and an atmosphere in which demand is brisk, prices are buoyant and the level of income is raised. Or it may also represent a quick, inflationary surge of prices and speculative activities to be followed by another crash. These phenomena take place within a period of time in a cyclical manner, and the English economists use the term "Trade Cycle" to give an explanation for these phenomena. The Americans call it "Business Cycle". In the words of Keynes, "a trade cycle" is composed of periods of good trade characterised by rising prices and low unemployment percentages, altering with periods of bad trade characterised by falling prices and high unemployment percentages"[1]. Mitchell defines business cycel as a fluctuation in aggregate economic activity. Prof. Hansen[2] suggests the following definition : the business cycle is a fluctuation in (*i*) *employment*, (*ii*) *output*, and (*iii*) *prices* (both consumer and wholesale prices) cyclically, these three move more or less in consonance, particularly with employment and output. In the recovery from deep depression, output and employment may rise rapidly with little increase in prices. Toward the end of the boom output and employment may rise very little, while prices may rise more rapidly.

A trade cycle reveals certain characteristics. In the first place, a trade cycle is simply a cycle in aggregate economic activity—recurring alternations of expansion and contraction. If the economy is left to itself, it fails to remain on an even keel. Period of expansion is, late or soon, followed by a period of contraction.

1. Keynes—A *Treatise on Money* Vol. I, P. 278.
2. Hansen—Business Cycles and National Income, P. 4.

Secondly, the upswing or downswing of trade cycle is cumulative or self-reinforcing. Once begun, the upswing or downswing persists in a given direction until some internal and external forces gather to neutralise the upward or downward movements of employment and output. If this is true, the movements are indeed wavelike in character.

Thirdly, whether the movements of employment, output and prices may strictly be characterized as *cyclical* is at least debatable All the economists agree that there is nothing "periodic" about the cyclical movements. These movements are recurrent but not rigorously periodic. Again, some cycles are mild and others are severe. Some cycles may be of a relatively long duration while others may last for a few years.

Fourthly, a trade cycle is pervasive in its consequences. Fluctuations in employment, output and prices in one time may be simultaneously reflected in other times also. We also find international propagation of the changes in employment, output and prices.

Different types of Trade Cycles

There is no specific time limit to the duration of a trade cycle. Generally, trade cycles vary from two to eleven years. Sometimes, a trade cycle may be of a relatively long duration, say, six to eleven years, when it is associated with important changes in business expectations as regards secular investment. A trade cycle of this type is known as Juglar Cycle, after the name of the French economist, Clement Juglar (1860). A trade cycle may be of shorter duration, say, two to four years, which is associated with short-run business expectations and with minor maladjustments. A minor cycle of this kind is known as Kitchin Cycle after the name of Joseph Kitchin (1923). Burns and Mitchell[1] hold that the available statistical evidences do not establish the existence of major cycles as distinct from minor cycles. But Prof. Hansen[2] accepts this distinction. Some economists hold the view that there are also long cycles which are of longer duration than eleven years. Thus they speak of "Kondratieff" long wave after the name of the Russian

1. Burns and Mitchell—"Measuring Business Cycles"
2. Hansen—Fiscal policy and Business Cycles. P. 27—41.

economist Kondratieff. The "Kondratieff" long wave is a slow wave-like fluctuation which is completed in a period of forty to seventy years. The upswings of the long waves are always indicated by rising tendencies of interest rates and prices. The declining phases also show falling tendencies in interest rates and prices. According to Prof. Schumpeter, the three known long waves, i.e., 1789—1814, 1814—1896 and 1896—1920, have coincided quite closely with the three tremendous surges of technological progress which characterised the last century or more. The first "Kondratieff" cycle was mainly due to the use of steam and steel and high rate of railroad building and the third cycle was mainly due to the discovery of electricity, development of chemistry and use of motors. The different types of business cycle can be shown in the following figure :

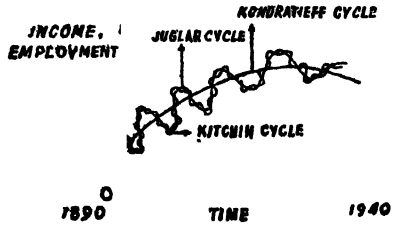


Fig. 27

Phases of a Trade Cycle

Burns and Mitchell[1] regard the *peaks* and *troughs* as the critical mark-off points in the cycle. From this standpoint the greater part of the cycle can be divided into two main parts : (a) the *expansion* phase, extending from trough to peak, and (b) the *contraction* phase, extending from peak to trough. Apart from this, we find lower and upper turning points of relatively short duration. At the lower turning point, *revival* grows rapidly into the long expansion phase. At the upper turning point, recession grips the economy, and soon develops into the contraction phase. Thus the trade cycle consists of four phases : (*i*) revival, (*ii*) upswing, (*iii*) recession, and (*iv*) downswing.

Some economists[1] distinguish five phases in the trade cycle, the

1. Burns and Mitchell—Measuring Business Cycles.
2. A. C. L. Day, for example. See his Outline of Monetary Economics, P. 322.

upswing, the boom, the collapse, the decline, and the depression.

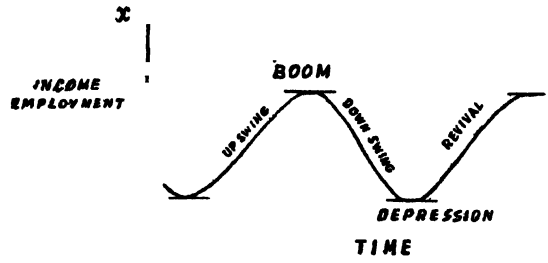


Fig. 28

The *upswing* is associated with rising activity, falling unemployment and slowly rising prices. The *upswing* culminates into *boom* which is marked by low levels of unemployment and sometimes by a certain tendency for an inflationary process to develop. The *collapse* involves sudden downturn in the level of business activity, falling prices and financial crisis. The *decline* is marked by a steady fall in the levels of activity and rising unemployment, together with falling prices. Finally, the depression is the situation in which the bottom has been reached, and there has not yet been a beginning of the recovery.

Trade Cycle Models

We shall now discuss some models of trade cycles. The important models of trade cycles are the following: (1) Schumpeter's model known as Innovation theory, (2) Hawtrey model known as a purely monetary explanation of the trade cycle, (3) Under-consumption theories, (4) Over-investment model, (5) Keynesian model, (6) Hicksian model. Last of all, we shall examine a generalized version of a trade cycle.

Exogenous explanations

There are, in fact, two exogenous theories of trade cycle, *viz.*, the Sunspot theory as developed by Jevons and H. L. Moore and the innovations theory as developed by Schumpeter. An exogenous explanation of a trade cycle means that the origin of business cycle lies in the fluctuation of something outside the economic system. According to Jevons trade cycles are caused by "sun-spots" which

occur in cyclical order at intervals of 10-45 years. The average duration of a trade cycle according to Jevons, is also 10-46 years. According to the "Sunspot" theory, when these sun-spots appear, the sun gives less heat and the result is a fall in the level of agricultural production which means a fall in income and employment of the agriculturists. But further research work has established the fact that though climatic changes may affect the level of agricultural production and consequently the level of income of the agriculturists, it is not an important determinant of cyclical fluctuations. At least, the statistical works of these writers fail to establish this theory.

Schumpeter's Model of the Business Cycle—Innovations theory

Schumpeter's theory of the business cycles is known as "innovations theory" of business cycles. Schumpeter's theory of business cycle runs in terms of a process inherent in the inner nature of a dynamic economy in which the impelling factor is the innovating entrepreneur. To quote Schumpeter, "If there be a purely economic cycle at all, it can only come from the way in which new things are, in the institutional conditions of capitalist society, inserted into the economic process and absorbed by it."[1] We will simply define innovation as the setting up of a new production function."[2] This covers not only new techniques of production, but also the introduction of commodities, new forms of organisation, and the opening up of new markets. Innovation represents a jump from an old production function to a new one, causing a *shift* in the marginal productivity curve.

The basic building block upon which the innovations theory of business cycle is based are : (1) the entrepreneurs and (2) innovations, plus the most important characteristic of *discontinuity* in the appearance of the latter. The entrepreneur is an innovator who is always ready to take a jump from an old technique of production to a new one and who is always capable of opening up new markets. The changes represented by innovation must be of large magnitude, "in the sense that they will disrupt the existing system and *enforce a distinct process of adaptation* which should show up as such in any

1. J. A. Schumpeter, "The Analysis of Economic Change" in *Readings in the Business Cycle Theory*, P. 7.

2. Schumpeter—Business Cycles, PP. 87-88.

time series material."[1] The innovations are not evenly distributed over time. Discontinuity in appearence is their essential features. They tend to "cluster", to come in "bunches" simply because "first some, and then, most firms follow in the wake of successful innovation."[2]

The Upswing of Prosperity—Let us first start from a position of equilibrium in the economy in which we may suppose savings to equal investment and in which unemployment does not exist. One or more innovators, being convinced of the probability of a particular innovation, may initiate the innovation process. Having obtained some amount of credit from the commercial banks, the entrepreneurs then establish new enterprises. There develops a pattern of expansion amply supported by the commercial bank supply of credit. The expansion proceeds by "rushes" because a forward push by the entrepreneurs impels a "herdlike" movement of followers who see the tempting profit possibilities opened up. Because of the discontinuity of innovations the new combinations in the process of production appear discontinuously in groups or swarms.[3] But many of the "older" firms are now faced with an increase in their costs and so they may be forced out of business altogether in certain circumstances.

The "swarm-like appearance of new enterprises" is intensified by the cumulative process—the secondary waves which spread all over the business sphere. Moreover, errors of optimism may further intensify the high tempo of business activity.

Recession—a period of adaptation—Schumpeter thinks that the boom will come to an end when the economic system reacts to the boom. Depression is the economic system's "adaptation to the situation into which the boom brings the system."[4]. The disturbances arising out of innovations are "big" and cannot be currently absorbed, and these disturbances disrupt the existing system and enforce *distinct process* of *adaptation*. This creates a difficulty for the new firms in respect of utilizing the receipts from the sale of their new products to repay outstanding bank debt. This

1. Schumpeter—Business Cycles, P. 101.
2. Ibid, P. 100.
3. Schumpeter—Theory of Economic Development, P. 223.
4. Schumpeter—Theory of Economic Development, P. 224.

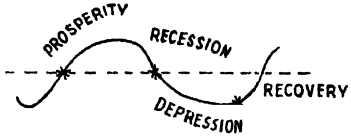
marks the beginning of credit deflation. Thus recession is a process of adaptation to the changed situation ushered in by the boom. The period of recession is necessary to allow the economic system to adjust to the innovations and set up a new equilibrium. The seed of the depression spiral is sown in the course of the boom by the "secondary" developments which take place during that period.

Depression—The period of depression in Schumpeter's analysis may be defined "as one in which there is being completed an accommodation to the new industrial situation created in the preceding period by the appearance of many relatively sudden innovations."[1] In the period of depression, we find losses, extreme pessimism and disillusionment. A rush for liquidity is likely to take place to build up cash balances against further emergencies.

Prosperity is followed by recession and then there is a process of adaptation through which the economy is back to "neighbourhood of equilibrium." But as the depressive forces gather momentum, the system outruns also this equilibrium and plunges down into depression.

Recovery—Schumpeter believes that there are certain forces of adjustment at work which tend to offset the depressive forces somewhat. One of these is what Schumpeter terms the "dilution or diffusion of effects," *i.e.*, the deflationary spiral tends to spread with increasingly diminished force. Collapse of some firms enables the remaining firms to undertake new methods of production. Innovators supply the propelling force that generates a new cycle. During the "recovery" phase employment will increase at an increasing rate up to the point of inflection.[2]

The four-phase cycle model developed by Schumpeter may be graphed in the figure No. 28 :



SCHUMPETERS FOUR-PHASE CYCLE

Fig. 28

1. Hansen—Business Cycle and National Income, P. 30
2. Schumpeter—Business Cycles, PP. 207-09.

Criticism

Many of Schumpeter's basic assumptions have got sociological implications. So, the criticisms of his theory of business cycle are rather sociological in character. In the first place, Schumpeter's definition of an entrepreneur who is an innovator "with revolutionary attitudes" as compared with the inertia of most people is not realistic. Moreover, the extreme emphasis placed on the entrepreneur creates a very strong *personal* element in the system of industrial development.[1]

Secondly, while there is a good deal of irregularity or *discontinuity* in the appearance of business cycles, the essential historical continuity in the development and appearance of innovations should not be lost sight of.

Lastly, Schumpeter ignores the other factors, *viz.*, the interaction of the multiplier and the accelerator, the marginal efficiency of capital and the level of aggregate effective demand, which govern the different phases of business cycles. Only the innovation process is not the necessary and sufficient condition of business cycles.

But still, Schumpeter's theory is very important in view of the fact that it has thrown some light on the close relationship between economic progress and business cycles.

Endogenous Theories

The endogenous theories of business cycles seek to account for cyclical fluctuations by means of mechanisms within the economic system itself which give rise to self-generating fluctuations in income, employment and prices. We shall now examine the endogenous explanations of cyclical fluctuations.

Purely Monetary Theory of Trade Cycle—Hawtrey Model

The purely monetary theory of the business cycle has been most uncompromisingly developed by Hawtrey. His theory is based upon three main factors : (1) the strategic role of the traders or wholesalers in the economy and their extreme sensitivity to changes in the discount rate ; (2) changes in the flow of money *i.e.*, changes in

1. Hamberg—Business Cycles, P, 242.

the demand for goods in terms of money which is generally determined by consumer's outlay ; and (3) the role of the so-called external drain and return of bank reserves.

Non-monetary factors may produce a partial depression in particular branches of industry in so far as they affect the consumer's outlay.

Changes in consumer's outlay are due to inherent instability of money and credit. Hawtrey thinks that the trade cycle is nothing but a replica, on a small scale, of an outright money inflation and deflation. If the flow of money could be stabilised, the fluctuations in economic activity would disappear. But it is not an easy task since the flow of money is never stable.

Hawtrey starts with the assumption that bank credit is the principal means of payment and that legal tender money is only subsidiary. The means of regulation of bank credit are the discount rate changes and the open market operations.

The Upswing—The upswing of a business cycle is brought about by an expansion of credit when the banks, confronted with the piling up of excess reserves, lower their discount rate for stimulating borrowing. The wholesalers or the traders who are peculiarly sensitive to such changes are then induced to increase their stocks. They become more willing to borrow money from the banks for increasing their stocks, and they give larger orders to the producer. The increased orders of the traders or wholesalers cause the manufacturers to raise their level of production and employment. This gives rise to an additional income and monetary demand on the part of the factors of production. Thus the whole amount of funds created by the banks is received as income by those engaged in producing the commodities. This finally results in an increase in consumer's income and consumer's outlay. Consumer's demand is then increased. Thus, in attempting to increase their stocks in response to the lower interest rate, the wholesalers actually create new consumer's demand "which tends to deplete their stock almost as fast as they are replenished." Increased demand means further increase in activity and the wholesalers who are still unsatisfied in the matter of increasing stocks further increase their orders to producers. A vicious circle or a spiral of cumulative expansion of productive activity is set up, fed and propelled by a continuous

expansion of credit and the dishoarding of idle cash balances. Another accelerating element in this situation is an increase in the velocity of circulation of money.

The Upper Turning-point—Prosperity comes to an end when credit expansion is discontinued and credit contraction begins in a cumulative way. Banks will begin to contract the volume of credit as soon as they find their cash reserves falling or as soon as there will be an outflow of gold from the country.

The Downswing—The contraction of credit exerts a deflationary pressure on prices, on money incomes and ultimately on inducement to invest. The rate of interest also is raised at that time by the banks for a contraction of credit. The combined effect of a fall in investment incentives or marginal efficiency of capital and a rise in the rate of interest is a strong damping of investments, particularly those made by traders who hold a strategic position in the economic system and who are highly sensitive to interest rate changes. The wholesalers will then try to reduce their stocks, and therefore, will curtail their orders to the munufacturers. The manufacturers also will curtail their level of production and employment. The income of the factors, as a result, will fall. So, there will be also a fall in consumer's income and consumer's outlay. There will be, thus, a cumulative contraction of productive activity. The vicious spiral downward is in all respects the negative counterpart of the vicious spiral upward.

Revival—Loans are liquidated during depression and generally money flows back from circulation into the reserves of the banks. Thus the reserve ratio tends to be normal. Hawtrey argues that after long depression, there will be always some people, who are willing to increase their borrowing and this should enable the banks to get over the dead point. The central bank then follows an open market purchase policy. Hawtrey is confident that if purchases of securities are carried far enough, the new money will find an outlet in circulation and this will contribute to an increase in consumer's income and outlay. Thus, a self-reinforcing process will be started.

Rhythm and Periodicity—Hawtrey argues that expansion cannot go on indefinitely since there is a limit to the increase in the quantity of money set by an overflow of gold from the country. So long as credit is regulated with reference to reserve proportions, the trade

cycle is bound to take place. Under the automatic working of the Gold Standard, "the length of the cycle was determined by the rate of progress of the processes on which the cycle depended, the absorption of currency during the period of expansion and its return during the period of contraction." According to Hawtrey, there is no trade cycle since the World War I, if by "cycle" we mean a periodic movement of marked regularity.

Criticisms

In the first place, Hawtrey's theory of business cycle can be criticised on the ground that it gives too much emphasis on the significance of the wholesaler in initiating changes in the level of business activity. *Secondly*, Hawtrey has also exaggerated the sensitivity of the wholesaler to changes in the rate of interest. If a cut in interest rate is supposed to be a temporary phenomenon, a wholesaler may not be at all willing to give more orders to the manufacturers. What is most important in governing the level of investment is not a fall in the rate of interest but a rise in the marginal efficiency of capital. Moreover, induced investments are governed mainly by an interaction of the multiplier effect and the acceleration co-efficient. Hawtrey model ignores the role of the multiplier and the accelerator and their interaction. Thus this theory ignores the factors which lead to an increase in investment and steady growth. The role of technology in initiating business fluctuations has also been ignored in this model. *Thirdly*, the business cycle is more than a monetary phenomenon. Production, sales mechanism, innovations and other real factors also affect the cyclical fluctuations. Moreover, it is the rise in the level of transactions (business and personal) which is essentially responsible for cash drain. *Lastly*, Hawtrey has given too much emphasis on the "inherent instability of credit" in the modern context. The idea of an inherent instability of credit is a product of the old commercial banking theories. The commercial banking school doctrines did take into sufficient consideration the changes in the velocity of circulation in the upswings and the downswings. In fact, recent theory has tended "to minimize the importance of such factors as the rate of interest and the operations of the banking system in explaining the trade cycle".[1]

1. A. C. L. Day "Outline of Monetary Economics. P 322.

Despite these criticisms, Hawtrey has made a real contribution to further analysis of the business-cycle theory.

Under-consumption Theories of the Trade Cycle

Under-consumption theories of business cycle date back as early as Sismondi, Rodbertus, Malthus, Marx and Lord Lauderable. Later on, Foster and Catchings on the one hand and Hobson on the other, developed the theory that the tendency to under-employment is to be traced to under-consumption. The under-consumption theories being a denial of J. B. Say's *Law of Markets* could not claim popular support in the last century. A brief summary of the under-consumptionist view of the business cycle can be given as follows :

During the course of upswing, the capital goods industries go through a process of expansion the funds for which come forth from current savings and increasing bank credit. Again, since processes of production are round-about, so that final consumer goods are for a long time forth-coming, prices will show a rising tendency with an increase in money income and with the increasing demand of the consumers. This further stimulates investment. However, once the processes of production are completed, the volume of consumer goods output will spurt far beyond the absorbing capacity of the economy. As a result there will be apparently an oversupply of goods stemming from the fundamental inadequacy of the purchasing capacity of the consumers. This will result in a fall in prices, and profit margins also will be wiped out. There will be a curtailment of output in the consumer goods industries which will be followed by a general depression.

Foster and Catchings hold that overproduction is bound to develop when savings are used for investment in new plant, equipment, and inventory, in the sense that new capital goods ultimately bring forth a supply of consumer goods that cannot be sold at the current level of prices. The result is a fall in prices and profit margins, the ultimate result being a crisis. The role of profits is crucial in the explanation of Foster and Catchings. According to these writers, the entire profits of the business are invariably reinvested instead of being distributed among the stockholders to be spent, presumably, on consumption. This is the fundamental source

of all trouble. Foster and Catchings further assume that every expansion of bank credit used for productive purposes will result in almost proportionate increases in output.

Hobson's thesis is that the shrinkage in total effective demand which is the main cause of cyclical depression stems from a failure of consumption to keep up with production.[1] According to him, depression is the product of *overproduction* of consumer goods during the period immediately preceding it. The high level of activity during the boom years generates a volume of output which is too large to be sold at current prices. Prices are then lowered for the sale of the accumulated stocks.

A Critical Review of the Under-consumption Theories

Keynes in his *General Theory* examines the position of the under-consumptionist school of thought.[2] In conditions where the volume of investment is "unplanned and uncontrolled subject to the marginal efficiency of capital" and to a long-term rate of interest "which seldom or never falls below a conventional level," these writers are Keynes feels, undoubtedly on the right track. But still Keynes differs from them on both practical and theoretical grounds ; on practical grounds, because the under-consumptionist writers place too much emphasis on consumption "at a time when there is still much social advantage to be obtained from increased investment ;"[3] on theoretical grounds, because the under-consumptionist writers neglect the fact that there are *two* ways to expand output namely, investment and consumption.

Prof. Hamberg[4] finds a strong element of truth in the under-consumption theories. The acceleration principle asserts, Hamberg points out,[5] that a decrease in the rate of increase in the demand for consumer goods is all that is necessary to precipitate a downturn in the demand for capital goods. Furthermore, the fact that the ratio of consumption to total national income shows remarkable stability may be the very thing that leads to the contraction in the demand for capital goods in the consumer goods industries. So, the

1. Hamberg—Business Cycles, P. 255.
2. Keynes—General Theory. P. 324-25.
3. Ibid P. 325.
4. Hamberg Business Cycles, 261-62.
5. Ibid. P. 275 (Foot note.)

under-consumption approach to the explanation of business cycles can be at all supposed to be absurd.

The version of Foster and Catchings may further be criticised on the ground that increased production is not necessarily deflationary and that an increase in the supply of money may be sufficient to offset the increased supply of goods, and hence check a fall in the level of prices. The defects of Hobson's analysis result primarily from errors of omission rather than from errors of commission.[1] He has failed to analyse the determinants of investment with the acuteness with which he described the factors influencing the savings function. The extreme inequality in the distribution of the national income which represents the core of his thesis, is primarily a long-run phenomenon.

Over-investment Theories of the Trade Cycle

The over-investment theories of business cycle may be classified under two heads, *viz*, (i) the monetary over-investment theory as developed by the Austrian School, and (ii) the non-monetary over-investment theory as developed by Spiethoff and Cassel. We are here concerned with the monetary over-investment theory of business cycle.

Monetary Over-investment Theory of Business Cycle

It is universally recognized that relative disparities exist in the rates of growth in capital goods industries and the consumer goods industries, the former category of industry fluctuating much more violently than the latter. The Austrian School contends that these relative disparities in the rates of growth of the two categories of industry can be traced to the banking system. The elasticity of bank credit and its impact on the rate of interest and the concept of forced saving provide the basic conditions for the monetary over-investment explanation of the trade cycle.

The Revival and Upswing—A rise in the marginal efficiency of capital caused by new inventions, new markets or new sources of raw materials, etc., coupled with unchanged interest rate, may make a larger volume of profitable investment feasible. But such a rise in the marginal efficiency of capital is not sufficient for the *over-expansion* of investment activities. The general over-expansion

[1] Hamberg—Business Cycles. P. 264.

of investment activities is possible only when these activities are financed by an increase in bank credit and not by voluntary saving out of current income. Again, a rise in the marginal efficiency of capital is not the only inducement to increased investment ; this must be associated with a low interest for stimulating investment. The Austrian economists believe that marginal efficiency of capital is highly sensitive to changes in the rate of interest ; that is to say, a fall in the rate of interest is just as effective as a shift in the position of the marginal efficiency of capital schedule itself.

At any given time, the total expenditures are divided between capital and consumer goods. If the savings function rises in a period of time and these savings are invested, there is a relative decline in the demand for consumer goods and a proportionate increase in the demand for capital goods. As a result of this situation, relatively more money will be spent on the production of capital goods. But the expansion of bank credit leads to some *forced* saving. This takes place due to two reasons[1] : (1) the rise in factor prices resulting from increased demand for capital goods leads to a rise in prices of consumer goods at a rate faster than the rate of increase in consumer's income ; and (2) rigidity of certain costs and incomes which are contractual in nature leads to a diversion of income from the lower income groups (with high propensity to consume) to the higher income group (with low propensity to consume). In general consumers are compelled to save simply because there is a shortage of consumer goods.

When producers spent their newly borrowed bank money on capital goods, new income to the owners of the factors of production employed in capital goods industries is generated. They will then try to raise their consumption which they were *forced* to sacrifice previously. They must bid up the prices of consumer goods sufficiently to induce the producers of these goods to take away the necessary factors of production away from the capital goods industries. Eventually the bank credit expansion will stop and the boom will come to an end.

The Crisis and the Downswing—Once the expansion of bank credit ceases and the borrowing power of investors sharply declines,

1. Hanberg—Business Cycles, P. 206.

capital goods producers can no longer meet competition from the consumer goods industries for the factors of production. In the meantime, the efforts of the consumers to restore their consumption to the former level lead to a rise in prices of consumer goods relative to the prices of capital goods. Prices of factors engaged in these industries then tend to rise. Eventually, the rates of interest rise. Rise in factor costs leads to a fall in marginal efficiency of capital. The combination of a fall in marginal efficiency of capital and a rise in the rate of interest results in a slackened demand for investment. This is Hayek's theory of capital shortage.[1]

It sounds perhaps paradoxical that a general increase in demand for consumer goods should have an adverse influence on the production of capital goods in general which derive their economic value from consumer goods which they help to produce. It is not difficult to solve the paradox.[2] Hayek assumes that under full employment production of consumer goods and the production of producer goods are alternatives, and at the end of the boom, the condition of full employment can be reasonably taken to be true. Secondly, it is assumed that the demand for consumer goods rises relatively to the demand for producer goods.

This assumption excludes the possibility of a compensatory expansion of credit. The result is a rise in interest-rate which raises the production costs more in the higher than in the lower stages of production.

Criticisms

The assumption of full employment sharply limits the usefulness of the monetary over-investment analysis. Secondly, as Prof. Hansen[3] observes, forced saving in itself is not a malignant factor. A steady rate of capital formation, stimulated by an *even* rate of forced saving is not likely to lead to significant fluctuations in production. On the other hand, a varying rate of voluntary saving also may cause harmful fluctuations in capital goods industries. Thirdly, an increase in bank credit may not lead to a rise in price level of the dynamic factors of growth, *viz.*, population

1. Hayek—Prices and Production (1935).
2. Haberler—Prosperity and Depression.
3. Hansen—Full Recovery or Stagnation, PP. 69-72.

increase, technological progress, capital accumulation, etc., lead to a continuing rise in the level of output. There is also no *a priori reason* why the expansion of credit can continue long enough to allow many of the new processes to be brought to completion[1]. In that case, increased demand for consumer goods will not ultimately lead to capital shortage.

Hayek's Ricardo effect

According to Hayek's second version[2], full employment is no longer necessary. Even a rise in the rate of interest is not essential for enforcing capital shortage. Expansion is brought to an end and depression started, according to Hayek's second version, by a fall in the inducement to invest. A fall in the inducement to invest is explained by a rise (beyond a certain limit) in the rate of profits in consumer goods industries. This assumption is based on the so-called "*Ricardo effect*". Its substance is contained in the familiar Ricardian proposition that "a rise in (real) wage will encourage capitalists to substitute machinery for labour and vice versa". That is to say, when the real wage rates fall, the producers will "shorten" their methods of production, make them less roundabout, use less capital per unit of output and more labour. Conversely, if real wages rise, there will be a strong tendency to substitute capital for labour, *i. e.*, employ more roundabout production techniques.

According to Hayek, in the later stage of an expansion, real wage rates fall. This brings about a shift to less capitalistic methods of production, reduces demand for loanable funds and initiates depression. Similarly, in depression, real wages rise and this rise eventually, by inducing a substitution of capital for labour, stimulates investment demand and brings about a general revival.

Critical Evaluation

Hayek's assertion that a *rise* in the marginal efficiency of capital with either a stable or a smaller rise in the rate of interest results in a *fall* in investment and thus depression is strange. *Secondly*, there are grounds, both theoretical and empirical, for

1. Hamberg—Business Cycles, P. 213.
2. See Haberler—Prosperity and Depression.

seriously doubting the importance of the shift to smaller ratios of capital to labour in the techniques of production. *Thirdly*, it is unrealistic to assume that entrepreneurs will give up current investment programmes in order to switch suddenly to less capital-using production methods. There is also good reason both of a theoretical and empirical kind, for doubting Hayek's assertion that a rise (fall) in real wages will increase (decrease) the ratio of capital to labour in techniques of production.[1] *Finally*, Prof. Hayek believes that a high propensity to consume and high rates of profit in consumer goods industries will bring about 'shortening of capital" implying a fall in investment demand. But Prof. Haberler[2] contends that the reason lies in scarcity of labour and not in the high rates of profits in consumer goods industries.

Even if the consumer goods industries may find it impossible to maintain the rate of growth which was possible so long as there existed unemployed labourers who could be drawn into employment, Prof. Hayek has over-estimated the short-run possibility of substituting labour for capital and *vice versa* in response to changes in the rate of profit. But the empirical evidences suggest, as Prof. Kaldor[3] points out, that labour and capital are more complementary (must be used in fixed proportion) than substitutes to each other.

Keynesian Theory of Trade Cycle

Keynes himself has relatively little to say about the causes of cyclical fluctuations in business.[4] As Hicks observes, "Keynesian Economics inspite of all that it has done for our understanding of business fluctuations has beyond all doubt left at least one major thing quite unexplained; and that thing is nothing less than the business cycle itself." Keynes shows how investment, saving and consumption interact to determine a given level of employment, but he does not explain why and how these variables continue to change with passage of time.

1. Hamberg—Business Cycles, P. 227.
2. Haberler—Prosperity and Depression.
3. Kaldor—"Stability and Full Employment." Economic Journal, Dec. 1938.
4. Gordon—Business fluctuations.

According to Keynes, "the essential character of the trade cycle and, especially, the regularity of time-sequence and of duration which justifies us in calling it a *cycle*, is mainly due to the way in which the marginal efficiency of capital fluctuates."[1] Now, the marginal efficiency of capital depends upon (1) the series of prospective annual yields from investment in new capital goods and (2) the cost of the capital goods. Fluctuations in the rate of investment are due to changes in any or both of these two elements. At times the rate of interest also "may certainly play an aggravating and, occasionally perhaps, an initiating part."[2] But Keynes thinks that the primary and typically controlling factor is fluctuations in the prospective yields. This together with fluctuations in the cost of capital goods accounts for rise and fall in marginal efficiency of capital. The explanation of the crisis is not primarily a rise in the interest rate, but a sudden collapse in the marginal efficiency of capital.

The later stages of the boom are characterised by optimistic expectations as to the future yield of capital goods strong enough to offset their growing abundance and their rising costs of production and, probably, a rise in the rate of interest also.

Keynes admits that it is highly improbable that all fluctuations either in investment itself or in the marginal efficiency of capital will be of a cyclical character. But he believes that "there are certain definite reasons why, in the case of a typical industrial trade cycle in the nineteenth century environment, fluctuations in the marginal efficiency of capital should have had cyclical characteristics."[4]

Course of the Cycle.

As the boom progresses doubts suddenly arise regarding the reliability of the prospective yields from investment in new capital goods due lo the decline in the *current* yield as the stock of newly produced durable goods steadily increases. At the same time, the *current* cost of new capital goods rises. These phenomena lead to a

1. Keynes—General Theory, P. 313.
2. Ibid, P. 315.
3. Ibid.
4. Ibid, P. 314.

collapse in marginal efficiency of capital which precipitate a sharp increase in liquidity preference. This implies a rise in the rate of interest, and thus the situation is aggravated. But the fundamental factor is the marginal efficiency of capital. The fall in the marginal efficiency of capital may also cause a downward shift in the consumption function, especially for those who suffer losses in a declining stock markets. The cyclical swings in the marginal efficiency of capital, Keynes points out, are made excessively violent by the uncontrollable and disobedient psychology of the business world.

The revival of confidence takes time and it relates to the factors which govern the recovery of the marginal efficiency of capital. Herein lies the explanation of the *time element* of a business cycle. The time which must elapse before recovery begins, depends firstly upon the length of life of durable assets in relation to the normal rate of growth during a given period, and secondly on the carrying-cost of surplus 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. In the first phase of the downturn, inventory stocks rise while goods in process decline. In the second phase, disinvestment takes place both in stocks and in goods in process. In the first phase of the recovery, continued disinvestment in inventories may offset more or less the rise of goods in process. Eventually, as expansion progresses, it feeds on itself and cumulates.

According to Keynes, the boom is characterised by over-investment only in the sense of disappointed expectations in view of the ensuing unemployment. For him, "the right remedy for the trade cycle 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."[1]

An appraisal of the Keynesian theory of trade cycle shows that it is not an integrated theory of business cycle although it can explain the course of the cycle. The Keynesian system does not explain why the marginal efficiency schedule of capital shifts to create cyclical fluctuations, but it can explain how the system works.

Hicksian Theory of Trade Cycle

Prof. Hicks' model of trade cycle is based upon the simple interaction of the multiplier and the acceleration principles, modified to allow for the effect of various types of lags and for the fact that the economy experiences not only business fluctuations but also secular growth.

Prof. Hicks distinguishes between "free" and "constrained" business cycles. A "free cycle" will die of its own accord because of a low autonomous investment (*i.e.*, that investment which is independent of changes in output, which occurs in direct response to inventions and is expected to pay for itself over a long period), a weak multiplier, or a weak accelerator. A "constrained cycle" is driven by powerful expansionist forces and hits the ceiling of full capacity output ; and since this necessarily checks further increase in output, the accelerator acts to reduce investment and this then initiates a downward movement in the economy as a whole. Constrained booms are checked when they hit the full employment ceiling.[1] Instead of going through the ceiling, the accelerator quickly drives the economy into a downswing. And the downswing through a cumulative movement might depress the economy and reduce gross investment to zero.

Hicks assumes the existence of both induced and autonomous investment and finds the *primary reason* for the cycle in the *effect of the acceleration principle on the induced investment.* Autonomous investment is not geared to profit opportunities but depends on long-run trend factors such as the growth of population and advance in technology. Induced investment implies those types of investments which are induced by changes in the level of income and output. Hicks points out, induced investments should depend not only on changes in consumption but also on changes in output.

Hicks assumes that there is an upward secular trend in output and that there is an equilibrium rate of growth which would call forth just the investment needed to absorb the saving generated by a steadily rising volume of income.[2] The cycle fluctuates around

1. Hicks—A contribution to the theory of trade cycle.
Also see the brilliant review article, "Hicks on Trade Cycle" by James S. Duesenberry, Quarterly Journal of Economics, Aug. 1940.
2. See Gordon—Business Fluctuations.

this upward secular trend in output. Hicks also analyses the output-investment lag and the income-consumption lag involved in cyclical fluctuations. He also assumes that autonomous investment rises at a steady rate.

With the above qualifications, Hicks shows how a business cycle is governed by the interaction of the multiplier and the acceleration principles. The magnitude of fluctuations depends on the size of the 'accelerator' (the amount of investment required per unit increase in output) and on the consumption function. Hicks argues that once started, cycles tend to be "explosive" in and upward direction. The boom is stopped when the full employment ceiling is reached. When this ceiling is reached, output can expand only at the rate permitted by the upward secular trend. The slower rate of expansion, through the acceleration principle initiates a fall in investment and thus begins the cumulative downswing. The downswing may reduce the level of gross investment to zero and at that time the acceleration principle ceases to function. Output thus tends to settle down at a level governed by the current output of autonomous investment. But autonomous investment continues to expand being governed by technological change. As when this new expansion wipes out the excess capacity of the firms, the acceleration principle again begins to operate, and the interaction of the multiplier and the acceleration principles generates a new cumulative upswing. The cycle is explained mainly in terms of induced investment. He also considers the possibility that credit tightness might be responsible for the slowing down in the rate of expansion after the full employment ceiling has been reached. Hicks believes that it is a "real" rather than a monetary ceiling which stops the boom, but that the monetary deflation and rise in liquidity preference which take place during depression do much to accentuate the severity of the downswing. This model of Hicks can be explained by the figure No. 29 :

In the figure No. 29 AA line indicates the growth of autonomous investment which slants upwards to the right, because autonomous investment increases through time at a more or less constant rate EE line indicates the level of output or income corresponding to the volume of autonomous investment. The distance between AA and EE depends on the combined value of the multiplier and the

accelerator. Let us suppose, at P_0, an invention occurs and induces an increase in investment. Output will then increase along P_0P_1 line. This increase in output will induce further increase in output till the full employment ceiling is reached. The full employment ceiling is indicated by the line FF. The total output has come upto this level because of both autonomous and induced investments. After P_1, there is no longer any induced investment and so output cannot increase further. But there is still a lower rate of expansion of autonomous investment. Ultimately the downswing takes place. If the fall in output would induce disinvestment the output would fall along Q_1q. But this does not happen. The downswing takes place along Q_1Q_2.

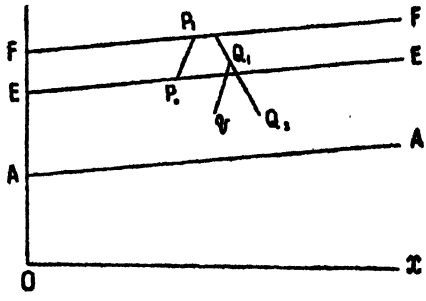


Fig. 29

Evaluation

According to Hansen, the "free cycle" hypothesis often offers a better explanation of the upper turning point than does the "constrained cycle" hypothesis[1] of Prof. Hicks. There are three self-limiting factors, according to Hansen within the dynamic process of expansion ;[2] (1) the exhaustion of autonomous investment, (2) the fading out of the boom as the *rate of increase* of physical output tapers off when full employment is reached, and (3) the slope of the consumption function. In whatever manner we explain the causes of the upswing and the downswing, it is a fact that the interaction of the multiplier and the acceleration principles plays a vital part in governing the business fluctuations.

It is true that Hicks' model considers the vital question of fluctuation about the upward secular trend and demonstrates the restrictiveness of the conditions under which an economy may be "regularly progressive." Yet the treatment of the trend in the

1. Hansen—Business Cycles and National Income, P. 484.
2. Hansen—Monetary Theory and Fiscal Policy, P. 148-50.

form of autonomous investment remains arbitrary.[1] His model "necessarily abstracts from many of the variables related to growth and institutional change."[2]

Shigeto Tsuru in his article, "Keynes versus Marx"[3] observes that the Hicksian theory of trade cycle, is "highly unrealistic" because of the importance he has attached to the concept of autonomous investment. According to him, the concept of autonomous investment does not attach importance to the productivity aspect of investment. It is also unrealistic, he thinks, to say that "autonomous investment, like pyramid-building, absorbs savings without adding to productive capacity."

The Hicksian model has been presented here in a highly oversimplified fashion.. It serves as a useful framework of analysis which, with adequate modifications, provides us with a good picture of cyclical fluctuations within a setting of growth. It serves especially to emphasize that, in a capitalist economy characterized by substantial amounts of double equipment, a period of contraction almost inevitably follows expansion. Since the rate of expansion of output moves ahead of the full-employment output, the ceiling imposes an enforced period of slowdown ; because induced investment depends on changes in output, this implies that there will be an absolute full in the level of investment.

Hicks' model also pinpoints the fact that in the absence of technological development and other powerful growth factors the economy will tend to languish in depressions for long periods of time.[4] First, without technological advance, autonomous investment may not rise over time, and thus an increase in output which is essential to an increase in investment may not actually take place until equipment has worn out to the point where some replacement investment is necessary. Second, if there is no technological development, the time at which this replacement is necessary will be deferred because no help is obtained from the obsolescence of existing

1. Bowen and Meier—"Institutional aspects of economic fluctuations" in Post-Keynesian Economics edited by Kurihara, P. 60-61.
2. Ibid.
3. Post-Keynesian Economics. Edited by Kurihara. P. 337.
4. Dernburg and McDougall—Macro-Economics. (Mc Graw-Hill Book Company, New York.) P. 218.

equipment. Thus the whole burden of initiating the accelerator is placed on the wearing out of equipment. One serious deficiency of the Hicks model is that Hicks defines full employment ceiling to be independent of the path of output. It is assumed to depend on the growth of population, technological development, etc., and is thus assumed to grow at the same rate as autonomous investment. But the full employment level of output depends on the magnitude of resources which are available to the economy. The stock of capital is one such resource. This implies that with increase in the capital stock ceiling is also raised in a period. In view of the fact that the rate at which output increases determines that rate at which the capital stock changes, the ceiling level of output will differ depending on the time path of output. So we cannot separate the long-run full employment trend from what depends upon a business cycle.

Inspite of the shortcomings of the Hicksian Theory of trade cycle, we can safely say that the model developed by Hicks has an outstanding contribution to the theory of trade cycle and in stating that the interaction of the multiplier and the acceleration principles influences not only the degree but also the periodicity of business fluctuations.

A generalized version of a trade cycle—a brief outline of the modern trade cycle theory.

There are three strands to the modern approach to a business cycle, *viz.*, (1) the marginal efficiency schedule in relation to the rate of interest, *i.e.*, the investment function in the Keynesian system, (2) the effect of changes in income upon the rate of investment (the principle of acceleration) and finally, (3) the role of the investment multiplier (based on consumption function) in relation to the generation of income. These inter-relationships are the foundation stones of an integrated theory of business cycle. The interaction of the multiplier and the accelerator involves a cumulative process.

Explosive and Non-explosive Cumulative Processes—The theory of self-reinforcing, cumulative process can be explained in the following way :

An increase in the level of investment in the operation of the multiplier effect leads to an increase in income. Any flow of income

tends to perpetuate itself into the future if the elasticity of expectations is unity. The increase in consumption function of the people raises the sales volume and this induces the businessmen to enlarge their production plans. This leads to an increase in demand for capital equipments. The acceleration principle then comes into operation. The result of this phenomenon is that output, prices, wages, and money incomes tend to rise. All income earned, it is assumed, tends to be spent, whether on investment goods or consumer goods. Moreover, the flow of income continues to perpetuate itself into the future because of rising expectations. Thus an expansionary process is "reinforced by optimistic expectations" and the cumulative movement of income and prices may be regarded "as an obvious process", the real difficulty lying "in an explanation of the turning points."[1]

There are four possible kinds[2] of chain reaction in the cumulative process which of these takes place depends upon the scope of the consumption function and the value of the optimum capital-output ratio. The boundaries of each of the four cases depends on the relative lengths of the various time lags in the chain of causation.

In the first place when the optimum capital-output ratio and the marginal propensity to consume are relatively small, the movement towards the new equilibrium level of income is steady. Secondly, if the optimum capital-output ratio and the marginal propensity to consume are rather bigger, there will be fluctuations on the way to the new equilibrium similar to the output-income lag, income-expenditure lag, and expenditure-output, lag etc., involved in the process of income generation. The net investment in equipment which is induced by a rise in the level of output leads to additional expansion of output, which for a time go beyond the final equilibrium level; "but the forces at work are not strong enough to cause explosion; the overshoot is only temporary."[3] The magnitude of these fluctuations depends on the size of the two relevant relationships.

The third kind of chain reaction takes place when the marginal

1. Lloyd Metzler, "Business Cycles and the Modern Theory of Employment." American Economic Review. June, 1946.
2. A. C. L. Day—Outline of Monetary Economics, P. 329.
3. Ibid. P. 330.

propensity to consume and the optimum capital-output ratio is still larger than that in the second chain reaction. An expansionary impulse in such a system causes a cumulative process in which no self-limiting tendencies are found. This process is not immediately explosive. This process involves fluctuations. The fourth case arises when the marginal propensity to consume and the optimum capital-output ratio is even larger than the third case. The level of income in this case rises too fast, there being no interval limitation as the chain reaction develops over a period of time.

The full employment ceiling and the down-turn

An analysis of the cyclical fluctuations in terms of the interactions of the multiplier and the accelerator has proved to be the most profitable convincing line of explanation of the trade cycle. Recent theory of trade cycle has minimized the importance of all other versions ; it has also minimized the importance of such factors as the rate of interest and the operations of the banking system.[1]

The fourth case of the chain reaction as referred to above which assumes the marginal propensity to consume and the optimum capital-output ratio to be too large provides the alternative explanation of the trade cycle. As has already been explained, once started, the expansionary process feeds on itself and shows no self-limiting tendencies, if the marginal propensity to consume and the optimum capital-output ratio is high. The next question that arises is, what does bring this expansionary process to an end ? If the process is self-reinforcing, there must be some external limitation to this expansionary process, and that limitation is the full employment ceiling. When the full employment is reached, it is not possible for the level of output to rise. Full employment imposes ceiling to the level of output and so provides an upper limit to the cumulative process of expansion.

The high boom leading to full employment may be either short-lived or long-lived. In the former case, it is rapidly replaced by downturn while in the latter case, it may well last for a couple of years when it is unusual for the boom to develop into a serious inflationary spiral. In the case of short-lived boom period, the important point is that output ceases to expand. There is then no

1. A. C. L. Day—Outline of Monetary Economics. P. 322.

necessity to install additional equipment to bring the capital-output ratio upto the optimum. In this case, there is no sufficient time for the inflationary forces to develop. Since the rise in the level of income and the consequent generation of effective demand must be proceeding at a vary rapid rate when full employment ceiling is reached because of the acceleration involved in the explosive cumulative process, there are clearly likely to be strong pressures to inflation at that point. Only if the high boom is short-lived, the serious inflationary spiral can be avoided.

The explanation of the second alternative situation, *i.e.*, a situation in which the boom may last for a couple of years without causing inflation, is at the same time, more complicated, and more plausible.[1] If the situation would be explained in terms of successful control policies by the monetary authorities, which for a time would hold the balance between inflationary and contractionary tendencies, serious complications would not arise for the explanation. It is, however, probably more appropriate to provide an explanation which is not related to such external forces.

The real difficulty is to explain adequately why the powerful expansionary process existing prior to full employment does not push the economy over into a sharp inflationary spiral once full employment is attained. How is it that a period of rapid expansion may be replaced by a period of relative stability and not by a period of contraction ?

A plausible explanation is the common tendency for the capital-goods industries to lengthen their order-books substantially rather than increase their prices when they are in the full-employment arena.[2] This implies that if these industries enter the full-employment zone before the consumer goods industries themselves become more or less fully employed, a substantial backlog of orders is likely to pile up in the capital goods industries. This development has got two consequences. In the first place, the rate of expansion of consumer goods industries begins to fall, since the fixed investment, *i.e.*, installation of fixed capital has reached the maximum, no further stimulus to the expansionary process comes

1. A. C. L. Day—Outline of Monetary Economics. P. 335.
2. Ibid.

from the rising investment, and the multiplier effects of past increments in investment also work themselves off. Consequently, the activities of the consumer goods industries mark a decline which may take place even below full employment inducing some rise in prices. But induced rise in prices is not likely to have serious effects. The second consequence of the developments is that some plans for net investment in fixed capital equipments continue to be made : the rise in the level of output of the consumer goods industries leads to a rise in demand for capital equipments. This sets the acceleration coefficient into operation. The overall result of all these developments is the attainment of full employment which may last for two or three years not only in the capital goods industries but also in the consumer goods industries. No serious inflationary spiral is witnessed in such a case. The duration of this situation largely depends upon the volume of the backlog of orders piled up in the capital goods industries.

But this situation cannot last for a very long period. When no new plans for fixed net investment are formulated output in consumer goods industries marks a decline. A time comes when the backlog of orders previously piled up in capital goods industries is fully exhausted. This leads to a drastic curtailment of output in capital goods industries. The demand for capital equipment for replacement purposes is also not sufficient to keep the capital goods industries fully employed.

The crisis appears at the point at which the level of net fixed investment falls. The immediate effect of this fall in net fixed investment in the capital goods industries is unemployment and a fall in the level of income of those who are employed in those industries. This leads to the operation of a downward multiplier effect. The level of activity, output, and income in the country falls sharply. Various financial strains and stresses are found in that case. The fall in the level of income means that the existing stock of fixed capital comes to be more than adequate. There is then no necessity for the replacement of equipment. The obvious consequence of this situation is a fall in gross investment to zero. This further decline in the level of investment also has a depressing effect on the level of income through a reinforcement of the downward multiplier process. The only possible equilibrium

position is one where planned savings equal zero, because only at that level can they be equal to planned gross fixed investment.[1] The process of contraction takes place in the form of an ordinary multiplier process whose limit is the level of income at which gross savings are zero. This equilibrium also is temporary. For a time the depression stage continues, with a low and more or less constant level of business activity not only in the capital goods sector but also in the consumer goods sector. Eventually, however, so much capital will have worn out that the capital stock falls to the optimum size for producing the low current level of output; the obvious consequence of this situation is the necessity of investment for replacement purposes. This ultimately is the factor which initiates the upswing.

This, then, is an outline of the modern theory of trade cycle. This theory depends upon the interaction of the multiplier and the accelerator, arising from changes in the size of the optimum stock of capital. This explanation assumes that this circular interaction is strong enough to be explosive; once an expansion gets under way, it does not contain self-limiting forces. The limit to expansion is provided by the full employment conditions. The lower limit is imposed by the fact that gross fixed investment cannot be less than zero. The boom and the depression stages may be either short-lived or long-lived. The length of the boom depends upon the extent to which backlog of investment orders piled up in the preceding period of time, which in turn depends upon the optimum capital-output ratio, on the average life of equipment and on the capacity of the capital equipment-producing industries.[1] The duration of such a cycle depends on the nature of the forces just outlined, and more generally, on the lengths of the various time-lags, e.g., output-income lag, income-expenditure lag, and expenditure-output lag, etc.

Criticisms

Even the modern theory of trade cycle as outlined above is by no means perfect. This explanation also may be criticised on the following grounds:

In the first place, insufficient regard has been paid in this theory to the attempts of the Government to control the cycle,—such

[1] A. C. L. Day—Outline of Monetary Economics.

attempts are nearly always made and may modify the course of the cycle. Secondly, this theory has minimized the importance of monetary elements (viz., changes in interest rates and its banking policy) too much. Thirdly description of the reactions of times is undoubtedly too mechanical.[1] Firms in some industries do not base their investment plans to any great extent on the level of output in the immediate preceding period of time; and again, other influences also may affect investment plans of all firms. "The important point, however, that has been dealt with in this discussion of a theory of trade cycle is the demonstration of the kind of instability that may easily develop and the kind of explanation that can contribute to a fuller theory of the trade cycle."[1]

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2. Gordon—Business Fluctuations.
3. Hamberg—Business Cycles.
4. Readings in the Business Cycle Theories (A.E.A.)
5. Keynes—General Theory, Appendix, "A note on Trade Cycle."
6. Hansen—Business Cycles and National Income.
7. A. C. L. Day—Outline of Monetary Economics. Ch. 24.
8. Hicks—Trade Cycle.
9. Duesenberry—Business Cycles and Economic Growth.

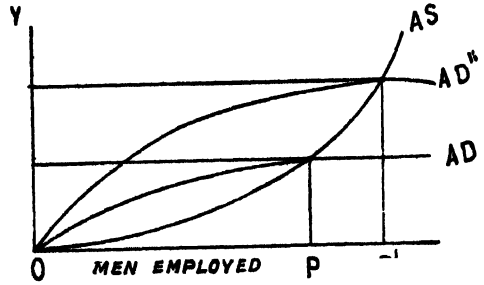
1. A. C. L. Day—Outline of Monetary Economics.

9

EMPLOYMENT THEORY

The classical economists by accepting Say's law had assumed away the problems of unemployment and had developed a system in which there was no unemployment. But Keynes in his "General Theory" seeks to provide a systematic and realistic explanation of the causes of unemployment. The Keynesian theory is 'general' in the sense that it is applicable equally well to economies with less than full employment.

The aggregate demand and supply curves for any community between them determine the volume of employment which is actually offered by the entrepreneur. In the following figure the aggregate demand and supply curves determine between them the volume of employment.



Men Employed

Fig. 30

When employment is below OP, the aggregate demand curve (AD) is always to the left of the aggregate supply curve—aggregate demand price being greater than aggregate supply price. The result will be an increase in employment. Again, when employment is greater than OP, the aggregate demand curve lies to the right of the aggregate supply curve. This will lead to a fall in employment upto OP since the entrepreneurs will try to avoid losses, the aggregate demand price being less than the aggregate supply price. If again, in a different situation, the community's aggregate demand curve is represented by AD'. the volume of employment will be OP'. Thus

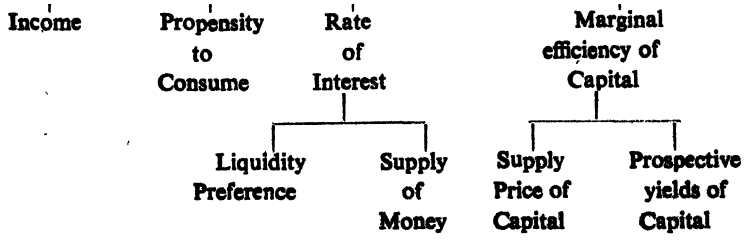
aggregate demand and aggregate supply between them determine the level of employment in the community. So long as the amount of money which entrepreneurs expect to receive from offering a given volume of employment exceeds the amount which they must receive to make that volume of employment just worth while, competition between them will raise the volume of employment ; when these two will be equal, the equilibrium level of employment of the community will be determined.

This brings us to the concept of "effective demand." It is that aggregate demand price which becomes "effective" because it is equal to aggregate supply price and thus indicates a position of short-run equilibrium. Effective demand is equal to total national receipts from the sale of consumer goods *plus* total national receipts from the sale of investment goods. This can be stated as follows :

Effective demand = National Income
= expenditure on consumer goods + expenditure on investment goods

Keynes at the beginning did not attach much importance to government expenditure as a determinant of employment. But in fact, income or employment depends upon three factors : private consumption expenditure, private investment expenditure and Government expenditure. That is to say,

$$Y = C + I + G$$



Consumption depends on the level of income (y) and the propensity to consume. Investment depends on the rate of interest and the marginal efficiency of capital. Again while the rate of

interest depends, according to Keynes, on the supply of money and the demand for money (liquidity preference), the marginal efficiency of capital depends on the supply price of capital and the prospective yield from capital. Finally, Government expenditure depends on the policy pursued by the Government. It also depends on economic forces under special circumstances.

Determination of the Equilibrium level of income

The *desire to save* and the *desire to invest* iu relation to income determine the *equilibrium level of income* for the economy as a whole. Income, savings and investment are interdependent variables.

The total income of the economy during a given period of time is the total amount received by households for the sale of their labour, plus the amount of interest on bonds received by households Plus the profits obtained by the businessmen. This total equals the value of the output of the economy in the same period, if we exclude from the total output that part of output which is in turn used up in producing other things, and that part of output which is meant for restoring the condition of machines, buildings, etc., which have detriorated during the given period.

If we add up the value of the income created in every firm in the country, we find, it equals the value of the new goods created in the country as a whole during a given period. Investment may be planned and unplanned. According to Keynes, aggregate consumption expenditure and aggregate investment expenditure constitute the aggregate output or the level of income. As aggregate investment is equal to aggregate saving by definition, aggregate consumption and aggregate saving together account for the whole of income. "The decisions to consume and the decisions to invest between them determine incomes."[1]

When the equilibrium level of income is determined, the savings are equal to investment. This is shown in the following diagram.

In this diagram CC curve shows the consumption function. "C+I" line indicates the sum total of consumption and investment expenditure in the community, the distance between CC curve and "C+1" curve indicating the volume of investment. O'Y' is the

1. Keynes—General Theory, P. 64.

equilibrium level of income. Corresponding to this, OY_0 also is the

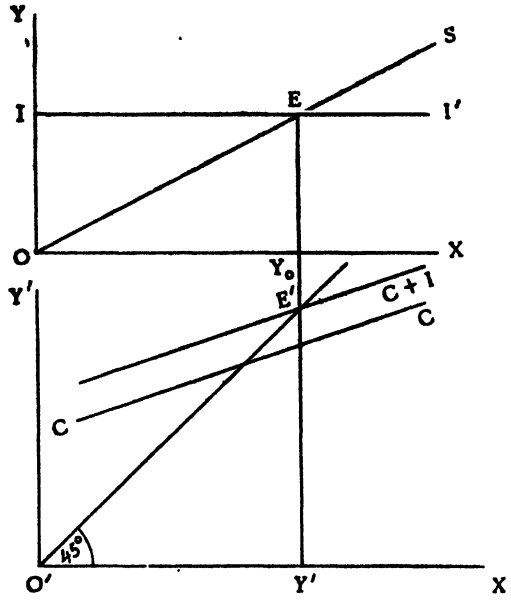


Fig. 31

equilibrium level or income, the point E indicating that saving schedule has intersected the investment scoedule at that point.

Underemployment Equilibrium

Equilibrium level of income may be associated with underemployment. The interaction of the savings and investment schedules might result in an underemployment equilibrium. Similarly there may also be full-employment equilibrium and over-employment equilibrium. Since output and employment are technically related via given production functions, any change in output or income may be considered as a result of a change in output or in the number of men employed to work with the existing productive facilities. Thus, the full-employment level of income may be regarded as an output from employing all the labour available in a given period. If labour shortage limits the further expansion of output in the face of rising aggregate demand, we experience a case of over-employment equilibrium in the sense that *real* national income (as distinguished from money national income) is neither rising nor falling. Similarly if

there is less than full employment, i.e., if opportunities for expanding output are limited inspite of the abundance of labour, we find a situation of underemployment, and equilibrium at that level of income is underemployment equilibrium.

The following diagram illustrates the case of underemployment equilibrium

In this figure at the point B, investment and saving schedules corresponding to the full-employment level of income intersect and OY_0 is the equilibrium level of income. Let us suppose, investment has fallen to I(y) curve because of a certain level of underemployment, but that does not stand in the way of attaining equilibrium. OY_1 is then the equilibrium level of income. Again, it may also happen that both investment and saving have fallen from the full employment level so that $I(y)$ and $S(y)$ curves have interesected at the point A, much below the point of B where $I_1(y)$ and $S_1(y)$ intersected. OY_0 is then the equilibrium level of income. What Keynes states is that savings and investment schedules may intersect at a level less than full employment.

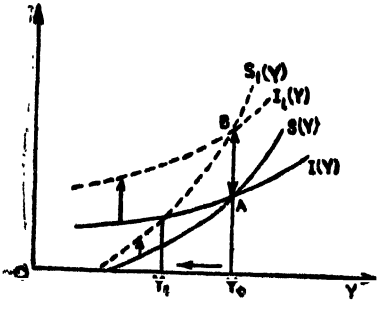


Fig. 32

The inevitable consistency of Savings and Investment

The simplest saving-investment relation is known as the "accounting" equality of saving and investment. According to this consideration,

Income = Consumption + investment
Saving = Income—Consumption
Investment = Income—Consumption.
∴ Investment = Saving.

This accounting equality of savings and investment logically follows from the definition of savings as the exess of income over current consumption and from the definition of current investment as that part of current income which is spent for purposes other than consumption. Since both savings and investment are equal to $Y—C$, we get the accounting equality of saving and investment $S=I$. This

identity holds valid regardless of whether the economy is in or out of equilibrium. "Saving" is a mere residual.

This accounting equality of savings and investment has often been a source of confusion. This confusion has been due to the inability of the critics to realize that while investment and saving are always *equal*, they are not always in *equilibrium.*[1] Keynes himself should have made it clear from the outset that the equality of saving and investment does not imply that they are necessarily always in *equilibrium.*

Possible inconsistency of Investment and Saving Plans

Although by definition, savings are equal to investment, there is no reason at all why they should be equal for future period. Plans to save are by no means necessarily consistent with plans to invest. This possibility of disequilibrium between savings and investment plans lies at the heart or the explanation of changes in the level of income in a country. This implies that there will be some unplanned saving (or dissaving) and/or some unplanned investment (or disinvestment). When there is unplanned saving or investment. forces must be at work to change the level of output and income.

As Klein points out, "there are two Keyneses on the matter of the savings—investment equation. One Keynes maintains the equality of saving and investment in terms of definitions of observable economic quantities with no refutable hypothesis behind the equation. The better side of Keynes' dual personality states the savings-investment relation in terms of intersecting schedules of economic behaviour, which determine an equilibrium position."[2]

Schedule concepts of Savings and Investment

The modern income analysis makes use of the *functional* or *schedule* concepts of saving and investment to explain the *smooth approach to new equilibrium income.* According to this approach, the functional equality of saving and investment is understood to mean that both savers and investors react to income variations in such a way that their decision to save and to invest are expected to be reconciled in the very process of these reactions. Just as

1. Hansen—A Guide to Keynes. P. 59.
2. Klein—Keynesian Revolution, pp. 91—92.

supply and demand are brought into equilibrium by the equilibriating mechanism of price, so are savings and investment in the schedule sense equilibrated by the income mechanism. This equilibrium can be shown by the following diagram.

In this diagrm the vertical axis indicates saving and investment while the horizontal axis indicates the level of income. The savings

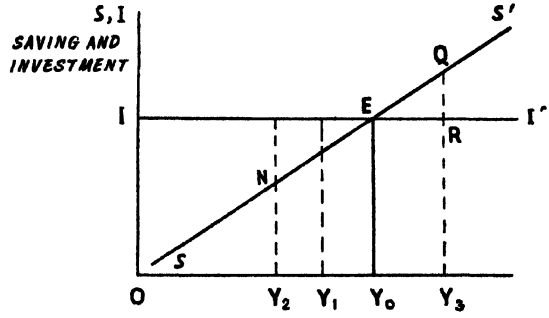


Fig. 33

function, S, cuts the investment function from below at E, indicating a stable equilibrium. At the level of income, OY_2, investment is greater than saving, while at the level of income, OY_3, saving is greater than investment. Excess of investment over savings means business profits, since the smaller the amount of income saved, the larger the amount of income spent and therefore the amount of sales. Consequently income rises to the next higher level until eventually it reaches the equilibrium level of income, at which savings and investment are in balance. If again, there is an excess of savings over investments, income tends to fall and comes down to the equilibrium level. The explanation of the process by which the actual level of income smoothly approaches the equilibrium level, after there has been a change in the level at which firms plan to invest, suffers from a serious limitation since it does not take into account adequately the business oscillations.

Dynamic Analysis of Savings and Investment Equilibrium

In fact, when firms attempt to rebuild stocks to the normal level when income is rising from one equilibrium level to another, the temporary re-investment in stocks that takes place makes the level of income to rise at a fast rate. In turn, when this

temporary re-investment in stocks slows down, the level of income starts to decline, and falls below equilibrium for a time. This leads to temporary disinvestment. After one or two such fluctuations, the level of income comes very near to the equilibrium. There are four stages in the oscillatory approach to the new equilibrium level of income. In the upswing, unplanned declines in stocks predominate ; around the height of their boom, planned additions to stocks predominate ; in the downturn, unplanned additions to stocks are the biggest element ; and in their lowest stages, planned stock reduction predominates.

Thus, we find that the movement of saving and investment to the new equilibrium level of income involves fluctuations which temporarily carry the actual level of income beyond the new equilibrium.

But this income generation involves time-lags, *viz.*, (i) lag between changes in output and changes in income receipts ; (ii) changes in income receipts and changes in expenditure and (iii) changes in expenditure and changes in output. The consideration of these time-lags has made the analysis of income determination dynamic in character.

The Robertsonian and Swedish systems of Period Analysis.

In his first formulation, Prof. Robertson defines to-day's income as being equal to *yesterday's* consumption *plus* investment so that to-day's saving, in his sense, is equal to yesterday's investment *plus* the excess of yesterday's consumption over today's consumption. According to Keynes,[1] when Robertson says that there is an excess of saving over investment, he means literally the same thing as falling income in Keynesian system and the excess of saving in Robertsonian sense is exactly equal to the decline in income in Keynesian sense. "If it were true that current expectations were always determined by yesterday's realised results, today's effective demand would be equal to yesterday's income."[2] Thus, Keynes thinks that Robertson's first formulation of the concepts of saving and investment may be regarded as an alternative to his analysis.

1. Keynes—General Theory. P. 78
2. Keynes—General Theory. P. 78

The second Robertsonian formulations[1] can be represented by the following equations :

$$(1)\quad Y_0 = C_1 + S_1$$
$$(2)\quad Y_1 = C_1 + I_1$$
$$(3)\quad C_1 = f(Y_0)$$

in which Y_0 indicates yesterday's income, Y_1 indicates today's income, C_1, S_1 and I_1 indicate to-day's consumption, saving and investment respectively.

Robertsonian formulation is unambiguous. Our current consumption takes place out of income earned yesterday. An "expenditure lag" is postulated in his analysis. Consumers are expected to increase their consumption expenditures when income rises, but not at once. A time-lag is involved in the adjustment of consumption to income. According to this analysis, tomorrow's consumption is a function of to-day's income.

The Swedish analysis does not relate "to day" to "to-morrow" or "yesterday" to "today". This analysis takes into consideration the relation of tomorrow's "planned investment" to tomorrow's "planned saving". "Planned saving" or "planned consumption" is a function of the "expected income" of consumers. According to the Swedish analysis, realized income may diverge from expected income. According to Klein[2] if *ex-ante* quantities are taken to be schedules of economic behaviour and *ex-post* quantities to be observed aggregates, then an exposition in these terms means nothing but schedules and observables. But as Prof. Hansen points out, it is doubtful[3] that planned savings and investment can best be interpreted as virtual points in the schedule sense. If planned investment is Rs. 10 crores and the amount of planned savings is Rs. 7 crores, the excess of planned investment over planned saving may be financed by new money or by unplanned disinvestment (*e.g.*, unexpected sale of inventory stocks). In the first case, realized savings will exceed planned savings by the amount of new money although realized investment will be equal to planned investment. In the second case, realized savings will equal planned investment. In the second case, realized savings will equal

1. Quarterly Journal of Economics, Nov, 1936, P. 173—article of Robertson, reprinted in his 'Essays in Monetary Theory'.
2. Klein—Keynesian Revolution, P. 116.
3. Hansen—Monetary Theory and Fiscal Policy, P. 224.

planned savings although planned investment will exceed realized investment by the amount of the disinvestment of inventories.

In his book "Money"[1] Robertson uses the terms, "intended investment" and "designed saving" which are quite similar to Hansen's formulation of the concepts of "intended investment" and "desired saving". Robertson here argues that while actual investment and actual saving are always equal, intended investment and designed saving will be equal at the point of equilibrium. Prof. Hansen also argues that at the point of equilibrium intended investment must equal the desired saving. But we must remember that while it is a *necessary* condition of equilibrium, it is not a *sufficient* condition for equilibrium. To quote Prof. Hansen, "a dynamics of income development has scarcely been formalized as yet."[2]

The above analysis of the Robertsonian and Swedish systems suggests the following conclusions. In the first place, the possible inconsistency of investment and saving plans is a useful way of analyzing variations in income.

Secondly, the analysis of an output lag, *i.e.*, any discrepancy between "intended investment" and "actual investment" is useful for the study of oscillations.

Thirdly, the discrepancy between actual and "desired saving" or between actual consumption and desired consumption is a useful way of stating the multiplier process over a period of time.

Period Analysis

Period analysis is indispensable to a proper and practical discussion of economic problems. The economic system is a circular flow of goods and services, input of factors and money payments, etc., involving some time-lags. All lags are not of the same duration. Unequivocal determination of the length of the lags is not possible.

Period analysis has the following characteristics :

In the first place, in the period analysis. change occurs only between periods, not within periods. Secondly, it presupposes a discontinuous leap from one period to another. Thirdly, it stresses the importance of time-lags in the circular flow in the economic system.

Advantages of the Period Analysis.—Period analysis has some

1. Robertson—"Money" Second revised edition (1948).
2. Hansen—Business cycles and National Income. P. 116.

advantages. In the first place, it views the process of change in a manner which appeals to commonsense. Secondly, it is more realistic because "we are accustomed to a world of frictions and lags, and we do not easily think of a process of change as a continuous movement without timelag." Thirdly, according to Fellner,[1] it avoids the pitfalls (*e.g.*, the assumption of monetary equilibrium and fulfilment of expectations) of the equilibrium analysis.[2] It also enables the theory of income to be integrated with the theories of business cycles.

Criticisms.—Even if we grant the importance of time-lags a theory built upon Robertsonian method will be too complex because of multiplicity of lags. Secondly, it makes the whole system too much mechanical, because it omits to give proper importance to expectations.[3]

Thirdly, as regards the significance of lags, Villard[4] points out that it is in connection with the flow of money payments rather than with the generation of income that the lags become important.

Fourthly, Prof. Pigou[5] points out that Rebertsonian argument that income earned in a period cannot be expended during the same period is unrealistic and illogical. He further accuses Robertson of regarding excess of saving over investment as a cause of difference between incemes in two periods.

Period analysis, therefore, has problems of its own which appear to be much more formidable than those facing instantaneous method, because it sets a much more ambitious task before itself.

Lastly, there may be a lack of adjustment between a period of expansion or a contraction. But, it is the purpose of such analysis to show why the economy is out of balance, what is done about it and what the consequences are.

The Theory of Forced Saving

The theory of *Forced Saving* has been adequately explained by Machlup.

1. Fellner's article in "Survey of Contemporary Economics".
2. Ibid P. 57,
3. Goodwin—"Econometrics", p. 424 in Hansen's Business Cycles and National Income.
4. Villard's article in "Survey of Contemporary Economics", edited by Ellis.
5. Pigou "Employment and Equilibrium". p. 27.

According to Machlup,[1] Saving and Investment are merely two different terms for one identical concept, *e.g.*, the difference between current income and consumption. The two are not equal by definition. Some reliable mechanism is required to bring about equality between the two. Machlup argues that on our view as to what the mechanism is depends which of the three following senses of the equality we accept.

In the first place, the amount of money disbursed today as additional investment outlay must be held by somebody to whom it is income. Even if the income-earner intends to spend all his income tomorrow, he has not spent it today, so there has been some saving today. Thus saving includes unspent portions of income which are intended to be spent later on.

Secondly, if the funds disbursed *in one single dose* of additional investment outlay are observed on their course through the economy, passing from hand to hand, one will see them to appear again and again as income of different people, each probable saving a part of it. If we follow the chain of spending and respectively long enough, the savings of the final recipients will eventually add up to the original investment outlay ; hence saving as the sum of the series will have become equal to investment.

Lastly, if the additional investment is not a single dose but *a rate per period*, that is to say, if the additional investment is repeated period after period, aggregate incomes per period will rise, and will continue to rise until the income recipients increase their rate of saving enough to offset fully the rate of additional investment. In other words, investments generate incomes, and under the influence of increased incomes, people are induced to save more ; hence saving which has been eventually reached and then maintained becomes equal to investment initially started and then maintained.

"In none of these senses", says Machlup, "is saving the result of spontaneous decisions on the part of the savers." In the first case, we did not give the saver enough time to go for shopping. In the second case, we simply waited long enough until a series of acts of saving added up to the sum of an original investment outlay. In the third case, we saw the level of additional investment forced the level of income upto a point where people were induced to save enough.

1. Machlup's article—Review of Economic Statistics, Feb. 1943.

"This last sense is the really essential one for Keynesian theory ; and in this sense the forced character of the saving is most apparent."[1]

An element of forced saving is recognized by Keynes himself when he talks of a "temporary reduction of the marginal propensity to consume."

Excepting for the last case, the other cases of saving-investment equality developed by Machlup do not refer at all to the significance of the equality or changes in the level of income have been lost sight of in his argument. The point is that we are dealing with the macro-economic rather than a micro-economic model, and therefore, the question of saving and investment being undertaken by different sets of persons need not arise at all. The first and the second models of Machlup are concerned more with the movement of a certain volume of funds than with the effects of changes in real investment on income.

Short-run Consumption Function

The propensity to consume or the consumption function indicates the relation between consumption and income, that is, C(Y),—a functional relationship between two aggregates. The functional relation between consumption and income can be stated in the form of a schedule showing the aggregate amount consumed at each assumed income level. This can also be shown by a consumption curve as has been given below :

This figure indicates that with an increase in income, consumption increases at the beginning. It increases upto that point where the entire income is spent out.

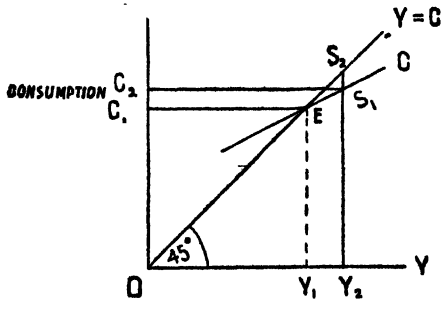


Fig. 34

In the above diagram E indicates that point. After this point further increase in income leads to growth of savings. Thus the consumption function measures not only the amount spent on consumption but also the amount saved. That is why, we

1. Machlup's article Review of Economic Statistics, Feb. 1943.

often speak of the propensity to save instead of the propensity to consume.

The *average* propensity to consume is the ratio of consumption to income, or, $\frac{C}{Y}$. It indicates the *proportion* of income consumed or saved. On the basis of experience it can be said that the average propensity to consume under the normal situation is a fraction less than unity. The concept of the *marginal* propensity to consume is highly important since it tells us, how the next *increment* of income will have to be divided between consumption and saving. It is the ratio of the change in consumption to the change in income, *i.e.*, $\frac{\delta c}{\delta y}$. The marginal propensity to consume is not far short of unity, small fluctuations in investment may lead to wide fluctuations in employment. On the other hand, marginal propensity to consume is not much above zero. This concept of consumption function has been developed by Keynes when he explains the psychological law of consumption. This law of consumption can be stated as follows :—

"The fundamental psychological law, upon which we are entitled to depend with great confidence both *a priori* from our knowledge of human nature and from the detailed facts of experience, is that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income."[1]

Factors determining short-run consumption function

The factors, apart from the amount of income of the community, determining the consumption function have been classified by Keynes under two heads (1) the subjective (endogenous) factors including psychological characteristics of human nature and the social practices and institutions, and (2) the objective factors (exogenous or external to the economic system).

So far as the subjective factors are concerned, Keynes lists eight motives which induce individuals to refrain from spending out of their incomes. These motives relate to such matters as building up a reserve against unforeseen contingencies. Provision for anticipated requirements in future, enjoyment of interest and appreciation

1. Keynes—General Theory, p. 96.

(because, a larger real consumption at a later date is preferred to a smaller immediate consumption), the desire to enjoy increasing future income, the desire to enjoy a sense of independence and the power to do things, securing some means for carrying out speculation on business project, bequeathing a fortune ; and for some people, the satisfaction of pure miserliness. With respect to the behaviour of business corporations and governments Keynes lists four motives governing accumulation of savings, *viz.*, (i) *the motive of enterprise*, (ii) *the motive of liquidity*, (iii) *the motive of improvement* and (iv) *the motive of financial prudence*, the anxiety to be "on the right side" by making a financial provision against user and supplementary costs.

The strength of all the motives governing the desire to save will vary enormously according to the institutions and organizations of the economic system.

On the basis of these motives, Keynes establishes his fundamental law of consumption that *as a rule and on the average*, as income increases, consumption will increase but not by as much as the increase in income. So, according to Keynes, the marginal propensity to consume $\left(\frac{\delta C}{\delta Y}\right)$ must be less than unity. Some writers have criticised Keynes on the ground that *historical* changes in income and consumption may not conform to this rule. Historical changes may cause *shifts* in the consumption function. But we should remember that Keynes takes only a *normal* condition and not historical changes or any abnormal war conditions into account for his analysis of consumption function.

Keynes does not make any distinction between the cyclical and the secular or long-run consumption function. Prof. Kuznets' long-run data tend to show that the *per cent* of income saved (and invested) over a long period has been more or less constant at, say, around 12 per cent ; but this view is not sufficiently accurate. Prof. Hansen[1] argues that "cyclically, the percentage of income saved rises and falls as income rises and falls. If, however, one concentrates attention exclusively upon the rising secular trend in real income there is no

1. Machlup—"Period Analysis and the Multiplier Theory." Readings in the Theories of Business Cycles. (A.E.A.) Keynes—General Theory. P.P. 107-8.

conclusive evidence that a higher *percentage* of income is saved now than formerly. But if we save the same *percentage* of income (at corresponding phases of the cycle) as in earlier periods, it follows that the *amount* saved is higher, since real incomes have risen". Thus Hansen takes into account both the cyclical and secular aspects of consumption function.

Keynes is primarily concerned with the short-period shift in consumption. But he says that "apart from short-period *changes* in the level of income, it is also obvious that a higher absolute level of income will tend as a rule, to widen the gap between income and consumption. For, the satisfaction of the immediate primary needs of a man and his family is usually a stronger motive than the motives towards accumulation."[1] These reasons will lead, as a rule, to a greater *proportion* of income being saved as real income increases. Again, Keynes also argues that a decline in income due to a decline in the level of employment, if it goes far, may even cause consumption to exceed income[2] not only by some individuals and institutions but also by the government. Thus, consumption is basically determined by standards already achieved (*i. e.*, when income in the recent past was at its highest level). This latter point hints at Duesenberry hypothesis as developed in Duesenberry's book, "*Income, Saving and the Theory of Consumer Behaviour*". According to Duesenberry,[3] individual consumption functions are interrelated. When people come into contact with superior commodities or superior patterns of consumption, with new goods or new methods of satisfying old wants, they are apt to feel after a while some dissatisfaction. This leads to an increase in the propensity to consume. This is known as "demonstration effect". Finally, so far as *shifts* in consumption function are concerned, Keynes is of the opinion that "far—reaching social changes" or the slow effects of secular progress may cause very gradual shifts over time in the consumption function. Thus, the subjective factors which determine the consumption function are relatively stable.

Keynes also gives emphasis upon six objective factors which may cause shifts in consumption function. The first objective factor is a

1. The structure of the American Economy. P. 32.
2. Keynes—General Theory, P. 98.
3. Duesenberry—Income, Saving and the Theory of Consumer Behaviour.

change in the wage level (and the price level). If all price and wage rate change, money income also changes in the same direction. If money income were doubled (prices and wages having been doubled), consumption outlays would also double. If *real* income doubles, consumption will probably rise by less than 100 per cent.

The second objective factor is *the changes in accounting practice with respect to depreciation.* Here, Keynes should have considered that this factor is not likely to be of great importance in the short run. Thirdly, the *windfall gains or losses* also cause shifts in consumption function. Fourthly, *changes in fiscal policy, e. g.* huge amount of war expenditure, heavy taxation, rationing and price control, etc. upset the normal relationship between consumption and income. Fifthly, *changes in expectations, e. g.* change in the economic outlook caused by wars, earthquakes or revolutions or any other factor may lead to a shift in the consumption function. Fifthly, the total wealth position of consumers has often been regarded as a possible influence on consumer expenditure. The argument in this respect owes its origin to Pigou effect. Other things remaining the same, the more saving a man has, the less the strength of his desire to accumulate more. This effect is significant only when prices are flexible. But Keynes assumes a rigid price structure for attaining equilibrium at the less-than-full employment level. Lastly, *substantial changes in the rate of interest*, according to Keynes, probably tend to modify social habits considerably over a long period. A rise in the rate of interest leads to a fall in the volume of investment which again leads to a fall in income. A fall in the level of income leads to a fall in the volume of savings. Keynes' analysis of the consumption function—the factors which make it shift, and the factors which determine its scope—is a revolutionary contribution to the growth of Monetary Economics.

The Marginal Propensity to Consume and the Instantaneous Multiplier

The idea that a change in effective demand has multiplier effects on income and employment already appears in economic theory around the turn of this century. Prof. Schneider points out that "the theory of inflation developed by Wicksell in his *Interest and Prices* is a multiplier theory, even if it is not explicitly couched in

such terms."[1] N. Johannsen also developed the multiplier theorem clearly using the same term—for the deflationary case in his theory of economic depressions first in 1903 and then in 1913.[2] He was mainly concerned with the downward multiplier effect.

The multiplier effect of an initial increase in investment in the present form was first stated by R. F. Khan (Economic Journal. June 1931). It was later on explained by Lord Keynes in his General Theory. Post-Keynesians have further developed the theory.

The multiplier refers to the numerical co-efficient indicating the increase in income which will result in response to the increase in investment. In its essence, the multiplier compares the relative sizes of a given initial increase in investment and total (direct and indirect) final increase in income. That is to say, it shows by how many times the effect of an increment of investment has been "multiplied" by causing effect on consumption and thus leading to an increase in the national income.

Calculation of the Multiplier.

We can calculate the multiplier when we use δI to represent a given increase in investment and δY the resultant increase in income. In this case, the multiplier, K, will be equal to $\frac{\delta Y}{\delta I}$. This implies that $\delta Y = KSI$. But we know that the size of the multiplier depends on the size of the marginal propensity to consume (and hence on marginal propensity to save). In fact, the simplest expression is that when K is the multiplier and s is the marginal propensity to save, then $K = \frac{I}{s}$. This can be proved in the following way :—

$$K = \frac{\delta Y}{\delta I}.$$

The marginal propensity to save, s (=1 − marginal propensity to consume), can be stated as $1 - \frac{\delta C}{\delta Y}$.

But since $\delta Y = dC + \delta I$, $s = 1 - \frac{\delta C}{\delta Y} = \frac{\delta I}{\delta Y}$.

1. Schneider—Money, Income and Employment. P. 131.
2. Ibid. P. 132.

So $\frac{1}{s}=\frac{\delta Y}{\delta I}$.

$\frac{\delta Y}{\delta I}$ is the definition of K, *i.e.*, the multiplier.

So, $K=\frac{1}{s}$ $\quad s=\frac{1}{K}$.

The marginal propensity to save, $s=\frac{1}{K}$. This is the investment multiplier. Similarly we can speak of the employment multiplier when a given increase in employment will cause an increase in total employment.

The multiplier can, of course, also be defined directly in terms of the marginal propensity to consume. Let us call the marginal propensity to consume, m. The multiplier in this case can be defined as follows :—

$$K=\frac{1}{s}=\frac{1}{1-m}$$

The marginal propensity to consume $(m)=1-s$

$$=1-\frac{1}{K}.$$

We can always obtain K provided we know either the marginal propensity to consume or the marginal propensity to save.

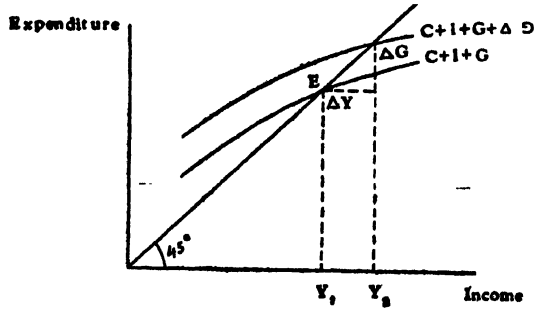


Fig. 35

We measure income along the horizontal axis and expenditure along the vertical axis. The intersection of the C+I+G line with

the 45° line determines the equilibrium level of income at E. Now let there be an increase in government expenditure.

This shifts the whole C+I+G line which would shift to its new position C+I+G+ΔG. The intersection of the C+I+G+ΔG line with the 45° determines the new level of income. The increase in income from y_1 to y_2 along the horizontal axis indicates the multiplier effect.

The size of the multiplier depends on the marginal propensity to consume. If the marginal propensity to consume is high, the multiplier will be large and *vice versa*. The Keynesian approach to the multiplier principle as explained above is known as the logical or the instantaneous theory of multiplier. It examines the operation of the multiplier effect at a point of time and not in a period of time.

The above figure has shown that the equilibrium level of income rises from Y_1 to Y_2 with increase in investment. We now have to find out by how much the equilibrium level of income rises by the amount ΔG. This is a problem in comparative statics.

Comparative-Static Analysis : For this purpose, we are to compare the original equilibrium level of income with the new equilibrium level of income. Let us handle our problem by introducing the saving function.

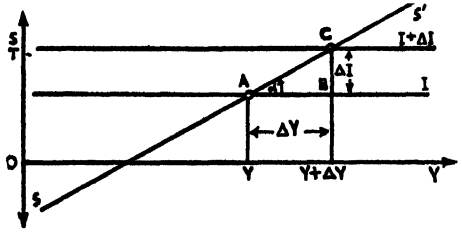


Fig. 36

The equilibrium level of income, we know, is determined at a point where the saving schedule intersects the investment schedule. In the above figure, OY represents the equilibrium level of income. When net investment rises by ΔI the corresponding equilibrium level of income becomes Y+ΔY. We are to explain the size of ΔY.

Let us assume the saving function to be linear. The triangle ABC immediately gives the following relationship :

$$\Delta y = \frac{1}{\tan \alpha} \quad \Delta I.$$

Now tan α, i.e., the slope of the savings function is, of course, the marginal propensity to save $\frac{\delta s}{\delta y}$.

$$\text{Therefore,} \quad \Delta y = \frac{1}{\frac{\delta s}{\delta y}} . \ \Delta I. \quad \cdots \quad \cdots \quad \cdots (2)$$

Since the sum of the marginal propensity to consume and the marginal propensity to save is equal to I, the equation (2) can be rewritten as follows :

$$\Delta y = \frac{1}{1 - \frac{\delta c}{\delta y}} . \ \Delta I \quad \cdots \quad \cdots \quad \cdots \quad (3)$$

The relationship between the equations (2) and (3) holds good generally, i.e., also for non-linear savings functions.

The exact proof is as follows :

The equation, $Y = C + I$, determines the equilibrium income as a function of I. This equation thus implicitly states the relationship between income and investment. Differentiating both sides of the equation with respect to I, we have :

$$\frac{\delta y}{\delta I} = \frac{\delta c}{\delta y} . \frac{\delta y}{\delta I} + I$$

$$\text{or,} \quad \frac{\delta y}{\delta I} . \left(1 - \frac{\delta c}{\delta y}\right) = I$$

$$\text{or,} \quad \delta y = \frac{1}{1 - \frac{\delta c}{\delta y}} . \ dI$$

$1 - \frac{\delta c}{\delta y}$ is the marginal propensity to save.

Thus, the multiplier theorem can be stated as follows :—

Given the propensity to consume, a small rise (fall) in autonomous investment (ΔI) leads to a rise (fall) in the equilibrium level of income by an amount equal to the product of the change in investment and the reciprocal of the marginal propensity to save.

The reciprocal of the marginal propensity to save is the *investment multiplier.*

It is to be noted that the multiplier relationship remains valid whether a rise in money income comes about through (a) a rise in prices only, or (b) a rise in real income and employment, prices remaining constant, or (a) a rise in real income and prices. These three cases differ only when the marginal propensity to consume and hence the size of the multiplier differs.

Expenditure Multiplier

Let us now consider the *expenditure multiplier.* The results obtained above can be easily extended to the case when net investment depends on the level of income, or broadly speaking, to the case where the propensity to *spend*[1], i.e. the sum of the propensity to consume and the propensity to invest, depends on the level of national income.

If the total expenditure function is A (Y, α), where α is a variable parameter indicating the position of the function, the equilibrium level of income is :

$$Y = A(Y, \alpha)$$

The equilibrium level of income here is a function of the variable parameter X. Differentiating with respect to α, we have :

$$\frac{\delta y}{\delta \alpha} = \frac{\frac{\delta A}{\delta \alpha}}{1 - \frac{\delta A}{\delta y}}.$$

The value of the right hand equation here is expenditure multiplier indicating *by how much the equilibrium level of income changes with a small shift in expenditure function.*

The equilibrium level of income in Fig. 37 has increased from OY_1, to OY_2 because of an increase in aggregate spending indicated by the distance of the C_2+I_2 line from the C_1+I_1 line.

It matters little as to whether the change in the equilibrium level of income is ensured through an increase in the propensity to consume or the propensity to invest in view of the fact that the equilibrium level of income always depends on the combined effect

1. Schneider—Money, Income and Employment (George Allen and Unwin, 1962) P. 116.

of both the influences. To put it accurately, if a rise in the propensity to invest is accompanied by a fall in the propensity to

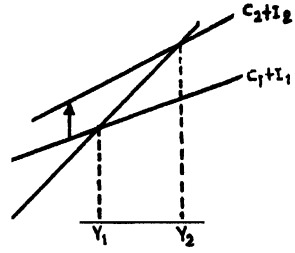


Fig. 37

consume, or if a rise in the propensity to consume is accompanied by a fall in the propensity to invest, there may not be any net change in the equilibrium level of income.

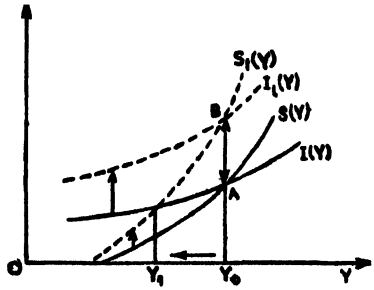


Fig. 38

In this figure, we find a rise in saving function (a fall in consumption function) by the amount of A B. The propensity to invest being assumed to be constant, the equilibrium level of income comes down to Y_1. But if propensity to invest goes up by the amount of AB as indicated by the distance between 1 (Y) curve and I_1 (Y) curve in the above figure, the equilibrium level of income remains at Y_0. Again, if neither the propensity to save nor the propensity to invest would rise (i.e., if the propensity to consume would not fall, the propensity to invest remaining constant), the equilibrium level of income also would stay at Y_0. The fall in money income, if it takes place in case the savings function increases investment function being given, may take the form of a fall in prices only, or a fall

in real income and prices, or a fall in real income only. This is an instance of deflationary gap.

Assumptions of the logical theory of multiplier and its criticisms

In explaining the multiplier principle, we are, in the first place, to assume that consumption function should remain stable when the multiplier effect is in operation. The fundamental difficulty is with regard to the determination of the marginal propensity to consume of the society as a whole. Unless it remains constant it is not possible to calculate the multiplier.

One difficulty in the determination of the marginal propensity to consume of the society as a whole is the fact that the distribution of income may change following the changes in income, and this will bring about an unexpected turn to the marginal propensity to consume of the society as a whole even if the marginal propensity to consume of an individual remains constant.

A similar critcism has been brought about by Prof. Haberler[1] who expresses the opinion that the psychological traits of the individuals in respect of saving and consuming cannot safely be regarded as constant. To this criticism it may be replied that Keynes himself considered this fact. He noted that the marginal propensity to consume may, at first, be less than the normal level, to be followed by another series of value of the marginal propensities above the normal, and then may return to its normal level.

Haberler in a well-known article in 1936[2] accused Keynes of dealing in tautology when he discussed multiplier—that is, of defining something as necessarily true, and then proclaiming as a discovery the "truth" of the relationship made inevitable by definition. Prof. A. G. Hart has contended that the multiplier concept is a useless "fifth wheel" since it adds nothing to the results already implied in the use of consumption function.

But the fact is that Keynes' multiplier analysis is much more than tautology for the purposes of a hypothesis about behaviour—namely, the existence of a stable consumption function. The multiplier analysis (or the Keynesian consumption—investment

1. Haberler—Prosperity and Depression.
2. Haberler—"Mr. Keynes' Theory of Mlutiplier': A Methodological Criticism." Reprinted in Readings in the Business Cycles A. E. A. (1944).

model) is actually comparative static analysis. But we can also develop a dynamic multiplier analysis on the basis of the lags and the length of period involved in consumption function.

Another serious criticism has been levelled against this assumption by Goodwin.[1] According to him, there is a time-lag between the receipt of income and its spending and between the spending of income and its subsequent re-emergence as income. Hence, the multiplier analysis, it has been argued, should take account of the relevant changes of relevant time lags.

But in reply to this criticism it has been said that in the vast majority of cases, the income-expenditure lag is of short duration and if an adequate period, say one month, is taken into consideration, the existence of this time lag will not introduce the complications imagined by Goodwin. Similar complications arise with regard to output-lag or production-consumption lag. Prof. Somers agrees that the production-consumption lag may affect the composition of investment, but does not affect the result. So, the gap can be ignored when we assume that given amount of increased rate of investment takes place in each period.

Keynesian theory of multiplier also assumes the existence of perfect foresight on the part of the businessmen so that there may not be any complication in establishing the view that the economic system will react almost immediately to the impact of the new investment. For the sake of simplicity the multiplier analysis is generally confined to a closed economy (but there is a separate theory of Foreign Trade Multiplier), that is, an economy where there is no international trade.

Leakages

As has already been stated above, the size of the multiplier depends on the marginal propensity to consume of the people or its reverse, the marginal propensity to save. The higher the marginal propensity to consume, the larger will be the multiplier. This indicates that saving and hoarding are leakages which reduce the marginal propensity to consume and tend to make the operation of the multiplier less effective.

The expenditure on imports is generally regarded as a leakage

1. Goodwin's article in "New Economics" edited by Harris.

since this reduces the domestic propensity to consume. It is, of course, true that in the long run, exports of an economy may increase and may even exceed the imports. This may compensate or even overcompensate the reverse multiplier effect of imports. So, the leakage caused by imports may be regarded as a short-run phenomenon.

Taxation sometimes constitutes a similar leakage, since it may lower the marginal propensity to consume. An expenditure tax is a good example in this context. But if there is any incentive tax, it may be an encouraging factor to further investment, and then it may not be treated as a leakage. Cancellation of debts with an increase in income may be regarded as a leakage since a part of income is then leaked out of the income stream. If, however, it comes back to the income stream when the creditors have got back their money and spent it or when they have again lent out lay money thus enabling the borrowers to spend more, it will not be necessarily regarded as a leakage.

Dynamic Multiplier

The notion that the Instantaneous Multiplier Theory as developed by Keynes does not give a true picture of the whole process has given rise to the concept of *Period Multiplier* or *Dynamic Multiplier*.[1] According to this analysis as developed by Goodwin,[2] Machlup and others, the full multiplier effect of a given increment of investment always takes time to be effective. According to this analysis, the limit to which the level of income would approximate following the increase in expenditure depends upon a chain of successive spendings which take place after the lapse of a given period of time. In this analysis we find a division of the time taken up by the full multiplier effect into different periods of more or less uniform length, in each period volume of investment being equal to that of saving. The effect of an increment in investment on income will be resultant of an increase of wages generated by the impact of the initial increase in investment.

1. For analysis of dynamic multiplier refer to Schneider's "Money, Income and Employment."

2. See Goodwin's article in "New Economics" edited by Harris.

We have so long discussed the multiplier theory in terms of comparative-static analysis. But in the real world the adjustment of the economic system to a change in net investment requires time. The multiplier problem thus requires a treatment in terms of dynamic analysis. Let us start with the assumption that investment increases during one period only, say, a year ; from the second period onwards investment falls back to the original level. This is shown in the following diagram :—

Fig. 39

The situation in which investment thus changes over a period of time is thus exposed to an *investment shock.* The period during which the investment shock takes place, national income increases as an impact of the increased investment and by an equal amount. But it may happen that the increase in income in one period may push up, in the positive propensity to consume, the level of income in the next period and so on. Let us give an example of the process of operation of the dynamic multiplier.

Let us suppose, in period I there has been an increase in income to the tune of 100 million rupees because of an increase in the investment to that extent. But the economic effects of the rise in national income are not exhausted in period 2 and assuming that Rs. 50 million out of the increased income in period 1 is spent in period 2, national income goes up to that extent in period 2. The transactors who receive the increased income in period 2 correspondingly raise their consumption into period 3, i.e., they spend Rs. 25 million out of Rs. 50 million earned in period 2. Thus, in the period 3 national income goes up to the tune of Rs. 25 million. In period 4 again, the transactors spend Rs. 12·50 million out of Rs. 25 million earned in period 3 and the national income goes up to that extent. In period 5, the transactors again spend Rs. 6·25 million out of Rs. 12·50 million earned in period 4, and the national income goes up to that extent and thus the process continues. This sequence of events over the different periods of time can be plotted in the following table :—

Period	*Change in investment* (*In millions of rupees*)	*Change in consumption*	*Change in income* (*In millions of rupees*)
1	100	—	100
2	100	50	150
3	100	50+25	175
4	100	50+25+12·50	187·50
5	100	50+25+12·5+6·25	193·75
⋮	⋮		
n	—	$100(\frac{1}{2})^{n-1}$	$100(\frac{1}{2})^{n-1}$

This table shows the effect over time of an investment shock of 100 (in million rupees), with a marginal propensity to consume of $\frac{1}{2}$, the increases in income in the individual periods are expressed in the following manner :—

1st Period : 100
2nd Period : $100+\frac{1}{2}\cdot 100$
3rd Period : $100+\frac{1}{2}\cdot 100+(\frac{1}{2})^2\cdot 100$
... ...
*n*th Period : $100+\frac{1}{2}\cdot 100+(\frac{1}{2})^2\cdot 100+\cdots\cdots+(\frac{1}{2})^{n-1}100.$

The increase in income in the *n*th period represents a geometric series of *n* terms with a ratio $\frac{1}{2}$. The following figure shows the increase in (ΔY_n) as *n* increases.

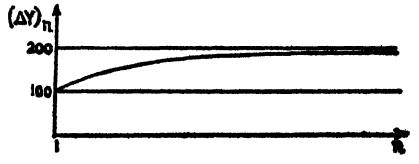


Fig. 40

In terms of this figure, with a marginal propensity to consume of $\frac{1}{2}$ the final effect of a permanent increase in net investment of 100 is a permanent rise in national income of 200. The curve in the above figure shows the path by which this increase is finally achieved.

The numerical illustration given above can be generalized in the following formula :—

$$(\Delta Y)_n = 1\cdot \frac{1}{1-\frac{\delta c}{\delta y}}\left[1-\left(\frac{\delta c}{\delta y}\right)^n\right]$$

The effect of a permanent change in net investment over time can be shown by the following diagram :—

Here, C+I curve represents effective demand and corresponding to this, equilibrium level of income is determined at R_1. If the increase in net investment is ΔI, this means a parallel upward shift of the curve of effective demand, and corresponding to this, the new

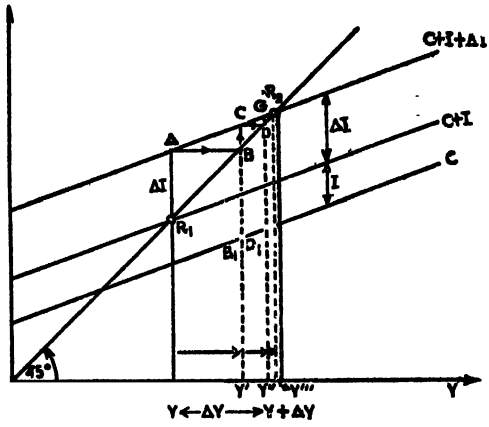


Fig. 41

equilibrium level of income is $OY+\Delta Y$. In the first period, income increases to the level of Y′ by the amount of ΔI. This leads to an increase in consumption by the amount Y′B and total effective demand for consumption and net investment becomes Y′C. Thus in the second period, income goes up by CD, i.e., to the level of Y″. Similarly, in the third period, the amount spent on consumption is Y″D, and total effective demand for consumption and net investment is Y″G, leading again to an increase in income to the level of Y‴, and so on. The *step function* ABCDGR_2...*thus represents the path by which the system moves from equilibrium* Y *to the new equilibrium* $Y+\Delta Y$ *over time.*

Great importance is attached to the time lags intervening between successive waves. We find, for example, income-expenditure lag and income-output lag.

There is no doubt that the multiplier theory, in order to be realistic, should take into account the period of time intervening between the injection of investment and the final result. But the

problem with which we are confronted is, how to decide the degree of importance of the different time lags. If we try to take account of all the relevant time lags, the analysis becomes too complicated. If again, we take only one kind of time lag into account, we face another problem of selecting the particular time lag. Moreover, there is still another question in this regard. Even if a particular time lag is selected it is not very easy to decide the manner in which time should be divided up into units of uniform length. For example, to take up the Robertsonian time lag, the "day" would be different for different groups of people. Prof. Machlup[1] speaks of four different types of transactions period and five types of income-period. It is perhaps because of this central difficulty that Keynes rejected the concept of period analysis.

Acceleration Principle

The Acceleration Principle was first developed by J. M. Clark.[2] Fluctuations in the demand for consumer goods lead to similar fluctuations in demand for capital goods. Again, changes in the demand for consumer goods lead to accelerated or magnified changes in the demand for capital goods. This phenomenon is known as *Acceleration Principle*. The reason of magnification of desired demands is purely technological. It depends upon the durability of capital goods. The more durable the productive equipment, the greater will be the acceleration co-efficient and *vice versa*.

The assumptions of the acceleration principle are the following.

In the first place, the rate of change in the demand for consumer goods is to continue for some future time.

Secondly, production function remains the same even under the impact of change in demand for consumer goods. In other words, there will be a fixed ratio between the consumer goods and the fixed capital goods. An increase in demand for consumer goods may only lead to overtime working, or to working in additional shifts, thereby leading to more intensive utilisation of the existing capital equipments. Again, any change in the technique of production

1. Machlup—"Period analysis and the Multiplier Theory."—Readings in the Theories of Business Cycles. (A. E. A.)

2. "Business Acceleration and the Law of Demand." *Journal of Political Economy*. March 1917. 217.

will correspond to a relative change in prices of the factors of production.

Thirdly, at every moment there is an optimum method of production for each product. This optimum method remains the same regardless of the interest rate. The proportions in which different types of products are produced are fixed (with respect to variations in levels of income).[1] The assumption of fixed production function rules out the possibility of excess capacity both in the consumer goods industries and the capital goods industries. But industries confronted with fluctuating demand are likely to maintain certain amount of excess capacity as a normal condition In these industries, productive capacity is determined usually on the basis of some average demand through a number of time periods Moreover, there is a possibility that all industries during periods of recession may have surplus capacity. But as Knox[2] has pointed out, it is not possible to desire a definition of surplus capacity that is both realistic and precise.

Fourthly, the optimum method of production requires a certain amount of capital. Moreover, relative prices are fixed (with respect to variations in levels of income). Let us for the time being consider a stationary economy. In such an economy, net income is equal to the value of consumption ; gross investment is equal to depreciation and net investment is equal to zero. Let us now assume a rise in the propensity to consume. This will lead to a new stationary equilibrium after all adjustments have taken place, with a higher level of income and a higher level of consumption. The technology remaining constant, this will also correspond to a higher level of replacement investment, since the stock of capital used in production of income is greater in situation 2 than in situation 1. So, we can say that, technology remaining constant, re-investment in a stationary economy depends solely on the level of consumption, and that there is a direct, proportional relationship between the two. If Ir denotes replacement investment, then,

$$Ir = \alpha C \quad \cdots \quad \cdots \quad \cdots \quad (1)$$

1. Duesenberry—Business Cycles and Economic Growth. P. 31.
2. Knox—"Acceleration Principle and the Theory of Investment." Economica, 1952, August.

But if the economy is progressive, the available stock of capital must not merely be maintained by replacement, but must expand. In the following figure, the progress of the economy from situation 1 to situation 2 is possible if there is an appropriate expansion of the capital stock,

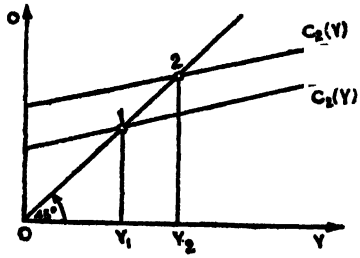


Fig. 42

This expansion of the stock of capital which implies an increase in net investment is induced by an increase in consumption, and larger the change in consumption, larger is the amount of induced investment.

If we introduce the element of time in the course of consumption by the function $C\ (t)$, the change in consumption at a point of time t may be indicated as $\frac{\delta c}{\delta t}$. The net investment I is then a rising function of $\frac{\delta c}{\delta t}$ when $\frac{\delta c}{\delta t}$ is positive. Thus, the direct, proportional relationship between induced investment and change in consumption may be expressed as follows :

$$K=\beta \cdot \frac{\delta c}{\delta t} \qquad \cdot(2)$$

Here, K indicates induced investment. Gross investment at any point of time consists of (a) re-investment which is a function of the absolute level of consumption, (b) induced investment which is induced by changes in consumption through time and (c) autonomous investment. In explaining the accleration principle we are concerned with that part of gross investment which is related to consumption and so, we may here neglect autonomus investment. We consider here the sum :

$$I_r+K=\propto .c+\beta \cdot \frac{\delta c}{\delta t}. \qquad \cdot(3)$$

If we now like to consider discontinuous changes in consumption, the equation (2) will be replaced by a relationship such as :

$$K_t=\beta \cdot (C_t-C_{t-1}) \qquad (2a)$$

or also $$K_t=\beta \cdot (C_{t-1}-C_{t-2}). \qquad (2b)$$

The equation (2*a*) indicates that net investment induced during any period is proportional to the difference between consumption in the same period and consumption in the preceding period. The equation (2*b*) also implies the same thing.

The equation (2) describes a particular *behaviour pattern of firms* since the investment decisions are made by firms, and this behaviour pattern of firm states that a given change in consumption induces firms to undertake a net investment of a certain amount. This is quite compatible with the fact thet investment decisions are governed by expectations of profit, and 'in fact, positive change in consumption is related to the expectations of rising profits. The relations of the equation (2) and equations (2*a*) and (2*b*) state the *acceleration principle*, and the constant β in equation (2) is called the accelerator. The relations here are dynamic in character establishing the fact that acceleration principle can never be explained in static terms.

The following figure throws more light on the operation of the acceleration principle :

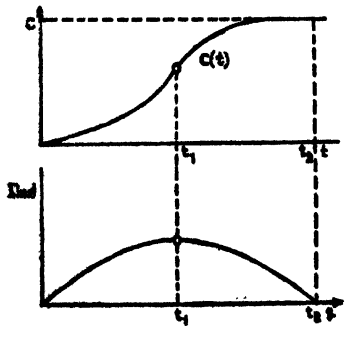


Fig. 43

In the upper portion of this figure the vertical axis indicates consumption and the horizontal axis indicates the time path. Until the point t_1, consumption grows at an increasing rate ; from t_1 onwards consumption continues to grow absolutely but at a decreasing rate, and from t_2, it remains constant, when the economy reaches a new stationary equilibrium level of income. On the basis of the upper portion of the figure, we can ascertain the course of net investment by multiplying the rate of growth of consumption $\left(\frac{\delta c}{\delta t}\right)$ by the accelerator. That is to say,

$$K=\beta\frac{\delta c}{\delta t}.$$

In the lower portion of the figure, the vertical axis indicates

the induced investment and the horizontal axis indicates the time. The rate of growth, $\frac{\delta c}{\delta t}$ in the lower portion of the figure, rises with rising t until the point of inflection t_1 and between t_1 and t_2, the rate of growth gradually declines with rising t. From t_2 onwards, the rate of growth is zero. Thus we conclude, (i) rising consumption leads to rising induced net investment as long as consumption grows at an increasing rate, and (ii) when consumption rises at a decreasing rate induced net investment declines. As long as the absolute value of this negative induced net investment is smaller than replacement investment (depreciation) the acceleration principle remains operative. Depreciation sets a limit to the actual volume of dis-investment only when the value of induced dis-investment is greater than depreciation.

The accceleration principle has some limitations. It is not legitimate to assume a fixed production function under the impact of a change in demand for consumer goods. There is every possibility that the technique of production may vary in accordance with the changes which are found in the relative prices of factors of production. Neglect to take account of the effects of changing demand on relative factor prices is one of the limitations of the acceleration principle.

According to Knox,[1] the acceleration principle is not precise since it fails to give a definition of excess capacity. J. M. Clark assumed full elasticity of the credit system since the acceleration effect might be stopped if the credit system was rigid. This assumption is not objectionable except under certain conditions. Except in the boom, the credit situation is seldom stringent. The most serious criticism of the acceleration principle has been made by Tinbergen[2] who relates the volume of induced investment not to the rate of change in income, but to the level of current profit Tinbergen found no significant correlation between changes in production index of investment goods and the rate of increase in index of consumer demand. Prof. Harrod[3] holds the contrary view.

1. Knox—"Acceleration principle and the Theory of Investment." Economica, August, 1952.
2. Tinbergen—"Statistical evidences on the Acceleration Principle" Economica, May, 1938.
3. Harrod—"Essays in Dynamic Theory."

According to him, if a certain amount of investment is actually found to be a function of the current profits, this will not require any modification of the acceleration principle. "It may be that the observed relation between profits and the investment is due to the level of profits being itself very closely correlated with the true causes of investment decisions. We do not as yet possess sufficient evidence to accept this correlation as a general proposition."[1]

The acceleration principle throws some light on an important characteristic of business cycles. It has been found that durable goods industries (both capital and consumer) fluctuate more violently during the course of the business cycle than the non-durable goods industries. This phenomenen can be accounted for, partly, by the acceleration principle. The most important fact about the acceleration principle is that production in the capital goods industries will change in an absolute direction merely as a result of a change in the direction of consumer demand. During the course of an upswing in the economy, then, a fall in the rate of increase in consumer demand is sufficient to induce a decline in the absolute level of production in the capital goods industries.[2]

The acceleration principle theory of investment is a special and rigid application of the more general relation between capital stock, income and returns on investment. To justify the transition, it is necessary to assume, among others, (i) that the amount of real capital per unit of output which a firm desires is effectively independent of the cost of raising funds for investment or (ii) that the cost of raising funds is in variant with respect to the amount raised.[3] There is obviously no technical reason why investment should move in proportion to the rate of increase of income.[4] The size of the prospective return associated with an increase in demand can vary for nen-technical reasons, and so can the return required to induce investment.

If the marginal-efficiency-of-investment schedule is elastic to the

1. Harrod—"Essays in Dynamic Theory."
2. Hamberg—Business cycles. P. 118.
3. Article of Knox—Economica, Vol. 19, 1952.
   Also see Duesenberry—Business Cycles and Economic Growth.. P. 39. (Mc Graw Hill, May, 1958)
4. Duesenberry—Business Cycles and Economic Growth. P. 39.

cost of raising funds, the rate of investment ought to be sensitive to the cost of raising funds for investment. It is generally argued that nvestment is not very sensitive to the rate of interest even though the marginal-efficiency-of-investment schedule is elastic. Thus the acceleration principle cannot be based on the assumption that the cost of raising funds is in variant with respect to the amount raised. It is true whether or not the market supply of loanable funds is very elastic.

Interaction of the Multiplier and Acceleration effects[1]

By combining the multiplier effect with the acceleration co-efficient, we are in a position to estimate more accurately the total effect on national income of the original increase in investment. This combination is achieved by making the total increment in national income consist of (i) the initial increase in investment, (ii) the consumption expenditures induced by the increased investment and (iii) proportional increase in investment induced by the increase in consumption. The first and the second factors give rise to the operation of the multiplier effect while the third comprises the acceleration effect.

The interaction of the multiplier and acceleration effects enables us to draw the following conclusions :

In the first place, if we take into account cnly the multiplier effect, *i.e.*, if we assume the acceleration co-efficient to be zero, a steady injection of new investment leads to a steady rise in national income equal to the value of the injection times the multiplier. Secondly, with a marginal propensity to consume of $\frac{1}{2}$ the national income of the immediately preceding period, and in addition an acceleration effect of unity, we find oscillations about the income level obtained from the multiplier effect alone. Thirdly, with higher values for the marginal propensity to consume and the acceleration co-efficient, the fluctuations in the level of national income occur increasingly around an average value which is equal to the income level attained on the basis of the multiplier effect alone. Fourthly, if we allow the values of the marginal propensity

1. See P. A. Samuelson's article, "Interactions between the Multiplier Analysis and the Principle of Acceleration." *The Review of Economic Statistics*, May, 1939. P. P. 75-78 Reprinted in "Essays in honour of Prof. Hansen."

to consume and the acceleration effect to go still higher, we get no oscillations, but get, instead, "explosive" effects,[1] the national income rising constantly and at a rapidly increasing rate.

It is to be noted that except for high values of the acceleration effect, the accelerator does not at all influence the ultimate level at which the national income finally settles. It can, at best, play some part in initiating *fluctuations* in the path of movement in national income from one level to another. So, it is *not* possible to raise the "income to higher and higher levels by the proceas of lifting yourself by your bootstraps *via* the interrelation of increased consumption and increased investment in the familiar expansionist process."[2]

The analysis of the interaction of the multiplier and the acceleration principles enables us to move towards an advanced stage in our conceptions of the nature of cyclical process.

Let us consider the mechanism of the interaction of the multiplier and the accelerator. We start with the familiar equation,[3]

$$Y = C(Y) + I_0 \cdots \quad \cdots \quad \cdots \quad \cdots (1)$$

If there is an increase in antonomous net investment of ΔI_0, we reach a higher equilibrium level of income,

$$Y = C(Y) + (I_0 + \Delta I_0) \cdots \quad \cdots \quad \cdots (2)$$

Thus the process which raises income to a higher level may again induce net investment and thus an interaction of the multiplier and the accelerator may set in. Let us give a numerical illustration in this regard. Let the economy be supposed to be a closed one. Let us further assum marginal propensity to consume to be $\frac{1}{2}$ and accelerator to be 2. A rise in income in one period is also supposed to be affecting consumption only in the next period. Let net investment rise by Rs. 100 per period. In period 1 income increases by Rs. 100. This leads to an increase in consumption to the tune of Rs. 50 in period 2. This leads to an increase in net investment of Rs. 100, so that the total investment is Rs. 200 and thus the rise in income is Rs. 250. This

1. Hamberg—Business Cycle, P. 123.
2. Hansen—Fiscal Policy and Business Cycles, PP. 283-84.
3. The analysis here is based on that in Schneider's Money, Income and Employment. Pages 181-185.

increased income again leads to an increase in consumption to the extent of Rs. 125 in period 3 and induced investment in the some period is Rs. 150, and so on. This is shown in the following table :

Period	Autonomous Investment	Induced Consumption	Induced Investment	Total Investment	Income (Insupeas)
1	100	—	—	100	100
2	100	50	100	200	250
3	100	125	150	250	375
4	100	187·50	125	225	412·50
5	100	206·25	37·50	137·50	343·75

Income for a given period of time may be stated as

$$Y_t = C_t + I_t \cdots \quad \cdots \quad \cdots \quad \cdots (3)$$

We may split up I_t into I^a and I_t^i indicating autonomous net investment and induced net investment respectively. So, the equation (3) may be re-written in the following way :

$$Y_t + C_t + I^a + I_t^i \cdots \quad \cdots \quad \cdots \quad \cdots (4)$$

Let us now assume that consumption during any period depends upon the income of the preceding period so that

$$C_t = \alpha \, . \, Y_{t-1} (0 < \alpha \leqq 1) \cdots \quad \cdots \quad \cdots \quad \cdots (5)$$

Induced investment during any period again depends upon the difference between consumption in period t and consumption in period t_{-1} (the acceleration principle) :

$$I_t^i = \beta (C_t - C_{t-1}), (\beta > 0) \ldots \quad \cdots \quad \cdots \quad \cdots (6)$$

The equations (4), (5) and (6) enable us to indicate the course of income through time for all possible combinations of the marginal propensity to consume (α) and the accelerator (β),

Using these three equations we can write :

$$\begin{aligned} y_t &= \alpha . \, Y_{t-1} + \beta (\alpha . \, Y_{t-1} - \alpha . \, Y_{t-2}) + I^a \\ &= \alpha (1+\beta) . \, Y_{t-1} - \alpha . \, \beta Y_{t-2} + I^a \quad \cdots \quad (7) \end{aligned}$$

The equation (7) contains only income as a variable, and it contains the values of income in three successive periods. The solution of equation (6) shows how the path of income through time depends upon the value of the marginal propensity to consume (α) and the accelerator (β). Prof. Samuelson[1] has shown, the change

1. Samuelson—"Interactions between the Multiplier Analysis and the Principle of Acceleration". (Review of Economic Statistics.) Vol. 21, 1924.

of income over time may follow one of the four alternative paths, A, B, C and D depending on the position of the point α, β in the following figure :—

In segment A combinations α, β are marked by a low value of

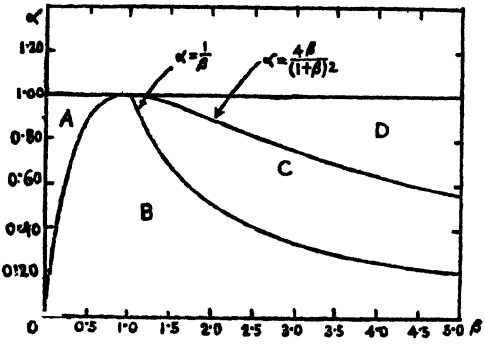


Fig. 44

the accelerator. In this case income rises continuously and approaches the value :

$$\frac{1}{1-\alpha} \cdot 1^{a} \qquad \cdots(8)$$

The final result here is determined by the multiplier effect. In the segment A, the equilibrium of the model is a stable one and is approached by a monotonic path, as is shown by the lime A in the above figure. If α and β have same numerical values in segment B, income is subject to *damped fluctuations*, and gradually approaches the value given by the equation (8). In the region B, the path to equilibrium is that of a *damped cycle.*

For combinations of α and β lying in segment C, income fluctuates around the value given by the equation (8) with oscillations of great magnitude. In the segment C, the equilibrium of the model is unstable. If α and β have large values in the segment D, income expands continuously. Theoretically, this is a never-ending cumulative process of expansion. In the segment D, the movement is simply an *explosive* one. The expansionist effect of a change in autonomous investment through an interaction of the multiplier and the accelerator (even assuming α and β to be constant) shows how complicated the process of the interaction of α and β is.

Long Period Consumption Function

We find controversies regarding the nature of long-period consumption-income relationship. One of the most debated problems centres round the question as to whether the basic relationship between consumption and income is one of proportionality or as Keynes thought, one in which the proportion of consumption to income could be expected to decline as income increased. The debate is mainly relevant to the long-term prospects of a growing economy.[1] Thus, if it is found that the productive power of an economy has been doubled in 20 or 25 years, should we think that consumer demand also has been expanding in the same proportion, assuming full employment ? If full employment is to be maintained and if consumer demand would expand in a small proportion, it would call for an increase in other sources of demand in greater proportion than income. Thus, public expenditure would have a greater expansion or investment expenditure would have increased on a larger scale.

That consumption function cannot be linear, non-proportional, and stable over long periods of time in a developing economy has been amply demonstrated by Kuznets' estimates of national income and consumption expenditure for the period 1869-1938 in 1929 prices.

The estimates made by Kuznets in this regard have resulted in an inconsistency, as we shall see in the following pages, between the notion that consumption is a stable function of income, with a marginal propensity less than one and the notion of consumption function derived by Kuznets from available data. Attempts for reconciliation between these two notions have been made by Arthur Smithies, Dusenberry and Milton Friedman.

In 1946, Simon Kuznets published estimates of national income and product for the United States, by overlapping decades, from 1869 to 1938. This is shown in the following table.

---

1. The discussion here has been highly influenced by Ackley's exposition of the different versions of long-run consumption function. See Ackley's book "Macroeconomic Theory". Pages 233-251

National Income and Consumption Expenditure in 1929 prices, 1869-1938[1]

Decade	National Income (billion of dollars)	Consumption Expenditures (billion of dollars)	"Average propensity to consur
1869-78	9·3	8·1	·86
1874-83	13·6	11·6	·86
1879-88	17·9	15·3	·85
1884-93	21·0	17·7	·84
1889-98	24·2	20·2	·84
1894-1903	29·8	25·4	·85
1899-1908	37·3	32·3	·86
1904-13	45·0	39·1	·87
1909-18	50·6	44·0	·87
1914-23	57·3	50·7	·89
1919-28	69·0	62·0	·89
1924-33	73·3	68·9	·94
1929-38	72·0	71·0	·99

From the above table it is clear that the average propensity to consume was relatively stable (between ·84 and ·89) over a very large growth of total income during 1884–1928. Kuznet's findings are consistent with the view that consumption is a stable function of income with a marginal propensity less than one (and equal to the average propensity). But Kuznet's findings were not consistent with the consumption function derived from annual data for the pre-World War II period. So, the question of reconciliation between the two sets of findings arises. We might say that there existed a "long-run" consumption function involving a proportional relationship, and a "short run" consumption function based on the assumption that MPC<APC. But the question is, how to ensure a reconcilia-

1. The table has been quoted from Ackley's book, "Macroeconomic Theory." P. 239.

tion between these two different sorts of reasoning? Prof. Arthur Smithies has tried to answer this question. His reasoning is this: Basically, consumption responds to income non-proportionally. But it might have happened, following Kuznets' findings, that the consumption function had been drifting slowly upward over the decades, as income had slowly increased, and that the upward drift of consumption function had just happened to affect the tendency for the average propensity to consume to decline as income increased. Arguments of Smithies can be represented by the following diagram.

In this figure, CF_1 line shows the basic consumption function (say as of the decade 1869-78, in Kuznets' data), the average annual income being Y_1 and average annual consumption being C_1. But the consumption function is gradually drifting upwards. By the decade 1889-98 as we find in Kuznets' data, the consumption had already moved up to position CF_5 in the above figure. If income would now be Y_1 (as might be the case in depression), consumption would then be C'_1. But, let us suppose, there was an increase in income upto Y_5 through economic growth and this produced average consumption of C_5. If there was no upward drift of average consumption function, the income level of Y_5 would have produced average consumption of C'_5. By the decade 1924-33 in accordance with the data of Kuznets, the consumption function reached CF_{12}, and coincidentally, average income also increased to the tune of Y_{12}, producing an average consumption function of C_{12}.

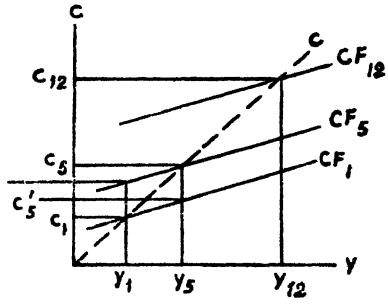


Fig. 45

Thus, the points C_1Y_1, C_5Y_5 and $C_{12}Y_{12}$ which fall on the broken line in the above figure indicate the data estimated by Kuznets.

Prof. Arthur Smithies thinks that it was mere coincidence that the upward shift of the consumption function had just about

exactly offset what would otherwise have been a decline in the average propensity to consume as a result of an increase in income. Prof. Smithies noted that the American population had been gradually migrating from rural to urban areas leading to an increase in aggregate consumption function. Another reason for upward shift in consumption function, according to Ackley, was that the age distribution of the population had been changing over this entire period.[1] Larger percentages were in the older age brackets who are supposed to be mostly consumers and not income-earners; this change in the age-groups might have affected the relationship of consumption to income, the total relationship increasing by an increase in their relative weight. Smithies also suggested another trend factor, and it was the constant introduction of new consumer goods in this period, and the incorporation of these goods into the customary standard of living. This factor was, of course, independent of the changes in the level of income. But this factor did have the effect, according to Smithies, of elevating consumption relative to income above what it would have been had the assortment of available goods been more stable. Smithies considered consumption function in terms of the following equation.

$$C = a + by + dt$$

Here a and b are constants. It indicates that consumption function in Keynesian sense would be: $C = a + by$. But, Smithies introduces dt, where t represents time. If there would be an upward trend, the coefficient d would be positive. If consumption would have a downward drift, d would be negative. If consumption would have no trend, *i.e.*, if it would be same in the long run as it was in the short run, d would be zero. By imputing appropriate value of t for the decades, the consumption data of which were estimated by Kuznets, Smithies obtained hypothetical consumption quite close to the direct estimates of Kuznets. Thus it was established by Smithies that consumption was non-proportional to changes in income.

Duesenberry[2] was not satisfied with the explanation given by Smithies. Duesenberry contended that the basic relationship was

1. Ackley—Macroeconomic Theory. P. 241.
2. Duesenberry-*Income, Saving, and the Theory of Consumer Behaviour.*

one of proportionality between income and consumption, and in this context, he showed that neither changing residence from the rural to urban areas nor age distribution could have produced nearly the upward shift which was necessary for Smithies' hypothesis.

Duesenberry defended his hypothesis of proportional consumption —income relationship to be consistent with *a priori* theory. The apparent non-proportionality observed in the short run merely reflects an *income-consumption lag* in the short run. The following figure indicates Duesenberry's position.

Let us consider the Figure no 47. Here the solid line Y shows steady increase in income, and corresponding to this increase in income, the solid line C indicates the steady increase in consumption. But income growth is not steady; there are upswings and downswings in the income growth and this has been indicated in the above figure by the broken line y'. Consumption responds to this change in income in the similar manner and this has been indicated by the broken line c'. If we view the relationship as a whole, we find the consumption-income relationship to be proportional. But if we consider a very short period composing only a single "cycle", we find that the relationship is non-proportional. The behaviour of the changing income (Y^1) and changing consumption (C^1) in a single cycle is shown in the Figure no. 48. The reason why the fall in consumption is less than fall in income in depression is that consumers adjust their consumption not only to their current income

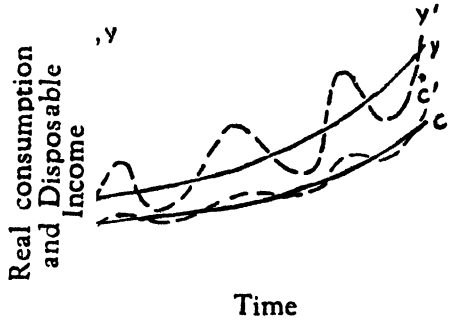


Fig. 46

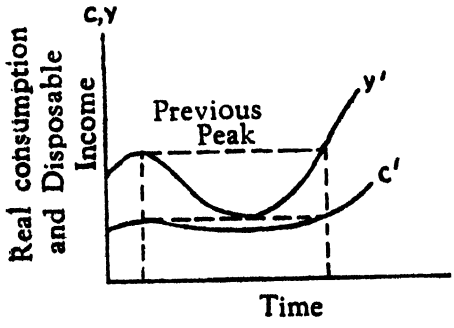


Fig. 47

but also to income earned previously, particularly previous peak income. When income moves into new high ground, consumption also responds more rigorously to increase in current income. Thus we find a "*ratchet effect*". Consumers find it easier to increase consumption than to curtail it. This ratchet is evident in the Figure no 48 by the brokn line C'.

Duesenberry suggests a consumption function of the following unusual form :

$$\frac{S_t}{Y_t} = a\frac{Y_t}{Y_o} + b$$

Here S and Y represent saving and income respectively, the subscript t refers to the current period and o to the previous peak. This equation thus states that the average propensity to save (St/Yt), or negatively, the average propensity to consume is a function of the ratio of current to previous peak income. If this ratio is constant, then the average propensity to save is constant. But if income falls below the previous peak, the average propensity to save falls. Correcting Dusenberry's equation to the more customary form. We get :

$$\frac{S_t}{Y_t} = 1 - \frac{C_t}{Y_t}.$$

Prof. Milton Friedman[1] has also tried to reconcile the conflicting indications about the consumption-income relationship. He distinguishes between "Permanent" income and actual "measured" income, and correspondingly between "Permanent" consumption and actual, "measured" consumption. Friedman thinks that the essential form of the consumption function is one of proportionality. "Permanent" consumption is proportional to "permanent" income. But the actual, observable "measured" income of any period, for any individual contains both permanent and transitory elements. Likewise, actual, observable "measured" consumption contains both permanent and transitory elements. Friedman assumes that the transitory components of consumption and income are uncorrelated with their corresponding permanent components, and, further, are

1. Milton Friedman—A Theory of the Consumption Function. (Princeton University Press, 1957).

uncorrelated with each other. The following figure indicates Friedman's position :

In this figure, OC is the basic consumption function which indicates same consumption function for any small sample of families. OC is the permanent consumption corresponding to a permanent income. Income OD is the average measured income for the whole community. At OD, the average permanent income of such families coincides with the average measured income.

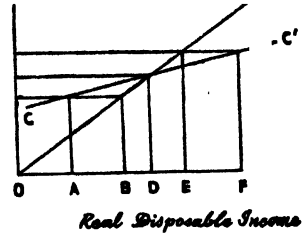


Fig. 48

These families have an average permanent consumption OH which also indicates their measured consumption.

But for the families which have the measured income of OA, the average permanent income is OB ; this is so because the permanent income necessary to produce permanent consumption of OG is OB. If we relate measured consumption to measured income we mistakenly associate consumption OG with income OA. Similarly, the families with measured income OF have permanent income of OE corresponding to which permanent consumption is OI. The apparent consumption function is *cc'*, with a marginal propensity to consume less than average propensity to consume. The basic function is exposed only by long-term income change, APC = MPC.

Friedman further considers the consistency of his hypothesis with data from time series.

Apart from the above explanations of long-run consumption functions, we find another essentially similar, although independent, theory of long-run consumption function formulated by Franco Modigliani and Richard Brumberg, which makes the proportion of income saved depend upon lifetime average income, again making saving relatively inelastic to changes in current income[1].

1. "Utility Analysis and the Consumption Function. An Interpretation of Cross Section Data" in Post-Keynesian Economics, edited by K. Kurihara.

War and Postwar Consumption Behaviour

The post-war period disclosed irregularities of consumer spending and these phenomena induced the economists to think anew of the nature of long-run consumption function.

The following figure provides us with information about the war and post-war consumption patterns.

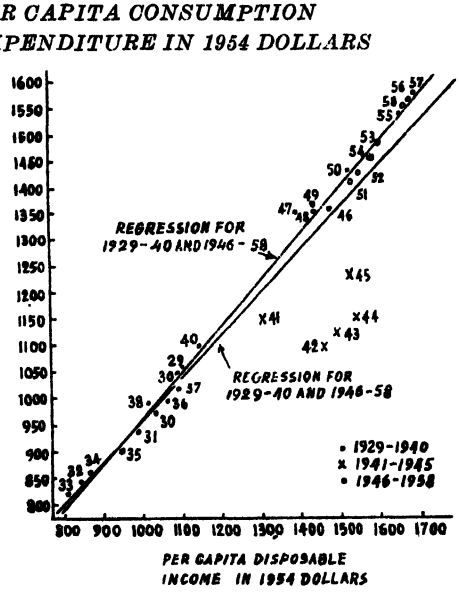


Fig. 49

During the period 1941-1945, consumer expenditures, though remaining high, were far below the levels that might have been expected on the basis of the pre-war relationship of consumption to income. This was, perhaps, due to rationing and other limitations on production of consumer goods during the war period. The gap between the desired purchase and the actual purchase led to "inflationary gap", In the post-war period, the aggregate consumption expenditures again increased and it was more or less on that level which was expected on the basis of an extension of the pre-war pattern. But the production of durable goods did not yet increase upto expectation, and it meant that expenditure on non-durable goods was considerably higher than usual relative to income. The higher slope of the consumption curve indicates that the function

which includes both the war period and the post-war period comes much closer to making consumption proportional to income.

But Ackley points out, it must be recalled, of course, in evaluating the deviations of actual consumption from consumption estimated in the above figure, that "the association of consumption and income is two-directional: income influences consumption spending; but "abnormally" high or low consumption also tends to make income abnormally high or low, reducing the apparent magnitude of the abnormality of consumption."[1]

The above analysis, however, establishes the fact that "a highly regular relationship does exist between aggregate consumption and aggregate disposable income. Only when we push somewhat deeper below the surface, do problems of interpretation and understanding continue to raise their ugly heads".[2] There is no doubt that the relationship between consumption and income which Keynes postulated has much ground to attract our attention.

Keynesian Analysis of Investment Function

In this theory of output determination for the economy as a whole Keynes regards investment simply as an independent variable assuming investment opportunities to be historically given. In his more elaborate "marginal efficiency of capital" theory, Keynes analyses investment activity as a dependent variable. According to Keynes, the basic determinants of investment are the marginal efficiency of capital and the rate of interest. The marginal efficiency of capital means the *anticipated rate of return* over its entire life on the original cost of a contemplated investment. In the words of Keynes, marginal efficiency of capital is "*equal to that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal to its supply price.*"[3] This gives us the marginal efficiencies of particular types of capital assets. The rate of investment will be pushed to the point on the investment-demand schedule where the marginal efficiency of capital in general is equal to the market rate of

1. Ackley—Macroeconomic Theory PP 248-49.
2. Ibid, P. 249.
3. Keynes—General Theory. P. 135.

interest.[1] The inducement to invest, it follows, depends partly on the investment-demand schedules and partly on the rate of interest. The inducement to invest will be strong if the *value* of an additional capital good exceeds its supply price or *replacement* cost. The *value* of an additional unit of a capital good is determined by two factors, *viz.* (1) the series of prospective annual returns which one may expect from that capital good over its life time, and (ii) the rate of interest at which these expected annual returns are discounted.

If we suppose $R_1+R_2+R_3+\ldots\ldots R_N$ to be the series of prospective annual returns or *prospective yields* of investment, C_R to be the replacement cost, r to be the rate of discount which would equalize the present value of the series of annual returns and the supply price (or the replacement cost) of the capital goods, then,

$$C_R=\frac{R_1}{1+r}+\frac{R_2}{(1+r)^2}+\frac{R_3}{(1+r)^3}+\cdots+\frac{R_N}{(1+r)^N}$$

Thus, r is the marginal efficiency of capital which equates the present *value* of the prospective annual returns to the *cost* of the capital goods.

The intersection of *r*, the marginal efficiency schedule, and the *i*, the interest rate schedule, determine the volume of investment within a given period of time. When the rate of interest is given, a rise or fall in marginal efficiency of capital leads to a rise or fall in the level of investment respectively.

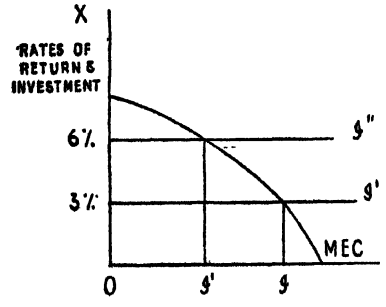


Fig. 50

Again, if the marginal efficiency of capital would remain constant as in the following diagram, a rise in the rate of interest (say, from 3% to 6%) would lead to a fall in investment from OI to OI'.

Similarly, it can be easily realised that if the marginal efficiency of capital is constant, a fall in the rate of interest will lead to an increase in the volume of investment.

1. Ibid—P. P. 136-37.

Determinants of long-term expectations

We have found that the marginal efficiency of capital depends on the relation between the supply price of a capital asset and its prospective yield. The considerations upon which expectations of prospective yields are based are partly existing facts which we can assume to be known more or less for certain, and partly future events which can only be predicted with more or less confidence. Keynes distinguishes between the anticipations formed on the basis of these factors and the confidence with which these anticipations are held. Both anticipations and the degree of confidence are important in the formation of expectation, leading to a course of action. We may anticipate large changes in the future, but may be uncertain as to what direction these changes will move ; then our confidence in the future course of action will be weak. The state of confidence depends on a variety of factors of which two are more important than the rest. In the first place, most of our decisions to do something positive can only be taken as a "result of animal spirits—of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities."[1] The second factor governing this confidence is the ability with which the prospective investors can make their investments liquid on the stock exchanges. Stock exchanges are largely influenced by the instability of speculation.

Keynes has failed to develop a consistent theory of expectation.[2] His main business is not to formulate a theory of expectation but the theory of employment, interest and money. He has treated long-run expectations as factors influencing the level of employment *via* the level of investment. Keynes has nowhere made a distinction between ex-ante and ex-post calculations. Expectations come only in ex-ante calculations.

Antonomous Investment and Induced Investment.

Autonomous Investment or independent investment is opened up by inventions, new products and new process. Induced investment is

1. Keynes—General Theory, P. 161.
2. Hart—"Keynesian analysis of Expectations and Uncertainty." Ch. 31 of New Economics edited by Harris.

governed by an increase in final demand or sales volume. Autonomous investment is not influenced by current national income ; but it is a basic influence on the level of national income itself. The basic assumption involved in induced investment is that profit fluctuations roughly parallel income fluctuations, the latter presumably inducing changes in the volume of current private investment.

Autonomous investment has a magnified effect on income *via* the multiplier. This rise in income, in turn, may *induce* a further rise in investment *via* the acceleration co-efficient. Thus we find a cumulative process growing out of the interaction of the multiplier and the accelerator.

Autonomous investment has to do with changes in techniques, and this calls for more capital per unit of labour. This has been defined as "*deepening of capital*" by Prof. Hansen. Induced investment also has to do with making provision for the unemployed and the new workers with capital of the prevailing types. This process has been defined as "*widening of capital*" by Prof. Hansen. While autonomous net investment is due to changes in techniques, induced investment is related to population growth and replaced investment.

The Theory of Capital as related to the Theory of Investment

The theory of capital is related to the theory of investment in the sense that it explains how the optimum stock of capital employed by the firm depends upon the relationship between the cost of assets, their expected yields, and the interest rate. It is found empirically that more capital-intensive methods involve lower unit cost (exclusive of interest rate) than less capital-intensive methods, and if we take this into consideration in formulating a theory of investment, then we should expect to find that the lower the rate of interest, the more capital-intensive will be the productive methods, *i.e.*, the higher will be the ratio of the value of capital employed by the firms to the value of their output. But these propositions are relevant to the cases of firms which are in equilibrium, and not to the cases of firms which are not in equilibrium and for which no investment occurs with respect to their capital structure. What is most important for the theory of investment is to solve two problems : first, to *find out the optimum* or *equilibrium stock of capital both for a firm and an economy* ; and second, *to explain at what rate investment takes place*

when the capital stock deviates from the optimum. The first problem is related to *the size of the stock*—capital—and the second problem is related to *the size of the flow*—investment—by which the stock grows or shrinks.[1]

If a firm has less capital than the optimum appropriate to the going rate of interest, cost of capital goods, and expected yields, and if the capital goods it requires are in the stock of its supplier, the investment can take place very rapidly. But the rate of investment is determined by the considerations outside the orbit of capital theory. The rate of investment is determined by the rate of wearing out or obsolescence of the particular capital goods if the investment is in plant or equipment. If the investment is in stocks, the rate of investment is determined by the rate of their sale or use in production.

In view of the complications involved in these approaches, we may formulate alternative theories of investment. One such alternative theory[2] is that instead of the production time of capital goods which is relevant to a single investment, we have, as a limit on the rate of investment for the economy as a whole, the productive capacity of the capital goods industry. If this industry can turn out capital goods at an annual rate of Rs. 100 crores, then gross investment cannot exceed Rs. 100 crores per year (at least in real terms) and net investment cannot exceed this figure less the amount of annual depreciation and obsolescence. If the latter is 20% of the capital goods, *i.e.*, Rs. 20 crores, then net investment cannot exceed Rs. 80 crores, nor fall below minus Rs. 20 crores. Gross investment can range from zero to Rs. 100 crores, net investment from Rs. 20 crores to Rs 80 crores.

From this illustration, it follows that there may be three possible rates of investment :—20, zero, 80. For the optimum stock of capital must always either exceed, fall short of, or just equal the actual stock of capital. If the optimum exceeds the actual, firm must try to produce more capital goods, and the capital goods industry will then exhaust its capacity to fill its orders. The rate of investment will be pushed up and the actual stock of capital will

1. Ackley—Macroeconomic Theory. P. 478.
2. Ackley—Macroeconomic Tneory. P. 479.

grow up. But unless the optimum stock of capital grows as fast or faster than the actual stock accumulates through investment, the actual stock must gradually "catch up" with the optimum. If, then, the optimum stock of capital becomes equal to actual stock of capital, the net investment will be zero. Capital goods will then just be replaced as they wear out, but no more. The third possible rate of investment reflects a situation in which the optimum stock of capital falls short of the actual stock of capital. In this case gross investment will be zero, and the net investment will be negative and its rate will be determined by the rate of depreciation. Again, unless the optimum stock of capital declines as fast as the actual stock, a point of equality is eventually reached, and the rate of net investment rises from negative to zero.

This model shows the disequilibrium between optimum stock of capital and the actual stock of capital which may take a long period of time to correct itself. A relatively slight disequilibrium between the optimum stock and the actual stock of capital may involve either a fairly considerable period of intense investment activities or stagnation in the capital goods industry.

One objection to the kind of theory developed above is connected with the concept *of capacity to produce capital goods.* Capacity to produce capital goods is usually flexible instead of being fixed. Output may go up even at a higher cost. If the idea of an increasing cost schedule is substituted for the capacity concept in the investment theory as outlined above, the cost of capital goods then becomes dependent on their rate of production. Let us, following Ackley[1], show the elements of the theory of investment in the figure no. 52. In the part A of the above figure, the optimum stock of capital is shown by the MEC (Marginal Efficiency of Capital) curve, each point on the curve being defined in terms not only of a given expectation of yields, but also in terms of a cost of capital goods associated with production of capital goods at a rate corresponding to zero net investment. Part C of the figure shown the supply of capital goods as curve S. The particular cost level used in defining the MEC curve in Part A is the level of x in Part C. If in Part A, K_0 is the

1. Ackley—Macroeconomic Theory. Pages 482-484.

existing stock of capital at the given rate of interest r_0, then there is a gap between the optimum stock and the actual stock of capital, the optimum stock being indicated by $\bar{K}$. This makes investment profitable. But, what will be the rate of investment ? The answer to this question has been provied by the part B of the diagram.

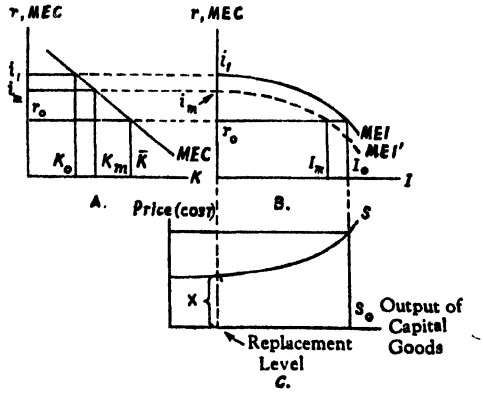


Fig. 51

Here we have drawn a curve MEI (Marginal Efficiency of Investment). This curve begins at level i_1, for this is the level of yield from capital goods when the actual stock of capital is K_0 and when the cost of production of capital goods is at level x. With the increase in the rate of investment, the MEI gradually declines reflecting the fact that increasing investment rates raise the cost of production of capital goods. The MEI in part B falls at the same rate as the S curve (supply cost) in part C rises. The rate of investment here is I_0, for at this rate the cost of capital goods is so high that a further increase in the rate of investment would reduce the percentage yield from capital goods below the rate of interest. Thus, I_0 here is the equilibrium rate of investment in the short run. Investment at any rate above zero leads to an increase in the actual stock of capital, K_0, and this leads to a downward shift of the MEI schedule (as indicated by the dotted MEI curve in the part B of the above figure). Thus when the capital stock has grown to K_m, the MEI schedule shifts downward, in part B, leading to a lower rate of investment, I_m. This Implies that the further growth of K proceeds more slowly toward $\bar{K}$.

The relationship of this analysis to the earlier one has been demonstrated in the following figure by drawing some solid curves.

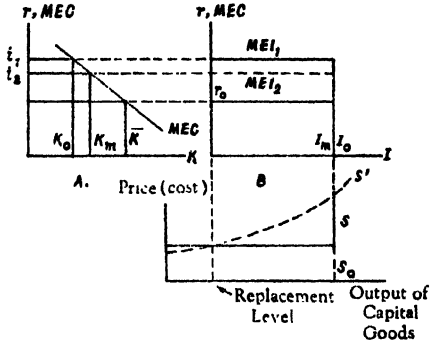


Fig. 52

In this figure, the supply curve is infinitely elastic up to some point of capacity at a given cost. The MEI schedule is thus represented by a horizontal straight line upto that point, and investment will take place, if it takes place at all, at rate I_0. As investment occurs at this rate, the actual stock of capital goes up, reducing the MEI curve (but not the rate of investment) until investment at zero rate is suddenly called for. If the supply curve is broken as in the part C of the above figure, we find barriers to an indefinite increase in the rate of investment, and then, the equilibrium stock of capital $\overline{K}$ can theoretically never be achieved, only approached. This is not, however, so important.[1]

According to Prof. Ackley, the theory of investment as developed here is in substance, essentially that of Keynes. But Keynes presented this substance, Ackley argues, in a confused way. Keynesian treatment of marginal efficiency of capital reflects confusion of factors relating to the size of the *stock of capital* with those relating to the *rate of investment*.[2] The ambiguities in the Keynesian theory of investment have also been pointed out by Prof. Lerner.

1. Ackley—Macroeconomic Theory. P. 484.
2. Ackley—Macroeconomic Theory. P. 485.

Lerner's analysis of the relationships between Marginal Productivity of Capital, Rate of Interest and Marginal Efficiency of Investment.

Lerner's paper on "Capital, Investment and Interest"[1] first seeks to distinguish between *marginal productivity of capital* and *marginal efficiency of capital*. The marginal productivity of any factor is usually defined as the increment of the value of the product which results if the quantity of the factor is increased by a unit, other things remaining constant. This definition lacks precision unless one specifies the point of view taken—that is, the *part of the economy* which is collaborating with the increment of factor, within which the increment of the product is to be taken into account, and from whose point of view the increment is to be valued. From the point of view of a single firm in a perfectly competitive market, the marginal productivity of a factor is simply the increase in the physical product of the firm multiplied by the price of the product. From the standpoint of the whole industry, the effect of the change on the output of all the other firms has to be taken into account as well as the effect of the change in output on the price.

The economy as a whole can increase its capital only by investing. This involves an exercise in the dynamic process. *Capital* stands for assets in general. Investment or savings must be adjusted to the rate of interest and this comes about as a result of two separate activities. Entrepreneurs bid up the price of assets until their marginal productivities are equal to the rate of interest. The firms adjust the rate of output of assets (=investment or savings of society) to the intensity which equates their marginal cost to their price. The combination of both these influences, Lerner points out, enables us to relate the rate of investment to the rate of interest and gives us the schedule of the *marginal efficiency of investment*. Keynes calls it the marginal efficiency of capital probably because any point on it represents a situation in which not only the (social) marginal efficiency of investment but also the (private) marginal productivity of capital is equal to the rate of interest, and Lerner says, Keynes "has failed clearly to distinguish between these two concepts."[2]

1. Lerner—Essays in Economic Analysis (Macmillan) 1953.

2. Lerner's essay, "Capital, Investment and Interest"—in "Essays in Economic Analysis." P. 350.

The individual schedule of marginal time preference and the social schedule of the marginal efficiency of investment show how the individual and society respectively adjust their rate of saving to the rate of interest. The schedule of the marginal productivity of capital shows how the individual adjusts the quantity of earning assets in his possession to the rate of interest. The difference between the marginal productivity of capital and the rate of interest is the force tending to make the stock of capital increase or decrease. The rate at which this change proceeds is given by that rate of net investment (positive or negative) which makes the marginal efficiency of investment equal to the rate of interest. These relationships are illustrated in the following three-dimensional diagram.

On this figure there is a surface made up of the schedules of the marginal efficiency of investment (which are curves like AB or CD relating the rate of investment I to the rate of interest or the marginal efficiency of investment), one curve for each amount of capital. The larger the amount of capital the lower the marginal efficiency schedule. The AE curve represents the marginal productivity of capital. Thus if the amount of capital is bF, (b is the *base* from which the amount of capital or the rate of net investment is measured), the marginal productivity of capital is FC. If the rate of interest is GH, the rate of investment will be FG with marginal efficiency of investment GH equal to the rate of interest. If the rate of interest is kept at this level and no other changes in data take place, the development of the economy can be shown as a movement from H towards L which lies on the surface and is of constant height. At L we find stationary long-period equilibrium when the rate of interest is equal to both the marginal productivity of capital and the marginal efficiency of investment. But this situation will never be reached since the rate of movement towards this situation, which is given by the rate of net investment, declines to zero as L is approached.

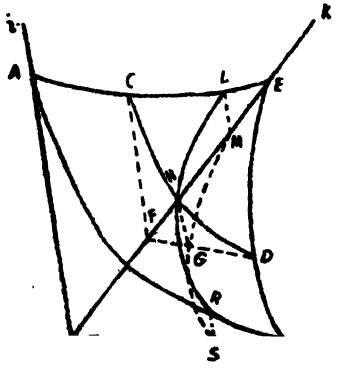


Fig. 56

While in the long-period equilibrium the rate of interest equals both the marginal efficiency of investment and the marginal productivity of capital, in the short-run equilibrium it equals only the marginal efficiency of investment. From the individual point of view, the short-period equilibrium is reached soon and the long-period equilibrium also does not take very long. From the standpoint of the society, the short-period equilibrium is reached fairly soon—as soon as the rate of investment adjusts itself to the rate of interest. But the long-period equilibrium from the standpoint of the society is not usually reached, and to borrow the famous Keynesian saying, then we are all dead, If it would be achieved the social marginal productivity of capital would be equal to the rate of interest.

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10

KEYNESIAN MODEL VS. THE CLASSICAL MODEL OF MONETARY EQUILIBRIUM

The classical theory of employment has been based on two basic postulates: (i) *The wage is equal to the marginal product of labour*, and (ii) *the utility of the wage when a given volume of labour is employed is equal to the marginal disutility of that amount of employment*. Disutility here must be understood to cover every kind of reason which might induce a man or a group of men to withhold their labour rather than accept a wage which had to them a utility below a certain minimum. This postulate is compatible with what may be called 'frictional' unemployment and 'voluntary' unemployment. But the classical postulates do not admit of the possibility of "involuntary' unemployment. Subject to these qualifications, the first postulate of the classical theory gives us the demand schedule and the second postulate gives us the supply schedule and the amount of employment is fixed at the point where the utility of the marginal product balances the disutility of the marginal unemployment. Keynes defines involuntary unemployment as follows:[1] "*Men are involuntarily unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labour willing to work for the current money-wage and the aggregate demand for labour at that wage would be greater than the existing volume of employment.*"

From this definition it follows that the equality of the real wage to the marginal disutility of employment presupposed by the second postulate corresponds to the absence of "involuntary" unemployment. Keynes contends that the classical theory provides no satisfactory explanation of what would happen to the level of selling prices in the face of a general wage reduction. Keynesian theory is in some respects a departure from the "classical" economics. The classical model can be summarized by the following equations:

1. Keynes—General Theory of Employment, Interest and Money. P. 151.

(1) $M = kpy$
(2) $Y = f(N)$
(3) $f'(N) = W/P$
(4) $N = f(W/P)$
(5) $S = f(r)$
(6) $I = f(r)$
(7) $L = I$

Here, M is the money supply; Y is the aggregate income function; f' (N) is the demand for labour; N is the supply of labour; r is the rate of interest; S is saving function; I is the investment function; W/P is the real wage, W being the money wage and P being the price level.

Demand for labour is a function of the real wage, (equation 3). If the real wage falls, there will be an increase in employment. Supply of labour (equation 4) also is a function of the real wage. It is argued in the classical model that if any one would feel better when both wages and prices double, he is subject to "*money illusion*". Equilibrium on the labour market is achieved when real wage equates the supply of and demand for labour. Involuntary unemployment will be eliminated by a fall in real wages, brought on by money wage cuts, just as excess supply on any market is eliminated by a fall in price. Competition on the labour market should, therefore, determine a unique real wage and level of employment which, via the production, are translated into a unique level of income.

Thus the classical system can be further elaborated as follows :—

$$D\left(\frac{W}{P}\right) = S\left(\frac{W}{P}\right)$$

Since the level of employment has been determined and the capital stock is fixed, the level of output (real income is determined by the production function),

$$Y = f(N, K')$$

where N is the level of employment and K' is the size of the capital stock.

If the level of real income is given and the ratio of real money balances to the volume of transactions is assumed to be fixed, the money supply determines the price level via

$$m_s = \frac{M}{p} = ky.$$

Product market equilibrium, as usual, is given by $I(i) = Y - C(y)$ but, since Y is already known, I is determined, and product market equilibrium merely serves to establish the rate of interest.

Thus, the labour market solution of classical economics has been reconciled with product and money market equilibrium.

Neo-Keynesian Theory of income determination

The modern neo-Keynesian theory of income determination can be explained by five equations :

(1) The income function : $Y = C(y, r) + I(y, r)$

(2) The demand for money balances : $\frac{M}{P} = L(y, r)$

(3) The aggregate production function : $Y = f(N)$
with $f'(N) > 0$ and $f''(N) < 0$.

(4) The demand for labour : $f'(N) = \frac{W}{P}$

(5) The Supply of labour : $N = f\left(\frac{W}{P}\right)$.

Here, Y refers to gross national product at constant prices C and I refer to consumption and investment respectively which depend upon income and rate of interest, r. M is the money supply. P is a price index of the goods and services entering into Y. The demand for labour and supply of labour are functions of $\frac{W}{P}$, *i.e.*, the real wage rate.

The following figure depicts the above analysis :

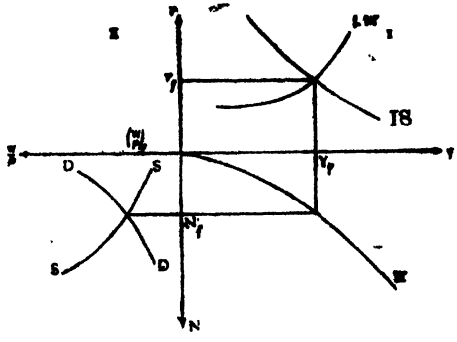

Fig. 57

The quadrant IV represents the aggregate production (the equation no. 3 above) reflecting the law of diminishing The quadrant III which is to the left of the quadrant IV

the equations 4 and 5, *i.e.*, the demand for labour and supply of labour, which together determine the level of employment and the real wage rate at the level of full employment. The figure in the quadrant I is the diagram of monetary equilibrium in the Keynesian system as given by Hicks and Hansen. While the IS curve represent the equation (1), the LM curve represents the equation (2).

The IS curve

Let us now see how the IS curve in drawn. The IS curve can drawn in the following way :—

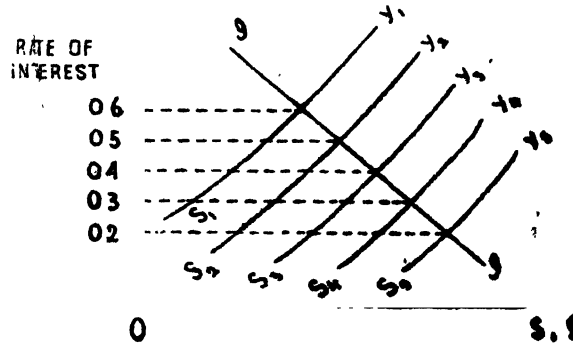

Fig. 58

In the figue No. 2 the investment function remaining given, we find a family of saving schedules corresponding to different levels of income. The rate of interest also varies accordingly. These savings schedules along with the investment demand schedule give us the IS curve in the follwing figure :—

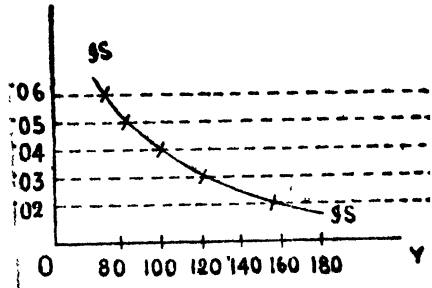

Fig. 59

The following diagrams show the Keynesian and the "classical"

monetary equilibrium separately. I_1 and S_1 in the "Keynesian" diagram assume $r=r_1$, I_2 and S_2 assume $r=r_2$ and so forth : The higher the rate of interest, the less is invested and the more is saved, at every level of income. If $r=r_1$, then $I_1=S_1$ at E_1, which

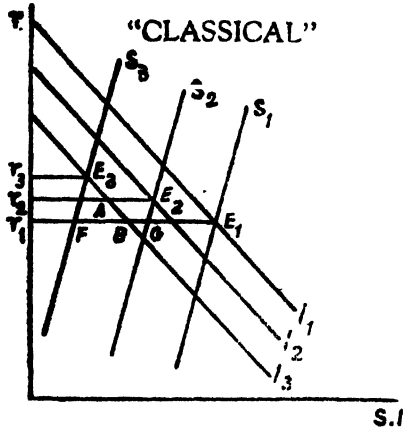

Fig. 60

indicates equilibrium level of income. At higher interest rates, the corresponding intersection points yield lower equilibrium income

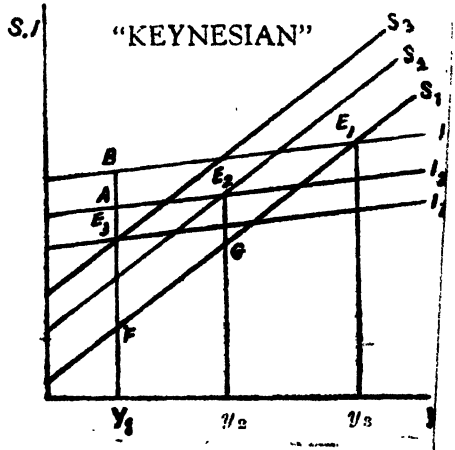

Fig. 61

levels y_2 and y_1. In the 'classical' diagram we find separate saving and investment function for each level of income S_3 and I_3 in the 'classical' diagram correspond to y_1, S_2 and I_2 to y_2, and so forth

in 'Keynesian' diagram. Points A and B in the 'classical' diagram show different amounts of investment corresponding to r_2 and r_1, given the level of income y_1. In the "Keynesian" diagram also we find the same points at that income level. Similarly F and G show the various levels of saving at $r=r_1$ for different levels of income. In both the diagrams we find the same points.

The LM curve

Let us now see how the LM curve is drawn. We have already seen that liquidity preference function, L, can be decomposed into $L_1(y)+L_2(r)$ where $L_1(y)$ represents the demand for transactions and precaution any balances, and $L_2(r)$ represents the demand for speculative balances. In the following diagram we find how LM curve is drawn from a family of liquidity preference schedules corresponding to different levels of incomes, the supply of money remaining constant. At different points of intersection of the

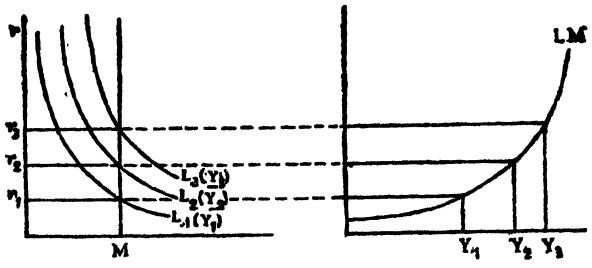

Fig. 62

liquidity preference schedules corresponding to different income levels and the supply of money schedule we find different rates of interest. From this we desire the LM curve. The LM curve shows the possible combinations of r and y that make the people willing to hold the stock of money in existence.

The Hicks-Hansen Diagram

Now we can show the Hicks-Hansen diagram of *monetary equilibrium* in the Keynesian system. This is shown in the following diagram :

At the each point of intersection of these two schedules we find an equilibrium level of income and also the equilibrium rate of interest. The rightward shift in the IS curve reflects either an

upward shift in the underlying investment demand function or a downward shift in the saving function. Similarly, the shift of LM

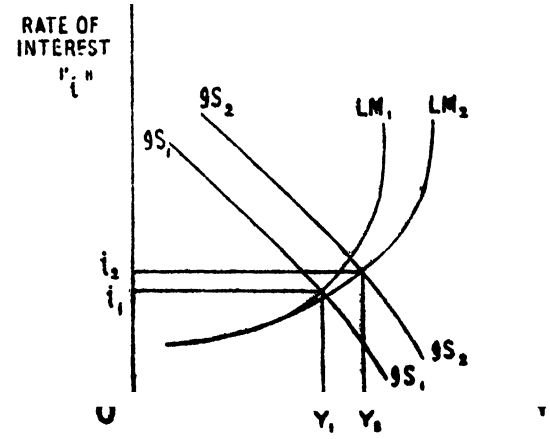

Fig. 68

curve from LM_1 to LM_2 may be due to either an increase in the supply of money or a decrease in the liquidity preference schedule.

Full-Employment Equilibrium

With flexible wages and prices, full employment will be automatically maintained. If real wages exceed the full employment level of real wages (W/P), money wages will fall due to the excess supply of labour. Costs and prices will be then reduced and the real value of cash balances M/P will then increase. This in turn shifts the LM curve upward and to the right, lowering r and expanding investment demand until the output corresponding to full employment has been absorbed. It follows that income is established at the full employment level in the labour market. The interest rate than equates saving and investment on the IS curve at this income level, and finally, the price level adjusts so as to satisfy liquidity requirements at this rate of interest.

UNDEREMPLOYMENT EQUILIBRIUM

Underemployment equilibrium is Keynesian Economics has three important specifics :

(a) *Liquidity trap*, (b) *The low interest elasticity of investment* and (c) *Wage rigidity*.

Monetary Equilibrium as affected by Liquidity Trap

We have already analysed the Keynesian argument that rate of interest can never be zero since demand for money schedule becomes infinitely elastic at certain stage. This is so because of the expectation of the investors that the rate of interest cannot fall any further and that bond prices are so high that no one expects them to rise still higher. Consequently everyone is willing to hold idle cash and monetary policy is then put out of commission. This phenomenon of liquidity trap may make the LM schedule interest-inelastic. Let us suppose, at $(W/P)_a$ there is an excess supply of labour exerting a downward pressure on money wages and prices. This leads to an expansion of aggregate demand by shifting the LM curve to the

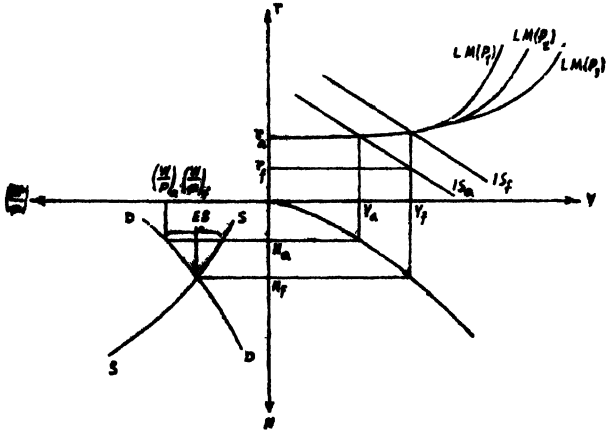

Fig. 64

right. This would lower the rate of interest and shift the IS curve from IS_a to IS_f in the above figure. The rate of interest required to equate planned saving and investment at Y_f would be r_f. But the infinite elasticity of the LM schedule does not lead to a fall in interest below r_a. As a result Y and N are prevented from rising above the level N_a and Y_a by inadequate effective demand. The real wage will stay at the level $(W/P_a)>(W/P)_f$. Competition for employment will reduce money wages, costs and prices, but the following price level, while increasing the quantity of money in real terms, has no influence on the rate of interest, and cannot, therefore, stimulate investment demand.

Interest—Inelastic Investment Demand

In the figure no. 65. we show interest-inelastic investment demand. Despite the elasticity of the LM schedule, full employment income

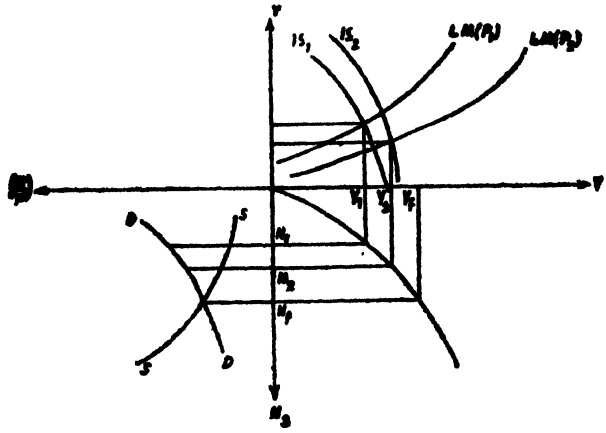

Fig. 65

may not be achievable. The IS curve is lying to the left of the point where the full employment level of income is determined. As long as it costs nothing to hold money, the money rate of interest cannot be negative. Hence the LM schedule has a floor at a zero interest at the full employment income level. Here equilibrium is under-employment equilibrium.

Wage rigidity

Unlike the classical economists, Keynes assumes that wages are rigid downward since the labourers have a "*money illusion*" so the supply of labour depends upon nominal and not upon real wages. Let us assume that W is fixed at W. The price level corresponding to full employment is P_f and the rate of interest r_f. However, the money supply is such that at P_f, $LM(P_f)$ intersects the IS curve at $Y_1 < Y_f$ and $r_1 < r_f$ in the following figure. Hence full employment cannot be achieved here. If output and employment would be at Y_1 and N_1 respectively with a price level P_1, at the level $LM(P_1) > LM(P_f)$. This is because P_1 must be less than P_f in order to make $\left(\frac{W}{P_1}\right)$ higher than An increase in quantity of money sufficient

to raise P_1 to the P_f level and to shift $LM(P_f)$ to the position where it may intersect the IS curve at Q, would establish full

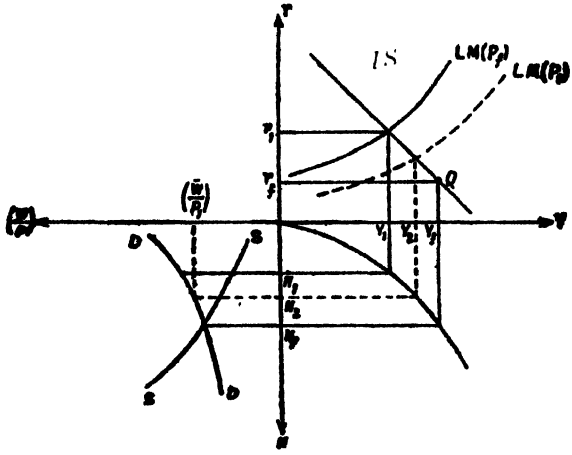

Fig. 66

employment. This is the Keynesian curve against the neo-classical quantity theory.

Keynesian Model compared with the Classical Model

Thus, we can compare the Classical and the Keynesian systems as follows :—

	Classical	*Keynesian*
(1)	$M=KPY$	$M=KPY+L_2(r)$
(2)	$Y=f(N)$	$Y=f(N)$
(3)	$f'(N)=W/P$	$f'(N)=W/P$
(4)	$N=f(W/P)$	$W=\overline{W}$
(5)	$S=f(r)$	$S=f(y)$
(6)	$I=f(r)$	$I=f(r)$
(7)	$S=I$	$S=I$

In Keynesian analysis, the novel feature is that speculative motive for holding money has been added to demand for money schedule. Secondly, the supply of labour function has been suppressed and replaced by rigid wages. Thirdly, in Keynesian system consumption depends on income rather than rate of interest. Perhaps, wage rigidity is the crucial Keynesian innovation.

In his "General Theory"[1], Keynes attacked the classical theory of employment as unrealistic in its assumptions and incorrect in its logic. In his theory of employment he started with the idea of consumption function (this being Keynes' most important contribution, in the opinion of Prof. Hansen, to Monetary Economics) and the recognition that total income is equal to total spending for consumption and investment. Keynes has been also too good a classical economist to assume away the price and profit mechanism. He assumes the price to be rigid. The basic differences between the classical model and the Keynesian model are three in number: (1) Keynes adds the speculative demand for money to the classical transactions demand; (2) Keynes suppresses the supply of labour function and assumes rigid wages since only in that case can there be any equilibrium at less than full employment, and (3) Keynes assumes saving (consumption) to depend on income rather than upon the interest rate.

It is very difficult to say which of the basic differences cited above constitutes the crucial difference between the classical system and the Keynesian system. Some economists have said that it is the first of these differences, others that it is the second, others the third, which still others say that it is none of these but something else that does not show up directly in this formal structure.

Some critics seek to show that there is hardly any significant difference between the classical model and the Keynesian model. They agree that the speculative demand for money could be added to the classical model without changing its basic conclusions. They also argue that the assumption of wage rigidity is not at all original, for even the classical economists recognised that rigid wages would cause unemployment. Again even the idea of consumption function, according to these critics, can be added to the classical model whatever may be the basic assumptions to the Keynesian theory of employment. One thing is quite clear. Whatever it may be emphasised that unemployment is caused by wage rigidity or by speculation, the primary determinant of the extent of unemployment, and therefore, of the level of income and output, is the scope of consumption function since changes in the level of income, and

1. Ackley—Macroeconomic Theory (Macmillan 1961) P. 406

consequently in consumption function, can ensure saving and investment equilibrium at less then full employment. How far income must fall below the full-employment level, that depends upon the scope of the consumption function. Thus the consumption function, insufficient *by itself* to explain anything, becomes the kingpin of the Keynesian theory of employment after all. That is why, Hansen calls it the "heart of the Keynesian analysis."

Criticisms of the Keynesian System

Keynes has been criticised for his wrong forecasts. He predicted, and his prediction was upheld by Hansen, that the mature economies of Western Europe and North America could expect a secular stagnation (saving tending to outrun investment). This, however, might have been the case had not the World War II and the subsequent "cold war" intervened. This is the view of the followers of Keynes. But the majority of the economists today, however would call the forecast incorrect, arguing "that Keynes" gloomy prospect merely reflected a short-sighted projection of the depression conditions of the early thirties."[1]

It has been alleged that the Keynesian model might better be considered as an extension and improvement of, rather than as a substitute for the macroeconomic thinking of the classical theorists. While Keynes legitimately criticised the basic assumptions underlying the classical model, it has not been fair on his part to question the logical consistency of the argument of the classical economists which rests upon those assumptions.

The first criticism of the Keynesian model is that it is too aggregative. It should have contained more variables and relationships than it does. Certain disaggregations are, however, made in applying the Keynesian model. For example, instruments in the broken forms of plants and equipments, consumer durable goods broken from other consumption expenditures, problem of income distributions etc., are instances of disaggregation.

A second general criticism of the Keynesian model is that it is "too static". On the one hand this may mean that the Keynesian model fails to deal with the short-run dynamics of income change; on the other, is it not suitable for analysing the problem of long-term

1. Ackley—Macroeconomic Theory (Macmillan 1961) P. 407,

growth. But if certain lags are introduced in the circular flow of income, the Keynesian model can be given some short-run dynamics. The Keynesian model is limited to the short-run by its own terms. It does not seek to analyse the long-term trends of growth. It does not even deal with the acceleration principle. Therefore, it is "too static" for the analysis of either of the trade cycle or the problems of economic growth. The theory of money wage determination in the Keynesian system is also inadequate. To assume money wages completely flexible, as in the classical system, to changes in employment is only slightly more absurd than to assume wages to be rigid and determined autonomously.

A third criticism of the Keynesian system is related to its money and interest rate analysis ; first, as to what it includes, then as to what it omits. Keynes has practically overlooked the roles of productivity and thrift as determinants of the rate of interest. Moreover, a purely Keynesian theory of interest is also indeterminate.[1] Again, major revisions in the actual level of interest rates must certainly give rise to entirely different speculative demand curves. Even in the short-run we may suppose that the level of interest rate expectations trails along after the movement of actual rates.

Another group of critics argue that the Keynesian system fails to take account of the "Pigou effect" or the "real balance effect" as Patinkin calls it. One can easily agree that Keynes may have incorrectly stated his position, yet not accept the substance of this criticism. Wages are simply not and could not be made flexible enough for the question to have much relevance, *unless the Pigou effect were very* powerful.[2] There is surely no evidence, Ackley contends, to support the view that the Pigou effect is or ever has been of appreciable significance to any real economy.

In conclusion, we can say that Keynesian system, inspite of its deficiencies, may be regarded as the starting point of all macro-economic theories of the post-Keynesian era. As J. R. Hicks once put it, "the General Theory is neither the beginning nor the end of Dynamic Economics" ; but it is acknowledged that the Keynesian system has become the common starting point for the work of others.

1. See pages.....of this book.
2. Ackley—Macroeconomic Theory, P. 417.

The Keynesian Indictment of Orthodox Economics

Keynes in his "General Theory" says, "I shall argue that the postulates of the classical theory are applicable to a special case only and not to the general case".[1] The pure theory of what determines the *actual employment* of the available resources has seldom been examined in any detail in the classical theory. Keynes contends that the classical theory "is wholly unable to answer the question what effect on employment a reduction in money-wages will have. For it has no method of analysis wherewith to attack the problem."[2] Keynes, however, does not in any way deny the generality of orthodox equilibrium analysis ; he only denies that orthodox economics provides an adequate account of disequilibrium phenomena.[3]

Keynes first attacks the classical theory of wages. His second attack is related to the charge of failure of the classical writers to recognize the existence of involuntary unemployment. The third and final item in Keynes' indictment is a denial of the relevance of Walras' Law.[4] Patinkin has argued that this portion of Keynes's indictment is wrong, or that the proposition which Keynes attacks is not, in fact, the one he thought he was attacking.

Keynesian indictment of orthodox Economics has given rise to an interesting controversy among the economists like Hicks, Patinkin, Oscar Lange and Modigliani which we shall now consider.

Dichotomy between classical and Keynesian Economics—Hicks-Patinkin controversy

It was in 1937 that Prof. Hicks[5] launched a Keynesian Counter-revolution. That counter-revolution has been carried forward by Keynes and other general equilibrium theorists. In a review of Patinkin's book, "Money, Interest and Prices", Prof. Hicks

1. Keynes—General Theory of Employment, Interest and Money, P. 3
2. Ibid P. 260.
3. Clower—"The Keynesian Counter-revolution"—The Theory of Interest Rates.
Edited by F. H. Hahn and Breching.—Proceedings of a conference held by International Economic Association.
4. Keynes—General Theory, P. P 18-21.
5. Hicks-"Mr. Keynes and the Classics : A Suggested Interpretation" Econometrica, 1937. Reprinted in "Readings in the Theory of Income Distribution."

says that the theory which Patinkin sets out, though it owes much to Keynes, is not Keynesian ; It is a modernised version of the theory which Keynes called "classical".[1] Hicks finds that Patinkin's analysis is nothing but a rehabilitation of classical economics.

Prof. Hicks thinks that the crucial point on which the individuality of the Keynesian theory depends is the implication that there are conditions in which the price-mechanism will not "work"—more specifically, that there are conditions in which the interest-mechanism will not work. This refers to the doctrine that there is a *floor* to the rate of interest—the "*liquidity trap*" as Robertson called it. Prof. Hicks argues, "In a world where the interest-mechanism can always operate—where the rate of interest is flexible and sufficiently flexible, in either direction, for its movements to have a significant effect on (saving or) investment—the Keynes theory is true and the "classical" theory is true ; they lead to the same results. Though the paths of analysis are different, the end-results, achieved when all the same things have been taken into account, are the same. And either analysis can be put into a general-equilibrium form in which it is directly apparent that they come to the same thing".[2] Hicks's argument in this context can be summarised as follows :

Keynes would argue that an increase in the propensity to save (money wages being fixed) would diminish employment directly ; but he would then qualify this statement by an admission that the diminished demand for transactions balances would lower the rate of interest (if interest is flexible), and that this would have a secondary effect increasing investment and hence employment—but to something less than its former level. A properly equipped "classic" would get to the same result by a different route. The classical model would state that the increase in saving would *directly* reduce the rate of interest, so that employment would increase in the investment-goods trades as it diminished in the consumption-goods trades ; but the classical model could (or should) go on to admit that the increase in saving would carry with it a diminution in the velocity of circulation (some of the saving would be hoarded), so that,

1. Hicks—"A Rehabilitation of classical Economics"? The Economic Journal, June 1957 P. 278.

2. Ibid, P. 279.

with an inelastic monetary system, and the fixed money wages that are being assumed, there would still be a net decline in employment. A general-equilibrium theorist, Hicks argues, would show the saving operating on interest and employment simultaneously. So long as the interest mechanism functions, one must come in the end to the same result by each method.

The classical theory has both a short-period form and long-period form. Hicks explains the classical long-period theory (or *full equilibrium* theory as called by Hicks) with the aid of his familiar IS and LL curves, the IS curve being assumed to be a horizontal straight line and movement along this representing merely monetary expansion (or contraction). The LL curve is fixed in position, as soon as the money supply is given. Here the rate of interest is solely determined in real terms, *i.e.*, by productivity and thrift, for the height of the horizontal IS curve is solely dependent upon the real factors in the system ; It cannot be affected by the position of the LL curve. All that the LL curve here determines is the level of money incomes. Hicks argues that the "dichotomy" between real and monetary economics has here appeared.

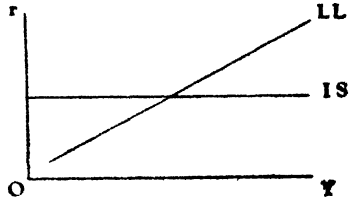

Fig. 67

Again, from what has been stated above, we can derive another interesting conclusion. With the classical economists, an increased supply of money would temporarily increase saving (even in real terms) through its distributional effects ; this would force down the rate of interest ; and (as was quite natural to a believer in wages fund) it would temporarily increase employment.

Here again, we find no basic opposition between the classical model and the Keynesian model.

Hicks argues that the gentle rightward slope of LL curve in the above diagram is "the correct form which it would take for an economist who recognises Keynes' *transactions motive*, and also his *precautionary motive*, but not his *speculative motive*".[1] Hicks thinks that "this shape of the LL curve would appear to the properly

1. Ibid P. 284.

equipped classical economist." In fact, we can find the precautionary motive already in Thoruton ; there are traces of it in Marshall ; and it also emerges in Walaras. Hicks contends that any of these writers should have recognised that the demand for money has some elasticity against the rate of interest, and that should have given his LL curve a rightward tilt. If only transaction motive would be taken into consideration, the LL curve would be a vertical straight line. If at the sametime, the IS curve would be a horizontal straight line corresponding to full equilibrium, the whole diagram would have reduced to the two perpendicular straight lines. The "dichotomy" would be then complete ; real and monetary theories would then completely fall apart. This is the case of the crude quantity theories. "But to suggest that such crude quantity theorising was characteristic of the more subtle minds among the older economists is a caricature of the history of economic thought."[1]

If our LL curve is crudely vertical, a rise in IS curve will simply raise the rate of interest. If we admit a precautionary motive, (the LL curve will then have a rightward slant,) we then should conclude that these real shifts will have monetary effects ; the money value of income will be affected in the full equilibrium, while in the temporary (short-run) equilibrium there may be effects on employment.

Hicks thus throws light on the links between the 'classical' way of thinking and the 'Keynesian' way of thinking. Hicks, however, also states that the Keynesian theory has got some peculiarities of its own which makes it non-classical. A Keynesian situation (non-classical) situation may arise, not only because the LL curve may be horizontal over certain stretches, but because the (short-period) IS curve may, over certain stretches, be vertical. A vertical IS curve, impinging upon a sloping LL curve, would show the rate of interest rising when investment increased ; but the rise in interest would be a matter of mere financial interest, without real effects. "It is because of their desire to cover this case, quite as much as the other, that modern Keynesians are convinced that Keynes, unlike the "classics", did make the right approach. It is true that when the two theories are properly understood, and fully worked out,

1. Ibid P. 284.

they largely overlap ; but they do not overlap all the way, and when they fail to do so, the Keynes theory has the wider coverage".[1]

Prof. Patinkin[2] in a rejoinder to Prof. Hicks argues that Prof. Hicks has failed to take the *real balance effect* into consideration. Hicks assumes that an increase in the real quantity of money affects the working of the economy only through its effect in shifting the LL curve rightwards ; there is no recognition of its effects on the IS curve. Patinkin objects to this argument.

Patinkin then raises the question : If the real-balance effect can —in principle—restore the economy to a full-employment position, what happens to the Keynesian Revolution ? Patinkin's answer to his own question is that "the Revolution goes on—though on a somewhat different plane."[3] In particular, the interest of Keynesian economics shifts from "unemployment equilibrium" (which is the concern of Hicks's article in 1937[4]) to unemployment disequilibrium. The main message of Keynesian economics, Patinkin concludes becomes that the automatic adjustment process of the market (even with the real-balance effect—and even when supplemented by monetary policy) is too unreliable to serve as a practical basis of a full-employment policy.[5] In other words, though the real balance effect must be taken account of in our themetical analysis, it is too weak to play a significant part in policy considerations.

Patinkin contends that this shift of interest strengthens the Keynesian Revolution : for it makes it independent of the special assumptions like absolute wage rigidities and the existence of a 'liquidity trap'. Patinkin thinks that while these assumptions aggravate Keynesian unemployment, they are not necessary for the validity of the Keynesian argument.

Dichotomy between Monetary and Real Equilibrium

Before we explain the determinants of monetary equilibrium and examine the dichotomy of the two, let us, first of all, set up a system

1. Ibid. P. 289.
2. Patinkin "Keynesian Economics Rehabilitated : A Rejoinder to Professor Hicks." The Economic Journal, September, 1959,
3. Ibid. P. 586.
4. Hicks, "Mr. Keynes and the 'Classics'." Econometrica, Vol. V. 1937.
5. Patinkin's article as cited above. Reprinted in the Readings in the Theory of Income Distribution.

of equations describing the relation between the variables to be analysed.[1] The equations of our system are :—

(1) $M = L(r,y)$
(2) $I = I(r,y)$
(3) $S = S(r,y)$
(4) $S = I$
(5) $Y = PX$
(6) $X = X(N)$
(7) $W = X^1(N)P$

Notations

Y	Money Income
M	Supply of Money regarded as given
r	Rate of interest
S	Saving
I	Investment
P	Price level
N	Aggregate Employment
W	Money wage
X	An Index of Physical output

Let us now define consumption (C) as

$$C = Y - I \quad \cdots \quad \cdots \quad \cdots \quad (8)$$

Equation (5) defines money incomes. Here we find eight *unknowns* and seven equations. We don't find here the equation relating the wage rate and supply of labour. We have already noted that this equation takes a substantially different form in the "Keynesian" system as compared with the "Classical" system.

In classical hypothesis, this equation is :

$$N = F\left(\frac{W}{P}\right); \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad (9)$$

or in the inverse form, $W = F^{-1}(N)P$.

In Keynesian system, however, within certain limits, the supply of labour is assumed to be perfectly elastic at a given wage rate which is rigid and historically given, say WX. For every value of money wage and price the corresponding volume of aggregate employment gives the maximum amount of labour obtainable in the market. If the demand is less than this, the wage rate remains fixed at W_a.

1. For a brilliant exposition of the dichotomy between Monetary and Real Economics, see Modigliani's article, "Liquidity Preference and Theory of Interest and Money" in "*Readings in the Monetary Theory*" reprinted from Economica, Vol. 12 (1944).

But as soon as all those who sought employment at the ruling wage rate $\frac{W_0}{P}$ have got employment, wages become flexible upward.

We can write the Keynesian hypothesis regarding money wage rate thus :—

$$W = aW_a + \beta^{F-1}(N)P \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad (9)$$

Here W_a is historically ruling wage rate and α and β are functions of N, W and P characterised by following properties :—

$$\alpha = 1, \quad \beta = 0 \quad \text{for} \quad N \leqq N_0 \quad \cdots \quad \cdots \quad \cdots \quad (10)$$
$$\alpha = 0, \quad \beta = 1 \quad \text{for} \quad N > N_0$$

Where N_0 indicates the level of full employment.

The equations and inequalities here suggest that if there is no full employment, *i.e.*, if N is not equal to N_0, the wage rate is not really a variable of the system but a datum *i.e.*, it is historically given or it is the result of "economic policy", or of both. When full employment has been reached at wage, W_0, the supply of labour ceases to be perfectly elastic : W becomes a variable to be determined by the system and (9) becomes a "genuine" equation. Even in the Keynesian system, it is acknowledged that the wage rate begins to be flexible downward before employment has reached the zero level. The equation (9) may also be regarded as the "supply of labour" function of the "classical theory." But instead of conditions (10) we have the identities (for all values of aggregate employment)

$$\alpha = 0, \ \beta = 1. \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad (11)$$

The following classical equation may be used to indicate "the demand for money."

$$M = ky. \qquad (1a)$$

The equation (1) has now been reduced to the equation (1*a*).

Now we find that the equations (1) to (7) and (9) and condtions (10) constitute the Keynesian system of monetary equilibrium while the equations (1*a*), (2) to (7), and (9), and identities (11) constitute the classical system.

On scrutiny of the Keynesian system of equations, we find that the first four equations contain only 4 *unknowns* and form a determinate system of monetary equilibrium. We can show this

1. Ibid.

equilibrium by drawing the IS and LM curves. This has been shown in the following figure.

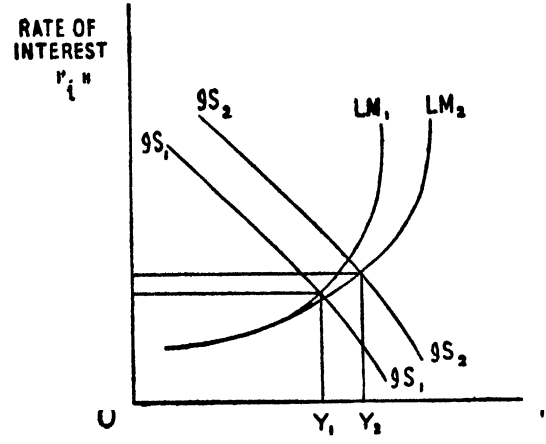

Fig. 68

The equilibrium point achieved at the point of intersection of the IS and LM curves shows the interrelationships between income, interest, saving and investment.

Let us now examine the *determinants of real equilibrium.* Equations (5), (6), and (7) explain the forces that determine the variables of real equilibrium : *physical output, employment, real wage rate.* Of these equations, the equation (7) is the most important. This explains the equilibrium in production at which the given and fixed money wage rate W_o is equal to the marginal net product of labour, or upto the point at which price equals marginal labour cost. Eliminating equation (5) by substituting into (7) we can reduce this part of the classical system to two equations in the two unknown x and N, where x' is used for $dx/d\mathrm{N}$:

$$W_o = x'(\mathrm{N})\frac{y}{x}\,; \qquad y = x(\mathrm{N}).$$

Since money income is determined exclusively by the *monetary* part of the system, the price level depends only on the amount of output. If it happens that at the given price level, the fixed wage is less than marginal product of labour, the forces of competition lead to an expansion of employment and output resulting in fall in prices.

This lowers the marginal product of labour until it is equal to the rate. If the wage rate would be higher than the marginal product of labour, the level of output and employment would fall and the prices would be pushed up.

The Dichotomy of Monetary and Real Equilibrium

Let us now replace y in equations (2) and (3) by the expression given in equation (5), the savings and investment equations then will be written as follows :—

$$(2a) \quad I = I(r, Px)$$

$$(3a) \quad S = S(r, Px)$$

If we divide price level by money wage rate, the equations become :

$$(2b) \quad I = I\left(r, \frac{P}{W}x\right)$$

$$(3b) \quad S = S\left(r, \frac{P}{W}x\right)$$

Next let us divide both members of the equations (4) and (5) by W and obtain,

$$(4a) \quad \frac{S}{W} = \frac{I}{W}$$

$$(4b) \quad \frac{Y}{W} = \frac{P}{W}x \cdot$$

Now, the equations stated above, *i.e.*, the equations (2*a*), (3*a*), (2*b*), (3*b*), (4a), (4*b*), and the equations (6), (7), (9) form a system of 7 *equations* in the 7 *unknows*, *viz.*, I/W, S/W, P/W, Y/W, r, x, N. These equations are, therefore, determined.

Next we can express the equation (1*a*) in the form $M = \bar{K}PX = Wk\left(\frac{P}{W} \cdot x\right)$. But since P/W and x have already been determined, this equation determines the money wage rate and hence the price level, money income, etc. This is essentially the "classical" procedure, and we can only repeat the classical conclusions indicating that the real part of the system, namely, employment, interest rate, output or real income, do not depend on the quantity of money. The quantity of money is simply to determine the price level. It follows that when all the supply and demand functions are homogeneous of the zero degree and when the economy is under static conditions and the people behave rationally, it must be so.

Oscar Lange criticises this dichotomy by alleging that "the traditional procedure of the theory of money involves a logical contradiction." Modigliani argues that Lange's criticism of Say's law is accptable, but it does not invalidate the logical consistency of the procedure of the quantity of money. The traditional theory is not based on Say's law. The necessary condition for money to be neutral is fulfilled even without assuming Say's law, if only people are assumed to behave "rationally"; This is all that the classical theory assumes and needs to assume. Say's Law is a sufficient condition for the neutrality of money but not a necessary one.

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11

SECULAR STAGNATION

Secular Stagnation is the name given to that school of thought which asserts that in the highly advanced economies, depressions are likely to become increasingly prolonged. That is to say, savings tend to outrun investment in the long run during a crisis which tends to be chronic. This concept envisages a time when the highly industrialised economies of the western worlds will enter into a state of *permanent underemployment* of their resources. This situation stems from an annual rate of investment which falls far short of that required for the level of national income necessary to ensure. In other words, the volume of saving becomes so high that it cannot be fully offset (*i.e.* invested) for ensuring full employment.

It must be noted that Keynes in his "General Theory" did not enunciate a thesis of secular stagnation. This was done by his American "Mohammed", Professor Hansen, and others. But "although not elaborated at any length, Keynes' ideas about the long run factors influencing investment demand, nonetheless, play an important part in shaping his treatment of the problem of income and employment.[1] It is Keynes' view that the marginal productivity of capital schedule is fairly inelastic, at least in the highly developed capitalist economies. Thus the accumulation of capital through investment must ultimately lead toward capital "saturation", a deficiency of investment opportunities relative to full-employment saving, and a necessary decline in income and employment to the extent necessary to eliminate the excess of saving.

Is Keynes really a stagnationist ?

Keynes held the view that the marginal productivity of capital scedule was fairly inelastic, at least in the advanced countries of the

1. Sweezy—Declining Investment opportunity. The New Economics edited by Harris. P, 42 .

west. Thus the growth of capital through investment must ultimately result in capital "saturation", a deficiency of investment opportunities relative to full employment saving—that is to say, full employment savings then will tend to outrun investment. This will necessarily lead to a decline in income and employment to that extent to which it is necessary to eliminate the excess of saving over investment.

Keynes' view has been summarized in the following figure :—

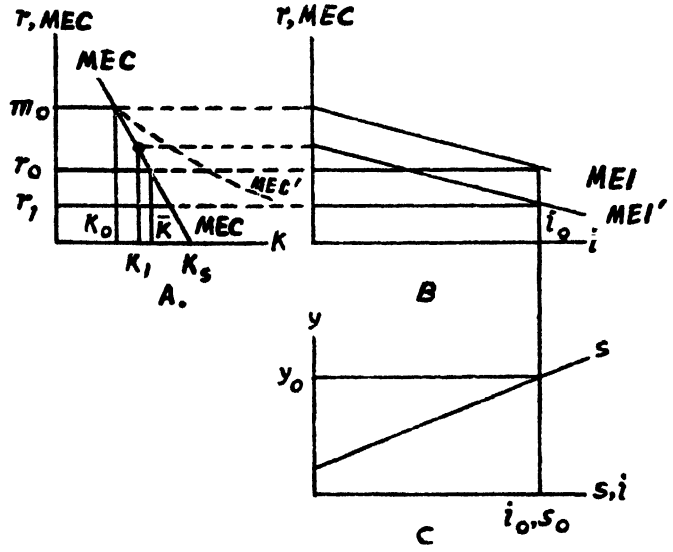

Fig. 60

Parts A and B of the above figure come from our discussion of the theory of capital as related to investment (see pages 220-24 of this book). We add a saving schedule in part C of the diagram. With an initial stock K (part A), the marginal yield on capital is greater than the rate of interest r_0. The cost schedule of capital goods being assumed to be given, a schedule of marginal efficiency of investment has been drawn in part B of the diagram with investment initially at i_0, producing a level of income, y_0, in part C of the diagram. Positive investment (as at i_0) leads to an increase in the capital stock from k_0 toward the optimum stock $\bar{k}$. At some point, the actual stock of capital reaches K_s and this leads to a downward shift of the MEI schedule to MEI'. The implication of this downward

shift of the MEI schedule is a fall in investment and incomes. This could have been offset if the rate of interest would fall to r_1. Here Keynes was a bit pessimistic on two points : (1) The rate of interest will not automatically fall to r_1 since this will be resisted by the activities of the speculators based on obsolate expectations. So, the fall in investment and income continues. (2) With solid MEC schedule as we find in part A of the diagram, there is a limit to how long income can be supported even by a progressive reduction in the rate of interest. When the actual stock of capital reaches k_s, there is no further scope of opening up of new investment opportunities. Capital accumulation beyond that point having no outlet for investment, saving tends to outrun investment in the longrun. This may be characterised as *secular stagnation*. Prof. Ackley[1] points out the basic error of the Keynesian position. "It is a failure to realize that a growth of income—a growth which the very act of investment permits—can prevent capital saturation. There is twice as much capital in use in the United States today as two decades ago. But we are not for that reason necessarily closer to capital saturation than we were then.[2] For the whole economy has grown too. Ackley argues that "Keynesian stagnation is not the *inevitable result* of capital accumulation." That does not, of course, mean that there can be no problem of capital accumulation. What is missing from Keynes' analysis, Ackley points out, is the "feedback" from income to investment, which is stressed in the acceleration principle.

Hansen's analysis of Secular Stagnation

The possibility of secular underemployment arises from the inability of the existing propensity to invest to offset full-employment savings and the relative stability of consumption function in relation to unstable propensity to invest. Given these propensities to invest and save, the economy may be in equilibrium far short of full employment for an indefinite period of time. The propensity to consume in advanced capitalistic society remains stable at a very low level. Prof. Hansen is of the opinion that not only has the tendency of the propensity to consume to be too low been carried

1. Ackley—Macrocconomic Theory, P. 509-12.
2. Sweezy—"Declining Investment opportunity." The New Economics edited by Harris. P. 425.

over from the past, but in recent times some institutional factors have tended, relatively speaking, to lower it still more. The rate of investment in such a situation has to fill a much wider gap in order to assure an equilibrium level of income consistent with full employmenl. Otherwise savings tend to outrun investment in the long run resulting in secular stagnation.

The theoretical possibility of secular stagnation is given in the following figure :—

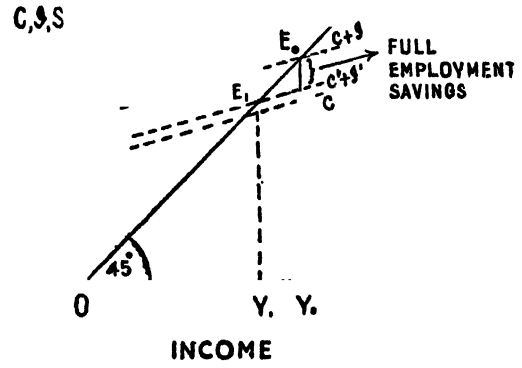

Fig. 70

In this figure, the equilibrium level of income (OYo) is determined at the point E_0. This is the position of full employment. Let us suppose, there has been a decline in investment opportunities the $C'+I'$ curve intersecting the 45° line to give the OY_1 level of income. The fall in the level of income from OY to OY_1 is due to the decline in investment opportunities. In other words, full-employment savings have not been neutralised by the propensity to invest. The economy will remain in the position of full-employment equilibrium when the propensity to invest will be kept stable at a level high enough to offset full-employment savings, or when the propensity to save will be made to fall to raise the propensity to consume so that the volume of savings to be offset by investment may be reduced.

The stagnation thesis is concerned with the autonomous growth factors or autonomous investment stimuli. These growth factors consist of (1) population growth, (2) break of the geographical frontier or opening up of new territories and/or discovery of new

market areas, and (3) technological advancement in the arts of production and in the development of new products. The stagnationists argue that the high rate of growth of population in the last century was undoubtedly responsible for a large part of capital formation. Increased population means increased demand for consumer goods. This leads to an increase in the level of investment. Increased population also induces net investment by providing the increase in the labour supply necessary to "man" the capital goods, and if proportional to the rate of capital accumulation by maintaining capital's marginal productivity.[1]

Hansen's argument that rapid population growth is an automatic stimulus to investment was never thoroughly convincing.[2] The causal connection between population growth and investment has relezance to public investment on housing and basic utilities, and it is far from obvieous with respect to private investment in facilities to produce ordinary consumer goods. An increase in population increases potential consumption, and thus the potential size of the economy and the capital stock which it can use without reducing the rate of return. But only in the investment first occurs and leads to an increase in income and consumer's demand, can the potential consumption be translated into actual demand and thus provide a justification for the investment. This has not been properly dealt with by Hansen, and because of this Hansen's argument that growing population induces increased investment is not convincing.

What is true of population growth holds also for the growth and development of new territories. Territorial expansion also induces new investments. The building of new territories and opening up of new markets require huge investment in highways, railroad, in communication facilities, etc.

But the era of territorial expansion, like the era of population growth, has come to an end for the advanced capitalistic countries of the West. This marks the end of foreign investments as well as movements of migrating population. The rate of growth of population has now been very low in these countries. Technological progress, no doubt, may provide sufficient investment outlets for the

1. Hamberg—Business Cycles. P. 154.
2. Ackley—Macroeconomic Theory. P. 511.

large amounts of saving generated at full employment incomes in the highly industrialized economeis of the world. But the stagnationists are pessimistic about the possible role of technological progress in providing the required outlets for the investment of full employment savings. When the era of other growth factors have come to an end, it is enough for the third, *i.e.*, the technological progress, to maintain its historic rate of growth under the pressure of the disappearance of the two growth factors, *viz.*, population growth and break of the geographical frontier. The marginal efficiency of capital is likely to fall much further than the rate of interest resulting in a decline in the level of investment.

We have thus arrived at the conclusion that long-run equilibrium with large-scale unemployment is perfectly possible. In this situation, savings exhibit a persistent tendency to outrun the rate of investment forthcoming at these levels. Keynes has pointed out that the "primary evil" of thrift lies in the fact that the propensity to save under conditions of full-employment generates more savings than can be easily neutralised by investment to maintain the full-employment level of income. Rapid growth of corporate and institutional savings at full-employment presents an additional problem of finding out profitable outlets so as to maintain full-employment.

One of the assumptions of the thesis of secular stagnation is that consumption function in the advanced society remains stable. The thesis explicitly and implicitly contains the habit that the propensity to consume will not sufficiently rise to close the gap between full-employment savings and investment. But, there is evidence that in the long run, the consumption function has a tendency to rise. It remains for the future to attend to or deny the validity of the stagnation thesis.

To the extent that the stagnationist position is based on Keynes' failure to see that the size of the capital stock can only be considered "large" or "small" in relation to the size of the national income, and that it is possible for the two to grow together, the position embodies an analytical error. The stagnationists could argue that capital accumulation necessarily leads to an advanced capitalist economy either into stagnation and unemployment or into maximum deficit

financing, only if it could show reasons why private demand including investment must fail to grow in proportion to productive capacity. "On balance, one must conclude that the stagnationists failed to make their case, if this case is understood as arguing the inevitable progress of capital accumulation into capital redundancy. If it is argued merely that the stagnation is a possible state for a wealthy economy, it was arguing little more than Keynes had already demonstrated, quite without reference to long-run capital accumulation."[1]

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2. Hamberg—Business Cycles, Chapter 4.
3. Kurihara—Monetary Theory and Public Policy.
4. Ackley—Macroeconomic Theory, Pages 509—512.
5. Meier and Baldwin—Economic Development.

APPENDIX

Baumol's model of the classical progress toward a stationary state

The classical progress toward a stationary state—Baumol's Model

Prof. Baumol in his book, "*Economic Dynamics*"[2] has shown the "magnificent dynamics" of the early classical school which is primarily concerned with the growth of population toward its maximum size—a size at which per capita income is just sufficient to permit the population to reproduce itself at the physical minimum level of subsistence. If the actual population would be below this size, the per capita income would exceed subsistence, and thus a margin would arise which will be divided between (a) payment of wages in excess of subsistence, thus giving rise to a population explosion, and (b) profits in excess of the capitalists' living expenses, a difference which can (and will) be invested to enable the growing population to have the necessary tools. The accumulation

1. Ackley—Macroeconomic Theory. P. 512.
2. New York, Macmillan, 1951, Ch. 2. Pages 11-19.

from profits contributes to an increase in the amount of working capital.

But in view of the scarcity of the natural resources, the growing amount of labour and capital encounters diminishing returns. Thus, with an increase in population, the margin between production and subsistence is gradually wiped out, thus eliminating both profits, and wages above the subsistence level. With zero profits accumulation comes to a close. The stock of capital remains stationary : with wages at the subsistence level, population growth also comes to a close. Prof. Ackley[1] has referred to some deficiencies of this model.

It has often been argued that its predictions have been prevented from utilization because improved technology has continually lifted the production function. Technological improvement has overcome diminishing returns. A major drawback of this model is that capital here has been considered as a "*wages-fund*", or at best, comprises the necessary equipments for workers newly-added to the labour force. But, in fact, accumulation of capital provides each worker—old newly-added—with *more* and *better* equipments thus contributing to an increases in his productivity. But if the rate of capital accumulation is greater than the rate of growth of population, the limits of natural resource capacity can be avoided, even without any technological change, and the economy would not then necessarily move towards a stationary state. Boumol's presentation is as follows :

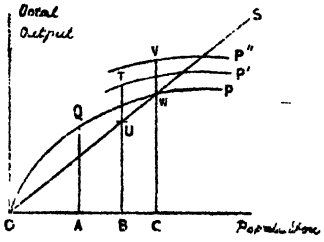

Fig. 71

Here, the line S shows the necessary volume of subsistence which has been shown as proportional to population (represented by the

1. Ackley—Macroeconomic Theory. P. 507.

horizontal axis of the diagram) and indicated by a 45° angle to the point of origin. The line P represents the aggregate production function of the economy which displays diminishing returns with increase in population. When population is OA, output is AN, and it exceeds the subsistence (AM), the marginal output then being divided between above subsistence wage payments to the labourers and entrepreneurial profits. The former induces an increase in population while the latter enables the increasing population to have the necessary equipments to raise the production function further. Thus while population increases from OA to OB, capital accumulation has raised production function from P to P', there being an excess of output, TU, over the subsistence BU. The excess amount of TU, again, will be divided between above-subsistence wage payments to labourers and entrepreneurial profits. Again, the population growth takes place from OB to OC and the capital accumulation raises the production function from P' to P''. The excess of output over subsistence here is indicated by VW, and so on.

This presentation of Prof. Baumol shows that population gradually moves towards its maximum size—a size at which per capita income is sufficient to permit the population to reproduce itself at the physical (or cultural) minimum level of subsistence.

12

ECONOMIC DEVELOPMENT

Mitchell in his "*Business Cycles*"[1] observed, "Few problems are more fascinating, more important, or more neglected than the rates at which development proceeds in successive generations in different countries." For two decades this observation of Mitchell went unheeded as the Great Depression of the early thirties of this century and the war economy of the 1940's diverted economists' attention to more immediate short-run economic problems. Keynesian analysis during the 1930's first gave special attention to the unwise policy of allowing the resources resulting from cyclical unemployment to be wasted and the danger involved in neglecting the possibility of '*secular stagnation*' in an advanced capitalist economy. These two problems which are connected with each other have been woven into the more general discussion of economic growth which has been a subject major importance in post-Keynesian economics.

The problem of growth has relevance to both advanced a backward economies. For an advanced economy, the probler how to maintain a high rate of growth while for a backw economy the problem is one of accelerating the rate of development

What is Economic Development ?

It is very difficult to point out one single characteristic economic development. But the authorities on the subject agree o the point that in economic growth the unidimensional measure i national income and that "economic development is a proces whereby an economy's real national income increases over a lon period of time."

If we give sole emphasis on growth in national income, we a to take a comprehensive view of the end result of the process development. But if we examine the process in greater details, observe that there are many ingredients of economic developme

1. W. C. Mitchell—Business Cycles, National Bureau of Economics Research, New york, 1927. P. 416.

affecting the factor supplies as well as the structure of demand for products. Particular changes in factor supplies are : (a) the discovery of land or additional resources, (b) capital accumulation or a change in the rate of capital formation, (c) population growth, (d) change in technology, and change in scale of operational units, (e) allocation of resources and (f) other institutional and organisational modifications.

Particular changes in the structure of demand for products are associated with changes in (a) the size and age composition of population, (b) level and distribution of income, (c) tastes and preference patterns and income (d) other organisational and institutional modifications.

Measurement of Economic Development

Economic development essentially implies an increase in real national income. It is very difficult to use per capita national income as a measure of economic development. The data or per capita ational income are misleading for a number of reasons. In the st place, the question arises as to the income to be determined the elements to be included in it. The costs of travel to work of wearing suitable clothes are generally included in income, ough we may regard these costs as expenses or intermediate ducts and hence deduct them from net income. Secondly, if an crease in per capita income is taken as a measure of the rate of owth, we are in the awakard position of having to say that a country not been developed inspite of an increase in real income since ulation has also increased at the same rate. Thirdly, if per capita come is the measurement, the population problem may be ncealed. As Prof. Simon Kuznets argues, "the choice of per-capita, -unit, or any similar single measure to gauge the rate of economic wth...carries with it the danger of neglecting the denominator the ratio. In a sense such neglect is an inevitable consequence e operation : we divide national product by total population ely to eliminate changes in the former 'produced' by mere changes

lso see C. P. Kindleberger—Economic Development.
(McGpaw-Hill, Koga-Kusha, 1958.) P. 1
. M. Meier and R. E. Baldwin—Economic Development.
(Asia Publishing House, 1960.) P. 2.

in the latter. To put it bluntly, in insisting on gauging economic growth by such per-unit measures, economists are treating the population factor either as an extremely simple variable that can be handled by mere division...or, what is worse, as an exogenous factor, beyond the ken of the economist as a student of economic growth."[1]

Thus Kuznets recommends to take the volume of real income and not the per capita income as a measure of economic development.

In view of the difficulties involved in taking per capita national income as a measure of economic development, it is the *volume of real national income which is taken as a measure of economic development.* A large real national income is normally a pre-requisite for an increase in real per capita income. For the maintenance of a steady rate of growth, it is the increase in real national income which is the most important factor. From the standpoint of economic development, the increase in net national income must be a sustained increase. A short-run expansion in real national income as we find in the boom period of a business cycle is not really a criterion of economic development.

If increase in per capita income is taken as a criterion of economic development, it is essential that total income must grow faster than population. Prof. Meade[2] has suggested that total income is a more appropriate concept to measure economic growth than per capita income.

Ingredients of Economic Development

Ingredients of economic development are different from the process of development. Ingredients of economic growth consist of land, capital and labour. The process includes changes in technology, in the scale of output, and in the allocation of resources. While ingredients undergo change in the course of economic development, process can be described as the changes in the development of resources, capital and people[3].

1. Kuznets—"Problems in Comparison of Economic Trends", in "Economic Growth: Brazil, India, and Japan" edited by S. Kuznets, W. E. Moore, and J. J. Speugler. Duke University Press, Durham, 1955. P. 12.

2. Meade—Trade and Welfare, Oxford University Press, London, 1955. Chap. 4.

3. Kindleberger—Economic Development, (1958). P. 10-11.

Land

Economic development requires certain minimum of land as input. By land we here mean physical resources. The most important consideration in regard to land relevant to economic growth is the land/output ratio. The land/output ratio differs widely for land of roughly the same net productivity in the same commodity, due to different inputs of other factors. Land as an agricultural input is an important ingredient of economic growth. Unused lands should be utilised for raising the net productivity of land as an agricultural input. But land differs in its ability to provide industrial materials, as well as in its capacity to produce food. Significance of land for industrial development is twofold. On the one hand, the economy may produce and sell raw materials to other countries. On the other land, the economy may produce materials for consumption in its own industry. Most of the underdeveloped countries and even a number of developed countries do not possess an adequate idea of what their natural resources are. If these countries would have an adequate idea of their natural resources, much development would be possible on the basis of known resources and known technology, awaiting only the application of capital, labour and entrepreneurship. After the known resources have been put to use in the best possible manner and new resources have been discovered, changes in technology will broaden the industrial base.

It is difficult to define land in an unambiguous manner by drawing a line of distinction between land, capital, and technology. It is difficult to distinguish land and capital. Land and capital are substitutes for one another. This substitution is limited by the availability of capital and by the capacity of capital to apply the appropriate technology. In capital-scarce countries, land is highly significant as an ingredient of development. For a developed country having abundant supply of capital, land is not so important as an ingredient of development.

The Role of Capital in the process of economic developement.

Capital occupies the central position in the process of economic development. Its role is stategic in the process of growth and it is the rate of capital formation which is the main key to economic development. M. Abramowitz has put capital in a tie for first place :

"It is probably safe to say that only the discovery and exploitation of new knowledge rivals capital formation as a cause of economic progress."[1] The process of capital formation is cumulative, and it passes through three stages, by, (*i*) *creation of savings*, (*ii*) *mobilisation of savings* and (*iii*) *investment of savings*. Capital formation increases income by investing savings, which makes possible more saving and more capital formation. At low stages of development, poverty precludes the saving necessary to form capital. Once the process is started, however, it feeds on itself.

Harrod-Domar growth model assigns a special place to the role of capital. Keynesian economics was interested in capital formation not for what it would produce but for the employment, it would generate. But Harrod and Domar growth model has given emphasis on the role of capital formation for economic growth.

Rate of Capital Formation

In determining the rate of capital formation we are to consider the ratio of capital to output, the rate of savings out of national income and the rate of population change. For raising the rate of capital formation, the capital-output ratio is to be lowered. A low capital-output ratio means a high productivity ratio. Then, savings-income ratio is also to be raised so that the country may be transformed from at least a 5 per cent saver to a 15 per cent saver ; that is to say, the greater the savings out of national income, the greater is the possibility of growth. Moreover, the rate of growth of population is to be kept under restraint so that increase in gross real national income may not be neutralised by corresponding increase in the size of population. These relationships among the rate of capital formation can be shown in algebraic terms

$$dY = \frac{S}{K} - dL$$

where dY means the rate of change in national income, S means the saving-income ratio dL means the rate of change in population and K means the capital-output ratio. This analysis is almost similar to Harrod-Domar growth model. The two elements, *saving-income ratio*

1. Abromowitz :—Economics of Growth—*A Survey of Contemporary Economics* edited by Haley.

and *capital-output ratio*, play important part in Harrod-Domar analysis of economic growth.

Let us now examine the concept of capital/output ratio and its limitations.

Capital-Output Ratio

In dealing with capital-output ratio, we should first of all distinguish between *average capital-output ratio* and *marginal capital-output ratio* and then, we should examine how far capital-output ratio differs from the marginal productivity of capital. For explaining capital-output ratio, we should take the help of a diagrammatic presentation of a production function as in the following :—

Here, we draw the iso-quants, 1, 2 and 3 indicating identical levels of output. Any point on iso-quant shows a combination of capital and labour. With OK amount of capital and OL amount of labour. The least-cost output is achieved at P, which lies on the highest possible iso-quant, 1., the cost-expenditures being given. The average capital/output ratio is the ratio between OK (capital) and OP (output). If the amount of capital is now raised to OK′, output increases. But to what extent output will increase depends partly upon the marginal productivity of capital and partly upon the efficiency of the inputs of the other factor. Assuming other inputs to be given, the marginal productivity of capital is the increase in output which results from application of a given increase in capital with all other inputs unchanged. The addition of K−K′ of capital in the above figure will increase output from P to T (or from iso-quant I to iso-quant 2) if the amount of labour remains unchanged.

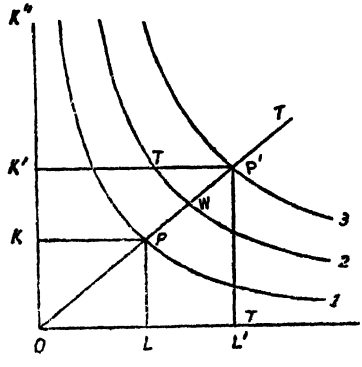

Fig. 72

The *marginal capital/output ratio* is represented by the relationship between the change in capital and the change that actually occurs in output. If, in this context, the new output after investment of K−K′ amount of capital is OP′ (that is, output increases from isoquant 1 to isoquant 3) in view of the availability of LL′

amount of labour, the marginal capital/output ratio will be KK'/PP or the slope of PP'. This implies that the economy is operating under conditions of fixed factor proportions despite the fact that the iso-quants in the above diagram show a wide range of substitutability between the factors. If the amount of labour would be either more or less than LL' when the amount of capital was K−K', the capital/output ratio would have changed.

If the capital/output ratio is constant as in the above figure, OP or the expansion path is a straight line, and the marginal productivity of capital differs from the capital/output ratio by the difference between KK'/PW and KK'/PP'. The marginal productivity of capital and the total productivity of capital would be the same only if the marginal productivity of labour in this case would be zero. Assuming the marginal productivity of labour to be zero, the marginal productivity of capital and the output/capital ratio (or the reciprocal of the capital/output ratio) are identical in this case. The concept of capital/output ratio has often been supposed to be a strategic factor in economic development. For achieving a rapid economic growth what is most essential is to raise the rate of capital formation on the one hand and to lower the capital/output ratio on the other.

Limitations of the Capital/Output Ratio

The first difficulty with which we are confronted in finding out the capital/output ratio inheres in the *ambiguities implicit in the notion of capital*, and *in imputing a given output to a given input.* The last problem is particularly difficult in case we take the time element into account.

It is really difficult to distinguish capital sharply from land and labour. It is difficult to separate resources from capital. Cleared land may be identical in agricultural productivity with acreage that once formed part of the virgin land. While the first incorporates capital, the second does not.

The difficulties are no less when the attempt is made to distinguish capital from labour. A sharp distinction between consumption and capital arbitrarily formation may be made ; but the line must be arbitrarily drawn. While education, for example, clearly contributes to further production and expenditure on education is an investment in human resources, leisure also similarly contibutes to further

production since if envigourates the person taking leisure afterwards. Another difficulty is raised by durable goods in the possession of consumers. If we take an arbitrary definition of capital and limit it to tangible and reproducible assets, excluding those owned by consumers except for housing, there is a question whether we should properly count as the output the gross or the net return, i.e., whether we should count the interest *and* depreciation or, interest alone. It makes a great difference. To the question whether we should count the net output or gross output in making an investment,[1] the answer is : it depends on whether the capital structure is likely to be fairly stable, or whether transformations in the structure of the economy are frequent. With stability, it is sufficient to deal with net output, since depreciation allowances are not required to shift capital to other sectors. If there is the possibility that capital may be shifted to other sectors, then gross production is the relevant concept. Another question is raised as to whether we should consider the capital cost or the current cost of the capital input in choosing between two competing investments.

Thus, depreciation of capital raises a series of problems. The basic problem is, how to calculate the depreciation allowances. Some capital tends to wear out more rapidly at the end of its life than at the beginning. If an economy is consistently growing, straight line depreciation will provide continuously more depreciation allowance than is readed 1 to make good physical wearing out of capital.

If me find a time lag involved in the application of inputs and the receipt of output therefrom, the investment problem becomes one of comparing the cost of a given input with the present value of its future output.

The production function of the type set out in the above figure assumes that there is no time lag between the application of input and the receipt of output therefrom. In case we find a time lag between the application of input and the receipt of output therefrom, the imputation of a given output to a given input becomes impossible. When output is received not instantaneously but in a different time sequence, the investment problem becomes one of

1. Kindleberger. Economic Development P. 43.
2. Ibid. P. 44.

comparing the cost of a given input with the present value of its future output. In that case, we are to apply a discount to future benefits. When output is constant begins immediately following the application of the input, the present benefit can be calculated from the formula,[1]

$$V = \frac{y}{r}$$

when V is the capitalized value of the stream of income, y, at the rate of interest, r where there is a lag in outputs, and variability we go back to the underlying series

$$V = \frac{y_1}{1+r} + \frac{y_2}{(1+r)^2} + \frac{y_3}{(1+r)^3} \cdots\cdots \frac{y_n}{(1+r)^n}.$$

The longer the time lag in receiving the initial outputs, and the smaller they are in relation to the ultimate level of output, the lower the present value (V) of an investment which must be compared with its cost (C).

If we disaggregate the model, the difficulty of associating inputs with outputs is further increased, and the rule according to which, investment should increase in the industries with the lowest capital/output ratio loses much of its meaning. This is largely the outcome of complementaries.

Apart from these theoretical objections, there is also a statistical objection. The capital/output ratio assumes a given efficiency of production. When the iso-quants pull in toward the origin, through technological innovation, so that the same inputs of capital and labour can produce more output, or the same output can be produced with fewer inputs, the meaning of the incremental capital/output ratio is clouded still further.

Although we find limitations, both theoretical and practical, of the concept of capital/output ratio, this concept is widely used as a planning tool. Its predictability is weak, particularly in the short run. In the First Five-Year Plan of India, an incremental capital/output ratio was assumed to be 3 : 1 ; but in practice the ratio was realized 1.2. But over longer periods of time, averaging the annual marginal rate appears to produce meaningful results.

1. Kindleberger—Economic Development, P. 45.

It has often been suggested that the concept of capital/output ratio is appropriate to use and handier than the marginal efficiency of capital in a country where labour is redundant.

Channels of Investment

The process of capital formation consists of three stages :— (a) creation of savings, (b) mobilisation of savings and (c) investment of savings. It is generally felt that the limiting factor in capital formation is the volume of savings, and that all the savings accumulated can be readily invested. This view has been disputed more recently. The International Bank for Reconstruction and Development has suggested that the main bottleneck is not funds, but projects which are sufficiently advanced in planning to warrant investment consideration, and in countries like Turkey, Mexico, Pakistan, it has been found that the basic lack is businessmen ready and willing to undertake the investment functions of the entrepreneur.[1] In developing countries like India, investment is undertaken by farmers, by domestic and foreign entrepreneurs, and by Government. Farmers are responsible for the largest investment projects in agriculture. In case the private entrepreneur is the channel of investment, it does not follow that he enjoys full autonomy in the process. Particularly when an underdeveloped economy depends on external capital for undertaking an investment project, the decision to tend a private entrepreneur may be more significant than his readiness to bear the burden of risk. Within the country private investment-decisions depend on a great deal on the role of the commercial banks as lenders of capital. But in a country wedded to economic planning, the commercial banks do not play the decisive role in channeling capital in economic development. This role is assigned to government. Private investments may be financed by development banks which again may be regulated by the Government.

Sources of Capital

For the purpose of capital formation it is essential that there should be growth of savings, mobilisation of savings and investment of savings. Saving may be undertaken by businessmen, by households,

1. Kindleberger—Economic Development, p. 48.

or by Government in the domestic economy, or may come from the foreign countries. These savings may be voluntary or may be involuntary result of inflation. In the field of agriculture there may be savings in kind. Personal savings may be governed by a number of factors. The rate of saving is a function of level of income, the distribution of income, the rate of interest, the rate of taxation, the existence of incentives and opportunities for social advance and many other objective factors. It may also be governed by some subjective factors like the characteristics of human nature, sense of foresight of the people etc. Different factors may have different significance under different circumstances. If a small percentage of the population recevies the bulk of income, it may not be difficult to increase savings. But what is most important is to induce this small section of the population to release these savings for the purpose of investment. Business savings come out of profits. Some considerable amount of gross investment arises out of depreciation and depletion allowances. For in an advanced economy, depreciation is naturally much higher as a percentage of income than it is in an underdeveloped economy. If capital replacement is more productive than the capital worn out, depreciation of capital may be a source of capital formation. But net savings come from profit and that he re-invested for the purpose of economic growth. Prof. Lewis believes that for achieving economic development a country is to be raised from 5 per cent savers of national income to at least 15 per cent savers of national income and the secret of this increase in saving income ratio is to be found in a high rate of profit. High incomes of the rich landlords are not much likely to initiate economic growth since they are likely to be satisfied with their social prestige and status. But high profits obtained by the businessmen or passed along in dividends to individuals lead to reinvestment of profits and this it leads to economic development. Government savings may arise out of curtailment of unproductive, civil expenditures ; it may also arise out of the surpluses of the state enterprises. If on the other hand the government takes recourse to deficit financing for financing the investment projects, it may create inflation and that inflation may lead to savings in some other sectors. Inflation leads to involuntary savings.

Growth of capital is essential for economic development. But capital formation is not the only ingredient of economic development

ment. The stages in economic development, particularly the stages of take-off and self-sustaining growth as pointed out by Rostow, are essentially interlinked with the rate of capital formation and that is again related to increased saving-income ratio on the one hand and low captial-output ratio.

Labour

Another important ingredient of economic development is labour. High rate of growth of population stands in the way of economic development. This has been demonstrated in India. But if the increased population is properly utilised and if the level of productivity of the man-power can be raised, it becomes conducive to economic growth. One part of growth is the simple acquisition of labour skills, knowledge of tools, capital equipments, and techniques of their use. But what is of fundamental importance is the change in social behaviour that makes economic development a comulative process rather than a once for all series of changes in capital and skill imposed from without.

Simon Kuznets has said,[1] "The major capital stock of an industrially advanced nation is not its physical equipment : it is the body of knowledge amassed from tested findings and discoveries of empirical science, and the capacity and training of its population to use this knowledge effectively." The individual and his environment, the family structure, the class structure, socio-economic institutions and culture are important influences governing social behaviour of the labour force. As Kindleberger points out[2], economic development is also associated with certain religions, city rather than rural life, cultural attitudes which emphasige competition rather than contemplation.

It is impossible to say in general as to whether the social attitudes lead or follow economic change. Instances of each case can probably be found. Interactions of social attitudes and economic change are quite likely in the usual form, with some social and cultural habits which often fail to give way under economic pressure.[3]

1. Quoted from Kindleberger's "Economic Development". P. 57.
2. Ibid. P. 25.
1. Kindleberger Economic Development, p. 75.

Technology and Entrepreneurship

Technology and entrepreneurship are also important ingredients of growth. Dewhurst, referring to the U. S., writes: "Technology, in fact, can be thought of as the primary resource." Schumpeter writes,[1] "The slow and continuous increase in time of the national supply of productive means and savings is obviously an important factor in explaining the course of economic history through the centuries, but it is completely overshadowed by the fact that development consists primarily in employing existing resources in a different way, in doing new things with them, irrespective of whether these resources increase or not."

Technological innovations may be either *labour-saving* or *capital-saving*. When technological innovations are labour-saving, there may be demand for special grades of labour skill ; capital saving innovations call for a different type of physical capital input.

Labour-intensives Investment Versus Up-To-Date Technology.

Economic development over a period of time leads to an increase in the capital/labour ratio and permits capital-deepening. The problem is : should a developing country use the technology appropriate to her existing factor proportions including particularly her capital/labour ratio, or should she start from the very beginning with a capital-intensive technique of production before her capital endowment is really suitable for this ! The problem may be studied in the following manner : should an underdeveloped country venture to take recourse to a capital-intensive method when labour is abundant and practically unemployed on a large scale and capital is scarce. The modern technology as developed in the advanced capitalist countries is based on the assumption of abundance of capital and shortage of labour. As Prof. Kindleberger says, much of the adoption of modern technology is mere demonstration effect on the side of production, the attempt to run before one can walk. Such technology wastes capital, since it uses it too intensively in a narrow sector, and requires ignoring opportunities for profitable investment.[2]

In dynamic terms, Bruton has suggested that the industries

1. Schumpeter—The Theory of Economic Development 1 Harvard University Press, Cambridge, May, 1949,) P. 49.
2. Kindleberger—Economic Development. P. 169.

which embody external economies are frequently capital-intensive. These capital-intensive investments must be undertaken before one can take advantage of opportunities for investment in labour-intensive industries. When industries are linked together in complementary interesting fashion the capital intensity of a particular industry does not necessarily indicate its suitability for investment until one has traced through and imputed to it its total return along with all the dfficulties that such a technique calls for. Bruton's argument further dwells on the fact that labour productivity is higher in capital-intensive than in labour-intensive industries and that this is an argument for the former. But this argument it not true with a competitive market for labour. Even if the argument is assumed to be true, it is not relevant. The investment criterion is net capital productivity. But if labour is redundant, gross capital productivity is the investment interior.

It has often been argued that capital-intensive industries are more income-generating and saving-creating than the labour-intensive industries, and thus the capital-intensive industres are likely to accelerate the rate of development faster than the labour-intensive industries despite a lower static level of output. As Gerschenkron has pointed out, borrowed technology···was one of the primary factors assuming a high speed of development in a backward country entering the stage of industrialization. He further says·····to the extent that industrialization took place, it was largely by application of the most modern and efficient techniques that backward countries could hope to achieve success.·····The advantages inherent in the use of technologically superior equipments were not counteracted but enhanced by its labour-saving effect. But this argument points out that growth in European countries embarking on industrialization frequently took place in those industries where technological progress had been the most rapid. Use of modern technology may attract entrepreneurs. But this may not be feasible and desirable when capital is in short supply, and costly while labour is cheap and abundant. Using modern technology in that situation may not only aggravate the unemployment problem but also invite the inflationary pressure, generated by

1. A Gerschenkron. "Economic Backwardness in Historical Perspective" in B. F. Hoselitz (ed).
"The Progress of underdeveloped Areas inchible Preist (1912).

the excessive capital expenditure. Of course once development is under way, as a result of the removal of large, socio-economic bottlenecks, the existence of sufficient resources, and presumably some capital formation, most rapid progress is made by using uptodate technology.

Another aspect of the problem should now be considered. While labour may be cheap and abundant in an underdeveloped country, it is always inefficient. On the one hand there may be low price and lower efficiency while on the other, there may be inefficient but high-price workers. The disparity between factor prices and factor efficiency may extend beyond labour, and particularly in the field of capital. A confusion arises with foreign investment in this case. In an underdeveloped economy the possibility of direct foreign investment in highly capital-intensive industries requires a weighing of two considerations : the opportunity cost of capital, i.e., whether the capital would be available at all even if it were not used where it was going ; and the possibility of dual economy. If the foreign capital would not be available for any other use with a higher return, its opportunity cost would be zero, which would justify investment in any industry at any set of factor proportions above the prevailing level.[1] The prospect of dual economy, on the other hand, may be favourable or unfavourable, depending upon whether the up-to-date technology serves as a means of training and stimulation to labour—a growing point—or inhibits productive effort because the gap is too wide.[2]

Between these two methods, the planner's choice should in general fall upon those industries which are mutually-supporting or economy-creating. But choice should, in general, be made in favour of labour-intensive industries where capital/output ratio is low. It is also essential that such industries should be of what Prof. Hicks has called the *quick investment type* so that they may go a long way towards neutralising the inflationary forces generated by a huge scale of development outlay. There is no contradiction between the need for labour-intensive methods and the need for increasing the capital-intensity in a country where even the maximum

1. Kindleberger—Economic development. P. 185.

possible supply of capital will leave scope for labour-intensive production. When capital is scarce, we require a low capital/output ratio. In that case we should choose those lines of works which are not only "*skill-light*" but also "*import-light*" (i.e., the problem of imported equipment and material is relatively low as compared with the total amount of capital required). When the country is highly sensitive to inflationary forces, a good ground is made for investment in those industries in which the time lag between the execution of the investment projects and the start of the flow of consumable goods is relatively short. The choice of size calls for a consideration of the cost-element and it should depend on the particular circumstances of each case.

The choice centres round between the two : maximization of output and maximization of employment. For rapid economic development, we do require quick increase in the level of output and that can be achieved by up-to-date technology. It is also a fact that greater output will generate more employment opportunities. So, there is hardly any conflict between employment-objective and output-objective. But much depends on the nature of the unemployment problem, and the long-run prospects of its correction. If employment becomes a primary and output a secondary objective, it is still necessary to use capital as efficiently as possible. The Indian experience suggests that it is desirable that there should be a *common production programme*—a simultaneous application of both the capital-intensive and labour-intensive techniques of production in the sectors suitable for the respective techniques.

Balanced and Unbalanced Growth

Balanced Growth may take three forms : extreme, moderate or sophisticated. The extreme view is that net or gross investment, or output, should expand at equal rates in all sectors of the economy : industry and agriculture, goods for consumption and investment, for export and for the home maket. Rosenstein-Rodan,[1] in his early exposition of balanced growth, argues : "complementarity makes to some extent all industries 'basic', and S. Paul[2] points out that this

1. Rodsenstein Rodan—"Problems of Industrialisation of Eastern and South-Eastern Europe." June, 1943.

2. S. Paul—"Sectoral Allocation in Development Planning." Econ., Journal, July, 1960.

view is "based on the notion that all industries are more or less equally endowed with external economies, (implying that) available resources should.. be equally dispersed among all industries to secure the optimum pattern of investment." Again, if we accept that the "consideration of 'balanced' growth emphasised how vital it is for a developing country to maintain a strong agricultural base,[1] then that emphasis applies equally to all sectors. The moderate view is that "all sectors should be expanded simultaneously", not necessarily at equal rates.[2] Nurkse's case for the sophisticated view of balanced growth rests on "external economies" caused by the effects of supply on demand. The argument is for "balance in demand", and the advice to the planner is, "choose ratios among sectoral growth rates such that the new incomes created just absorb the new output produced, given the income-elasticities of demand." Three riders are attached[3] : (a) this process minimises waste of the scarcest resource, capital, by preventing excess capacity, (b) private entrepreneurs, seeing that capacity is not wasted and that products find markets, are encouraged to invest by balanced growth, and this leads to further growth ; (c) because, a buyer spreads extra income over many products, "sophisticated" balanced growth requires 'moderate' balanced growth—by spreading available resources over the production of many commodities.

Balanced Growth is often supported by the argument from "balance in supply." Sectors supply each other's inputs, so, simultaneous growth reduces waste of capital resulting from shortage of ancillary factors.

Unbalanced Growth involves "staggering" economic development, so that net or gross investment, or output, grows faster in some sectors than in others. Hirschman emphasises the historical failure of balanced growth, especially in Latin America![4] Rostow shows that economic growth was initiated in the same "leading sectors" in various developed countries.[5] Paul Streeten gives stress on the

1. Meier and Baldwin—Economic Development.
2. Lewis—Theory of Economic Growth (1955). P. 283.
3. Michael Lipton—"Balanced and Unbalanced Growth in underdeveloped countries." Economic Journal, Sept. 1962.
4. Hirschman—Strategy of Economic development (Yale 1958).
5. Rostow—Stages in Economic Growth. (Oxford Economic Papers June, 1963).

features of consumer psychology which invalidate balanced growth recommendations.[1]

The two main unbalanced growth-processes are Hirschman's "*linkage*" and Streeten's "*anabolism of wants.*" Hirschman shows how the supply of a new input, or the demand for a new output, induces entrepreneurs to expand their activities. This process is often one-way, in the sense that a unit of investment in A induces a unit of investment in B, but not vice versa. So, a given initial investment devoted solely to A will create more final output than would any equal, balanced or income-elasticity-oriented distribution of that investment between A and B. The short-term capacity may focus entrepreneurs' attention on crucial bottlenecks, and hence may encourage secular growth.

Streeten's case for unbalanced growth concentrates on the demand side. Accepting Nurkse's argument that the lack of effective demand is the major restraint on investment, Streeten questions whether simultaneous expansion of many outputs is the best way to remove that restraint. Certain "key" wants, once satisfied, engender new wants : so investment should be concentrated rather than dispersed.

It appears that unbalanced growth has much to recommend it in an economy with a high trade/income ratio, whereas balanced growth is otherwise needed to secure a "balanced diet. In support of balanced growth, Lewis says, "In development programmes, all sectors of the economy should grow simultaneously, so as to keep a proper balance between all sectors...The logic of this proposition is as unassailable as its simplicity."[2] Singer also points out, "In its most watered-down versions it comes pretty close to identifying balanced growth with the kind of growth with which the observer agrees ..[Technical usages are not] entirely unrelated to more emotional roots of the concept."[3]

As against these arguments in favour of balanced growth, Hirschman advocates unbalanced supply in terms of a disequilibrium path from the "low-level equilibrium trap" to the high-level, balanced,

1. Paul Streeten—Unbalanced Growth.
2. Lewis—Theory of Economic Growth. P. 283.
3. Singer—"The Concept of Balanced Growth in Economic Development—Theory and Practice", Malayan Economic Review, Oct. 1958.

developed equilibrium. According to Hirschman, unbalanced growth may ultimately produce the possibility of balanced growth.

"Balanced" and "unbalanced" are insufficiently clinical; "growth" is insufficiently precise. What is to grow—income or income per head? Total output, "economic power", may interest a Government more than income per head, or "economic welfare"; and the choice of output-raising policies itself affects population growth.[1]

With regard to India, we find three bottlenecks, viz., *shortage of domestic savings for financing investment, skill bottleneck, lack of heavy capital equipments*,—these bottlenecks make it very difficult to introduce the technique of balanced growth.

The Nurkse Thesis in support of balanced growth

Ragnar Nurkse advocates the case for balanced growth and says that low real income is "a reflection of low productivity which in turn is due largely to lack of capital. The lack of capital is a result of the small capacity to save, and so the circle is complete."[2] Nurkse contends that Say's law is never valid in the sense that the output of any single industry, newly set up with capital equipment, can create its own demand. Technical discontinuities call for "jumps" in the rate of output, but "the small and inelastic demand in a low-income country tends to make such jumps risky, if not altogether unpromising."

The only way out of the problem is "more or less synchronized application of capital to a wide range of different industries. Here is an escape from the deadlock; here the result is an over-all enlargement of the market..."Most industries catering for mass consumption are complementary in the sense that they provide a market for, and thus support, each other...The case for 'balanced growth' rests on the need for a "balanced diet."

The Singer Critique

Hans Singer[3] does not support the application of this thesis. Singer asserts that for an understanding of the problem of balanced

1. Michael Lipton—"Balanced and Unbalanced Growth in underdeveloped countries", Economic Journal, P. 641.

2. Ragnar Nurkse—Problems of Capital formation of an underdeveloped economy ch. I.

3. Hans Singer "The concept of Balanced growth and Economic Development: The University of Texas Conference on Economic Development. April 1958.

growth, we have to construct some kind of fundamental picture of an underdeveloped economy. He defines an underdeveloped economy as one with 70 to 90 percent of the employed population in agriculture, and adds, "Arthur Lewis has defined the process of economic growth as one of transforming a country from a 5 per cent saver to a 15 per cent saver. We can, with equal justice, define the process as one of transforming a country from an 80 per cent farmer to 15 per cent farmer." A transformation from mainly agriculture to mainly non-agriculture is not only an essentially part of the development process, but this structural change also has a "multiplier effect". Singer feels that there are "several areas of doubt" about the balanced growth theory in its Rodan-Nurkse form. If the balanced growth theory encourages underdeveloped countries to embark on large and varied packages of industrial investment, with no attention to agricultural productitviy, it may lead to trouble. Singer quotes Fleming : "Whereas the balanced growth doctrine assumes that the relationship between industries is for the most part complementary, the limitation of factor supply assures that the relationship is for the most part competitive". Singer concludes that the theory of balanced growth is premature rather than wrong for an underdeveloped economy and that it is applicable to a subsequent stage of sustained growth rather than to the breaking of a deadlock. For launching growth "it may well be better development strategy to concentrate available resources on types of investment which help to make the economic system more elastic, more capable of expansion under the stimulus of expanded markets and expanding demand."[1]

The fundamental trouble with the balanced growth doctrine, Singer concludes, is its failure to come to grips with the problem of underdeveloped countries like the shortage of resources and other bottlenecks.

Hirschman's Strategy of Economic development,—the case for maximising the total linkage effects.

Hirschman contends that *deliberate unbalancing* of the economy, in accordance with a pre-designed strategy, is the best way to achieve economic growth. He gives emphasis on *ability to invest* which depends

1. Hirschman—"Strategy of Economic Development". (New york) 1958.

mainly on how much investment has already been made. He agrees with Singer that application of the balanced growth theory requires huge amounts of precisely those abilities which we have identified as likely to be very limited in supply in underdeveloped countries." Hirschman introduces the concept of "*linkage*" effects. He refers to two methods of unbalanced growth, viz., development via excess capacity and development via shortage. The rate of growth is likely to be faster with chronic imbalance, precisely because of the "incentives and pressures" it sets up. Any particular investment project may have both '*forward linkage*' and '*backward linkage*'. When an investment project encourages investment in subsequent stages of production, it is a case of forward linkage and when an investment encourages investment in earlier stages of production, it is a case of backward linkage. The task is to find the projects with the greatest *total* linkage. The projects with the maximum linkage will vary from country to country and from time to time, and can be discovered only by empirical studies of the "input-output matrix" variety. Underdeveloped countries are weak in interdependence and linkage" and so what is required is to raise the total linkage of the investment projects to the maximum possible extent and that can be ensured by the technique of unbalanced growth. "The question of priority must be resolved on the basis of a comparative appraisal of the strength with which progress in one of these areas will induce progress in the other."

Conclusion

We may conclude, in the words of Kindleberger, "Assuming that overriding consideration is increased output at the fastest possible pace, and not some maximum employment or some redistribution of income which accords with welfare, resources should be invested where they will earn tbe highest possible return, direct and indirect, including imputed external economies and correcting where necessary for differences between private and social costs."[1] This calls for chalking out a scheme of priorities. For the economically advanced countries, however, balance in demand and balance in supply are relatively more important than the scheme of priorities since a standard level of economic development has already been achieved.

1. Kindleberger—Economic Development (Mc graw Hill 1958). P. 166).

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1. Kindleberger—Economic Development (Tokyo, 1966)
2. Meier and Baldwin—Economic Development
3. Higgins—Economic Development
4. Ragnar Nurkse—Problems of Capital Formation of an Underdeveloped Economy.
5. Bhabatosh Dutta—Economics of Industrialisation. (World Press, Calcutta)
6. Michael Lipton—"Balanced and Unbalanced Growth in underdeveloped countries." Economic Journal, Sept. 1962.
7. Lewis– Theory of Economic Growth.
8. Hirschman—Strategy of Economic Development.
9. Amartya Sen—"Some Notes on the choice of capital intensity in Development Planning". Quarterly Journal of Economics Nov. 1957.

13

MONETARY POLICY AND ECONOMIC DEVELOPMENT

Objectives of Monetary Policy

With the changes in patterns of central banking and with changes in the economic scenes of different countries, the objectives of monetary policy also have changed. After the Great Depression of the early thirties of this century, the scope of monetary policy has been broadened. The traditional objectives of central banking policy have been designed to regulate credit and currency, control and protect the external value of the national monetary unit and mitigate the fluctuations in the general level of production, trade, prices and employment.[1] Various objectives of monetary policy have been laid down by the central banks set up in recent years and some of these objectives are quite conflicting.[2] But the objectives of monetary policy have traditionally been contra-cyclical in content based of the notion that an appropriate monetary policy can usually lessen the fluctuations in general activity from which we now actually suffer, and can thus prevent or at least markedly reduce the degeneration".[3] Along with the objective of mitigating cyclical fluctuations, it has also been the objective of most of the central banks to maintain exchange stability. But maintenance of exchange stability had a different significance in the days of gold standard when the goal of achieving or maintaining price stability had often to be sacrificed. Prior to the Keynesian Revolution exchange stability and price stability, were the traditional objectives of monetary policy. In pre-Keynesian days, monetary policy was the single established instrument of aggregate economic policy and the major objective of the economic policy was to achieve price stability. The Keynesian Revolution introduced an alternative instrument, fiscal policy, and

1. Preamble to the Bank of Canada Act 1934
2. See E. S. Shaw—Money, Income and Monetary policy (Chicago; Richard D. Irwin Inc. 1950). pp 398-406
3. J. W. Angell. "The General objectives of Monetary Policy." in the "Lessons of Monetary Experience," A. D. Gayer ed (New york)

a second objective, maintenance of full employment (more commonly described as economic stability), which might come in conflict with the traditional objective of price stability.[1] Apart from monetary policy and fiscal policy, two other instruments of economic policy after the World War II have been the policy of debt management and the policy of maintaining international balance.[2] Since the middle 1950's economists have added the fourth item to the list of objectives of monetary policy, viz., adequately rapid economic growth. Thus, the four major objectives of monetary policy which is now one of the four instruments of aggregative economic policy are maintenance of (i) exchange stability. (ii) price stability, (iii) full employment and (iv) achievement and maintenance of rapid economic growth. From short-run considerations the objective of full employment or economic stability is important. This is particularly true of a mature economy. But an underdeveloped country needs a policy of secular growth.

For an underdeveloped economy we require a monetary policy the essential objective of which is to achieve economic growth, this objective having priority over other objectives. Before we examine the case for a growth-oriented monetary policy in an underdeveloped economy, we should very briefly refer to the nature of economic underdevelopment and the meaning of economic development.

Economic Development—Its relation to monetary expansion

The problem of growth has relevance to both advanced and underdeveloped economies. For an advanced economy, the problem is how to maintain a high rate of growth while for an underdeveloped economy the problem is how to achieve an accelerated rate of growth. But the question arises, what is actually meant by economic development ? It is very difficult to point out one single characteristic of economic development. But the economists agree on the point that in economic growth the unidimensional measure is national income and that "economic development is a process whereby an economy's

1. H. G. Johnson Art. "Monetary Theory and Policy". Economic journal June 1962. Reprinted in "survey of contemporary Economics" Vol. I. p. 30. (Published by Macmillan. New york. 1965 and prepared for Royal Economic Society and American Economic Association).

2. Ibid.

real national income increases over a long period of time."[1] If by economic growth, we mean increase in national income, we are to take a comprehensive view of the end result of the growth-process. But if the process is examined in greater details, we come across a number of ingredients of economic development, viz., land, capital accumulation, population growth, change in technology and change in scale of operational units, allocation of resources and other institutional and organisational modifications.

Economic development essentially implies an increase in real national income. It is very difficult to use per capita national income as a measure of economic development. The data on per capita national income are misleading. As Prof. Simons Kuznets argues, "the choice of per-capita, per-unit or any similar single measure to gauge the rate of economic growth.....carries with it the danger of neglecting the denominator of the ratio. In a sense such neglect is an inevitable consequence of the operation : we divide national product by total population largely to eliminate changes in the former 'produced' by mere changes in the latter... To put it bluntly, in insisting on gauging economic growth by such per-unit measures, economists are treating the population factor either as an extremely simple variation that can be handled by mere division...or, what is worse, as an exogenous factor, beyond the ken of the economist as a student of economic growth."[2] Thus, Kuznets recommends taking the volume of real income and not the per capita income as a measure of economic development.

In view of the difficulties involved in taking per capita national income as a measure of economic development, it is the volume of real national income which is taken as a measure of economic development. A large real national income is normally a pre-requisite for an increase in per capita real income. For the

1. C.P. Kindleberger—Economic Development.
(Mc graw Hill, koga—kusha, 1958) P. I
Also see G-M. Meier and R.E. Baldwin—Economic Development.
History, Institutions and Policy. P. 2.
(Asia Publishing House, Calcutta, 19 0)

2. Kuznets. "Problems in comparison of Economic Trends." in "Economic growth : Brazil, India and Japan" edited by S. Kuznets, W.E. Moore and J.J. Spengler.
Duke University Press, Durham. 1955. P. 12

maintenance of a steady rate of growth, it is the increase in real national income which is the most important factor. From the standpoint of economic development, the increase in real national income must be a sustained increase. With a check to the increase in the rate of growth of population so that a per capita income may rise, a short-run expansion in real national income as we find in the boom period of a business cycle is not really a criterion of economic development. Economic development in general terms can then be stated to connote (a) a rise in real national income and also in per capita income over time, (b) a gradual transformation of the subsistence sector which is a hall-mark of a backward economy into a monetised sector, and (c) institutionalisation of saving and investment. The first two aspects of economic development have direct relevance for the optimum degree of monetary expansion in a growing economy. The third aspect has a larger implication for promotional monetary policy of the central bank in an underdeveloped country.

Assuming that comparative price stability remains the objective, monetary policy has the task of ensuring a rate of expansion of money supply that is consistent with the requirements of economic development. An increase in gross income implies a crresponding increase in the volume of transactions and an increase in money supply should be made proportional to the increase in the value of transactions so as to avoid a fall in price with consequent adverse effects on output, employment and development.[1]

The fundamental objective of economic policy in a developing country is the promotion of development with stability. In specific terms, this implies the attainment of a stady rate of growth of real national income and of reasonably full employment, together with general financial stability. Financial stability, broadly understood, would comprise domestic price stability as well as exchange stabilty, with approximate equilibrium in the balance of payments, taking care of the capital movements that the economy encounters.

A Positive Monetary Policy for Economic Development.

Economic growth has become an important policy objective in the Post-Keynesian era and the insight got in the process of economic

1. B.K. Madan—Monetary Policy and Economic Development.—Reserve Bank of Indta Bulletin July 1964 Page 890.

development has amply demonstrated that money supply—or, more generally, currency and credit supply—is not a passive factor in economic development. The theory of economic development which looks upon the supply of currency and credit passively following the flow of goods rather than determining the flow of goods is largely erroneous. While it is admitted that the 'minimum critical effort" to be exerted by an underdeveloped economy for the economic development is governed by a large number of variables like capital accumulation, innovations in technology and many other growth-oriented institutional factors, it is, however, being realized that a number of real variables governing economic development may themselves be influenced by successful operation of monetary policy.

C. R. Whittlesey advocates the development-objective of monetary policy and contends that economic growth as an objective of monetary policy would represent the same significant step in the development of monetary policy in the post-war years which full employment represented in the pre-war decade.[1] He thinks that the full-employment objective is essentially short-run in character. Full employment, of course, can be defined in dynamic terms in the sense of full utilisation of potential as well as existing capacity. But so long as it is interpreted in static terms, that is, full utilization of existing capacity only, it cannot be regarded as a desirable objective of monetary policy for a growing economy. But full employment-objective being considered in a dynamic sense, we don't find any conflict. As Whittlesey says,[2] the economic growth objective looks toward optimising the country's capacity to produce. The full employment objective looks towards optimizing the current utilization of the capacity. In other words, ideal output under the full employment objective is the country's economic potential at the prevailing level of technology ; under the economic growth objective it is the country's economic potential at a *progressive level* of technology, and specifically at a level which progresses in an ideal manner.

An underdeveloped economy should adopt economic growth as its objective rather than full employment in static terms. In accepting the achievement of economic development with stability as the objective

1. C.R. Whittlesey "Relation of Money to Economic Growth" American Economic Review, Papers and Proceedings, XLVI (May, 1956). P.P. 188-201.
2. Ibid P. 198.

of monetary policy the question arises, whether inflation is necessary or helpful for development. It is commonly believed that a degree of inflation acts as a fillip to development owing to the greater relative growth of profits than of wages under slowly rising prices and the consequent increase in the proportion of savings or investment relatively to that of consumption to national income.[1] Since some degree of inflation has been unavoidable as an incident of growth, it is likely that such gradual inflation has usually imparted some stimulus to economic growth. It is generally argued[2] thst a mild inflation is conducive to economic growth since capital formation is promoted by the increased business activities of the entrepreneurs, lagging wages, and forced savings by the fixed income groups. But the economists do not always agree on the point. Adler holds a compromising view in this regard. For him, "the best price level from the point of view of development objective differs from country to country ; it lies somewhere between the extremes of stability without development, and inflation without development."[3] He recommends some inflation with some development. But U. Tun Wai of the I. M. F. points out the existence of a negative correlation between inflation and economic development in most cases. In a statistical study relating to sixteen underdeveloped countries, he has come up with the interesting finding that "all countries surveyed except Mexico had more development in the period of less inflation than in the period of greater inflation."[4] Even if mild inflation is conducive to economic development, underdeveloped countries cannot usually maintain inflation at the 'mild' level. It is possible for advanced countries like U. S. A., U. K., West Germany, etc. to keep inflation at a mild level by a net work of their built-in-stabilizers and

1. "Monetary Policy and Economic Development",—Address delivered by B.K. Madan at the fifth SEAZA central banking course held at Karachi during January—March, 1964.

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See Page 888 of the Bulletin.

2. E.M. Bernstein and I.G. Patel, "Inflation in relation to Development." I.M.F. Staff Papers, Nov. 1952.

3. John H. Adler, "The Fiscal and Monetary Implications of Development Programmes", American Economic Review 1952. pp. 584-600.

4. U. Tun Wai, "The Relation between Inflation and Economic Development", I. M. F. Staff Papers, Oct. 1959. pp. 309-310.

other fiscal and monetary instruments. But underdeveloped countries in the absence of sound central banking systems and an efficient tax administration can hardly succeed in keeping inflation at the mild level. It is also clear from observed experience that marked inflation is inimical to growth rather than helpful to it. Apart from its adverse effects on distribution of incomes, its effects on production are also deleterious, as inflation increases inefficiency, distorts the pattern of investment and results in maldistribution and dissipation of resources. With this idea in mind, Howard Ellis[1] is strongly opposed to the development objective of monetary policy. He contends that any positive monetary policy for accelerating the rate of economic growth in an underdeveloped economy produces a strong inflationary pressure and "inflation has particularly pernicious effects on development."[2] Ellis thinks that economic growth must not be made "an injunction upon the monetary authority."[3] Full employment is a better objective. "Wildcat banking would not help."[4]

The essence of the argument against the attempt to use the monetary policy to accelerate growth is that all roads lead to inflation. Positive policy is likely to be expansive. Inflationary tendencies lie in the demonstration effect which induces the economy to consume too much and to overinvest in the private sector, in the grandoise development plans, using too capital-intensive projects of governments on a wide front. The inflationary financing of growth reduces the level of voluntary savings, as income recipients are unwilling to hold money or claims payable in money of declining value. It distorts the pattern of investment by substituting for the criterion of productivity that of capacity to resist depreciation. And inflation tends to become cumulative as income-earners exercise what Walker calls extra-market power and strike for high wages, demand governmental stabilization of farm prices or subsidies to farmers and industry, etc.,

1. H. Ellis, "The Financing of Economic Development in underdeveloped Areas", Indian Economic Journal, III (January, 1956), also his comments on Whittlesey's Paper in American Economic Review, Papers and Proceedings, XVVI (May, 1956).
2. Ellis, Comments on Whittlesey's Paper, op. cit., p. 207.
3. Ibid.
4. Ibid.

to protect their incomes in real terms and to push the burden of the extra spending into others.[1] In addition to these considerations in a closed economy, an open economy is not in a position to distort incentives in favour of imports and against exports, and in favour of the use of foreign capital instead of high-priced domestic labour.[2] If inflation is followed by depreciation, the distortion does not occur.[3]

Institutions and appetites which make for inflation, and inflation's bad effects on development, have led monetary authorities to emphasize stability rather than growth. The achievement of stability, it has been thought, brings economic growth as a byproduct. The duty of the authorities, as Ellis states, therefore, is to ignore, or pay only slight attention to, the requirements of growth, and to concentrate attention on stability.[4]

But although Ellis strongly disfavours a positive monetary policy for growth, particularly an inflationary monetary programme in an underdeveloped economy, he makes some concession to the growth view when he says, "Governments do, of course, intervene in the economic process to quicken the pace of progress—sometimes successfully. This intervention might extend into the specific uses of credit and all manner of direct controls over saving and investment."[5] This is, no doubt, an important concession for our purpose when we try to develop a case for positive monetary policy for growth. Ellis' characterization of underdeveloped countries, though true in a broad sense, does not perfectly fit the Indian case. India is no doubt, an underdeveloped economy ; but at the same time it has attained some maturity.[6] It resembles what Boeke calls "dual economies."[7] It is quite obvious that a country like India should

1. E. R. Walker,—"From Economic Theory to Policy" (Chicago University Press, Chicago, 1943, Ch. VI).

2. M. E. Kreinin—"Controlled Inflation in Israel, 1949-54." Journal of Political Economy, April, 1956, Page 117.

3. Kindleberger's "Economic Development." (Kogakusha Company Ltd. Tokyo, 1960)

4. Ellis—Comments on Whittlesey's Paper in American Economic Review, Papers and Proceedings XLVI (May, 1956). P. 206.

5. Ibid. P. 208.

6. H. N. Ray—The Role of Monetary Policy in Economic Development (The World Press Private Ltd., Calcutta, 1962). P. 25.

7. J. H. Boeke—Economic and Economics Policy of Dual Societies. (Institute of Pacific Relations, New York, 1963). P. 4.

not yield to conditions of hyperinflation for the sake of growth. But if inflation is moderate and conducive to growth of saving, inflationary finance of development may be a useful aid to the process of growth.

Some degree of inflation has—as a matter of fact—been unavoidable as an incident of growth and it is likely that such gradual inflation has usually imparted some stimulus to economic growth. But we must not forget that hyperinflation distorts the investment pattern as well as production programmes and results in dissipation of resources. But inflationary financing of economic development results in a rise in money supply that is likely to be greater than in proportion to the increase in national income for two reasons. Firstly with increased national income, demand for money as a component of saving tends to increase due to precautionary and speculative motives of holding money. With increase in per capita income, the need to hold a relatively large proportion of income in the form of money is felt intensely in view of the increase in financial commitments of the people, that with increase in national income, the ratio of the stock of money to national income at current prices or alternatively speaking, the income velocity of money falls with the growth of national product, has been verified by Million Friedman on the basis of the data relating to the American economy.[1] The behaviour of cash balances in the newly developing countries should not be different though, of course, it may possibly be argued that a development of the financial system and consequent improvement in the payments mechanism may lead to a fall in demand for money in a developing economy, thereby lowering the ratio of stock of money to national income.[2] Secondly, with the gradual monetization of the hitherto subsistence sector, savings and investment processes in this sector get translated into monetary form and they grow at a faster rate.

A successful operation of the monetary policy may actually raise the savings-income ratio and canalise the supply of increased savings that is generated in the process of economic development in the socially desirable lines which may raise the growth potential of the

1. Studies in the Quantity Theory of Money, edited by Milton Friedman, Chicago, 1956.

2. B. K. Madan's article, "Monetary Policy and Economic Development" The Reserve Bank of India Bulletin, July, 1964.

economy. A growth-oriented monetary policy should seek to mobilise the flow of savings into the banking system of the country and suitably organise the system for this purpose, and also to regulate the credit policy so as to ensure that savings are invested in such sectors. For the development of such facilities as would accelerate the rate of growth of the economy over and above maintaining an overall rate of desired monetary expansion, the monetary authorities have the responsibility of channelising credit to different sectors of the economy so as to assure adequate supplies at reasonable cost in accordance with the priorities and needs of the production programme. This calls for a regulation of the flow of credit so that it may not slip into undesired channels like speculative build-up of stocks, etc. Money flows must also be distributed in the desirable channels, apart from being regulated to expand at the warranted rate.

The growth objective of monetary policy, for its realisation should also take into consideration the sectoral impact of monetary policy. Monetary Policy has an incidence no less than taxation, and we should examine whether monetary expansion can be used to turn the terms of trade against the agricultural sector which tends to benefit from an increase in the level of production in the secondary or tertiary sector. If it is possible to raise the prices of industrial goods through inflation, without raising the prices of essential agricultural goods including foodstuffs and raw materials, the terms of trade between the two sectors will change and this may help to neutralise the strong opposite pressures. Monetary machinery should be so organised as to make credit available to agriculture through some more economical institution than the money lender and to ensure that it is used productively. For an underdeveloped economy, there are the considerations like credit-worthiness of the borrowers and the condition of agricultural marketing etc. on the basis of which the central bank may give loans.[1] If, however, agricultural system gets adequate financial accommodation from the central bank this may benefit the terms of trade between country and town in behalf of the latter by expanding agricultural production. It may also be possible through an expansion of banking habits in the rural sector, to mobilise rural savings for

1. Dr. S. N. Sen—Central Banking in underdeveloped Money Markets, (Bookland (P) Ltd. Calcutta, 1952).

urban investment, although the more likely direction of the flow is the opposite. For capital formation of the country it is essential that agricultural supplies must be elastic. This is possible if the process of agricultural development is financed by the banking system on a large scale.

The growth objective of monetary policy may be reduced to a number of interrelated objectives. The first task of the monetary authority is to provide an efficient payments mechanism. If the payments mechanism does not operate efficiently, specialization and exchange through markets which are expected to increase with the widening of the monetary sector of the economy will suffer. Secondly, the monetary authority will have to ensure a certain rate of expansion in money supply appropriate to the growth process. We may call it the optimum rate of expansion of money supply. This rate is indicated by the rate of expansion in national product, the extent of increase in cash balance requirements in response to an increase in per capita national income and the rate of transformation of the subsistence sector into the monetized sector. With the gradual transformation of the subsistence sector into the monetized sector, the proportion of total production exchanged against money enlarges. Prof. Kindleberger has shown this correlation by plotting money supply as percentages of national income against per capita national income in constant dollars for thirty-five countries.[1] If the percentage would actually remain constant, the money supply would grow with income. But the fact that the percentage rises substantially with development, however, underlines the faster growth of the money supply than of income.[2]

E. S. Shaw has given emphasis on the responsibility of the monetary authority for determining the right quantity and quality of money. As he puts it,[3] "The more difficult responsibility of the monetary system is to guide qualitatively and quantitatively, the flow of funds to economic units whose aggressive spending is

1. G. Kindleberger—Economic Development (New York: The McGraw—Hill Book Co., Inc. 1958) p. 102.
2. H, N. Ray—Role of Monetary Policy in Economic Development (World Press Calcutta 1962) p. 28
3. E. S. Shaw—Money, Income and Monetary Policy (Chicago: Richard D. Irwin, Inc.) p. 203.

stimulating real output and the flow of financial assets to economic units whose restraint in spending free resources for real investment."[1] In this regard, the monetary authority often faces difficulties because of the role of the non-bank financial intermediaries in a developing economy. We shall discuss the role of the non-banking financial intermediaries in a developing economy in greater details in a separate chapter and examine the Gurley-Shaw thesis relevant to this study.

Relevance of a Positive Monetary policy to Deficit Financing

The relevance of positive monetary policy to deficit financing is based on the ground that deficit financing for economic development in a country like India inevitably leads to an expansive monetary policy. That is to say, it inevitably leads to creation of cash and expansion in supply of money. We are to examine how far an expansive monetary policy initiated by deficit financing contributes to economic development. If it is not possible on the part of the government to raise the rates of taxes or introduce new taxes on a substantial scale, the government in an underdeveloped economy usually goes on with their programme of capital formation by bidding away resources from the consumer goods sector by deficit financing.

A positive monetary policy for supplementing the efforts for development has got particular relevance to deficit financing. Inflationary pressure is an inevitable effect of the process of accelerated growth. That is more so under the impact of deficit financing. The phrase 'deficit financing' has been used in the West to describe the financing of a deliberately created budgetary deficit, the method of financing resorted to being borrowing or a type that results in a net addition to total outlay or aggregate expenditure.[1] This means that borrowing either results in the activisation of idle deposits held in banks by private individuals or creation of deposits by the banks directly undertaking the purchase of government securities. In rare cases, government may also borrow from the public who part with their cash for purchasing the government securities. It should be noted that creation of money or expansion of the supply of cash has

1. Dr. V. K. R. V. Rao—Deficit Financing, Capital Formation and Price Behaviour in an underdeveloped economy. Eastern Economist Pamphlets, Delhi, Oct. 1953. p. 1.

not been usually predicated as the method of deficit financing, with the exception of Germany under Hitler.[1] Deficit Financing in the orthodox sense has its historical origin not in the requirements for economic growth but in war finance. But in the Indian economy, particularly during the plan period in India, the term 'deficit financing' has been used to denote the direct addition to gross national expenditure through budget deficits, whether the deficits are of revenue or of capital account. The essence of such a policy lies in government spending in excess of the revenue it receives in the shape of taxes, earning of state enterprises, loans from the public, deposits and funds, and other miscellaneous sources. The government may cover the deficit either by running down its accumulated balances or by borrowing from the banking system (mainly from the Central Bank of the country and thus 'creating money'). There is a significant difference between the inflationary potential created by the expansion of currency and that created by the expansion of credit, though the both have the same effect of adding to the immediate volume of money supply. The main point of difference is that while the expansion of credit by the banking system is limited by the cash resources of the banks, the expansion of currency by the central bank adds to the cash resources of the banking system and thus enables the latter to further expand the volume of credit. Again a bank expands credit against assets of a more than equivalent value pledged with it by the borrower, and the maintenance of the assets involves an obligation on the part of the borrower to repay the loan, failure to honour which will lead to the sale of his assets. But expansion of currency by the central bank when the government seeks loan does not nvolve any definite obligation of repayment. That is to say, while the expansion of bank credit is self-liquidating in character, the expansion of currency by a central bank is not self-liquidating in character. Moreover, in the case of the expansion of bank credit, the parties which borrow do so for the implementation of specific projects from which they expect direct returns by the sale of goods or services produced, and if the projects are successfully implemented they need not repay the loans by selling away their assets they had to keep with the banks for obtaining

1. Dr. V. K. R. V. Rao—"Deficit Financing, Capital Formation and Price Behaviour in an underdeveloped economy." Eastern Economist Pamphlets, Delhi, Oct. 1953. P. 1.

loans. Government projects are likely to be wasteful and uneconomical if there is no careful planning and competent administration, and in that case financing of government projects by creating budgetary deficits is likely to lead to inflation. As a result of deficit financing, money supply increases because of the expansion of currency and prices rise ; and because of the fact that the expansion of currency does not assure the economy of any immediate direct return and because of the fact that the absence of saleable securities against which the government outlay is undertaken lessens the chances of mopping up additional income created by the additional outlay deficit financing inevitably leads to some inflationary rise in prices. The multiplier effect of the increased government investment financed by newly created money does not operate fully in an underdeveloped economy which suffers from a number of bottlenecks and, which is subject to major savings in consumption function. But the prejudice against deficit financing is subordinated to the need of essentiality when huge defence outlay is to be financed during war. But economists have often differed, surprisingly enough, on the desirability of undertaking deficit financing for the financing of economic development. But Dr. V. K. R. V. Rao argues that deficit financing is not necessarily always inflationary.[1] Whether deficit financing is inflationary or not depends upon the following factors : (a) the scale of investment outlay, (b) the extent to which the additional incomes created by the outlay are mopped up and returned to the exchequer by way of tax revenues, (c) the effect of the expansion of currency upon the behaviour of the balance of additional income not mopped up in regard to its outlay on consumption, investment and private handing, (d) its impact on the balance of trade, (e) the purposes for which there has been a deliberate gap between revenue and expenditure, (f) the effectiveness of the investment undertaken in bringing about an increased flow of consumable output and the time lag involved in this flow to emerge, (g) the effectiveness of the price policy and the restrictive monetary-cum-fiscal policy in preventing a significant rise in prices of the goods, (h) extent of the rigidity of money wage rate and (i) the manner in which the policy of financing a deliberate gap between revenue and expenditure is administered.

1. Ibid. P. 16.

Dr. V. K. R. V. Rao with the use of a mathematical model has made a case in which a limited but continuous deficit will lead to a once-and-for-all rise in prices so long as some part of the newly created money consistently comes back to the government in taxes or savings.[1] This is, of course, simply a multiplier model. The higher the marginal propensities to pay taxes and save—the latter influenced by inelastic price expectatives and the price rise—the higher the possible deficit or the lower the resulting price increase. In the long run we find two forces of opposing directions at work[2]: an attempt to maintain the value of cash balances by increased savings, and an attempt to maintain real consumption. Inelastic price expectations permit consumption to decline in the short run. But the possibility of continuous deficit financing depends, of course, on the stability of the marginal rate of tax, which again is dependent upon the extent and rates of income tax, and on the stability of the elastic expectations which induce savings.[3]

Deficit financing, no doubt, results in the creation of cash and thus in total money supply. If, however, it leads tosome forced savings, the inflationary impact of this expansion in money supply may be neutralised. A rise in price itself may lead to forced savings to some extent. By raising the volume of savings, the inflationary financing of economic development may break rigidities and bottlenecks which hold down the tempo of increased production. In the absence of an adequate capital market in an underdeveloped economy, deficit financing may indirectly aflect the consumption or the aggregate expenditures on investment goods via changes in liquidity. When the central bank creates money, it raises the supply of money on a larger scale than the use of commercial bank credit for financing a deficit. In India where the banking habits of the people have not yet grown to the maturity in the rural areas people may have a preference for holding currency rather than bank money.

1. Dr. V. K. R. V. Rao—Deficit Financing, Capital Formation and Price Behaviour in an Underdeveloped Economy. Eastern Economist Pamphlets, Delhi.
2. C.P. Kindleberger—Economic Development (McGraw. Hill Book Company Inc. New York. KoGakusha Company Ltd. Tokyo 1958, P. 193 footnote.
3. Ibid, P, 194.

Deficit financing is not inflationary when the government purchases, against its cash balances, foreign exchange essential from the central bank for financing imports. Deficit financing may be non-inflationary also in the case of an increased production throughout the economy and the progressive monetization of the indigenous rural sector, With a secular increase in money income there may be a secular decrease in income velocity of circulation of money. Some deficit financing may be permitted to offset this decline in income velocity of circulation of money. The financial machinery may operate in a number of ways to effect a more efficient utilization of the existing money supply, thus producing what will appear statistically as an increase in velocity.[1] Deposits created by commercial banks through the making of loans are almost by definition active deposits. This may not raise the physical amount of money supply, but may raise the velocity of circulation of money income.[2] If M, Ma and Mi represent total, active and idle balancs, respectively, and V, Va and Vi represent their respective income velocities, we have (assuming a fixed money supply)

$$M = M'a + Mi$$
$$M_v = M_a V_a + M_i V_i$$

Since $V_i = O$ by definition, and if V is regarded as roughly unchanged, determined by payment patterns, habits, etc.,

$$V = \frac{M_a}{M} \cdot V_a.$$

That is, observed income velocity (v) varies directly with the proportion of the money supply in active circulation $\left(\frac{M_a}{M}\right)$.

Deficit financing, as we have already noted inevitably leads to an increase in the money supply and the desirablity of deficit financing on certain scale is to be judged with reference to the impact of that increased money supply on prices on the one hand and the general output level on the other. Over the plan period, the following table shows the variation in the money supply with the public over the true plan period in India.

1. W. L. Smith—"On the Effectiveness of monetary Policy." American Economic Review. sept, 1956 P. 601.
2. Ibid P. 602.

Table 1 Monetary Expansion in India, 1951-65 (Rs. Crores)

		March 30, 1951	Increase during First Plan		Increase during Second Plan		Increase during Third Plan (Four years)	
			Absolute	Percentage	Absolute	Percentage	Absolute	Percentage
1.	Money Supply with the public	2020·6	196·2	+ 9·7	703·7	+ 31·7	1211·4	+41·5
2.	Currency with the public	1404·8	166·2	+11·8	527·0	+ 33·5	670·9	+32·0
3.	Demand Liabilities	591·4	45·4	+ 7·7	172·3	+ 27·1	532·2	+65·8
4.	Time Liabilities	330·8	135·5	+41·0	651·1	+139·6	313·2	+28·0
5.	Total Demand and Time Liabilities	922·2	180·9	+19·6	823·4	+ 74·6	845·4	+43·9
*6.	Total Monetary Resources (1+4)	2351·4	331·7	+14·1	1354·8	+ 50·5	1524·6	+57·8
	Principal Factors Affecting Total Monetary Resources							
1.	Net Bank Credit to Govt. Sector	807·5	+297·6	+36·9	+1383·5	+125·2	+ 852·4	+34·3
2.	Bank Credit to Private Sector	587·1	+235·6	+40·1	+ 671·8	+ 81·6	+ 805·7	+53·9
3.	Net Foreign Exchange Assets of Banking Sector	860·9	− 95·8	−11·1	− 663·5	− 86·7	— 84·2	−82·9

* Figures here are inclusive of aid obtained by India from the U. S. A. under P. L. 480.

Source: Report on Currency and Finance, 1964-65 The Reserve Bank of India. Statement 26.

The Indian Experience of Deficit Financing.

During the first year of the First Five Year Plan, there was no deficit financing ; in fact there was a very small surplus. During the second and the third years of the plan, deficits were financed mainly by drawing down cash balances ; but after 1954-55 deficits were financed almost wholly by expansion of treasury bills. Thus deficit financing was resorted to mostly during the last two years of the plan.[2] In the Second Five year plan deficit financing was resorted to on a large scale and it was estimated that the amount of deficit financing in the second plan period would amount to Rs. 1200 crores of which an amount of Rs 200 crores would be made available by running down the accumulated sterling balances with the Bank of England, and the remaining Rs. 1000 crores would be created by the Reserve Bank of India. For enabling the Reserve Bank of India to print more money, the reserve Bank of India Act, 1954, was amended twice first in 1956 and then in 1967, and in terms of the second amendment, the Reserve Bank of India can now print any amount of money provided there is a minimum amount of gold and foreign security reserves of Rs. 200 crores of which an amount of Rs. 115 crores must be maintained in gold and the balance amount of Rs 85 crores can be maintained either in gold or in any foreign currency. The actual amount of deficit financing was, however, limited to Rs. 948 crores. In the Third Five-Year Plan, the amount of deficit financing was originally limited to the extent of Rs. 550 crores. It was subsequently raised to Rs. 1150 crores. In the ad hoc annual plan for 1966-67 the amount of deficit financing is likely to be Rs. 12 crores. For the Fourth Five-Year plan, there is, at present, no scheme for dificit financing.

In the First Five-Year plan, there was 14·1 p. c. growth in the total monetary resources and national in corve incernce in prices increased by 18 p. c. Thus expanded money supply did not actually create any serious problem. Rather the expanded money supply come to

Source : Report on Currency and Finance, 1964-65, The Reserve Bank of India. Page 552-53.

2. K. C. Chako—The Monetary and Fiscal policy of India. (Vora & Co. Publishers Private Ltd. 1957) Pages 265-63.

3. Statement of Sri Ashoke Mehata, India's Planning Minister to the House of the people of the Indian parliament, 7th April 1966.

be utilized for raining the level of total output. But that was not the case with the Second Plan. In the Second Plan, monetary resources increased by 50·5 p. c. ; but the level of national income increased by 20 p. c. as against the target of 25 p. c. increase. In the Third plan also while monetary resources increased by 37·8 p. c. the level of national income actually increased by 17 p. c. Thus throughout the Second and the Third Plan periods, the rate of growth of national income lagged for behind the rate of growth of monetary resources.

Let us also examine the movements in price indices of selected commodities in the following table.

Table 2

Movements in price indices of selected commodities over the plan period. (1952-53 = 100).[1]

	weight	1951	1956	1961	1964	1965
1. All commodities	1000	120·2	98·1	127·5	139·2	151·5
2. Food articles	504	112·4	92·8	117·5	142·0	154·5
3. All agricultural commodities	461	120·6	95·7	126·2	138·4	154·1
4. Industrial Raw Materials	155	153·7	109.4	159.1	144·9	163·8
5. Manufactures	290	118·7	102·9	129·7	132·6	141·0

The above table shows that during the First Plan period, prices actually showed a downward movement. But in the Second Plan period, prices showed an upward trend. It might be due to expanded money supply under the impact of deficit financing. But the rise in prices in the Third Plan period was not, perhaps, due to deficit financing. Cost-Push influences had the upperhand in the Third Plan period. Expansion in the supply of money during the First Plan period contributed to an increase in the general increase in output and the scheme of deficit financing to the extent of Rs 290 justified the cause of deficit financing. But the experience of the Second Plan was different. Although the prices showed an up-

1. Report on Currency and Finance 1964-65. Statement 13 Reserve Bank of India.

ward movement, the government could not help taking recourse to large scale deficit financing for the proper implementation of an ambitious plan. But the Reserve Bank of India was wise enough to pursue a policy of controlled expansion. While the Reserve Bank of India went on creating money, there being 36·9 p. c. and 40·1 p. c. increase in net bank credit to the government sector and private sector respectively, it also introduced a network of control measures, quantitative, qualitative and selective,—for keeping the upward movement of prices under control. In 1956, the Reserve Bank of India took recourse to selective methods of credit control for the first time and on 17th may 1957, the Reserve Bank raised the Bank Rate form 3½ p. c. to 4 p. c. In the Third Plan period the scale of deficit financing was lowered. But the Reserve Bank of India still continued to play the dual role, the promotional role and the regulatory role, in financing economic development. The Third Plan period, as we shall see later, was a period in which the Reserve Bank of India introduced a network of monetary control measures. Bank Rate had been raised thrice during the Third Plan period.[1] The techniques of variable reserve requirements, open market operations and the selective credit controls were also vigorously pursued. A policy of credit squeeze was also pursued for the time being. But still, during the Third Plan period, as the table 1 shows, net bank credit to the government sector increased by 125·2 p.c. and that to the private sector increased by 81·6 p. c. Thus we find that the Reserve Bank's monetary policy is not simply a positive monetary policy for growth. It is a positive monetary policy combined with the measures for controlling the inflationary tendencies. It is a policy of controlled expansion quite in keeping with the requirements for economic development.

The Indian public opinion also is not now in favour of deficit financing and this was evident when the Indians welcomed the surplus budget for 1965-66. The banking circle also is not in favour of further pursuing the policy of deficit financing. Sri V. T. Dehejia, Chairman of the State Bank of India recently called for a moratorium on deficit financing for the Fourth Five-year Plan Period. "Now we have no choice but to have balanced budgets both at the

1. Bank rate was raised from 4 p.c. to 4½ p.c. in January 1963, from 4½ p.c. to 5 p.c. in September 1964 and from 5 p.c. to 6 p.c. on 17th February, 1965.

centre and the states, at least during the next five years. This is necessary for regaining the health of the economy," he said.[1] He said that the last three Plans have had several remarkable successes but there had been one major failure to check rising prices, wholesale prices rising by nearly 38 percent and foodgrains prices rising by nearly 50 per cent during the period 1961-66.[2] The main cause of this disturbing price situation at present is that we overshot the target of money supply at a time when we failed to reach the target in the increase in real production. For instance, during the year 1965-66. The money supply increased by more than Rs. 400 crores, and this increase took place during a period when the national income stood still.[3] It is essential that prices must not be allowed to rise further in India that more purchasing power should not be distributed in the hands of the people than the increase in productivity in the interests of the common people. For an orderly economic growth we have to control inflation and evolve an income policy to ensure equitable and economic distribution of the national product.

Objections to Inflationary Financing of Economic Development and their validity.

In considering the role of inflationary financing of economic development of an underdevelopment we should also note the popular objections to such a policy we have already noted the view of Prof. Ellis[4] that economic growth must not be made "an injunction upon the monetary authority,"—that "wild cat banking will not help." Although Prof. Ellis[5] gives this much of concession that government intervention in the economic process to quicken the pace of progress "might extend into the specific uses of credit and all manner of direct controls over saving and investment" there are some critics who do never support inflationary financing of economic development. We shall here consider the objections to

1. V. T. Dehejia's address to the Rotary Club of Bombay on April, 29, 1966).
2. "Economic Survey" statement of the Finance Minister before the Parliament on 26th Feb. 1966.
3. Ibid.
4. H. Ellis—"The financing of Economic Development in underdeveloped Areas"—Indian Economic Journal, January, 1956. Also see his comments on Whittbrey's Papers in the American Economic Review, Papers and Proceedings, XLVI (May, 1956). P. 207.
5. Ibid.

inflationary financing of development and examine their validity. Then we shall make out a positive case for such a method, taking into account the possible adverse effects of such a policy.

The essence of the argument against the attempt to use an expansive monetary policy for accelerating growth is that it is inflationary in impact ; positive monetary policy is likely to be expansive and "the contributions which the central banks cun make in situations of economic growth is to maintain stability from day to day, to ignore an opportunity to affect the trend."[1] It is usually argued that serious inflationary pressure stands in the way of economic development. It distorts the stability of the economy. It may also adversely affect the balance of payments. Increased purchasing capacity of the consumers calls for increased imports from foreign countries, and this leads to a drain of foreign exchange reserves. Moreover, increased prices of exportable goods within the country may discourage the foreign importers to import their goods, if their demand for such goods is not inelastic, from the home country suffering from serious inflationary pressure. This also may lower the export earnings.

But this argument is not accepted by the economists in general. It has been argued[2] that mild inflation may be conducive to economic growth since capital formation is promoted by the increased business activities of the entrepreneurs, lagging wages, and forced savings by the fixed income groups. But Adler holds a different view.' His view is more or less compromising in this regard when he says, "the best price level from the point of view of development objective differs from country to country ; it lies somewhere between the extremes of stability without development, and inflation without development."[3] Adler seems to recommend some inflation with some development. But U. Tun Wai, of the I. M. F. points out the existence of a negative correlation between inflation and economic

1. Kindleberger—Economic Development. (McGraw Hill Book Company Inc. New York, 1958 P, 187).

2. Bernstein and Patel, "Inflation in relation to Economic Development," I.M.F. Staff Papers, Sept. 1952.

3. John H. Adler, "The Fiscal and Monetary Implications of Development Programmes." American Economic Review. May, 1952.

4. Ibid.

development in most cases. In a statistical study relating to sixteen underdeveloped countries, he has come up with the interesting finding that "all countries surveyed except Mexico had more development in the period of less inflation than in the period of greater inflation."[1] In Post-war Brazil, particularly during the period 1945-1952, private investment borrowed heavily from banks, leading to an expansion of the money supply, rising profits, shifts of resources. big increases in productivity, and rising prices, including a shift of the terms of trade against the industrial sector. During this period inflation stimulated economic growth. But after 1952, certain bottlenecks in the economy in the field of production, speculative investment and social tension resulting in demand for wage increases not only aggravated the inflationary pressures but also blocked further real expansion.[2] Thus, it is clear the impact of inflation upon the Capital formation depends not only simply on the magnitude of inflation as such but also on a complex of factors related to the production structure and investment patterns.

The second objection to inflationary financing of growth is that it very often tends to divert productive resources towards luxury consumption and towards those investments which are, no doubt, profit-yielding but of low productivity. In the words of Bernstein and Patel, "private business in such a situation undertake investments having a high degree of ownership benefits but a low degree of use benefits."[1] Increased investments in residential buildings, decoration of office buildings, etc., are the illustrations of this kind. These investments are profit-yielding, no doubt; but they are not conducive so much to the growth of the economy.

We can question the validity of these objections to inflationary financing of economic development. The diversion of productive resources towards luxury consumption and unproductive but profit-yielding investment may be "a consequence of inadequate planning rather than inflation."[3] In Brazil, during the period of 1945 to 1952,

1. U. Tun Wai—"The Relation between Inflations and Economic Development." I.M.F. Staff Papers. Oct. 1959.

2. Bernstein and Patel "Inflation in relation to economic Development"—I.M.F staff papers, II No. 3. (Nov. 1952) P. 383

3. Felipe Pazos "Economic Development and Financial stability." I.M.F. Stalff Papers III, No. 2 (Oct. 1953) P 250.

inflationary financing of economic development did actually contribute to growth. But during the period 1952-55, the economy moved sideways rather than upward for a time, as speculative activities, bottlenecks in production, skill and transport, and social tension resulting in demand for wage increases blocked further real expansion,[1]

In 1956 and 1957 the real expansion resumed : The general index number of industrial production (1956=100) in India showed the following movement in the first four years of the Third Plan period[2] when there was 37·8 p.c. increase in monetary expansion (as shown in table 2) over that in the Second Plan period. (General Index Number of Industrial Production).

Table 3.

(General Index Numbers of industrial production)

	1956=100
1960	130·1
1961	139·2
1962	151·3
1963	163·8
1964	174·7

The general index number of industrial production was 130·1 at the end of the Second Plan (1960) as against 100 at the beginning of the Second Plan. But the general index number of industrial production in the Third Plan continued to rise although there was considerable monetary expansion during the period.

The table no. 2. shows that inflationary financing of economic development in India led to 37·8 p.c. increase in the monetary expansion in the four years of the Third Plan. But during the same period, general index of industrial production reached the figure 194·7.

1. Kindleberger Economic development (McGraw Hill New York 1957) P. 194.
2. Report on Currency and Finance. 1964-65. The R.B. of India Statement 8B.
3. Ibid. P. 27. The figures for 1950-51 and 1955-56 have been obtained from the Draft Second.

Similarly the general index of agricultural production also showed an upward trend, as will be evident from the following table 4.

Table 4

(General Index Numbers of agricultural production)

	1949-50=100
1950-51	96
1955-56	115
1961-62	141·4
1962-63	137·2
I963-64	140·5
1964-65 (anticipated)	150

The general index member of agricultural production showed a downward trend in agricultural production during the years 1962-63 and 1963-64. In 1964-65, the position improved considerably. But we should evaluate the general index numbers of agricultural and industrial production in the context of the monetary expansion during the same period, and then we may come to the conclusion that inflationary financing of India's economic development has not been injurious to her economic growth.

The third objection to inflationary financing of economic development is socio-ethical in character. It has often been argued that inflation redistributes real income in a manner that does not conform to the canon of equity,—that it discriminates the businessman as against the fixed income-earners. This objection, in itself, has not got much relevance to the growth-objective of a developing society. The fixed income-earners may be compelled to curtail their consumption under pressures of inflation but any curtailment of non-essential consumption goods is welcomed, provided the supply of essential commodities is duly ascertained, in a drive for mobilising the internal financial resources. The businessman may have increased income during inflation, but there is also the opportunity of mopping up the surplus income of the upper income group by means of taxation, forced saving, public borrowing or by any other means appropriate to the fiscal programme and utilising it for financing growth.

Critics of inflationary financing of economic development have again argued that inflation encourages flight of capital abroad. This is the fourth objection to inflationary financing of growth and this is quite possible, if not irritable. Not only that goods are sought to be imported from foreign countries at a relatively cheaper rate but it is also possible that indegenous investors may be encouraged to invest their capital elsewhere and not within the country. This may also have another effect. Increased prices of exportable goods also may not encourage the foreigners to import their goods from the home country. This has actually been happening in India in the Third Plan period. One of the reasons of the export-earning being not upto expectation is the inflationary rise in prices. To cope with the situation arising out of flight of capital abroad, the government of the country should give some special facilities to the investors in the form of granting equity capital or empowering the institutional agencies of industrial finance to be more liberal in granting financial help to the producers of consumption goods.

The fifth objection to inflationary financing of economic development is that it may lead to a spontaneous reduction in private savings. But we may say that reduction in private savings is likely to be more than neutralised by the increase in business savings and corporate savings. Prof. W. A. Lewis[1] is of the opinion that an inflation almost certainly increases savings. Total savings increases since the entrepreneurial and peasant classes who benefit from the process of rising prices have a marginal propensity to save greater than that of other classes of the community.

The fall in real income of the fixed income earners is more than neutralised by the increase in income of the entrepreneurial and the peasant classes, and the saving propensities of the latter groups being greater than that of the former, the aggregate savings tend to rise. Bernstein and Patel[2] have given a somewhat, different argument in

1. W. A. Lewis—The Theory of Economic Growth (Homewood, Illionis, Richard D. Irwin, inc. 1955). P. 222.

2. Bernstein and Patel—Inflation and Economic Development. I.M.F. Staff Papers II. Nov. 1952, p. 376.

this context. According to them, inflation, if within limits, does not discourage total savings of the non-entrepreneurial class since it compels some saving by the public to restore or maintain the real value of the cash balances they hold to finance consumption. The increase in national income in the process of growth calls for increased cash balances and the need for increased cash balances becomes greater and greater with the gradual monetization of the subsistence sector. In these circumstances, volume of saving must increase. If the increased savings are re-invested fully the inflationary process will have a cumulative expansion. But if the increased savings are hoarded partially, it will work as leakages in the process of cumulative expansion in the level of investment.

The fifth objection to inflationary financing is that inflation makes it very difficult both for the private investors and the government to secure funds at fixed interest rates.[1] The supply of private capital being low, the government then has no other alternative than to take recourse to further monetary expansion for financing economic development which adds fuel to the inflationary forces that are already operative in the country. This stands in the way of economic development.

This objection has validity when the inflationary pressure is very acute, and not of a mild type. So for as India is concerned, this objection is not valid. During the Plan period when the policy of inflationary financing of economic development has been systematically pursued, the government of India has practically found no difficulty in attracting new loans. The following table indicates the internal interest bearing obligations of the government of India :

References :

1. Kindleberger—Economic Development (1966 edition)
2. H. N. Ray—Role of Monetary Policy in the Economic Development of India (The World Press, Calcutta).
3. Santi Kumar Ghosh—Inflation and Economic Development, (The World Press, Calcutta).

1, H. N. Ray—the Role of Monetary Policy in Economic Development, (The World Press Private Limited, Calcutta, 1962.) P. 54.

4. H. G. Johnson—"Monetary Theory and Policy." (Reprinted in Surveys of Contemporary Economy, Vol. I)
5. B. K. Modan—"Monetary Policy and Economic Development." Reserve Bank of India Bulletin, July, 1964.
6. A. R. Whittlesey—Relation of Money to Economic Growth." American Economic Review, Papers and Proceedings, May, 1956.
7. Ellis—Comments on Whittlesey's Paper, American Economic Review, Papers and Proceedings, May, 1957.
8. Bernstein and Patel—"Inflation in relation to Development", I. M. F. Stuff Papers, Nov., 1952.
9. Ellis—"The Financing of Economic Development in underdeveloped Areas", Indian Economic Journal, January 1956.
10. Dr. V. K. R. V. Rao—"Deficit Financing, Capital Formation and Price Behaviour in an underdeveloped democracy", Eastern Economist Pamphlets.
11. K. C. Chacko—Monetary Policy of India.

14

A SURVEY OF GROWTH MODELS

The classical theory of economic growth

Classical economics is an outstanding illustration of a dynamic macro-economic theory of growth. It is essentially an analysis of the process by which a portion of the economic surplus available in the community is utilised or employed for the purpose of capital accumulation. The classical theory of economic growth may be summed up in the following propositions.*

Proposition I :—The Production Function.

The celebrated classical economists like Adam Smith, Malthus and Mill agreed on the point that total output, O, was a function of the labour force, L, the stock of capital, Q, the supply of land available or of known resources, K, and the level of technique, T.

So,

$$O = f(L, K, Q, T) \qquad (1)$$

The classical economists were aware of the importance of the entrepreneurial function in production, but they did not make it a strategic part of their analysis. We shall, however, note in the present context that Schumpeter gave greatest emphasis on the entrepreneurial function in production.

Proposition II :—Capital accumulation permits technological progress. For the classical economists, the development of the capitalist economies was a race between technological progress and the rate of growth of population. The classical economists seemed to think that there was always a good supply of better techniques and new commodities to be introduced in the economic system, but they considered that the rate at which these opportunities could be utilised was limited by the flow of capital for new investment. For them, the whole process of technological progress, T, was capital-absorbing. That is to say, the technological progress might be treated as a function of the level of investment.

So,

$$T=f(I) \tag{2}$$

So, the classical economists gave emphasis on capital accumulation and saving for promoting the level of investment in order that technological progress might more than neutralise the rate of population growth.

Proposition III :—Investment depends on profits.

That expectations of profits govern the level of investment was admitted by the classical economists. By investment, I, the classical economists would mean net investment which implied a net addition to the stock of capital dQ.

So,

$$I=dQ=I(R) \tag{3}$$

here R is return on fixed factors of production (Land and Capital) or profits.

Proposition IV :—Profits depend on labour supply and the level of technique. This proposition can be symbolically written as,

$$R=f(T, L) \tag{4}$$

where R is the profit, T is the level of technique and L is the labour force.

The equations (3) and (4) may be substituted in equation (2) which gives us

$$T=f(I)=f[I(R)]=f\{I[R, (T, L)]\}. \tag{4a}$$

Proposition V :—The size of the labour force depends upon the size of the wages bill.

This proposition is what is known as the Wages Fund Theory. This may be symbolically written as

$$L=f(W) \tag{5}$$

Where L is the labour force and W is the wage rate.

Proposition VI :—The wages bill depends on the level of investment.

The classical economists considered wages to be dependent upon the wages fund which was built up by saving and put into effective use through investment. Except for Malthus, the classical economists seemed to think that savings found their way into investment more or less automatically. So,

$$W=f(I) \tag{6}$$

Where W means wages bill and I means the level of investment.

These equations may be closed by adding an identity, *total output equals profits plus wages.*

Thus,

$$O = R + W \qquad (7)$$

This implies that the total output or national income is equal to the total value of all goods or services produced, and this amount is divided between workers and producers.

Schumpeter's theory of economic growth

The basic element in Schumpeter's analysis of the process of economic growth is the entrepreneur. The entrepreneur is an innovator. Innovations may occur in a variety of forms ; (1) the introduction of a new commodity ; (2) the use of a new method of production ; (3) the opening of a new market ; (4) the conquest of a new source of raw material supply ; or (5) the reorganization of any industry. The nature of the entrepreneurial function reveals the dynamic nature of Schumpeter's conception of economic development.

Schumpeter's model also can be explained by some propositions which are as follows.[1]

Proposition I :—The Production Function.

This proposition, like the first proposition of the classical model may be expressed as

$$O = f(L, K, Q, T) \qquad (1)$$

Proposition II :—Savings depend on factor incomes like wages, profits and the interest rate.

Schumpeter thinks that proportion of a given wage or profit income that will be saved is dependent upon the rate of interest.

So,

$$S = f(W, R, r) \qquad (2)$$

where W is wage, R is profit and r is the rate of interest.

Proposition III :—Investment may be sub-divided into autonomous investment and induced investment.

Thus,

$$I = I_1 + I_2 \qquad (3)$$

where I_1 means autonomous investment and I_2 means induced investment.

1. See Higgins, "Economic Development" Pages 125—131.

Proposition IV :—Induced investment is a function of the level of profits and the rate of interest.

This proposition may be expressed as,

$$I_2 = f(R, r, Q) \quad (4)$$

With an increase in current profits and a fall in the rate of interest, induced investment tends to increase. But investment falls as the rate of interest goes up, and then the rate of current profits falls.

Proposition V :—Autonomous investment depends on the rate of resource discovery (*i.e.*, innovations) and technological progress.

This can be expressed as follows :

$$I_1 = f(K, T) \quad (5)$$

where K is the rate of resource discovery and T is the rate of technological progress over a period of time. Schumpeter recognises the role of the rate of population growth as a determinant of the autonomous investment, but does not attach much importance to this factor.

Proposition VI, VII & VIII :—Technological *powers* and the rate of resource discovery (*i.e.*, innovations) depend on the supply of entrepreneurs, and the supply of entrepreneurs depend on the rate of profits and the social climate. Symbolically we may write,

$$T = f(E) \quad (6)$$

$$K = f(E) \quad (7)$$

$$\text{and} \quad E = f(R, X) \quad (8)$$

where T is technological progress, E is the entrepreneur, K is the rate of resource discovery, R is the rate of profits and X is the social climate.

Proposition IX :—Gross National Product depends on the relationship between Savings and Investment and the Supermultiplier.

Thus,

$$O = f(I—S) \quad (9)$$

Where O is output, I is investment and S is saving.

Proposition X :—The wages bill depends on the level of investment.

Thus, $W = f(I)$ (10)

Proposition XI :—The social climate is reflected by the distribution of income.

Thus. $X = f\left(\frac{R}{W}\right)$, (11)

$\frac{R}{W}$ implies the ratio of the rate of profit to the rate of wage and W is the social climate.

Proposition XII :—An identity : Gross National Product equals profits plus wages.

Thus O=R+W.....(12)

The basic building block upon which Schumpeter's theory of economic growth is based are (1) the entrepreneurs and (2) innovations plus the characteristic of discontinuity in the appearance of innovations.

Schumpeter's model runs in terms of a process inherent in the inner nature of a dynamic economy in which the impelling factor is the innovating entrepreneur. Innovation represents a jump from the old production to a new one, causing a *shift* in the marginal productivity curve. The changes represented by innovation must be of large magnitude, "in the sense that they will disrupt the existing system and enforce a distinct process of adaptation which should show up as such in any time series material."[1] The innovations are not evenly distributed over time. Discontinuity in appearance is their essential feature. They tend to "cluster" to come in "bunches", simply because 'first some and then, most firms follow in the wake of successful innovation."[2]

In his theory of capitalist development, Schumpeter starts with the assumption of a purely stationary state. There are, however, opportunities for new combinations of the factors of production. Entrepreneurs recognise these profit opportunities and prepare to exploit them. For this purpose, the entrepreneurs borrow from credit-creating banks and "of funds starts, the circular flow." The entrepreneurs pay interest for these funds. Then a "swarm-like"

1. Schumpeter—Business Cycle. P. 101.
2. Ibid. P. 100.

entrepreneurial activity begins. The expansion proceeds by "rushes" because a forward push by the entrepreneurs impels a "hardlike" movement of followers who see the tempting profit possibilities opened up. Because of the discontinuity of innovations the new combinations in the process of production appear discontinuously in groups or swarms. The swarm-like appearance of new enterprises is intensified by the cumulative process—the secondary waves which spread all over the business sphere. Moreover, the errors of optimism may further intensify the high tempo of business activity. But many of the "older" firms are now faced with an increase in their costs and so they may be forced out of business altogether in certain circumstances. Schumpeter points out that the boom in entrepreneurial activity comes to an end when the economic system reacts to the boom. Depression is the economic system's "adaptation to the situation into which the boom brings the system."[1] The disturbances arising out of innovations are "big" and cannot be currently absorbed, and these disturbances disrupt the existing system and enforce *distinct process of adaptation.*

It is a painful readjustment process or recession, but, before long, the climate is again ripe for further entrepreneurial activity. The seed of the depression is sown in the course of the boom by the "secondary" developments which takes place during that period. The secondary investments are based upon actual or expected price rises. Although Schumpeter believes that it is theoretically possible that the system may never recover, he maintains that the usual case is a return to equilibrium and full employment before too long a period. The liquidation of the weak enterprises gradually exhausts itself with the necessary adjustments to the innovations. Once equilibrium is restored, the stage is then set for a new wave of innovations and a repetition of the cycle.

The new equilibrium is, however, higher than the equilibrium from which the growth began. National and per capita incomes in real terms continually rise via the cyclical mechanism. Unlike

1. Schumpeter—Theory of Economic Development. P. 224.
2. Meier and Baldwin—Economic Development, Theory, History and Policy (Asia Publishing House, 1957) P. 91.

Ricardo and Marx, Schumpeter does not give emphasis on a conflict of distributional interests during the process of development.[1] Labour, in particular, reaps large gains, since a major share of innovational effects under capitalism are directed towards mass-produced consumer commodities. Schumpeter further notes that the process need not start from a stationary position nor need the innovations be introduced merely in the neighbourhood of equilibrium. Economic development, as Schumpeter notes, is an uneven, disharmonious process, cyclical swings are the cost of economic development under capitalism.[2]

Harrod-Domar Model of Economic growth

Post-Keynesian economists like Harrod and Domar have endeavoured to extend the Keynesian system into a more comprehensive long-period theory of output and employment which analyses short-run fluctuations as being embodied in a long-run setting of economic growth. Both Harrod and Domar are concerned with determining the conditions required for smooth uninterrupted growth in real national income. Although their models of steady growth differ in details, they are essentially similar in substance. Harrod-Domar model is different both from the classical model and the Keynesian model. It differs from the classical model in the sense that it recognises the fact that in capital accumulation investment generates income along with the increase in productive capacity of the economy resulting from its enlarged capital stock ; the classical model gave emphasis on the capacity side of capital accumulation, but took for granted adequate demand. Again in the Keynesian theory of employment attention has been given to the problem of adequate effective demand, but the problem of capacity has been ignored. Although Keynes has introduced the savings investment problem in his theory, he has not duly considered the secular problem of increasing productive capacity which results from investment. Harrod-Domar analysis seeks to consider both sides of the investment process. Harrod-

1. Meier and Baldwin—Economic Development, Theory, History and Policy (Asia Publishing House, 1957) P. 91.

Domar analysis runs as follows: Assuming a full employment equilibrium level of income, the annual maintenance of this level of income requires that the volume of spending generated by investment must be sufficient to absorb the increased output made possible by investment. But if the marginal propensity to save is given, the absolute volume of net investment will increase with a higher national income and greater capital accumulation. For a sustained full employment equilibium level of income it is essential that the absolute volume of net investment must expand.

This in turn requires a continuous growth in real income. If, let us suppose, real income remains constant, the net investment or the creation of new capital equipment would have one or more of the following effects: (1) the new capital would remain unutilised, (2) the new capital would be used at the expense of previously constructed labour, whose labour and/or markets the new capital has taken away; (3) the new capital would be substituted for labour. Thus capital formation without a corresponding increase in income would result in unemployed capital and labour. So it is essential that for avoiding excess capital goods and tackling the problem of unemployment of labour, there should be growth in income. The objective of a growth model should be to ensure the growth in income sufficient for maintaining full employment.

Domar's Model.

Domar constructs his model around the following question; since investment increases productive capacitv and also creates incomes, what should be the rate of increase in investment to make the increase in income quite in keeping with the increase in productive capacity so as to maintain full employment? His assumptions are; (1) an initial full employment level of income has already been achieved; (2) there is no government control of foreign trade; (3) there are no lags in adjustment; (4) the average and marginal propensities are equal; (5) the propensity to save and capital-output ratio are constant.

Domar's formulation runs as follows: Let investment be represented by I. Let S stand for the ratio of increase in real income

or output to an increase in capital. Thus, it is the reciprocal of the accelerator or the marginal capital co-efficient. S denotes the increase in the annual amount of real income that can be produced by a dollar of newly created capital. The total increase in productive capacity of I dollars invested will be I times S dollars per year. But if the output of previously existing plants is curtailed because of the competition with new capital, the productive capacity of the whole economy will not in that case increase by I times S dollars, but by a smaller amount that can be indicated as I times σ. The difference between S and σ is the difference between the increase in productive capacity per dollar invested only in new plants and the productive capacity of the whole economy (which is calculated on the basis of the gain in capacity in new plants less the loss in capacity of previously existing plants). Accordingly, S is greater than σ.

Now, the total net increase in output that the economy can produce may be represented by I times σ. It represents the aggregate supply side of the economy. The aggregate demand side of the economy is indicated by the Keynesian multiplier. Let $\Delta\gamma$ and ΔI indicate absolute annual increase in income and absolute annual rate of increase in investment respectively. Let the propensity to save represented by $\propto$. Then, the increase in income equals the multiplier $\left(\frac{1}{\propto}\right)$ times increase in investment.

$$\Delta\gamma = \frac{1}{\sim}(\Delta I) \qquad (1)$$

If the economy is initially at the full employment level, the national income will then equal the productive capacity. National income and productive capacity will then increase at the same rate so as to maintain the level of full employment.

We have already noted that the aggregate supply side of the economy is represented by $I\sigma$. That is to say, the annual increase in potential productive capacity is equal to I times σ. Again, the right-hand side of the equation (1) *i.e.*, $1/\sigma \cdot (\Delta I)$ shows the annual increase in actual income. It represents the aggregate

demand side of the economy. Thus we get the fundamental equation of the model :—

$$\frac{1}{\alpha} \cdot (\Delta I) = I\sigma. \quad \ldots \quad \ldots \quad (2)$$

The left hand side of the equation indicates the demand aspect of the problem and the right hand side indicates the supply aspect of the problem.

Solving this equation, by multiplying both sides by α and dividing by I, it follows

$$\frac{\Delta I}{I} = \alpha\sigma. \quad \ldots \quad \ldots \quad (3)$$

Now, the left side of the equation (3) indicates the annual increase in investment divided by the volume of investment itself ; so it indicates the annual percentage rate of growth of investment. So, increase in income should grow at the annual percentage rate of $\alpha\sigma$ for the maintenance of the level of full employment.

R.F. Harrod in his "Essays in Dynamic Theory"[1] has focussed attention on the problems of a growing economy. The three basic assumptions of Harrod's dynamic theory are,

(i) the level of a community's income is the most important determinant of its supply of saving ; (ii) the rate of increase of its income is an important determinant of its demand for saving ; and (iii) demand is equal to supply.

It thus consists in "a marriage of the 'acceleration principle' and the 'multiplier theory."[2] Harrod's equation probably gives too much importance to the acceleration principle, and the necessary modification is introduced subsequently.

Harrod starts with the assumption that investment is equal to saving. Thus, Harrod states

$$GC = S. \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Since G can be expressed as $\Delta Y/Y$, C can be expressed as $I/\Delta Y$, and S as S/Y, the equation (4) becomes

$$\frac{\Delta Y}{Y} \cdot \frac{I}{\Delta Y} = \frac{S}{Y}.$$

1. Economic Journal, 1939.
2. Harrod—Economic Essays—p. 254.

$$\text{or} \quad \frac{\Delta Y}{Y} = \frac{S}{C} \qquad I = S \qquad 4(a)$$

This establishes two important behaviour relations: saving depends on the level of income, and investment depends on the rate of growth of income. The latter relation involves the acceleration principle: the increase in the rate of output that takes place induces the increase in the stock of capital that makes it possible. For the maintenance of full employment, the desired saving out of a full employment income must be neutralised by an equal amount of desired investment. The same is true with regard to planned saving and planned investment, or ex-ante saving and ex-ante investment. But to induce this much investment, income must be growing.

Let us now consider the two equations of Harrod, one for the actual rate of growth and the other for the warranted rate of growth.

Let G stand for the geometric rate of growth of income or output in the dynamic economic system, the increment being expressed as a fraction of its existing level. G will vary directly with the time interval chosen—*e. g.* 1 per cent per annum = $\frac{1}{12}$ per cent per month. Let Gw stand for the *warranted rate of growth.* The *warranted rate of growth* is taken to be that rate of growth which, if it occurs, will leave all parties satisfied that they have produced neither more nor less than the right amount. Gw is also the equilibrium rate of growth in the sense that producers will remain satisfied. Let C stand for actual capital accumulation.

Let S stand for the fraction of income which individuals and corporate bodies choose to save. Let C stand for the value of the capital goods required for the production of a unit increment of output. The value of C depends on the state of technology and the nature of the goods constituting the increment of output. It may be expected to vary in accordance with changes in income or in the phases of the trade cycle. It may be somewhat a function of the rate of interest, Cr is the inverse of the capital co-efficient or the output-capital ratio. It is the required capital to sustain the output that will satisfy the demands for consumption arising out of consumers' marginal addition to income. In other wards, Cr denotes

the amount of capital required to maintain the rate of advance given by Gw.

Harrod's fundamental equations in its simplest form runs as follows :-

$$G = \frac{S}{C} \tag{5}$$

$$Gw = \frac{S}{Cr} \tag{6}$$

the equation (6) denotes an equilibrium of a steady advance.

The warranted rate of growth of the system appears as unknown term, the value of which is determined by certain "fundamental conditions", namely, the propensity to save and the state of technology.

The maximum possible long-run rate of growth which Harrod calls the *natural rate* depends upon population growth and technical progress (which is assumed to be neutral and which proceeds at a steady foreseen rate). This rate of growth requires a certain rate of investment to implement it.

Harrod's problem is that these two rates of investment are determined by quite different causes (the one by the thriftiness of the economy and the other by technical conditions) and there is no reason to expect them to coincide. The natural rate is what Mrs. Joan Robinson calls the *potential growth ratio of a Golden Age Economy.*

This natural rate of growth indicates the potential growth ratio of the "Golden Age" economy. Provided (1) that the basic conditions of "Golden Age", *viz.*, the neutrality of technical progress and the constancy of the savings ratio, are maintained, (2) that the growth ratio (which depends upon population growth and growth of productivity per head) does not require a rate of investment "which exceeds the one that may be provided out of the surplus created by the minimum consumption standards of wage-earners" and (3) that the stock of capital is perfectly adjusted to the rate of investment, a "Golden Age" is in principle possible.[2] The concept of "Golden Age" is simply an expository device and by no means

an ideal indicating an era of plenty and not of stagnation. In fact, every rate of growth has a "Golden Age" and the problem is how to determine that particular growth rate which is optimum for the economy under a set of conditions.

In Harrod's equations, if G is greater than Gw, then the value of C must be less tuan Cr (required capital accumulation for warranted growth). There will then be a deficiency of capital; the amount of desired capital goods will be greater than the actual amount of capital goods. This situation culminates in a chronic inflationary gap. If again, G is less than Gw, C will be greater than Cr; that is, the actual capital accumulation will exceed the required capital accumulation for warranted growth. It will then lead to a chronic deflationary gap.

Harrod's first equation *i.e.*, $G = \frac{S}{C}$ is a truism since it assumes investment to be necessarily equal to saving. Harrod's second equation which seeks to determine the warranted rate of growth is better than the first in putting emphasis on time sequences in growing economies. But that also fails to explain fully the mechanism of a planned process of growth simply because it gives us a theoretical model for purely spontaneous growth. Harrod's third equation which seeks to determine the natural rate of growth is more realistic.

The objective of a growth model, is to find the requirements for maintaining full employment over a long period, *i.e.*, the rate of growth of income that the maintenance of full employment requires.

The difference between Harrod's version and Joan Robinson's version of economic growth is that Joan Robinson treats the ratio of saving to income as determined by (1) saving out of profits and saving out of wages, and (2) the distribution of income between profits and wages. But this is not essential. If workers' and rentiers' families had the equal saving propensities it would still be true that the ratio of consumption to income would be considerably higher in respect to wages-earners than in respect to profits-receivers

for the rentiers do not receive the whole of profits. A substantial portion of profits is retained by entrepreneurs to build up reserves and to finance investment.

Given the saving function of each class separately a higher share of wages which entails a lower share of profit in total income means a higher consumption-income ratio. When the given real wage rate becomes high, the amount of saving forthcoming from a given total income falls. The amount of investment required to implement the potential growth ratio is also influenced by the real-wage rate. Thus with a given degree of mechanisation, the amount of saving forthcoming is less and the amount of investment required to implement the potential growth ratio is higher, the greater the real wage rate and there must be some real wage rate that ensures equality between them. Mrs. Joan Robinson believes that in a 'Golden Age' the actual rate of growth and the natural rate of growth are equal to each other and the warranted rate of growth has accommodated itself to them. The relation between the saving propensities and the technical conditions determine the rate of profit at which the natural rate of growth of the economy can be secured.

The equations of both Domar and Harrod are similar and from our discussion above, we can draw the following conclusions.

(1) The lower the capital-output ratio and the higher the average productivity of capital, the rate of growth of national income will also be faster.

(2) Given the value of the capital-output ratio or the average productivity of capital, the larger the proportion of income that is saved, the higher the rate of growth of national income. If G or the rate of development is slow, then it must be due either to one or both of the following factors :—

(a) The proportion of income that is saved is low.

(b) The capital-output ratio is high.

Harrod's model can be readily translated into Domar's. Both the models show that for the maintenance of full employment, desired savings out of a full employment income must be neutralised by an

equal amount of investment. Let desired saving, denoted as S, be expressed by the marginal propensity to save times income, that is $S = \alpha Y$. Let desired investment, denoted as I be expressed by the capital co-efficient, denoted by vk, times the increase in income (output), that is $I = k\triangle Y$.[1] Thus, if S is to equal I at a full employment lend of income, it must be true that $\alpha Y = k\triangle Y$,

$$\text{or} \quad \frac{\triangle Y}{Y} = \frac{\alpha}{k} \qquad \cdots \quad \cdots \quad (7)$$

The rate of growth here is the same as Domar's $\alpha\sigma$ and Harrod's Gw. The equilibrium rate of growth depends on the size of the multiplier (determined by α) and the productivity of new investment (σ or $1/v$).

The main points of the Harrod-Domar model may be summarized as follows :—

1. Investment is the central point in the problem of steady growth. Investment has a double role to play : it generates income on the one hand, and increases the productive capacity of the economy on the other.

2. The increased capacity may result in greater output or greater unemployment, depending on the behaviour of income.

3. The rate of growth of full employment income must be sufficient to absorb full employment savings and have full utilization of the capital stock. Domar's model shows that this equilibrium rate of growth depends on the size of multiplier and the productivity of new investment. It is equal to the propensity to save times the inverse of the accelerator.

4. The conditions of the Harrod-Domar model state a steady line of advance for the economy. But if the actual rate of growth deviates from the warranted rate of growth, price fluctuations take place. If G is greater than Gw, the inflationary forces reveal themselves and if G is less than Gw the economy tends towards chronic deflation.

1. $vk = 1/\sigma$ Where σ indicates Domar's expression for the net increase in productive capacity resulting from a dollar of newly created capital. See Meier and Baldwin—Economic development. p. 108.

5. The business cycle is viewed as a deviation from the path of steady advance. Deviations in the upward direction are limited by a full employment ceiling, and deviations in the downward direction are limited by a floor of autonomous investment and consumption. Even if the actual rate of growth is greater than the warranted rate of growth, the economy may still remain depressed if the natural rate of growth is less than the warranted rate of growth. In that circumstance output cannot actually expand sufficiently rapidly.

Harrod-Domar model also suffers from certain weaknesses. In the first place, the models of both Harrod and Domar are weak in assuming the key parameters like the propensity to save and the capital-output ratio to be constant. In reality, both savings-income ratio and capital-output ratio do change over a period of time. These changes would modify the requirements of steady growth, and if the changes take place in certain direction, the requirements may not be as intricate as the models indicate. Again, if the assumption of fixed proportion is dropped, and labour can be substituted for capital, then the requirements, for steady growth do not appear so regid.[1] Secondly, the models fail to take into account whether steady growth is facilitated by price changes. Some degree of price flexibility may actually be sufficient to stabilize an otherwise unstabilized economy.[2] If we make allowance for price changes and variable proportions in production, the economic system may have much stronger stability than the Harrod model shows.

But inspite of these limitations arising out of the rigidity of the model, "the issues considered in the Harrod-Domar analysis are an integral part of any examination of development problems in countries that have experienced considerable development in the past but now face the problem of maintaining development in the future."[3]

The chief merit of the central equation of Harrod and Domar is that it can become a powerful tool for purposes of economic planning. Given different values of S and C, it is possible to obtain

1. See Meier and Baldwin—Economic Development. P 111.
2. Ibid. P. 112.
3. Ibid. P. 112.

different rates of growth of national income. If any economy desires higher rate of growth of national income, then all that it has to do is to manipulate economic forces in such a way that both the proportion of savings out of national income and the average productivity of capital are raised.

Harrod and Domar attach importance during the process of growth to accumulation of capital. They give emphasis on the fact that capital accumulation by means of saving out of full employment income is not only indispensable for the maintenance of full employment income but also for creating productive capacity and generating income of the economy. One of the chief merits of the Harrod-Domar approach is that it provides a theoretical model for purely spontaneous economic growth. It can explain the requirements of the dynamic equilibrium path, *i.e.*, the requirements of an economy which is moving on a path of smooth uninterrupted growth. It also provides the most important point regarding planning in an underdeveloped economy with low saving-income ratio.

Basic Principles of the theory of long-run growth

The Harrod-Domar analysis enables us to generalise the basic principles of long-run growth. Keynesian theory is a short-run theory of income-determination. The short-run theory restricts the analysis to the *income-generating effect of investment, the capacity, technology and population being given.* But the long-run theory of growth takes into consideration the *capacity-increasing effect of investment*, along with a consideration of its *income-generating effect.* So, the long-run theory of economic development should take into account the dual effects of investment. For achieving a disturbance-free or uninterrupted long-run economic growth, income and net investment must grow exponentially. To borrow the equation of Domar, for a disturbance-free growth,

$$\frac{1}{\alpha}\cdot(\Delta I)=I\sigma$$

That is to say, the annual increase in actual income must be equal to the annual increase in potential productive capacity.

Here $\frac{1}{\alpha}$ shows the multiplier and σ shows the productive capacity of investment. The rate of growth of income and of investment are directly proportional to the level of income and thus increase with rising income. If the desired degree of utilization of the growing capital stock is to be realized, income must grow at an ever-increasing rate.

The rate of growth depends on the saving-income ratio and the capital-output ratio ; the lower the saving-income ratio and higher the capital-output ratio, the smaller is the rate of growth at any given level of income. Conversely, the higher the saving-income ratio and lower the capital-output ratio, the greater is the rate of growth. In this case the effect of a high marginal propensity to save is entirely different from that in short-run theory of income determination, where an increased saving, other things remaining constant, leads to a reduction in income operating as a leakage in the process of multiplier. But this is not contradictory. The short-run theory analyses income fluctuations in income which occur within a given productive capacity, and concentrates on those effects of income which result from the capacity-increasing effect of investment. In the long-run, however, the saving-income ratio is considered with a constant degree of utilization of the growing productive capacity. Thus, the long-run growth explains the trend of national income, with the short-run theory of income determination explains the fluctuations of income around the trend.[1]

G. Bombach has shown the long-run the theory of economic development in the following diagram :

In this figure the savings function, $S=f(y)$ has been drawn in quadrant I. The propensity to save being given, we can immediately determine the level of investment required if a warranted level of income is to be reached, quadrant Π shows the addition to the capital stock which is equal to the prevailing net investment. In quadrant IV, the straight line through the point of origin shows the relationship between the capital stock, given its degree of utilization,

1. Schneider—*Money Income and Employment.* Pages 185-92.

and potential income. The capital stock K_1, K_2.....corresponds to the potential income Y_1, Y_2,... ..

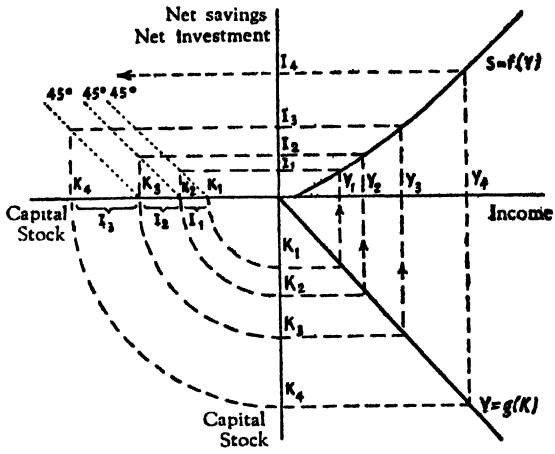

Fig. 73

The process of growth takes place in the following way. Let K_1 be the capital stock in the first period. If this capital stock is utilised to that degree desired by the firms, the real income Y_1 can be produced. But this real income Y_1 can be absorbed only if net investment is at the level I_1, which raises the capital stock from K_1 to K_2 (Quadrant II). If this productive capacity is utilized to the degree desired by the firms, the level of income Y_2 must be produced. This income can be absorbed if net investment is at the level of I_2. This in turn leads to an increase in capital stock from K_2 to K_3 and so on. The absolute increases in K, Y, and I become ever larger, and the process of growth never leads to a stationary position of the economy.

Duesenberry's Growth Model

Duesenberry's growth model operates on the basis of the following principle : growth occurs because the actual capital-output ratio remains sufficiently below the optimum rate to induce sufficient investment to keep income growing faster than capital accumulates. Let us suppose there are two equilibrium growth rates, the second equilibrium 'growth' rate is at a fantastic 1000 per cent per period.

The following chart indicates the values for this second equilibrium sequence :

K	$\overline{K}(=2{\cdot}22y_t)$	$Y(=5i_t)$	$C(={\cdot}8y)$	$I(=\overline{K_{t-1}}-K_{t-1})$
2	222	100	80	20
22	2,442	1,100	880	220
242	26,862	12,100	9,680	26,620

Here K indicates a capital stock, $\overline{K}$ indicates optimum rate of growth, Y implies national income, C implies consumption and i implies investment.

The model involves the following equations

$$i_t = by_{t-1} - k_{t-1} \quad \cdots \quad \cdots \quad (1)$$
$$c_t = ay_t \quad \cdots \quad \cdots \quad (2)$$
$$y_t = c_t + i_t \quad \cdots \quad \cdots \quad (3)$$
$$k_t = k_{t-1} + i_{t-1} \quad \cdots \quad \cdots \quad (4)$$

Here, i_t means investment during a period, c_t means consumption during a period, k_t means relationship of investment to capital during a period.

From the first three equations we derive

$$y_t = \frac{}{1-a} y_{t-1} - \frac{1}{1-a} k_{t-1} \quad \cdots \quad \cdots \quad (4)$$

From this we can calculate the percentage growth rate of income (r_y) in the following way :—

$$r_y = \frac{y_t - y_{t-1}}{y_{t-1}} = \frac{y_t}{y_{t-1}} - 1 \quad \cdots \quad \cdots \quad (5)$$

Similarly from equations (4), (3) and (2) we can derive the growth rate of capital (r_k).

$$r_k = \frac{k_t - k_{t-1}}{k_{t-1}} = \frac{k_t}{k_{t-1}} - 1 \quad \cdots \quad \cdots \quad (6)$$

Each growth rate is a function of the (lagged) capital/output ratio. If we plot these growth rates in a quadrant in which growth rates are measured vertically and $\frac{k_{t-1}}{y_{t-1}}$ horizontally it is clear that

1. Ackley—Macroeconomic Theory, P. 534.

the percentage rate of growth of income is a straight line with a negative slope and percentage rate of growth of capital is a rectangular hyperbola, asymptotic to the axes. If these lines intersect at all, they must intersect twice. The significance of the intersection of the r_y line and r_k line is that where $r_y = r_k$, rate of growth of income and rate of growth of capital are identical, and therefore, both the subsequent values of r and of k/y will remain unchanged. It

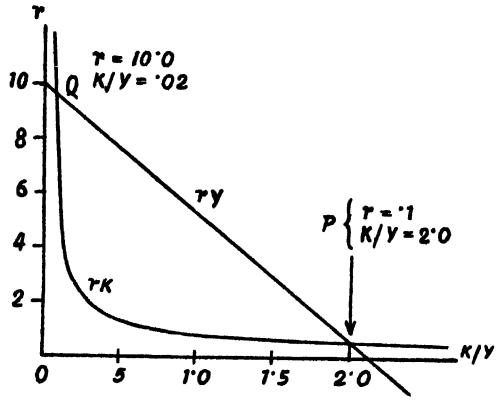

Fig. 74

indicates an equilibrium rate of growth. The intersection at p is unstable since at levels of k/y less than 2, r_y is greater than r_k, *i.e.*, rate of growth of income exceeds the rate of growth of capital. For levels k/y greater than 2, r_k is greater than r_y; *i.e.*, rate of growth of capital exceeds the rate of growth of income, further increasing k/y. The *intersection at Q indicates the stable equilibrium rate of growth.*

"Duesenberry's book has much more that is important and relevant to say about both growth and cycles. But his fundamental vision of the growth process is essentially new, and it explains some aspects of historical processes that no other theory explains as well." Like Harrod, Duesenberry also approaches the problem of growth from the demand side. He is truly optimistic about growth.

Let us see the differences in approach to the problem of growth among Keynes, Harrod and Duesenberry. Keynes[1] failed to grasp clearly that the growth of demand and output could create investment opportunities for capital "*widening*" and being pessimistic about the possible extent of capital "deepening" saw an inevitable impasse for an economy disposed to save a large fraction of a full employment income. Capital accumulation might cause it to run out of investment opportunities "within a generation." Harrod saw the possibilities for widening investments and built the accelerator (without lag) into his model. "In any case his model was also essentially pessimistic as to steady growth ; it was a tight rope from which the slightest slip in either direction was fatal."[2] But Duesenberry is truly optimistic about growth. He contends that given the right set of parameters on economy might well move towards growth, even by staying sufficiently far behind its optimum capital requirements. All of them agree on the point that output and its ability to grow are limited by aggregate demand.

The Solow model of Economic Growth

Solow's model seeks to show the limitations of the Harrod-Domar formulation of requirements for steady growth in advanced countries. He argues,[3] "this fundamental opposition of warranted and natural rates turns out in the end to flow from the crucial assumption that production takes place under conditions of fixed proportions."[2]

Solow demonstrates[4] that with variable technical co-efficients there will be a tendency for the capital-labour ratio to adjust itself through time in the direction of an equilibrium ratio. If the capital-labour ratio is initially above the equilibrium value, capital and output will grow more slowly than the labour force. Let us consider the rural sector of underdeveloped countries and start with a small population

1. Ackley Macroeconomic Theory. P. 534.

2. Ibid.

3. Solow "A Contribution to the Theory of Economic Growth." Quarterly Journal of Economics, February, 1956. P. 91.

4. Also see Higgins—Economic Development, (Asia Publishing Company), Pages 333-37.

and a substantial amount of "capital" which here includes improved land. The ratio of capital to labour is actually above the *equilibrium ratio.* Therefore, if the supply of labour force increases, there would be a move toward more labour-intensive techniques : man-year output will tend to fall. Once the capital-labour ratio has fallen to the equilibrium ratio, it will be held constant until land (which is included in capital) begins to give out. If then, the equilibrium ratio is to be maintained, more capital either in the form of land or in any other form, should be allocated to the rural sector of the economy, but this will not happen under the conditions of technological dualism. Instead, once the land gives out, the marginal productivity of labour will fall below minimum real wage rates and unemployment, disguised or open. will begin to reveal itself.

Solow considers the possibility of multiple equilibrium with one unstable equilibrium between rate of growth and the capital-labour ratio, and with two stable equilibrium points, one with a high capital-labour ratio and one with a low capital-labour ratio. If the process of growth begins with a relatively high capital-labour ratio, the system moves towards rapid growth with capital-intensive techniques. If, on the other hand, the process of growth begins with a relatively low capital-labour ratio, it moves towards equilibrium rate of growth with labour-intensive techniques. Thus the industrial sector, where we find initially a relatively high ratio of capital to labour, is likely to move towards an equilibrium growth path with a high capital-labour ratio even if technical co-efficients are not fixed. The rural sector, on the other hand, beginning with a high ratio of labour to capital, will show a tendency toward a process of growth with a still lower capital-labour ratio.

Solow feels that "it would take us too far afield to go wholly classical with a theory of population growth and fixed supply of land :—an unfortunate decision since the classical model would conform closely to the rural sector of underdeveloped countries. In the rural sector of the underdeveloped countries, the propensity to consume being high, savings may fall to zero even when income is

positive so that net investment may cease and capital stock may become stationary while the labour force still continues to increase. Solow's model does indicate it, but Solow does not actually deal with the problems connected with this. It is clear that in such a case, disguised unemployment is likely to take place since the marginal productivity of labour falls short of the minimum real wage rates. Obviously per capita income tends to decline. It is interesting to note that Solow treats population growth as a function of per capita income, and not to be an autonomous force. The pattern of population, in Solow's model is that for very low levels of income per head, or real wage, population tends to decrease ; for higher levels of income, population begins to increase, and for still higher levels of income, the rate of population growth levels off and starts to decline. The result has got similarity to Leibenstein's "minimum effort thesis."

Finally, Solow introduces rigid wages, and concludes that with a wage-price ratio corresponding to a capital-labour ratio that would normally tend to decrease, unemployment develops and vice versa. Here also we find that these are the conditions of the rural sector of underdeveloped countries.

Rosenstein-Rodan and the Three Indivisibilities

Rosenstein-Rodan's first article[1] gave stress on the limitations imposed by the size of the market on the process of growth. More recently, his argument has run in terms of "three indivisibilities."[2] He thinks that the emphasis upon external economies is a major mark of difference between static theory and a theory of growth. In static theory, external economies are relatively unimportant. But in the theory of growth "external economies abound because given the inherent imperfection of the investment market, imperfect knowledge and risks, pecuniary and technological external economies have a similarly disturbing effect on the path towards equilibrium." Distinction between the pecuniary and technological external

1. P. N. Rosenstein-Rodan, "Industrialization of Eastern and South-Eastern Europe"—Economic Journal, 1943.

2. Rosenstein-Rodan—"Notes on the Theory of the Big Push." M. I. T., CIS, March, 1957.

economies is not relevant to a process of growth. But it is essential that three different kinds of indivisibilities and external economies should be distinguished :

(1) Indivisibilities in the production function especially the indivisibility of supply of social overhead capital (lumpiness of "capital").

(2) "Indivisibility" of Demand (complementarity of demand).

(3) "Indivisibility" (kink in the) supply of savings.

A minimum quantum of investment is a necessary (though not sufficient) condition of success. This is, in short, the basic argument of the theory of the big push.

Let us now consider the three indivisibilities as explained by Rosenstein-Rodan.

Indivisibility in the Production Function (lumpiness of capital): Social overhead capital, (power, transport, communications, housing, etc.) is the most important example of indivisibility and external economies on the supply side, or indivisibilities in the production function create investment opportunities in other industries. Moreover, these indivisibilities require "a great minimum size", so that "excess capacity will be unavoidable over the initial period in underdeveloped countries." Social overhead capital must precede other directly productive investment if services cannot be imported. Investments in social overhead capital have a high minimum durability, a long gestation period, and a minimal "industry mix" of several different types of public utilities.[1]

Indivisibility of Demand (Complementarity of Demand): The basic idea behind the concept of indivisibility of demand is that investment decisions are interdependent, and individual investment projects have high risk because of uncertainty as to whether their product will find a market. The risk of not finding a market reduces the incentive to invest. This will be the problem with all investment projects. But it may be the case that the new producers may be each others' customers and may "verify Say's law by creating an additional market." "Complementarity of demand would reduce the

1. Higgins—Economic Development, p. 386.

risk of not finding a market. Reducing such interdependent risks increases naturally the incentive to invest."

Rosenstein-Rodan also contends that a minimum quantum of investment is required to produce a "bundle" of wage goods on which the newly employed workers can spend their income. Without the assurance of a complementary investment undertaking any single investment project may be considered too risky. In other words, there is an *indivisibility in the decision-making process.* Prof. Higgins also gives stress on this point.[1] "Allocation of capital on the basis of individual estimates of short-run returns on various marginal investmant projects is the very process by which underdeveloped countries got where they are."[2] Government intervention in the decision-making process is required to enable the needed investment to take place. Rosenstein-Rodan also refers to the "*psychological indivisibilities*" involved in the process of growth. He says, "isolated and small efforts may not add up to a sufficient impact on growth, and an atmosphere of development effervescence may also arise only with a minimum speed or size of investment."

Finally, Rosenstein-Rodan argues that international trade is not always a means of avoiding the necessity of a "big push." International trade may reduce the range of fields in which the big push is required since some of the needed wage goods may be imported. But international trade does not at all eliminate the need of the big push.

Leibenstein's Model—The Critical Minimum Effort Thesis.

Leibenstein develops the famous *critical minimum effort thesis* which is an empirical theory. The problem may be approached in this way. Economic backwardnsss is characterised by a set of related factors that have a certain degree of stability. The *degree* of stability is characterised by the fact that some of the important variables have equilibrium values that possess at least stability in

1. Higgins—Economic Development, P. 387.
2. Ibid.

in the small though not necessarily perfect stability[1]. The actual values are different from the equilibrium values because the economy is always being subjected to stimulants or shocks. These stimulants tend to raise per capita incomes above the equilibrium level. But in backward countries the smallness of magnitude of these stimulants does not permit long-run development, and to get rid of economic backwardness, the efforts of these countries are below the critical minimum for persistent growth.

We often say that an underdeveloped economy is encircled by a vicious circle of poverty. The vicious circle idea has been interpreted by different economists in different ways. Leibenstein points out a relationship between the vicious circle idea and the critical minimum effort thesis. He thinks, a possible interpretation is that the vicious circle idea implies nothing more than the fact that the determinants of economic backwardness are mutually consistent. If the circle is truly vicious, there would appear to be no way out. But the vicious circle has to be broken if economic development has to be achieved. We have to explain how the vicious circle can be broken, and it is here that the critical minimum effort idea appears.

The question is, under what types of conditions does the critical minimum thesis hold? The simplest example of the thesis is a system in which for small values of the stimulant the income-raising factors are zero, but for higher values they are positive. Leibenstein thinks that the result can be obtained, *i.e.*, the vicious circle can be broken, if we assume that for small values of the stimulant the generated income-depressing factors are, in the long run, more significant than the induced income-raising forces, but that for high values of the stimulant the reverse is true. How this works out in detail depends on what the specific stimulants are how the stimulants are related to *specific* income-raising factors, and how both, in turn, are related to income-depressing factors.

An alternative possibility is that the consequences of the income-depressing factors have an upper limit but the simultaneously

1. Leibenstein—Economic Backwardness and Economic Growth. (John Wiley & Sons, IWC. New york 1963). P. 94.

generated income-raising factors have either no upper limit or a higher upper limit. Thus, the income-depressing factors may be operating autonomously or be generated by the stimulant and upto some maximum effect they may be more significant than the income-raising factors. As a consequence, *if the income-raising factors are stimulated beyond the maximum of the income-depressing factors, the critical minimum has been reached and the economy would, in this case, be on the road to development.*[1] *The population growth effect* fits this case. It may be the case, although not necessarily, that any small increase in capital will stimulate a more than equivalent increase in population. Thus, a 1 per cent increase in capital will generate (via raising incomes and depressing mortality rates) a more than I per cent increase in population and proportional decline in average income. There is a biologically determined maximum rate of population growth between 3 and 4 per cent. Thus, persistent capital accumulation above a certain minimum rate would permit development. And if the sustained rate of capital accumulation, Leibenstein points out, is

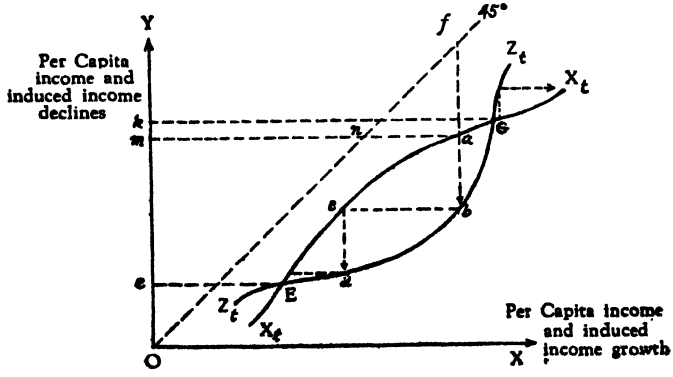

Fig. 75

positively related to the size of the stimulant, the minimum effort thesis applies. From what has been said, it should be clear that "the minimum effort idea is both consistent with the vicious circle notion and at the same time offers a way out."

1. Leibenstein—Economic Backwardness and Economic Growth. P. 40

This diagram illustrates the critical minimum thesis, and shows the struggle between two opposing sets of forces: the per capita income-raising forces and the per capita income depressing forces. The income-raising forces are generated by the previous level of per capita income, and the strength of the income-depressing forces is determined by the level to which per capita income would have been raised had the income-raising forces been the only forces in operation. The ordinate Y indicates per capita income. The abscissa X represents the effects of all per capita income-raising forces, and Z represents the effects of all the per capita income-depressing forces. The 45 degree line measures the induced increases and decreases in per capita income. The curve X_t indicates the extent to which income would be increased in the current period, given the related per capita income level of the previous period shown on the ordinate, if the income-raising forces were in the only ones in operation. In the above figure, the income level of the initial period is *om*, the income-raising forces generated will in the next period raise the income level by *na*. But at the same time the effects of the income-depressing forces will reduce income below the point to which they would have been raised by the income-raising forces. The curve Z_t indicates the extent to which income is depressed for each alternative level to which income would have been raised if the income-raising forces had been the only ones permitted to operate. Thus, the figure shows that if income had been raised to the point on the abscissa opposite *f*, the income-depressing forces would have reduced income by *fb*. Keeping in mind the meaning of the two curves X_t and Z_t, if we follow the events step by step, the initial income level O*m* will generate the path *abcd*, and so on, until the path eventually settles at the point E. Similarly, if we begin with a level of per capita income above OK, we generate an explosive income growth path.

This is an illustration of the critical minimum effort thesis. If the initial stimulants raise per capita income above O*e* but not above O*k*, the path of change, as shown by the arrows will eventually lead to a return to the equilibrium position E. But, if the stimulant is

sufficiently large so that income does rise above Ok, the path of change is one of endless expansion.

Mahalanabis Model of Sectoral Planning

The problem of allocation of investment between different sectors which Prof. P. C. Mahalanabis discussed in his paper on "The Approach of Operational Research to Planning in India"[1] has led to an interesting controversy on this aspect of development planning. Any appreciation of the Mahalanabis model has to take into account the fact that the model aims at an integration of a mathematically articulate model of growth with the requirements of policy-making in an underdveloped economy. The success of the model has, therefore, to be judged not in terms of its ability to provide us with a complete explanation of the process of growth but whether it isolates the proximate variables involved in any process of development and their inter relationships, in a manner that the planner may know something about the relative distribution of emphasis among them that would be economically most advantageous.[2]

Prof. Mahalanabis began with a global model for the entire economy. That model did not make any distinction between the various sections of the economy, either functional or institutional. He considered the relative rate of growth of income per unit of time to be determined by two factors, the ratio of investment to national income (α) and the proportion in which investment expands productivity (β). This formula would very simple and even more inadequate than the Harrod-Domar model. The danger with such a formula is that it very often degenerates into a mere tautology.

Mahalanabis's Second model divided the entire economy into two main sectors as in the Marxian sheme of reproduction. Accordingly, there were two productivity co-efficients (β_k, β_c) and two allocation co-efficients (λ_k, λ_c) instead of an overall productivity co-efficient and an overall fraction indicating the ratio of investment to national

1. Sankhya, December, 1955.
2. Sukhamoy Chakravarty. "The Mahalanabis Model of Development Planning" Arthaniti, Nov. 1957. P. 57

income with this difference, the two growth-models were essentially the same in character.

In the final Mahalanabis model, we find the breaking down of the consumption goods sector into three components, while keeping the investment goods sector unaltered in scope. The targets in this model are given in terms of desired increases in employment and output, the investment opportunities over summed up in the shape of a total investment figure and the technical possibilities are given by the capital-output ratios and the capital employment ratios of the four sectors. The instrument of adjustment are the allocation parameters i.e., the proportions of investment in the four sectors, viz., the investment goods sector (k), the factory consumer goods sector (C. 1), the sector of small and household industries (including agriculture) producing consumer goods (C. 2) and the sector producing services (C. 3)

The unknowns of Prof. Mahalanabis' system are :—

$$\begin{array}{cccc} Y_k & Y_1 & Y_2 & Y_3 \\ N_k & N_1 & N_2 & N_3 \\ \lambda_k & \lambda_1 & \lambda_2 & \lambda_3 \end{array}$$

where Y's stand for the sectoral increases in income, N's for the sectoral increases in employment and λ's for the allocation parameters. The data of the model are :—

$$\begin{array}{cccc} \beta_k & \beta_1 & \beta_2 & \beta_3 \\ \theta_k & \theta_1 & \theta_2 & \theta_3 \end{array}$$

where β's stand for output/capital ratios, θ's for Capital/Labour ratios and I for the total amount of investment that can be made.

The equation of Prof. Mahalanabis' system are :—

(1) $Y_k+Y_1+Y_2+Y_3=Y$ (an arbitrary constant)

(2) $N_k+N_1+N_2+N_3=N$ (another arbitrary constant).

(3) $\lambda_k+\lambda_1+\lambda_2+\lambda_3=I$

(4) $Y_k=I \cdot \lambda_k \cdot \beta_k$

(5) $Y_1=I\lambda_1 \cdot \beta_1$

(6) $Y_2=I\lambda_2 \cdot \beta_2$

$$(7)\quad Y_3 = I\lambda_3 \,.\, \beta_3$$
$$(8)\quad N_k = I \,.\, \lambda_k/\theta_k$$
$$(9)\quad N_1 = I \,.\, \lambda_1/\theta_1$$
$$(10)\quad N_2 = I \,.\, \lambda_2/\theta_2$$
$$(11)\quad N_3 = I \,.\, \lambda_3/\theta_3$$

Thus, we find 11 equations and 12 unknowns, and the system, as Dr. Ashok Mitra[1] pointed out, has one degree of freedom. This is closed by Mahalanabis with the equation,

$$(12)\quad \lambda_k = \tfrac{1}{3}.$$

While this assumption at first sight may appear to be arbitrary, Prof. Sukhomoy Chakravarty[2] has shown that this is not so if we take the pattern of growth of future income into account. λ_k determines the time path of future income in Mahalanabis' two-sector model, the conclusions of which are broadly valid even when the consumer goods sector is further classified into three parts, $\lambda_k = \frac{1}{3}$, is chosen as the maximum practicable value, as Prof. Mahalanabis "felt it would not be possible to go beyond this value under present conditions."

Prof. Tsuru[3] has pointed out that the model neglects the demand side altogether and increases in sectoral output are not linked up with increases in sectoral demand. This involves an assumption of extra ordinary flexibility of the aggregate and the sectoral propensities to consume. Tsuru has also objected to this model on the ground that "it is a mixture of Keynesians and input-output concepts."

The question arises, how the income and employment targets of Mahalanabis' model are obtained. Prof. Amartya Sen[4] elaborates this analysis in the following manner.

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1. Ashok Mitra "A note on the Mahalanabis Model" Economic Weekly March 13, 1957.

2. Sukhomoy Chakravarty—Economic Weekly, March 16, 1957.

3. Shigeto Tsuru "Some Theoretical Doubts on the Plan Frame", Economic Weekly, Annual Number, 1957.

4. Dr. Amartya Sen—"A note on the Mahalanabis Model of Sectoral Planning",—Arthaniti, (Calcutta University.)

Once the demand equations are introduced, we must have total increases in income and employment as unknown and also have to give up the assumption that a fixed proportion (λ_k) of investment is being made in the investment goods sector, i.e., we have to give up equation (12) above.

We have three demand equations linking up increases in demand for the three types of consumer goods with increases in income and/or employment.

$$(12)\quad Y_1 = D_1(Y, N)$$
$$(13)\quad Y_2 = D_2(Y, N)$$
$$(14)\quad Y_3 = D_3(Y, N)$$

we now have 14 equations and only 12 unknowns and the system is overdetermined. When, however, Y and N are variables rather than targets, the system becomes once again just determined and no more.[1]

This 14 equations—14 unknowns-equality is economically quite significant, as it tells us that (a) if the techniques of production (βs and θs) are given and (b) if demand for consumer goods is linked up uniquely with income and/or employment, only a certain rise in income and a certain increase in employment are possible, given the total amount of investment. Thus we have to reverse our approach. We cannot start with given N and Y as our targets. N and Y will emerge as parts of the solution of the system.[2] If we want to introduce some degree of freedom into the model we have to allow the possibility of technological choice or introduce some control over consumption through taxation, rationing or other methods. In the first case β's and θ's become variables and that effect is not completely neutralized by the production function equations relating β's and θ's. In the second case, through taxation, rationing or some other method the amounts of consumption can be affected so that the model may have some degree of freedom. Prof. Amartya Sen further argues, even when the problem of

1. Ibid. May, 1958. P. 29.
2. Dr. Amartya Sen's article in Arthaniti, May, 1958.

technological choice and the possibility of controlling consumption (within limits) are introduced and consequently choice between alternative combinations of income, employment and investment in the investment goods sector is possible, it is not obvious why we should start our exercise with given targets of income and employment without looking at the alternative combinations which are also within reach.[1] The procedure of adjusting allocation parameters to achieve certain a *priori* goods of income and employment as a general method of development planning may look to some like the celebrated cart before the horse.[2]

The pattern of factor prices has also not been taken into account by Mahalanabis when he fixed his targets and the basis of this model —that is also a loophole of the model.

KALDOR'S GROWTH MODEL

Nicholas Kaldor objects to both the instability of the Harrod-Domar model and the escape from it through factor substitution.[1] In view of the rigidity of the technology embodied in machines, ready substitutability of capital for labour is not possible. To produce a change in technology new investment is required. The escape from instability according to Kaldor, lies through the relations running between technical progress and the Capital/Labour ratio. If technical progress is to go ahead, this is likely to increase the marginal productivity of capital and lead to more investment. On the contrary, if capital investment is to gain on technical progress, the marginal product of capital will fall, so that investment will have to wait for technology to catch up. The relationship has been illustrated in the following figure.[3]

1. Ibid, Pages 32-33.
2. Ibid.
3. Nicholas Kaldor—"A model of Economic Growth. Economic Journal, December, 1957. Reprinted in "Essays in Economic Stability and Growth."

In this diagram labour productivity Y/L has been plotted against the Capital/Labour ratio K/L. One production function F_t shows the technical one position in period *t*. The curve levels out as

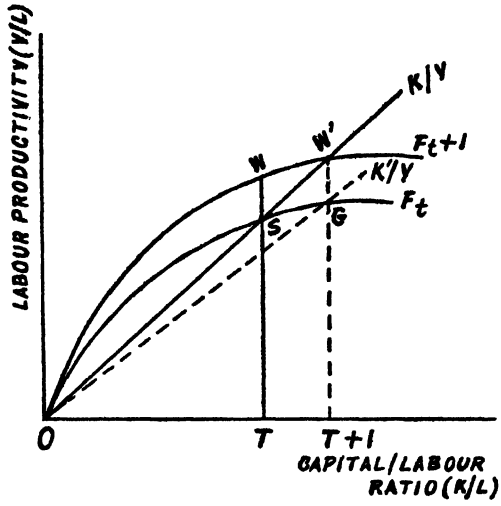

Fig. 76

increasing ratios of capital to labour contribute less and less to total output with a fixed supply of labour. When this curve is flat, the marginal product of capital is zero. If technical progress moves the function from F_1 to F_t+1, this raises the marginal product of capital, the tangent to F_1+1 at *w* being steeper than that to F_t at *s*. It is likely that further investment will take place to restore the marginal productivity of capital and the Capital/Labour ratio at *w'*. If, on the other hand, capital investment had gained on technical progress, and the K/L ratio has increased along the horizontal axis from T to T+1, with production function F_t still operating, the decline in marginal productivity of capital would tend to discourage investment until the capital/output ratio was restored by technical progress to $O-w$.[1] The consequence is that economic growth, in

1. The Theory of Economic growth : A Survey,—Hawn and Mathews, Economic Journal, Dec, 1964, p. 797.

the Kaldor model, tends to work along an equilibrium path in which the growth rates for the capital stock, for total output, for labour productivity are all equal.

The main elements in the Kaldor model are as follows : (1) A classical saving function. (2) Rejection of an orthodox production function in favour of a "technical progress function." But some sort of short-run production function does survive in most of Kaldor's formulations, and a marginal product of labour in the short-run sense can therefore be identified.[1] (3) An investment function in which the desired capital-output ratio is an increasing function of the excess of the profit rate over a monetarily determined interest rates ; or, in the Kaldor-Mirrlees version, one that depends on a fixed pay-off period for investment per worker. (4) Rejection of perfect competition, as a result of which the profit margin per unit of output at a given capital-labour ratio becomes a variable.

This profit margin liberates the distribution of income from the shackles of marginal productivity. The variability of profit margin comes about in two ways both of which imply a departure from the full-employment assumption : (1) The elasticity of supply of labour to an individual firm is held to be a diminishing function of labour scarcity. Changes in the intensity of demand may, of course, lead to variations in the ratio of real wage to the marginal product of labour. An increase in the intensity of demand in this regard raises profit per unit of output in capital-goods industries. (2) The short-run production function is held to exhibit increasing returns, as witnessed by the empirically observed tendency for total output and per capita output to fluctuate together. An increase in intensity in demand in this regard raises the profit margin in consumer-goods industries.

Kaldor and Mirrlees' treatment of technical progress is based on the vintage approach. They suggest that the basic functional

1. Mirrlees and Kaldor—"A New Model of Economic Growth."—Review of Economic Studies, June, 1962.

relationship (at least in the long period) is not a production function, expressing per capita output as an increasing function of per capita capital, but a technical progress function.[1] The technical progress function in Kaldor's model is non-linear, showing a diminishing rate of response of productivity increase to investment increase. This is not the same as diminishing returns to capital in the ordinary sense. The underlying notion is that technical progress has two elements : an exogenous increase in ideas, and the extension and exploitation of these ideas by learning. More investment permits the stock of ideas currently available to be more thoroughly explored and developed, but there are limits to their potentialities ; hence the tendency to diminishing returns.

An increase in the stock of capital at a steady rate permits a greater increase in productivity than an equal increase in capital carried out at an uneven pace, because in the latter event too many resources relatively would be devoted to the exploration of the ideas available in one period and not enough to the ideas available in the next.

From the formal point of view, the Kaldor technical progress function can be regarded as an extension of Cobb-Douglas in a particular direction : Cobb-Douglas implies that the slope of the technical progress function $d(y'/y)/d(k'/k)$ is constant in all circumstances, Kaldor has it varying with k'/k. Both have in common the assumption that this slope is independent of k/y. Without this assumption a unique technical progress function relating to y'/y and k'/k cannot be drawn.

Kaldor's model throws some new light on the role of technical progress in the process of economic development. Solow argues that some technical progress is "embodied" in capital equipment, i.e., cannot be realized without new investment. But Kaldor while emphasizing on the relationships between technical progress and investment relies on capital-labour ratio.

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1. The Theory of Economic Growth : A Survey,—Hawn and Mathews, The Economic Journal, Dec. 1964. P. 849.

2. See Solow's model as discuss.d in this chapter.

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THE LEVEL OF INCOME AND THE BALANCE OF PAYMENTS

The determinants of national income in an open economy

In a closed economy with propensities to consume and invest being given, a certain equilibrium level of income is determined, and that is also characterized by the equality of voluntary savings and voluntary investment. Assuming net investment to be autonomous and constant the equilibrium level of income is given by the equation :

$$Y = C(Y) + I_o \quad \ldots(1)$$

$$\text{or } S(Y) = I_o \quad \ldots(2)$$

In an open economy.

$$Y = C(Y) + I + (Ex - Im) \quad \ldots(3)$$

where Ex stands for export, Im stands for imports, and Ex − Im stands for export or import surplus.

Propensity to import is a function of income. i.e.,

$$Im = Im(Y) \quad \ldots(4)$$

The marginal propensity to import, q can be stated as

$$q = \frac{dIm}{dy} \quad (5)$$

So, the equation (3) can be re-written as

$$Y = C(Y) + I + Ex - Im(Y). \quad (6)$$

This equation determines a unique equilibrium income for the open economy. This equation can be re-stated as

$$S(Y) - I = Ex - Im(Y) \quad \ldots(7)$$

We can show this by the following diagram. In the diagram I − Ex represents the aggregate of autonomous investment and exports. The line Im(y) + s(y) represents the sum of the savings and import functions. OY_o is the equilibrium level of income corresponding to the point of intersection of the I + Ex line and

$I_m(Y)+S(Y)$ line. The distance AE is the difference between exports and imports, the balance of payment deficit, at the level of income, Y_o. No other level of income can become equilibrium level of income

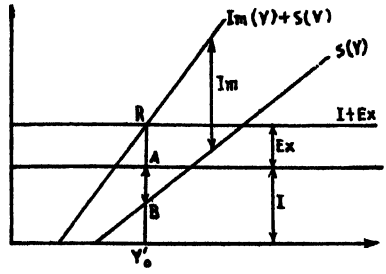

Fig. 77

since in that case the difference between voluntary savings and voluntary investment is not equal to the difference between exports and imports.

Relation between changes in the level of Income and the Balance of trade

There is a reciprocal relationship between the changes in the level of income and the balance of trade. Changes in the balance of trade affect the equilibrium level of income and changes in the equilibrium level of income affect the balance of trade. These phenomena can be clearly explained when we assume constant price level, interest rates, quantities of fixed investment in each country, and unemployment in each country so that increased demand for the goods of a country leads to increased output.

Let us first of all examine the effects of the changes in the level of income on the balance of trade. The value of imports of the home country must depend on its level of business activity and income experienced before the import plans are made. The *marginal propensities to import* being a function of the level of income in the country, with an increase in income, there is every likelihood of an increase in the value of imports. By marginal propensity to import

1. Schneider—Money, Income and Employmnt.

we mean the ratio between a change in plans to import and a change in income. The relationship between change in level of income and the change in the import plan has the following consequences. First if *the marginal propensity to import is greater than zero*, the *direct effect of a rise in the level of income in the home country will be a deterioration in the balance of trade.* Similarly a rise in the level of income abroad will increase the imports of the foreigners and thus improve our balance of trade position. Secondly, expenditure on imports does not directly create income in the home country. Purchases of foreign goods generate income for the foreigners. The expenditure on import is quite similar to saving which leaks out of the system, and contributes no direct impulse to a further round of expansion of the level of home income.

As imports are parallel in their effects to savings, so exports are parallel in their effects on investment. As investment is determined by independent variables (by such factors as the state of industrial techniques), similarly, the level of exports also does not normally depend directly on the level of income in that country. The level of exports is determined by external factors, *viz.*, the level of income abroad. So, changes in both investment and export are 'autonomous' in the present context. As an initial increase in investment in the domestic economy sets the multiplier process into operation and induces a multiple change in the level of income and employment at home, similarly, an increase in exports sets the foreign trade multiplier into operation. An increase in exports leads to an increase in demand for home-produced goods, which generates income for the producers of those goods and thus leads to more expenditure by them ; hence we find a multiplier expansion.

Generally speaking, an increase in the volume of export surplus either because of increased exports or because of a fall in the volume of imports initiates a multiple expansion of income. Similarly a deterioration in the balance of trade leads, other things remaining the same, to a multiplier contraction in income. It is to be noted that the level of imports directly depends on the home level of income.

The Foreign Trade Multiplier

In an open economy with foreign trade, goods produced (Y) plus imports (M) are equal to goods bought (C+I) plus goods exported (X). If we assume that there are neither savings nor investments, all income is spent on consumption and must equal C.

$$\text{Since} \quad Y+M=C+I+X$$
$$\text{and} \quad I=0. \quad Y=C$$
$$\therefore \quad X=M..$$

Exports are now equal to imports at every level of national income. We can derive the foreign trade multiplier from this simple economy. If exports shift from X to X', the change in income, from Y to Y', will imply the change in exports multiplied by the reciprocal of the marginal propensity to import. As we have already argued that X=M at every equilibrium level of income, we can say that $dX=dM$. Dividing both sides into dY, we can write,

$$\frac{dY}{dX}=\frac{dY}{dM}$$

$$\text{or} \quad \frac{1}{\frac{dM}{dY}} \text{ or } \frac{1}{MPM}$$

Thus any continuing change in exports in an open economy when we assume that there is neither saving nor investment, will raise the

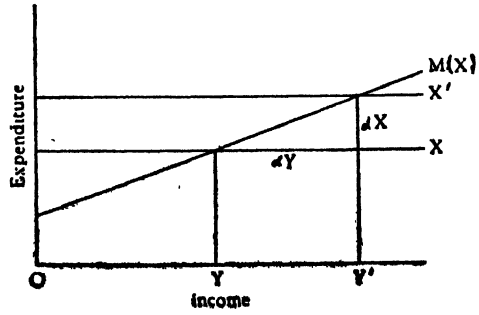

Fig. 78

equilibrium level of income to the point where it is matched by an equal increase in imports.

This is shown in the following figure :

This figure demonstrates the foreign trade multiplier without any savings. The increase in exports pushes up the x line to x' resulting in an increase in income from oy to oy'

This equality of exports and imports with no saving or investment was the analysis of Hume. But Hume used the Specie-flow analysis, relying on price rather than income. But it works more efficiently through the moving mechanism of income provided that there are no savings. *Hume's law that exports equal imports is the foreign-trade equivalent of Say's law of markets that demand equals supply. And it is equally invalidated by the introduction of savings*[1]. If again there are savings and investment, the equilibrium condition of income is still :

$$I = S,$$

but investment (I) breaks down into two parts, *viz.*, domestic investment (Id) and foreign investment (If).

So, $$Id + If = S$$

But net foreign investment (If) may be written as the excess of export over import, that is to say,

$$If = X - M.$$

Substituting this in the previous equation we get,

$$Id + X - M = S$$

$$\therefore \quad Id + X = S + M.$$

This is the basic condition of the equilibrium level of national income in an open economy. The multiplier is now the reciprocal of the slope of the sum of the two functions M(y) and S(y), and will be the same for an increase in exports or an increase in investment. So, the change in exports must be equal to the change in savings plus the change in imports. In other words,

$$dX = dS + dM,$$

1. Kindleberger—International Economics (Irwin series) 1958, P. 131.

Let us now divide both sides of the equation into dY and derive,

$$\frac{dY}{dX}=\frac{dY}{dS+dM}$$

$\frac{dY}{dX}$ is K, the foreign trade multiplier :

$$K=\frac{dY}{dS+dM} \text{ or } \frac{1}{\frac{dS}{dY}+\frac{dM}{dY}} \quad \frac{1}{MPS+MPM}$$

The following figure shows foreign trade multiplier with savings and domestic investment. Here $Id=S$ and $X=M$ at the equilibrium

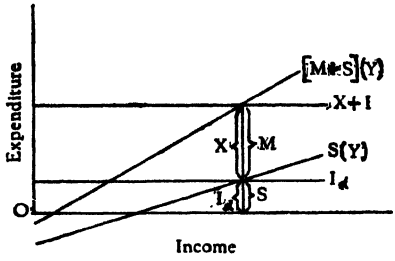

Fig. 79

level of income, Y. This is not necessarily the case always. If long-term lending takes place, X can exceed M, provided that S exceeds Id by an equal amount sufficient to maintain the equation $Id+X=S+M$. With increase or decrease in exports the position of foreign trade multiplier will be as follows :

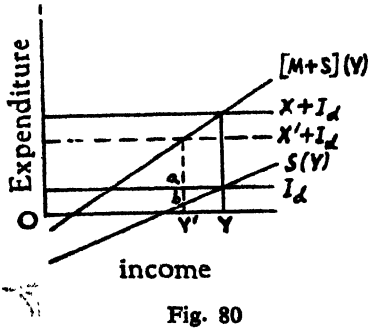

Fig. 80

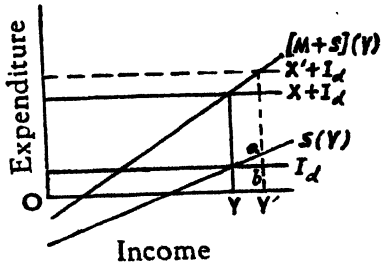

Fig. 81

These Figure Nos. 80 and 81 show foreign trade multiplier with decrease in exports and increase in exports respectively.

Increase in exports leads to an increase in national income from OY to OY' in Fig. 80 while decrease in exports leads to a fall in national income from OY to OY' in Fig. 81. Savings and investment have been taken into consideration.

The Foreign Trade Multiplier without Foreign Repercussions

The foreign trade multiplier without foreign repercussions is in operation in the circumstances in which the home country is so small in relation to the rest of the world and the influence of the home country on the other is so small that no appreciable effects is reflected back to the home country. To explain this phenomenon we shall assume that *realized savings plus realized imports equal investment plus realized exports.* This can be shown in the following way :

Aggregate Income = Consumption of home goods + Imports + Saving

Aggregate Output = Consumption of home goods + Exports + Investment

Income = Output

Imports + Savings = Exports + Investments.

It follows that if planned purchases of imports plus planned saving are not equal to planned purchases of exports plus planned investment for some period, then some plans will not be realised precisely. The only stable equilibrium position is attained when all plans are realised precisely. If they are not realised, plans will be revised which will cause changes in the level of income. Both imports and saving plans depend upon the level of income. An equilibrium level of income is determined when import and saving plans are equal to export and investment plans.

The foreign trade multiplier without repercussion shows what will be the effect of a change in the original level of investment or exports upon the level of income. The rise in plans to imports starts only when consumers' expenditure rises as a result of induced rises in income.

The Foreign Trade Multiplier with Foreign Repercussions

The conditions that must be satisfied by an equilibrium level of income in the case of the foreign trade multiplier with foreign

repercussions are just the same as in the earlier case. The only point of difference is that in this case we put emphasis on the fulfilment of the condition : in each country, planned saving plus imports must equal planned investment plus exports.

Moreover, the fact that imports of one country must necessarily be equal to the export of the other should also be taken into consideration. The equilibrium position satisfying these conditions when the initiating change is expansionary is one in which the level of income in both the importing and the exporting countries is higher than it was at the initial stage. An initiating expansion of home investment will induce the following changes in the position of income, output and employment in either countries. In the first place, the change in the level of income in either country will be relatively large if its own marginal propensities to save and import are small. If the leakages into savings and imports are not very significant, an initial increase in investment will obviously lead to further expansion of income in the home country. If, however, the propensities to save and import are relatively large in the home country and small in the foreign country, the equilibrium rise in the level of income may be larger in the foreign country than at home. But usually, the equilibrium rise in income is larger in the home country when the initiating impulse operates in the home country. In the second place, the rise in the level of income in the home country will be greater than in the case when no account is taken of foreign repercussions, some of the rise in activity in the foreign country being reflected back to cause further expansion of income in the home country. This expansion through reflection from abroad will be larger, the larger is the ratio of the foreigners' marginal propensity to import to their marginal propensity to save. If again, the foreigners' marginal propensity to import is high and the marginal propensity to save is relatively small so that the *reflection ratio* is large, then most of the leakages from internal expenditure in the foreign country (*i.e.*, imports of the foreign country) benefit the home country.

The most important factor which sets the multiplier process into operation is the initial increase in investment. Apart from this

factor, there is another important initiating change and that is a switch in demand between home goods and foreign goods. Some of the induced increases in demand in the country which is experiencing an expansion in the level of income and business activity affect its imports and so prevent the fall in income in other country from going as far as it would otherwise do. Similarly some of the induced reductions in demand in the multiplier process in the other country affect its imports. This phenomenon leads to a contraction in the level of activity in the home country.

In the final equilibrium position, the country which had an improvement in its balance of trade position as the proximate effect of the switch in demand between home goods and foreign goods always finds a higher level of output and income than initially and the other country always finishes with a lower level of output. The equilibrium change in the balance of trade is less than the proximate change, but the way in which this proximate change takes place is never reversed in the equilibrium position. We can simply follow the determinants of the new equilibrium level of income in the two countries. As we have already argued, the smaller are the leakages into savings and imports, greater will be the expansion of income and output in a country. Again we have also seen that the change in the level of output and income in either country will be the greater the smaller is the other country's reflection ratio. We have also found that the *reflection ratio* is small when the other country's marginal propensity to save is large compared with its marginal propensity to import.

The Foreign Trade Accelerator

In foreign trade there may on occasion be an effect comparable to the domestic accelerator, and we call it 'the foreign trade accelerator.' An increase in the volume of exports leads through increases in investment to an import surplus. The increase in investment may take place in export industries or import-competing goods industries. Or the general prosperity resulting from increased exports may lead to new investment in industries producing for domestic consumption.

The accelerator effect is first demonstrated through the increase in exports which in the next step raises national income and consumption. The increase in exports and induced consumption calls for an expanded capacity so that the third period leads to an increase in investment which again stimulates income and consumption. And the cumulative process thus continues.

The balance of payments effect of a foreign trade accelerator can be shown as follows :

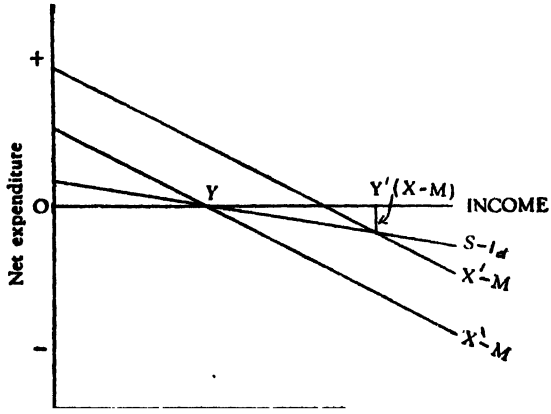

Fig. 82

The S − I*d* schedule is the saving investment schedule X − M indicates export surplus. In this diagram, the S − I*d* schedule is negatively sloped, since investment increases faster than savings. An increase in exports which replaces X − M schedule upward to X′ − M will therefore produce a balance of payments deficit shown at Y′.

Foreign trade accelerator may have foreign repercussion, which is the effect of the change in exports and/or imports on national income abroad, and the backward effect which this has on foreign trade and national income at home. If the country under consideration is very small and if she has a very poor share of trade with other countries, the foreign repercussion of foreign trade acceleration may be neglected ; but when the country is very big and has a sizeable share of other countries' trade the foreign repercussion of the foreign trade acceleration becomes important.

[We have seen how a change in the balance of trade position of a country affects its level of income. We have also seen how a change in the domestic level of income affects the level of income in the other country. Now we shall try to define the equilibrium rate of exchange and examine the effects of exchange rate changes upon the balance of trade and the internal price-level. We shall find that the effects of an exchange rate change on the demand in each country for the other's goods and so on ; the balance of trade between the two countries can be conveniently summarized in terms of elasticities. In the next chapter, we shall see how an equilibrium rate of exchange can be defined.]

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EQUILIBRIUM RATE OF EXCHANGE—EXCHANGE RATE CHANGES AND ITS EFFECTS UPON BALANCE OF TRADE AND THE INTERNAL PRICE LEVEL

We have seen how a change in the balance of trade position of a country effects its level of income. We have also seen how a change in the domestic level of income affects the level of income in the other country. Now we shall try to define the equilibrium rate of exchange and examine the effects of exchange rate changes upon the balance of trade and the internal price-level. We shall find that the effects of an exchange rate change on the demand in each country for the other's goods and so on ; the balance of trade between the two countries can be conveniently summarized in terms of elasticities. In the first place, we shall see how an equilibrium rate of exchange can be defined.

Equilibrium Rate of Exchange

The concept of equilibrium rate of exchange is a rather hackneyed subject. Enough attention has been extended to this subject but the equilibrium rate of exchange has not yet been defined in a way which is universally acceptable.

Gustav Cassel tried to define equilibrium rate of exchange by the purchasing power parity of two currencies in two different countries. But, it is acknowledged today that the purchasing power parity theory fails to provide a definition of the equilibrium rate.

The ordinary way of defining the equilibrium rate of exchange is to define it "*as that rate which, over a certain period of time, keeps the balance of payments in equilibrium.*"[1]

Prof. Ragnar Nurkse examines the component elements of this definition and then tries to modify it. He first raises the question,

1. "Conditions of International Monetary Equilibrium"—Essays in International Finance, No. 4, Spring 1945.—Ragnar Nurkse.
Reprinted in the "Readings in the Theory of International Trade" (A. E. A.)

what is the length of period over which payments have to be balanced? In other words, what is actually meant by the phrase, "over a certain period of time" ? The standard period should be one during which seasonal as well as cyclical fluctuations in the rate of exchange would be eliminated. Prof. Nurkse thinks that the standard period should be one during which there would be no net change in a country's reserve of international means of payments. The second question is, what shall we include in the balance of payments for the purpose of this definition ? According to Nurkse, the transfer of gold or other liquid reserves which may be necessary to balance a country's external accounts should be excluded. Otherwise, these accounts would always be in balance and there would never be any disequilibrium. Short-term capital movements also should be excluded. These capital movements may be of two categories : equilibrating and disequilibrating capital movements. Apart from international currency transfers and short-term capital movements, no exclusions are necessary, and we must include all other international transactions entering into the balance of payments. A certain rate of exchange may be an equilibrium rate with a certain flow of foreign investment. With a different flow of foreign investment, this rate is not likely to be an equilibrium rate.

Having examined the "standard period" and the "balance of payment", we are to examine the third question : what does balance of payments equilibrium actually mean ? Payments can be made equal to receipts by artificial restrictions on imports. But this enforced equilibrium should not serve our purpose of defining the equilibrium rate of exchange. *The true equilibrium rate is that rate at which payment and receipts are equalized without additionol restrictions on trade.*

Thus, we find that Prof. Nurkse's definition of the equilibrium rate of exchange can be stated as follows. The equilibrium rate of exchange is that rate at which payments and receipts (excluding international currency transfers and short-term capital movements) are equalized without addition of restrictions on trade over a period of time during which there would be no net change in country's reserve of international means of payment.

Mrs. Joan Robinson[1] points out, the exchange rate is determined from day to day by the supply and demand of home currency in terms of foreign currency. Any change in the conditions of demand and supply reflects itself in a change in the exchange rate, and at the ruling rate the balance of payments balances from day to day. It is obvious that there can be no one rate of exchange which is the equilibrium rate corresponding to a given state of world demands and techniques. In any given situation there is an equilibrium rate corresponding to each rate of interest and level of effective demand, and any rate of exchange can be turned into an equilibrium rate by altering the rate of interest appropriately. Moreover, within very wide limits, any rate of exchange can be made compatible with any rate of interest provided that money wages can be sufficiently altered. "The notion of the equilibrium exchange rate is a chimera. The rate of exchange, the rate of interest, the level of effective demand and the level of money wages react upon each other like the balls in Marshalls bowl, and no one is determined unless all the rest are given."[2]

Currency depreciation—its effects

By devaluation of currency, we mean a fall in the external value of a currency in terms of the external value of another currency. The immediate effect of devaluation is an improvement of the balance of trade position of a country. The exports of a country are promoted and the imports are restricted. The cause of this improvement in balance of trade is simple in the sense that cost of increases and exports are made easier. Moreover, the general price level of a country tends to rise when the currency is devalued.

All these effects of devaluation are subject to certain conditions. It is, however, possible that an improvement in the balance of trade may lead to no primary increase in employment if the elasticity of home supply of export is zero and the elasticity of demand for import is unity. In that case no increase in exports and no fall in imports

1. Joan Robinson—Essays in the Theory of Employment. Essay on "The Foreign Exchanges." Reprinted in ' Readings in the Theory of International Trade." (A. E. A.)

2. Ibid.

will take place. The effects of devaluation will depend on the elasticity of home country's demand for and supply of foreign exchange. As Mrs. Joan Robinson points out, the elasticity of the demand for and the supply of foreign exchange is composed of four underlying elasticities. Thus, the elasticity of demand for foreign exchange depends upon (a) the elasticity of home demand for imports, (b) the elasticity of the foreign supply of imports, (c) the elasticity of foreign demand for these goods, and (d) the elasticity of the home supply of import-competing goods. The elasticity of home supply of import-competing goods depends upon the range of available import-competing goods and upon their degree of substitutability for imports.

The elasticity of the supply of foreign exchange depends upon (a) the elasticity of the foreign demand for our export, (b) the elasticity of home supply of export, (c) the elasticity of the home demand for for these goods and (d) the elasticity of the foreign supply of goods competing with these exports. This fourth elasticity in its turn depends upon the range of the available export-competing goods and their degree of substitutability for exports.

The actual effect of devaluation in each particular case will depend upon the precise relationship between these different elasticities. Devaluation will be most successful when demand for and supply of foreign exchange are highly elastic. This is known as *Marshall-Lerner condition.* This condition states, in effect, that depreciation will improve the balance of payments of a country and appreciation worsen it, if the sum of the elasticities of demand for a country's exports and of its demand for imports is greater than one. The most basic of these elasticities are the elasticity of home demand for import and the elasticity of foreign demand for export.

Marshall-Lerner condition

Marshall-Lerner condition states the situation under which a depreciation of the exchange rate improves the balance of payments of a country. For explaining the Marshall-Lerner[1] condition, let us use the following notations.

x = Volume of exports.

m = Volume of imports.

1. Kindleberger—International Eocnomics (Appendix 'D' to chapter 9)

Px, Pm = Foreign prices of exports and imports, respectively.

qx, qm = Domestic prices of exports and imports, respectively.

r = exchange rate, expressed as units of domestic currency paid per unit of forein currency.

ex = (foreign) elasticity of demand for exports

em = (domestic) elasticity of demand for imports

By definition $Px = \frac{Qr}{r}$ and $Qm = Pm \cdot r$

That is to say, foreign prices of exports

$$= \frac{\text{domestic prices of exports}}{\text{exchange rate}} \quad \text{and}$$

domestic prices of import = foreign prices of import × exchange rate

The demand for exports depends on their foreign price,

$$\text{or} \quad x = x(Px) = x\left(\frac{Qx}{r}\right)$$

Total revenue from exports (in foreign currency) will be then,

$$x\left(\frac{Qx}{r}\right) \cdot \frac{Qx}{r}.$$

The demand for imports again depends on their domestic price, or $M = M(Qm) = M(Pm.r)$, and total expenditure on imports (in foreign currency) will be then $M(Pm.r) \cdot Pm$.

As a result the balance of trade in terms of foreign currency is,

$$\text{Balance of trade} = x\left(\frac{Qx}{r}\right) \cdot \frac{Qx}{r} - M(Pm.r).Pm.$$

A simple assumption for deriving this is that the supply elasticities in both countries are infinite, so that the home prices of each country's exports when expressed in its own currency (Qx and Pm in our notation) are constants. With Qx and Pm assumed to be constant, the balance of trade becomes a function of the exchange rate alone, the effect of a change in the exchange rate is observed by differentiating $B(r)$ with respect to the exchange rate.

$$\frac{dB}{d_r} = \frac{d_x}{d\left(\frac{qx}{r}\right)} \cdot \left\{-\frac{qx}{r^2}\right\}\frac{qx}{r} + x \cdot \left\{-\frac{qx}{r^2}\right\} - \frac{dm}{d(P_m.r)} \cdot P_m{}^2.$$

In the first bracket we recognise the foreign demand elasticity for exports, e_x, in the second, the domestic elasticity of import demand, e_m. The minus signs make the expressions for the elasticities positive (in the absence of Giffen's paradox).

Inserting the elasticities as stated above in the equation, we get the condition for a successful depreciation which is as follows :

$$\frac{\text{M.P}_m}{x.\frac{qx}{r}}[e_m]+[e_x]>1.$$

M.P_m is the value of imports and $x\frac{q_x}{r}$ is the value of exports, both expressed in terms of foreign currency. If trade was balanced at the beginning, the above condition states that the sum of the demand elasticities has to exceed unity, if a small depreciation should be successful. This is the Marshall-Lerner condition. If there is an import surplus, i.e., if $\text{M.P}_m > x.\frac{q_x}{r}$, a small depreciation will still result in an improvement even if the aggregate of the demand elasticities is less than unity. In general, the Marshall-Lerner condition states that depreciation can lower, leave unchanged, or raise the foreign exchange value of exports as the foreign demand curve is less than, equal to, or greater than unity.

As a result of devaluation, costs of import increase. Moreover, increase in the volume of exports sometimes creates an artificial scarcity of commodities and factor in the economy. The overall result of increasing exports, falling imports and increasing cost of import is a rise in the general price level. But to what extent there will be an increase in the general price level depends upon a precise relationship between the different elasticities stated above. Because of devaluation, that is, because of increasing prices of imports, the domestic manufacturing industries get a stimulus to produce more within the country. However, devaluation may be inflationary in its effect. So, there is a question of choosing between price stability (without devaluation) and increase in exports (because of devaluation when a country faces balance of payments difficulties). The ideal

policy would be one of combining devaluation and an anti-inflationary policy. As a principal remedy devaluation may be a desirable policy for a country suffering from a seriously adverse balance of payment and severe unemployment. But regard must be paid to conditions abroad. A second occasion when devaluation may be justified is in the case of a country suffering from an adverse balance of payment, but with good employment position at home. But in this case, devaluation should be followed by some measure of internal deflation if devaluation results in rising prices.

Thus we find that the actual effects of devaluation, and the conditions of success of devaluation are related to the precise relationship between elasticity of demand for and supply of foreign exchange.

Exchange rate changes,—prices of export-type goods change, prices of domestically produced goods constant

If there is a rise in the demand for a country's export-goods because of changes in the exchange rate, prices of export-type goods are likely to be affected. The necessary conditions are that with increase in volume of exports (as when we find depreciation in the external value of currency) the prices of export-type goods rise considerably but that prices of other domestically produced goods should not be affected. When the currency is devalued and there is no scope for further increase in output of the industries producing export-type goods, the prices of export-type goods will definitely rise. The second condition is fulfilled *i. e.*, there will be no increase in prices of domestically produced goods, if there is appreciable unemployment in industries other than the export industries. Alternatively, it will be satisfied when the rise in the prices of export-type goods does not lead to any substantial diversion of domestic demand for them to other domestically produced goods, and when any induced multiplier expansion in the domestic level of activity is relatively insignificant.[1]

Exchange rate changes and the terms of trade

Changes in the exchange rates lead to changes in the terms of trade, *i. e.*, the ratio of the relative prices of imports and exports,

1. A. C. L. Day—Outline of Monetary Economics. P. 396.

in either country. With devaluation of a currency, a deterioration takes place in the terms of trade since imports in that case become dearer in terms of home currency by the extent of depreciation. This also makes imports dearer in terms of exports. Again changes in the internal price levels of exportable goods in each country also affect the terms of trade. In the depreciating country the internal prices of exportable goods rise in reaction to the tendency to increased foreign demand for them because of a fall in their price to the foreigner, which arises from the depreciation. Similarly, in the other country, the internal price levels of exportable goods fall. Changes in the internal price levels of exportable goods in each country acting together may be sufficient to more than offset the effects of exchange rate changes on the terms of trade. *Together, they can cause the terms of trade of the depreciating (home) country to improve, and the terms of trade of the other country to deteriorate.*[1] This is possible when the elasticities of supply of exports in the two countries are considerably low. If the elasticities of supply of exports in the two countries are low enough to cause an improvement of the terms of trade, then its balance of trade must also improve. If again, supply elasticity of exports is zero in one country and is infinite in the other, the terms of trade between the two countries will be unaltered by devaluation of the currency. When the home elasticity of supply of exports is zero and the foreign elasticity is infinite, the effect on the balance of trade between the two countries depends solely on the home elasticity of demand for imports. The effect of the depreciation depends on home elasticity of demand for imports ; as long as this is more than zero the rise in the home currency price of imports obviously restricts the volume of imports and so causes a curtailment of foreign currency expenditure. This indicates an improvement of the balance of trade position of the country.

Prices of Import-competing goods change, prices of other domestically produced goods constant

It is quite possible that changes in exchange rates may affect only the prices of those domestically produced goods which compete with the imports, prices of other domestically produced goods remaining

1. A. C. L. Day—Outline of Monetary Economics. P. 397.

constant. Since export prices in both the countries remain unaltered, the depreciating country suffers from an adverse terms of trade by the extent of devaluation in this context. This is also likely to lead to an adverse balance of trade. In this case, the possibilities of increasing output of import-type goods should be limited. There should also be either substantial quantities of unemployed productive resources available for other domestic industries, or the rise in the prices of imports and import-type goods must not cause any appreciable diversion of demand to domestically produced goods. There should not also be substantial operation of the multiplier effect in the level of business activity. *When export prices remain unaltered and the import prices rise by the full percentage of currency depreciation, terms of trade move against the depreciating country by the full percentage.* Correspondingly, *the terms of trade in the appreciating country improve* by the same percentage.

All prices tending to change

We shall now consider the case where all prices tend to change because of the changes in the exchange rates. If the prices of all goods produced in the depreciating country rise in price and/or if all goods produced in the other country fall in price, the effect on the terms of trade and the balance of trade between the countries, once the final equilibrium is reached, is the same as if there had been a smaller exchange depreciation with no change in price.[1] The effects of a change in the exchange rate on the balance of trade are the consequence of the change in the relationship between home and foreign prices in each country. If overall price change within each country reduces the change in the relationship between the two price levels, the effects on the terms of trade and the balance of trade is the same as if the depreciation had been smaller and there had been no internal price changes.[2]

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1. A. C. L. Day—Outline of Monetary Economics. P. 402-403.
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THE INTERNATIONAL PROPAGATION OF PRICE CHANGES

Business cycles have the tendency to spread internationally ; that is to say, changes in the general price level tend to propagate changes in the price level of other countries. But the *extent* to which they will spread, the *timing* of the speed, and *mechanism* by means of which the propagation may take place are all uncertain. In the first place, the extent to which an upswing or a downswing in one country is spread among other countries is largely governed by the size and the economic diversity of the country of origin. As we shall note, one of the basic mechanisms through which price changes in one country are diffused among other countries is the increase in imports of the country undergoing expansion or decrease in imports of the country undergoing contraction. Increased imports of the home country mean increased exports to other countries, providing the latter with an expansionary force too. Secondly, international propagation of price changes becomes effective particularly in countries of large size. Large countries, particularly the countries which are industrially advanced, tend to generate enough demand for imports visibly to affect the export industries of other countries with cyclical fluctuations in their demand. However, large size by itself is not so important in this context. What is more important in this case is the relative importance of foreign to domestic trade in the country when the expansion or contraction originates. The higher is the ratio of foreign to domestic trade, the more effective will be the impact of the fluctuations in national income of the country in question on the exports of other countries. Much depends on the *nature* of the economy ; that is to say, a primary-producing country and an industrially advanced country will not have the same role in initiating international propagation of price changes.

The medium through which price changes are transmitted from country to country is the foreign trade mechanism. Foremost

among the various elements of the trade balance are the export and import items and capital movements. Exports provide the exporting countries with a source of increased demand and national income while imports provide the outlet through which cycles may spread. Increased imports may also be a damping factor to the upswings of the countries undergoing expansion. International capital movements mean international movements of loanable funds—short-term and long-term credit, which play an important role in the pattern of domestic cyclical fluctuations.

International Propagation of Inflation

Initiation of inflation in a country means an excess of demand over supply resulting in a rise in the general price level. If the transactors react to this defensively, we find an inflationary process. This inflationary process in one country affects the state of business in other countries. Some of the initial increase in government expenditure in the home country is likely to involve additional imports—that is, additional exports of the foreign country. The increased pressure of demand there sets off price rises, which themselves induce further price rises via the defensive reactions of the transactors. But the price movements in both the countries are not necessarily parallel to one another. If the prices rise faster in one country than in another, a shift in the pattern of trade between the two countries occurs.

The country in which the prices are moving rather slowly shifts into a balance of payments deficit, if the sum of the demand elasticities is less than unity. If this sum is greater than unity, it switches into balance of payments surplus. The country having a surplus balance of payments experiences an inflationary pressure. This implies a faster increase in their country and a slower increase in prices in the country having a deficit in the balance of payments. If the sum of elasticities is greater than unity, the acceleration occurs in the country where the rate of rise in prices was tending to fall behind. If on the other hand, the sum of elasticities is less than unity, the faster price rise is accelerated and the rate of rise in prices in the other country tends to fall behind. If there are some transactors in the country undergoing expansion who react to the inflationary pressure passively, the inflationary process in the

country in question will slow down. If an inflationary process results in a reduction of international currency reserve in any country, the country in question may be compelled to take adequate monetary and fiscal measures for controlling the inflationary pressure. International spiral of inflation comes to an end when a country introduces contractionary policies to check it. Any reduction in demand anywhere in the world must slow the inflation down.

International Propagation of Deflation

There is no essential difference between the process of deflationary spending in an economy and the international propagation of depression from country to country. In both cases, the multiplier mechanism transmits fluctuations in income and employment from one country to another. A major deflation in one country will be transmitted to other countries having trade relations with that country through a resulting fall in latter's imports. From the standpoint of other countries this means that their income and employment will contract sharply via the reserve operation of the foreign trade multiplier process. The extent to which a deflation in one country will affect the level of business activity in another depends mainly on the former's marginal propensity to import. On the other hand, a depression abroad is transmitted to the domestic economy through a fall in the volume of exports and resulting multiple contraction of domestic money income. That depends on the strength of the relative elasticities of foreign supply of exports and the home demand for imports.

Trade between Primary producing and Industrial countries

An examination of the mechanism of the international propagation of price changes becomes more analytical when we consider the trade between a primary producing country and a manufacturing country. Let us first consider two cases in turn, one where initiating rise in demand occurs in the primary producing country, and the other where it occurs in the manufacturing country.

When initiating rise in demand occurs in the primary producing country transactors try to buy more goods than initially; government expenditure then increases in real terms. Output being more or less constant in the primary producing country, the only way

in which the transactors can maintain expenditure at a higher level in real terms is to run a balance of payments deficit. This may take place in two ways. The primary producing country in these circumstances can import more goods from the industrial country and the industrial country can import less goods from the primary producing country so as to release more primary products for purchasers within that country. In either case, the primary producing country can secure equilibrium between total demand and total supply if there is a deficit in its balance of trade by an amount equal to the value of the initiating rise in its total expenditure because of increased demand. Changes in the economic condition of the primary producing country have induced effects on the level of business activity in the industrial country. The industrial country also will have to raise the level of output as there will be an increase in the volume of exports to the primary producing country and as that country will cut its import from the primary producing country. These phenomena will affect the level of output, income and employment of the industrial country. The change in the level of activity in the manufacturing country depends solely on the marginal propensity to save in that country and on the size of the initiating rise in total expenditures in the primary producing country because of increased demand in that country.

The way of change in the price level in the primary producing country in the new equilibrium level depends on each country's elasticity of demand for the products of the other. If the sum of demand elasticities is greater than unity, an initiating rise in demand in the primary producing country leads to a rise in price in that country. The extent of the change in the price level in the primary producing country also depends upon the marginal propensities to import and to save in each country. The rise in prices is the smaller the larger is the sum of the demand elasticities (assuming that it is greater than unity). A relatively rise in prices leads to a relatively big switch in demand if the elasticities are large. The rise in prices will also be smaller the larger is the marginal propensity to save and the smaller is the marginal propensity to import in the industrial country. Finally, the rise in price level will not be significantly large if a great proportion of the initial rise in the primary producers' expenditure flows immediately into imports.

When the initiating change is a rise in demand in the industrial country, the balance of payments in the new equilibrium situation must necessarily be at the original position of a zero balance. Any increase in demand for primary products in an industrial country can be satisfied by an equal reduction in the quantity of primary products brought by the people in the primary producing country. The first effect of an increase in expenditure in the industrial country is on its imports. The increase in expenditure has also two induced effects. One is that there is an induced increase in the level of business activity in the industrial country. The second is that there is a relative change in the price level. The smaller is the marginal propensity to save, the larger is the induced increase in the level of business activity in the industrial country.

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18

INTERNATIONAL CAPITAL MOVEMENTS

We find international capital movements when residents of a country and/or its government acquire claims against foreigners or foreign governments, or when they acquire real assets abroad. Capital movements may be classified in various ways. They may be divided into "*induced and autonomous*", "*stabilizing and destabilizing*", "*real and equalizing*", "*abnormal and normal*", "*equilibrating, speculative, income and autonomous*" movements. The most usual division, however, is into short-term and long-term movements. It is very difficult to draw rigid line of demarcation between these two. But sufficiently clear distinctions can be made. There are two distinctions between long-term and short-term capital movements that are important for our purpose. One way of distinction is to ask whether the transaction involves short-term claims (of less than a year's maturity) such as bank deposits or bills, or whether it involves long-term credit instruments or fixed real assets. The other way of distinction is to see whether the capital movement is durable or not ; if it is likely to be reversed quite quickly it is a short-term movement ; if not, it is a long-term capital movement. In a broad sense, these categories coincide, but in detail they do not. Temporary shifts of capital may involve long-term assets (such as purchases of long-term securities and shares) ; relatively permanent movement may use very liquid claims such as bank-deposits.

Short-term Capital Movements

There are three main reasons for short-term capital movements, *viz.*, changes in relative rates of interest, expected changes in exchange rates and other expected changes relevant to the interest rate changes and exchange rate changes. When exchange rates are quite stable, changes in the interest rates can induce short-term capital movements. When the short-term interest rate (*i.e.*, rates on bills or bank lending rates etc.) rise in a country, the cost of borrowing from that country rises and it is

advantageous on the part of that country to lend to other countries. Banks and other financial institutions then choose to lend to the country with high short-term rates of interest. If, again, the long-term interest rates rise in a country, speculators may be induced to purchase its bonds in the belief that the change will be reversed shortly. Complications arise in this context when exchange rates do not remain stable. Prior to the First World War, exchange rates remaining stable, changes in interest rates were sufficient to initiate short-term capital movements. On the gold standard, short-term capital movements had two functions, one in the balance of payments and the other in the banking system. When a short-term capital movement gives rise to a gold flow as it would often do under the gold standard system, the two items have opposite roles in the balance of payments. A capital outflow involving an outflow of gold marks a deficit in the balance of payments. An inflow of gold indicates balance of payments surplus. When the short-term capital movements are substitutes for a gold movement, they have the same sign. Under gold standard prior to the First World War, the changes in exchange rates were limited by the so-called *gold-points*, which were the *exchange rates at which purchases and shipments of gold in one direction or the other became profitable.* In these circumstances, changes in the rates of interest were the most important influence on short-term capital movements. An increase in the short-term rate of interest would attract funds in a country. But changes in exchange rates during the First World War and after the War and the abandonment of the gold standard led to some uncertainties about the exchange rate movements. The effects of changes in interest-rates on short-term capital movements would no longer be predicted with confidence. In addition to changes in exchange rates, other expected changes like fears of political changes, war and exchange control also exert their influence on short-term capital movements.

An increase in the rate of interest is taken not as a sign of strength indicating the readiness of the authorities to protect the balance of payments but as a sign of weakness, and as a preliminary to eventual currency depreciation.[1]

1. Kindleberger—International Economics.

Under destabilizing speculation, an import surplus leads to capital outflow and increased loss of reserves rather than to the inflow which would finance the balance of payments on current account and to no movement of reserves. An export surplus, on the other hand, leads to capital inflow bringing about an addition to gold and exchange reserves and excess banking reserves. Short-term capital movements came to be regarded in the inter-war period as a menace to international stability.

Long-term Capital Movements

The influences which operate on short-term capital movements are also important in shaping the long-term capital movements. Expectations of exchange rate changes, either in the near or in the distant future, influence the willingness to acquire long-term claims or take upon liabilities expressed in foreign currency. Changes in the relative interest rates are also relevant to the long-term capital movements. If the long-term rates of interest rise in a country, there is every reason to believe that foreigners will tend to lend more to that country. A rise in interest rates in a country, if it does not induce expectations of still further rises, attracts long-term capital to that country. Again, other things remaining equal, a high level of interest rates in one country is likely to attract an appreciable proportion of the new flow of savings into the long-term capital markets of the world. High interest rates relative to other countries lead to a *continuing* attraction to capital flow into a country.

Long-term movements of risk capital take place on a larger scale ; the more prosperous business is found in a foreign country compared with business in the lending country, and the more favourable prospects in the foreign country compared with those in the lending country.

Effects of Capital Movements on Income level and the Balance of Payments

Capital movements affect the income levels mainly in two ways, namely, by aiding the maintenance or raising of levels of real income and expenditure in the borrowing country and the maintenance or raising of real income level in the lending country.

When a country faces a deficit in the balance of payments, it is generally compelled to reduce its real income and expenditure. But a foreign loan may, in that case, enable that country to avert the crisis and not to reduce the real income and expenditure because of a balance of payments deficit. Alternatively, a country may be enabled to raise its total expenditure upto a level that would not have been possible if there would not be the creation of a deficit in its balance of payments. It may be then in a position to import more consumer goods or capital goods. A balance of trade surplus leads to higher level of activity and income in the lending country if it has not yet attained full employment. Again, if the lending country has already reached the stage of full employment, it can maintain its position if the savings coming forth at that level are invested abroad.

International capital movements can increase the level of income both in the lending and in the borrowing countries when they initiate certain expenditures which would not have otherwise taken place. If full employment exists in both the lending and the borrowing countries and if, therefore, no additional expenditure takes place because of international loans, the borrowing country tends to move into a balance of payments surplus and the lending country tends to be a balance of payments of deficit. The current balance, of course, remains unchanged since there is no net increase in total expenditure.

International loan can also indirectly induce changes in balance of payments of the lending and the borrowing countries. If the borrowing country spends the entire amount of the loan on imports from the lending country, the lending country tends to move into a balance of trade surplus and the borrowing country tends to move into a balance of trade deficit. These changes in the balance of trade positions of the lending and the borrowing countries effect their respective balance of payments position. Of course, the strength of this influence depends upon the elasticity of the borrowing country's demand for imports and the elasticity of lending country's supply of exports. If there are unemployed resources in the lending country the balance of trade surplus leads to a multiplier increase in the level of income, output and employment. If these conditions persist long enough to reach the final condition of

equilibrium, there will be shifts in the pattern of trade between these two countries because of an ultimate increase in income in both the countries. If ultimately, there is an increase in the level of income in the borrowing country because of the proper investment of its borrowed funds its balance of trade deficit will be reduced leading to an improvement in its balance of payments position.

References :—

1. Kindleberger—International Economics, Ch. 17.
2. A. C. L. Day—Outline of Monetary Economics, Ch. 33.
3. Hamberg—Business Cycles, Ch. 10.

19

DIRECT CONTROLS AND THE BALANCE OF PAYMENTS

In the earlier chapter we have seen that balance of payments of a country is affected by the changes in the level of income, the changes in the price level and the changes in interest rates. So, if these forces are brought under control, the government can control the balance of payments indirectly. But the government can control the balance of payments *directly*. Direct controls may be broadly classified into exchange controls, physical controls and fiscal controls.

Different types of disequilibrium in the Balance of payments

There may be different types of disequilibrium. *Cyclical disequilibrium* occurs either because the patterns of business cycles in different countries follow different paths, or because income elasticities of demand for imports in different countries are different.

Secular disturbances to equilibrium are those which occur because of long-run and deep-rooted changes in an economy as it moves from one stage of growth to another. In the early stages of development, domestic investment tends to exceed domestic savings, and imports to exceed exports. Disequilibrium, under these circumstances, may arise because insufficient capital is avilable to finance the import surplus. At a further stage of development, domestic savings tend to exceed domestic opportunities for investment, and exports outrun imports. Disequilibrium may be due to the fact that long-term capital outflow falls short of the surplus savings or because surplus savings exceed the investment opportunities abroad. At a still further stage, when savings are equal to domestic investment and capital movements in the long-run are, on balance, zero, it may be regarded as a sign of disequilibrium. Structural disequilibrium at the goods level takes place when a change in demand or supply of exports or imports causes a change in the previously existing equilibrium, or when it is found that a change has taken place in the basic circumstances under

which income is earned or spent abroad, in both cases without the requisite parallel changes elsewhere in the economy.[1]

Structural disequilibrium at the factor level takes place when factor prices fail to reflect accurately factor endowments. The disequilibrium may not appear directly in the balance of payments. The economy may adjust to the factor prices as they are, or exports and imports level of income and exchange rate so that the balance of payments is in equilibrium at those factor prices. The result, however, will be that one or more factors have structural unemployment.[2]

There may also be income disequilibrium. Two types of income changes may create balance of payments difficulties, *viz.*, (*i*) those that occur independently in one or more countries, and (*ii*) those that are linked together through the international propagation of the business cycle. An independent change in income in a given country may be inflationary or deflationary.

It is very difficult to define fundamental disequilibrium. Let us, however, examine the fundamental disequilibrium.

Fundamental Disequilibrium

There has been a great controversy as to the correct diagnosis of fundamental disequilibrium. It has been laid down in the agreement of the International Monetary Fund that a member country shall not propose a change in the par value of its currency except for correcting a fundamental disequilibrium. It has also been laid down that the Fund shall concur in a proposed change if it is satisfied that the change in the par value of the relevant currency is essential for correcting a fundamental disequilibrium. But the Fund Agreement has no where defined fundamental disequilibrium.

According to Prof. Haberler,[3] fundamental disequilibrium should be defined in terms of an objective, unambiguous and observable criterion, and that criterion is an actual deficit in the

1. Kindleberger—International Economics, p. 534.
2. Ibid. p. 542.
3. Haberler's article in the *Review of Economic Statistics*, Nov. 1944, (Pages)—171-81.

balance of payments. But Prof. Hansen[1] argues that an actual deficit in the balance of payments is not a satisfactory criterion on the basis of which the existence of fundamental disequilibrium can be determined. According to him, a deficit in the balance of payments is no proof of the country's exchange rate being out of line. It may be due to an unbalanced structure of production. If a balance is sought to be brought about by exchange depreciation, it may serve to perpetuate a serious distortion in the structure of the economy. This view of Hansen has also been supported by Ragnar Nurkse[2] when he says that balance of payments equilibrium is not the sufficient criterion of the equilibrium rate of exchange. Judged by this criterion alone, there would be no justification for regarding the British pound sterling as overvalued during 1925-30.

The home level of unemployment and its magnitude as compared to that in a foreign country should be duly taken into consideration before fundamental disequilibrium is determined. Broadly speaking, we should take into consideration at least four factors before determining whether a country has been suffering from fundamental disequilibrium. (i) The presence of abnormal movements of gold and/or of equalising short-term capital movements; (ii) the length of time the country has been suffering from an imbalance in its current account; (iii) the extent to which the country has been forced by the pressure on its balance of payments take recourse to additional restrictions on imports; and (iv) the level of employment and the extent to which the fall in employment has been due to the pressure on its balance of payments. After these conditions have been duly examined, it will be necessary to examine how far this disequilibrium is of the structural kind and how far it is capable of being remedied by a suitable adjustment in its rate of exchange.

The common view about the existence of a fundamental disequilibrium in any country refers to *sustained imbalance in the*

1. Hansen's article, "A Note on Fundamental Disequilibrium" in the *Review of Economic Statistics*, Nov. 1944, pp. 182-83. Reprinted in his book, "America's role in World Economy."

2. See Ragnar Nurkes's article in '*Readings in the theory of International Trade*'. (A. E. A)

member country's current international accounts, which ought to reflect itself also in price and production data, monetary and banking statistics, etc. apart from the balance of payments.

Direct controls affecting the Balance of Payments

Generally, a government takes recourse to direct controls for checking the fundamental disequilibrium.

We have already pointed out that there are three types of direct controls affecting the balance of payments, *viz.*, exchange controls, physical controls and fiscal controls. In case of exchange control, the task is to restrict imports to the level of exports directly or to impose more comprehensive exchange control if it is necessary to limit expenditure on foreign services and restrict the movement of capital as well. In the process of controlling imports both prices and national income are affected. A restriction of imports will raise prices in the market which has reduced supplies and will lower them in the export market, where they become redundant. Restriction of imports also affects national income. Physical controls imply controls over the movements of goods meaning the same thing as exchange control except that it has got no control over movement of money. Fiscal controls involve the application of taxes or subsidies to certain kinds of imports and exports.

Foreign exchange restrictions may be divided into two basic types and a third mixed category. The first is quantitative, in which foreign exchange is rationed by amounts of currencies or types of imports. The second is cost, under which the foreign exchange used for certain purchases is limited by the necessity of effecting a clearing of demand and supply at a price reached by the market. The mixed system allows certain categories of transactions quantitatively restricted licence to go forward at a fixed rate while other types take place at rates determined by market forces.

Effects of Tariffs

Tariffs have seven effects, *viz.*; *the protective effects, the consumption effect, the revenue effect, the redistribution effect, the terms of trade effect, the employment effect and the balance of payments effect.* Protective and consumption effects of tariff can be illustrated in both general and partial equilibrium. The protective, consumption,

revenue and redistribution effects of a tariff in partial equilibrium can be shown by the following diagram :—

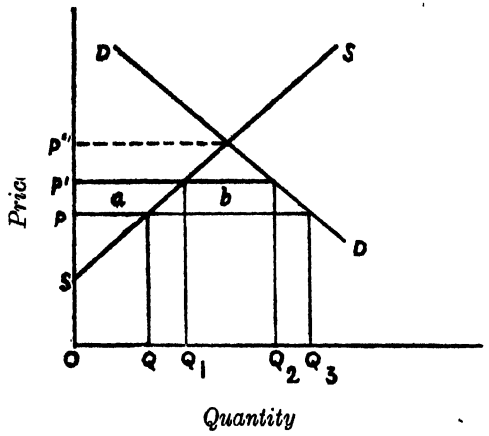

Fig 83

$Q-Q_3$ represents imports at the price OP prior to the imposition of a tariff. PP' indicates the tariff. The protective effect is shown by the increase in domestic production $Q-Q_1$. The consumption effect is the reduction in total consumption, Q_2-Q_3. The revenue effect is the money amount received by the government on the new level of imports, the rectangle *b*, and is derived from multiplying new imports, Q_1-Q_2, by the tariff, $P-P'$. The redistribution effect is the quadrilateral *a*, which is the additional producers' surplus.

The size of the protective effect, relative to a given tariff, is determined by the elasticity of the supply curve. If the supply curve is highly elastic, the protective tariff will be large ; if inelastic, small. A tariff should not be encouraged when the protective effect is sufficient to raise the domestic production to the extent where it will satisfy domestic demand without imports. In the above figure, if the tariff is PP'', all imports will be kept out.

The protective effect of an import duty is favourable for an industry or a region dominated by a single economic activity. The consumption effect is almost always unfavourable. The infant-industry argument in favour of tariff is often abused. A tariff for revenue only is one where the protective effect and

the redistributive effect are missing. The income effect of tariffs may be stated thus : a tariff shifts the import schedule downward by raising import prices. So, the consumers shift their purchases to home-produced, import-competing goods. This leads to an increase in income by an amount which is a multiple of the decline in imports at the starting level of income. The gain in employment brought about by the increase in national money income in the tariff-imposing country is achieved at the expense of a decline in national income and employment abroad in view of the fact that the exports of the foreign country are cut off.

Effects of Tariffs on Employment

According to the supporters of free trade tariffs involve unemployment in the export industries in the long run. But the supporters of tariffs argue that unemployment is not necessarily found in export industries even when exports fall off in the long run. The new home demand creates employment opportunities. According to Prof. Haberler,[1] a favourable result of tariffs can be expected only in the short run. When employment is due to friction, tariffs cannot appreciably reduce unemployment. Cyclical unemployment can be tackled by tariffs to some extent within certain limits. As Scitovsky[2] points out, tariffs can influence the level of employment through the following factors : (1) the value of imports net of tariffs, (2) the value of exports, (3) the shape of the propensity to consume. (4) the rate of interest and (5) the marginal efficiency of investment.

The imposition of tariffs always diminishes the value of import and on the ground always increases employment and income. The impact effect of tariffs to create an export surpluls is sometimes of short duration. A change in tariffs tends to raise or to lower the level of employment according as it makes the distribution of income more or less unequal. Since tariffs always diminish the value of imports they always raise the liquidity of the banking system. This leads to a fall in the rate of interest which tends to stimulate the domestic level of investment and employment.

1. Haberler—Theory of International Trade.
2. See the article of Scitovsky in Readings in the theory of International Trade (A. E. A.).

Tariffs also affect the marginal efficiency of investment when they alter the relationship of the prices of industry's output and the capital equipments required for producing the output. An import duty increases the marginal efficiency of investment in industries producing commodities which are close substitutes for those affected by the duty. Similarly an import duty diminishes the marginal efficiency of investment in industries which make use of imported goods. These phenomena affect the level of investment and employment. If the unemployment is concentrated in the export industries, tariffs cannot solve the problem.

Tariffs and Economic Development

Tariffs play an important part in financing the economic development of an underdeveloped economy. The revenues derived from tariff can be utilised for financing economic development. Again, tariffs are essential for reducing the deficit in the balance of payments which an underdeveloped country is likely to have when she is moving towards economic development. Tariffs can improve the terms of trade as well as the balance of trade, and this role of tariffs is important for a country seeking economic development. The out-flow of foreign exchange from such a country can be checked by tariffs. By imposing tariffs on certain imports the indigenous industries, particularly the infant industries, can be protected and thus they can contribute much to the increase in output and employment of the country.

Effects of tariffs on terms of trade

The Government imposing the direct controls is entitled to have some revenue accruing from tariffs. Restrictions on imports in the home market lead to a rise in the home prices of imports. The revenue resulting from this increased home prices of imports may be obtained either by the foreign exporters (who may raise the selling prices of these goods) or by the traders at home. If the revenue arising out of restrictions on imports is obtained by the foreigners, there is a deterioration in the terms of trade of the home country. If again the elasticity of demand for imports on which restrictions have been imposed is less than unity, the balance of trade tends to become unfavourable. Normally restrictions on imports are imposed

in such a way that it yields revenue to the country imposing the restrictions. With this assumption we find either a gap developed between the price paid to the foreigners for imports and the price paid by home users (in addition to the normal gap resulting from cost of transport, normal profits of importers, etc.) or some sort of rationing at home. These consequences suggest that balance of payments in these cricumstances cannot be improved if there is no adverse movement in the terms of trade. Rationing of imports and rise in home prices of imports lead to a fall in home demand for imports. If the foreigners maintain a constant selling price of their exports when the demand for their exports falls the terms of the home country remains unchanged. If, again, the foreigners reduce the prices of their exports because of a fall in demand for their exports, the terms of trade of the home country are improved.

Tariffs can improve the terms of trade both in the partial equilibrium and in the general equilibrium. If tariffs raise the price in the importing country and partly lower the price in the exporting country, there is an improvement of the terms of trade of the importing country. We should first understand what is meant by terms of trade.

Terms of Trade

The terms of trade in the Marshall—Edgeworth two country—two commodity model is the price line OP which passes through the point of intersection of the two offer curves in the following figure.

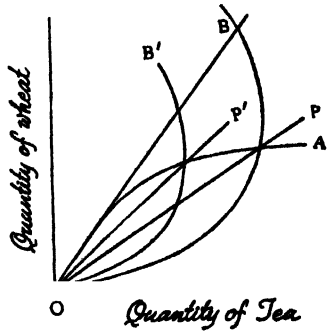

Fig. 84

A and B are the offer curves of America and India respectively. A shift of the price line from OP to OP' as might occur if India

would experience a decrease in the demand for wheat, which would shift her offer curve from OB to OB', would be a favourable shift in the terms of trade. A shift in the other direction, however, would be unfavourable. The above diagram indicates the terms of trade under conditions of general equilibrium.

The ratio of export prices to import prices in a later period as compared with an earlier period is called the "*net barter terms of trade.*" In algebraic form we can express it as :

$$\frac{Px_1}{Pm_1} \cdot \frac{Px_0}{Pm_0}$$

where Px is the price of export and Pm is the price of import.

The net barter terms of trade has got nothing to say about what has happened to the balance of payments. To make up for part of this deficiency, the gross barter terms of trade were developed by Prof. Taussig to relate the quantities of exports and imports exchanged for one another in a subsequent period as compared with an initial period That is to say,

$$\frac{Qx_1}{Qm_1} \quad \frac{Qx_0}{Qm_0}$$

where Qx and Qm imply quantity of exports and quantity of imports respectively.

Prof. Viner has developed the concepts of "*single factoral*" terms of trade and the "*double factoral*" terms of trade including productivity as a factor. The *single factoral terms of trade* indicates the price of imports relative to the price of exports adjusted for changes in the productinity of a country's factors in the production of exports. The *double factoral terms of trade* takes into consideration as well the increase in efficiency of foreign factors in producing import goods. Prof. Robertson has characterised the single factoral terms of trade as the most significant of all terms of trade concepts. It indicates the rate at which the services of a country's factors are exchanged for goods from foreign countries. In case export prices fall relative to import prices, but productivity increases significantly, a country is definitely better off in real terms. The net barter terms of trade are inadequate measure of gains from international trade under conditions of increased efficiency.

Let us further examine how tariffs can improve the terms of trade in general equilibrium. The following figure shows a pair of offer curves OA and OB of the country A and country B, respectively, which intersect at P. This gives a price OP between the two commodities, say, wheat and cloth. A tariff imposed by the country

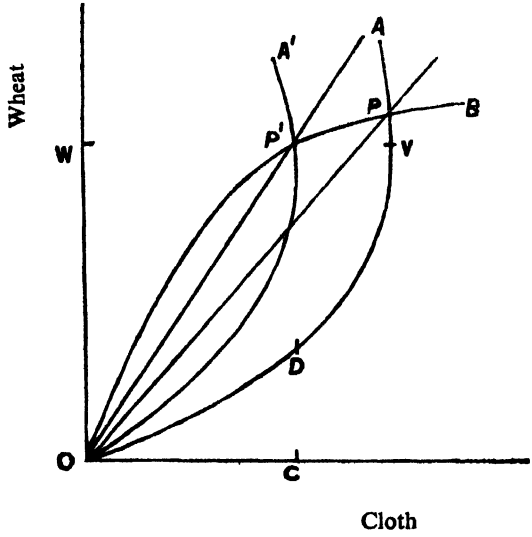

Fig. 85

B on wheat from the country A may be represented by a new offer curve, OA'. The curve OA' may represent either an import tax on wheat from the country A or an export tax on cloth of the country B. For OW of wheat, for example, it would previously offer WV of cloth but now offer only WP', collecting P'V in taxes. Or it would be prepared to offer OC of cloth for DC of wheat whereas now it requires P'C in wheat, collecting P'D as tariff. The shift of the offer curve from A to A' changes the terms of trade from OP to OP'. This is an improvement of the terms of trade of the country B. The gain in terms of trade from imposing a tariff depends on the elasticity of the foreign offer curve. If the foreign offer curve would be completely elastic, a straight line from the origin with the slope of OP, the imposition of a tariff would cut down trade but would leave the terms of trade unchanged.

1. A. C. L. Day—Outline of Monetary Economics, P. 456.

But there may be mutual retaliation. If Britain can improve the terms of trade by imposing a tariff, so can the United States. The following figure shows such a case.

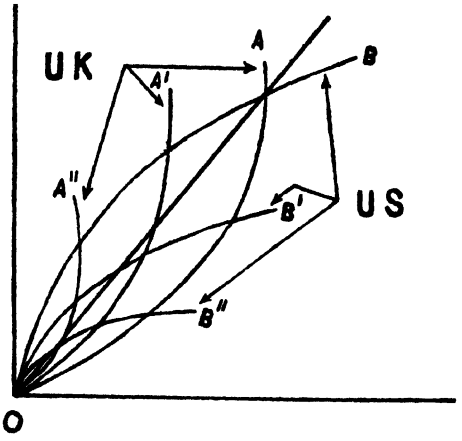

Fig. 86

In this figure we find that tariffs have been imposed by Britain and the United States in retaliatory sequence and these are indicated by OA, OA', OA'', and OB, OB', OB''. curves. These tariffs leave the terms of trade unchanged at the end but greatly reduce the volume of trade. This system of tariffs ensures that both countries lose, and reciprocal removal of tariffs, on the other hand, enables both countries to gain.

Optimum Tariff

Imposition of a tariff improves the term of trade when the foreign offer curve is elastic. But the tariff should not be raised too high, the loss in the quantity of trade will not outweigh the improvement in the term of trade. So, we should be in search of an optimum tariff. The following figure (No. 87) shows the offer curves of India (A) and the United States (B) in terms of tea and wheat, together with the relevant Trade-indifference curves of the two countries, 1, 2, 3, 4, 5, 6, 7, for India, and i, ii, iii, iv, v, vi, vii for the U.S.

As the tariff will be imposed, India's offer curve will shift from A to A' holding the origin at O. The new Indian offer curve will

intersect the U. S. offer curve at P' and produce new terms of trade OP' (which has not been drawn in the above figure). They will also

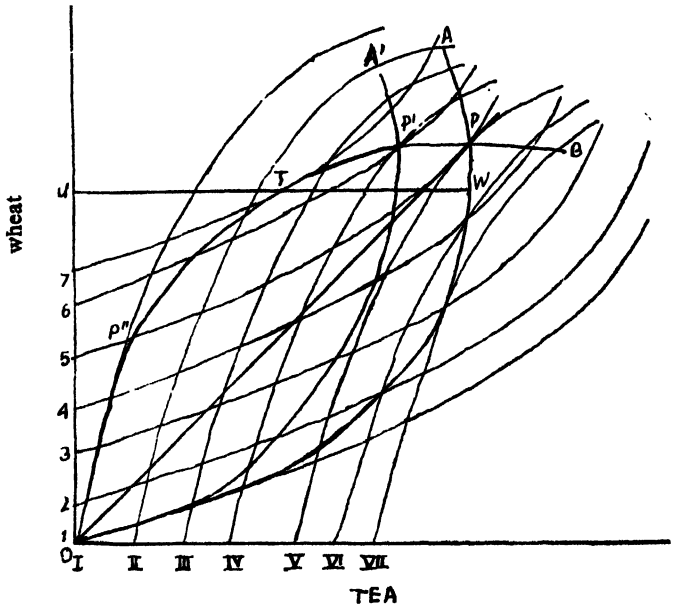

Fig. 87

push up India on a higher trade indifference curve (No. 6) and set the U. S. back to a lower indifferenc curve (No. IV).

A still higher tariff which will again create a new offer curve for India so that it intersects the B offer curve at P'' would keep India on the trade indifference curve (No. 5). Between these is the point (T), when the U.S. offer curve is tangent to the highest possible trade indifference curve of India (7). Here, the tariff is larger than our first, but it is smaller than the limiting tariff at P'' which would mark the U. S. indifferent whether it trades or not.

In the next diagram (fig. 88) point T is on the U. S. offer curve (B). At this point, the U.S. is willing to trade TQ of wheat for OQ of tea.

But the price line OT which is implied here has not been tangent to Indian trade indifference curve, and India will not be in

equilibrium if she trades OQ of cloth. India will trade at T only at a price tangent to its trade-indifference curve at T. In the Figure

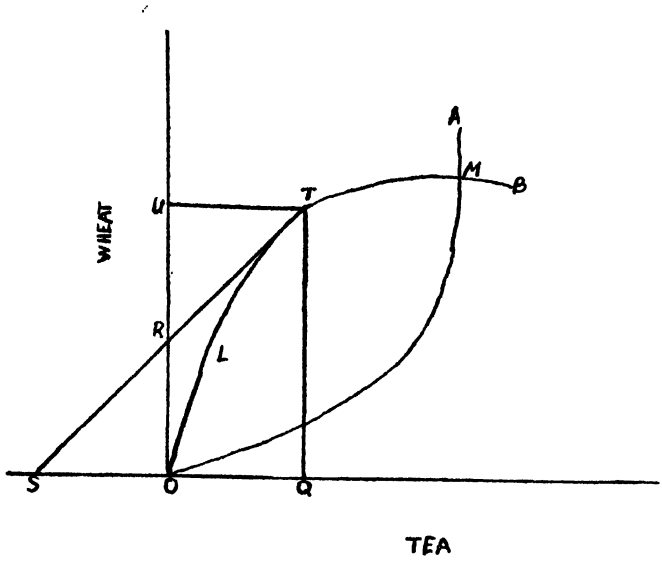

Fig. 88

No. 88 we have drawn such a tangency and extended it to the vertical axis at R to the horizontal axis at S. For India, this is the equilibrium price. India will trade at ST and the U.S. at OT, if exports of tea OQ are subject to an export tax of $\frac{SO}{OQ}$ in India, or imports of wheat UR are subject to an import tax of $\frac{RO}{UR}$.

For measuring the elasticity of the U.S. offer curve B at T, we draw a tangent at a given point and extend it to the vertical axis for the B offer curve and the horizontal axis for OA. We also drop a straight line, UT to the relevant axis. The elasticity of the offer curve at T is represented by the distance from the point of intersection of the straight line on the vertical axis to the origin (UO) divided by the distance from the intersection of the tangent to the origin RO. If R is at the middle point between U and O, the elasticity of the B offer curve at T is 2. If the offer curve is a straight line from O to L, the elasticity at L is infinity. The elasticity

of the offer curve at M, where the tangent and the straight line are identical, is one. If the B offer curve is downward-sloping after M, its elasticity is less than one since the tangent intersects the vertical axis farther from the origin than the straight line to the axis.

Now we can state the formula for the optimum tariff. If T is a point on B's offer curve which touches the highest trade-indifference curve of A, the optimum tariff at point T is $\frac{SO}{OQ}$. Since OQ = UT, by similar triangles we have :

$$\frac{SO}{UT} = \frac{RO}{UR} = \frac{1}{UR/RO} = \frac{1}{(UO-RO)/RO} = \frac{1}{UO/RO - 1}$$

Since $\frac{UO}{RO}$ is the elasticity of the offer curve at point T, the optimum tariff is :

$$\frac{SO}{OQ} = \frac{1}{UO/RO - 1} = \frac{1}{e-1}$$

Discriminatory Exchange Control

Some exchange controls discriminate by currency, some by commodity and some by both. Discriminatory exchange control implies that stronger restrictions are deliberately placed on some kinds of transactions than on another. It is discriminatory when a purchaser is required to buy at a price dearer than another cheaper price or when a seller is required to sell at a price cheaper than another dearer price, or when a seller or a buyer is prevented from selling or buying respectively at any price. Discrimination may be by *commodity*, *by use* or *by origin*. A tax or a restriction may be imposed on imports of some kinds of commodity or on imports of a particular commodity that may be allowed for a particular purpose, or higher duties may be imposed on imports from some specific countries than from others. There may also be discrimination in exports and on invisible items. A multiple exchange rate system can discriminate by commodities, by countries or both.

Effects of Tariffs on Balance of Trade

An improvement of the terms of trade of the home country, because of the fact that the foreigners have reduced the prices of

The analysis of the optimum tariff has been fully based on Kindleberger's analysis in the Appendix F to his International Economics.

their exports, leads to an improvement of its balance of trade, since for a smaller total quantity of imports, less is paid to foreigners per unit of imports. Thus we find that import control is a means of improving the balance of trade position of an economy. But if the foreign elasticity of demand for home country's exports is greater than zero, exchange devaluation is preferable to import control as means of securing an improvement in the balance of trade.

If the prices of home-produced goods remain unchanged in each country inspite of direct controls, terms of trade remain unchanged. But the improvement in the home balance of trade resulting from this phenomenon leads to increased expenditure on home-produced goods and so to an expansionary process at home ; the induced effects on investment and interest rates being ignored. In the similar manner, the deterioration in the balance of trade in the other country leads to a contractionary process in that country. These two processes interact through the operation of the foreign trade multiplier. The balance of trade shows an improvement in the country imposing controls, and the level of business activity also rises in that country. Control over disequilibrating short-term capital movement through the banking mechanism and an exchange equalization account tend to neutralize violent disturbances in the balance of payments caused by these movements. Control over long-term capital movements also can be justified on the ground of preventing "quasi-permanent movements of 'flight' capital, such as the movements in the thirties from Europe to America because of political fears."[1] If the capital movements are brought under control of the Government or of the Central Bank of a country, the country concerned gets the opportunity of following an independent monetary policy.

Multiple Exchange Rates

The device of maintaining multiple exchange rates originated in Germany in the early thirties. The simplest of multiple exchange rate systems is one employing only two rates, an official rate (usually an overvalued one) for permitted transactions, and a free rate for all others. On the supply side, official rate is

1. A.C.L. Day—Outline of Monetary Economics, P. 46).

confined to exports capable of holding their markets even at an overvalued rate. On the demand side, imports of basic requirements alone are usually permitted at the official rate. All transactions other than those permitted at the official rate take place at the free rate.

Multiple exchange rate system permits the abandonment of quantitative restrictions and licensing. This system substitutes a system of rationing demand by cost or price for rationing of imports by quantitative restrictions on supply. Multiple exchange rates are in essence a form of partial devaluation. Consequently, foreign exchange is less scarce than it would be with a single but overvalued rate. Despite some advantages over exchange control with devaluation whatever, multiple exchange rates have the defect of introducing an additional element of complexity. Moreover, we often find inefficient use of resources resulting from the combination of taxes and subsidies implicit in this system. So multiple rates are, however, only a halfway house to devaluation, and introduce uncertainties and distortions of their own.[1]

Purposes of Discriminatory Controls

Discriminatory controls may be imposed simply on political grounds. Colonies may be compelled (as was the case in India when the system of Imperial Preference was introduced in the thirties of the present century) to discriminate in favour of the parent country, or it may be considered desirable to favour political allies in imposing economic controls if discriminatory controls are likely to be more beneficial to the balance of payment of a country than controls which are non-discriminatory. Again if discriminatory controls enable a country to maintain its trade at a very high level which would not have been possible without such controls, there is a good case in favour of discriminatory controls. The actual structure of discrimination depends largely on the pattern of world trade and payment.

It is obvious that the primary purpose of any control, discriminatory or non-discriminatory, is to improve the balance of payments position of a country. Discriminatory controls may also aim at checking capital flight and increasing the gains from

1. Ellsworth—International Economy (Macmillan. 1958) P. 348.

international trade. These controls enable a country to secure increasing amount of foreign exchange.

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1. Kindleberger—International Economics.
5. Meade—Balance of Payments.
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4. Hansen—America's role in World Economy.
   Appendix on "A note on fundamental disequilibrium."
5. International Currency Experience—Article of Ragnar Nurkse (League of Nations Publication).
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8. Readings in the Theory of International Trade (American Economic Association)—Article of Scitovosky.

20

RECONCILIATION OF EXTERNAL BALANCE AND INTERNAL BALANCE

External balance means balance of payments stability *i.e.*, a situation in which a country is neither in balance of payments deficit nor in balance of payments surplus. Unlike internal balance, external balance is inevitable in the long run since no country can remain either in balance of payments surplus or in balance of payments deficit indefinitely. External balance in special cases may also be regarded as meaning an optimum stock of currency reserves. If there is an excess currency reserves, the country is in balance of payments surplus, and if there is a deficit in the volume of currency reserves the country faces balance of payments deficit.

External balance may be static or dynamic. In static balance, exports equal imports. In this case with $X=M$, $S=Id$ because $X+Id=S+M$, where X stands for exports, M stands for imports, S stands for saving and Id stands for domestic investment. There is no change in the balance of payments arising out of changes in income or domestic expenditure. In secular or long-run external balance, we are concerned with stages of development. Here long-term capital movements of normal character are required. The condition of dynamic external balance for short periods of time is that export and imports differ by the amount of net short-term capital movements or net gold movements and that there are no large destabilizing short-term capital movements. The condition for dynamic external balance in the long-run is that exports and imports differ by the amount of long-run autonomous capital movements made in a normal direction, *i. e.*, from the low-interest rate country to a country with high interest rate.

There are four methods of securing an external balance, *viz.*, (i) changing the monetary and fiscal controls, (ii) changing the level of relationship between prices of home-produced and foreign-produced goods, (iii) changing the flow of long-term lending and

(iv) changing the intensity of controls. We shall now examine these methods.

Four methods of attaining external balance

The first of the methods which enable an economy to attain external balance refers to monetary controls like interest rate changes, fiscal controls like changes in the tax structure and budgetary system and internal direct controls like changes in investment controls.

The second method for attaining external balance is to change the terms of trade either by changes in exchange rate or by securing changes in internal price levels. The major disadvantage of the method of changing relative prices for attaining external balance is that there is no guarantee that exchange depreciation will always improve the balance of payments of a country. To what extent devaluation leads to an improvement in the balance of payments depends upon the relative elasticities of demand for and supply of currency. If the pattern of demand elasticities is such that although the depreciation improves the balances of trade and payments, it throws another country into balance of payments difficulties ; and if this second country deals with its difficulties, the first country finds itself in difficulties once again. If exchange depreciation fails to solve the balance of payments difficulties, an appreciation of the exchange rate may be somewhat desirable. Appreciation of the exchange rate leads to an improvement of the terms of trade.

A currency appreciation is justified for securing external balance in the fallowing cases : when a country suffers from severe unemployment with a balance of payments surplus, the proper remedy lies in the domestic sphere in the form of interest rates, budget-deficits, etc. If after employment reaching maximum, a surplus in the balance of payments still remains, then the proper remedy is an appreciation of the currency. If we find a severe inflationary pressure with a deficit in the balance of payments, the first remedy should be internal deflationary measures. If these result in producing a surplus in the balance of payments, then currency appreciation is to be adopted as a secondary remedy. But if with the elimination of inflationary pressure the balance of

payments still continues to be adverse, then some devaluation may be justified. But even in this case so long as inflationary pressures exist, devaluation would actually complicate the situation instead of providing a solution. It is in the background of this case that Prof. Harrod[1] condemned the British devaluation of 1949. Since devaluation was wrong at the time, Harrod advocated an appreciation of the sterling in terms of dollar. This would help the efforts of the authorities towards the elimination of inflationary pressures at home. The experiences of exchange rate adjustments in different countries reveal that acceptance of a policy of appreciation or depreciation of currency demands a certain degree of theoretical sophistication and a certain degree of confidence in one's assessment of the smallness of the demand elasticities. Again, there remains the difficulty that if the sum of the demand elasticities is unity or very near to it, then neither exchange appreciation nor exchange depreciation will have much effect on the balance of payments.

The third method of restoring external balance that has been used is a change in the scale of long-term lending taking place or a change in the level of grants made from one country to another. These changes may be brought about by changes in relative interest rates which in turn lead to changes in the level of business activity in the country where the changes are taking place.

The fourth method of restoring external balance is the method of changing the intensity of direct controls. The controls have the virtue of acting quickly, and they can provide a permanent remedy to any balance of payments problem, however large. But this method has the disadvantages in terms of reduced benefits from the division of labour, possibilities of retaliation, and the reduction of competition spurs to home industry, which are the important effects of moving away from a free world.[2]

Effects of the changes introduced for attaining external balance upon the internal economy—a reconciliation between internal and external balances.

Exchange depreciation and the changes in the intensity of control to tackle the problem of balance of payments deficit give rise to

1. Harrod's article—Quarterly Journal of Economics, Feb. 1952.
2. A. C. L. Day—Outline of Monetary Economics, P. 476.

expansionary tendencies in the country. It is possible to ensure a reconciliation between internal balance and external balance. If an economy has an adverse balance of payments along with internal underemployment or favourable balance of payments with internal over-employment, then exchange rate changes (provided demand elasticities are suitable) or change in direct controls can ensure both internal and external balance. If an adverse balance of payments is associated with internal over-employment, or if a surplus balance of payments is associated with internal under-employment, then changes in the internal level of activity or in the level of long-term lending from one country to another can provide a movement towards both internal balance.

For securing a reconciliation between internal balance and external balance at least two of the methods outlined above should be applied at the same time. We can here give some illustrations. Devaluation may be a desirable policy for a country suffering from a seriously adverse balance of payments and severe unemployment. Under such conditions, the first emphasis should be on devaluation followed by some amount of internal deflation. Again, if a country has got an adverse balance of payments but a good employment position at home, the first remedy should be exchange depreciation to be followed by some measure of internal deflation if devaluation results in rising prices. Again, if a country suffers from severe unemployment but enjoys a surplus balance of payments, the proper remedy is a policy of internal deflation and if this leads to a deficit in the balance of payments, some depreciation may be necessary as a secondary measure. The last case that of a country suffering from sereve inflationary pressure with an adverse balance of payments has given rise to some controversies. Prof. Harrod[1] thinks that the principal remedy in such a case is internal deflation to be followed by some amount of devaluation as a secondary remedy. On the other hand, Hinshaw[2] argues that currency depreciation is justified as a principal remedy where the disequilibrium is deep-rooted. In such case, Hinshaw thinks,

1. Harrod's comment on Hinshaw's article (Published in the Quarterly Journal of Economics, Nov. 1951) Published in the Quarterly Journal of Economics, Feb. 1952.
2. Hinshaw's article, "Currency depreciation as an anti-inflationary device."

internal deflationary measures may be too heroic and painful. So, according to Hinshaw, a country suffering from both severe inflation and an adverse balance of payments may have to depend first on devaluation to be followed by some amount of internal deflation.

It may be noted that short-term capital movements can play an important part in ensuring smooth and rapid adjustment to changes by acting as a cushion to absorb the immediate effects of changes until the slower acting adjustment are able to come into play.[1]

It should also be noted that the methods outlined above for attaining external balance may provoke retaliation by other countries which may neutralise the benefits to be achieved from these measures. These possibilities are particularly serious in the cases of currency appreciation or depreciation and of direct controls. Thus exchange depreciation may be looked upon as an attempt to "begger-my-neighbour", by depriving him of the export markets, and provoke a similar depreciation by him in turn. The risks of retaliation, when direct controls are imposed, are still more serious and practically, this possibility has been a very strong argument against the imposition of direct controls to tackle the problem of balance of payments deficit.

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1. A. C. L. Day—Outline of Monetary Economics, Ch. 37.
2. Hinshaw's article, "Currency appreciation as an anti-inflationary device."—*Quarterly Journal of Economics, November 1951.*
3. Comment on the above by Harrod, *Quarterly Journal of Economics, February 1952.*
4. Meade—Balance of Payments.
5. 5. Kindleberger—International Economics.

1. A. C. L. Day—Outline of Monetary Economics, Pages 481-82.

GOLD STANDARD AND GOLD EXCHANGE STANDARD

A country is said to be on gold standard (*i*) when its monetary authorities are committed to the policy of buying and selling gold at fixed price freely, (*ii*) when the purchasing power of a unit of its currency is kept equal to the purchasing power of a given weight of gold, and (iii) when the external value of its currency is fixed through the medium of gold. The gold standard was the dominat international monetary system in the last third of the nineteenth century and the first third of the twentieth century.

Gold Standard may be *Gold Circulation Standard or Gold Bullion Standard.* Gold circulation standard is also known as Full Gold Standard. A country is on a full gold standard when gold serves not only a standard of value but also circulates as coins. Before 1914 Britain had this kind of gold standard and so had the U. S. A., France, Germany and other countries of Europe. Under gold bullion standard, the value of the currency is fixed in terms of gold by making such currency convertible into gold (bullion not coin) and *vice versa.* But gold does not circulate as coins.

Under international gold standard exchange rates are always stable since each national currency is convertible into gold at a fixed rate and so into another currency at a fixed rate. There may be minor fluctuations in the exchange rate under gold standard and that will be within an upper and a lower limit set by the *gold export point* and *gold import point.* The gold export point is the upper limit beyond which the domestic price of a foreign currency may not rise, while the gold import point is the lower limit beyond which the domestic price of a foreign currency may not fall. The gold export point and the gold import point take into account the cost of sending gold from one point of the system to another. The external value of a currency under gold standard is determined by the *mint par* of the standard monetary unit relative to that of being currencies and the limits set by the gold export point and the gold import points.

The Gold Adjustment Process

Gold standard provides a self-regulating automatic mechanism for economic adjustment among trading nations. The golden rule of gold standard is that *with an inflow of gold, currency is to be expanded and with an outflow of gold, currency is to be contracted.* Two forces, *viz.*, the banking reactions and the multiplier-induced reaction, set the gold standard adjustment process in motion. The outflow of gold that arises from a balance of payments deficit leads to an automatic contraction of currency and automatic tendency to rising interest rates and restrictive bank lending policies. We find reverse tendencies in case of an inflow of gold. The central banks of the countries which are on gold standard make their credit policies flexible so as to give timely response to the movements of gold. They raise the Bank Rate when gold is lost and lower it when gold is obtained. These banking reactions have some palliative effects on the situation. A rise in interest rates attracts short-term capital towards the country losing gold and thus tends to offset the outflow of gold to some extent. Moreover, increased interest rates which raise the cost of borrowing and reduce the availability of credit tend to reduce the demand for imports and thus offset the outflow of gold from the country indirectly. The rise in the interest rates also restricts the level of business activity in the country.

The multiplier process also has some part to play in setting the gold standard adjustment process in motion. In a country losing gold, there is a multiplier contractionary process. Similarly, in a country gaining gold we find a multiplier expansionary process. In the long run, the banking reactions and the multiplier process operate together, both forces leading to change in the level of business activity. In the country in which there is a decline in the level of business activity, there is a fall in the volume of imports and in the country in which there is an increased level of business activity, we find an increase in the volume of imports. This leads to a reduction in the outflow of gold from the deficit country or inflow of gold into the surplus country. Although these changes in the level of activity cannot, by themselves, restore equilibrium in the balance of payments except in the limiting case where the marginal propensity to save in each country is zero, the operation of the forces of banking

reactions and the multiplier enables a country to move towards external balance. But in so doing they face a serious disturbance in the internal balance of both the economies. This can be explained by an illustration. Let us suppose, a country has been suffering from a serious inflationary pressure with a surplus balance of payments. If that country is to adhere to the 'rule of the game', it will have to expand its currency because of the inflow of gold. It will then aggravate the inflationary pressure which will be detrimental to internal balance. But if gold standard is to work, price stability must be sacrificed at the expense of exchange stability. Gold standard is a jealous God ; it will work provided it is given exclusive devotion.[1] At the point of external balance, there is no gold flow while at the point of internal balance, there is no fluctuation in price-level. The only possible equilibrium is one in which both internal and external balance are restored. The classical explanation was not concerned with the role of a change in the level of activity as a means of securing adjustment.

Conditions for Full Adjustment

Although the only possible equilibrium in the process of adjustment under gold standard is one in which there will be internal and external balance, there is no guarantee that any position of equilibrium will be achieved. Even if it is achieved, there is no guarantee that it will be achieved smoothly and rapidly.

The first point to be noted is that a change in the level of activity is essential in the adjustment process and that internal balance cannot be restored until the end of the adjustment process. The second point is that even if the rule of the game is not strictly adhered to by the central bank, automatic multiplier and automatic monetary-induced contraction in the level of activity take place in a country which is losing gold. This will be possible because of the fact that the operation of the multiplier process which affects the level of income and output, also affects the internal price level until the internal balance is restored. Again, if a price change leads to speculation about further price change in future, adjustment cannot take place. Moreover, the process of adjustment may fail to attain equilibrium if the marginal propensities to import of both the

1. Crowther—An Outline of Money.

countries are considerably large. This is also the case with a situation in which the sum of the price elasticities is too small.

Conditions for Rapid and Smooth Adjustment

The first condition for the rapid and smooth adjustment is definitely in obedience to the 'rules of the game'. Another condition for rapid adjustment is flexibility of prices and wages in both directions. The third condition is the existence of high demand elasticities so that comparatively small relative price changes lead to considerably big changes in imports and exports and consequently in gold outflow and gold inflow. Lastly, there should not be speculations about further price rises in future if there is an initial increase in the price level in any country.

The Gold Standard in Practice

Obedience to the 'rules of the game' lies at the heart of the classical explanation of the condition of gold standard. But in fact, the 'rules of the game' were rarely followed at all closely either before 1914 or after, in Great Britain. Nevertheless, the adjustment process before 1914 appears to have been smooth and rapid. This was largely due to the fortunate pattern of trade and of long-term lending in cyclical fluctuations before 1914. Britain was particularly a long-term lender to non-European countries prior to 1914. The marginal propensity to import of Great Britain was at that time relatively small largely because she would import essential foodstuffs. But the marginal propensities of the country to which Great Britain would give long-term loans were relatively high. Consequently, while during depreciation Great Britain had a surplus balance of payments because of a decline in long-term lending, there was at the same time an unfavourable balance of trade because exports declined more than imports. Since British trade and lending would occupy a predominant importance at that time, there was a basic tendency towards stability in the external balance of the whole world.[1] Another element of stability arose from the complementarity between British long-term and short-term lending[2]. While there would be a decline in British long-term lending

1. A. C. L. Day—Outline of Monetary Economics. P. 491.
2. A. C. L. Day—Outline of Monetary Economics. P. 492.

during crises, its place would be occupied by short-term lending and this would help Britain to tide over the situation. London's facilities were always such that it could shift the burden of giving loans to foreign countries from the 'long' to the 'short' shoulder.

Another factor which contributed to the smooth working of gold standard was the confidence of the member countries in the stability of gold standard. Perverse speculation about price changes which was largely responsible for the collapse of gold standard was not very serious prior to the First World War. It became significant only in the inter-war period, particularly in late twenties. Most of the other countries, particularly 'newer' countries, would maintain close economic relations with Britain. So the working of the British currency system would definitely affect other currency systems. Even the countries with independent monetary systems would accept the predominance of London. As stability was found in the British currency, other countries also would try to follow the system of London.

The classical explanation of the collapse of gold standard is non-adherence to the 'rules of the game'. But the real cause of the collapse of gold standard was other than this ; and for understanding this fully, we should examine the working of gold standard after the First World War.

After the First World War, New York became a major source of long-term capital and as such, London's position in the world market became relatively weaker. It was no longer essential to carry on all international monetary transactions through London. Another structural change that came after the War was the extension of gold exchange standard to include many countries of Europe, the reserves of these countries being held as bank deposits or short-term securities in London or New York (and later in Paris). The purpose was to economize in the use of gold and to earn interest on these deposits. The shortage of gold would induce the countries to accept gold exchange standard.

Advantages and Disadvantages of Gold Standard

An international gold standard has the following advantages :—

In the first place, it is an objective system and is not subject to changing policies of the Government or the currency authority.

Secondly, gold standard enables the country to maintain the purchasing power of its currency over long periods. Thirdly, gold standard preserves and maintains the external value of the currency (the rate of exchange) within narrow limits. Exchange stability facilitates good trade and international division of labour. Fourthly, it gives all the advantages of a common international currency and establishes an international measure of value. This facilitates international trade. Fifthly, gold standard helps to adjust the balance of payments automatically. Lastly, it inspires confidence in the financial stability of the economy and contributes to national prestige.

The disadvantages of gold standard are the following :—

Firstly, it is costly and the cost is unnecessary since we can find out an alternative medium of exchange which may be less costly. Secondly, even the value of gold does not remain absolutely stable over long periods of time. Thirdly, in view of the fact that the supply of gold is, on the whole limited, currency cannot be expanded in response to the requirements of trade. Recently even the gold standard has been a *managed* standard. The central banking technique has been applied deliberately to control the working of the gold standard. It is thus no longer automatic as it was claimed to be. Fourthly, exchange stability in gold standard can be maintained only at the expense of price stability. The position is serious when inflation is associated with an inflow of gold and depression is associated with an outflow of gold. Fifthly, gold movements lead to changes in interest retes, so that investment is stimulated or checked solely in order to expand or reduce money income. But these changes in interest rates may not be in keeping with the central banking policy to be followed. Lastly, a country on a gold standard is unable to follow an independent monetary policy. It may be compelled under pressure of circumstances to violate the rule of the gold standard, and in fact, this was the basic cause of the collapse of gold standard.

The Collapse of Gold Standard

Collapse of gold standard was due to a complex of factors. Non-adherence to the 'rules of the game' was to some extent responsible for the collapse of gold standard. Another factor responsible for

its breakdown was the perverse speculation about price changes. Shortage of gold also was, to some extent, responsible for the collapse of gold standard. Urge for economizing in the use of gold induced some countries to accept gold exchange standard. Fourthly, disturbances caused by war, such as German reparations and increasing internal rigidities in many countries which reduced price flexibility and made the complete adjustment back to internal and external balance extremely slow, were also responsible for the breakdown of gold standard. Fifthly, the choice of gold parities at which some countries returned to the gold standard were inappropriate. This called for additional adjustment of internal price level. Lastly, the United States which was becoming increasingly important as a source of long-term capital cut its long-term lending drastically, but tended to run into a balance of trade surplus. This meant great balance of payments burdens for the countries which would maintain economic relations with the U. S.

"The major lesson of the inter-war period is that the maintenance of internal and external balance in the modern world is a very difficult task, which cannot be left to the automatic working of simple institutions operating under simple rules."[1]

Gold Exchange Standard

Among the various schemes and proposals which repeatedly crop up in the discussions of monetary reform, one that has enjoyed a wide appeal is the idea of an international currency system with exchange rates stable (as under the gold standard), but with liquid foreign balances constituting the international monetary resources. Gold, it has been suggested, could be dispensed with in such a system not only as a means of international payment but also as a standard of value, especially if the currency or currencies in which the resources were held were maintained reasonably stable in terms of goods and services.[2] Under gold exchange standard, the internal currency consists of notes and coins other than gold and these are not convertible into gold for domestic purposes. But, for external purposes they are convertible, not into gold directly, but into a foreign currency which is convertible into

1. A. C. L. Day—Outline of Monetary Economics. P. 496.
2. International Currency Experience (League of Nations Publications).

gold and as such the convertibility of foreign currency in gold can ensure a gold reserve and be kept in the central bank of the country concerned.

A Critical Review of Gold Exchange Standard.[1]

The Genoa Conference recommended the gold exchange standard to avoid deflation. As events turned out, the deflation was only postponed ; the principle of "gold economy" was abandoned when it was most needed at a time, when other factors making for depression were coming into play in any case.

It had been alleged that gold exchange standard tended to breed inflation. In fact, no general rise in prices, of course, occurred during when the standard was in fairly extensive operation. On the contrary, prices of primary commodities showed a falling trend. The gold exchange standard was intended to be anti-deflationary and in that sense "inflationary." Without it there would be general deflation due to the shortage of international currency which would have "corrected" the situation through a reduction in the value of international transactions and an increase in the output of new gold. With it, the gold shortage was made good by exchange reserves, gold production could remain lower than it otherwise would have been, and there was thus an "economy of gold" even in the sense of an economy of productive resources engaged in gold mining.

A great defect was that the Central Bank's reliance on exchange reserve as against gold was marked with variability. The principal motive of the adoption of the standard should have been the avoidance of a world-wide deflation. But the individual countries were not always aware of this task to the desirable extent and this was the cause of that variability.

Countries in need of foreign capital could be induced to observe the exchange standard rules by various means of persuasion and pressure exerted by the lending countries.

The holding of foreign balances instead of gold in the central monetary reserve came to be regarded as damaging to the prestige of a great or even a moderately great nation. For this reason,

1. Ibid.

France, Germany, Italy and Poland did not regard their own use of the gold exchange standard as anything but a transitory expedient. But this was not the case with an underdeveloped economy like India.

The gold exchange standard has got, more or less, all the merits of gold standard although the system is less expensive than gold standard.

But gold exchange standard also could not finally ensure a sound international currency system. In fact, stability in international currency practices has been achieved to some extent through the International Monetary Fund which began to operate in March, 1947.

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1. A. C. L. Day—An Outline of Monetary Economics, Ch. 38.
2. Meade—Balance of Payments, Ch. 14.
3. League of Nations Publication—International Currency Experience.
4. Hawtrey—Gold Standard in Theory and Practice.
5. Crowther—An Outline of Money.
6. Halm—Monetary Theory.

APPENDIX

The Operation of the Gold Standard and of Variable Exchange Rates Compared

The system of Gold standard in effect means the automatic use in all countries of monetary policy for the maintenance of external balance. The second system is that in which the financial policy is employed in all countries for the maintenance of internal balance and variable exchange rates are used for maintaining external balance.

Both these mechanisms are essentially of the same character in 'real' terms. Both operate to maintain the two objectives of internal and external balance by the combined use of the two means, first, of a financial policy of expansion or contraction of total domestic expenditure and, second, of an alteration in the relative prices of the products of the two countries making up the international system. This last change is brought about under the mechanism of gold standard by a reduction in the domestic level of money wage rates and prices in the deficit country and by a rise in money wages and prices in the surplus country : in the case of variable exchange rates, it is achieved by a depreciation of the value of the currency of the deficit country in terms of the currency of the surplus country.

If we don't take into consideration some complicating factors (such as the existence of debts fixed in terms of the currency of one or the other country ; or the effect of the depreciation of the currency upon the speculative capital movements ; or the differences that may exist in the case of adjustment of wage rates on the one hand and of exchange rates on the other), the two mechanisms ensure fundamentally the same "real" adjustments to any given spontaneous disequilibrium.[1]

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1. Meade—Balance of Payments (The Oxford University Press ; London) 1962.

These two methods may be compared with the help of Tables 'A and 'B' in pages 410 and 411.

Table A

Gold Standard

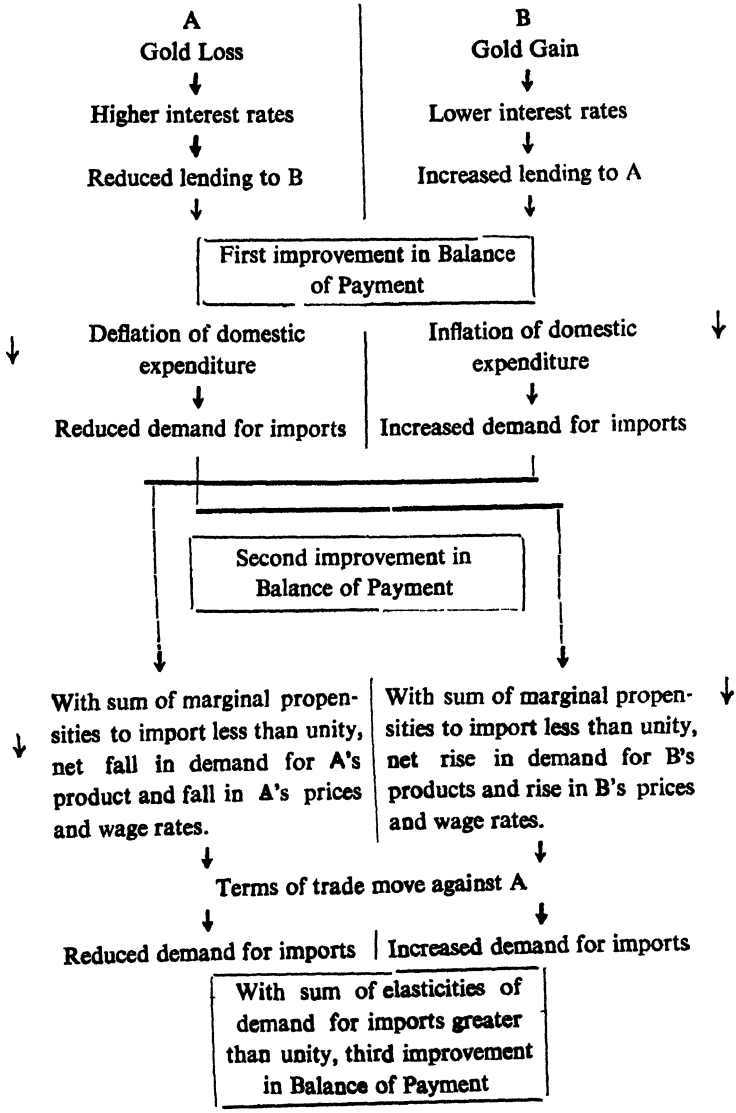
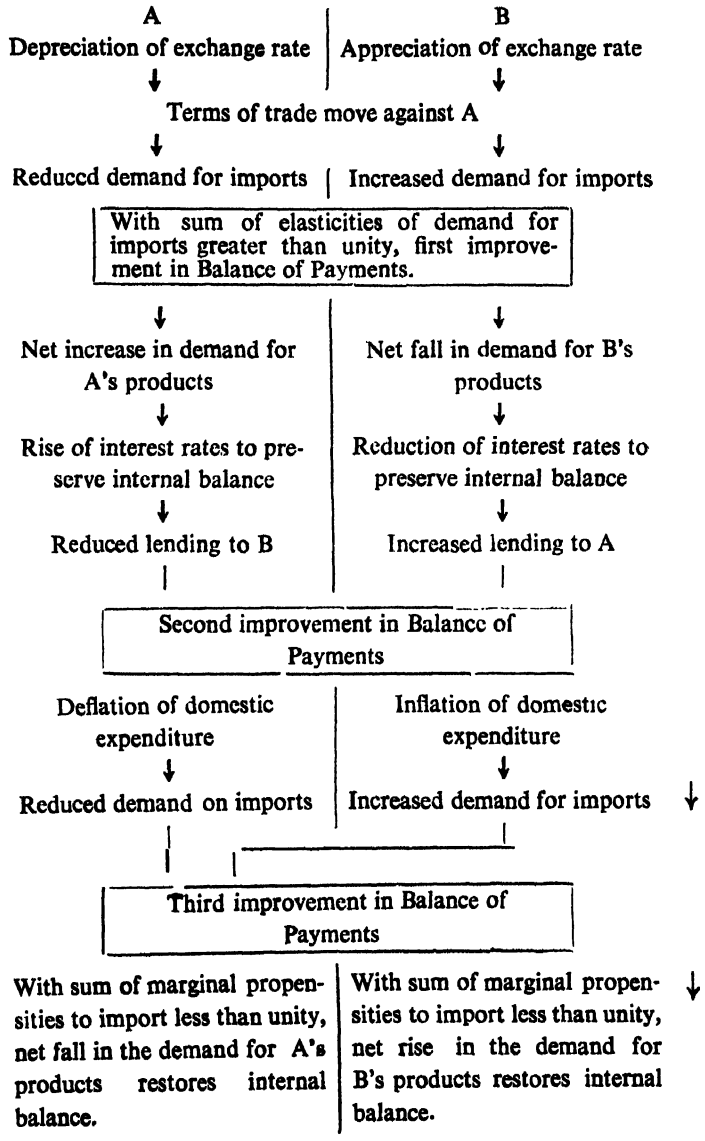


Table B

Variable Exchange Rates



Let us first consider Table 'A' which outlines the operation of the gold standard mechanism.

The increased flow of capital transfers from country A to country B causes A to have a deficit and B a surplus in the balance of payments ; gold flows from A to B and as a result of this outflow of gold from A, there is a contraction in the domestic supply of money in A and an expansion in B. As a result of the reduced supply of money in A and increased supply of money in B, rate of interest will rise in A and fall in B. This will itself reduce the incentive for capital transfers from B to A ; and this will be the first factor at work restoring equilibrium to the balance of payments between A and B.

But the higher rate of interest in A will result in reduced domestic expenditure in A, and similarly lower rates of interest in B will result in increased domestic expenditure in B. Reduced domestic expenditure, with the given marginal propensity to import, will lead to a fall in demand in A for imports from B, and the increased domestic expenditure in B will lead to a rise in demand in B for imports from A. This will lead to a rise in A's exports and fall in A's imports. Correspondingly, B's exports will fall and imports will rise. This is the second main factor in restoring equilibrium to the balance of payments of A and B. If the sum of the marginal propensities to import would be less than unity, deflation of domestic expenditure in A because of high interest rates would lead to net fall in demand for A's products and fall in A's prices and wages rates. Correspondingly, in B increased domestic expenditure because of low interest rates would lead to a net rise in demand for B's products and rise in B's prices and wages rates, the sum of marginal propensities to imports being less than unity. As a result, the terms of trade will move against A. This will lead to reduce demand for imports in A and increased demand for imports in B. The result will be an improvement in balance of payments, with the sum of elasticities of demand for imports greater than unity.

Table 'B' shows the operation of the mechanism of variable exchange rates. It will be seen that the same three influences are at work restoring external balance although in a different order and by rather different means.

With variable exchange rates, the immediate effect of the increased transfer of capital funds from A to B is to increase the demand of A's

residents for B's currency so that the value of A's currency in terms of B's currency depreciates. This depreciation of A's currency will make A's products cheaper relatively to B's products ; and, provided the sum of the elasticities of demand for imports in A and in B is greater than unity, this will lead to an improvement in A's balance of trade. This is the first factor in restoring equilibrium.

This improvement in A's balance of trade will upset the internal balance and it will lead to a net increase in domestic expenditure on A's products and a net fall in domestic expenditure on B's products. For the maintenance of internal stability, the authorities in A must adopt a deflationary financial policy in A and the authorities in B must adopt an inflationary policy. Rates of interest will rise in A and fall in B, and this will reduce the incentive to lend from A to B. The change in capital transfer between A and B induced by this change in interest rates will thus help to restore external balance between A and B. This is the second factor in restoring equilibrium.

Rise in rates of interest in A will lead to a fall in domestic expenditure, and given the marginal propensity to import, this will cause a reduction in demand in A for B's products. In B, on the other hand, fall in rates of interest will raise the domestic expenditure and lead to a rise in demand for A's products. Thus A's exports will rise and imports will fall and B's exports will fall and imports will rise. This will lead to an improvement in the balance of payments position and this is the third factor in restoring equilibrium.

Provided the sum of marginal propensities to import is less than unity, deflation of domestic expenditure in A, because of the rise in interest rates, will lead to a net fall in the demand for A's products and this will restore internal balance ; on the other hand, inflation of domestic expenditure in B, because of the fall in interest rates, will lead to a net rise in the demand for B's products and this will restore internal balance.

The mechanism of these changes is essentially the same, although considerably easier to follow, under a system of variable exchange rates.

Reference :

Meade—Balance of Payments.

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PROBLEM OF INTERNATIONAL LIQUIDITY AND THE INTERNATIONAL MONETARY FUND

The problem of international liquidity has been uppermost in our mind at a time when an ideal system of equilibrium rate that maintains the accounts of all countries simultaneously in equilibrium, all of them being simultaneously free from mass unemployment on the one hand and inflation on the other, cannot be easily established. In the days of the classical Gold Standard, there could be no special problem of international liquidity though there might indeed be a general problem of liquidity with bearing upon inflation and deflation. Under the Managed Gold Standard gold remained as international money. Certain assets were then fully liquid in terms of international money while some other assets were then not liquid in terms of international money although they were liquid in terms of national money. Gold has always been regarded as the most important kind of international money although holding of convertible foreign exchange may be regarded as a measure of international liquidity. International liquidity is required because of the debts that are expressed (and have ultimately to be paid) in foreign money. So long as foreign money or the most part of foreign money are expected to be stable in terms of gold, gold will serve as the internationally liquid assets.

Nature, Size and Distribution of International Liquidity

Let us now consider the nature, size and distribution of international liquidity. The nature of international liquidity is apparent when the ways in which a country may settle outstanding external debts are taken into consideration. A country may first of all seek to liquidate the outstanding external debts by the transfer of gold, or some convertible foreign exchange to the creditor country. Dollar and sterling are now two world currencies which may be transferred to the creditor country for liquidating outstanding external foreign exchange. A currency to serve satisfactorily as reserve currency for

other countries should have the quality of being the currency of a great trading nation and of being one which may be easily earned by normal trade and whose balances guarantee that they may be exchanged for goods durable in themselves for the world demand which exists from them. Moreover, such a currency must be supported in its home country by sound banking institutions and must not suffer from recurrent scarcity. Secondly, the ability of a country to meet balance of payments deficits may be assessed in terms of its government's ability to command public credit and in terms of its traders' ability to command private credit. "Accumulation facilities" which may be treated as means of internal payments occur when a foreign country accepts payment of debts in the debtor's currency, allowing the proceeds to accumulate in the debtor's country as bank deposits or short-term assets. This ultimately depends upon creditor country's willingness to accept the debtor country's currency. Thirdly, international payments obligations may be settled by drawing rights upon foreign currencies. Foreign loans and assistance fall in this category. Every member of the I. M. F. has drawing rights upon the I. M. F. which is essentially a pool of currencies to provide additional rights for member-nations and thus augment the world stock of liquidity.

The need for liquidity is a combined function of the size of likely balances i.e. of the volume of international payments and the magnitude and duration of their instability. It is the volume of payments and its instability and not merely the volume of visible trade which essentially determine the revenue requirements. The size of the aggregate world reserves of international liquidity is governed by the (a) requirements for the maintenance of exchange stability of the leading cnrrencies, (b) the policies which each of the leading economies is preserving with regard to the control of their levels of income and employment and (c) the extent of multilateral trade among nations. The volume of international monetary reserves determines the degree of imbalance (as to magnitude and duration) which the world monetary system can tolerate in the absence of adjustment by depreciation or relative changes in income. In terms of the need for international liquidity the world aggregate of international liquidity should be ideally distributed. The existing distribution of international liquidity being far short of the optimum distribution,

we should try not only to explore the possibilities of raising the total volume of international revenues but we should also seek to the optimal distribution of liquidity.

The total international liquidity is increased if revenues are kept in assets of another country. This, of course, may have an inflationary impact. When the question of repayment of revenues kept in assets of another country arises, the result is likely to be deflationary. Again, an overall shortage of liquidity will make itself felt by simultaneous pressures on the revenue position of a number of countries. If the rate of increase in international liquidity permits the achievement of full employment in any country, any further increase of reserves should be either sterilised to avoid inflation or should be lent out to those countries which are in dire necessity of international revenues. What is most important in this regard is to devise some "rules of discipline" regarding the rate of investment and consumption in the underdeveloped countries. So long as the rate of investment and consumption is not stabilised in those countries where both output-capital ratio and savings-income ratio are low, they will have to rely more and more on stand-by credits for meeting exceptional strains, and in that case the rules of discipline cannot be maintained. Redistributional reserves through international lending operations and through making provisions for using the reserves by underdeveloped countries may speed up the actual rate of growth in those countries. Thus, an international co-operation reform of revenue policy would have contributed to the equalisation of the rate of investment and growth.

Keynes Plan and White Plan : The I. M. F., which came into existence at the Bretton Woods Conference of 1944, was based upon two Plans, one by Keynes and another by Dr. Harry D. White.

Harrod's Proposal

Prof. Harrod recommends the revaluation of gold. While the dollar prices of goods entering into international trade increased substantially in 1950-51 as compared with 1937-38, the price of gold remained (and still remains) stable at the U. S. buying price of $ 35 per ounce, settled in 1934, and the value of gold as means of international settlement was commensurately diminished. Prof. Harrod has estimated that if the gold production in 1950-51 had been

one-third greater than in 1936-38 and this production had been raised 2½ times in its dollar price, this would have given an annual value of $ 2,549,9 million for new gold produced outside the United States and the U. S. S. R. for monetary use. Prof. Brian Tew[1] holds that Harrod's proposal for an upward revaluation of gold price would certainly have the advantage of increasing the money value of total reserves and of increasing the share of gold in the total. It would, however, have the disadvantage of discrediting the use of national currencies as Keynes advanced his plan on behalf of the British Government and Dr. Harry D. White put forward his plan on behalf of the U. S. Treasury. Both of them tried to find out the ways and means of augmenting the volume of international foreign exchange reserve which might be made available to the countries suffering from balance of payments difficulties. Countries suffering from balance of payments difficulties (after the collapse of gold standard) tried to tackle the poblem by adopting various measures like competitive currency depreciation, exchange control and multiple currency practices. The international capital market had been passing through a very critical phase and both Keynes and White tried to set up an international economic institution which would promote international economic co-operation, multilateral trade, mutual convertibility of currencies and help the member countries to take the problem of their balance of payments disequilibrium. So far as the ends were concerned, Keynes plan and White plan were similar, but they differed with regard to means. Keynes plan sought to set up an *International Clearing Union* which would administer a "quantum of international currency, suited in amount to the needs of world trade and capable of deliberate expansion and contraction in order to preserve an appropriate level of world effective demand." White's proposal was for setting up an International Stabilisation Fund "with resources and powers adequate to the task of helping to achieve monetary stability and to facilitate the restoration and balanced growth of international trade." In the Keynes plan, the volume of foreign trade was the main consideration on which the fixation of quota would be based. In the White plan the amount of quota of each member

1. Brian Tew—International Monetary Co-operation 1945—60. P. 185.

of the stabilisation Fund would be determined by an agreed formula which would give weight to factors as the country's gold and foreign exchange, the fluctuations to which its balance of payments was liable and its national income.

Keynes visualised his Union on a bigger scale than White did his Fund. The aggregate size of the quota proposed by Keynes was 30 to 35 billion dollars while that of the quota proposed by White was only five billion dollars. The name of the international currency in which the quantum was to be expressed, according to Keynes, was "Bancor" whose value would be treated as equivalent to that of gold for the purpose of setting international transactions and whose value would be defined in terms of gold. The name of the international currency in the White plan was "Unitas" which, in effect, would only be a unit (=$10) in terms of which gold deposits of the member countries with the Fund would be expressed. While *Unitas* was only a name for gold to the value of $10, the Bancor under the Keynes plan was intended to be an international currency transferable within the International Clearing Union for the settlement of international debt.

The method of payment by the deficit countries to the surplus countries, according to Keynes plan, was as follows :

Each member country would agree to accept payments from other members by a transfer of Bancor to their credit in the books of Union. The central banks of member countries would maintain accounts with the Union through which exchange balances between them might be periodically cleared. A member's quota with the Union would serve to supplement its own gold and currency reserves as a means of tackling both external and internal imbalances. In the White plan a member country suffering from serious deficit in balance of payments purchases foreign currency from the Stabilisation Fund in exchange of its own currency. In the Keynes plan, the deficit country was to be allowed to draw upto one-fourth of its quota within a year unconditionally. Thus it became more liberal than the White plan which was more pro-creditor and anti-debtor organisation. Again, Keynes visualised a greater variability

of the exchange rates of the currencies than did White. Keynes plan intended to create "a world central bank" while the White plan intended to create "a world foreign exchange shop or market." Scammell thinks that Keynes plan by facilitating over draft facilities was better than White plan which would simply extract hard cash and gold from member nations.

International Monetary Fund

The gold standard was abandoned because of the fact that the 'rules of the game' could not be strictly adhered to. In fact, the rigidity of the system made it very difficult to follow. Moreover, domestic monetary policies in the gold standard were made subordinate to the policy of maintaining an exchange stability. In the circumstances, every country realised the necessity of having an international currency system which would be acceptable to all. Both Keynes plan and White plan gave emphasis on the fact that gold was still to play a vital part in any international currency system as a standard of international value. These two plans also recommended the setting up of an international monetary institution. These two plans were considered in the conference of Bretton Woods in 1944, and the direct outcome of this consideration was the setting up of the International Monetary Fund which began its operation in March, 1947.

Purposes of the I. M. F.

The I. M. F. was established with the following objectives (Article one of the Fund Agreement):

(1) To promote international monetary co-operation through a permanent institution.

(2) To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment of all members.

(3) To promote exchange stability, to maintain orderly exchange arrangements among members and to avoid competitive exchange depreciation.

(4) To assist in the establishment of a multilateral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions.

(5) To give confidence to members by making the Fund's resources available to them under adequate safeguards thus providing them with the opportunity to correct maladjustments in their balance of payments without resorting to measures destructive to national or international prosperity.

(6) In accordance with the above to shorten the duration and lessen the degree of disequilibrium in the international balance of payments of members.

There are three major functions of the I. M. F. *viz.*, (i) The Fund serves as a short-term credit institution ; (2) The Fund provides a mechanism for improving short-term balance of payments position of the member countries ; and (3) The Fund provides machinery for international consultations.

Gold Standard and the I. M. F.

Gold plays an important part in the operation of the Fund. In fact gold has not been demonetised but dethroned by the I. M. F. Gold serves as a common denominator for the different currencies. Gold also maintains the liquidity of Fund's resources. As it repurchases its local currency whenever possible, it serves as a stop-gap during a temporary balance of payments disequilibrium and stabilizes the exchange rates as it maintains a perfectly elastic supply of and demand for foreign exchange. The I. M. F. brings the great gold-producing and gold-holding countries into the fold of the same international payment system which might refuse to become members if gold would be dethroned. The effects of transactions with the Fund upon money, credit and price etc. of the member countries are almost a 'replica' of the gold standard mechanism. The manner of expansion of credit in the new system is the same with gold standard. But a country, unlike gold standard, is not under compulsion to contract its currencies in case of balance of payments deficit.

Under the I. M. F., the advantages of gold standard are secured and the disadvantages of gold standard are avoided. Under gold standard, every country balances its external account with the rest of the world as a whole and not with countries individually. In the same way under the I. M. F. scheme currencies are convertible at parities fixed at a particular moment though

subject to change under appropriate condition. Again under gold standard, a country with a net deficit in the balance of payments meets it by export of gold or drafts, etc. The I. M. F. quota performs this function. Under gold standard, there are no restraints such as quota and direct exchange restrictions. Similarly, under the I. M. F. system also such restrictions are not supported, and it has been laid down that all existing restrictions will be abolished after the transitional period is over.

Two important drawbacks of gold standard have been removed in the I. M. F. scheme. First, under gold standard, gold reserves of a country would be affected in precisely the same way by an import surplus on current account (*i.e.*, unfavourable balance of trade) and by the withdrawal of capital. There would be an outflow of gold and a consequent contraction of credit. The I. M. F., on the other hand, enables a country to meet her adverse balance by the help of the I. M. F. without unfavourable effects on its credit structure which are to be found in deflationary policy. Secondly, gold standard is very rigid in maintaining exchange stability. The I. M. F. system seeks to maintain exchange stability without making the system too rigid as under gold standard. Changes in exchange rate are allowed for meeting a fundamental disequilibrium, and these changes in the exchange rate caused by the changes in the par value are to be made by a country with the permission of the I. M. F.

Gold has still some important functions to perform in the I. M. F. system. First, when gold parities are allowed, it will help to keep the rates of exchange stable. Secondly, when there is a temporary disequilibrium in the balance of payments of a member country, gold serves the purpose of a stop-gap. Thirdly, gold is still the common denominator for the currencies of different countries. Lastly, since gold has not been demonetised in the I. M. F. system and since it has been given a definite place in the I. M.. F., it has induced gold-producing or gold-holding countries to join the Fund. Halm observes, "The Fund's gold provision is not just window-dressing. Gold plays a really important role as the Fund's most liquid asset as a common anchorage for the member countries."[1]

1. Halm—Monetary Theory, (1945) Pages 208-9.

Par Value and the Provision of Currency Depreciation under the I. M. F.

The members of the Fund are required to announce the parities of their currencies in terms of gold. For avoiding *fundamental disequilibrium*, a member country may propose a change in its par value. Under the terms of agreement a member country can change the par value of the currency upto 10% by simply giving a notice to the I. M. F. The Fund is not entitled to make any objection in such a case. Beyond this 10% but less than 20%, the approval of the Fund is necessary and in that case it should inform its decision within 3 days. But if a member country is willing to lower the par value by more than 20% no limit is imposed on the time allowed to the I. M. F. for the consideration of the proposal of the member country. The fund approves a requested change in the par value of a member's currency if that is essential to correct a fundamental disequilibrium. In particular, the Fund shall not reject a requested change necessary to restore equilibrium because of domestic, social and political policies of a country applying for a change. But the Fund must see that this change in par value may not be introduced as a case of competitive depreciation. The I. M. F. agreements have got a provision for currency depreciation only, and not for currency appreciation. The Fund gives emphasis on the necessity of maintaining stable exchange rates with some sort of flexibility in exchange rate. Gold standard is based on the maintenance of a fixed and stable exchange rate. But the I. M. F. has rightly given emphasis on the flexibility in the adjustment of exchange rate on the one hand and on stability in the exchange rate on the other. Stability here implies the readjustment of exchange rates in an orderly manner and the avoidance of competitive exchange depreciation.

Lending Policies of the I. M. F.

The I. M. F. sells foreign currencies to a member country provided that country can prove her necessity and she is not declared as 'ineligible' to use the resources of the Fund and provided the required currency is not rationed. No member country can use the resources of the Fund for meeting her long-term requirements. "The essential test of propriety of the use of the Fund's resources

is not the character of the goods imported, but rather whether the prospective balance of payments position of the country concerned (including long-term capital movements) will be such that its use of the Fund's resources will be of relatively short duration." According to the stand-by arrangements, the member country may discuss with the Fund for the drawing of foreign exchanges in future. The stand-by arrangements are limited to the periods of not more than six months but are renewable and a change of $\frac{1}{2}$ of 1% should be paid to the Fund in advance. Sometimes, the Fund may take the initiative to help a member country so that she can overcome her temporary difficulties.

Loans and Purchase Provisions

A member country's capacity of taking loans from the I. M. F. is upto 25 per cent of its quota in any year. At present foreign currencies even of 50% of the quota may be purchased by any country. If at any time, the Fund's holdings of a member's currency become equal to double its quota, that country is entitled to have foreign currency from the Fund in exchange of gold. If any member country's currency remains totally unsold for four years, that country is entitled to purchase from the Fund a total amount of foreign currency equivalent to its quota. Apart from this, if the currency of a member country is purchased by other countries, that country is entitled to draw further amounts of foreign currency from the Fund.

These provisions provide a safeguard against a quick expansion of the Fund's holding of scarce currencies and secondly, it compels members to adopt necessary measures for securing equilibrium at an early date. The Fund provides only short-term loans, the uniform service charge being $\frac{3}{4}$ to 1% ; but apart from this provision, the rate increases with the duration and the size of the loan.

Repurchase Provisions

When a member country finds itself in difficulties, she is entitled to have assistance from the Fund. But with an improvement in her balance of payments position, she should share this improvement with the Fund by causing a transfer of gold or foreign currencies to it. At the end of the financial year, each member country must

repurchase with gold or any other currencies convertible into gold one half or any increase that has taken place during the year in the Fund's holding of its currency, provided the following conditions are fulfilled :—

(a) the monetary reserves of the country outside the Fund do not fall short of the quota ;
(b) the Fund's holding of the member country's currency do not fall short of 75% of its quota ;
(c) the increase in the fund's holding of its currency is less than the decrease of a member's monetary reserves ; and
(d) the amount to be repurchased is increased by more than one half of an increase in the reserves of the member country's currency.

Quota

The resources of the Fund consists of gold and currencies of the member countries. Previously the total resources of the Fund were $16,000 m. In February, 1965, they were raised to $21, 000 m. The basis of the quota system of the Fund is far from being satisfactory. The considerations taken into account in determining the quota of a particular member were (a) national income, (b) gold and dollar holdings of a member country, *i.e.*, its international purchasing power, (c) the extent and volume of fluctuations in the balance of payments and (d) the economic importance of the member country in the world economy.

The members of the I. M. F. were required to pay either 25% of its quota or 10% of its "net official holding of gold, and the U. S. dollars," whichever were less in gold and the rest in its own currency. Now, the quota of the different nations being increased one-fourth of the quota increase is to be paid in gold, the remainder in currency.

The quota determines the extent to which a member country can hope to use the resources of the Fund in the event of the necessity of avoiding a temporary balance of payments crisis. It also determines the contribution of each member country to the common pool of gold and foreign exchanges which can be lent to the member.

The following table shows the quota of some countries.

I. M. F. Quota

(million dollars)

U. S. A.	...	5160
U. K.	...	1950
China	...	550
France	...	985
India	...	750
Canada	...	550
Holland	...	412·5
Belgium	...	337·5
Australia	...	400
Japan	...	500
Czechoslovakia	...	Withdrawn
Poland	...	Withdrawn
Italy	...	500
West Germany	...	1200

India subscribed to the quota of the U. S. S. R. in full as the latter came out of the I. M. F. and thus became one of the "Big-Five" of the I. M. F.

The purposes of the quota system are to raise the resources with which the fund is to start, to assure every member country of the condition of avoiding the necessity of undertaking any restrictive policy to tackle the temporary balance of payments crisis and to create a kind of liquidity in international payment to the extent to which the currencies of the member countries pooled in the Fund can be used as a means of international payments.

How to Solve the Present Problem of International Liquidity

The I. M. F. has not been successful in solving the problem of international liquidity which has now taken a serious turn. So, there have been various proposals for reorganising the I. M. F. and also for improving the position of international liquidity, international reserves, and thus of increasing the future danger of flights from these currencies into gold.

Triffin Plan

Triffin rules out the possibility of solving the problem by an upward revaluation of gold. Triffin is also opposed to using some national key currencies as international reserves, the arrangement being dangerously unstable in a world where the key currencies are subject to fluctuations in their own values from time to time. Triffin Plan deals with the ways and means of internationalisation of the foreign exchange component of the world monetary reserves and Triffin believes that this internationalisation of the foreign exchange component of the world monetary reserves is possible by a proper reorganisation of the I. M. F. Instead of using sterling and dollar as international reserves, countries, Triffin argues, should be given the choice of keeping any portion of their reserves they intend with the I. M. F. in the form of gold-convertible interest-bearing deposits with exchange rate guarantee. The countries suffering from temporary deficits in the balance of payments will then get accommodation from the Fund, and the member countries also will have the incentive to deposit their surplus, reserves with the Fund since such deposits will earn some interest. Triffin is also in favour of abolishing the present quota system which has imparted a rigidity to the international payments mechanism. He is in favour of augmenting the resources of the I. M. F. if full consent of the member-countries is available. But he contends that there will be an automatic expansion in the volume of international liquidity with an increase in the volume of deposits of reserves with the I. M. F. by the member countries when they will enjoy surpluses in balance of payments. The possible danger of this automatic expansion in international liquidity is the likely inflationary impact. But Triffin suggests a safeguard against the possibility of an inflationary impact by imposing a ceiling on the Fund's lending operation, the actual amount of loan given by the I. M. F. being to that extent which is just necessary to preserve an adequate level of international reserves.

Dr. Scammell fears that Triffin plan may not be acceptable to the surplus countries. Triffin plan concentrates exclusively upon increasing the volume of international liquidity. Scammell

has praised the theoretical aspect of Triffin's plan, but with a note of warning, he comments, a successful plan must be one which will commend itself to the leading participant countries and which, in practice, will not allow the arrangements to fall under the domination of any single country or group of countries.

Scammell's Proposal

Scammell's argument is that the basic cause of the problem lies in the fact that while the I. M. F. insists that the member-countries should try to attain the objectives of fixed exchange rate, full employment and free trade, the Fund cannot actually help the member-countries fully into their needs of international reserves. But in this attempt, the I. M. F. does not practically provide any real system of adjustment for balances of payments in a world of full employment and expanding economies. Simply by allowing the member countries to devalue their respective currencies (excepting in cases of competitive depreciation) up to certain range or by selling or lending international reserves to the member countries, the I.M.F. cannot actually provide any real system of adjustment of balance of payments. Direct controls may be treated as important aid to the system of adjustment of balance of payments ; but the I.M.F. forbids method of achieving external balance. *Scammell recommends exchange rate fluctuations as the adjustment mechanism and according to his suggestion, the present system of managed flexibility or adjustable peg system of exchange rate should be replaced by a freely fluctuating exchange rate system.* But freely fluctuating exchange rate system may take us back to international instability of the post-gold standard period. Given the rigidities of modern markets, highly flexible and unregulated exchange rates may conflict sharply with the highly immobile and rigid international price structures. Freely fluctuating exchange rate system may give rise to speculative forces and may thus be an impediment to the achievement of full employment and economic growth in under-developed countries. But Scammell thinks that a freely fluctuating exchange rate system is better than a managed flexibility system in the sense that while under the latter system it is very difficult to choose the

timing and the appropriate percentage of devaluation, in the former this problem is not found. Scammell further argues that the managed flexibility system also may give rise to speculative forces and impede the efforts for accelerating the rate of growth. In his opinion, this particular problem will not be so serious in a freely fluctuating exchange rate system. According to Scammell, the greatest disadvantage of the adjustable peg system is that it robbed the deficit countries of the only possible mechanism of adjustment when they suffer from balance of payments deficit.

The Angell Proposal

Prof. James Angell[1] has sought to modify the proposal of Triffin. He argues that the I.M.F. should be made into a central bank for its members, and that the present quota system of the Fund should be abolished. He has, however, extended his support to the present guarantee clause protecting the I.M.F. holdings of member currency so that no member country will demand gold in settlement of payments due either from another member country or from the Fund. The I.M.F. will be an international lender of the last resort. In case of excessive Fund holdings of a member country's currency, the Fund should, according to Angell, suspend payment of interest on the deposit held by the member with it, or impose charge on any holdings by it of the member's currency, or require the member country to repurchase, either with gold or with any other currency acceptable to the Fund, excess Fund holdings of the member country's currency. But Angell's proposal seeks to eliminate gold from international payments. It may undermine business confidence and adversely affect incentives to invest on international scale among the member countries themselves.

Proposals of Maulding, Roosa, Posthuma and Stamp

Mr. Maulding, the British Chancellor of Exchequer gave a plan at the annual meeting of the I.M.F. held in 1962, for increasing international liquidity within the Fund. He advocated setting up

1. J. W. Angell—"The Reorganisation of International Monetary System—An Alternative Proposal" in *Economic Journal* December, 1961.

of "*mutual currency account*" in the Fund. The countries participating in this scheme may pay into the account in currencies which are temporarily in surplus in the exchange markets or which have been anyhow acquired by the member country. A country thus having deposit with the account can utilise the deposits whenever it faces deficit in its balance of payments. This scheme mainly relies on exchange guarantee. This scheme can tackle the problem of international liquidity only temporarily and not permanently. In the same meeting Mr. R. V. Roosa also gave another plan for increasing international liquidity. Roosa gave stress on creating new reserve centres. In future we may find growth of reserves of the member-countries in currencies other than dollar and sterling. But it is doubtful as to whether the Roosa plan, even if it is fully implemented, will be able to solve the problems of international liquidity. We may here also refer to the proposals of Prof. Posthuma and Mr. Mackwell Stamp, a former Director of the I.M.F. *Posthuma is in favour of holding by a country of the reserves of "key" currencies which include dollar, sterling and the currencies of the six member countries of the European Common Market.* Prof. Posthuma urges that the U.S.A., U.K. and the six countries of the E.C.M. should hold at least 40 p. c. of their reserves in these currencies and the balance in gold. But Posthuma seems to ignore the risks involved in seeking to increase international liquidity by using national currencies as international reserves. Mr. *Stamp advocates a policy of not only expanding the volume of international liquidity, but also of allocating a bigger portion of loans for financing economic growth of the underdeveloped countries.* The I.M.F. under this Plan should be authorised to issue "Fund Certificates" to a value of say $ 3 billion over next one year. Under this plan, the Fund would issue certificates which could be given to an aid conducting agency for properly allocating them to the underdeveloped countries under an agreed programme. These certificates would circulate as international money and would be treated at par with gold by the countries which accept them in payment of goods and services. Stamp plan does not, however, give the details of the limits to which these certificates would be issued.

Bernstein Plan

Mr. Bernstein has, first of all, analysed the factors governing the demand for international liquidity. For meeting the transactions and precautionary demands for international liquidity, Bernstein has suggested that the central banks of the member countries of the I. M. F. should regard their quota with the Fund as part of their working reserves. For meeting the speculative demand for international liquidity, the I. M. F. should be empowered, Bernstein suggests, to borrow funds under stand-by agreements from those countries that have got increased international reserves and lend out to the countries suffering from deficit in international reserves. Mr. Jacobson, one Ex-Managing Director of the Fund has supported the view of Bernstein. Bernstein proposal does not, however, provide any lasting solution as it does not actually assure us of an increase in total world liquidity. It simply prevents some countries from accumulating large amount of limited supply of international liquidity.

Balogh's Proposal

Mr. T. Balogh has given stress on (i) reducing the need for international reserves (ii) creating additional liquidity and (iii) enlarging the Bretton Woods conception. For reducing the demand for international reserves, Balogh has recommended the introduction of "automatic credits" through regional or universal clearing. He has also recommended the purposive creation of equilibrating demand. In times of general boom, this would necessitate restrictions on the part of the fully employed mature deficit countries. It also provides for the automatic use of persistent surplus of mature creditor countries and for loans on a medium-long-term basis to be used for accelerating the rate of economic development. For creating additional liquidity, Balogh has suggested to increase the I. M. F. quota and to raise the gold prices. For enlarging the Bretton Woods conception, Balogh has recommended an integration of the "liquidity approach" (i. e. the capacity to create new liquidity) and the equilibrium approach (i. e. arrangement to

reduce the need for liquidity). According to Balogh, the transformation of the I. M. F. into an international central bank would be the least costly and most effective way of dealing with the problems. This would call for a revision of the I. M. F. Charter. Balogh contends that an International Development Fund may be established as an agency of the I. M. F. which may be entrusted with the duty of helping a member country to stabilise investment pattern and/or achieve a high rate of growth so that there may not be violent fluctuations in demand for international liquidity or the imbalance between demand for and supply of international reserve in a member-country may not be so serious as to distort its growth.

An Appraisal of the Problem

The above survey of the different proposals for raising international liquidity reflects the awareness of experts of the weakness of the existing system. There is no doubt that the Fund's policies require re-examination so as to keep pace with the mounting problem of international liquidity. Time has come for revising the Charter of the I. M. F. to facilitate internationalisation of foreign exchange reserves on lines as suggested by Keynes and modified by Balogh. This can be done by pursuing a phased programme progressively. A scheme of international monetary co-operation imposes some obligations on both the developed and the underdeveloped countries. They should manipulate their internal monetary and fiscal operations in such a manner that domestic stability on the pattern of investment and rate of growth may be maintained. Apart from this, there should be a general revision of the export-import policy of every member country so that it can be reformulated in keeping with the demand and supply positions of international liquidity. The measures adopted so far to augment international liquidity have been the following : (1) The formation of a crisis Fund of $ 6 billion to be constituted by the U. S. A., Britain, Canada, Japan and the six E. C. M. countries to ensure that if any of these countries faces sudden balances of payments difficulties the surplus countries would at once lend to the I. M. F. their currencies

in required amounts so long as such lending does not exceed their respective commitments to the crisis fund ; and on receipt of such currencies, the I. M. F. would re-lend these to the deficit countries. (2) The quota of the member countries have been raised further from what they were originally. (3) The borrowing facilities from the Fund have been liberalised. (4) The Bale Agreement among some West European central bankers to adopt a policy of mutual support and co-operation for protecting a weak currency. The annual report of the working of the I. M. F. in 1963 was submitted on 6th Sept. 1964, in the annual meeting held in Tokyo. It will be here interesting to refer to the annual report of Mr. Schweitzer, the present Managing Director of the I. M. F. who said that a greater stress on fiscal policies rather than monetary policy would leave greater freedom for monetary policies to be adopted to changing international situations in the interest of the co-ordination of monetary policies among the major countries. Mr. Schweitzer has expressed the view that "restrictive monetary policies in Europe, coupled with more liberal monetary policies in the United States, as evidenced by the growing disparity in interest rates between the two areas, carry with them dangers of their own." As to fiscal policies Mr. Schweitzer has urged countries in strong payments positions to make every effort to lower impediments to imports and capital exports. He has strongly recommended an early increase in the quota of all countries which belong to the Fund. This would increase conditional liquidity which is available to countries on the understanding that they will follow constructive policies to eliminate their payments deficits. It has been revealed in the annual report of 1964 that the Fund has substantially increased its work on the problems of developing countries. The remarkable revival of export prices in 1963 contributed to an improvement of over-all balance of payments position of less developed countries, which showed a surplus of 850 million dollars in 1963 as against a deficit of 650 million dollars in 1962. It is to be expected that imports in the developing countries will sooner or later catch up with the improvement in their export earnings, bringing their reserves accumulation to a halt. Experiences have already shown that in the long run it is a

disadvantage of both creditor and debtor countries alike if a backlog of commercial payments accumulates which cannot be paid off except over a long period.

The conclusion we arrive at from the above study is that any proposal for allowing greater liquidity of the resources of the I. M. F. would scarcely solve the problems of developing economies. Greater liquidity than the present liquidity aims at correcting temporary trade imbalances in the developed countries whereas the problem of developing nations requires a long range solution. What we require most is to create an atmosphere in which a country will be in a position to stabilise its output and growth which will enable a country to move towards self-sufficiency and to import less in relation to export.

References :

1. B. Tew—International Monetary Co-operation, 1945-60.
2. Scammell—International Monetary Policy.
3. Hansen—America's Role in World Economy.
4. Sayers—Modern Banking.
5. S. K. Basu—A Survey of Contemporary Banking Trends.
6. Triffin—Gold and Dollar Crisis.
7. B. Tew—The International Monetary Fund : Its Present Role and Future Prospects.

APPENDIX TO CHAPTER 2

Latane's Demand Function for Money

Latane adopted a pragmatic approach to the constant-velocity and Keynesian formulations of demand for money, found that a simple linear relationship between the ratio of money (currency plus demand deposits) to income and the reciprocal of high-grade long-term interest rates fitted the historical data closely. In Keynesian theory, the demand for money as an asset is a function of the rate of interest and the demand for money as a medium of exchange is a function of income. Keynes believed in the opportunity cost of holding money but ignored it. Latane tested a function of the form $\frac{Y}{M}=f(V)$, and got a Keynesian type of liquidity preference curve.[1]

Latane's demand function for money depends on both income (with a unitary income elasticity) and the long-term interest rate, while Friedman's demand function for money depends only on income, with an income-elasticity substantially above unity. The difference between Friedman and Latane arises on account of the fact that both of them use different time periods and definitions of money. In Friedman's analysis money means currency plus demand deposits plus time deposits while in Latane's, mony means currency plus demand deposits only. The real issue is which definition gives the better empirical result. Latane has shown that his formulation fits the subsequent data well. Latane explains the difference between the income-elasticities of the two functions by the facts that over the period covered by Friedman's calculations time deposits grew more rapidly than demand deposits, and the long-term rate of interest declined from 6·4 per cent to 2·9 per cent. Latane also adduces evidence for the existence of a liquidity trap,

1. H. Latane—"Cash Balance and Interest Rates." "A Pragmatic Approach." Review of Economics and Statistics, 1956. Vol. XXXVI P. 456.

though he prefers to explain it by the cost of bond transactions rather than by Keynes' speculative motive. Friedman's demand function, by contrast, does not fit the subsequent data, since the secular declines in velocity has reversed itself. Latane's analysis would attribute this to the subsequent upward movement of interest rates. Latane arrives at the conclusion that the relation between v and r is a constant. He uses a linear relationship between income velocity and the rate of interest, $V = 0{\cdot}77r + 0{\cdot}38$, where $V = Y/M$, income divided by the quantity of money. This yields the demand function for money, $M = Y/(0{\cdot}77r + 0{\cdot}38)$. Using this definition $W = Y/r$, this can be written equivalently as :

$$M = \frac{W}{0{\cdot}77 + 0{\cdot}38/r} \quad or \quad M = \frac{W}{0{\cdot}77 + 0{\cdot}38W/Y}$$

If wealth is assumed to be measured by income capitalised at long-term rate of interest, the quantity of money demanded in Latane's function can be expressed as a function of interest and wealth or of wealth and income, as above.

1. Latane—"Income Velocity and Interest Rates. A Pragmatic Approach." Review of Economics and Statistics, Nov. 1960.

APPENDIX TO CHAPTER 14

SOLOW'S TECHNICAL PROGRESS FUNCTION

Economic growth depends not on capital and labour inputs only ; it is the function of a complex of some additional factors like economies of scale, external economies, education, market research. These are the Residual elements in growth. According to Solow, the 'Residual' is the ratio between an aggregate arithmetic index of output and of input embodied in a linear homogeneous production function. Solow has developed a model in which technical change plays a vital part in the process of growth, and through this model, Solow shows that the rate of growth of the Residual, or the rate of growth of technical progress can be estimated.

The mathematical formulation underlying the Solow method proceeds along the following lines :

$$Q = F(K, L, t) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where Q represents output, K and L are capital and labour respectively, and the variable t for time appears in F to allow for technical change which is a "catch all" expression for any kind of shift in the production function.

If technical progress is neutral, the production function takes the form :

$$Q = A(t)\, f(K, L) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1a)$$

The multiplicative factor $A(t)$ measures the cumulative effect of neutral shifts over time. Shifts are said to be neutral if they leave unchanged the marginal rates of substitution among the factors of production but simply increase or decrease the output attainable from given inputs.

In terms of Cobb-Douglas Production Function

$$\bar{Q} = \bar{A} + \bar{L}^{\alpha} + \bar{K}^{\beta} \quad \ldots \quad \ldots \quad \ldots \quad (1b)$$

where $\bar{Q}$ stands for rate of growth of output, $\bar{A}$ for rate of technical progress, α and β for elasticity of output in terms of labour and capital respectively, $\bar{L}$ and $\bar{K}$ for rate of change in labour and capital respectively. If we differentiate (1a) with respect to time and

introduce wk and wl as the relative shares of capital and labour respectively in national product, the equation (1b) can be re-written as follows :

$$\frac{Q'}{Q} = \frac{A'}{A} + wk\frac{K'}{K} + wl\frac{L'}{L} \quad \ldots \quad \ldots \quad (2)$$

where dots indicate time derivatives. Now let us assume q is the output-labour ratio (Q/L) and K is the capital-labour ratio (K/L), then,

$$\frac{q'}{q} = \frac{Q'}{Q} - \frac{L'}{L} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2a)$$

and,

$$\frac{q'}{q} = \frac{A'}{A} - wk\ \frac{K'}{K} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2b)$$

For empirical estimation of technical change, let us transpose equation (2b) to

$$\frac{A'}{A} = \frac{q'}{q} - wk\ \frac{K'}{K} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2c)$$

Solow applies his model to the American economy for the period 1909—1949. He finds that the overall result for the whole period of 40 years is an average upward shift of about 1·5 per cent per year. During the same period, output per man hour approximately doubled. At the same time, the cumulative upward shift in the production function was about 80 per cent. Solow finds that about one-eighth of the total increase ($12\frac{1}{2}$ p. c.) is traceable to increased capital per man hour, and the remaining seven-eighths ($87\frac{1}{2}$ p. c.) to technical change.

The above analysis was given by Solow in his paper in the Review of Economics and Statistics, 1957. Later on, Solow has modified his analysis further. He points out that a technical improvement more often requires that the concrete inputs, especially the capital inputs, change their form and sometimes the same is true of the output. Solow calls this kind of technical change as "embodied" technical change and the other kind, which is purely organizational has been characterized by Solow as "disembodied" technical change. In case of disembodied technical change, productive capacity depends on the amount of capital accumulated but not on its age. In case of

embodied technical change, obsolescence is to be taken into account. Solow's modified version for a given level of technology, embodied in a given "vintage" of capital goods is as follows :

$$Qt = AJt^{\alpha} Lt^{1-\alpha} \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad (3)$$

where Qt is potential output, Lt is the full employment supply of labour and $Jt = \Sigma(1+\lambda)^{v} K_{v}(t)$, with λ representing the geometric rate of technical progress and $K_{v}(t)$ the quantity of capital goods constructed in year v thus enjoying the level of technology $(1+\lambda)^{v}$ and surviving in year t. To estimate a production function of this type requires data on potential output or the capacity output, the supply of labour, and the equivalent stock of capital.

References

1. Solow—Capital Theory and the Rate of Return.
2. Solow's articles in Review of Economics and Statistics, Aug. 1957 and A. E. R. Papers and Proceedings, 1962.

ERRATA

Page	*Line*	*Incorrect*	*Correct*
21	27	dose	does
36	14 (Equation 10)	S	S_L
36	30 (Equation 15)	B_r	B_S
57	25	Liebhabsky	Liebhafsky.
63	11	in	it
63	12	it	in
73	23	absense	absence
108	5	interest	interesting
126	18	there	the
172	19	detriorated	deteriorated
177	23	yesterday's	to-day's.
187	21	$\delta y = KSI$	$\delta Y = K.\delta I$
201	27	autonomus	autonomous
268	3	when output is constant begins	when output begins
268	8	r where	r. Where
270	30	this	thus
299	16	1967	1957
299	29	in corve incernce	income interms of
300	8	for	far
306	3	member	number
308	13	fifth	sixth
308	22	for	far
308	last line	The following... India.	Deleted.
309	3	Modan	Madan
314	31	"of funds starts the circular flow."	"creation of funds starts the circular flow."

Page	*Line*	*Incorrect*	*Correct*
318	30	$1/\delta.(\Delta I)$	$1/\varkappa.(\Delta I)$.
322	6	tuan	than
324	4	vk	k
324	foot note	vk	k
329	1	chart	chart[1].
331	14	on	an
348	22	I − Ex	I + Ex
348	23	$I_m(y)+S(y)$	$I_m(Y)+S(Y)$.
352	3	x	X
352	3	x'	X′
352	4	oy	OY
352	4	oy′	OY′
361	23	cost of	cost of imports
363	4	forein	foreign
363	7	Q_r	q_x
363		All Q_x, Q_m	q_x, q_m
363		All P_m	p_m
364		All P_m	p_m
368	22	productinity	productivity
387	6	B	A
387	6	A	B
387	8	A	B
387	9	B	A
387	9	it	it (A)
387	14	B	A