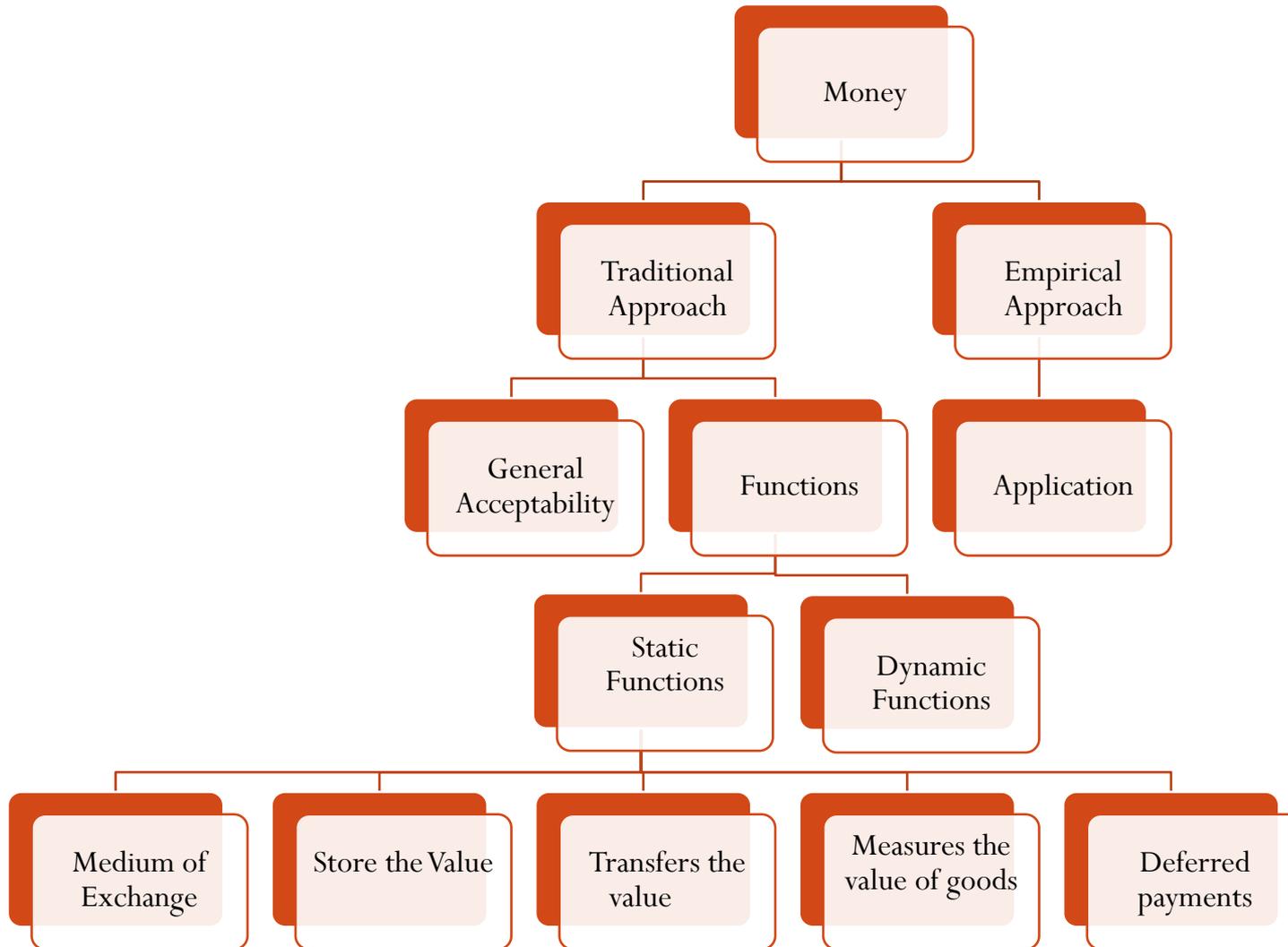# Monetary Economics

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Surat

# Definition of Money

- The concept of Money is very broad as it is defined by various monetarist in their own ways. Broadly speaking, the concept of money is classified in two approaches-viz., Traditional Approach & Empirical Approach.

- In tradition approach the concept of money is defined from its functional point of view while that of empirical approach explains the money from its applicability point of view.

# Conceptual Framework of Money



Money
- Traditional Approach
  - General Acceptability
  - Functions
    - Static Functions
      - Medium of Exchange
      - Store the Value
      - Transfers the value
      - Measures the value of goods
      - Deferred payments
    - Dynamic Functions
- Empirical Approach
  - Application

# Few Definitions on Money...
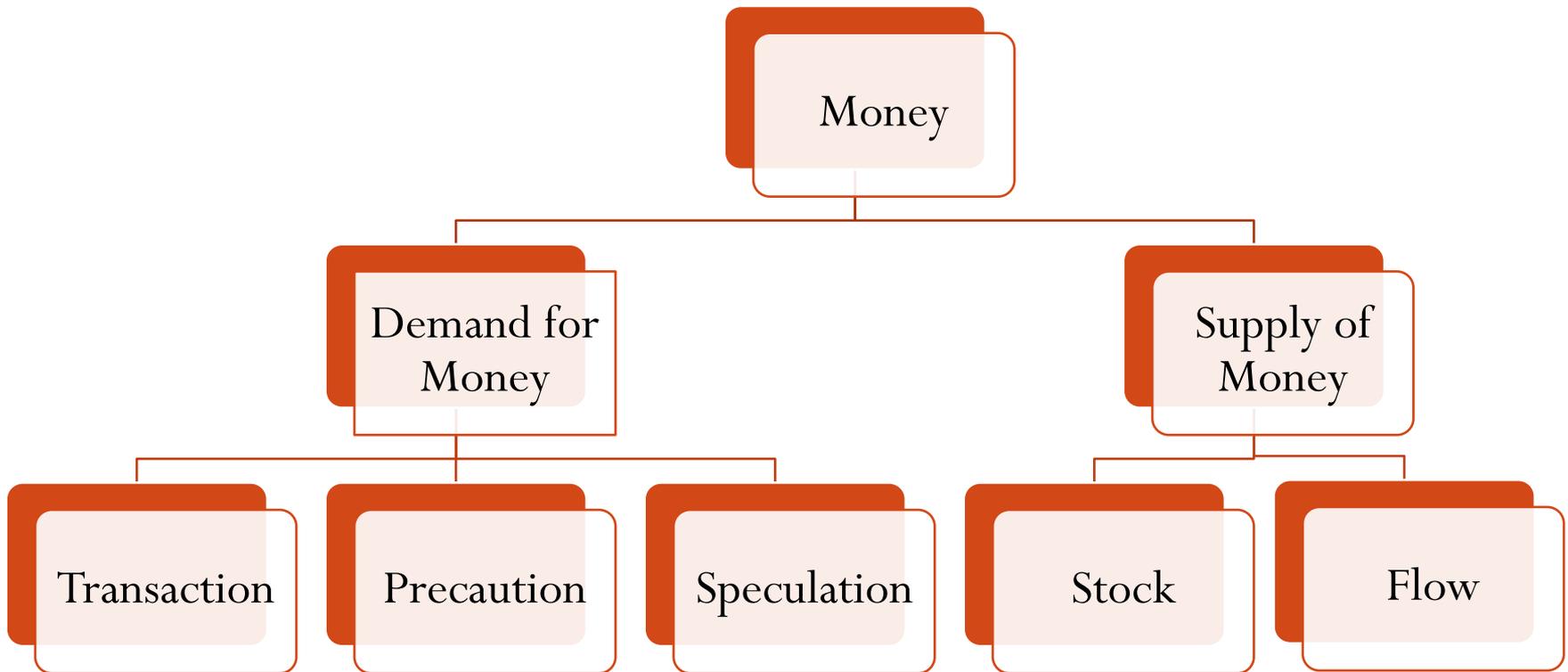
## Traditional Approach

- **Seligman** defines money as *"a thing that possess general acceptability..".*

- For **Walker**, *"Money is what money does"*.

- According to **Hicks**- *"money is defined by its functions"*.

- **Hawtrey R.G.** observed- *"money is defined by one of those concepts which, like a teaspoon or umbrella, but unlike an earthquake or a buttercup, are defined primarily by the use or purpose which they serve"*.

- Prof **Newlyn** says- *"Anything is money which functions generally as a medium of exchange"*.

- **Crowther** put it as *"anything which is generally acceptable as a means of exchange & which at the same time acts as a store of value"*.

# Few Definitions on Money...

## Empirical Approach :

- Empiricist holds money as a complex phenomenon. They describes the concept of money as a **<span style="color:red">Host of Financial Assets or Quasi Money or Near Money</span>** point of view.

- As **Friedman and Schwartz** put it as – "The definition of money is to be sought for not on the grounds of principles but on the grounds of usefulness in organizing our knowledge of economic relationship".

- In short, in the proponents of this approach believes that money in modern economy plays several roles.

- Paul **Einzing** classifies the functions of money into two broad categories- static & dynamic. In its static functions money is used as a passive technical instrument of exchange and in dynamic context money works as a determining force in moulding the functioning of the economic system & setting a particular economic trend.

# Facets of Money

```
                        Money
                          |
        +-----------------+-----------------+
        |                                   |
  Demand for                           Supply of
    Money                               Money
        |                                   |
  +-----+-----+-----+                 +------+------+
  |           |     |                 |            |
Transaction Precaution Speculation  Stock        Flow
```
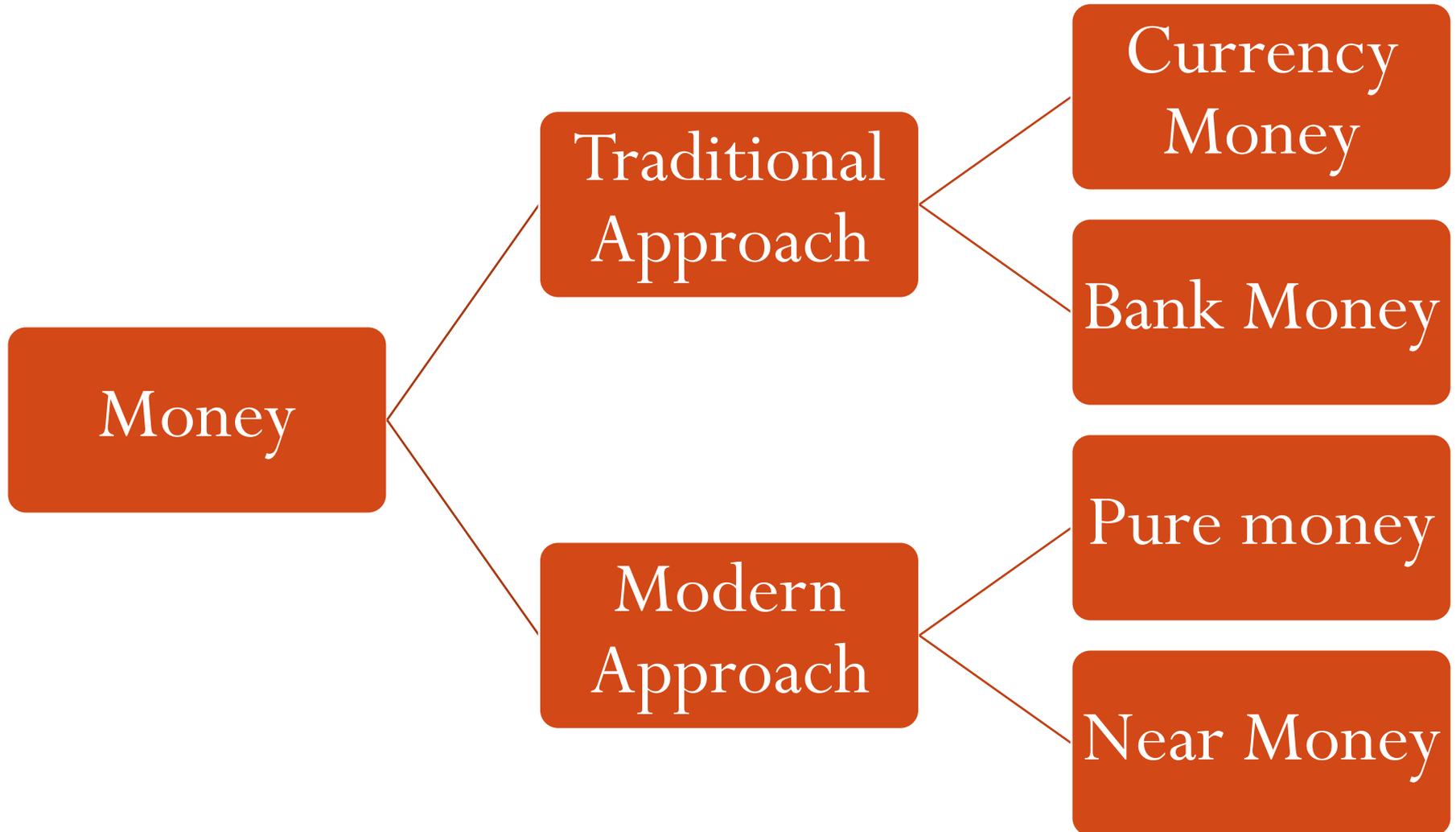
# Supply of Money (Ms)

- The supply of money refers to the amount of money which is in circulation in an economy at any given point of time. In other words , *the total stock of money held by the public (individuals, banks & Government departments) at any given point of time* is known as money supply.

- Money supply is a stock as well as flow concept. When money supply is viewed at a point of time, it is a stock of money held by the public on a particular date. And when viewed over a period of time it becomes a flow concept.

# Velocity of Circulation of Money (V)

- The average number of times a unit of money circulating from one hand to another in the spending process during a given period of time (usually a year) is referred to as velocity of circulation of money. It is symbolically represented as **"V".**

- The flow of money is measured by multiplying a given stock of money held by the public with the velocity of circulation of money.
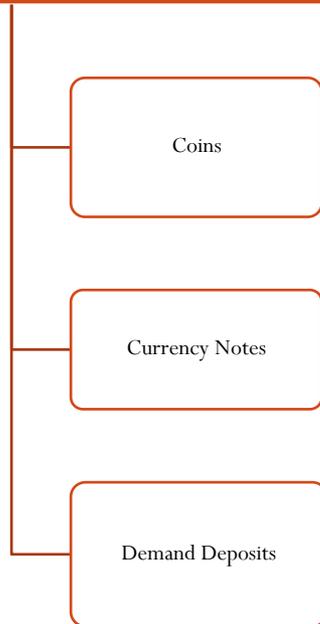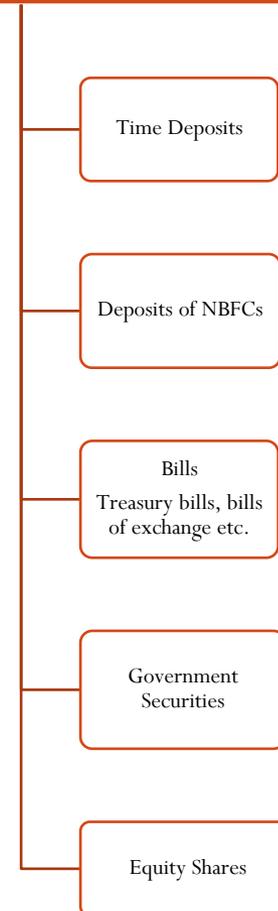
$$Ms = M \times V$$

# Constituents of Money Supply



Money
- Traditional Approach
  - Currency Money
  - Bank Money
- Modern Approach
  - Pure money
  - Near Money

# Constituents of Money Supply

## Pure Money

- Coins
- Currency Notes
- Demand Deposits

## Near Money

- Time Deposits
- Deposits of NBFCs
- Bills
  Treasury bills, bills of exchange etc.
- Government Securities
- Equity Shares

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# Components of Money Supply In India

- The report of the Second Working Group on Money Supply of the RBI published in 1977 spelled out a meaningful definition of money supply to facilitate rational policy formulation of the Indian economy.

- Based on the two fundamental functions of money, namely, medium of exchange & store of value the RBI undertakes four measures of money stock relevant for the formulation of its monetary policy.

- These measures are commonly expressed in symbolic terms as –
  M1, M2, M3 and M4.

# Concepts of Money Supply according to RBI

$$M_1 = C + DD + OD \text{ (Pure Money)}$$
$$M_2 = M1 + POSBD$$
$$M_3 = M1 + NTD \text{ (Broad Money)}$$
$$M_4 = M3 + TPOD$$

Holding a notion of the liquidity approach to money , RBI sums up the following assets as Aggregate Monetary Resources (AMR)-

Currency (C), Demand deposits of banks (DD), Other Deposits of the RBI (OD) , Post Office Saving Bank Deposits (POSBD),Net Time Deposits of Banks (NTD) & Total Deposits of Post Office (TPOD)

# New Concept of Constituents of Money Supply

- Under the Chairmanship of Dr. Y.V. Reddy in June 1998, the *Report of the Working Group on Money Supply: Analytical & Methodology of Compilation* gave the new concept of money supply in which they coined the concept of-

$NM_1 = C + DD + OD$

$NM_2 = NM_1 +$ Short term time/fixed deposits of residents

$NM_3 = NM_2 +$ Long term time/fixed deposits + Call or term funds with financial institutions.

# Determinants of Money Supply
## (Factors affecting Money Supply)

L. V. Chandler states that the major determinants of the quantity of money in an economy are-

1. The Size of Monetary Base-

   Monetary gold stock, reserve assets ( Govt. Securities, bonds & bullions foreign exchange reserves etc with central bank).

2. Community's choice to hold money.

3. Extent of Monetisation.

4. The Cash Reserve Ratio (CRR).

5. Government Budgetary Policy of Monetary Finance.-Pump in & Pump out policy.

# Demand for Money

Motives/Objectives of Demand for Money:

1. Transactionary Motive.

2. Precautionary Motive

3. Speculative Motive.

# Factors Influencing Demand for Money

1. Income of a person (Positive).

2. Rate of Interest (Negative).

3. Proportion of tax & taxation policy (Positive & Negative).

4. Price level (Negative).

5. Availability of money – Money supply (Positive).

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# Demand for Money

- For explaining the determinants of the value of money , two major theories have been expounded by the economists viz.,

    1. The Quantity Theory of Money – Q.T.M.
    2. The Income Expenditure Theory.

# Approaches of Demand for Money

- Broadly speaking there are three distinct approaches to the concept of demand for money.

```
                    ┌──────────────────┐
                    │ Demand for Money │
                    │     Q.T.M.       │
                    └──────────────────┘
           ┌───────────────┼───────────────┐
  ┌─────────────┐  ┌──────────────────┐  ┌─────────────┐
  │  Classical  │  │ Keynesian Version│  │   Modern    │
  │   Version   │  │    Liquidity     │  │   Version   │
  │             │  │ Preference App   │  │             │
  └─────────────┘  └──────────────────┘  └─────────────┘
    ┌──────┴──────┐                              │
┌──────────────┐ ┌──────────────┐      ┌──────────────────┐
│Cash Transaction│ │Cash Balance App.-│    │Friedman's Version-│
│App. –Fisherian │ │Cambridge Version │    │ Chicago Version   │
│Version/ American│ │                 │    │                   │
│  Approach      │ │                 │    │                   │
└──────────────┘ └──────────────┘      └──────────────────┘
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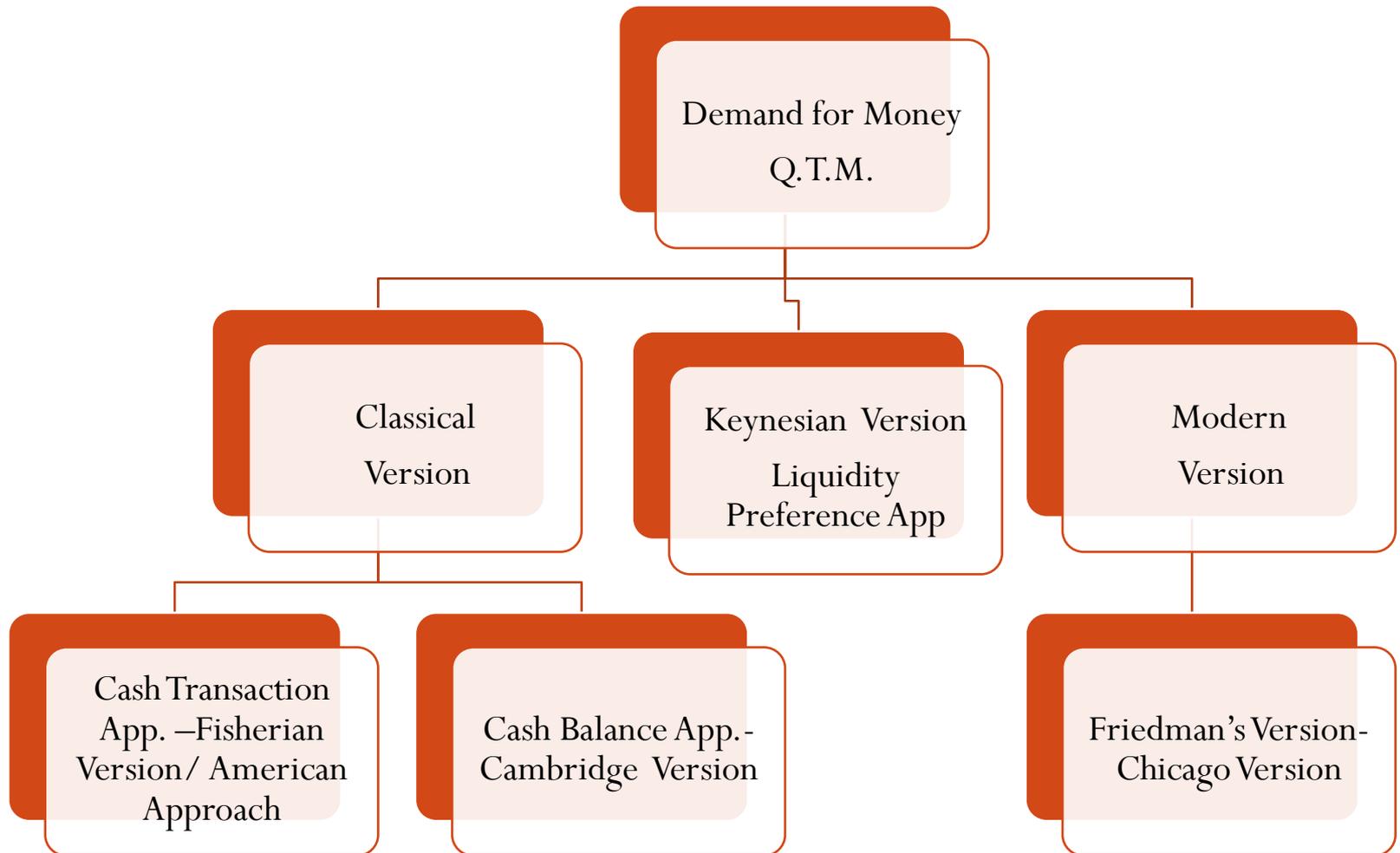
# The Quantity Theory of Money- QTM

**The Gist of QTM:**

The QTM is the crux of the classical monetary thoughts which proclaim the idea of an unique functional relationship between money & prices.

In its crudest form , the theory states the price level or the value of money is dependent upon the quantity of money- the price level varies in direct proportion to the quantity of money. Hence value of money varies in a inverse proportion. Functionally,

**Price/Value of Money= $f$ ( Quantity of Money)**

There are two refined to the traditional QTM ,namely, The Cash Transaction Approach & The Cash Balance Approach.

# Irving Fisher
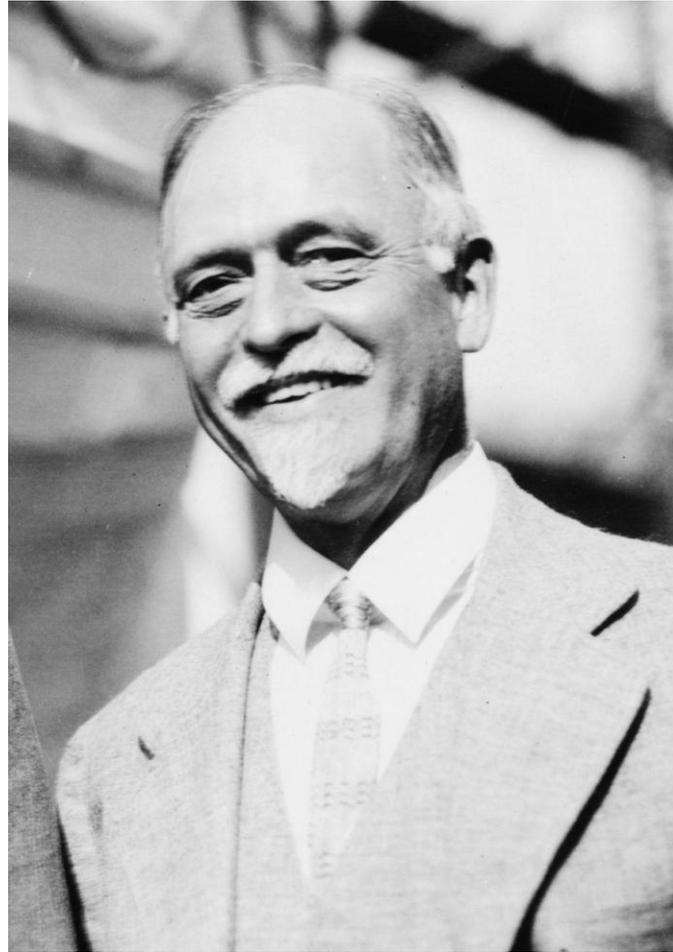


## Founder of Q. T. M (Cash Transaction Approach)

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# The Cash Transaction Approach / Fisherian App.

- An American economist Prof. Irving Fisher in his book "***Purchasing Power of Money***" (1911) tried to provide a formulistic expression to the direct relationship between quantity of money & the general price level through the equation of exchange.

- Fisher held that ***the general price level varies directly & proportionately with the quantity of money.*** Thus when the money supply is doubled the price will also be doubled & if the money supply is halved , the price will also be halved.

Where, M = quantity of money.

      V = velocity of circulation of money.

      P = general price level.

      T = total volume of transaction.

**Equation of Exchange**

$$MV = PT$$

OR

$$P = \frac{MV}{T}$$

# The Cash Transaction Approach/ Fisherian App.

- Thus the product MV gives the aggregate effective supply of money during a given period, & PT is the money value of all the things bought during a given period ( demand for money).

- Hence, MV=PT connotes that under monetary equilibrium , the supply of money equals to demand for money.

- However, Fisher did not include the concept of bank money which plays an important role in modern economy. So Fisher revised his equation of exchange & his new equation is under –

**Modified Equation of Exchange**

$$P = \frac{MV + M'V'}{T}$$

Where, M' = the volume of bank money.

V' = velocity of circulation of bank money.

# Diagrammatic Representation
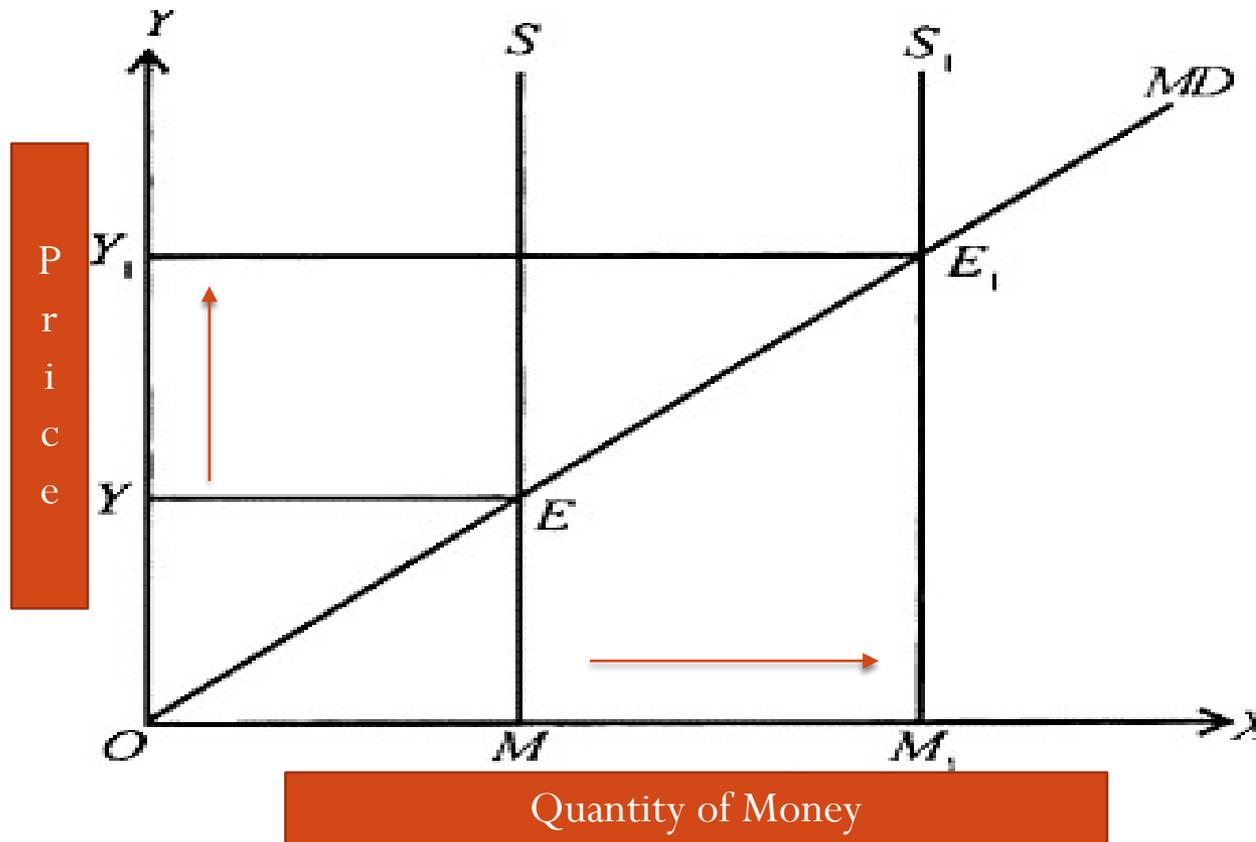
# Assumptions of Fisherian Analysis

1. The price level (P) is a passive variable.

2. The total volume of transaction (T) is an independent but constant variable in short run.

3. The velocity of circulation of money (V) is an independent element in the equation & is constant in the short period.

4. The ratio of M/M' is constant.

5. Full employment.

6. Short period analysis.

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# Criticisms Against Fisher's QTM

1. It is just a mathematical truism.

2. The price level is wrongly assumed to be a passive variable.

3. The V may not be a constant factor.

4. The assumption of full employment is unrealistic.

5. The equation of exchange has a technical inconsistency.

6. The ultimate determinants of value of money lie behind the equation of exchange & not in it.

7. It is mechanical & lacks human touch.

8. It is a lop-sided approach.

9. The theory neglects the role of interest rate.

10. Theoretical dichotomy into theory of money & theory of value.

11. It is a static approach.

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# Cash Balance Approach

# Cambridge Approach

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# Proponents of Cambridge School of Economics
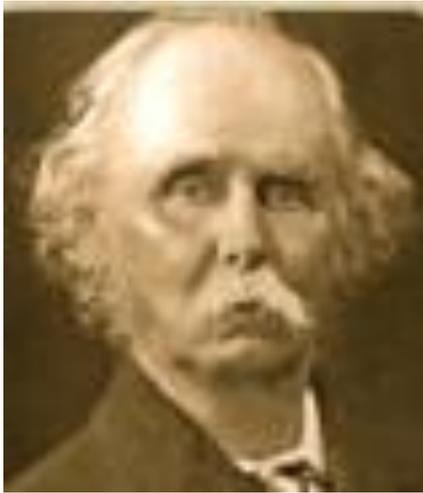


Dr. Alferd Marshall
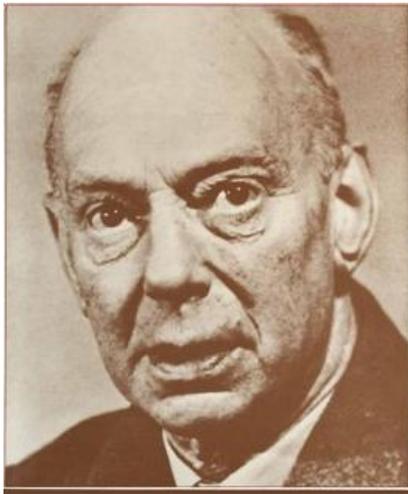


D. H. Robertson
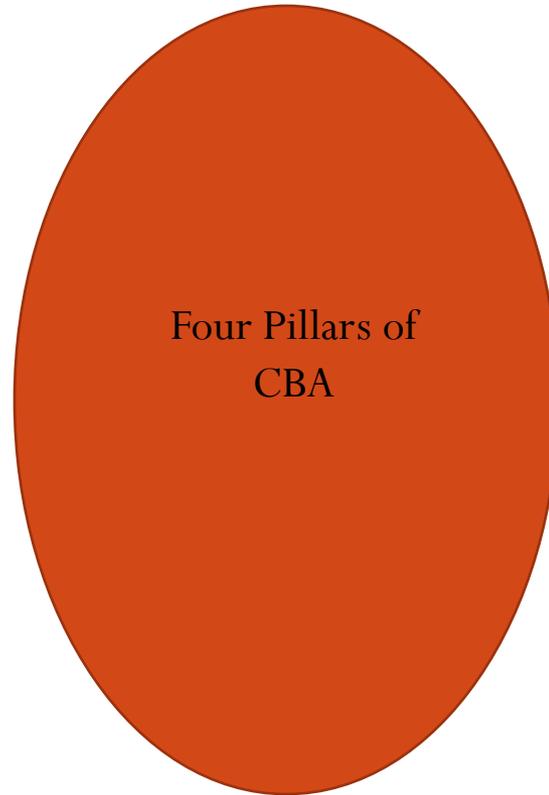
Four Pillars of CBA



Prof. A. C. Pigou
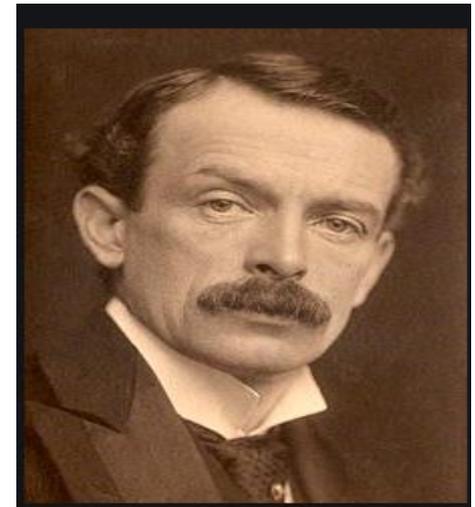


Lord J. M. Keynes

# The Cash Balance Approach-Cambridgian Approach

- The equation of exchange enjoyed its greatest popularity in the United States in the early 20$^{th}$ Century. In contemporary Europe, however, a slightly different approach known as Cash Transaction Approach was propounded particularly by the Cambridge economists namely, Marshall, Pigou, Robertson & Keynes.

- The theory states, the value of money depends upon demand for money & supply of money. Functionally,

$$Vm = f ( D_M \ \& \ Ms)$$

- Value of money & price level is inversely related with one another.

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# The Cash Balance Equations

**Marshall Equation**

$$M = KPY$$

**Pigou's equation**

$$P = \frac{KR}{M}$$

**Robertson's Equation**

$$P = \frac{M}{KT}$$

**Keynesian Equation**

$$p = \frac{n}{k}$$

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# Diagrammatic Representation

Pigou's Diagrammatical Explanation
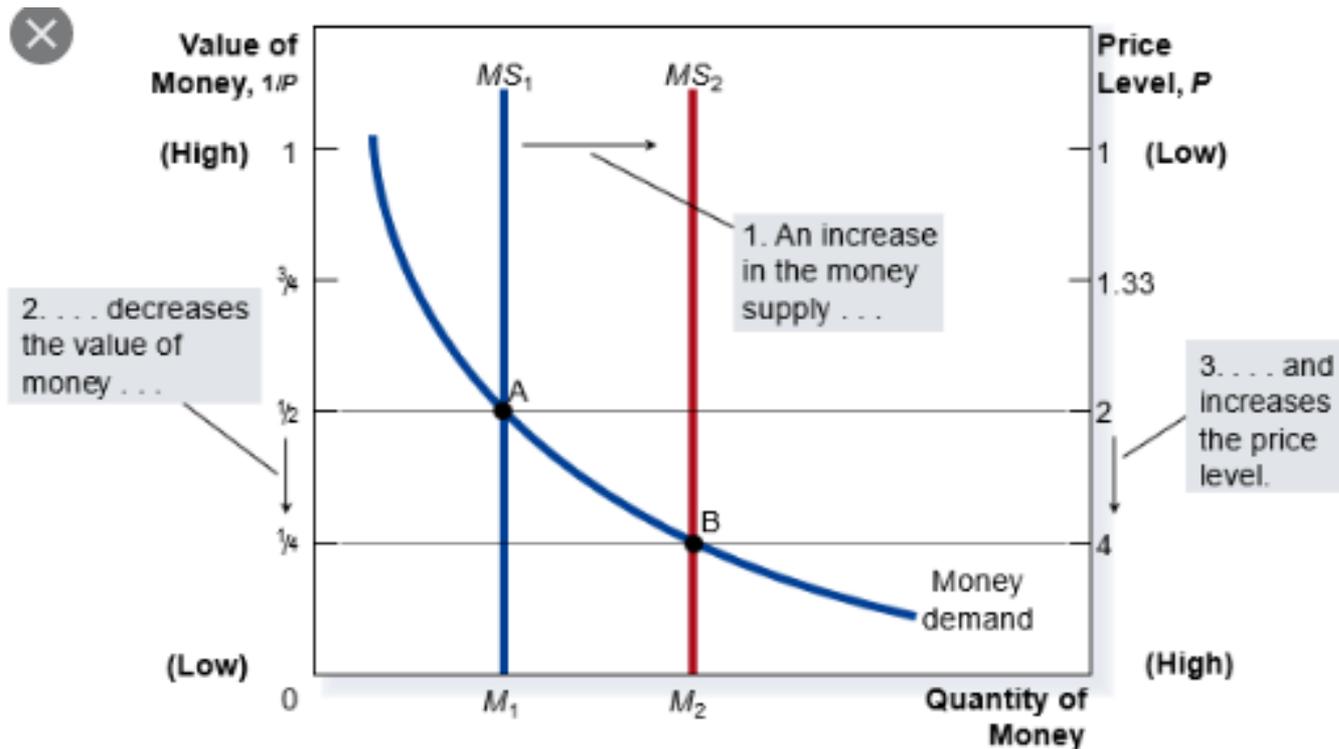
# A Comparison Between Fisherian & Cambridge Versions

- <u>Similarities</u>

1. Identiical hypothesis.

2. Similar equations of Fisher & Roberson.

3. Different angles of the same phenomenon.

- <u>Dissimilarities</u>:

1. Difference in the concept of demand for money.

2. Difference in the concept of money supply.( Flow V/s. Stock)

3. Difference in approach & emphasis on V & K.

4. Mechanistic V/s. Realistic Approach.

# Superiority of Cambridge Version Over Fisher Version

- Humanistic Approach.

- Better mode of thinking.

- Integration of theory of money with general theory of value.

- More realistic approach.

- Foundation of modern theory of interest & demand for money.

- More convenient equation.

# Shortcomings of Cambridge Version

1. Narrow view.

2. Omission of crucial factors.

3. Circular reasoning.

4. Unrealistic assumptions.

5. Ignores rate of interest.

6. Ignores the significance of real factors.

7. Inadequate in dealing with dynamic conditions.

8. Fails to examine the degree of impact of changes in money supply on output & prices together.

9. Fails to explain trade cycle phenomenon.

10. Wrong conception of the dichotomy of the economy-Real & Monetary Sectors.

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# Chicago Version of Q.T.M.

- In later 50s interest in the Q.T.M. was received by Milton Friedman of Chicago School of Economics, in reformulating the theory. He professed that some more direct link might exist between price & economic activity.

- He presented his views in his paper "*The Quantity Theory of Money: A Restatement*" published in 1956. However, the gist of his views can be easily found in his another paper " *The Supply of Money & Changes in Prices & Output*" submitted to Joint Economic Committee in 1959.

# The Main Propositions of Chicago Version of Q.T.M.

(A)  The Quantity theory is fundamentally a theory of the demand for money.

(B) The demand for money is unitary elastic in relation to the price level.

(C) Real income is the main determinant of demand for money.

$$Dm = f(Y)$$

(D) Demand for money is not only determined by price and income levels , but also by an important factor – cost of holding money or cash balance.

(E) The cost of holding money can be measured in terms of (i) the rate of interest earned on alternative assts say, bonds, equity, etc. (ii) the expected rate of change in price level.

# Demand for Money Function

Demand function has strategic importance in determining the variables which are significant for the analysis of the economy as a whole, such as price level or money income.

$$M = f ( P, Y, 1/P* \, dp/dt, rb, re, w, u )$$

Where,

M=Demand for money,

P= general price level,

Y= total flow of income,

1/P* dp/dt = size of normal returns in the form of appreciation or depreciation in money value, per rupee of real assets,

rb= the market bond interest or returns on bonds,

re= the market interest of equity or returns on equity,

w= ratio of non-human to human wealth,

u= utility determining variables which tend to influence taste & preferences.

# Key Points...

- Change in the stock of money causes a change in the price level or income.

- Country's real income is more closely related to the total currency , demand deposits and time deposits of the banks.

- Control of components of money supply is the best means of achieving and maintaining economic stability.

# Theories of Interest

What is Interest?

In simple terms interest is a compensation for capital for its contribution in process of production or in other words, it is a reward paid for parting with liquidity.

# Theories of Interest



Determination of Interest

- Classical Theory of Interest
  - Investment – Saving (I.S.)Parity Theory
    - Alfred Marshall & Irving Fisher
- Keynesian Theory of Interest
  - Liquidity Preference Theory (L.M.)
    - Lord J.M.Keynes
- Modern Theory of Interest
  - I.S.- L.M. Theory
    - Hicks-Hensen Synthesis
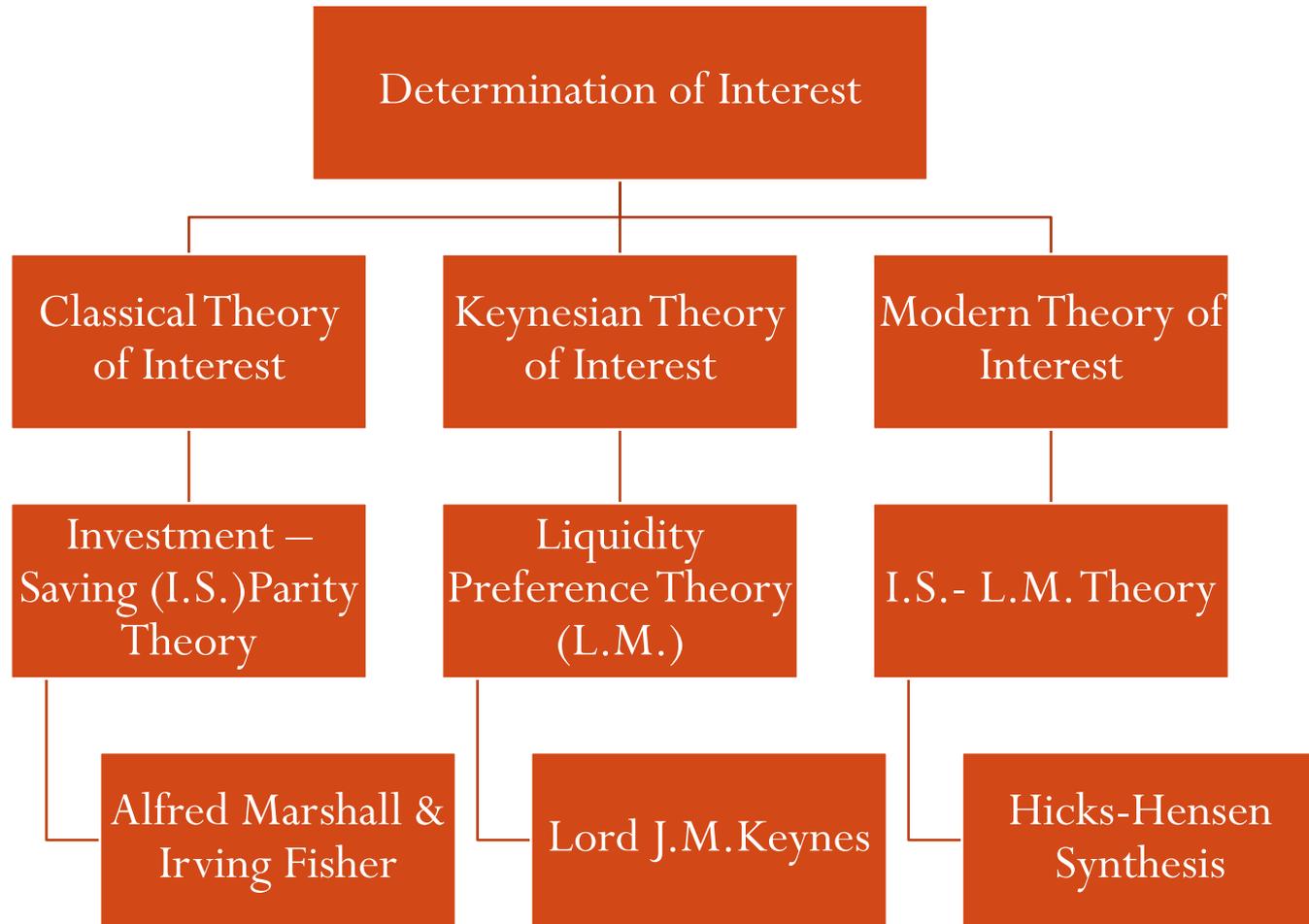
# Classical Theory of Rate of Interest

- Classical theory of interest rate determination was propounded by Prof. Alfred Marshall & Irving Fisher.

- This theory is also to be called as Demand-Supply theory.

- The essence of the theory indicates that in a market rate of interest is determined by the equilibrium of demand & supply of Savings.

- The classist believed that interest is a price paid for the supply of savings to meet the demand for investment.

- The theory explains the determination of interest rate by analyzing the real factors like Savings & Investment.

# Demand & Supply of Savings

## Demand for Savings

- The demand for savings comes from investors for investments in business activities.

- The demand for investment is high when the capital (as a factor of production) gives high returns.

- It is beneficial to borrow more capital only if marginal productivity of capital is more than interest paid.

- There will be equilibrium at a point where marginal productivity of capital equals interest rate.

## Supply of Savings

- Supply for investment comes from savings of those who have excess income over consumption. $(S = Y - C)$.

- Savings depends on various factors like capacity to save, willingness to save, income levels, interest rate etc.

- However, interest rate is one of the important factor determining savings. For instance, people save more when they gets high rate of interest & vice versa.

# Saving Investment Parity

- $S = I \ldots(i)$
- $Y = E \ldots(ii)$
- $Y = C + S \ldots(iii)$
- $E = C + I \ldots(iv)$
- $Y = E \ldots(ii)$
- $C + S = C + I \text{----}(v)$
- Therefore , $S = I$

# Investment Demand Curve

- According to classical economists, it is the changes in the rate of interest that brings about equality between savings & investments.

- For them, rate of interest, is determined by supply of savings & demand for investments.

- The demand for investment is stipulated to be decreasing function of the rate of interest. (Therefore, Investment Curve is a negative sloped curve). At lower rate of interest more would be borrowed for investment.
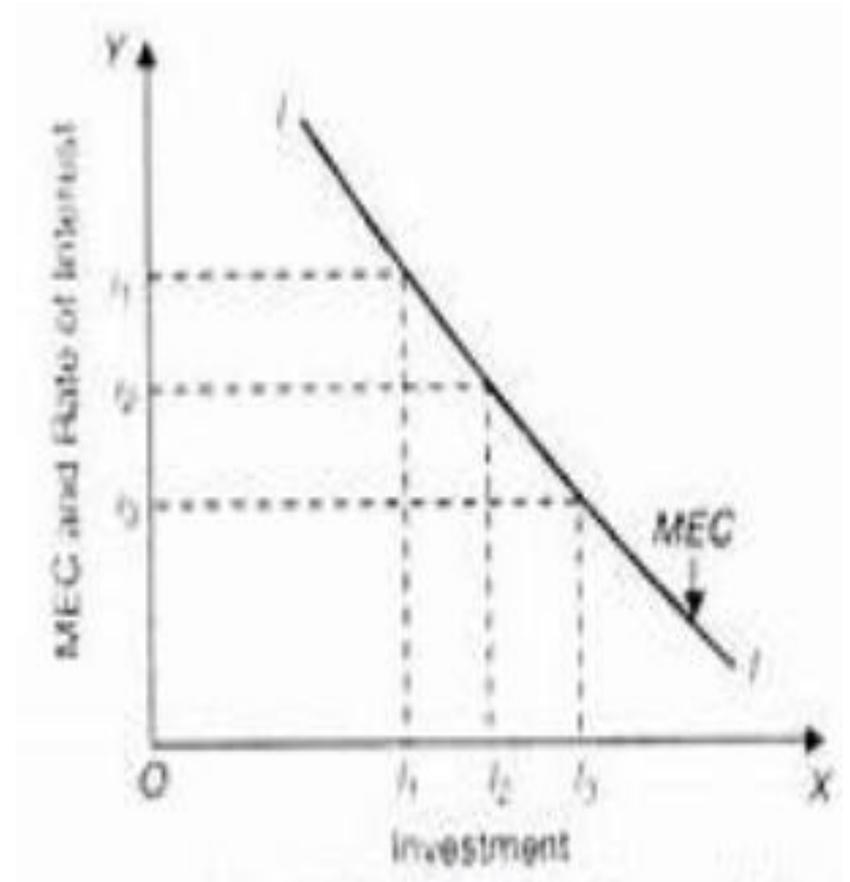
# Saving Curve

- On the other hand, the saving of the people are taken to be increasing function of the rate of interest (i.e., the higher the rate of interest, higher will be the savings & vice versa).
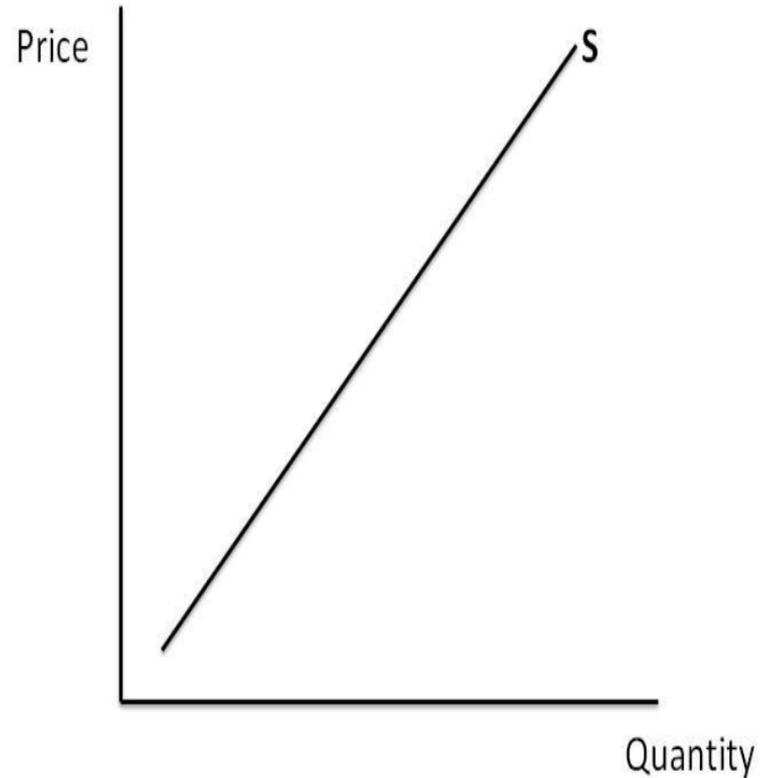
# Determination of Rate of Interest

- The loan market will be in equilibrium at the rate of interest at which the demand for investment is equal to supply of savings.

- Any changes in rate of interest would cause investment & supply of savings to become equal.

- It will be seen that intersection of investment demand curve(II) & supply of savings curve(SS) determines rate of interest. (i)
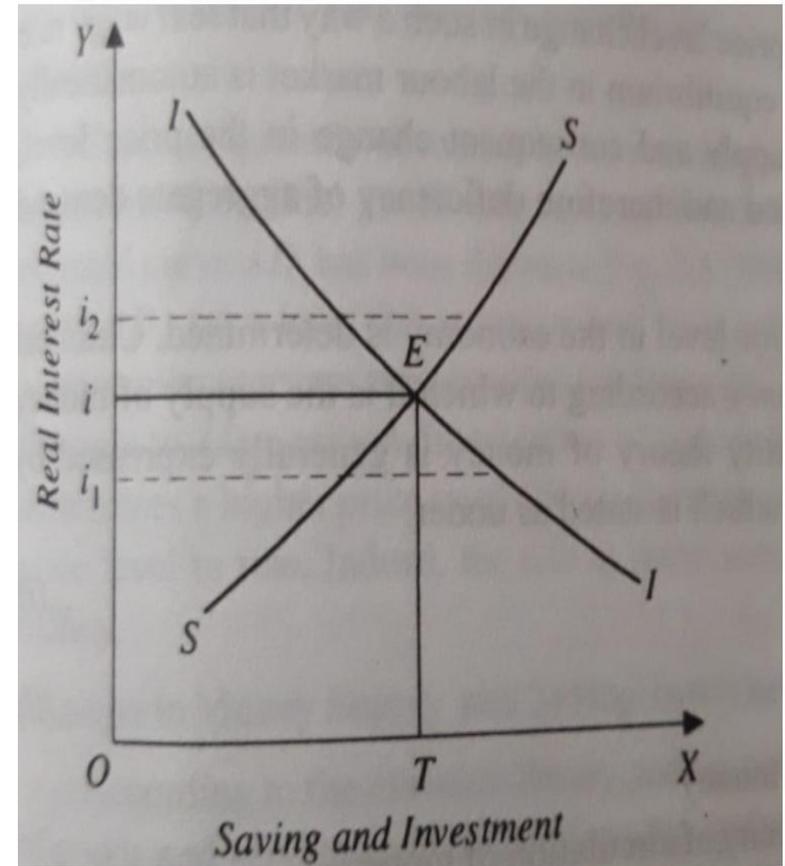
# Keynesian Liquidity Preference Theory

- Interest is the reward paid for parting with liquidity i. e, giving up the cash balance held.

- Interest is regarded by Keynes as a purely monetary phenomenon in the sense that it is determined by the interaction of demand for money (liquidity preference) and supply of money (the total quantity of money).

$$R = f(L, M)$$
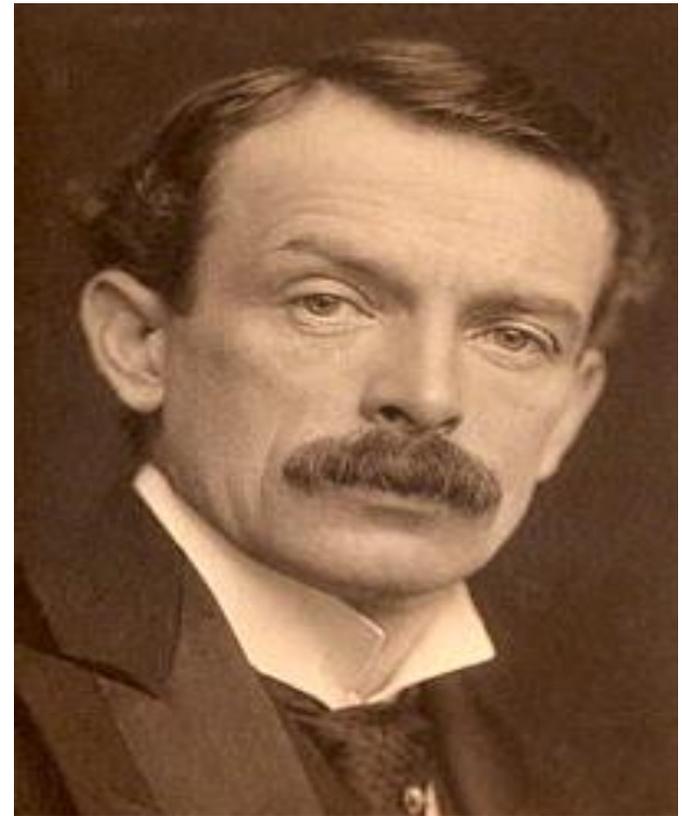
**Lord J.M. Keynes**

# Liquidity Preference Curve
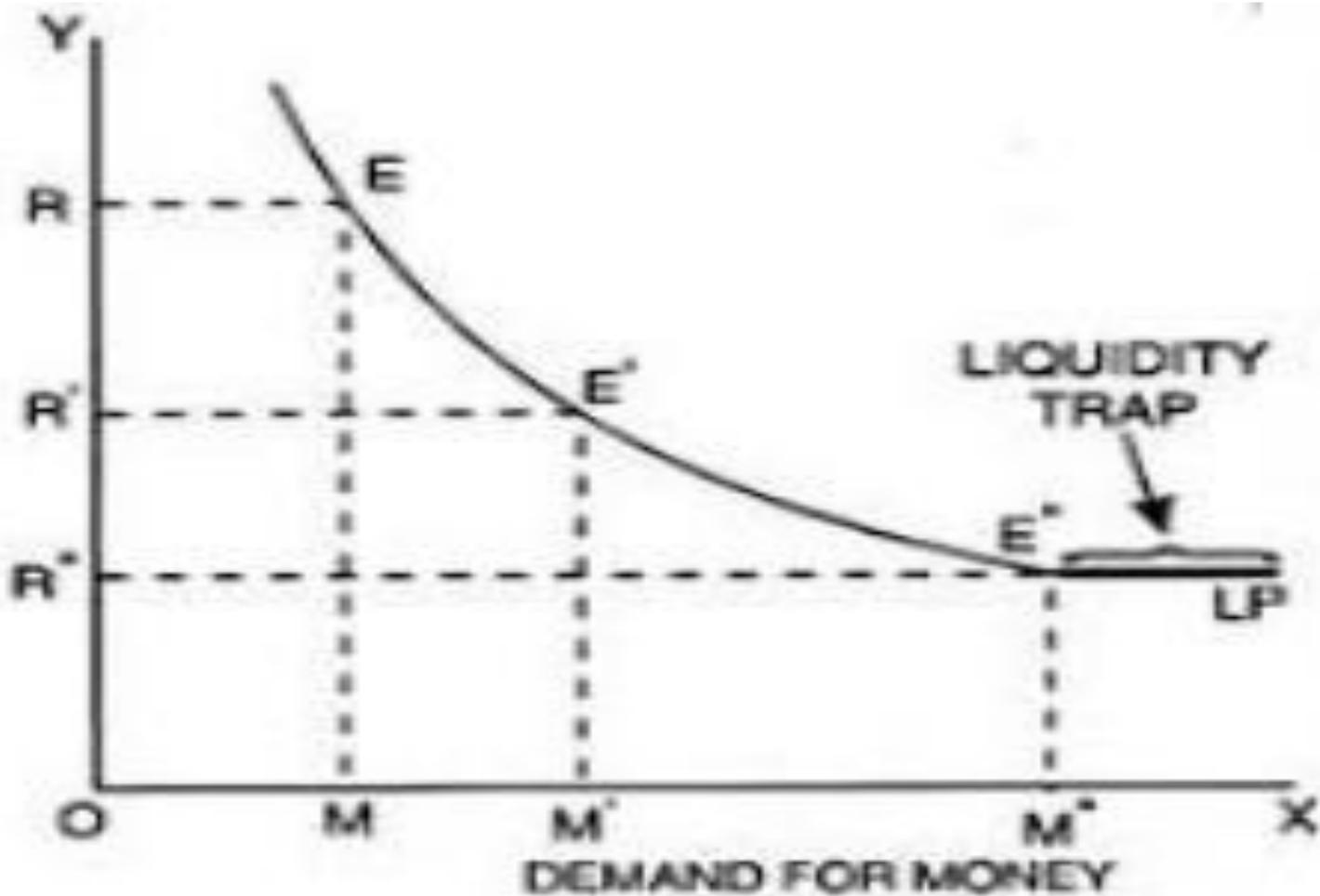
# The Demand for Money

- According to Keynes, the total demand for money is divided into two principal demands, namely,

(i) Demand for money as a medium of exchange
   (Active Cash Balance)

(ii) Demand for money as a store of wealth.
   (Idle Cash Balance)

Thus fulfilling all the three motives of demand for money viz.,

   a. Transaction (Active Cash Balance)

   b. Precaution (Idle Cash Balance)

   c. Speculation (Idle Cash Balance)

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# The Statement

- The liquidity function is postulated by Keynes in which he explained that demand for money is positively correlated with income – an increase in the level of incomes implies a rise in the demand for money, and vice versa. On the other hand, it is negatively correlated with the rate of interest – arise in rate of interest reduces the demand for money and vice versa.

- Functionally ,

$$L = f( y, r )$$

Where,

L= demand for money

y= level of income

r= rate of interest

# Formulistic Explanation

$$M = L\ (\ y\ ,\ r\ )$$

$$L = L_1 + L_2 \ \ldots..(i)$$

$$M = M_1 + M_2 \ \ldots..(ii)$$

$$M_1 = L_1\ (y) \ \ldots\ldots\ (iii)$$

$$M_2 = L_2\ (r) \ \ldots\ldots(iv)$$

Now considering equation # 2

$M = M_1 + M_2$ and replacing….

$$M = M_1 + M_2$$
$$= L_1\ (y) + L_2\ (r)$$
$$= L\ (y,\ r)$$

Therefore,

$$M = L\ (\ y\ ,\ r\ )$$

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# Determination of Interest Rate
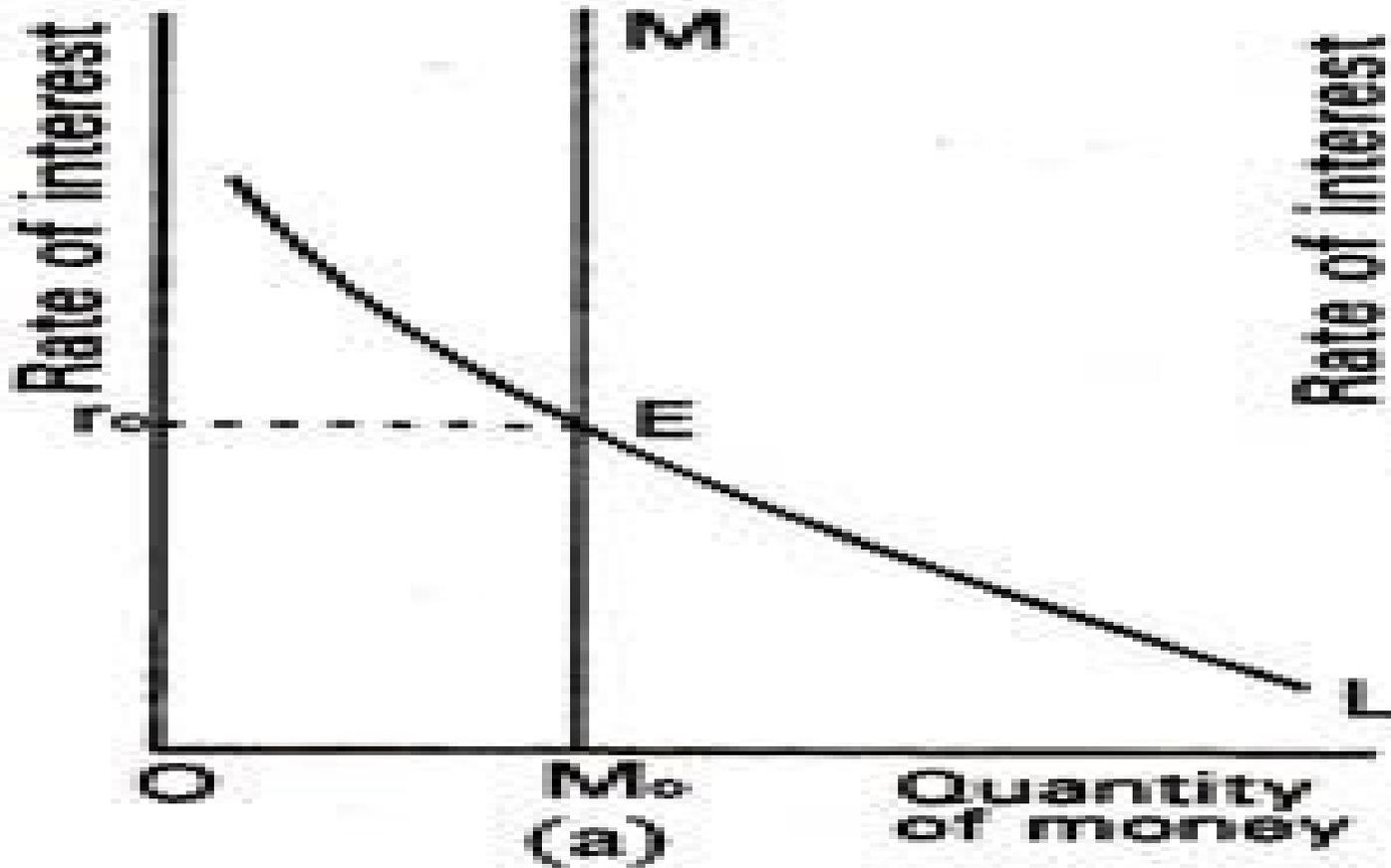
# Changes in Demand & Supply of Money



Fig. 1

Fig. 2
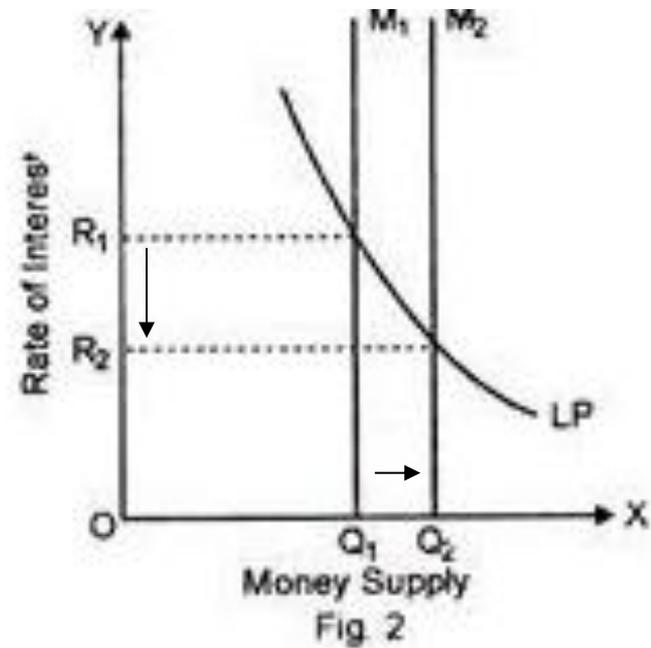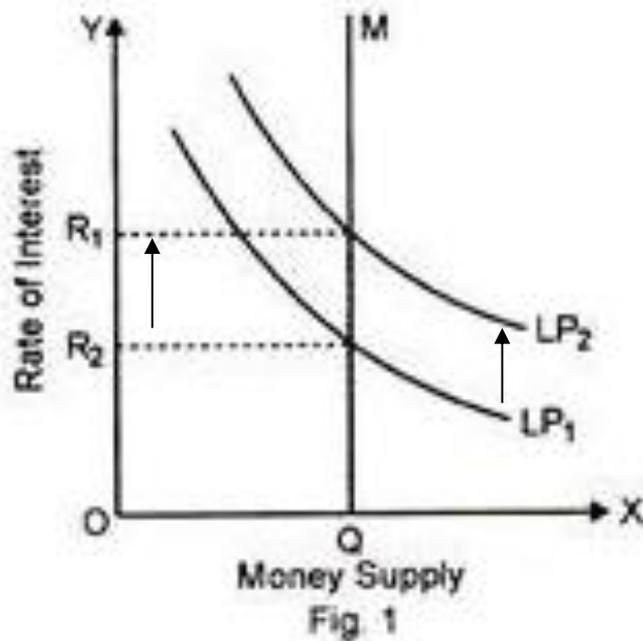
# When Both Changes
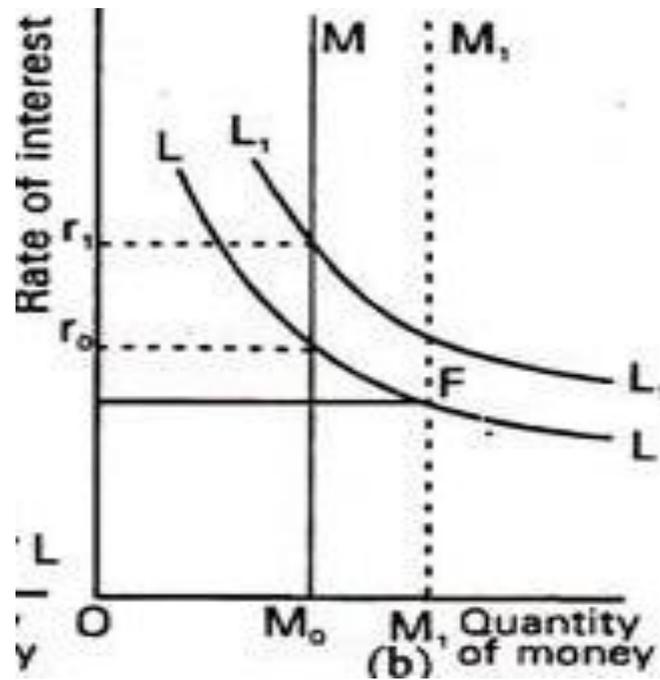
# Determination of Interest Rate
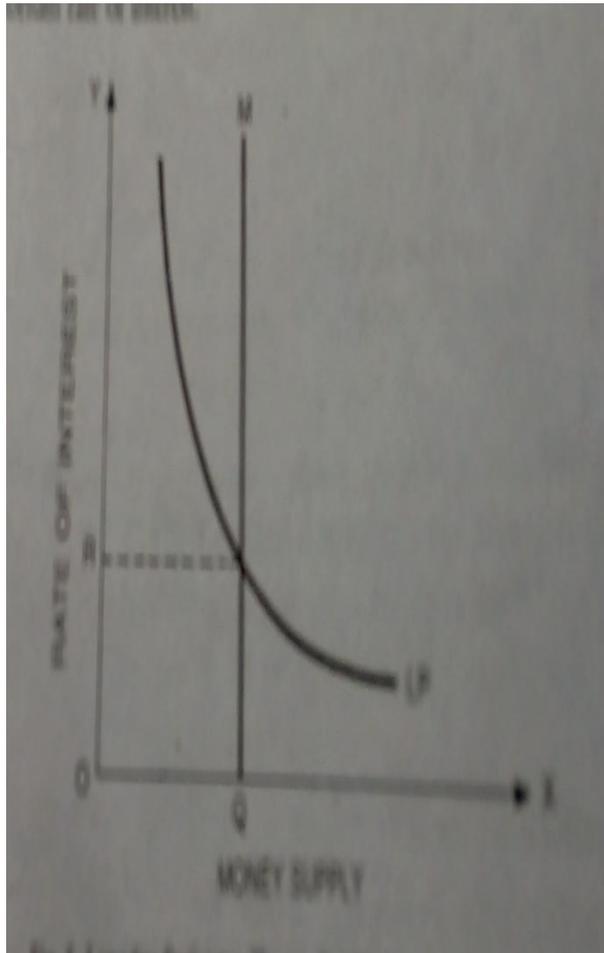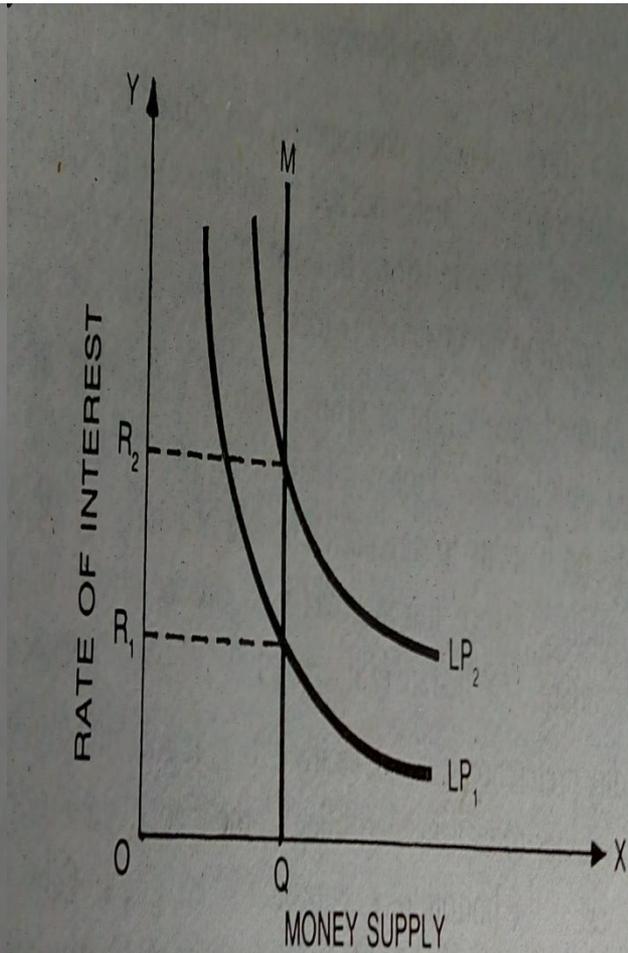


| Equilibrium Rate of Interest | Change in Demand for Money | Change in Supply of Money |
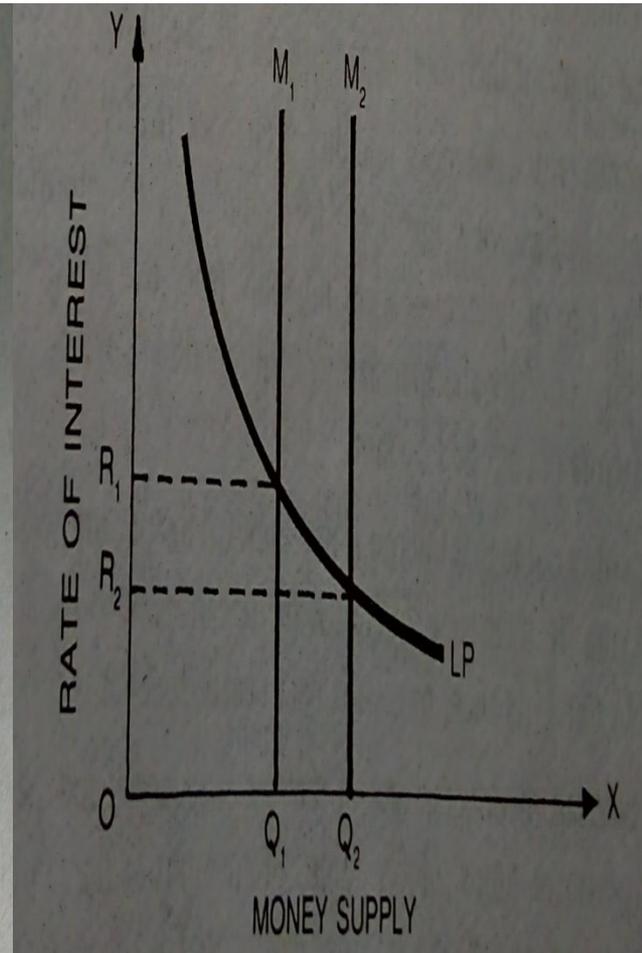
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# Hicks- Hansen Synthesis : I.S. – L.M. Model

- The **IS–LM model**, or **Hicks–Hansen model**, is a two-dimensional macroeconomic tool that shows the relationship between interest rates and assets market (also known as real output in goods and services market plus money market. The intersection of the "investment–saving" (IS) and "liquidity preference–money supply" (LM) curves models "general equilibrium" where supposed simultaneous equilibria occur in both the goods and the asset markets.

- The model was developed by John Hicks in 1937, and later extended by Alvin Hansen as a mathematical representation of Keynesian macro economic theory.

- Hicks, who had seen a draft of Harrod's paper, invented the IS–LM model (originally using the abbreviation "LL", not "LM").

# Using Classical Theory to derive IS Curve

- From the classical theory we get a family of saving curves at various income levels. As income rises the saving curve shifts to right, which depicts that as income rises, saving will also rise, provided as interest rate remains constant. (See Fig. A.)

- Investment Curve is a downward sloping curve signifies that investment demand is inversely related with rate of interest. (which is depicted as I).

- It has been observed the interest rate which equalizes savings & investment ,keeps on falling as income level increases. (See Fig. B.)

- The steepness of IS curve depends on elasticity of investment demand to the change in rate of interest.
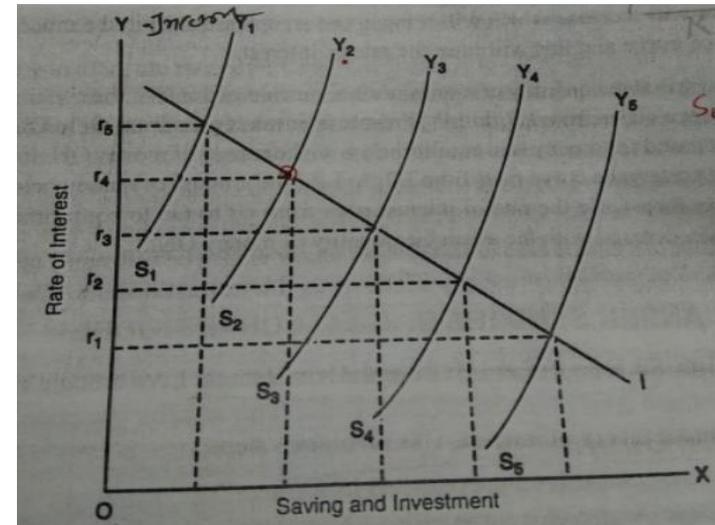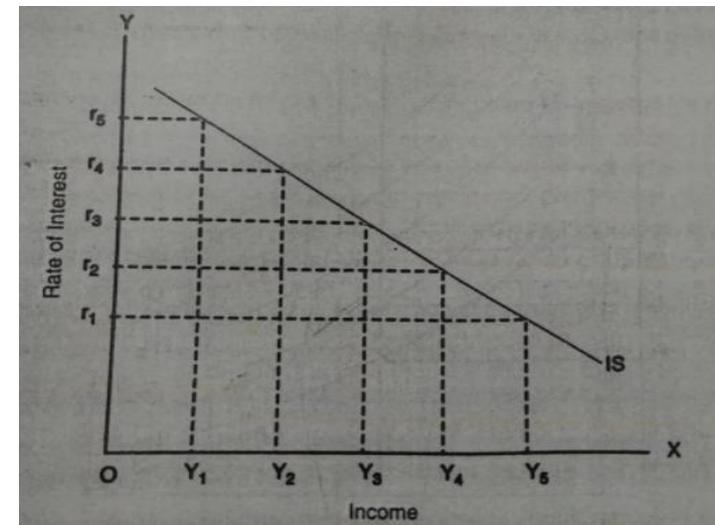
Fig. A



Fig. B

# Using Keynesian Theory to Derive LM Curve

- Fig.C shows various liquidity preference curves at various levels of income. The higher the income, greater the amount of money held for transactions & therefore, higher the LP curve. (See Fig. C)

- Fig. D. shows that the LM curve slopes upwards to the right. This is because of higher the level of income, higher will be the demand for money. [L=$f$(Y)].(See Fig. D)

- There are two factors on which the slope of LM curve depends. First, responsiveness of demand for money(LP) to the change in income & second, is the elasticity of demand for money to the change in rate of interest.
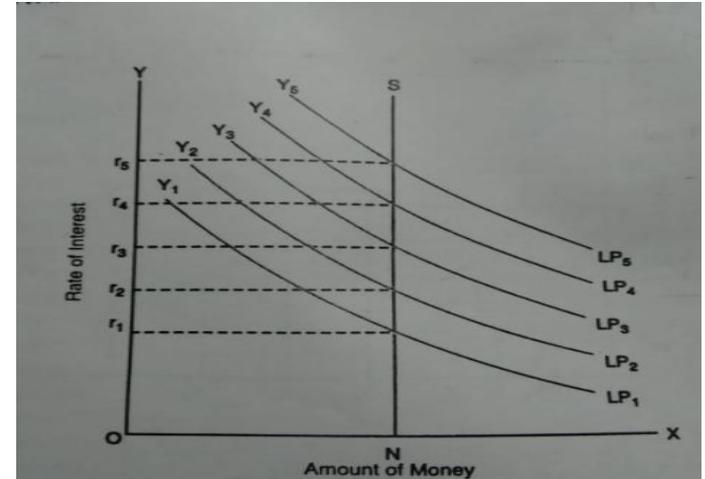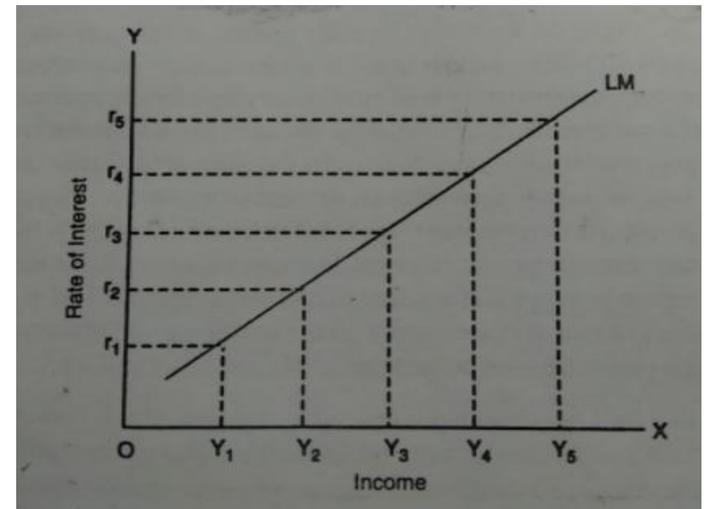
Fig. C


Fig. D

# Intersection of IS & LM Curves

- The IS & LM curves relate to two variables namely, income & rate of interest. These curves are plotted in Fig. E.

- The IS curve represents the classical theory which slopes downwards & LM curve represents the Keynesian theory which moves upwards. The intersection of these two curves represents the synthesis of two theories.

- The point where IS & LM curves intersects represents the equilibrium rate of interest.



Fig. E
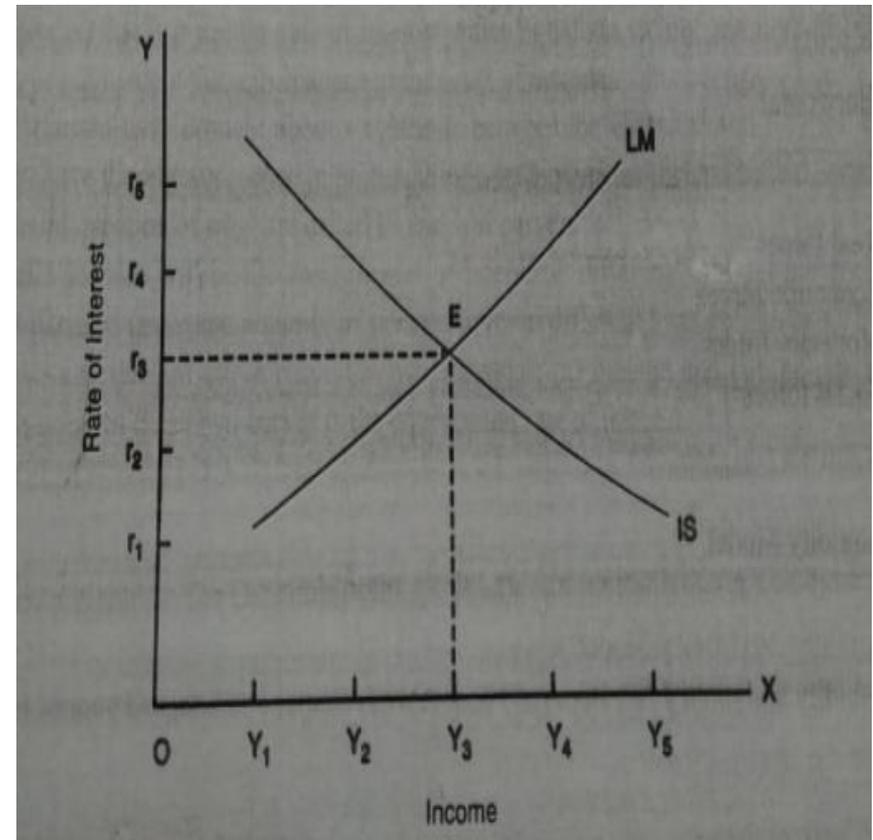
# Thank You

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