

ECONOMICS MODULE 4

Current Controversies in Macroeconomics

Keynesian Counter revolution

The Keynesian Revolution was a fundamental reworking of economic theory concerning the factors determining employment levels in the overall economy. The revolution was set against the then orthodox economic framework, namely neoclassical economics. The early stage of the Keynesian Revolution took place in the years following the publication of John Maynard Keynes' General Theory in 1936.

It saw the neoclassical understanding of employment replaced with Keynes' view that demand, and not supply, is the driving factor determining levels of employment.

This provided Keynes and his supporters with a theoretical basis to argue that governments should intervene to alleviate severe unemployment.

With Keynes unable to take much part in theoretical debate after 1937, a process swiftly got under way to reconcile his work with the old system to form neo-Keynesian economics, a mixture of neoclassical economics and Keynesian economics.

The process of mixing these schools is referred to as the neoclassical synthesis, and Neo-Keynesian economics may be summarised as **"Keynesian in macroeconomics, neoclassical in microeconomics"**.

Theory of employment

A central aspect of the Keynesian revolution was a change in theory concerning the factors determining employment levels in the overall economy. The revolution was set against the orthodox classical economic framework, and its successor, neoclassical economics, which, based on Say's Law, argued that unless special conditions prevailed, the free market would naturally establish full employment equilibrium with no need for government intervention.

This view held that employers will be able to make a profit by employing all available workers as long as workers drop their wages below the value of the total output they are able to produce – and classical economics assumed that in a free market workers would be willing to lower their wage demands accordingly, because they are rational agents who would rather work for less than face unemployment.

Keynes argued that both Say's Law and the assumption that economic actors always behave rationally are misleading simplifications, and that classical economics was only reliable at describing a special case. The Keynesian Revolution replaced the classical understanding of employment with Keynes's view that employment is a function of demand, not supply

Dual Decision Hypothesis,

Clower managed to account for Keynes' **"unemployment equilibrium"** by **introducing a new concept of "dual hypothesis"**. He also introduced a new concept, namely 'notional demand' and reintroduced 'effective demand'. The concept of effective demand was popularised by Keynes. Leijonhufvud does not accept the idea that Keynesian economics is an 'equilibrium economy'. He argued that the whole Keynesian economics should belong to disequilibrium economics. Shackle's contribution is also included in the category of disequilibrium.

Janos Kornai criticised Walras's 'General Equilibrium Theory', GeorgescuRoegen introduced a new concept of '**Bio Economies**'. In the following pages we will discuss each of the above concepts in detail.

Equilibrium and Disequilibrium

The word 'equilibrium' in its usual sense means an 'absence of motion'. A market is in equilibrium if and only if market price and quantity traded are stationary over time. The economy may be said to be in a state of disequilibrium if prevailing prices are such that demand differs from supply in any market.

This means that individual trading plans, taken as a whole, are mutually inconsistent which in turn, means that at least some individual plans cannot be carried into effect at prevailing market prices. In these circumstances, it is plausible to suppose that prevailing prices tend to vary over time – rising in market where demand exceeds supply, falling in market where supply exceeds demand.

Notional and Effective

Demand Robert Glower introduced two types of demand namely 'Notional Demand' and 'Effective Demand'. The former is the demand of households at full employment equilibrium prices. Some households will reduce their consumption expenditure if the economic system does not reach full employment equilibrium.

It is due to the fact that their actual incomes have fallen below the national incomes. The latter functions are those which take into account the constraints. When there is considerable unemployment, the excess supply of labour at the going real wage rate is not matched by an equivalent excess effective demand for goods and services because some 'notional' excess demand has been eliminated by the reallocation of expenditure reflecting the constraint of reduced incomes.

Those deviations from full employment equilibrium are spread throughout all markets via the multiplier process. Producers now will receive the wrong price signals, which will not necessarily induce the adjustment that leads to full employment equilibrium.

The labour market would be cleared if money wages were reduced but such wage reductions are not communicated to employers as an increase in effective demand for output. In consequences, labour markets are cleared by adjusting employment to unchanged wages instead of wages being adjusted to unchanged employment level. In a nutshell, economic adjustments depend more on income instead of relative prices. It is due to the fact that all exchange is regarded as disequilibrium exchange at 'false prices'. According to pre-Keynesian concept there is automatic adjustment of prices to clear markets.

If we eliminate this automatic mechanism from price behaviour there will be either shortages or surpluses in all markets and less than full employment. It can be concluded that Glower gives a new terminology to Keynes' '**Unemployment Equilibrium**' by introducing the concept of the 'dual-decision hypothesis'. But many economists do not accept Glower's view. Whatever the reality may be on this question, we find a lot of changes in the field of macroeconomics since the publication of his essay. But some of the contemporary economists like Leijonhufvud and Okun have adopted the notion of 'dual decision hypothesis' as the micro-foundations of a Keynesian type of macroeconomics. Glower's contribution is largely theoretical in nature.

Walrasian equilibrium

The crucial feature of the neoclassical approach is that when market demands and supplies are in imbalance prices will adjust to bring about market-clearing equilibrium in all markets. The first major economist to expound this adjustment mechanism in a general-equilibrium context (that is, one that takes account of all interdependencies between all the markets) was Leon Walras [41, who gave his name to this branch of economic analysis.

In the 1930s, Walrasian economics was still a very undeveloped field. It was only by the very late 1930s that the mathematics required for Walrasian analysis was being developed and not until the 1950s that the Walrasian proposition that a perfectly competitive market-clearing equilibrium exists was proved mathematically. This means that nowadays we have a much clearer idea of the Walrasian micro foundations of (neo-)classical thinking than did Keynes and his contemporaries.

General equilibrium

The problem to which Walrasian analysis is addressed is as follows. Is there a set of prices (P_1 to P_m) such that in every market the demand for each good Walrasian and Keynesian Adjustment Mechanisms 295 equals the quantity supplied, i.e. do we have competitive market-clearing general equilibrium? When general equilibrium is established no further possibilities for mutually advantageous exchange remain.

If they did, so that it was possible for at least one trader to increase his utility without any other trader being made worse off (that is, a Pareto-efficient allocation of the goods had not yet been established), then further exchanges would take place. Because of the limitations of mathematical technique at that time Walras was unable to offer a rigorous proof that a competitive general-equilibrium set of prices exists.

Walras's demonstration that competitive equilibrium could be established was restricted to counting equations and dependent variables.

We have already established that there will be m excess demand equations of the form of 16.4. In general equilibrium each one must equal zero because each market is cleared.

This would appear to give us m equations to determine m prices; however, because of Walras's law this is not the case. Walras's law states that the sum of excess demands over all m markets must always be zero. In general equilibrium the sum of excess demands over $m - 1$ markets is zero;

therefore, to obey Walras's law the excess demand in the m th market must also be zero.

The m th equation is thus redundant because it yields no further information than that given by the $m - 1$ equations.

The m th equation is said to be dependent on the other equations, so we are left with only $m - 1$ independent excess demand equations. It is therefore possible to determine only $m - 1$ prices and these are relative prices.

They state the rate at which one good will exchange for other goods. The number of relative prices (exchange rates) is always one less than the number of goods being traded.

This can be readily seen by considering a model with only two goods, A and B. There is only one independent relative price, the price of A in terms of B, which gives the number of units of B which have to be exchanged in order to buy one unit of A. The relative price of B in terms of A is not independent because it is just the reciprocal $1/P_{AB}$ or P_{BA} .

The key result of the analysis of a pure exchange Walrasian economy is that one can show that in an m -good economy there will be $m - 1$ relative prices at which all markets will be cleared.

The $m - 1$ relative prices can be expressed in $m - 1$ equations.

This has subsequently been proved by Arrow and Debreu. A good, accessible exposition of the whole area is to be found in Weintraub.

2 Mathematically an equation is linearly dependent if it can be formed from a linear combination of two or more equations in the system to which it belongs. For example, given the excess demands in a three-good model such that

$$E_1 = E_1(P_1, P_2, P_3)$$

$$E_2 = E_2(P_1, P_2, P_3)$$

$$E_3 = E_3(P_1, P_2, P_3)$$

then if there exist any two numbers α and β such that

$$\alpha E_1 + \beta E_2 = E_3$$

for all values of P_1, P_2 and P_3 then the three excess demand functions are said to be linearly dependent.

terms of a common standard. One good (which one does not matter) is chosen as a numeraire and the relative prices of the other goods are expressed as the number of units of each good which exchange for one unit of the numeraire.

If we choose good 1 as the numeraire, then the price of the numeraire, p_1 , is fixed at 1 and the other $m - 1$ prices are expressed in terms of units of good 1. Prices are not expressed in terms of money because we are dealing with a pure barter economy.

A neo-Keynesian fixed-price quantity-constrained model

Having sketched out three possible non-market-clearing states that can exist once we allow false trading to occur, we shall now construct a simple macroeconomic model in which money wages and prices are fixed and agents can be quantity-constrained.

The model consists of three markets: the goods market, the labour market and the money market. We simplify by assuming that money is the only financial asset so that we can neglect bonds and the interest rate. We also assume that the money market adjusts quickly so that it is cleared in each short-run time period of analysis.

This leaves us with two markets, the goods market and the labour market, which may remain unclear. When a market experiences excess supply then sellers are rationed; when it has excess demand buyers are rationed. Households are sellers of labour and buyers of goods; firms are buyers of labour and sellers of goods. Hence we have the classification summarised in Table 17.1.

TABLE 17.1

	Households	Firms
Rationed sellers	Excess supply in the labour market	Excess supply in the goods market
Rationed buyers	Excess demand in the goods market	Excess demand in the labour market

For example, when there is excess supply in the labour market households are rationed sellers.

It is one of the axioms of quantity-constrained models that exchange is voluntary: no one is forced to buy more than he wants to or sell more than he wants to. A further axiom is that rationed sellers and rationed buyers cannot exist in the same market. These two postulates ensure that the actual quantity

Rational expectations

- A powerful criticism of the adaptive-expectations hypothesis is that it assumes people keep basing their expectations on the values of lagged variables and fail to learn from their past errors. When inflation is rising the error between actual and predicted inflation is positive over successive periods, and so is serially correlated. This error is repeated and so is called systematic, yet no attention is paid to it if expectations are adaptive.
- If economic agents are rational, they will make full use of all the available information when forming expectations and not just rely on past values of the relevant variable.
- Expectations which are conditioned on all the available information are called rational expectations. When expectations are formed rationally the errors between actual inflation and the expected rate are random and are serially uncorrelated or independent over time.
- There is no systematic error by definition because any systematic error would reveal that information had not been fully used when the expectations were formed. So the expected or mean error is zero.

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- If expectations are rational, then where ϵ_t is a serially uncorrelated error term with a zero mean.
- When expectations are formed rationally then people use information derived from the model which they think explains how the economy behaves.
- This means that if inflation is due to monetary expansion, then information about the current movements in the money supply will be important in conditioning expectations. For instance, if the rate of inflation is determined by

$$\left(\frac{\dot{P}}{P}\right)_t = \rho \left(\frac{\dot{M}}{M}\right)_t + \epsilon_t$$

where (\dot{M}/M) is the rate of growth of the money stock, then

$$E \left(\frac{\dot{P}}{P}\right)_t = \rho \left(\frac{\dot{M}}{M}\right)_t$$

Substituting 18.21 and 18.22 into equation 18.15 (p. 351) gives

$$f(U_t) = \rho \left[\left(\frac{\dot{M}}{M}\right)_t - \left(\frac{\dot{M}}{M}\right)_t \right] + \epsilon_t$$

New Classical Macroeconomics

The main innovation of the new classical macroeconomics as compared with Keynesian analysis is the aggregate supply function. In a new classical model aggregate output consists of a permanent component and a cyclical component

which depends on the divergence between actual and expected prices.

A new classical model is completed by adding an aggregate demand

relationship which is subject to exogenous shocks. Nominal aggregate demand is defined as usual as real output times the price level.

A portfolio-adjustment equation which determines the desired holdings of goods, interest-bearing financial assets and money is added. The aggregate demand side of the model does not differ from that in the Keynesian-neoclassical synthesis as significantly as does the specification of aggregate supply.

1. How the new classical model works compared with the Keynesian neoclassical synthesis can be simply illustrated by means of a standard aggregate demand and supply diagram, as in Figure 19.1. We start in a position of long-run equilibrium.

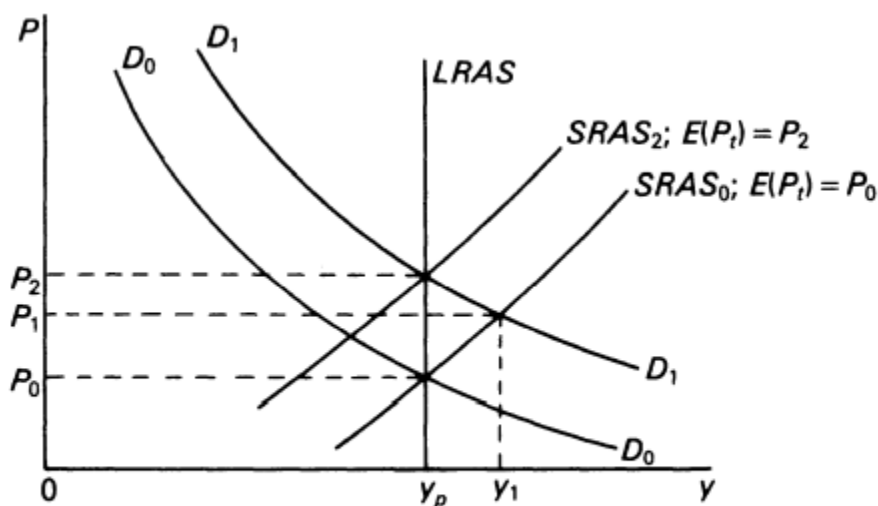


FIGURE 19.1 *Adjustment in a new classical model*

Aggregate demand is D_0 , output is at its permanent level, y , p' and the price level is P_0 . Then the government increases aggregate demand to D_1 by policies which must include expanding the money supply. The short-run supply function when the expected price level is P_0 is $SRAS_0$.

At first the price level rises

to P_1 . Traders, expecting the general price level to be P_0 , think relative prices have risen. Output therefore expands along $SRAS_0$ to y_1 . As traders adjust their expectations about the general price level so the short-run supply curve shifts up to the left. Once prices have stabilised at P_2 and price expectations

have adjusted fully, the short-run aggregate supply function has shifted up to SRAS2, for which $E(P)_t = P_2$.

Output has returned to its previous level as long-run aggregate supply is invariant with respect to the price level.

Essentially the same analysis could be conducted assuming continuous inflation. The rate of inflation would be measured along the vertical axis and each a short-run supply curve would be defined for a particular rate of expected inflation.

Output would rise if the actual rate of inflation were higher than the expected rate and the permanent level of output, y_p would be consistent with any steady rate of inflation, giving a vertical long-run aggregate supply relationship. Expressed in terms of the rate of change of prices, the Lucas supply relationship closely resembles the Phillips relation:

$$y_t - y_{pt} = \gamma \theta (\dot{P}/P - E(\dot{P}/P))_t \quad (19.8)$$

where

\dot{P}/P = actual rate of inflation
 $E(\dot{P}/P)$ = the expected rate of inflation in the sense of the rate of inflation agents *think* exists currently

An endogenous explanation of business cycles?

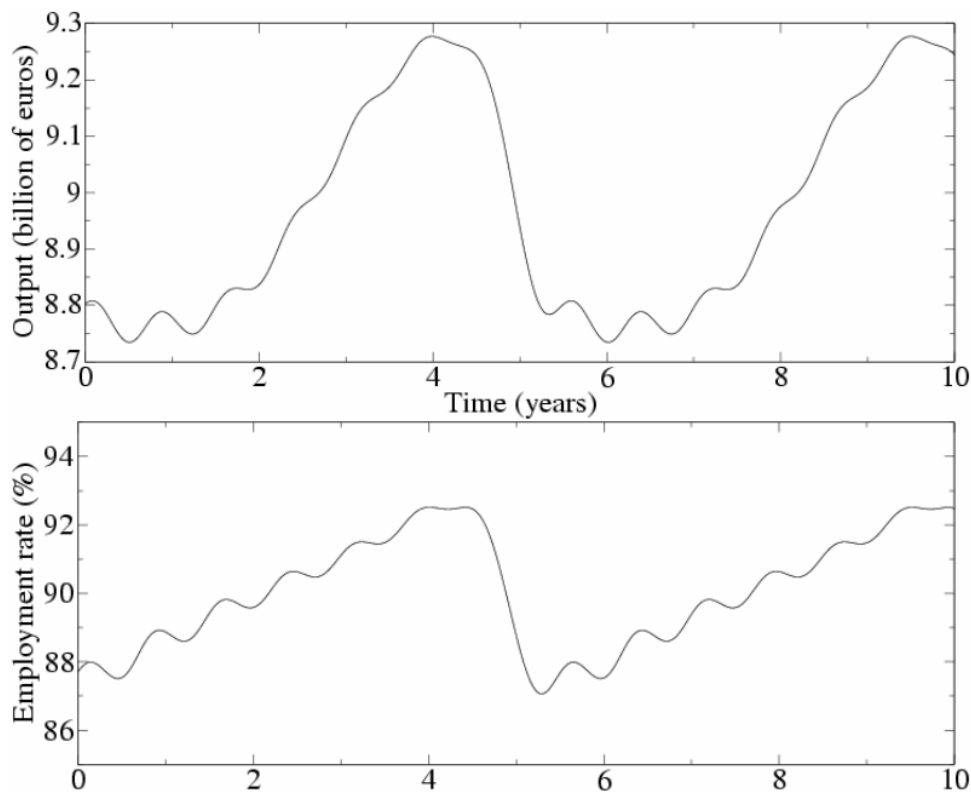
There are few, if any, systems of high complexity with stable behaviour. Most physical and biological systems exhibit natural variability, i.e. they include destabilising processes that make them deviate from equilibrium; limitations on resources, on the other hand, cause these deviations to remain bounded in amplitude.

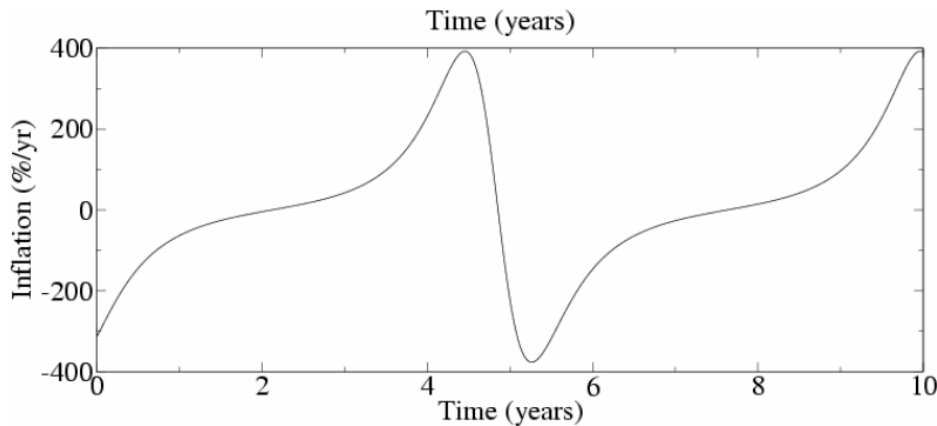
Examples of such systems are the global climate system or regional ecosystems dominated by predator–prey interactions. Concerning the coupled ocean–atmosphere system, both short-term weather and longer term climate variability arise from the interaction between the variability of exogenous forcing and the interplay of nonlinear feedbacks.

Variations of external forcing do play a key role in the variability: indeed, the diurnal and seasonal cycles steer a large part of this variability and are clearly visible in the power spectrum of meteorological and oceanographic variables. Nonlinear feedbacks in the climate system though – such as those between cloud cover or surface properties and the radiative fluxes – are essential drivers of long-term and large-scale variability, even in the absence of exogenous forcing variations.

The same interaction can be observed in ecosystems. Loeuille and Ghil (2004) compared intrinsic (endogenous) and climatic (exogenous) factors in the population dynamics of North American mammals.

They found that both types of factors have to be taken into account to understand the behaviour of animal population series. Again, variability arises from the interplay of nonlinear, endogenous dynamics and responses to exogenous shocks.

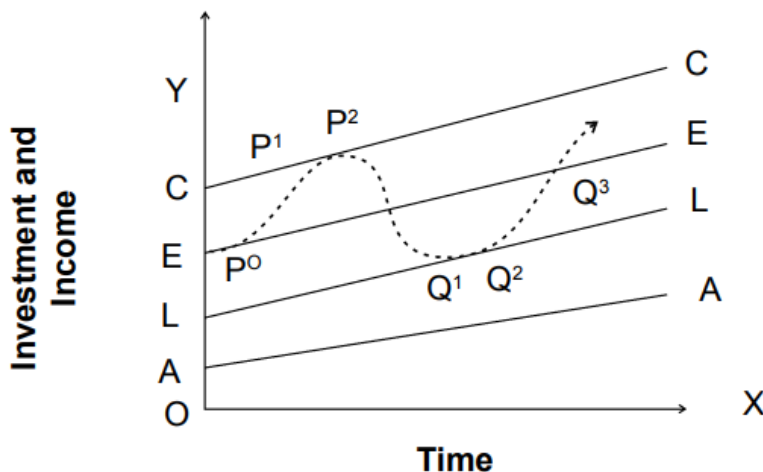




- Hicks Theory of Business Cycles J. R. Hicks in his "Contribution to the Theory of Trade Cycles" has propounded a complete theory of business cycles based on the interaction between the multiplier and accelerator by choosing certain values of marginal propensity to consume (C) and capital output ratio (V).
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- To explain business cycles of the real world, Hicks has incorporated the role of buffers in his analysis. He introduces output ceiling when all the given resources are fully employed and prevent income and output to go beyond Y O X O Y X New Equilibrium Initial Equilibrium Panel (b) Time Panel (c) Time Initial Equalisation Income (Output) Income (Output) Y X O Panel (e)
- Time Initial Equalisation Income (Output) 165 it, he visualises a floor or the lower limit below which income and output cannot go because some autonomous investment is always taking place.
- According to Hicks, cyclical fluctuations in real output of goods and services take place above and below rising line of trends, or growth of income and output. This theory explains business cycles along with equilibrium rate of growth.
- The long run equilibrium growth of income is determined by the autonomous investment and the magnitudes of multiplier and accelerator.
- Hicks assumes that autonomous investment, depending on technological progress, innovations and population growth, grows at a constant rate.

With further assumptions of stable multiplier and accelerator, equilibrium income will grow at the same rate as autonomous investment. Therefore, the failure of actual output to increase along the equilibrium growth path, sometimes to move above it, and sometimes to move below it determines the business cycles.

- According to Hicks, the values of marginal propensity to consume and capital output ratio fall in either region C or D in figure below.
- In case of values of these parameters lie in the region C, they produce cyclical movements whose amplitude increases over time, and if they fall in region D they produce explosive upward movement of income or output without oscillations



- In the above figure, AA = Autonomous Investment, LL = Flour Line that sets lower limits below which income (output) cannot fall, EE = shows equilibrium growth path of national income determined by autonomous investment and effect of multiplier and accelerator, FF = Full employment ceiling, CC = Ceiling line.
- When the economy reaches point P0 along the path EE, there is an external shock outburst of investment due to certain innovation or jump in governmental investment. When the economy experiences an outburst of autonomous investment, it pushes the economy above the equilibrium growth path EE after point P0. The rise in autonomous investment due to external shock causes national income to increase at a greater rate than

that shown by the slope of EE. This greater increase in national income will cause further increase in induced investment through the acceleration effect. Y Q3 P1 P2 O E A C X L E C L A P O Q2 Q1 Investment and Income Time

166 This increase in induced investment causes national income to increase by a magnified amount through multiplier. So under the combined effect of multiplier and accelerator, national income or output will rapidly expand along the path from P0 to P1. Movement from P0 to P1 represents the upswing or expansion phase of the business cycle. But this expansion must stop at P1 because this is the full employment output ceiling. The limited human and material resources of the economy do not permit a greater expansion of national income than shown by the ceiling line CC. Therefore, when point P1 is reached the rapid growth of national income must come to an end. Hicks assumes that the full employment ceiling grows at the same rate as autonomous investment. Therefore, CC slopes are unlike the very steep slope of the line P0 to P1. When point P1 is reached the economy must at the same rate as the usual growth in autonomous investment. There is slackening off at point P2 and national income starts moving toward equilibrium growth path EE. This movement from P2 downward represents the down rising or contraction phase of the business cycle. In this downswing investment falls off rapidly and therefore multiplier works in the reverse direction. The fall in national income and output resulting from the sharp fall in induced investment will not stop on touching the level EE, but will go further down. The economy must consequently move all the way down from point P2 to point Q1. But at point Q1 floor has been reached. When during downswing such conditions arise, the accelerator becomes inoperative. After hitting the floor of the economy may for some time crawl along the floor through the path Q1 to Q2. In doing so, there is some growth in the level of national income. This rate of growth as before induces investment and both the multiplier and accelerator come into operation and the economy will move towards Q3 and the full employment ceiling CC. This is how the upswing of cyclical movement again starts.

Critical Appraisal Following criticisms

are levelled against the Hicks theory

1. According to Kaldor, this theory is based on the principle of acceleration in its rigid form.
2. According to Duesenbery, the basic concept of multiplier – accelerator interaction is an important one but we cannot really accept to explain observed cycles by a mechanical application of that concept.

Goodwin's Model of Business Cycles

- Goodwin's model of business cycles like that of Hicks is an extension of the multiplier – accelerator model of business cycles. He thinks there is a need to combine growth and cycles.
- However, introduction of growth in the model of trade cycles by means of growing autonomous investment is not fully sufficient. Growth in the labour force and improvement in techniques are crucial factors in determining economic growth. These two factors cause persistent growth in productive capacity, but not necessarily equal to growth in demand.
- Adequate growth in demand is achieved through occasional bursts of innovative investment. Structural coefficients of the economy such as propensity to consume or save and capital – output ratio are such as to give explosive oscillations.
- Investment once begun carries the free market economy to full employment and this upper limit rises rapidly with accumulation of capital, which allows the realisation of technological progress. The expansion of the economy is constrained by the full employment ceiling. However, after remaining at the peak, certain forces push it downward again.
- Thus, in absence of lags, Goodwin's model visualises a two phase cycle, full employment and deep depression. Model Goodwin takes capital stock rather than income as the central explanatory variable
- He rejects the proportionality of capital and output, and explains investment on the basis of comparison of desired capital stocks with the

actual capital stock. He uses 'flexible accelerator' as the explanatory principle for investment.

- According to this principle, net investment will be undertaken as long as desired capital stock is greater than the existing capital stock. The crucial equation of model of cyclical growth is that of factors which determine desired capital

(K^*) stock is; $K^* = vY + \beta(t)$ where v = acceleration coefficient (capital - output ratio) Y = output, $\beta(t)$ = parameter representing a change in technique or technology

According to the equation, innovation or technological advance implies that more capital is desired with a given output and the accelerator (v) implies that more capital is desired with increased output. Thus, this equation described the **principle of 'Flexible Accelerator'**.

The pressure to expand capital stock through investment is proportional to the difference between desired capital stock (K^*) and the actual capital stock (K), subject to two non-linear constraints. The upper limit is set by maximum output of new capital goods obtainable with given capital stock and labour, and therefore corresponds to the full employment ceiling. The lower limit is set by the rate at which capital can be scrapped at zero gross investment. It follows that, $I = (K^* - K) \cdot \lambda$ where, λ = proportion of gap between desired capital stock (K^*) and actual capital stock (K) since investment leads to the expansion in productive capacity, this equation represents the supply side of the model.

Demand in this model is given by the Keynesian multiplier, and can be stated as; $Y = f(I)$ The relation between income or output (Y) and investment (I) depends on the size of the multiplier, which is governed by marginal propensity to consume or save. Propensity to save is rather small, which ensures higher value of multiplier in the downsizing of a business cycle. The complete version of Goodwin's model; $I = \lambda [vY + \beta(t) - K]$ From the above equation, capital stocks (K) depend on investment and technological change (i. e. innovations).

Critical Appraisal

1. Goodwin assumes an economy whose behaviour is characterised by tendency towards 'explosive oscillations'.
2. If the economy's inherent tendency is towards 'dumped cycles', then persistent cycles cannot be accounted for by Goodwin theory.
3. According to Ragnar Frisch, persistent random shocks to the system provides a reasonable explanation of trade cycles
4. This theory has not any empirical evidence in the analysis of business cycles

Policies to Control Business Cycles

Business cycles disrupt economic activity and hinder economic development, coupled with adversely affecting the standard of living of the major section of the people.

Hence, their control is essential. following policy measures are useful for their control.

I) Monetary Policy Measures

The monetary policy measures regulate the supply of money, especially bank money in accordance with the needs of the economy and control business cycles.

A) Bank Rate

The central bank bring about necessary changes in the bank rate, taking into consideration of the state of the business cycle. The increase in bank rate enables to control of the state of prosperity/inflation, and its cut down facilitates the revival of the economy from the depression.

B) Cash Reserve Ratio

Increase in cash reserve ratio restricts credit expansion and controls the state of prosperity. Depression can be controlled by decreasing the cash reserve ratio.

C) Open Market Operations

The sale of securities in the market during the prosperity controls credit

expansion as well as growing demand for goods and services, and restricts the state of prosperity. The purchase of securities facilitates the removal of the economy from the depression.

D) Selective/Qualitative Measures

Besides quantitative measures, the selective or qualitative credit control measures like fixation of margin between security and loans, rationing of credit, control through directives, moral suasion, and publicity direct controls are useful in controlling business cycles with their necessary applications.

II) Fiscal Policy Measures

The fiscal policy measures regulate the demand for goods and services and control the phases of business cycles. They are :

A) Taxation

Increase in taxation is useful to control the state of prosperity, their reduction is useful in reviving the economy from the depression.

B) Public Expenditure

The policy of cut down in public expenditure arrests the state of prosperity or inflation. On the contrary, increase in public expenditure revives the economy from the depression.

C) Public Debt

The government should raise more and more public debt, especially the internal public debt, which reduces purchasing power of the people, their demand for goods and services, and control prosperity. The repayment of public debt by the the government facilitates the control of the state of depression.

D) Budgetary Policy

The policy of surplus budget is useful to control the prosperity, and deficit budget is desirable in the control of increasing depression.

E) Savings Policy

The policy of voluntary as well as forced savings is suggested to control higher intensity of inflation. On the contrary, discouraging savings is useful to restrict the state of depression.

III) Other Policy Measures

All other measures not included in money and fiscal measures are included under this category. They consist of :

A) Production Policy

The policy should attempt to promote the output during the prosperity, and to curtail the output during the depression.

B) Price Policy

The policy of price control is useful in dealing with the problem of business cycles. The government should fix upper and lower limits within which only the prices will fluctuate.

C) Wage Policy

The policy of hike and reduction of wages should be adopted during prosperity and depression respectively.

D) Unemployment Insurance Scheme

The government should collect unemployment insurance fund from the workers, especially during prosperity. It can be useful to compensate the workers during their unemployment in depression.

E) Socialist Economy

The problem of business cycles is the part and parcel of the capitalist economy due to lack of cooperation and coordination in economic decision making. Hence, the socialist economy featured by the government decision making is useful in dealing with the business cycles.

Exogenous shocks in models

with endogenous variability As we have seen, both RBC and EBC models have their shortcomings, and thus it seems that an entirely satisfactory theory of the business cycle has still to be developed. Such a theory should be able to explain the properties of business cycles and output volatility without relying exclusively on the properties of exogenous shocks that are not fully understood. Two strategies are thus possible. First, maintain the RBC framework but explain the exogenous shocks the model takes as input, and their characteristics, from scratch. Studying technological progress and innovation belongs to this strategy (see for example Rotemberg and Woodford, 1994). Second, following the EBC

theory, it is possible to assume that business cycles originate from within the economic system, because of intrinsic destabilising processes, but are also continuously perturbed by additional exogenous shocks. Even though the two approaches are complementary and together can contribute to explaining the actual business cycle process, this paper will now focus on the second one, through the introduction of exogenous shocks into our EBC model.

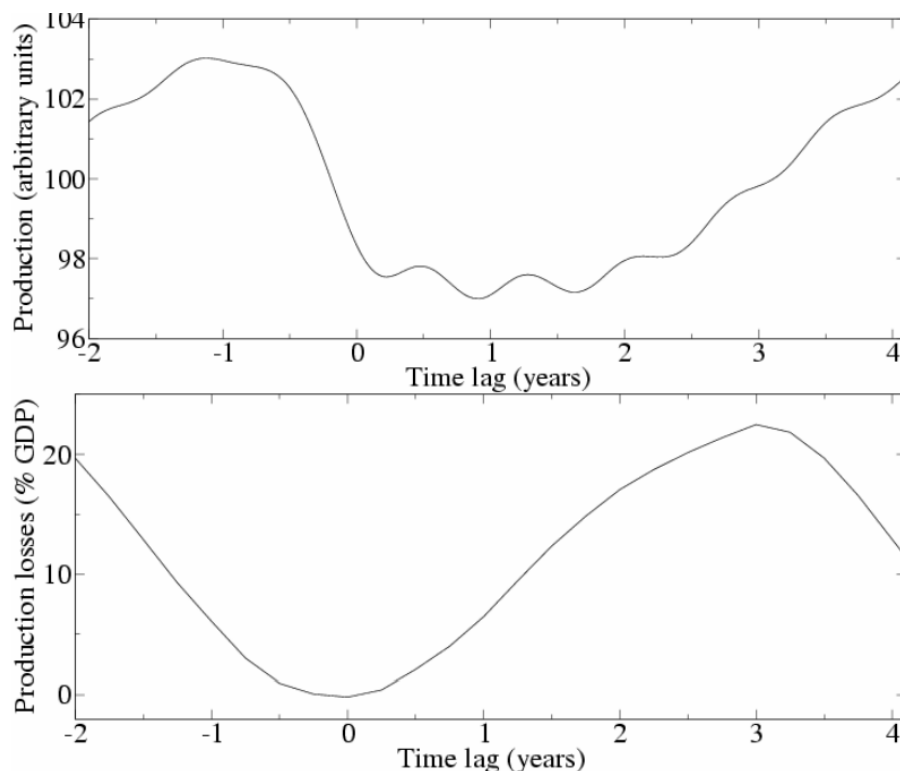


Figure 2. The EBC model: production and production losses over time lag

Real Business Cycle Models

Real business cycle theory is an outgrowth of the new classical theory, which in turn built on the original classical economics. In fact, real business cycle models are sometimes referred to as the second generation of new classical models.

CENTRAL FEATURES OF REAL BUSINESS CYCLE MODELS Recall that new classical economists believe macroeconomic models should have two characteristics:

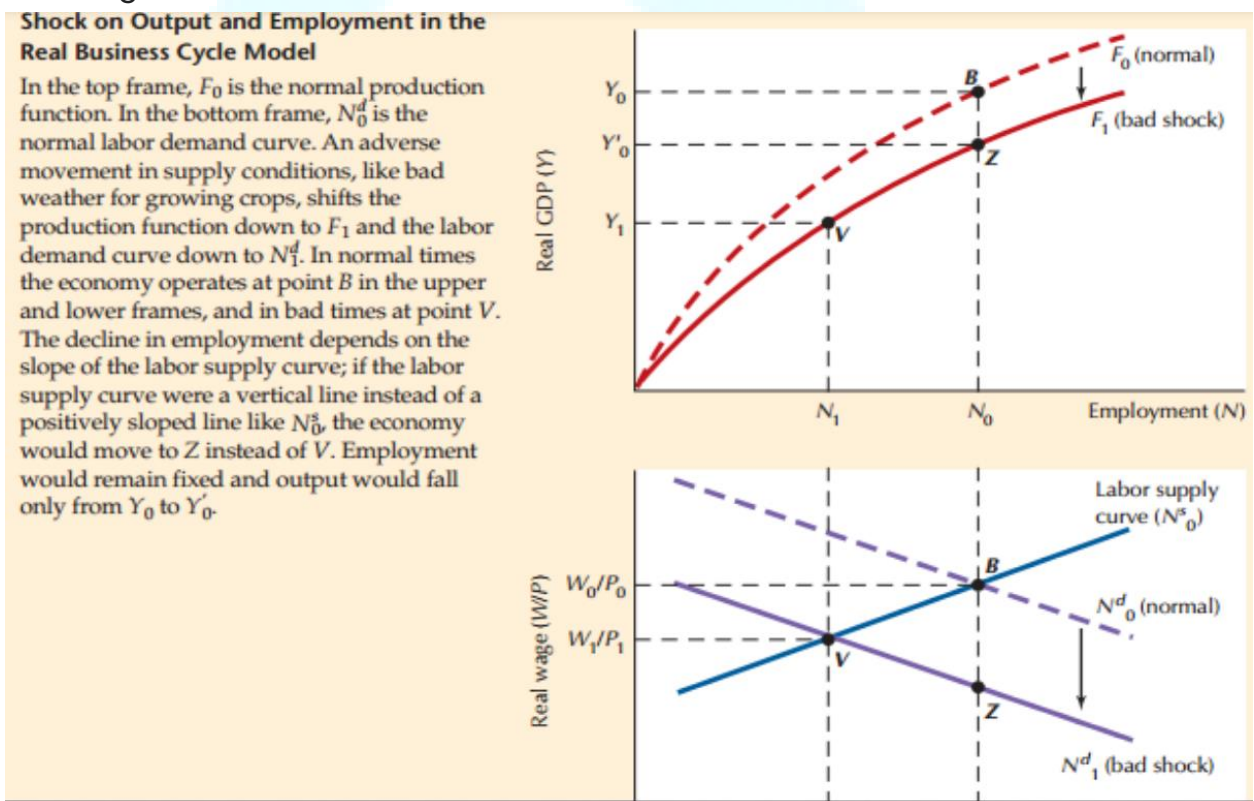
1. Agents optimise.

2. Markets clear. Real business cycle theorists agree. A hallmark of real business cycle models is their careful attention to microeconomic foundations—the individuals' optimising decisions. Real business cycle theorists also believe that the business cycle is an equilibrium phenomenon in the sense that all markets clear. This belief contrasts with the Keynesian view that the labour market does not clear. The Keynesian model includes involuntary unemployment. In real business cycle models, as in new classical models, all unemployment is voluntary. Where real business cycle theorists part company with new classical economists is on the causes of fluctuations in output and employment. Real business cycle theorists see these fluctuations as "arising from variations in the real opportunities of the private economy." ¹ Factors that cause such changes include shocks to technology, variations in environmental conditions, changes in the real (relative) prices of imported raw materials (e.g., crude oil), and changes in tax rates. Fluctuations in output also occur with changes in individuals' preferences—for example, a change in the preference for goods relative to leisure. These are the same factors that determined output in the classical model. But classical economists believed that for the most part these factors changed only slowly

- The RBC model assumes that the origins of business
- cycles lie in real (or supply) shocks rather than monetary (or demand) shocks.
- The main source of shifts in output lies in swings in
- the aggregate supply curve (both long-run and short run), and not the aggregate demand curve.
- The RBC model argues that fluctuations in output (Y)
- are caused by fluctuations in natural real GDP (Y_N) itself.
- Supply shocks can occur due to new production
- techniques, new products, bad weather, new source
- of raw materials, and price changes in raw materials.
- The RBC model assumes that the supply shocks are highly

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- persistent, meaning that a favourable supply shock lasts several
- years, dies away smoothly and is replaced by an adverse shock that lasts several years.
- In short, the RBC theory simply assumes and does not explain
- the persistence of business cycles that was the main criticism against the Lucas model.
- In the RBC model, the economy responds to these persistent
- supply shocks based on the new classical assumption of continuous equilibrium.
- Firms produce the amount they desire at prices and wages
- that respond flexibly to changing economic conditions, and
- hire the number of workers they want; workers obtain exactly
- the number of hours of work that they desire at the market-determined real wage.



The top frame in Figure 1, exhibits the production function (F), which shows how much output can be produced by each additional worker. An adverse supply

shock leads to a downward shift in the production function, for instance from the usual curve F_0 to the bad shock curve F_1 , implying a decline in the productivity of each worker. In the lower frame of Figure 1, the labour demand curve N_d , which shows the marginal product of labour, shifts down in response to the adverse supply shock from the line labelled $N_d 0$ to the line $N_d 1$. The effect of the adverse supply shock on both output and employment depends on the slope of the labour supply curve. If the slope of the labour supply curve is positive, as along the line labelled $N_s 0$, then a lower real wage induces workers to supply less labour.

Since the economy is always in equilibrium in the RBC model, the demand for labour shifts as a result of the supply shock from point B to point V. Employment falls from N_0 to N_1 , while output falls from Y_0 to Y_1 , seen in the upper frame of the Figure. If the labour supply curve is a vertical line rising above N_0 through points Z and B. Then the economy's equilibrium point would be shifted downward by the adverse supply shock from B to Z. The shock would cause no change in employment, and in the upper frame, there would be a much smaller decline in output, from Y_0 to Y'_0 .

HYMAN MINSKY GROWTH CYCLES

A fruitful transition from the short-run dynamics of a macroeconomic model and the real-financial fluctuations associated with Hyman Minsky would be the probe of a benchmark macroeconomic model offered by him below.

Minsky considers the following equations:

$$Y = C + I$$

$$C = C(Y)$$

$$I = I(P_{IS}, \bar{W})$$

$$P_K = L(M, \bar{K})$$

$$P_{ID} = P_K$$

$$P_{IS} = P_{ID}$$

$$M_D = M_S$$

The model is certainly familiar from introductory macroeconomics where the exogenous variable M is money, and the subscripts D and S against it denote demand

and supply of money in the money market equilibrium condition. K and W are the given capital stock and wage bill respectively, which are given. The 'price' of money $P_M = 1$. P_{IS} is the supply price of a unit of investment, P_K is the market price of existing real capital and P_{ID} is the demand price of a unit of investment. The explanatory sequence is as follows: : The portfolio balance equation or the liquidity preference relation above yields a value of P_K for every quantity of M . Given W , I adjust so that $P_{IS} = P_K$.

Once I is given, C and Y are determined. However, productivity of capital takes the form of expected future earnings (gross profits after taxes) of an assembly of capital goods within a producing unit. Recall the arithmetical relation from basic macroeconomics that the value of the capital stock will necessarily equal the discounted value of a stream of future returns. The discussion of the marginal efficiency of capital MEC is relevant here and can be substituted for the equation for P_K . Hence, this one is the unstable equation in the system and shifts

downwards whenever a wave of pessimism overcomes investors. Changes in investors' confidence can lead to potentially destabilising macroeconomic cycles even when the interest rate is relatively stable in the face of aggregate demand shocks. Building upon Keynes, Minsky argued that the explanation for the level of aggregate demand must be sought in the financial markets, in the financing of investment plans.

Disequilibria therein affect the valuation of capital assets relative to the price of current output and this price ratio determines investment activity. Keynes' General Theory,

Minsky explained, was concerned with how these two sets of prices (capital and financial assets, on the one hand, and current output and wages, on the other) were determined in different markets by different explanatory variables which gave rise to fluctuations in economic activity

New Keynesian Economics

Keynes sought to explain involuntary unemployment—at times, mass involuntary unemployment. He set out to show how aggregate demand affected output and employment.

The Keynesian models can explain unemployment and a role for aggregate demand in determining output and employment. A key element in these models is money wage rigidity. A fall in aggregate commodity demand, for example, leads to a fall in labour demand.

As a result of fixed-wage labour contracts and workers' backward-looking price expectations, the money wage will not fall sufficiently in the short run to maintain the initial employment level. Employment and output will fall. Unemployment will rise. Over the past three decades, economists working within the Keynesian tradition have pursued additional explanations of involuntary unemployment.

The models that have resulted from this research effort are called new Keynesian models. In part, this new research is a response to the new classical critique of the older Keynesian models. N. Gregory Mankiw and

David Romer, both of whom have made important contributions to the new Keynesian economics, state that “the new classical economists argued persuasively that Keynesian economics was theoretically inadequate, that macroeconomics must be built on a firm microeconomic foundation.” 9

Not all new Keynesians are this critical of the earlier Keynesian models, but their main task has been to improve the microeconomic foundations of the Keynesian system.

Because they see wage and price rigidities as central to Keynes’s explanation of involuntary unemployment, much effort has gone to show that these rigidities can arise from the behaviour of optimising agents. New Keynesian economists have not tried to develop one rationale for all price and wage rigidities.

Rather, they believe that a number of features of the wage- and price-setting process explain such rigidities.

In fact, the new Keynesian literature is characterised by what has been called a “dizzying diversity” of approaches. These approaches have, however, the following common elements:

1. In new Keynesian models, imperfect competition is assumed for the product market. This assumption contrasts with the earlier Keynesian models that assumed perfect competition.
2. Whereas the key nominal rigidity in earlier Keynesian models was the money wage, new Keynesian models also focus on product price rigidity.
3. In addition to factors that cause nominal variables (e.g., the money wage) to be rigid, new Keynesian models introduce real rigidities—factors that make the real wage or firm’s relative price rigid in the face of changes in aggregate demand. We consider three types of new Keynesian models: sticky price (menu cost) models, efficiency wage models, and insider–outsider models.

Macroeconomic Policy: Objectives and Instruments

- Microeconomics and macroeconomics—the two major divisions of economics—have different objectives to be pursued.
-
- The key microeconomic goals are the efficient use of resources that are employed and the efficient distribution of output.
-
- These two goals of microeconomics are encapsulated as 'efficiency' and 'equity'.
-
-
-
- But macroeconomic goals are quite different because the overall response of the economy must not match with the individual units. As macroeconomics looks at the whole, its objectives are aggregative in character. In other words, because of different levels of aggregation, these two branches of economics focus on different economic objectives.

1. Macroeconomic Policy Objectives:

The macroeconomic policy objectives are the following:

(i) Full employment,

(ii) Price stability,

(iii) Economic growth,

(iv) Balance of payments equilibrium and exchange rate stability, and

(v) Social objectives.

(i) Full employment:

Performance of any government is judged in terms of goals of achieving full employment and price stability. These two may be called the key indicators of the health of an economy. In other words, modern governments aim at reducing both unemployment and inflation rates.

Unemployment refers to involuntary idleness of mainly labour force and other productive resources. Unemployment (of labour) is closely related to the economy's aggregate output. Higher the unemployment rate, greater the divergence between actual aggregate output (or GNP/CDP) and potential output. So, one of the objectives of macroeconomic policy is to ensure full employment.

The objective of full employment became uppermost amongst the policymakers in the era of Great Depression when unemployment rate in all the countries except the then social-ist country, the USSR, rose to a

great height. It may be noted here that a free enterprise capitalist economy always exhibits full employment.

But, Keynes said that the goal of full employment may be a desirable one but impossible to achieve. Full employment, thus, does not mean that nobody is unemployed. Even if 4 or 5 p.c. of the total population remain unemployed, the country is said to be fully employed. Full employment, though theoretically conceivable, is difficult to attain in a market-driven economy. In view of this, a full employment objective is often translated into **'high employment' objective**.

This goal is desirable indeed, but 'how high' should it be? One author has given an answer in the following way;

"The goal for high employment should therefore be not to seek an unemployment level of zero, but rather a level of above zero consistent with full employment at which the demand for labour equals the supply of labour. This level is called the natural rate of unemployment."

(ii) Price stability:

No longer the attainment of full employment is considered a macroeconomic goal. The emphasis has shifted to price stability. By price stability we must not mean an unchanging price level over time.

Not necessarily, price increase is welcome, particularly if it is restricted within a reasonable limit. In other words, price fluctuations of a larger degree are always welcome.

However, it is difficult again to define the permissible or reasonable rate of inflation. But sustained increase in price level as well as a falling price level produce destabilising effects on the economy. Therefore, one of the objectives of macroeconomic policy is to ensure (relative) price level

stability. This goal prevents not only economic fluctuations but also helps in the attainment of a steady growth of an economy.

(iii) Economic growth:

Economic growth in a market economy is never steady. These economies experience ups and downs in their performance. This objective became uppermost in the period following World War II (1939–45).

Economists call such ups and downs in the economic performance as trade cycle/business cycle. In the short run such fluctuations may exhibit depressions or prosperity (boom).

One of the important benchmarks to measure the performance of an economy is the rate of increase in output over a period of time. There are three major sources of economic growth, viz.

- (i) the growth of the labour force,**
- (ii) capital formation, and**
- (iii) technological progress.**

A country seeks to achieve higher economic growth over a long period so that the standards of living or the quality of life of people, on an average, improve. It may be noted here that while talking about higher economic growth, we take into account general, social and environmental factors so that the needs of people of both present generations and future generations can be met.

However, promotion of higher economic growth is often hampered by short run fluctuations in aggregate output. In other words, one finds a conflict between the objectives of economic growth and economic

stability (in prices). In view of this conflict, it is said that macroeconomic policy should promote economic growth with reasonable price stability.

(iv) Balance of payments equilibrium and exchange rate stability:

From a macro- economic point of view, one can show that an international transaction differs from domestic transaction in terms of (foreign) currency exchange. Over a period of time, all countries aim at a balanced flow of goods, services and assets into and out of the country. Whenever this happens, total international monetary reserves are viewed as stable.

If a country's exports exceed imports, it then experiences a balance of payments surplus or accumulation of reserves, like gold and foreign currency. When the country loses reserves, it experiences a balance of payments deficit (or imports exceed exports). However, depletion of reserves reflects the unhealthy performance of an economy and thus creates various problems. That is why every country aims at building a substantial volume of foreign exchange reserves.

Anyway, the accumulation of foreign exchange reserves is largely conditioned by the exchange rate, the rate at which one currency is exchanged for another currency to carry out international transactions. The foreign exchange rate should be stable as far as possible. This is what one may call it external stability in price.

External instability in prices hampers the smooth flow of goods and services between nations. It also erodes the confidence of currency. However, maintenance of external stability is no longer considered as the

macroeconomic policy objective as well as macroeconomic policy instrument.

It is, however, because of growing inter- connectedness and interdependence between different nations in the globalised world, the task of fulfilling this macroeconomic policy objective has become more problematic.

(v) Social objectives:

The list of objectives that we have referred to here is by no means an exhaustive one; one can add more in the list. Even then we have incorporated the major ones.

Macroeconomic policy is also used to attain some social ends or social welfare. This means that income distribution needs to be more fair and equitable.

In a capitalist market-based society some people get more than others. In order to ensure social justice, policymakers use macroeconomic policy instruments.

We can add another social objective in our list. This is the goal of economic freedom. This is characterised by the right of taking economic decisions by any individual (rich or poor, high caste or low caste).

2. Macroeconomic Policy Instruments:

As our macroeconomic goals are not typically confined to “full employment”, “price stability”, “rapid growth”, “BOP equilibrium and stability in foreign exchange rate”, so our macroeconomic policy instruments include monetary policy, fiscal policy, income policy in a

narrow sense. But, in a broader sense, these instruments should include policies relating to labour, tariff, agriculture, anti-monopoly and other relevant ones that influence the macroeconomic goals of a country. Confining our attention in a restricted way we intend to consider two types of policy instruments: the two "giants of the industry " monetary (credit) policy and fiscal (budgetary) policy. These two policies are employed toward altering aggregate demand so as to bring about a change in aggregate output (GNP/GDP) and prices, wages and interest rates, etc., throughout the economy.

Monetary policy attempts to stabilise aggregate demand in the economy by influencing the availability or price of money, i.e., the rate of interest, in an economy.

Monetary policy may be defined as a policy employing the central bank's control of the supply of money as an instrument for achieving the macroeconomic goals.

Fiscal policy, on the other hand, aims at influencing aggregate demand by altering the tax- expenditure-debt programme of the government. The credit for using this kind of fiscal policy in the 1930s goes to J.M. Keynes who discredited the monetary policy as a means of attaining some of the macro- economic goals—such as the goal of full employment.

As fiscal policy has come into scrutiny in terms of its effectiveness in achieving the desired macroeconomic objectives, the same is true about the monetary policy. One can see several rounds of ups and downs in the effectiveness of both these policy instruments consequent upon criticisms and counter- criticisms in their theoretical foundations.

It may be pointed out here that as there are conflicts among different macroeconomic goals, policymakers are in a dilemma in the sense that neither of the policies can achieve desired goals. Hence the need for additional policy measures like income policy, price control, etc. Further, while the objectives represent economic, social and political value judgments they do not normally enter the mainstream economic analysis. Ultimately, policymakers and bureaucrats are blamed as troubleshooters.

Monetary policy

- The demand side of economic policy refers to the actions undertaken by a nation's central bank to control money supply to achieve macroeconomic goals that promote sustainable economic growth.
- Monetary policy, the demand side of economic policy, refers to the actions undertaken by a nation's central bank to control money supply to achieve macroeconomic goals that promote sustainable economic growth.
- Monetary policy can be broadly classified as either expansionary or contractionary. Monetary policy tools include open market operations, direct lending to banks, bank reserve requirements, unconventional emergency lending programs, and managing market expectations (subject to the central bank's credibility).
- Monetary policy consists of the process of drafting, announcing, and implementing the plan of actions taken by the central bank, currency board, or other competent monetary authority of a country that controls the quantity of money in an economy and the channels by which new money is supplied.

- Monetary policy consists of management of money supply and interest rates, aimed at achieving macroeconomic objectives such as controlling inflation, consumption, growth, and liquidity.
- These are achieved by actions such as modifying the interest rate, buying or selling government bonds, regulating foreign exchange rates, and changing the amount of money banks are required to maintain as reserves.
- Economists, analysts, investors, and financial experts across the globe eagerly await the monetary policy reports and outcome of the meetings involving monetary policy decision-making. Such developments have a long lasting impact on the overall economy, as well as on specific industry sectors or markets.
- Monetary policy is formulated based on inputs gathered from a variety of sources. For instance, the monetary authority may look at macroeconomic numbers like GDP and inflation, industry/sector-specific growth rates and associated figures, geopolitical developments in the international markets (like oil embargo or trade tariffs), concerns raised by groups representing industries and businesses, survey results from organisations of repute, and inputs from the government and other credible sources.
- Monetary authorities are typically given policy mandates, to achieve stable rise in gross domestic product (GDP), maintain low rates of unemployment, and maintain foreign exchange and inflation rates in a predictable range.
- Monetary policy can be used in combination with or as an alternative to fiscal policy, which uses taxes, government borrowing, and spending to manage the economy.
- The Federal Reserve Bank is in charge of monetary policy in the United States. The Federal Reserve has what is commonly referred to as a "dual mandate": to achieve maximum employment while

keeping inflation in check. Simply put, it is the Fed's responsibility to balance economic growth and inflation.

- In addition, it aims to keep long-term interest rates relatively low. Its core role is to be the lender of last resort, providing banks with liquidity and serve as a bank regulator, in order to prevent the bank failures and panics in the financial services sector.
- Fiscal policy refers to the use of government spending and tax policies to influence economic conditions, especially macroeconomic conditions, including aggregate demand for goods and services, employment, inflation, and economic growth.

Fiscal policy refers to the use of government spending and tax policies to influence economic conditions.

- Fiscal policy is largely based on ideas from John Maynard Keynes, who argued governments could stabilise the business cycle and regulate economic output.
- During a recession, the government may employ expansionary fiscal policy by lowering tax rates to increase aggregate demand and fuel economic growth. In the face of mounting inflation and other expansionary symptoms, a government may pursue contractionary fiscal policy.
- Fiscal policy is largely based on the ideas of British economist John Maynard Keynes (1883–1946),
- who argued that economic recessions are due to a deficiency in the consumption spending and business investment components of aggregate demand.

- Keynes believed that governments could stabilise the business cycle and regulate economic output by adjusting spending and tax policies to make up for the shortfalls of the private sector.
- His theories were developed in response to the Great Depression, which defied classical economics' assumptions that economic swings were self-correcting. Keynes' ideas were highly influential and led to the New Deal in the U.S., which involved massive spending on public works projects and social welfare programs.
- In Keynesian economics, aggregate demand or spending is what drives the performance and growth of the economy.
- Aggregate demand is made up of consumer spending, business investment spending, net government spending, and net exports.
- According to Keynesian economists, the private sector components of aggregate demand are too variable and too dependent on psychological and emotional factors to maintain sustained growth in the economy.
- Pessimism, fear, and uncertainty among consumers and businesses can lead to economic recessions and depressions, and excessive exuberance during good times can lead to an overheated economy and inflation.
- However, according to Keynesians, government taxation and spending can be managed rationally and used to counteract the excesses and deficiencies of private sector consumption and investment spending in order to stabilise the economy.
- When private sector spending turns down, the government can spend more and/or tax less in order to directly increase aggregate demand.
- When the private sector is over optimistic and spends too much, too fast on consumption and new investment projects, the government

can spend less and/or tax more in order to decrease aggregate demand.

- This means that to help stabilise the economy, the government should run large budget deficits during economic downturns and run budget surpluses when the economy is growing. These are known as expansionary or contractionary fiscal policies, respectively.
- **Expansionary Policies** To illustrate how the government can use fiscal policy to affect the economy, consider an economy that's experiencing a recession. The government might issue tax stimulus rebates to increase aggregate demand and fuel economic growth.
- The logic behind this approach is that when people pay lower taxes, they have more money to spend or invest, which fuels higher demand.
- That demand leads firms to hire more, decreasing unemployment, and to compete more fiercely for labour. In turn, this serves to raise wages and provide consumers with more income to spend and invest.
- It's a virtuous cycle, or positive feedback loop. Rather than lowering taxes, the government may seek economic expansion through increases in spending (without corresponding tax increases).
- By building more highways, for example, it could increase employment, pushing up demand and growth. Expansionary fiscal policy is usually characterised by deficit spending,
- when government expenditures exceed receipts from taxes and other sources. In practice, deficit spending tends to result from a combination of tax cuts and higher spending.

Fiscal Policy	Monetary Policy
Change in government spending and tax rates	Change in interest rates / money supply.
Set by the Government	Set by a Central bank
No specific target	Target inflation
Side effect on government budget / borrowing	Side effect on exchange rate and housing market
Strong political dimension to changing tax rates	Mostly independent from the political process

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What Is Okun's Law?

Okun's Law is an empirically observed relationship between unemployment and losses in a country's production.

It predicts that a 1% increase in unemployment will usually be associated with a 2% drop in GROSS DOMESTIC PRODUCT (GDP).

When economists are studying the economy, they tend to hone in on two factors: output and jobs.

Because there is a relationship between these two elements of an economy, many economists study the relationship between output (or more specifically, gross domestic product) and unemployment levels.

Okun's Law looks at the statistical relationship between GDP and unemployment. Okun's Law can also be used to estimate gross national product (GNP).

- Okun's law is an observed relationship between a country's GDP (or GNP) and employment levels.
- Okun's law was coined by Arthur Okun, a Yale economist who served on President Kennedy's Council of Economic Advisors. Okun's law predicts that a 1% drop in employment tends to be accompanied by a drop in GDP of around 2%. Likewise, a 1% increase in employment is associated with a 2% GDP increase.
- Okun's law is not without controversy, and some economists disagree about the exact relationship between employment and productivity.
- Although Okun's law is not derived from any theoretical prediction, observational data indicates that Okun's law often holds true.

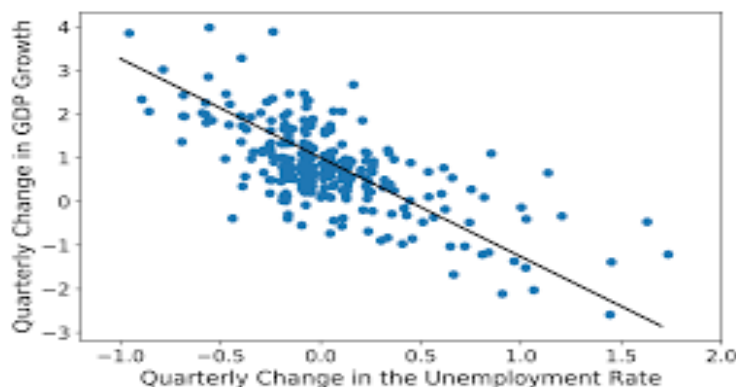
Understanding Okun's Law

Arthur Okun was a Yale professor and an economist who studied the relationship between unemployment and production. Okun was born in November 1928 and died in March 1980 at the age of 51.

He studied economics at Columbia University, where he received his Ph.D. During his tenure at Yale, Okun was appointed to President John Kennedy's Council of Economic Advisors, and remained in this position under President Lyndon B. Johnson as well.

As a Keynesian economist, Okun advocated for using fiscal policy to control inflation and stimulate employment. He first proposed the relationship between unemployment and a country's GDP in the 1960s. In general, Okun's findings demonstrated that when unemployment falls, the production of a country will increase.

The logic is fairly straightforward. The amount of output that an economy produces depends on the amount of labour (or the number of people employed) in the production process; when there is more labour involved in the production process, there is more output (and vice versa).



In Okun's original statement of his law, an economy experiences a one percentage point increase in unemployment for every three percentage point decrease in GDP from its long-run level (also called potential GDP).

Similarly, a three percentage point increase in GDP from its long-run level is associated with a one percentage point decrease in unemployment. Potential GDP is the level of output that can be achieved when all resources (land, labour, capital, and entrepreneurial ability) are fully employed.

Ricardian Equivalence

Ricardian equivalence is an economic theory that says that financing government spending out of current taxes or future taxes (and current deficits) will have equivalent effects on the overall economy.

This means that attempts to stimulate an economy by increasing debt-financed government spending will not be effective because investors and consumers understand that the debt will eventually have to be paid for in the form of future taxes.

The theory argues that people will save based on their expectation of increased future taxes to be levied in order to pay off the debt, and that this will offset the increase in aggregate demand from the increased government spending.

This also implies that Keynesian fiscal policy will generally be ineffective at boosting economic output and growth.

This theory was developed by David Ricardo in the early 19th century and later was elaborated upon by Harvard professor Robert Barro. For this reason, Ricardian equivalence is also known as the Barro–Ricardo equivalence proposition.

- **Ricardian equivalence maintains that government deficit spending is equivalent to spending out of current taxes.**
- **Because taxpayers will save to pay the expected future taxes, this will tend to offset the macroeconomic effects of increased government spending.**

- **This theory has been widely interpreted as undermining the Keynesian notion that deficit spending can boost economic performance, even in the short run.**

Understanding Ricardian Equivalence

Governments can finance their spending either by taxing or by borrowing (and presumably taxing later to service the debt). In either case, real resources are withdrawn from the private economy when the government purchases them, but the method of financing is different.

Ricardo argued that under certain circumstances, even the financial effects of these can be considered equivalent, because taxpayers understand that even if their current taxes are not raised in the case of deficit spending, their future taxes will go up to pay the government debt. As a result, they will be forced to set aside some current income to save up to pay the future taxes.

Because these savings necessarily involve forgone current consumption, in a real sense they effectively shift the future tax burden into the present. In either case, the increase in current government spending and consumption of real resources is accompanied by a corresponding decrease in private spending and consumption of real resources. Financing government spending with current taxes or deficits (and future taxes) are thus equivalent in both nominal and real terms.

Crowding Out Effect?

The crowding out effect is an economic theory arguing that rising public sector spending drives down or even eliminates private sector spending.

- The crowding out effect suggests rising public sector spending drives down private sector spending.
- There are three main reasons for the crowding out effect to take place: economics, social welfare, and infrastructure.
- Crowding in, on the other hand, suggests government borrowing can actually increase demand.

Understanding the Crowding Out Effect

One of the most common forms of crowding out takes place when a large government, such as that of the U.S., increases its borrowing and sets in motion a chain of events that results in the curtailing of private sector spending.

The sheer scale of this type of borrowing can lead to substantial rises in the real interest rate, which has the effect of absorbing the economy's lending capacity and of discouraging businesses from making capital investments.

Companies often fund such projects in part or entirely through financing, and are now discouraged from doing so because the opportunity cost of borrowing money has risen, making traditionally profitable projects funded through loans cost-prohibitive.

Large governments increasing borrowing is the most common form of crowding out, as it forces interest rates higher.

The crowding out effect has been discussed for over a hundred years in various forms.

During much of this time, people thought of capital as being finite and confined to individual countries, which was largely the case due to lower volumes of international trade compared to the present day. In that context, increased taxation for public works projects and public spending could be directly linked to a reduction in the capacity for private spending within a given country, as less money was available.

The Crowding Out Effect vs. Crowding In

On the other hand, macroeconomic theories such as Chartalism and Post-Keynesian posit that government borrowing, in a modern economy operating significantly below capacity, can actually increase demand by generating employment, thereby stimulating private spending as well. This process is often referred to as "crowding in."

Crowding in theory has gained some currency among economists in recent years after it was noted that, during the Great Recession of 2007–2009, massive spending on the part of the federal government on bonds and other securities actually had the effect of reducing interest rates.

Types of Crowding Out Effects

Reductions in capital spending can partially offset benefits brought about through government borrowing, such as those of economic stimulus, though this is only likely when the economy is operating at capacity. In this respect, government stimulus is theoretically more effective when the economy is below capacity.

If this is the case, however, an economic downswing may occur, reducing revenues the government collects through taxes and spurring it to borrow

even more money, which can theoretically lead to a vicious cycle of borrowing and crowding out.

Social Welfare

Crowding out may also take place because of social welfare, albeit indirectly. When governments raise taxes in order to introduce or expand welfare programs, individuals and businesses are left with less discretionary income, which can reduce charitable contributions. In this respect, public sector expenditures for social welfare can reduce private-sector giving for social welfare, offsetting the government's spending on those same causes.

Similarly, the creation or expansion of public health insurance programs such as Medicaid can prompt those covered by private insurance to switch to the public option. Left with fewer customers and a smaller risk pool, private health insurance companies may have to raise premiums, leading to further reductions in private coverage.

Infrastructure

Another form of crowding out can occur because of government-funded infrastructure development projects, which can discourage private enterprise from taking place in the same area of the market by making it undesirable or even unprofitable. This often occurs with bridges and other roads, as government-funded development deters companies from building toll roads or from engaging in other similar projects.

Crowding Out Effect Example

Suppose a firm has been planning a capital project, with an estimated cost of \$5 million and a return of \$6 million, assuming the interest rate on its loans is 3%. The firm anticipates earning \$1 million in net income (NI). Due to the shaky state of the economy, however, the government announces a stimulus package that will help businesses in need but will also raise the interest rate on the firm's new loans to 4%.

Because the interest rate the firm had factored into its accounting has increased by 33.3%, its profit model shifts wildly and the firm estimates that it will now need to spend \$5.75 million on the project in order to make the same \$6 million in returns. Its projected earnings have now dropped by 75% to \$250,000, so the company decides that it would be better off pursuing other options.

Incomes Policy in Trade Cycles:

Concept of Incomes Policy:

The concept of 'Incomes Policy' has gained currency in recent years, as a means of counteracting 'demand pulls' and 'cost push' inflation.

The central objective of this policy is to reconcile the objectives of economic growth and price stability.

Price stability is to be ensured by restraining increases in wage and other incomes from outstripping the growth of real national product. Incomes policy seeks to concentrate on curbing private consumption expenditure in an effort at reducing the pressure of 'aggregate demand' on 'aggregate supplies'.

The concentration on restraining private consumer expenditure is justified on the ground that among the constituents of aggregate effective demand, it is the largest accounting for about two-thirds to three-fourths of the total expenditure in most countries. To repeat, the income policy implies intervention by the authorities in the distribution of wages and other incomes aimed at preventing demand from rising excessively in relation to growth of national output.

Working of Incomes Policy:

There is a growing need for an incomes policy because the proportion of incomes and prices determined in non-competitive markets is likely to increase with increasing industrial employment, growing unionisation, collective bargaining and increasing scale of enterprises. Further, continuous experience of a high level of aggregate demand may lead to more aggressive claims on the part of labour and more permissive attitude on the part of employers towards wage increases.

The inducement to adopt an incomes policy is stronger where relative price stability is needed to facilitate expansion of employment or to improve the critical balance of payments position. Policy-makers prefer an incomes policy in order to correct a chronic balance of payments to a policy of devaluation.

However, when it comes to providing guidelines for controlling other types of incomes such as profit, rent and interest, its policy makers are not very clear. While the general objective has been laid down in countries like Netherlands, Sweden, France, Norway, U.K. and U.S.A., no operational incomes policy has been adopted in any country except Netherlands. In the U.K. the first attempt at income policy was made during the Second World War and it met with little success.

The other policy measures like subsidies, price controls, rationing, compulsory savings all played an important part in holding down prices. There was a good deal of suppressed inflation in the economy.

The labour government which took office in 1964 adopted a policy on productivity, prices and incomes as an integral part of its plan for promoting economic growth but soon due to bad economic conditions, balance of payments difficulties and rising prices, the policy of freezing all prices and incomes ran into difficulty.

The European incomes policy however, did not fare badly though it proved to be a costly experiment. Not only did inflation continue but it also led to distortions in the economies giving rise to severe inflation in the U.K., U.S.A. and also in Japan. From this, one of the policy implications is that in a period of excessive overall demand, an incomes policy can only play a role subordinate to fiscal, monetary and other economic policies in fighting cost-inflation.



Stabilisation policy

is a strategy enacted by a government or its central bank that is aimed at maintaining a healthy level of economic growth and minimal price changes. Sustaining a stabilisation policy requires monitoring the business cycle and adjusting fiscal policy and monetary policy as needed to control abrupt changes in demand or supply.

In the language of business news, a stabilisation policy is designed to prevent the economy from excessive "overheating" or "slowing down."

- Stabilisation policy seeks to keep an economy on an even keel by increasing or decreasing interest rates as needed.
- Interest rates are raised to discourage borrowing to spend and lowered to boost borrowing to spend.
- Fiscal policy can also be used by increasing or decreasing government spending and taxes to affect aggregate demand.

- The intended result is an economy that is cushioned from the effects of wild swings in demand.

Understanding Stabilization Policy

A study by the Brookings Institution notes that the U.S. economy has been in a recession for about one in every seven months since the end of World War II. This cycle is seen as inevitable, but stabilisation policy seeks to soften the blow and prevent widespread unemployment.

A stabilisation policy seeks to limit erratic swings in the economy's total output, as measured by the nation's gross domestic product (GDP), as well as controlling surges in inflation or deflation. Stabilisation of these factors generally leads to healthy levels of employment.

The term stabilisation policy is also used to describe government action in response to an economic crisis or shock such as a sovereign debt default or a stock market crash. The responses may include emergency actions and reform legislation.

The Roots of Stabilization Policy

Pioneering economist John Maynard Keynes argued that an economy can experience a sharp and sustained period of stagnation without a any kind of natural or automatic rebound or correction. Previous economists had

observed that economies grow and contract in a cyclical pattern, with occasional downturns followed by a recovery and return to growth.

Keynes disputed their theories that a process of economic recovery should normally be expected after a recession. He argued that the fear and uncertainty that consumers, investors, and businesses face could induce a prolonged period of reduced consumer spending, sluggish business investment, and elevated unemployment which would all reinforce one another in a vicious circle.

New Cambridge: a Keynesian open-economy model

The main purpose of the NewCambridge group of British economists is to show that Keynesian results can be obtained in an open-economy model in which the constraint imposed by the requirement of asset portfolio equilibrium is taken account of.

The aim is to refute the deduction of the monetary approach to the balance of payments. This deduction is that policies which cause BOF imbalances can only have temporary effects on real output because they alter the domestic money supply and so cause continuing portfolio adjustment until the BOF becomes zero.

The New Cambridge economists argue that a non-zero BOF is consistent with long-run equilibrium because the monetary impact of BOF imbalances can be sterilised by running a government budget deficit or surplus of the required amount.

This argument is explained below. In an open economy the government can finance its budget deficit or surplus by selling its bonds to domestic

residents, ΔD , or to foreigners, ΔF , or by expanding the domestic credit part, ΔC , of high-powered money. The government budget constraint now becomes $\Delta D = \Delta C + \Delta F$. This argument was also advanced by a non-Cambridge economist,

Economic Policy The national income accounting identity in an open economy was derived in

$$Y - (C + I + G) = X - F$$

where X = exports, and F = imports, measured in domestic currency values. By including tax revenues, T ,

$$Y - T - (C + I) = G - F$$

Now the term in brackets in the equation is private-sector disposable income minus private-sector expenditure and is identical to the private sector's net acquisition of financial assets.

A unique feature of the New Cambridge model is its private expenditure function. It is assumed that the private sector's desired stock of financial assets is a fixed proportion of its disposable income. Thus the net acquisition of financial assets by the private sector will only remain positive over an extended time period if disposable income is growing.

If the economy is in stationary long-run equilibrium,

$$Y - T - (C + I) = 0 \text{ and so } G - F = 0$$

In addition,

it is assumed that if output changes, the induced asset stock adjustment is quite rapid and is completed within a year.

Thus if income rises from one stationary equilibrium to another, the private sector's net acquisition of assets is positive over the year, but by the end of the year a new desired level of financial asset stocks is attained so that equation holds once more.

When private-sector net financial asset acquisition is zero then we get that in equilibrium $-(G - T) = (X - F)$

Hence a government budget deficit (surplus) must be matched by an equal sized current-account deficit (surplus) on the balance of payments. This result follows from the New Cambridge expenditure function.

An appreciation of this point enables one to understand why the New Cambridge model specifies the private-sector expenditure function in the way that it does. In long-run equilibrium the domestic private sector's asset holdings are constant, given a stationary economy.

The New Cambridge economists argue that private-sector portfolio balance, which requires constant bond and money holdings, can be made consistent with imbalances on the government budget and on the balance of payments.

Given that domestic residents' holdings of bonds must be constant for long-run portfolio balance (that is, $\sim BD = 0$) then the government's budget constraint becomes

$$G - T == MIF + \sim DC$$

Long-run portfolio balance also requires that the money stock is constant. However, a non-zero BOF means that the foreign exchange component, FR, of high-powered money is changing since $BOF = MR$.

Given that the private sector is not changing its net asset position then the BOF must equal the current account plus the net change in the stock of domestic government bonds held by foreigners, MIF. Therefore, we have

$BOF = MR = (X - F) + MIF$ Policy Analysis when Asset Stocks Adjust
Substituting $tvI F = MR - (X - F)$ from into equation

we get $G - T = MR - (X - F) + /j.DC$

Substituting $G - T = -(X - F)$ from equation we get $MR = -MC$ Therefore since $/j.J[= MR + MC$, $/j.J[$ must be zero

Thus high-powered money as well as domestic bond holdings remain unchanged while the government budget and BOF are both non-zero.

In the new Cambridge model a current -account deficit is prevented from reducing the money stock by the authorities selling government bonds to foreigners and by sterilising the remaining BOF deficit by increasing the domestic credit component of high-powered money to offset the decline in foreign exchange reserves.

The other side of the operation is that the government budget deficit, which equals the current-account deficit, is financed by selling government bonds to foreigners and by domestic credit expansion. Similarly a current-account surplus is offset by a government budget

surplus. The latter's financing requirements prevent the current-account surplus from expanding the domestic money supply.

THEORIES OF DEMAND FOR MONEY

There are two main approaches to explain the demand for money :

1) the classical approach, and

2) the Keynesian approach.

Related to classical approach is the neoclassical theory, which is based on the same assumptions but different determinants when compared to the classical theory

The Classical Approach This theory is often associated with economists like J.S. Mill and Irving Fisher. According to them, people demand money because every individual and business firm gets money by selling goods and services (including factor services) and in turn use this money for the purchase of goods and services produced by others. Hence, from the viewpoint of classical economists, people wish to hold cash balances in order to carry out day-to-day transactions. The amount of money demanded by an individual or a business firm therefore, depends upon the volume of transactions. Since there is a fairly stable relationship between the level of income and the volume of transactions, the former is taken as an approximation for the latter

The Neo-classical Theory The early neoclassical theory of the demand for money was put forward by the Cambridge economists Alfred Marshall and A.C. Pigou. That is why the neoclassical theory is also called the 'Cambridge Equation Approach'.

According to the Cambridge approach, a proportional relationship exists between the 'demand for money' (M_d) and the 'money value of national output' (Y). Demand for money function, therefore, takes the form : $M_d = KY$
.....

(1) where K is a constant ($0 < K < 1$). It may be seen from Equation (1) that K is the demand for money per rupee of income (per unit of time). In other words, the Cambridge K would show the proportion of income which, on average, the public



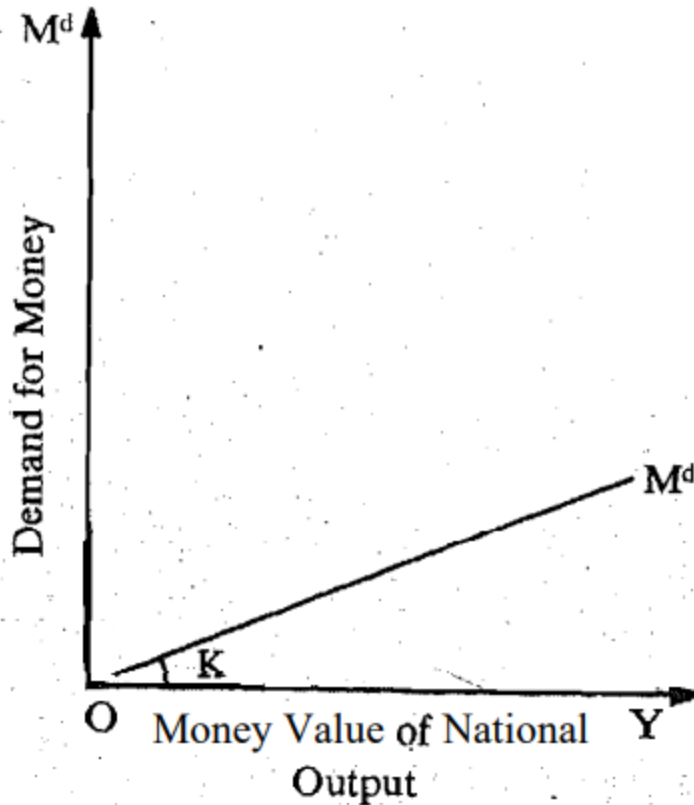


Fig. 2.1. Demand for Money Function

would like to hold in the form of Money. This is represented in Figure 2.1.

where in demand for money are in direct proportion to the changes in Y - the proportion between them being equal to K . It may be noted that Cambridge Equation specifies the demand for money as a function of money income alone.

Equation (1) may be rewritten as $M^d = K \cdot P \cdot Y$ where P = general price level (2) Y = real national income Equation (2)

gives us the demand function for real money. One of the key features of this equation is that it shows a proportional relationship with P and y . It

implies that any change in the general price level or in real national income would lead to an equal proportionate change in the demand for money, i.e., the income elasticity as well as the price elasticity of demand for money are both equal to unity. It may be noted that the neo-classicals have postulated a very simple function of demand for money which has been fruitfully applied in the development of the quantity theory of money.

A comparison of the classical and neo-classical theories of demand for money reveals that, though the basic assumptions of these theories are similar, yet they differ from , each other in one important way :

The classical approach was concerned with the volume of total transactions, while the Cambridge approach focused primarily on the level of income.



Keynesian Theory

John Maynard Keynes gave his own formulation of demand for money in his well known book, *The General Theory Employment Interest and Money*. Some of the economists who agreed with the Keynesian framework of analysis helped in further development of Keynesian theory of demand for money. Keyoen began by working the following two inter-related questions :

i) Why is money demanded ?

ii) What influences the demand for money ?

answers to these questions gave.us the Keynesian Theory of demand for money, Now let us study the answers to these questions.

The Determinants of Demand for Money

1) The transaction motive The time of receiving income and the time of incurring expenditure by an individual firm generally do not coincide. In order to meet the needs of transactions during this time gap some money is kept aside, known as the transactions demand for money. The smaller the time gap between a person's receipts and payments, lesser will be the transaction demand for money. Let us understand this with the help of an illustration. Two individuals, A and B who had the same salary per month say Rs. 4. Assuming that each individual spends his income each day in such equal amounts that at the end of the income-period they are left with zero cash balance. The pattern of transaction balance of the two individuals is shown in Figure 2.2.

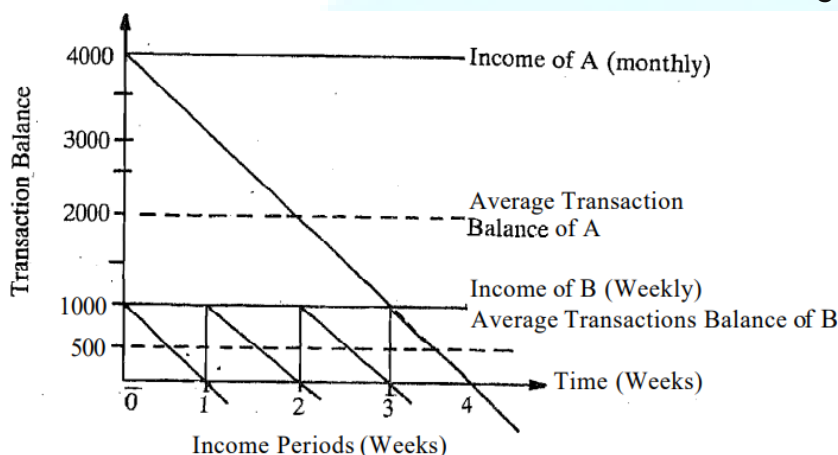


Fig. 2.2 The Transaction Demand for Money and the Income-period.

The above assumption implies that the average transaction balance during the income-period would be equal to half of the income of that period. Individual A would therefore, have a transaction balance of $\text{Rs. } 4,000 \times \frac{1}{2} = \text{Rs. } 2,000$, while the transaction balance of individual B would be $\text{Rs. } 1,000 \times \frac{1}{2} = \text{Rs. } 500$.

The Precautionary Motive

The precautionary demand for money arises mainly due to the uncertainty of future receipts and expenses. The cash held by an individual firm helps in

meeting unexpected fall in receipts or rise in expenditure or both in future. Like transaction demand, precautionary demand for money also is related to the level of income, and varies directly with it. Compared to a small firm, a firm having high turnover needs more cash in hand. In a similar manner, a rich man generally needs a larger amount of cash for precautionary purposes. A firm's precautionary demand for money is influenced not only by the level of income of the firm but also by factors like political situation and business conditions prevailing in the economy.

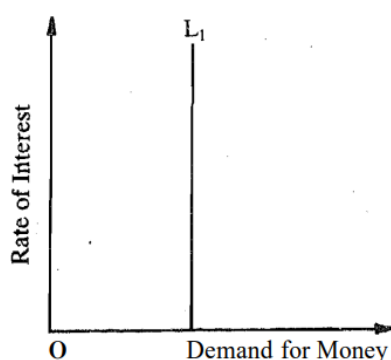


Fig. 24 Relation between interest and transaction demand for money.

Speculative Motive

The Keynesian proposition that the money is held for transactions and precautionary purposes does not conflict with the classical theory : a transaction's balance is nothing but money saving as the medium of exchange. Same can be said for the precautionary balances also. However, the third motive introduced by Keynes, viz., the speculative motive for holding money, represents a distinct break from the classical theory.

The speculative demand for money is sometimes called the 'asset demand for money'. According to the speculative motive, money is demanded as an asset to

make speculation in bonds which are long-dated government securities. The speculative demand for money comes from the people who desire to make capital gains by buying bonds when their prices are low and selling them when their prices rise. People holding speculative balances keep anticipating the behaviour of bond prices in future. If they expect bond prices to fall in future, they hold speculative balances so as to be able to buy the bonds when their prices actually fall and sell them when their prices' actually go up.

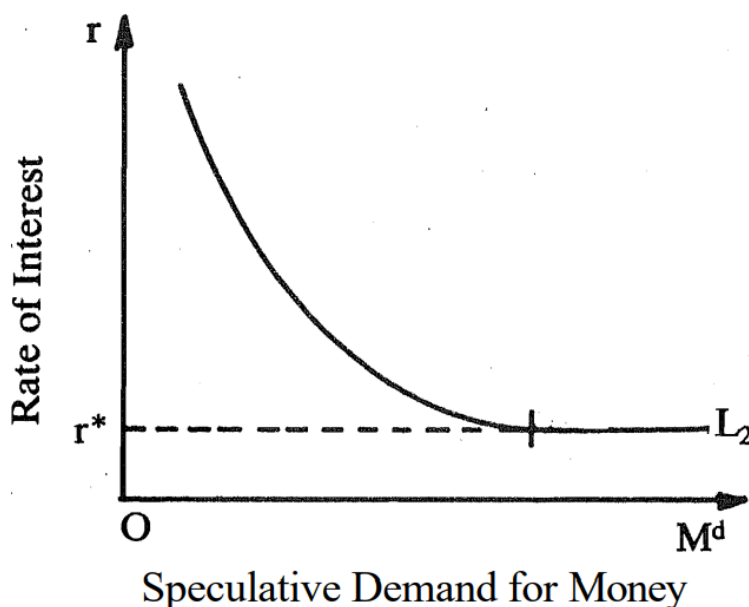


Fig. 2.5. Keynes' speculative demand for money.

Total demand for money According to the Keynesian Theory, the total demand for money M^d is composed of L_1 and L_2 ; ie.

$$M^d = L_1(Y) + L_2(r) \therefore \dots\dots\dots,$$

Where, $L_1(Y)$ represents the transactions and precautionary demands for money, both of them being an increasing function of the level of money income (Y). The third component, viz., $L_2(r)$, represents the speculative demand for money which is a declining function of rate of interest (r).

Equation is an additive function of demand for money showing that the demand for money is the sum of interest-inelastic component of transactions and

precautionary demands (L_1) and interest-elastic of speculative demand (L_2). This is shown in Figure

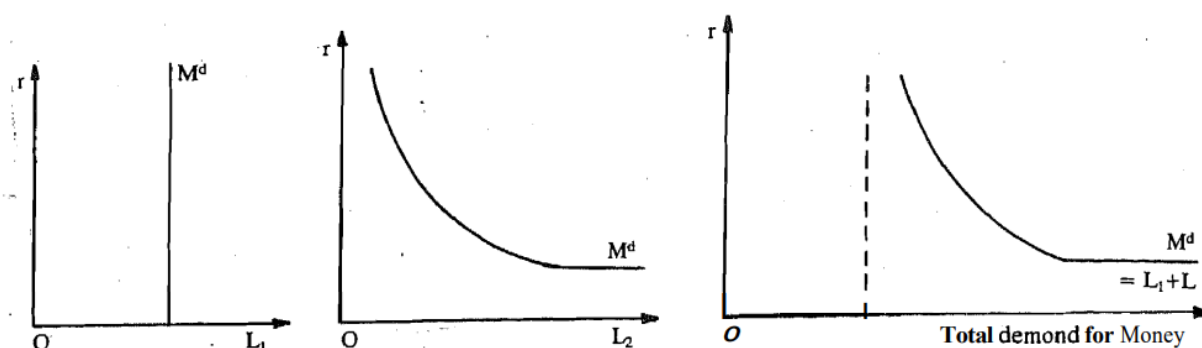


Fig. 2.6. Total Demand for Money (i.e., $L_1 + L_2$)

THE SUPPLY OF MONEY

Supply of money in an economy at any point of time refers to the volume of money held by the households and firms for transactions and settlement of debts.

In the generally accepted measures of money supply we do not include the money held by the government and money lying with the commercial banking sector.

This is done mainly to separate the producers of money (i.e. government and banking system) from the demands of it (i.e., the households, firms and institutions).

The supply of money at any point of time consists of:

1) Currency: It consists of both paper currency and the coins in circulation. The former is in terms of currency notes of the denomination of rupees two and above issued by the central bank, i.e. Reserve Bank of India, and rupee one notes issued by the Government of India.

2) Net demand deposits : Total demand deposits with banks include deposits from the public and those deposits which one bank holds with other banks (viz., inter-bank deposits). Only the former component of total demand deposits are

included in the supply of money, as money, by definition, is something held by the public.

3) 'Other deposits' with the Reserve Bank of India: They include demand deposits of quasi-government institutions, foreign central banks, foreign governments, the World Bank, etc. This component of money has been a very negligible proportion of total money supply in India. The conventional measure of money supply (known as M) includes coins and currency notes in circulation with the public and the net demand deposits. This measure is often referred to as a narrow measure of money supply.

In modern literature on money supply, distinction between money and liquidity has been emphasised. In this context, it may be found that it is not only money (in the conventional sense) but also near-money that is part of the liquid assets available with the public for spending. People's ability to spend, therefore, depends upon the amount of overall liquidity in the economy which depends both on the total stock of money as well as near-money assets. In the near-money assets we include:

- i) savings deposits with post office savings banks and commercial banks,**
- ii) time deposits of the banks (net of inter-bank deposits).**

We know that a cheque facility is available against the saving deposits, which adds to liquidity. Similarly, fixed deposits can be prematurely encashed or a loan can be taken against them. Both these options result in greater liquidity. Till 1967-68, the Reserve Bank of India defined money supply only in the conventional manner (i.e., M).

But from 1967-68, it also started publishing a broader measure of money supply and called it aggregate monetary resources (AMR).

Since 1977, the RBI has added two other measures of money supply, called M2 and M3.

These four alternative measures of money supply, as given by the RBI, may be stated as : M or M1 = currency held by the public + demand deposits of the public
 $M2 = M1 + \text{savings deposits with post office}$

$AMR \text{ or } M3 = M1 + \text{time deposits of banks held by the public} + M3 + \text{total post office deposits}$ Both M1 and M3 are conceptually the same as M and AMR respectively. However, these differ in their coverage.

M1 and M3 measures of money supply give a better coverage to the co-operative banking sector than do M and AMR. Post office savings deposits are far less liquid than commercial bank savings.

Saving deposits with post office can be withdrawn on demand, but have the following restrictions :

- 1) Chequable portion of these deposits is very small**
- 2) There are restrictions on the number of withdrawals in a week.**
- 3) There is a maximum limit on the amount of any single withdrawal**

{unless an advance notice is given by the post office}.

Consequently, post office savings deposits do not serve as a medium of exchange

and are less liquid than the savings deposits with the commercial bank. It is with a view to treating post office savings deposits as separate from the commercial bank savings deposits that M2 and M3 series of money supply were provided by the RBI.

Agencies of Money Supply

Money supply with the public is influenced mainly by the central bank of country and its commercial banks. Through its fiscal policy, the government also affects, to some extent, the supply of money.

Central Bank and Money Supply: The central bank of a country controls money supply both directly as well as indirectly. It is directly responsible for the issue of currency notes and coins. On the other hand, it can indirectly influence the deposit component of the money supply. We know that a commercial bank can

create deposits keep* in view its cash balances. If the central bank uses methods to reduce the supply of cash balances with the commercial bankers, the latter will be able to give less loans and advances and create less deposits. The opposite will be the consequence if the central bank uses its power to increase the cash balances with commercial banks. In order to achieve this, the central bank uses various control instruments, like changes in statutory reserve requirements of commercial banks, changes in interest-rate structure of banks, open-market operations, lending policy towards commercial banks, etc.

Commercial bank and money supply :

Commercial banks can create demand deposits or bank money. These deposits are created in two ways :

- 1) When people deposit their cash with the banking system, they convert their 'cash in hand' into demand deposits. These deposits are known as primary deposits.
- 2) The cash brought into the banking system through these primary deposits% then either used to buy financial assets from the market (e.g. bills, bonds, etc.) or lent to industry and business. We know that when any bank lends to a customer, it does-not give cash to him ; instead the bank credits the loan amount to the cursive?s account, thus creating demand deposits in his name. Since,these deposits have been created on the basis of primary deposits these are known as derivative deposits.

If banks are able to grant more loans on a given amount of primary deposits, it would result in more bank money. It must be noted tHat time deposits do not become the basis of credit creation because time deposits are not used M a means. of payments – these are only savings for the specified period The capacity of the banking system to create bank money depends upon the following factors :

- Availability of cash with the banking system
- Willingness to borrow from the banking system

- Ratio of cash to bank deposits
- Credit control policy of the central bank of the country

Government and money supply : The Government also affects the supply of money.

- Whenever the government imposes taxes or borrows from the public, it reduces the volume of available money with the public. On the other hand, when government
- finds that its income through taxation and public borrowings falls short of its
- expenditure, it borrows from the central bank (against its own securities) to pay off its Credit ura Consequently, the availability of cash with the public and the banking
- system will increase. As the availability of cash with the public and the banking
- system changes, so does the economy's capacity to expand or reduce credit.
- It may, be concluded that the supply of money in an economy increases under the following situations :
- when the public wants to hold less cash with themselves and is willing to borrow more from the banking system ;
- when commercial banks expand their credit operations ;
- when the Central bank issues more currency or follows a monetary policy that Demand for end Supply ofMoney helps in extending credit.

Post Keynesian approaches to demand for money

Friedman's restatement of Quantitytheory of money

Milton Friedman in his essay (1956), "The Quantity Theory of Money – A

Restatement", reformulated the quantity theory of money. Friedman treated money as one type of asset. Economic agents such as households, firms and the government want to hold a certain portion of their wealth in the form of money.

Thus, money is an asset or capital which has a positive return. Hence Friedman's Demand for money theory is essentially a part of wealth theory. Friedman takes permanent income as a proxy for wealth.

Money Demand Function

Wealth can be held in five different forms:

(i) Money, (ii) Bonds, (iii) Equities, (iv) Physical Goods, and (v) Human Capital.

Each form of wealth has unique

characteristics. Each form of wealth yields certain returns. The first four forms can be categorised as non-human wealth while the last one is human wealth.

Non-human wealth can easily be converted into money. Human wealth (it refers to the income generating productive capacity of human beings such as education, skill or good health) can neither be liquidated easily nor can it be used as security to borrow money.

According to Friedman demand for money depends on the following variables:

(i) Total wealth: An individual's total stock of wealth is the most important determinant of his money demand. Greater the wealth of an individual, the more money he would demand for transactions and other purposes. Estimates of total wealth of an individual are seldom accurately available. Friedman used discounted value of permanent income y_p as an index of wealth. The permanent income is the aggregate expected yield from wealth during the agent's lifetime.

(ii) The proportion of human to non-human wealth:

The proportion (w) in which the wealth (permanent income) of the agent is divided between these two forms of assets is an important factor in determining the money demand in real terms. Friedman in his Permanent Income Hypothesis suggested a relatively lower MPC out of human wealth. Due to this, although the

ratio of human wealth to non-human wealth remains relevant, it does not play an important role in Friedman's theory.

(iii) The expected rate of return on money and other financial assets:

Unlike other theories demand for money, Friedman takes broad definition of money. Thus, he includes time deposits along with the demand deposits and currency. So, money too has expected nominal return (R_m) like other forms of assets. As permanent income of an individual is stable, His wealth (which is surrogate by permanent income) is stable.

Money and other financial assets are competing with each other to get their share

out this fixed wealth. Thus, demand for money depends on the incentives for holding other assets relative to money (Bonds : ($R_b - R_m$), Equities: ($R_e - R_m$)). If the return on financial assets (bonds and equities) decreases vis-à-vis money, individual agent would want to hold more money.

(iv) Price and expected inflation: Rising price level due to inflation has two opposing effects. Inflation erodes the purchasing power of money (in nominal terms). In such situations, an individual will want to hold higher nominal money balances to keep his real money balances constant. Further, there is an increase in the relative return on non-human assets such as real estate, gold, unique art pieces, etc. This will influence people to hold less money. Thus it will depend on the relative return ($\pi_e - R_m$) of physical goods.

(v) Other variables: Variables such as taste and preference, expected economic instability (global financial crisis, phases of business cycle), and institutional factors (method of wage payment system, payments of bills) too affect the demand for money. All these factors are captured in the variable (z).

Baumol-Tobin Model of Transaction Demand for Money

Here we would present a simpler version of the model which was independently developed by William Baumol (1952) and James Tobin (1956). It emphasises the cost and benefit of holding money using inventory theoretic approach. The model was originally developed to provide micro-foundations for aggregate money demand functions commonly used in Keynesian and monetarist macroeconomic models.

The following are the salient features of the model:

Money is held for transaction purposes. Thus, it serves as a medium of exchange.

Holding of cash is considered as an inventory on the part of the individual or economic agent. The individual would minimise the cost of holding the cash. Alternative to holding money in cash (which does not yield interest) is to hold interest-yielding bonds.

For an individual, the time of receiving income and the time of spending money is not synchronised. Income is received once a month while purchases/expenditures are spread evenly throughout the month.

Money is held in cash to bridge the time gap between the income receipt and flow of expenditure.

Individual will exchange bond into cash to facilitate his evenly spread expenditure stream, use the cash, and again go for exchange.

Each time the agent exchanges bonds to cash, there is some transaction cost/ brokerage fee which is fixed and independent of the volume of exchange. We call these exchanges as transactions.

As each of this type of exchange (transaction) involves cost, the individual will keep in mind the trade-off between the interest earnings on bonds and the cost of transaction(exchange).

Individual's average cash/money holding is determined by the number of transactions (exchanges) made.

A rational individual would minimise his cost of exchange (transactions) and decide about his optimum number of transactions.

Aggregate demand for money will reflect this representative individual's demand for average money holding.

Let us use the following notations:

y = periodical real income [time period could be a month or a year]

T = length of the entire period (month or year) in days

n = number of exchanges (transactions) during the time period

b = brokerage fee per transactions

r = real interest rate

As n number of exchanges are being made in the entire period (which has T days), the period is split into n intervals and each interval's length in days is T/n days. To facilitate the smooth, evenly distributed expenditure stream, the agent's real periodical income y is equally distributed in these n intervals and each of these interval's expenditure requirement is y/n

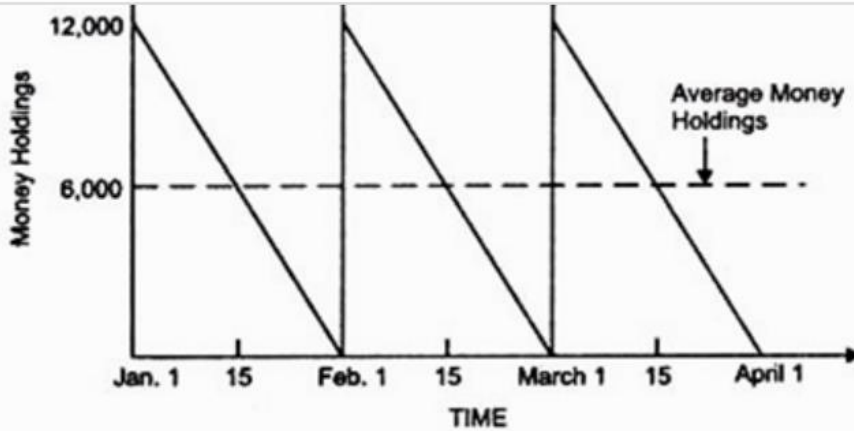


Fig. 15.4. *Stream of Cash Payments and Transactions Demand for Money.*

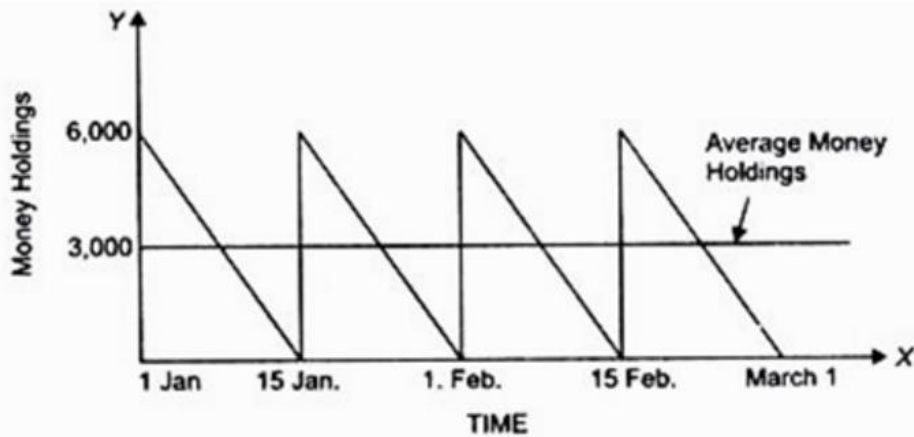


Fig. 15.5. *Transactions Demand for Money and Stream of Cash Payments.*

PIGOU EFFECT

The Pigou effect is the stimulation of output and employment caused by increasing consumption due to a rise in real balances of wealth, particularly during deflation. The term was named after Arthur Cecil Pigou by Don Patinkin in 1948.

Pigou's hypothesis and the liquidity trap

An economy in a liquidity trap cannot use monetary stimulus to increase output because there is little connection between personal income and money demand. John Hicks thought that this might be another reason (along with sticky prices)

for persistently high unemployment. However, the Pigou effect creates a mechanism for the economy to escape the trap:

- As unemployment rises,
- the price level drops,
- which raises real balances,
- and thus consumption rises,
-

which creates a different set of IS-curves on the IS-LM diagram, intersecting the LM curves above the low interest rate threshold of the liquidity trap.

Finally, the economy moves to the new equilibrium, at full employment. Pigou concluded that an equilibrium with employment below the full employment rate (the classical natural rate) could only occur if prices and wages were sticky.

Government debt and the Pigou effect

Robert Barro argued that due to Ricardian equivalence in the presence of a bequest motive, the public is not fooled into thinking they are richer when the government issues bonds to them, because government bond coupons must be paid from increased future taxation.

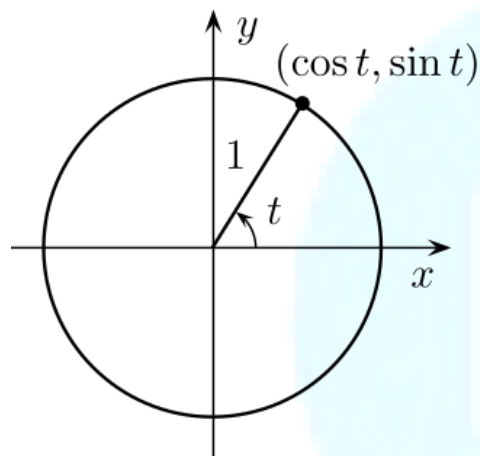
Therefore, he argued that at the microeconomic level, the subjective level of wealth would be lessened by a share of the debt taken on by the national government. As a consequence bonds should not be considered as part of net wealth at the macroeconomic level. This implies that there is no way for the government to create a "**Pigou effect**" by issuing bonds, because the aggregate level of wealth will not increase.

Arrow-Debreu model

suggests that under certain economic assumptions (convex preferences, perfect competition, and demand independence) there must be a set of prices such that aggregate supplies will equal aggregate demands for every commodity in the economy

: The A-D model is one of the most general models of competitive economy and is a crucial part of general equilibrium theory, as it can be used to prove the existence of general equilibrium (or Walrasian equilibrium) of an economy.

In general, there may be many equilibria; however, with extra assumptions on consumer preferences, namely that their utility functions be strongly concave and twice continuously differentiable, a unique equilibrium exists. With weaker conditions, uniqueness can fail, according to the Sonnenschein–Mantel–Debreu theorem.



In 1954, McKenzie and the pair Arrow and Debreu independently proved the existence of general equilibria by invoking the Kakutani fixed-point theorem on the fixed points of a continuous function from a compact, convex set into itself. In the Arrow–Debreu approach, convexity is essential, because such fixed-point theorems are inapplicable to non-convex sets. For example, the rotation of the unit circle by 90 degrees lacks fixed points, although this rotation is a continuous transformation of a compact set into itself; although compact, the unit circle is non-convex. In contrast, the same rotation applied to the convex hull of the unit circle leaves the point $(0,0)$ fixed.

Notice that the Kakutani theorem does not assert that there exists exactly one fixed point. Reflecting the unit disk across the y -axis leaves a vertical segment fixed, so that this reflection has an infinite number of fixed points.

Non-convexity in large economies

The assumption of convexity precluded many applications, which were discussed in the Journal of Political Economy from 1959 to 1961 by Francis M. Bator, M. J. Farrell, Tjalling Koopmans, and Thomas J. Rothenberg.[6] Ross M. Starr (1969) proved the existence of economic equilibria when some consumer preferences need not be convex.[6] In his paper, Starr proved that a "convexified" economy has general equilibria that are closely approximated by "quasi-equilibria" of the original economy; Starr's proof used the Shapley–Folkman theorem.

The Arrow–Debreu model specifies the conditions of perfectly competitive markets.

In financial economics the term "**Arrow–Debreu**" is most commonly used with reference to an Arrow–Debreu security. A canonical Arrow–Debreu security is a security that pays one unit of numeraire if a particular state of the world is reached and zero otherwise (the price of such a security being a so-called "state price"). As such, any derivatives contract whose settlement value is a function on an underlying whose value is uncertain at contract date can be decomposed as a linear combination of Arrow–Debreu securities.

The Neoclassical Model of Growth is widely used in growth theory, business cycle theory, and quantitative applications in public finance.

The usual formulation of the model assumes that in the economy markets are complete, so that even if there is uncertainty, and/or even if agents are heterogeneous, in general it is possible to write an equivalent representative agent version of the model economy. This is the so-called perfect aggregation result under complete markets.

For this reason, very often the representative agent is assumed to exist beforehand. The implication is that in the usual formulation of the Neoclassical Model there is no heterogeneity.

The lack of heterogeneity in the model is clearly at odds with the observations from actual economies: agents are heterogeneous at least in gender, age, ability, wealth, preferences...

the Overlapping Generations Model

The Neoclassical model of growth ignores all this heterogeneity, hence it remains silent about its effects, for instance on (optimal) policy. – In actual economies markets are far from complete:

What is an OLG model?

An overlapping generations model, abbreviated to OLG model, is a type of economic model in which agents live a finite length of time long enough to overlap with at least one period of another agent's life. As it models explicitly the different periods of life, such as schooling, working or retirement periods, it is the natural framework to study the allocation of resources across the different generations.

Some of the features of the OLG model.

- One important aspect of the OLG model is that the steady state equilibrium need not be efficient, in contrast to general equilibrium models where the First Welfare Theorem guarantees Pareto efficiency. Because there are an infinite number of agents in the economy, the total value of resources is infinite, so Pareto improvements can be made by transferring resources from each young generation to the current old generation.
- Not every equilibrium is inefficient; the efficiency of an equilibrium is strongly linked to the interest rate and the Cass Criterion gives necessary and sufficient conditions for when an OLG competitive equilibrium allocation is inefficient.

- Another attribute of OLG type models is that it is possible that 'over saving' can occur when capital accumulation is added to the model—a situation which could be improved upon by a social planner by forcing households to draw down their capital stocks.
- However, certain restrictions on the underlying technology of production and consumer tastes can ensure that the steady state level of saving corresponds to the **Golden Rule savings rate** of the Solow growth model and thus guarantee inter-temporal efficiency. Along the same lines, most empirical research on the subject has noted that over saving does not seem to be a major problem in the real world
- A third fundamental contribution of OLG models is that they justify the existence of money as a medium of exchange. A system of expectations exists as an equilibrium in which each new young generation accepts money from the previous old generation in exchange for consumption. They do this because they expect to be able to use that money to purchase consumption when they are the old generation.

cash in advance model of Clower–Monetarism and Fiscalism

The cash-in-advance constraint, also known as the Clower constraint after American economist Robert W. Clower,

is an idea used in economic theory to capture monetary phenomena. In the most basic economic models (such as the Walras model or the Arrow–Debreu model) there is no role for money, as these models are not sufficiently detailed to consider how people pay for goods, other than to say everyone has a budget constraint. To be able to say anything about the money supply, inflation, monetary policy and so on, economists must therefore introduce additional assumptions into their models. One possibility, and the more popular one, is to introduce a cash-in-advance constraint i.e. a requirement that each consumer or firm must have sufficient cash available before they can buy goods.[2] An alternative

assumption would be a 'Money-in-the-Utility-Function' assumption pioneered by Miguel Sidrauski, which states that people have a tendency to hold a certain amount of cash because they derive utility from holding it. Without these (or similar) assumptions economic theory would find it difficult to explain why people carry around a good (money) which takes up space in their wallet, can't be consumed and does not earn any interest.

EXAMPLE

A company with \$5000 on hand and incomes of \$3000 a month has a constraint of \$8000. That means, if the terms of an economic exchange (buying equipment, etc.) require terms that are cash-in-advance, then the limit that the company can actually obtain is \$8000.

Money Supply

What Is the Money Supply?

The money supply is all the currency and other liquid instruments in a country's economy on the date measured. The money supply roughly includes both cash and deposits that can be used almost as easily as cash.

Governments issue paper currency and coins through some combination of their central banks and treasuries. Bank regulators influence the money supply available to the public through the requirements placed on banks to hold reserves, how to extend credit, and other money matters.

The money supply refers to the amount of cash or currency circulating in an economy.

Different measures of money supply take into account non-cash items like credit and loans as well.

Monetarists believe that increasing the money supply, all else equal, leads to inflation.

Economists analyse the money supply and develop policies revolving around it through controlling interest rates and increasing or decreasing the amount of money flowing in the economy. Public and private sector analysis is performed because of the money supply's possible impacts on price levels, inflation, and the business cycle. In the United States, the Federal Reserve policy is the most important deciding factor in the money supply. The money supply is also known as the money stock.

Effect of Money Supply on the Economy

An increase in the supply of money typically lowers interest rates, which in turn, generates more investment and puts more money in the hands of consumers, thereby stimulating spending. Businesses respond by ordering more raw materials and increasing production. The increased business activity raises the demand for labour. The opposite can occur if the money supply falls or when its growth rate declines.

Change in the money supply has long been considered to be a key factor in driving macroeconomic performance and business cycles.

Macroeconomic schools of thought that focus heavily on the role of money supply include Irving Fisher's Quantity Theory of Money, Monetarism, and Austrian Business Cycle Theory.

Historically, measuring the money supply has shown that relationships exist between it and inflation and price levels. However, since 2000, these relationships have become unstable, reducing their reliability as a guide for monetary policy. Although money supply measures are still widely used, they are one of a wide array of economic data that economists and the Federal Reserve collect and review.²

How Money Supply Is Measured

The various types of money in the money supply are generally classified as Ms, such as M0, M1, M2, and M3, according to the type and size of the account in which the instrument is kept. Not all of the classifications are widely used, and each country may use different classifications. The money supply reflects the different types of liquidity each type of money has in the economy.

M1, for example, is also called narrow money and includes coins and notes that are in circulation and other money equivalents that can be converted easily to cash. M2 includes M1 and, in addition, short-term time deposits in banks and certain money market funds.² M3 includes M2 in addition to long-term deposits. However, M3 is no longer included in the reporting by the Federal Reserve.³

Money supply data is collected, recorded, and published periodically, typically by the country's government or central bank. The Federal Reserve in the United States measures and publishes the total amount of M1 and M2 money supplies on a weekly and monthly basis. They can be found online and are also published in newspapers.

High Powered Money:

High powered money or powerful money refers to that currency that has been issued by the Government and Reserve Bank of India. Some portion of this currency is kept along with the public while the rest is kept as funds in the Reserve Bank.

Thus, we get the equation as:

$$\mathbf{H = C + R}$$

Where H = High Powered Money

C = Currency with the public (Paper money + coins)

R = Government and bank deposits with RBI

Thus the sum total of money deposited with the public and the funds of banks is termed as powerful money. It is mainly created by the central bank. Since funds of commercial banks play an important role in the creation of credit, so it is very important to study about funds.

Reserve Fund is of two types:

(i) Statutory Reserve Funds of banks which is with the central bank (RR), and

(ii) Extra Reserve Fund(ER).

Thus **$H = C + RR + ER$**

High powered money is also known as secured money (RM) because banks keep with them Reserve Fund(R) and on the bases of this Demand deposits (DD) are created. Since the basis of creation of credit is Reserve Fund (R) and R is obtained as a part of high powered money (H) Security fund so high powered money is termed as Base money.

2. Components of High Powered Money:

The following are the important components which determine high power money:

1. Currency with the public

2. Other Deposits with RBI

3. Cash with Banks

4. Bankers Deposits with RBI.

High powered Money (H) includes currency with Public (C), important reserves of Commercial banks and other reserves (ER).

Determinants of Money Supply

forms the most important or key part of the financial superstructure of any economy. Hence its control becomes the basic ingredient in almost every macro-economic policy prescription. It is crucial for this purpose, to identify the main determinants of money supply.

The focal point of this module is to provide a behavioural explanation for the changes in money supply in an economy. This requires a theoretical framework which is capable of analysing the myriad of influences impinging on money supply arising from various sectors of the economy. This helps in identifying and analysing the key determinants of money supply. The money multiplier theory, with its foundations in the works of Friedman and Schwartz (1963) and Cagan (1965) is one such framework. It tries to relate the stock of money M to the monetary base H and through the money multiplier m

,to the public's preferences between currency, demand deposits and time deposits and to the bank's holding of reserves as a proportion of aggregate deposits/liabilities. Empirical validity and policy amenability of this theory makes the money multiplier framework our choice of study. The key problem of the Money multiplier Theory lies in the stability and predictability of the reserve money multiplier. This is essential to emphasise a stable and predictable relationship between the money stock

and reserve money and to emphasise the superiority of the monetary base as an instrument of money stock control via interest rates.

POLICY TOOLS TO CONTROL MONEY SUPPLY

The Reserve Bank is the only institution which can issue currency. When commercial banks need more funds in order to be able to create more credit, they may go to market for such funds or go to the Central Bank. Central bank provides them funds through various instruments

. This role of RBI, that of being ready to lend to banks at all times is another important function of the central bank, and due to this central bank is said to be the lender of last resort. The RBI controls the money supply in the economy in various ways.

The tools used by the Central bank to control money supply can be **quantitative or qualitative.**

Quantitative tools control the extent of money supply by changing the CRR, or bank rate or open market operations.

Qualitative tools include persuasion by the Central bank in order to make commercial banks discourage or encourage lending which is done through moral suasion, margin requirement, etc.

It should be evident by now that if the Central bank changes the reserve ratio, this would lead to changes in lending by the banks which, in turn, would impact the deposits and hence, the money supply. In the previously discussed example, what would the money multiplier be if the RBI increases the reserve ratio to 25 per cent? Notice that in the previous case, Rs 100 in reserves could support deposits of Rs 400.

But the banking system would now be able to loan Rs 300 only. It would have to call back some loans to meet the increased reserve requirements. Hence, money supply would fall.

Another important tool by which the RBI also influences money supply is Open Market Operations.

Open Market Operations refers to buying and selling of bonds issued by the Government in the open market. This purchase and sale is entrusted to the Central bank on behalf of the Government.

When RBI buys a Government bond in the open market, it pays for it by giving a cheque. This cheque increases the total amount of reserves in the economy and thus increases the money supply. Selling of a bond by RBI (to private individuals or institutions) leads to reduction in quantity of reserves and hence the money supply.

There are two types of open market operations:

outright and repo.

Outright open market operations are permanent in nature: when the central bank buys these securities (thus injecting money into the system), it is without any promise to sell them later. Similarly, when the central bank sells these securities (thus withdrawing money from the system), it is without any promise to buy them later. As a result, the injection/absorption of the money is of permanent nature.

However, there is another type of operation in which when the central bank buys the security, this agreement of purchase also has specification about date and price of resale of this security. This type of agreement is called a **repurchase agreement or repo.**

The interest rate at which the money is lent in this way is called the repo rate. Similarly, instead of outright sale of securities the central bank may sell the securities through an agreement which has a specification about the date and price at which it will be repurchased.

This type of agreement is called a reverse repurchase agreement or reverse repo. The rate at which the money is withdrawn in this manner is called the reverse repo rate. The Reserve Bank of India conducts repo and reverse repo operations at various maturities: overnight, 7-day, 14-day, etc.

This type of operations have now become the main tool of monetary policy of the Reserve Bank of India. The RBI can influence money supply by

changing the rate at which it gives loans to the commercial banks. This rate is called the Bank Rate in India. By increasing the bank rate, loans taken by commercial banks become more expensive; this reduces the reserves held by the commercial bank and hence decreases money supply. A fall in the bank rate can increase the money supply

Money multiplier process

The money multiplier framework postulates a relationship between ordinary M and high powered money H where M is the money produced by the RBI and the Government and held by the public in the form of currency C and Demand deposits DD.

While High powered Money H is money produced by the RBI and the Government and held by the public in the form of currency C and by the banks in the form of reserves R. In the case of Broad Money M3 we will also include Time Deposits TD.

Ignoring other deposits OD we have

$$M1 = C + DD \quad M3 = C + DD + TD$$

$$\text{Demand deposit multiplier} = 1/[c + (r + e)(1 + t)]$$

$$\text{Total Deposit multiplier} = (1 + t) / [c + (r + e)(1 + t)]$$

$$\text{Currency multiplier} = c / [c + (r + e)(1 + t)]$$

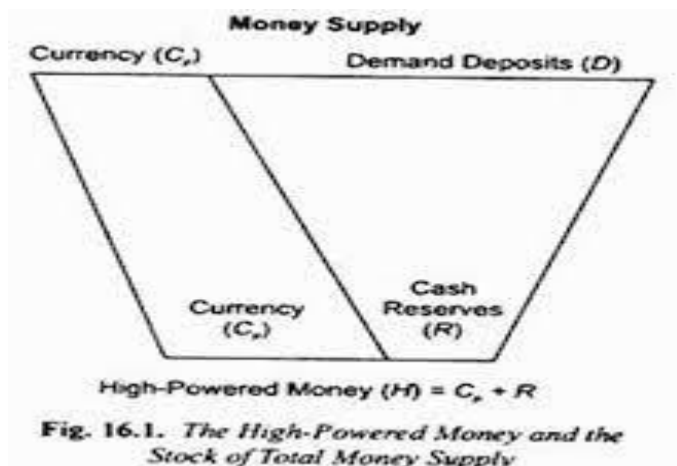
$$\text{Narrow Money multiplier} = (1 + c) / [c + (r + e)(1 + t)]$$

$$\text{Broad Money multiplier} = (1 + c + t) / [c + (r + e)(1 + t)]$$

These expressions tell us the amount by which, The Demand Deposits, Total Deposits,

Total Currency, Narrow Money and Broad Money will increase when there is a certain increase in H in the economy

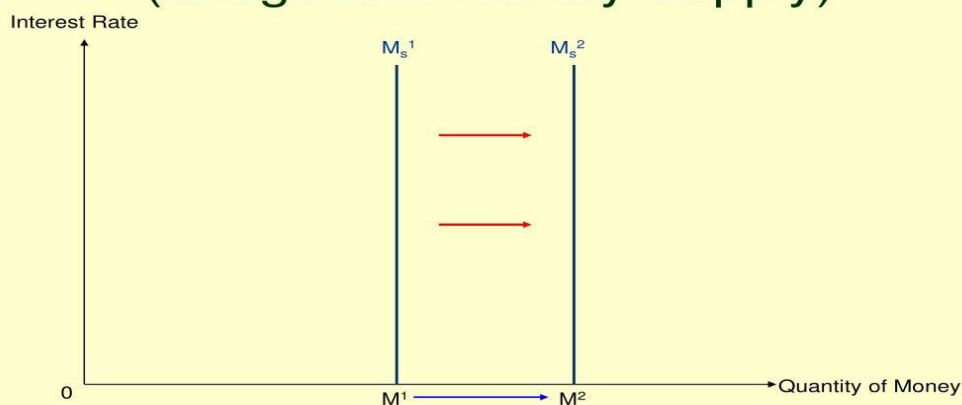
GRAPHICAL EXPOSITION OF EQUILIBRIUM AND STABILITY ANALYSIS IN THE MONEY MULTIPLIER FRAMEWORK



The Money Supply Curve

We saw that the amount of money in the economy ultimately depends on the monetary base H , the excess reserve ratio, the required reserve ratio and the currency to deposit ratio. We can depict this money supply process through two money supply curves depending on the impact of interest rates on the determinants of money supply.

Shift outward of Money Supply (Exogenous Money Supply)



The exogenous money supply curve

It refers to the situation where the supply of money in the economy is determined by banks' preference for excess reserves and depositors, preference for holding cash and this preference is not affected by interest rates. Here the complete money multiplier is constant, with the money supply curve vertical.

In this situation c_d , e_d and r_r shift the money supply curve to the left, since a rise in any of these variables leads to a lower complete money multiplier and thus a lower money supply and a decrease in any of these variables has the opposite effect. The Monetary Base has a direct effect on the Money Supply, an increase in H shifts the money supply curve to the right, whereas a decrease shifts it to the left

The Endogenous Money supply curve:

- As interest rates rise, many banks decrease their excess reserves (to be able to lend out additional funds at higher rates.)
- This leads to an increase in the amount of money in the economy because the complete money multiplier increases. Similarly, higher interest rates lead to a lower currency to deposit ratio, which works through the complete money multiplier to increase the Money Supply.
- This results in an upward sloping endogenous money supply curve because higher interest rates lead to a greater quantity of Money supplied.
- Changes in the required reserve ratio r_r or the monetary base H will shift the endogenous money supply curves in the same direction as was the case with the exogenous money supply curve, An increase in r_r or a decrease in H shifts the Money supply curve to the left, resulting in a lower

stock of Money at each interest rate.

