



VALUATION OF SECURITIES

CONCEPT OF VALUE

Firm's assets are of two types: **Real Assets & Financial Assets.**

Real Assets

Physical or identifiable assets such as gold, land, equipment, patents, etc. They are the opposite of a financial asset.

Real assets tend to be most desirable during periods of high inflation.

An **asset** that is intrinsically valuable because of its **utility**, such as **real estate** or physical **equipment**.-
opposite of **nominal asset**.

Financial Assets

A non-physical asset, such as a security, certificate, or bank balance. opposite of non-financial asset. Financial assets include Cash, and those assets that can be converted to cash in a reasonably short period of time - one year at most, but less time in many cases.

Financial assets are cash and other assets that convert directly into *known amounts* of cash. The three basic categories are cash, marketable securities, and receivables. In the balance sheet, financial assets are listed at the *current value*. For cash, this means the face amount; for marketable securities, current market value; and for receivables, net realizable value.

WHY VALUATION ?

- **Note that if either the buyer or seller is not both willing and able, then an offer does not establish the value of the asset.**

- **In general, the value of an asset is the price that a willing and able buyer pays to a willing and able seller.**

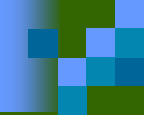
The value of the firm is affected by two key factors :Risk & Return.



These factors are fundamental to the valuation of the firm.

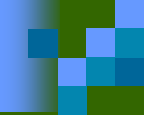
The principal goal of a firm is to maximize the market value of its securities. Higher the risk, other things being equal, lower the value; Higher the return, other things being equal, higher the value.

However, in the world of uncertainty, the expected return is not realized. Thus, risk can be thought of as the possibility that the actual return from holding a security will deviate from the expected return. The greater the magnitude of deviation & the greater the probability of its occurrence, the greater is said to be the risk of the security.



The **return** from an investment is the realizable cash flow earned by its owner during a given period of time. Not knowing what lies ahead, investors are unable to plan it with certainty, because both return from the investment & the timing of return are uncertain. Return is generally expressed as a % of the beginning-of-period value of the investment.

The issue of valuation is so important in real business world that it is accepted as the principal criterion for gauging the effectiveness of all the financial decisions.



An important role of the financial manager is to make recommendations concerning the value of different securities. “The value of a security may be defined as its worth in money or other securities at a given moment of time.” The value is expected either in terms of the security or in terms of the accounting procedure applicable to the security.

Valuation of securities is helpful to the financial manager in identifying & managing the parameters determining / influencing the prices of security. On the basis of the valuation he can design investment & financing activities of the firm, which exploits the relevant variables to maximize the market value of the shares.



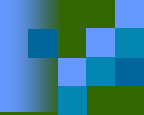
CONCEPTS OF VALUATION

- **GOING CONCERN VALUE**
- **LIQUIDATION VALUE**
- **MARKET VALUE**
- **REPLACEMENT VALUE**
- **BOOK VALUE**
- **INTRINSIC VALUE**

GOING CONCERN VALUE

The value of security of a profitable operating firm with prospects for indefinite future business might be expressed as going concern value. The worth of the firm would be expressed in terms of the future profits, dividends or growth expected of the business.

The value of a company as an operating venture. The difference between the liquidation value and the going-concern value is the value of intangibles associated with the running of the business, such as goodwill and intellectual property.



The value of a company as an ongoing entity. This value differs from the value of a company's assets if they were to be liquidated in that an ongoing operation has the ability to continue to earn profit, while a liquidated company does not.

Going-concern value includes the liquidation value of a company's tangible assets as well as the value of its intangible assets, such as goodwill. This is the main reason why the purchase price of a company tends to be higher than the current value of the assets of the company.

LIQUIDATION VALUE

- The estimated **amount** of **money** that an **asset** or **company** could quickly be sold for, such as if it were to go out of **business**. If the **liquidation value per share** for a company is less than the **current share price**, then it usually **means** that the company should go out of business (or that the **market** is devaluing the **stock**), although this is uncommon.
- Liquidation value may be either the result of a *forced liquidation* or an *orderly liquidation*. Either value assumes that the sale is consummated by a seller who is compelled to sell and assumes an exposure period which is less than market normal.
- It is the value of securities of the firm which is about to go out of business. It is expressed as the amount left for the stockholders after selling the firm's assets & paying its liabilities.
- **Net** amount that could be realized by selling the **assets** of a firm after paying the **debt**.

MARKET VALUE

The current quoted price at which investors buy or sell a share of common stock or a bond at a given time. Also known as "market price".

The market capitalization plus the market value of debt. Sometimes referred to as "total market value".

In the context of securities, market value is often different from book value because the market takes into account future growth potential. Most investors who use fundamental analysis to pick stocks look at a company's market value and then determine whether or not the market value is adequate or if it's undervalued in comparison to its book value, net assets or some other measure.

A security's last reported sale price (if on an exchange) or its current bid and ask prices (if Over-the-Counter); i.e. the price as determined dynamically by buyers and sellers in an open market. also called market price.

- Market value of the security can be determined for the stock or debt which is traded in the stock market, i.e, the value of the securities reflected in the bond or stock market's perception of the firm.



REPLACEMENT VALUE

The **value** of an **asset** as determined by the estimated **cost** of replacing it.

The term replacement cost or replacement value refers to the amount that an entity would have to pay, at the present time, to replace any one of its assets

BOOK VALUE

The value at which an asset is carried on a balance sheet. In other words, the cost of an asset minus accumulated depreciation.

The net asset value of a company, calculated by total assets minus intangible assets (patents, goodwill) and liabilities.

The initial outlay for an investment. This number may be net or gross of expenses such as trading costs, sales taxes, service charges and so on.

In U.K., book value is known as "net asset value**".**



Book value is the **accounting value of a firm. It has three main uses:**

- 1. It is the total value of the company's assets that shareholders would theoretically receive if a company were liquidated.**
- 2. By being compared to the company's market value, the book value can indicate whether a stock is under- or overpriced.**
- 3. In personal finance, the book value of an investment is the price paid for a security or debt investment. When a stock is sold, the selling price less the book value is the capital gain (or loss) from the investment.**

Book value is the value of the securities appeared in the B/S. The BV of the debt is fairly close to its par/face value while of the common shares can be calculated by dividing the firm's equity by the number of shares outstanding.

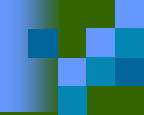
INTRINSIC VALUE

The actual value of a company or an asset based on an underlying perception of its true value including all aspects of the business, in terms of both tangible and intangible factors. This value may or may not be the same as the current market value. Value investors use a variety of analytical techniques in order to estimate the intrinsic value of securities in hopes of finding investments where the true value of the investment exceeds its current market value.

For example, value investors that follow fundamental analysis look at both qualitative (business Model, governance, target market factors etc.) and quantitative (ratios, financial statement analysis, etc.) aspects of a business to see if the business is currently out of favor with the market and is really worth much more than its current valuation.

The actual value of a security, as opposed to its market price or book value. The intrinsic value includes other variables such as brand name, trademarks, and copyrights that are often difficult to calculate and sometimes not accurately reflected in the market price. One way to look at it is that the market capitalization is the price (i.e. what investors are willing to pay for the company) and intrinsic value is the value (i.e. what the company is really worth). Different investors use different techniques to calculate intrinsic value.

The amount by which a call option is in the money, calculated by taking the difference between the strike price and the market price of the underlier. For example, if a call option for 100 shares has a strike price of Rs.35 and the stock is trading at Rs.50 a share than the call option has an intrinsic value of Rs.15 share, or Rs.1500. If the stock price is less than the strike price the call option has no intrinsic value.



A security's IV is the price that is justified for it when the primary factors of value are considered. It is the “real worth” of the debt or equity distinguished from the current market price.

The finance manager estimates IV by appraising fundamental factors :

- **Value of the firm's assets**
- **Likely future interest & dividends**
- **Likely future earnings**
- **Likely future growth rate**

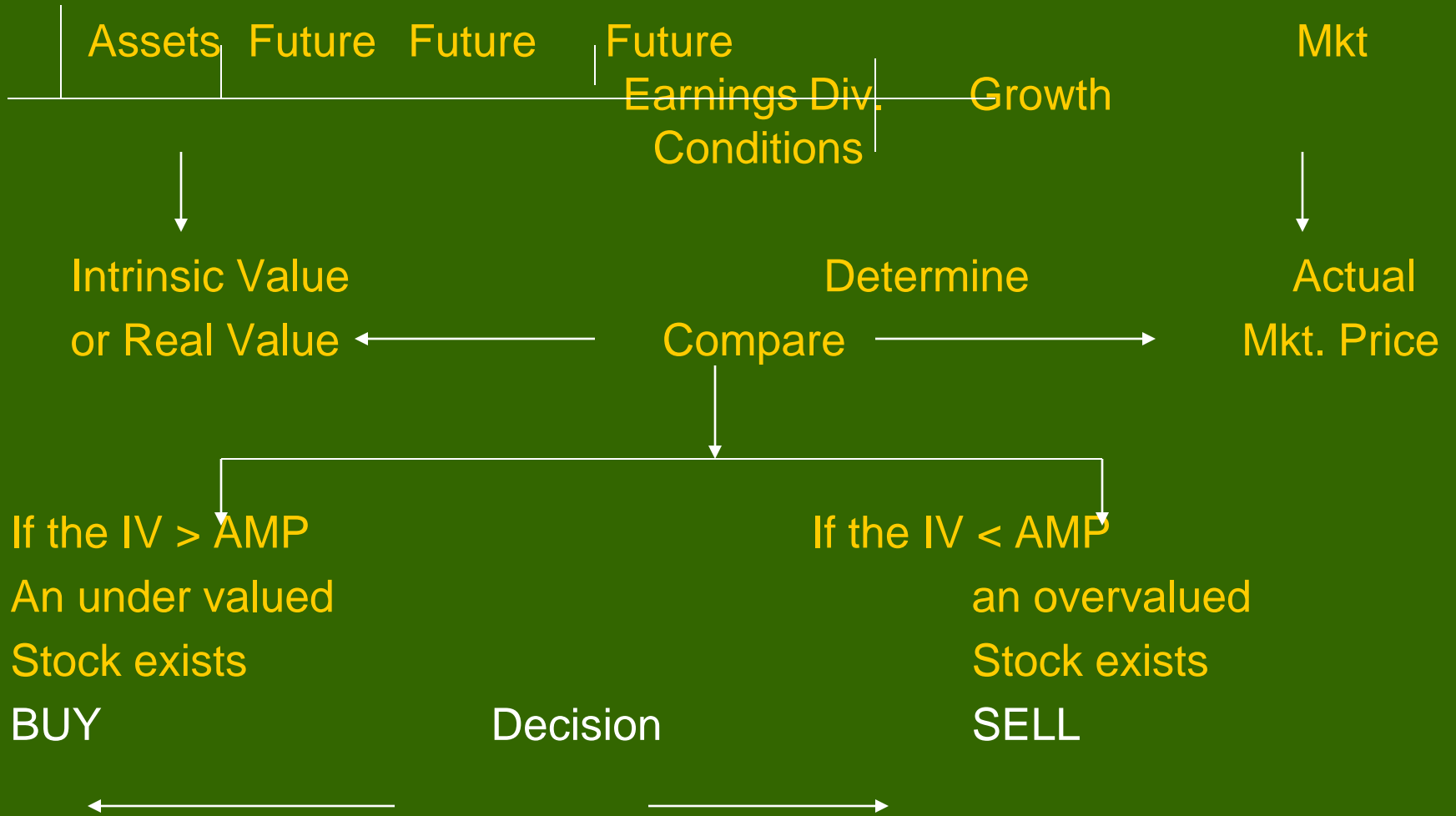
- **Value of the firm's assets** : The physical assets held by the firm have some market value. They can be liquidated if need be to provide funds to repay debt & distribute to SHs.
- **Likely future interest & dividends**: For debt, the firm is committed to pay future interest & repay principal amount. For preference & common stock, the firm makes attempts to declare & pay dividend. The likelihood of these payments affects present value.
- **Likely future earnings** : The expected future earnings of the firm are generally viewed as the most important single factor affecting security value. Without a reasonable level of earnings, interest & dividends payments may be in jeopardy.
- **Likely future growth rate** : A firm's prospects for future growth are carefully evaluated by investors & creditors and are the factors influencing IV.

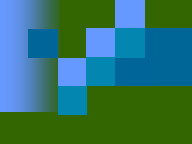
INTRINSIC VALUE ANALYSIS

IVA is the process of comparing the real worth of a security with market price or proposed purchase price. The fundamental factors affecting value usually change less rapidly than the market price of the security. The analyst has to locate variances between IV & the asking price of the security.

The primary goal of IV analysis is to locate clearly undervalued or overvalued stocks. In case of an undervalued security, the market has not discovered that fundamental factors justify a higher market price. That is the security is worth more than its selling price. As soon as the investing public discovers this situation, for e.g., when management announces higher EPS than expected, investors will buy the stock & force a rise in its price. The investors who have purchased the stock when it was undervalued would be benefited.

For overvalued stock, the reverse situation is true. When the investors holding the stock discovers that it is overvalued, they will sell the share, causing a drop in market price. It is thus wise to avoid purchasing overvalued stocks.





In general, the intrinsic value of an asset = the present value of the stream of expected cash flows discounted at an appropriate required rate of return.

Basic Valuation Model

From the financial point of view the value of the asset is equal to the PV of the benefits associated with it.

$$V_0 = \sum_{t=1}^n \frac{CF_t}{(1+k)^t}$$

Where, V_0 = Value of the asset at the time zero,

C_t = Expected CF at the end of the period t ,

K = Discount rate applicable to CF_1 .

n = expected life of the asset

What Does *Valuation* Mean?

The process of determining the current worth of an asset or company. There are many techniques that can be used to determine value, some are subjective and others are objective.

For example, an analyst valuing a company may look at the company's management, the composition of its capital structure, prospect of future earnings, and market value of assets.

Judging the contributions of a company's management would be more of a subjective valuation technique, while calculating intrinsic value based on future earnings would be an objective technique

What Does *Present Value - PV* Mean?

The current worth of a future sum of money or stream of cash flows given a specified rate of return. Future cash flows are discounted at the discount rate, and the higher the discount rate, the lower the present value of the future cash flows. Determining the appropriate discount rate is the key to properly valuing future cash flows, whether they be earnings or obligations.

Also referred to as "discounted value".

Valuation of a Bond

A debt investment in which an investor loans money to an entity (corporate or governmental) that borrows the funds for a defined period of time at a fixed interest rate. Bonds are used by companies, municipalities, states and U.S. and foreign governments to finance a variety of projects and activities.

Bonds are commonly referred to as fixed-income securities and are one of the three main asset classes, along with stocks and cash equivalents..

The indebted entity (**issuer**) issues a bond that states the interest rate (**coupon**) that will be paid and when the loaned funds (**bond principal**) are to be returned (**maturity date**). Interest on bonds is usually paid every six months (**semi-annually**). The main categories of bonds are corporate bonds, municipal bonds, and U.S. Treasury bonds, notes and bills, which are collectively referred to as simply "Treasuries".

Two features of a bond - credit quality and duration - are the principal determinants of a bond's interest rate. Bond maturities range from a 90-day Treasury bill to a 30-year government bond. Corporate and municipals are typically in the three to 10-year range.

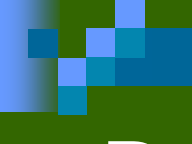
Bond Terminology

There are several terms with which you must be familiar to solve bond valuation problems:

- Coupon Rate - This is the stated rate of interest on the bond. It is fixed for the life of the bond. Also, this rate time the face value determines the annual interest payment amount.
- Face Value - This is the principal amount (nominally, the amount that was borrowed). This is the amount that will be repaid at maturity
- Maturity Date - This is the date after which the bond no longer exists. It is also the date on which the loan is repaid and the last interest payment is made.

What Does *Bond Valuation* Mean?

A technique for determining the fair value of a particular bond. Bond valuation includes calculating the present value of the bond's future interest payments, also known as its cash flow, and the bond's value upon maturity, also known as its face value or par value. Because a bond's par value and interest payments are fixed, an investor uses bond valuation to determine what rate of return is required for an investment in a particular bond to be worthwhile.



Bond valuation is only one of the factors investors consider in determining whether to invest in a particular bond. Other important considerations are: the issuing company's creditworthiness, which determines whether a bond is investment-grade or junk; the bond's price appreciation potential, as determined by the issuing company's growth prospects; and prevailing market interest rates and whether they are projected to go up or down in the future.

(A) Bond with a Maturity Period

$$B_0 = \sum_{t=1}^n \frac{\text{INT}_t}{(1 + k_d)^t} + \frac{B_n}{(1 + k_d)^n}$$

$$\begin{aligned} V_0 &= I/(1+Kd)^t + F/(1+Kd)^n \\ &= I(\text{PVIFA } Kd, n) + F(\text{PVIF } Kd, n) \end{aligned}$$

Where,

V = Value of bond,

I = annual interest rate,

F = Principal amount repayable at the time of maturity,

n = Maturity period.

Kd = Expected rate of return.

(B) Perpetual Bond

$$V = \frac{INT}{(1 + k_d)^1} + \frac{INT}{(1 + k_d)^2} + \dots + \frac{INT}{(1 + k_d)^\infty}$$

$$V = \sum_{t=1}^{\infty} \frac{INT}{(1 + k_d)^t}$$

$$V = INT(PVIFA_{k_d, \infty}) = \frac{INT}{k_d}$$

$$B_0 = \sum_{t=1}^{n=\infty} \frac{INT}{(1 + k_d)^t} = \frac{INT}{k_d}$$

$$V = \sum_{t=1}^{2n} \frac{\frac{DVT}{2}}{\left(1 + \frac{d}{2}\right)^t} + \frac{MV}{\left(1 + \frac{d}{2}\right)^{2n}}$$

$$V = \frac{DVT}{2} (PVIFA_{k_d/2, 2n}) + MV (PVIF_{k_d/2, 2n})$$

Valuation of Preferred stock

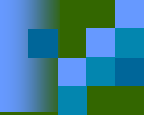
- Preferred stock represents an ownership claim on the firm that is superior to common stock in the event of liquidation. Typically, preferred stock pays a fixed dividend periodically and the preferred stockholders are usually not entitled to vote as are the common shareholders.

- Preferred stock is very much like common stock, except that the dividends are constant (i.e., the growth rate is 0%).

- Therefore, we can use the DDM with a 0% growth rate to find the value:

A hybrid security:

- it's like common stock - no fixed maturity.
- technically, it's part of equity capital.
- it's like debt - preferred dividends are fixed.
- missing a preferred dividend does not constitute default, but preferred dividends are cumulative.

- 
- May be callable, convertible, or adjustable rate.
 - Is usually non-voting, and non-participating.
 - Priority: lower than debt, higher than common stock.

Preferred stocks can usually be valued like a perpetuity:

$$V = \frac{D}{k_p}$$

Priyank Ltd. preferred that pays Rs. 4.125 dividend per year. Suppose our required rate of return on Xerox preferred is 9.5%

$$V = \frac{4.125}{.095} = \text{Rs.43.42}$$

Expected Rate of Return on Preferred stock

Just adjust the valuation model:

$$k = \frac{D}{V}$$

Valuation of Preference Shares

- The value of the preference share would be the sum of the present values of dividends and the redemption value.
- A formula similar to the valuation of bond can be used to value preference shares with a maturity period:

$$P_0 = \sum_{t=1}^n \frac{PDIV_1}{(1 + k_p)^t} + \frac{P_n}{(1 + k_p)^n}$$

Valuation of Equity Shares

- is a variable-income security.
- dividends may be increased or decreased, depending on earnings.
- represents equity or ownership.
- includes voting rights.
- Priority: lower than debt and preferred.

It is difficult to value the equity shares due to 2 factors:

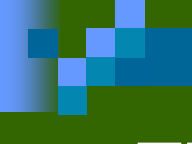
- The estimates of the amount and timing of expected cash flows by investors are more uncertain. In case of debentures and preference shares rate of interest & dividends respectively are known with certainty. Thus, it is easy to forecast cash flow, associated with them.
- The earnings and dividends on equity shares are generally expected to grow unlike the interest on bonds and preference dividend.

1. **Dividend capitalisation approach**
2. **Single period valuation**
3. **Multi period valuation**
4. **Valuation with supernormal growth**

(A) Dividend Capitalisation Approach

The value of a share today is a function of cash inflows expected by investors and risk associated with cash flows. Cash inflows expected from an equity share will consist of :

1. Div. expected to be received by the owner for holding the share.
2. Price which he expects to obtain when the share is sold. Thus, the price which the owner is expected to receive when the share is sold will include the original investment plus capital gain (or minus capital loss).



The ultimate conclusion is that for SHs in general, the expected cash inflows consists only of future dividend and therefore, the value of common share is determined by capitalisation of future dividend stream by an appropriate rate of discount. Thus, the value of share is the present value of its future stream of dividends. For applying the dividend capitalisation approach to equity share valuation, 2 assumptions are to be made :

- 1. Dividends are paid annually.**
- 2. The first dividend is received one year after the equity share is bought.**

(B) Single Period Valuation

Let us assume that an investor intends to buy a share and will hold it for one year only. Then the price of equity share will be :

$$P_0 = D_1 / (1 + K_e) + P_1 / (1 + K_e)$$

Or

$$P_0 = D_1 / (1 + K_e) + P_1 / (1 + K_e)$$

Where,

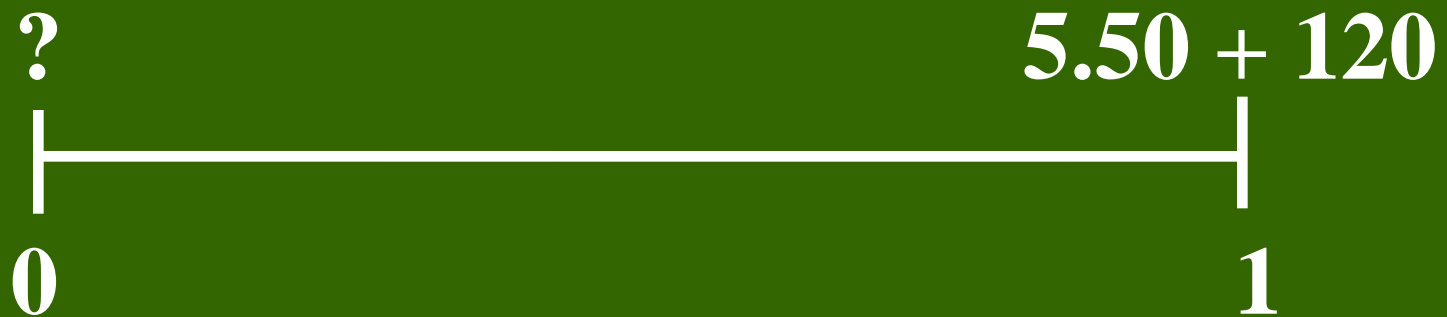
P_0 = Current price of equity share

D_1 = Dividend expected a year hence

P_1 = Price expected a year hence

K_e = RRR on equity share

You expect XYZ stock to pay a Rs.5.50 dividend at the end of the year. The stock price is expected to be Rs.120 at that time. If you require a 15% rate of return, what would you pay for the stock now?



$$P_0 = \frac{D_1}{1 + Ke} + \frac{Po(1 + g)}{1 + Ke}$$

$$P_0 = \frac{D_1 + Po(1 + g)}{1 + Ke}$$

$$P_0(1 + Ke) = D_1 + Po(1 + g)$$

$$D_1 = Po(1 + Ke) - Po(1 + g)$$

$$D_1 = Po(Ke - g)$$

$$P_0 = \frac{D_1}{Ke - g}$$

$$g = \frac{P_1 - P_0}{P_0}$$

Calculation of Expected Rate of Return

If

$$P_0 = \frac{D_1}{Ke - g}$$

Then

$$Ke = \frac{D_1}{P_0} + g$$

(C) Multiple Period Valuation Model

- More realistic and complex.
- Since equity shares have no maturity period, they may be expected to bring a dividend stream of infinite duration. Hence, the value of an equity share may be :

$$P_0 = \frac{D_1}{(1+Ke)^1} + \frac{D_2}{(1+Ke)^2} + \frac{D_3}{(1+Ke)^3} + \dots + \frac{D_\infty}{(1+Ke)^\infty}$$

$$P_0 = \sum_{t=1}^{n=\infty} \frac{Dt}{(1+Ke)^t}$$

- Regarded as generalised multi-period valuation formula.

Valuation with Constant Dividend

If we assume that the dividend per share remains constant year after year at the value D , then

$$P_0 = \frac{D_1}{(1 + Ke)^1} + \frac{D_2}{(1 + Ke)^2} + \frac{D_3}{(1 + Ke)^3} + \dots + \frac{D_\infty}{(1 + Ke)^\infty}$$

$$P_0 = \frac{D}{Ke}$$

Valuation with Constant Growth in Dividend

Most stock valuation models are based on the assumption that dividend tends to increase over time. If we assume that dividend grow at a constant compound rate, we get

$$D_t = D_0(1 + g)^t$$

Where, D_t = Dividend for the year t ,
 D_0 = Dividend for year 0,
 g = Constant compound growth rate

Now, the formula for calculating the price of equity share will be :

$$P_0 = \frac{D_1}{(1 + Ke)^1} + \frac{D(1 + g)}{(1 + Ke)^2} + \frac{D1(1 + g)^2}{(1 + Ke)^3} + \dots$$

$$P_0 = \frac{D_1}{Ke - g}$$

It simplifies to :

(D) Valuation with Variable growth in Dividend

(Super Normal Growth)

The dividend of a company may not grow at a constant rate indefinitely. Many firms enjoy a period of super-normal growth which is followed by a normal rate of growth. Thus, when the pattern of expected growth is not constant, the perpetual growth model, i.e.,

$$P_0 = \sum_{t=1}^{n=\infty} \frac{D1V1}{(1 + Ke)^t}$$

OR

$$P_0 = \sum_{t=1}^{n=\infty} \frac{Dt}{(1 + Ke)^t}$$

is to be modified.

If the dividend of the firm are expected to grow at a super-normal growth, i.e., g_s for n years and then grow at a normal growth, i.e., g_n till infinity. The earlier equation will become

$$P_0 = \frac{D_1}{(1+Ke)^1} + \frac{D(1+g_s)}{(1+Ke)^2} + \dots + \frac{D(1+g_s)^{n+1}}{(1+Ke)^n} +$$

$$+ \frac{D(1+g_n)}{(1+Ke)^{n+1}} + \frac{Dn(1+g_n)^2}{(1+Ke)^{n+2}} + \dots$$

$$P_0 = \sum_{t=1}^n \frac{D(1+g_s)^t}{(1+Ke)^t} + \sum_{t=n+1}^{\infty} \frac{Dn(1+g_n)^{t-n}}{(1+Ke)^t}$$

Where,

D_1 = Dividend expected a year hence,

g_n = normal growth rate of dividend,

g_s = Supernormal growth rate of dividend

Now for the calculation of the value of P0 in the equation the following procedure may be followed :

Step-1: Using the common procedure for calculating the PV of uneven cashflow stream, the PV of dividend for the supernormal growth is to be calculated.

$$P_0 = \sum_{t=1}^n \frac{D_t}{(1 + Ke)^t}$$

Step-2 : Calculate the value of the share at the end of initial growth period.

$$P_n = \frac{D_{n+1}}{K_e - g}$$

(as per the constant growth model)

And discount the value to the present, i.e.,

$$\frac{D_{n+1}}{K_e - g} \times \frac{1}{(1 + K_e)^n}$$

Step-3 : Add the two PVs Components to find out the value of the share.

$$P_0 = \sum_{t=1}^n \frac{Dt}{(1 + Ke)^t} + \frac{Dn+1}{Ke - gn} \times \frac{1}{(1 + Ke)^n}$$