# UNIT – III (Random Walk Theory)

As per this theory, changes in stock prices are independent of each other. The prices of today are independent of the past trends. The present price is randomly determined and only information flow can influence prices. As information is free and independent, the resulting prices are free and independent.

A word of caution is necessary here. This Random walk hypothesis was postulated by researchers on the basis of empirical work on the market price behaviour. It does not therefore tantamount to the same theory as the capital market efficiency theory. Only market efficiency promtoes randomness and is therefore not a necessary condition. The fact that prices move independently has been found empirically and the analysts found an explanation for this in the efficient functioning of the markets and the market absorption of the information quickly and efficiently. The equilibrium price of a stock is determined by demand and supply forces, based on the available information. Quickly as the fresh information becomes available, a new equilibrium point is reached and the resultant price is thus independent of the part.

This Random walk hypothesis contradicts the Chartist and Technical School which believes that the present prices are the result of the past trends and that averages discount all fluctuations and that the average trends move in a predictable manner as the history of trends repeats itself. On the other hand, fundamental school postulates that the prices are a function of the intrinsic valuye pf the stock and prices result from changes I the intrinsic value and information relating to fundamental factors influence the equilibrium prices. Random walk hypothesis is an offshoot or a phase of the capital market efficiency theorem. The market efficiency theory postulates that prices are the result of free flow of information which the market absorbs quickly and efficiently.

**Assumption of Random Walk Theory**

1. Market is supreme and no individual investor or group can influence it.
2. Stock prices discount all information quickly.
3. Markets are efficient and that the flow of information is free and unbiassed.
4. All investors have free access to the same information and nobody has superior knowledge or expertise.
5. Market quickly adjusts itself to any deviation from equilibrium level due to the operation of free forces of demand and supply.
6. Market prices change only on information relating to the fundamentals, when the equilibrium level itself may shift.
7. These prices move in an independent fashion, within undue pressures or manipulation.
8. Nobody has better knowledge or insider information.
9. Investors behave in a rational manner and earned and supply forces are the result of rational investment decisions.
10. Institutional investors or any major fund managers have to follow the market and market cannot be influenced by them.
11. A large number of buyers & sellers and perfect market conditions of competition will prevail;

**Random Walk and Efficient Market Theory**

Random Walk hypothesis is considered as restatement or a form of Efficint Market Theory by some Analysts. The EM -
(Efficient Market Hypothesis) is based on the flow of free and correct information and the market absorption of it. This information flow and its absorption by the market are the critical elements of this theory. There are three types of information affecting the market, namely, pst Prices and trends, other public information and inside information. If all these types are not absorbed perfectly by the market, there is a possibility of some gaining above average returns, from the investments.
Based on the above three types of information, the analysis have placed the market absorption and the related theory under three heads; namely:
a. Weak Form of EMH, which absorbs only market price information,
b. Semistrong Form which absorbs price information and also all other public information and
c. Strong Form which absorbs all types of information including insider information.
Weak form of EMH is closely related to the Random Walk Hypothesis, as the past prices are already absorbed by the market and the present prices move therefore independently of the pat, which is the same as the Random walk hypothesis. The present trends are thus random variables, and past data cannot be used to predict the future. All the information on the past data on price trends and volumes was already absorbed earlier.
As prices have no memory of the past, yesterday prices have nothing to do with today's prices. To give an example from BSE quotation Dr. Reddy Labs has yearly low of Rs. 190 and a high of Rs. 333; its price at close on Oct. 15, 1996 was Rs. 215, but it opened on Oct. 16, at Rs. 212 and closed at Rs. 210. A day later it opened again at a higher price, independent of the last closing. It is futile exercise that the present day price can be derived by any past data, at least in short run. If that is proved empirically, then prices move in a random fashion like the walk of a Drunkard, each move independent of the other. It is anybody's guess or the result of a toss of coin of what will be the price of TISCO today or Dr. Reddy Labs tomorrow. Thus the Random Walk hypothesis states that prices move in random manner, independent of the past prices.
In the real world, the weak form of market efficiency may exist, as prices do move in an independent manner which the empirical evidence has shown as the past prices are already absorbed by the market. However, it is to be canceded that market imperfection, costs of information and blocks to the free flow of information may stand in the way of free play of market forces. Speculators and groups of interested parties or even brokers may manipulate the prices through corneing of shares and reducing the flating stock of the market.
Both the Random walk hypothesis and weak form of EMH, state almost the same thing, namely, that knowledge of the past stock price does not aid the investors to gain any improved performance. The prices move independent of the other; although they may move in a random manner they move around a trend line decided by the anticipated real earnings of the company and its fundamentals. Both EMH in weak form and the Random Wal;k Theory thus postulate that analysing the past does not improve the forecasting ability of stock prices and new information and prices that result from them cannot be predicted.

**Empirical Tests**

There were several empirical tests on the Random Walk Theory. The question tested was whether the security prices follow a "Random Walk, whether today's prices are in any way a

function of the past prices. Similarly weak form of Market efficiency also states that no investor can use the price information of the past to earn superior return on investment. Investors who analysed the past fundamentals involving price behaviour of the past did pick up good blue chips in their portfolio, but that did not give them superior portolio

Empirical tests were conducted both in the past and the present and in India and abroad on the validity of Random Walk hypothesis. These tests to some extent support the hypothesis that price changes of today are independent of the past price changes. But the evidence is not conclusive and results varied with the time period's chosen and the data used. Cowles (1934) and JOnes (1937) and Kendall (1953) etc. have shown in their research that security prices moved in a random fashion.

**Filter Tests**

Filter tests are based on the principle of fixing a filter level varying from 0.5% to 5%, and then examine how well pick up both trends and reversals. Thus, if a stock moves up a filter point say 5%; then buy it and hold it long; when it reverses by the same filter point, 5%, sell it and take a short position in it. A short position is one where on sells even without holding shares to deliver. When the stock price reverses again at the filter point, cover the short position by buying the shares in the market. By this process, the contention of chartists that prices and volume data of the past are supposed to tell the entire story and our approach is to forecast the trends and reversal only. Filterig is the screening of the important information affecting the prices from unimportant and see how well the price changes pick up the trends and reversals. The results of tests conducted by Fama, Blume and Alexander on the basis of filter points also did not gie conclusive proofs. If the filter level is low, the market swings capture these levels, but if the filter level is taken to be large, then results did not prove the hypothesis. Even in case of smaller filters, if transaction costs and other charges are taken into account the investors did not profit by using the filter tests. In sum, the results of filter tests did not prove the chartist school's validity. Stock prices do not move in a predictable fashion of movement and reversals and one cannot make return in excess of the results warranted by the risks assumed by the investors. These results prove that the weak form of market efficiency holds good as it is not possible to gain more from the price infomration of the market.