The main problem with Keynesian approach to the demand for money is that it suggests that individuals should, at any given time, hold all their liquid assets either in money or in bonds, but not some of each.

This is obviously not true in reality.

Tobin's model of liquidity preference — deals with this problem by showing that if the return on bonds is uncertain, that is, bonds are risky, then the investor worrying about both risk and return is likely to do best by holding both bonds and money.

Portfolio theories like the one presented by Tobin emphasises the role of money as a store of value. According to these theories, people hold money as part of their portfolio of assets. The reason for this is that money offers a different combination of risk and return than other assets which are less liquid than money — such as bonds.

To be more specific, money offers a safe (nominal) return, whereas the prices of stocks and bonds may rise or fall. Thus, Tobin has suggested that households choose to hold money as part of their optimal portfolio.

Portfolio theories predict that the demand for money depends on the risk and return associated with money holding as also on various other assets households can hold instead of money. Furthermore, the demand for money should depend on real wealth, because wealth measures the size of the portfolio to be allocated among money and the alternative assets.

For instance, the money demand function may be expressed as:

$(M/P)_d = f(r_s, r_b, \pi^e, W)$

where r_s = the expected real return on stock, r_b = the expected real return on bonds, π^e = the expected inflation rate and W= real wealth. An increase in r_s or r_b reduces money demand, because other assets become more attractive. An increase in n^e also reduces money demand, because money becomes less attractive. An increase in W

raises money demand, because higher wealth means a larger portfolio.
It is against this backdrop that we study the portfolio theory of money demand.

Speculative Demand for Money as Behaviour toward Risk:
Tobin ignored the determination of the transactions demand for money and considered only the demand for money as a store of wealth. The focus is on an individual's portfolio allocation between money-holding and bondholding, subject to the wealth constraint, i.e., W = M + B, where W is the total fixed wealth, M is money and B is bond.

In Tobin's theory there is no such thing as fixed normal level to which interest rates are always expected to return as has been postulated by Keynes. Following Tobin, we can assume that the expected capital gain is zero. This is because the individual investor expects capital gains and losses to be equally likely.

The best expectation of the return on bonds is simply the prevailing market rate of interest (r). But this is just the expected return on bonds. The actual return also includes some capital gain or loss, since the interest rate does not generally remain fixed.

Thus, bonds pay an expected return of interest, but they are a risky asset. Their actual return is uncertain due to the fact that the market rate of interest fluctuates even in the short run.

In contrast, money is a safe asset because it yields no return at all. At the same time money is a safe asset since no capital gain or loss is made by holding money. In Tobin's view an individual will hold some proportion of wealth in money for reducing the overall riskiness of his portfolio.

If only bonds are held, returns would be maximum no doubt but the risk to which the investor is exposed will also be maximum. A risk-adverse investor would voluntarily sacrifice some return for a reduction in risk. Tobin argues that money as an asset is demanded as an aversion to risk.

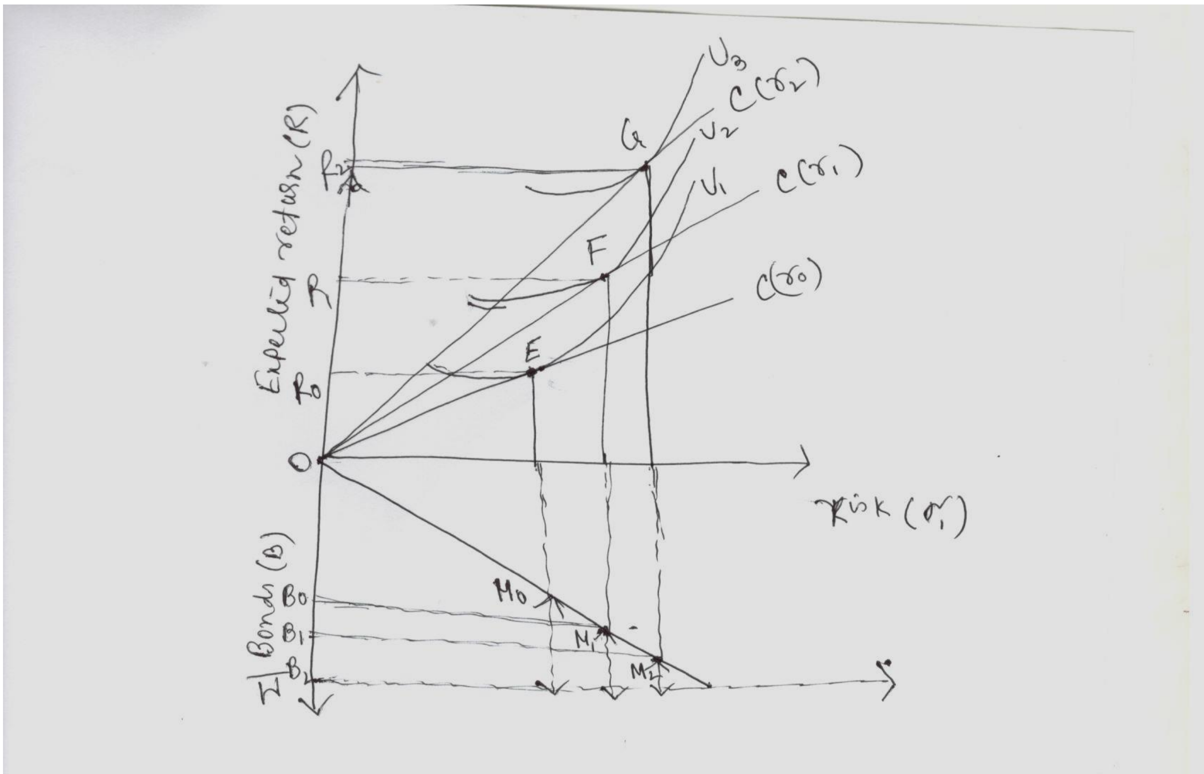

Fig – 1

Tobin's theory is explained in Fig. 1. On the vertical axis of the upper quadrant, we measure the expected return to the portfolio; on the horizontal axis we measure the riskiness of the portfolio. The expected return on the portfolio is the interest that can be earned on bonds.

This depends on two things: (i) the interest rate and (ii) the proportion of the portfolio held in bonds. The total risk to which an individual is exposed depends on (i) the uncertainty concerning bond prices — that is, the uncertainty concerning future movements in market rate of interest, and (ii) the proportion of the portfolio held in bonds.

Let us denote the expected total return by R and the total risk of the portfolio as a σ_t. If an individual holds all his wealth (W) in money and none in bonds, i.e., W = M + 0, both R and σ_t will be zero, as shown by the origin (point 0) in Fig. 1. With an increase in the proportion of bonds, i.e., W = M + B; as M falls and B increases, R and a, will both rise.

The opportunity line C is a locus of points showing the terms on which the individual investor can increase R at the cost of increasing σ_t. A movement along C from left to right shows that the investor increases his bond holding only by reducing his money holding.

The lower quadrant of Fig. 1 shows alternative portfolio allocations, resulting in different combinations of R and σ_t. The vertical axis measures bond holding. The amount of bonds (B) held in W increases as the investor moves down the vertical axis to a maximum of W.

The difference between W and B is the asset demand for money (M). The line OB in the lower part of the diagram shows the relationship between a, and B. As the proportion of B in W increases, σ_t also increases. This means that as the proportion of bonds in the portfolio increases, the total risk of the portfolio increases, too.

Preference of the Investor: Risk-Aversion:

The optimal portfolio allocation depends on the preferences of the investor. Here we assume that the investor is risk-averse. He wants the best of both the worlds — a high return on the portfolio by avoiding risk. He will accept more risk if he is compensated by an increase in expected return. Let us assume that the utility function of the investor is $U = f(R, \sigma_t)$

where an increase in R increases utility (U) and an increase in σ_T reduces U. In Fig. 1 we show three indifference curves of the investor for three levels of utility U_1, U_2 and U_3. Each indifference curve shows the risk-return trade-off, i.e., the terms on which the investor is desirous of taking more risk if compensated by a higher expected return.

All the points on any such indifference curve yield the same fixed level of utility.

Any movement from U_1 to U_2 and from U_2 to U_3 implies higher level of utility, i.e., higher levels of R and the same or even lower levels of σ_t. The indifference curves are upward sloping because the investor is risk-averse. He will take more risk only if compensated by a higher return. Moreover, the curves become steeper as the investor moves to the right, implying increasing risk aversion.

If we make this assumption, then the more risk the individual has already taken on, the greater will be the increase in expected return required for the investor to be exposed to a greater degree of risk. We may now determine the optimal portfolio allocation of a risk averse investor.

Optimal Portfolio Allocation:

A risk-averse investor will move to that point along the line C which enables him to reach the highest attainable indifference curve. At that point he ends up choosing that portfolio which he intends to choose and, thus, maximises his utility. The reason is obvious. At the

tangency point E, with R = R* and $\sigma_t = \sigma^*_t$, the terms on which the investor is able to increase expected return on the portfolio by taking more risk, shown by the slope of the line C, is equated to the terms on which he (she) is willing to make the trade-off, as is measured by the slope of the indifference curve.

From the lower part we see that this risk-return combination is achieved by holding an amount of bonds equal to B*, and by holding the remainder of wealth ($\bar{W}$ – B* = M*) in the form of money.

The demand for money thus shows the investor's 'behaviour towards risk', i.e., the result of seeking to reduce risk below what it would be if $\bar{W}$ = B and M = 0. In Fig. 1 such an all-bonds-portfolio would be associated with risk of σ_t and the expected return of R, as shown by point F in the upper part of the diagram.

This portfolio yields a lower level of utility than that represented by bond holdings of B* and money holdings of M*.

The reason is that as the investor moves to the right of point E along the line 0C, the additional return expected from the portfolio by holding more bonds (and less money) is not adequate to compensate the investor for the additional risk (the slope of the line 0C is less than that of the indifference curve U_2). The movement to point F takes the investor to a lower indifference curve, U_1.

Interest Rate Changes and the Speculative Demand for Money:

In Tobin's theory the amount of money held as an asset depends on the level of the interest rate. Fig. 1 shows the relationship between interest rate and asset demand for money. An increase in the rate of interest from r_0 to r_1 and then to r_2 will improve the terms on which the expected return on the portfolio can be increased by taking more risk.

So the line 0C becomes steeper. It rotates anticlockwise from $C(r_0)$ to $C(r_1)$ and then to $C(r_2)$.

The investor responds by taking more risk and earning higher expected returns by moving from E to F and then to G. It may be noted that each point is one of portfolio optimisation. In this case his holdings of bonds (risky asset) increase (from B_0 to B_1, and then to B_2) and money holdings fall (from M_0 to M_1, then M_2).

In short, as the interest rate rises, a given increase in risk, which corresponds to a given increase in the amount of bonds in the portfolio, will result in a greater increase in expected return on the portfolio.