

Business Valuation Methods and Approaches

Exam \Rightarrow Min. 1. Question

Practical \Rightarrow Notebook & Calculator

1. INTRODUCTION

The value of a business is determined by various factors such as the quality of the business, the profit potential the economic environment and the industry influence, to name a few. The economic environment, the industry influence and company analysis are the 3 key steps in valuation of a company. **The value of an asset is the present value of its expected returns.** Specifically, we expect an asset to provide a stream of returns during the period a holder owns it. To convert this estimated stream of returns to a value for the security we must discount this stream at our required rate of return. This process of valuation requires estimates of (1) The stream of expected returns and (2) the required rate of return on the investment.

Because of the complexity and importance of valuing shares various techniques have been revised overtime. These techniques fall into one of the three approaches:

- Income Approach:** Under this approach, we commonly apply the discounted cash flow (DCF) techniques where the value of the company is estimated based on the present value of some measure of cash flow, operating cash flow and free cash flow.
- Market Approach:** Under this approach, we value companies using relative valuation techniques where the value of a company is estimated based upon its current price relative to variables considered to be significant to valuation such as earnings, cash flow from my book value or sales.
- Cost Approach:** Under this approach, the value of the company is based on replacement cost or reproduction cost where the company is either very new and has fewer future potential or it is in stage of liquidation.

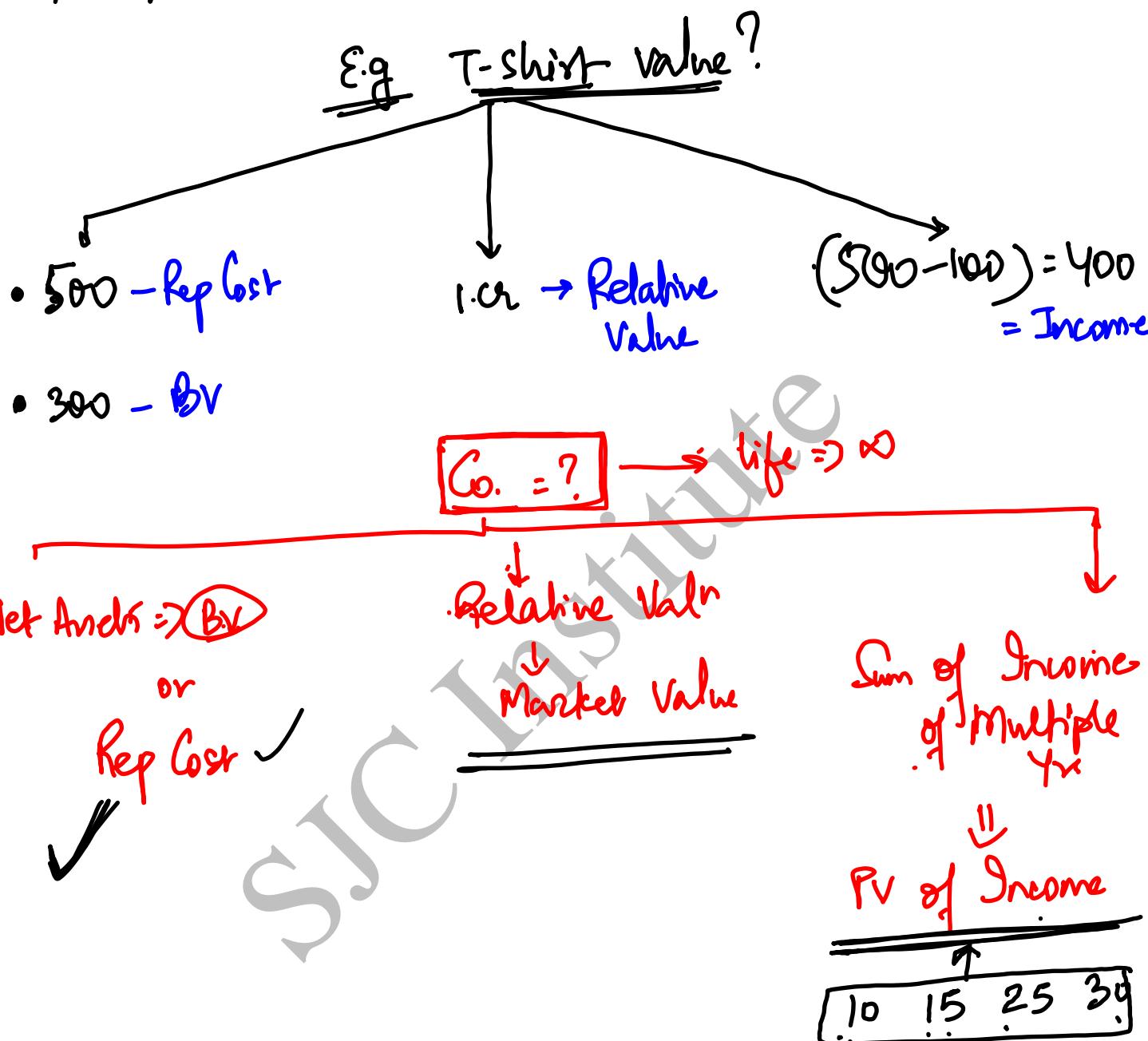
2. DISCOUNTED CASH FLOW ANALYSIS (DCF) METHOD

Students should understand that application of income approach heavily relies on the concept of discounting or application of capital budgeting techniques. It is advisable for the students to brush up their concepts for a better understanding of valuation under Income Approach.

While valuing companies, there are three predominant definitions of future cash flows: **dividends, free cash flow, and residual income.** Under Income Approach, a company's value is estimated as the present value of cash distributed to shareholders (dividend discount model)

Valuation

Co. / Sec / Annuity / HR



1. Approaches of Valuation

(a) Income Approach :- PV of cash flows that can be generated over the period.

With Bright future

(b) Market Approach :- Relative Value as a multiple of earnings or sales
with bright future
but with unique competency or book value or any other
that has mkt.
(Relative \Rightarrow person-to-person / G. to G. - change)

(c) Cost Approach :- Net Book Value or
Replacement Cost

Very new/Liquidation

2. Income Approach

Discounted Cash Flow Method

Value = Present Value of future Cash flows
over the period of time

$$\begin{aligned}\text{Present Value} &= \text{future Value} \times \frac{1}{(1+r)^n} \\ &= \underbrace{\text{future Value}}_{\text{Cash flows}} \times \underbrace{\text{Disc factor}}_{1}\end{aligned}$$

1. Discounting Rate = Weighted Avg Cost of Capital
(WACC)

or
Risk adjusted disc rate
Weight (Bv/MV) $\times W$

	<u>k_0</u>	<u>Weight (Bv/MV)</u>	<u>$\% \times W$</u>
(a) <u>WACC</u> \Rightarrow	k_d ✓		
	k_p ✓	✓	
	k_e ✓	✓	
	k_r ✓	<u>✓</u> <u>✓ (b)</u>	<u>✓ (a)</u>
		<u>$k_0 = (a)/(b)$</u>	

(b) Risk adj disc rate \div Nominal interest rate

$$= (1 + \text{risk free rate})^{\text{real}} (1 + \text{infl rate}) (1 + \text{risk prem}) - 1$$

real: infl rate \times beta

E.g! R_f real rate = 5%

Infl rate = 4%

Risk prem = 3%

\therefore Risk adj disc rate = ?

$$\text{Soln: } (1+0.05) \times (1+0.04) \times (1+0.03) - 1 = 0.1248 \Rightarrow 12.48\%$$

or the present value of cash available to shareholders after the company meets its necessary capital expenditures and working capital expenses (free cash flow model).

2.1 Discount Rates

The discount rate represents the rate used by investors to calculate the present value of a future cash flow. The most basic forms of discount rates are applicable in case of Time Value of Money applications. In an inflationary economy, a rupee earned today is more valuable than a rupee earned in future. This happens due to decline in the purchasing power of money. The principle of the time value of money explains why interest is paid or earned - Interest compensates the depositor or lender for the time value of money. It also underlies investment. Investors are willing to forgo spending their money now if they expect a favourable return on their investment in the future.

The discount rate is usually calculated as the risk-free rate plus a spread that reflects the risk associated with the cash flow. The investor asks a question that how much return they should expect from the respective investment depending on the nature of investment. The discount rate is, therefore, based on the characteristics of the investment. However, it may be adjusted by investors to reflect their expectations.

In case of business valuation, the discount rates are often represented by the Cost of Capital. Cost of capital represents a minimum benchmark rate that a company must overcome before it can generate value for its financers (lenders, preference shareholders, and equity shareholders).

COST OF CAPITAL

Cost of Capital (K_c) represents the cost of funds used for financing the business. It is the rate of return that the suppliers of capital—bondholders and owners—require as compensation for their contributions of capital.

- If business is financed solely through Equity, K_c is the same as Cost of Equity (K_e)
- If business is financed solely through Debt, K_c is the same as Cost of Debt (K_d)

Usually, companies use a mix of Debt and Equity while financing their business, thus the overall cost of capital is derived from a weighted average of cost of all capital sources, known as the Weighted Average Cost of Capital (WACC).

The following points should be remembered while using discounted cash flow techniques.

Cost of capital should be weighted average cost of capital (WACC) since free cash flows represents the cash available to all stakeholders i.e., contributors of capital.

Discounted should be computed after taxes since free cash flows are estimated after taxes.

The weights assigned should ideally be based on Market Values. However, in the absence of market values, book values are used as a proxy.

While calculating Weights of Debt, Equity and Preference shares, a 'Target Capital Structure' in the mature stage should be considered.

Discount rates should be real or nominal if free cash flows are real or nominal respectively. Nominal cash flows and nominal discount rates are preferred.

Systematic risk borne by each provider of capital should be adjusted since each provider of capital expects a return that compensates the risk taken.

$$WACC = W_e \times K_e + W_d \times K_d (1 - t) + W_p \times K_p$$

$$W_e = \frac{\text{Value of Equity}}{\text{MV of Debt} + \text{MV of Equity} + \text{MV of Preference Capital}}$$

$$W_d = \frac{\text{Value of Debt}}{\text{MV of Debt} + \text{MV of Equity} + \text{MV of Preference Capital}}$$

$$W_p = \frac{\text{Value of Preference Capital}}{\text{MV of Debt} + \text{MV of Equity} + \text{MV of Preference Capital}}$$

It should be noted that under IFRS / Ind AS environment, Preference Shares are increasingly being classified as either Debt or Equity, depending on their terms of issue. Thus, in most practical cases, there may be Debt and Equity only.

$$\begin{aligned} WACC &= \text{Cost of Debt} \times \frac{\text{MV of Debt}}{\text{MV of Debt} + \text{MV of Equity}} \\ &= \text{Cost of equity} \times \frac{\text{MV of Equity}}{\text{MV of Debt} + \text{MV of Equity}} \end{aligned}$$

Q1

Ex book No. _____ Pg No. _____

Suppose Alpha Ltd has a capital structure composed of the following:

Debt ₹30 million

Equity ₹45 million

If the before-tax cost of debt is 11% (Pre-tax Kd), the required rate of return on equity is 16.5% (K_e), and the marginal tax rate is 30%, **what** is Alpha Ltd's weighted average cost of capital?

Reference

WACC

What's New

Soln to Q1 Pg -

$$\underline{N1} \quad K_d \text{ (post tax)} = 11\% (1-0.3) = 7.7\% \\ = 16.5\%$$

N2 K_e

Computation of WACC

<u>Source</u>	<u>K (%)</u>	<u>$BV(m)$</u>	<u>$K \times BV$</u>
Debt	7.7	30	231
Equity	16.5	45	742.5
		<u>75</u>	<u>973.5</u>

$$\therefore WACC = \frac{973.5}{75} = 12.98\%$$

(c) K_d

Perpetual Debt
or

Irredeemable Debt
(both condition met)

↓
No redempⁿ

- Life is not known / not given
- Int rate constant

↓

$$K_d = \frac{I(1-t)}{I_p}$$

I = Int. Amt

t = tax rate

I_p = Net Issue Proceeds

↓
Redeemable Debt
and

Conventional/Bullet/
Plain-Vanilla Debt
(both condition met)

- Redemption at once at a given time
- Int rate constant

↓

$$K_d = \frac{I(1-t) + \frac{R_p - I_p}{n}}{\frac{R_p + I_p}{2}}$$

R_p = Redemption Proceeds

n = life

Redeemable
Debt but
non-conven-
tional

(Any one condition)

- Redemption is haphazard
- Int rate is not constant

If I_p not given, assume
 $I_p = 100$ or $K_d = I\% \cdot (1-t)$

Note: $K_p \Rightarrow K_d$:

↓

Just replace $I(1-t)$ with
Pref Dividend

$$I_p = \frac{Cf_1}{1+r} + \frac{Cf_2}{(1+r)^2} + \frac{Cf_3}{(1+r)^3} + \dots + \frac{Cf_n}{(1+r)^n}$$

Solve this eqn & find
 $r \Rightarrow r = K_d (IRR)$

Answer

$$W_d = \frac{30}{30 + 45} = 0.40$$

$$W_e = \frac{45}{30 + 45} = 0.60$$

We can also be calculated as residual proportion i.e., $(1 - 0.40) = 0.60$

$$WACC = [W_d \times \text{Post Tax } K_d] + [W_e \times K_e]$$

$$WACC = [(0.40) \times (0.11)(1 - 0.30)] + [(0.60)(0.165)] = 0.1298 \text{ or } 12.98\%$$

COST OF DEBT

The Cost of Debt (K_d) is the interest rate paid by the company on such debt. The cost of Debt is the rate at which the company can borrow funds as on the valuation date. In the absence of such information, different approaches are adopted.

The cost of debt measures the current cost of borrowing funds to finance projects. In general terms, it is determined by the following variables:

- The risk-free rate: As the risk-free rate increases, the cost of debt for companies will also increase.
- The default risk (and associated default spread) of the company. As the default risk of a company increases, the cost of borrowing money will also increase. The default spread can vary according to maturity period.
- Since interest expense is tax-deductible, we use the after-tax Cost of Debt for discounting purposes. The after-tax cost of debt is calculated as Pre-Tax Cost of Debt $\times (1 - \text{Tax rate})$.

Valuers may sometimes apply an analytical approach to calculate Effective Interest Rate and Effective Tax Rate. It can be calculated as Interest Expense as it appears in the Profit & Loss Statement divided by Average Debt as it appears in the Balance Sheet. Similarly, Effective Tax rate may be calculated as Tax expense divided by Profit Before Tax on the Profit & Loss Statement.

Q2

Ex book No. — Pg No. —

Int rate

If the rate at which the company can borrow funds from the financial institutions is 11 % and the tax rate applicable to the company is 30 %. **Find** the Post Tax Cost of Debt.

Reference

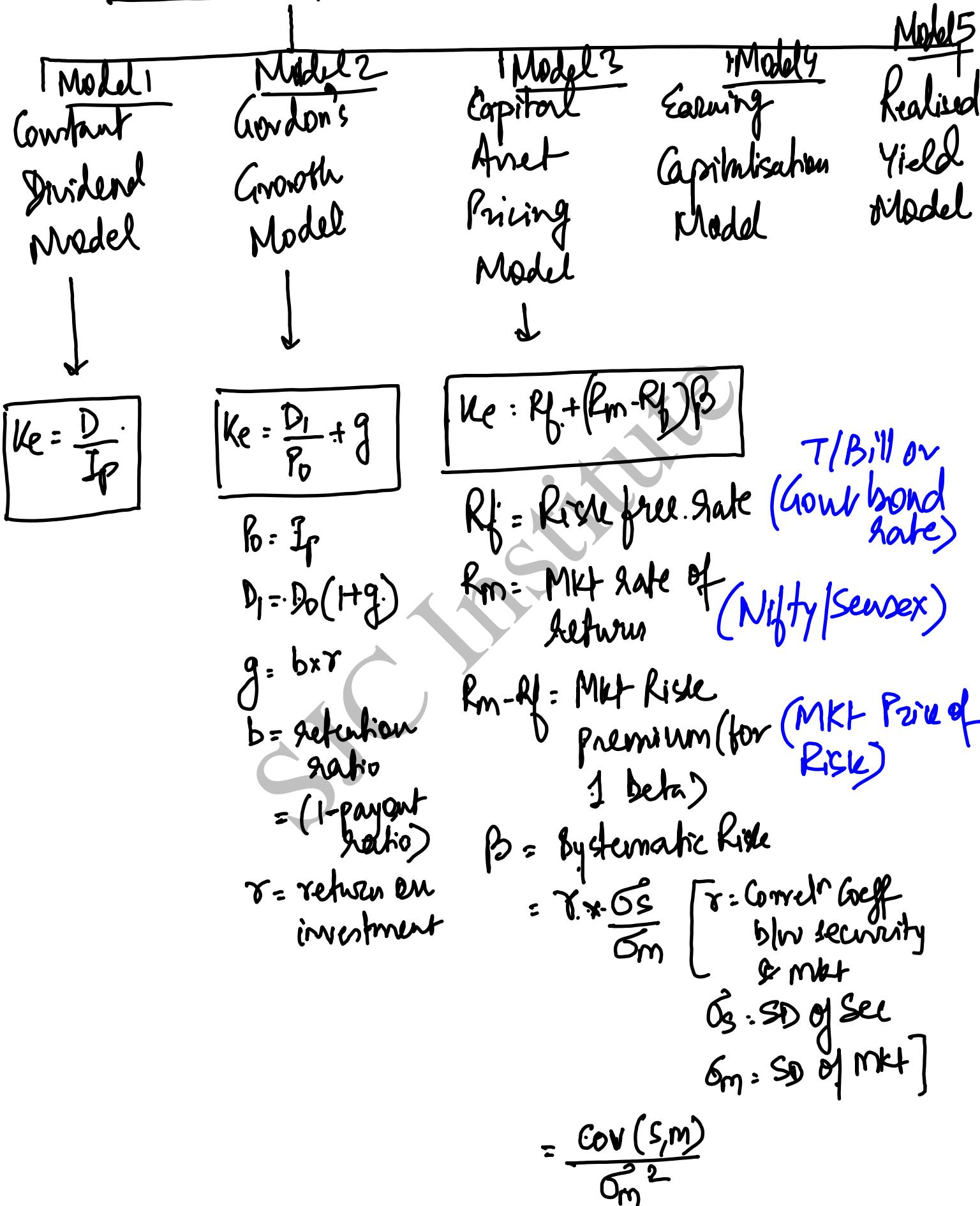
Cost of Debt

What's New

$$\begin{aligned} I_p &= 100 \text{ (Int)} \\ I &= 11\% \text{ of } 100 = .11 \end{aligned}$$

Ans to Q2 Pg No. — As life is not given, debt is perfect
 120 | CMA Final Business Valuation
 $\therefore K_d = 11\% (1 - 0.3) = 7.7\%$ or $\frac{(I)(1-t)}{I_p} = \frac{(11)(1-0.3)}{100}$

(d) K_e = Cost of Equity



Model 4
Earnings Gap Model $\Rightarrow K_E = \frac{EPS}{MPS}$ or $\frac{EPS}{I_P}$

$$K_E = \frac{1}{P/E \text{ Ratio}} \quad \left[P/E \text{ Ratio} = \frac{MPS}{EPS} \right]$$

Model 5

Realised Yield Model \Rightarrow

Other models \Rightarrow assumes eq shares are held
for perpetual period

RY Model \Rightarrow assumes eq shares are sold
after a certain period

Return = Div Yield + Capital appreciation

$$\text{P.A.} = \left(\frac{\text{Div. P.A.}}{P_0} \right) + \left(\frac{P_n - P_0}{P_0} \times \frac{1}{n} \right)$$

Or

$$I_P = \frac{D}{1+r} + \frac{D}{(1+r)^2} + \frac{D}{(1+r)^3} + \dots + \frac{D+P_n}{(1+r)^n}$$

Answer

$$11\% \times (1 - 0.30) = 7.7\%$$

COST OF EQUITY

Although the rate of return demanded by equity investors is not as clearly defined as it is by lenders, equity investors do expect a return on their investment. There are various models that attempt to estimate the Cost of Equity.

Capital Asset Pricing Model (CAPM)

One of the most used models is Capital Asset Pricing Model (CAPM). The major insight of the capital asset pricing model (CAPM) is that only systematic (non-diversifiable) risk is priced.

$$\text{Cost of Equity} = \text{Risk Free Rate} + (\text{Beta} \times \text{Equity Risk Premium})$$

Risk Free Rate: a return on an investment that has least likelihood of default e.g., 10 Year Government Bond Yield

Company's Beta: Sensitivity of stock return with respect to the market return

Equity Risk Premium: The equity risk premium (ERP) refers to the additional return (or premium) required by investors to invest in equities (e.g., broad market index like Nifty 50) rather than a risk-free asset (e.g., Government Bond). It equals the difference between the return on a broad equity market index and the risk-free rate of return. Risk premium is what a particular market (E.g., BSE Sensex) earned over the rate that a risk-free asset (e.g., Govt bond) earned. i.e. [Market Return – Risk Free Rate of Return]

Q3

If the 10 Year Government bond yield is 7.5% and the BSE Sensex return over the last one year is 15%. Assuming the company's Beta is 1.2, **what** is the Required return on Equity?

Reference

Cost of Equity

What's New

CAPM

Answer

$$\begin{aligned} K_e &= 7.5\% + (15\% - 7.5\%) \times 1.2 \\ &= 16.5\% \end{aligned}$$

Soluⁿ to Q3 qg =

$$K_e = \text{Return on equity} = R_f + (R_m - R_f) \times \beta$$

$$= 7.5\% + (15\% - 7.5\%) \times 1.2$$

$$= 16.5\%$$

where R_f : Rf rate of return = Govt bond Rate

R_m : Mkt rate of return = Sensex Rate

β = Beta

UNSYSTEMATIC RISK, SYSTEMATIC RISK (BETA)

An investor should not keep all his investments in a single stock. Diversification plays an important role in reducing the risk. When an investor diversifies across assets that are not perfectly correlated, the portfolio's risk is less than the weighted average of the risks of the individual securities in the portfolio. The risk that is eliminated by diversification is called unsystematic risk (also called unique, diversifiable, or firm-specific risk). Because the market portfolio contains all risky assets, it must be a well-diversified portfolio. It is often advised and assumed that the investor is a diversified investor and has already eliminated that risk. The risk that remains cannot be diversified away and is called the systematic risk (also called non-diversifiable risk or market risk). The concept of systematic risk applies to individual securities as well as to portfolios. Some securities' returns are highly correlated with overall market returns. Examples of companies that are highly correlated with market returns are luxury goods. These companies have high systematic risk (i.e., they are very responsive to market). Other companies, such as utility companies, respond very little to changes in the systematic risk factors. These companies have very little systematic risk. Hence, total risk (as measured by standard deviation) can be broken down into its component parts: unsystematic risk and systematic risk. Mathematically:

$$\text{Total Risk} = \text{Systematic Risk} + \text{Unsystematic Risk}$$

UNDERSTANDING BETA

The sensitivity of an asset's return to the return on the market index is referred to as its beta. Beta is a measure of Systematic Risk and is a standardized measure of the covariance of the asset's return with the market return.

For example, if beta is 1.8 and the market is expected to move up by 10%, then the stock should move up by 18% (1.8×10).

Beta can be calculated as follows.

$$\text{Beta} = \frac{\text{Covariance of assets return with market return}}{\text{Variance of market return}} = \frac{\text{Cov}_{\text{stock market}}}{\sigma_{\text{market}}^2}$$

Ex book No - Pg No -

Q4

Try

6s

6m

Security S.D. = 3% Market S.D. = 2.20%

Coefficient of correlation for security with market = 0.80

Rm

(Rsm)

Return from market portfolio = 9.8%. Risk free rate of return = 5.20%

Rf

$\rightarrow \beta$

Find the required return from the security.

Reference**Return using CAPM****What's New****Beta Calculation****Answer**

$$\text{Coefficient of correlation} = \frac{\text{Covariance}}{(\text{SD security}).(\text{SD market})}$$

$$0.80 = \frac{\text{Covariance}}{(0.03).(0.022)}$$

$$\text{Covariance} = 0.000528$$

$$\begin{aligned}\text{Beta} &= \text{Covariance} / (\text{Market variance}) \\ &= 0.000528 / (0.0220) \\ &= 1.091\end{aligned}$$

$$\text{Required return from the security} = \text{RF} + \text{Beta} (\text{RM} - \text{RF})$$

$$\begin{aligned}&= 5.20 + 1.091(9.80 - 5.20) = 10.22\% \\ &= 5.2 + (9.8 - 5.2) \times 1.091 \\ &= 10.22\%\end{aligned}$$

Solu to Q4 Pg No. —

$$\beta = \text{Beta} = \gamma_{sm} \times \frac{\sigma_s}{\sigma_m}$$

$$= 0.8 \times \frac{3}{2.2}$$

$$= 1.091$$

$$R_e = R_f + (R_m - R_f) \times \beta$$

$$= 5.2 + (9.8 - 5.2) \times 1.091$$

$$= 10.22\%$$

The risk-free rate = 5.5%

The market price of risk = 7% $(R_m - R_f)$

The company's beta = 1.2

Cost of debt 8%

Tax rate = 40%

Capital structure: Debt: 40% and Equity: 60%

Calculate:

(i) cost of equity.

$$R_e = R_f + (R_m - R_f) \times \beta$$

(ii) Calculate WACC

Soln to Q 5 Pg -

part(i)

Cost of Equity

$$= R_f + (R_m - R_f) \times \beta$$

$$= 5.5 + 7 \times 1.2$$

$$= 13.9\%$$

where R_f = Risk free rate
= 5.5%

$(R_m - R_f)$ = Market Price
of Risk = 7%
 $\beta = 1.2$

part(ii)

WACC

Source

K

Weight

$K \times \text{Weight}$

1.92

8.34

10.26

Debt

4.8%

0.40

Equity

13.9%

0.60

1

$$\therefore \frac{\text{WACC}}{K_0} = \frac{10.26}{1} = 10.26\%$$

Note! $K_{debt} = I\% \cdot (1-t)$

$$= 8\% \cdot (1 - 0.4)$$

$$= 4.8\%$$

Reference
Cost of Equity
What's New
WACC
Answer

(i) Cost of equity = $5.5\% + 7\% (1.2) = 13.9\%$

(ii) Weighted average cost of capital = $13.9\% (0.60) + 8\% (1-0.40) (0.40) = 10.26\%$

~~Try~~ **Q6** *Q6 Book No - Pg No -*

The standard deviation of the return on the market index is estimated as 25%. If the covariance of Company A's returns with the returns on the market index is 0.05, **what** is the beta of Company A? *Cov(E,M)* 6m

Reference
Beta
What's New

Soln to Q6 Pg -

Answer

$$\text{Beta} = \frac{\text{Cov}_{\text{stock market}}}{\sigma_{\text{market}}^2} = \frac{0.05}{0.25^2} = \underline{\underline{0.8}}$$

$$\text{Beta} = \frac{\text{Cov}(E, M)}{\sigma_m^2} = \frac{0.05}{(0.25)^2} = 0.8$$

In most cases, Beta is calculated using the regression equation based on market prices of the company being valued and a relative index. It is difficult to estimate Beta in case of Private companies, but some models have been devised to calculate the same.

BUILD-UP MODEL

The build-up method is usually applied to companies **where betas are not readily available**. It starts with the riskfree rate and adds one or more premiums for different risks. However, it does not apply beta adjustments to factor risk premiums.

A traditional build-up model is given as:

$$K_e = \text{Risk-free rate} + \text{Equity risk premium} + \text{Size premium} + \text{Company-specific premium}$$

- The equity risk premium is usually estimated with reference to equity indices of listed companies.
- The size premium is usually inversely related to the size of the company being valued,

Note: Model 6: Build-up Model

where betas are not readily available

$$R_e = R_f + \text{Est Equity Risk Premium} + \text{Size Premium}$$

$$+ \text{Co. Specific Premium}$$

Size Premium \Rightarrow Extra return - inversely proportional to the size of the Co.

- Big Co. - low premium
- Small Co. - High premium

Co. Specific Premium \Rightarrow Extra return - due to unsystematic risk
 - associated only with the Co. being valued

In case of Pvt Co. :-

- Premium for lack of controlling interest
- Premium for lack of marketability

Model 7 :- Adjusted Cost of Equity

$$K_e = [R_f + \beta (R_m - R_f)] + \text{Sovereign Risk} + \frac{\text{Industry Specific Risk}}{\text{size}} + \frac{\text{Size Specific Risk}}{\text{size}}$$

$$+ \text{Technology Risk} + \text{Location Risk} +$$

+ Mgmt Specific Risk + Cyclical Risk

- Sovereign Risk :- If entity is in a different country
- Industry Specific Risk :- When beta considered is that of overall market index
- Size Specific Risk :- Compared with avg industry size in terms of profit/losses.
- Technology Risk :- State of technology applied vs others
- Location Risk :- Risky location
- Mgmt Specific Risk :- Due diligence are advise
- Cyclical Risk :- As per its product life cycle - if the product is on downside stage.

2. Various Models for Valuation

Abhi Take

$$K_e = \frac{D}{I_p} : V$$

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

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

$$V = P_0 = \frac{D_1}{K_e - g}$$

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

$$\left. \frac{P_0}{D_1} = \frac{1}{k_e - g} \right)$$

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

1. Dividend Discount Model / Constant Dividend Model

$$k_e = \frac{D}{I_p}$$

$$I_p = \frac{D}{k_e}$$

For buying a small lot of equity shares.

for matured lots paying constant dividend each year.

$$\therefore \boxed{\text{Value of Eq Shares} = \frac{D}{k_e}}$$

Realised Yield Model

$$I_p = \frac{C_{F_1}}{1+r} + \frac{C_{F_2}}{(1+r)^2} + \dots + \frac{C_{F_n}}{(1+r)^n}$$

$$\boxed{\text{Value of Share} = \frac{\text{Eq}}{\text{PV of future Cash flows}}} @ k_e$$

- The company-specific risk premium may also include a premium for unsystematic risk based on the premise that the risk associated with private companies cannot easily be diversified away.
- Further, when estimating the required return for private companies, valuers should also consider:
 - The relative values of a controlling versus minority interest in the company; and
 - The impact of lack of marketability on share value.

ADJUSTED COST OF EQUITY

Various researchers and authors believe that the CAPM does not adequately incorporate all relevant factors while calculating the Cost of Equity. Under CAPM, the primary determinant of risk is Beta (β). It represents the extent of risk, in terms of volatility in return, associated with the stock under valuation. β is used as a multiplier to assess the risk premium expected by an investor over risk free return. This is determined with reference to the rate of return from the overall secondary capital market index and / or that of the industry sector to which the company belongs. Certain additional risk factors can be incorporated into calculation of Cost of Equity. Such additions by way of %age of additional return should be considered for specific risks. The same should be based on assessment of mostly intangible factors, as explained above, and impacts thereof on returns generated by a company. The revised CAPM formula could be as under:

$$K_e = R_f + \beta \times (MRR - R_f) + K_s + K_i + K_z + K_t + K_l + K_m + K_{cyclical}$$

Where:

K_s = Sovereign risk if the entity under valuation is in a different country.

K_i = Industry or sector specific risk in case the β considered is that of the overall Market index.

K_z = Size specific risk as compared to the average industry size in terms of capacity of production and/ or annual turnover.

K_t = State of technology applied by the company vis-à-vis other players and risk of getting disrupted by a start-up.

K_l = Location specific risk, e. g., if the company's assets are in a risky location.

K_m = Management specific risk if findings from due diligence are grossly adverse.

$K_{cyclical}$ = Cyclical risk if the company's product is on the downslide stage of product life cycle.

Consideration of and ascribing a value in %age terms for most of the above additional risks related returns are of critical importance, if the decision by the investor is with reference to a hurdle rate of return. That rate is generally the average of rates of returns from other businesses of the investor. Such investors for example could be a conglomerate investing for a merger or acquisition transaction, or a Private Equity Fund deciding the floor rate of return at the point of exit via IPO failing which some other condition would apply.

For the purposes of this curriculum, we are not covering Cost of Preference Capital. However, its calculation is similar to that of Cost of Debt, but without tax benefits.

2.2 Valuation using Discounting Models

2.2.1 Realised Yield Approach

Q7

Current forecasts are for JSB Estates to pay dividends of 3, 3.24, and 3.50 over the next three years, respectively. At the end of three years, you anticipate selling your stock at a market price of 94.48. What is the price of the stock given a 12% expected return?

Reference

TD

Valuation of Equity Shares

What's New

Ke
Realised Yield

Answer

$$PV = \frac{3.00}{(1+0.12)^1} + \frac{3.24}{(1+0.12)^2} + \frac{3.50 + 94.48}{(1+0.12)^3}$$

$$PV = ₹ 75$$

2.2.2 Dividend Discount Model

Dividends: Dividends are cash flows received by the shareholders. The value of a company from a shareholders' perspective is given by the present value of dividends expected to be received by the shareholders.

The shareholder's investment today is worth the present value of the future cash flows she expects to receive, and ultimately, she will be repaid for his investment in the form of dividends. Even if the investor sells the stock at any time prior to the liquidation of the company, before all the dividends are paid, she will receive from the buyer of the shares the present value of the expected future dividends. Further, the value derived under this method is usually less volatile and reflect the long-term earning potential of the company.

DISADVANTAGES OF DDM:

This method cannot be applied for companies that don't currently pay dividends. While it is theoretically possible to expect that the companies will start paying dividends, there are various factors that affect dividend payment by a company. Further, this method takes the perspective of an investor who owns a minority stake in the company and cannot control the dividend policy. If the dividend policy dictated by the controlling interests bears a meaningful relationship to the company's underlying profitability, then dividends are appropriate.

Soln to Q7 Pg -

Price of Stock = PV of future Cash flows @ ke

$$3 \times \frac{1}{(1+0.12)} + \frac{3}{1+0.12}^2 + \frac{3.24}{(1+0.12)^2} + \frac{3.50 + 94.48}{(1+0.12)^3}$$

Yr	Cflow	$\frac{DF}{1+r} = \frac{1}{(1+r)^n}$	PV = CF × DF
1	3	$\frac{1}{1.12} = 0.893$	$3 \times 0.893 = 2.679$
2	3.24	$\frac{1}{(1.12)^2} = 0.797$	$3.24 \times 0.797 = 2.582$
3	97.98	$\frac{1}{(1.12)^3} = 0.712$	$97.98 \times 0.712 = 69.76$

75.02

$$\begin{aligned}
 &= 3 \times 0.893 + 3.24 \times 0.797 + 97.98 \times 0.712 \\
 &= 75
 \end{aligned}$$

However, if the dividend policy is not related to the company's ability to create value, then dividends are not an appropriate measure of expected future cash flow to shareholders.

Dividends may be appropriate as a measure of cash flow in the following cases:

- The company has a history of dividend payments.
- The dividend policy is clear and related to the earnings of the company.
- The perspective is that of a minority shareholder.

If we extend the holding period indefinitely, the value simply becomes the present value of an infinite stream of dividends. We would arrive at the value as follows:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)}$$

V_0 = Value of shares at present date

D_t = dividend in the time period t

r = required return on equity

Q8

Let's assume that the shareholder Ms Alka holds the shares of A Ltd for an infinite period. A Ltd is a matured company giving a constant dividend of ₹3 per share every year. Ms Alka expects 12 % return from her investment in A Ltd. **Find** the value of A Ltd for Ms Alka.

Reference Value of Equity Shares	What's New <i>* $\frac{D}{r - ke}$</i> <i>Constant Div</i>	Constant Dividend Model
---	---	--------------------------------

Answer

$$V_0 = \frac{D_1}{r} = \frac{3}{12\%} = ₹25 \text{ per share}$$

We should understand that application of this method would require the valuer to expect that the dividends would be constant forever, which may be a difficult assumption to make.

Soln to Q8 Pg -

$$\text{Value of A Ltd (eq shares)} = \frac{\text{Div}}{ke} = \frac{3}{0.12} = 25$$

Q9 Ex Book No - Pg No -

Astavinayak Ltd. has an issued and paid-up capital of 50,000 shares of 100 each. The company declared a dividend of 12.50 lakhs during the last five years and expects to maintain the same level of dividends in the future. The control and ownership of the company is lying in the few hands of Directors and their family members. The average dividend yield for listed companies in the same line of business is 18%.

Calculate the value of 3,000 shares in the company.

Reference

Valuation of Equity Shares

What's New

Constant Dividend Model

Sol'n to Q9 Pg —

Answer

$$\text{Dividend per share} = \frac{12,50,000}{50,000} = ₹ 25$$

$$\text{Dividend yield} = 18\%$$

$$\text{Value per Share} = \frac{25}{0.18} = 138.89$$

$$\text{Value of 3,000 Shares} = 3,000 \times 138.89 = 4,16,667.$$

$$\text{Dividend Per Share} = \frac{12,50,000}{50,000} = 25$$

$$\text{Value of a Share} = \frac{25}{18\%} = 138.89$$

$$\text{Value of 3000 shares} = 3000 \times 138.89 \\ = ₹ 416,670$$

H.W (try) Q10

Following are the information of two companies for the year ended 31st March, 2016:

Particulars	Company A	Company B
Equity Shares of ₹ 10 each	8,00,000	10,00,000
10% Pref. Shares of ₹ 10 each	6,00,000	4,00,000
Profit after tax	3,00,000	3,00,000

Assume the Market expectation is 18% and 80% of the Profits are distributed.

(i) What is the rate you would pay to the Equity Shares of each Company?

(a) If you are buying a small lot. = Constant Div Model

(b) If you are buying controlling interest shares. = Earn Gp Model

(3) Earnings Capitalisation Model

→ To acquire controlling interest in a Co.

$$\text{Value of eq sh} = \frac{\text{EPS}}{\text{Ke}}$$

$$= \text{EPS} \times \text{P/E Ratio}$$

[Also used in
Relative Valⁿ]

Standard Notes

1. Value of Co. ⇒ Value of Eq shares + Value of Pref^{sh}
+ Value of Debt

Enterprise Value

2. Evaluating investing in Pref Shares
MP is given: Act MP < Intrinsic Price = Buy

MP is not given: PD Coverage Ratio = $\frac{\text{PAT}}{\text{P.Div}}$

minimum greater than 1 & then compared with industry avg.

- (ii) If you plan to invest only in preference shares which company's preference shares, would you prefer? *MPS PD Cov Ratio*
- (iii) Would your rates be different for buying small lot, if the company A retains 30% and company B 10% of the profits? *Constant Div*

[Note: A control premium is an amount that a buyer is sometimes willing to pay over the current market price of a publicly traded company in order to acquire a controlling share in that company.]

Reference

**Valuation of Equity Shares based on
Controlling Interest - Small lot / big lot, Constant
Dividend & Earning Capitalisation Method**

What's New

Evaluation of preference share

Answer

- (I) (a) **Buying a small lot of equity shares:** If the purpose of valuation is to aid a decision of buying a small (non-controlling) position of the equity of the companies, dividend capitalisation method is most appropriate (assuming consistent dividends are paid). Under this method, value of equity share is given by:

$$\frac{\text{Dividend Per share}}{\text{Capitalisation Rate}} \times 100$$

$$\text{Company A: } \frac{2.4}{18} \times 100 = 13.33$$

$$\text{Company B: } \frac{2.08}{18} \times 100 = 11.56$$

- (b) **Buying controlling Interest equity shares:** If the purpose of valuation is to aid a decision of buying controlling interest in the company, **EPS capitalisation method** is most appropriate. Under this method, value of equity is given by:

$$\frac{\text{Earning per share}}{\text{Capitalisation Rate}} \times 100$$

$$\text{Company A: } \frac{3}{18} \times 100 = 16.67$$

$$\text{Company B: } \frac{2.6}{18} \times 100 = 14.44$$

- (ii) **Preference Dividend coverage ratios** of both companies are to be compared to make such decision. Preference dividend coverage ratio is given by:

$$\frac{\text{Profit after Tax}}{\text{Preference Dividend}} \times 100$$

Sohu to Q10 Pg -

part (i) (a) Eq shares - Buy a small lot
= Constant Div Model

	A	B
<u>EPS</u>		
PAT	3,00,000	3,00,000
→ Pref div	60,000	40,000
EPSFASH	<u>240,000</u>	<u>2,60,000</u>
No. of Eqsh	80,000	1,00,000
EPS	3	2.60

$$\underline{DPS} = \text{EPS} \times \text{Payout Ratio} = 3 \times 80\% = 2.40 \quad 2.60 \times 80\% = 2.08$$

$$\underline{\text{MPS for Small lot}} = \frac{\text{DPS}}{K_e} = \frac{(2.40)}{0.18} = 13.33 \quad \left(\frac{2.08}{0.18} \right) = 11.56$$

part (b) MPS for buying controlling int
= Earnings Capitalisation Model

	Co. A	Co. B
EPS	3	2.60
K _e	0.18	0.18
MPS = EPS/K _e	16.67	14.44

part (ii)

Evaluations of investments in Pref. Sh.

As details to compute MP of PS & Act Price are not given, we are using PD Coverage Ratio to evaluate:-

<u>Co. A</u>	<u>Co. B</u>
$\frac{\text{PAT}}{\text{PD}} = \frac{300000}{60000} = 5$	$\frac{300000}{40000} = 7.5$

As PD Cov Ratio is higher in Co.B, it should be preferred.

part (iii)

MPS for small lot — Constant Dividend Model

	<u>Co. A</u>	<u>Co. B</u>
EPS	3	2.60
Payout Ratio	70%	90%
DPS (EPS × Payout)	2.10	2.34
MPS = $\frac{\text{DPS}}{\text{uc}} = \frac{2.10}{0.18} = 11.67$		$= \frac{2.34}{0.18} = 13$

Company A: $\frac{3,00,000}{60,000} = 5 \text{ times}$

Company B: $\frac{3,00,000}{40,000} = 7.5 \text{ times}$

If we are planning to invest only in preference shares, we would prefer shares of B Company as there is more coverage for preference dividend.

- (iii) Yes, the rates will be different for buying a small lot of equity shares, if the company A retains 30% and company B 10% of profits.

The new rates will be calculated as follows:

Company A: $\frac{2.1}{18} \times 100 = 11.67$

Company B: $\frac{2.34}{18} \times 100 = 13.00$

Working Notes:

- Computation of earnings per share and dividend per share (companies distribute 80% of profits)**

Particulars	Company A	Company B
Profit after tax	3,00,000	3,00,000
Less: Preference dividend	60,000	40,000
Earnings available to equity shareholders (A)	2,40,000	2,60,000
Number of Equity Shares (B)	80,000	1,00,000
Earnings per share (A/B)	3.0	2.60
Retained earnings 20%	48,000	52,000
Dividend declared 80% (C)	1,92,000	2,08,000
Dividend per share (C/B)	2.40	2.08

- Computation of dividend per share (Company A retains 30% and Company B 10% of profits)**

	Co. A (₹)	Co. B (₹)
Earnings available for Equity Shareholders	2,40,000	2,60,000
Number of Equity Shares	80,000	1,00,000
Retained Earnings	72,000	26,000
Dividend Distribution	1,68,000	2,34,000
Dividend per share	2.10	2.34

4. Gordon's Model or Dividend Growth Model

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

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

D_1 = Expected div at the end of Y₁

k_e = Cost of equity / Capitalisation rate of eq shares

g = Constant growth rate (from Y₂ to ∞)

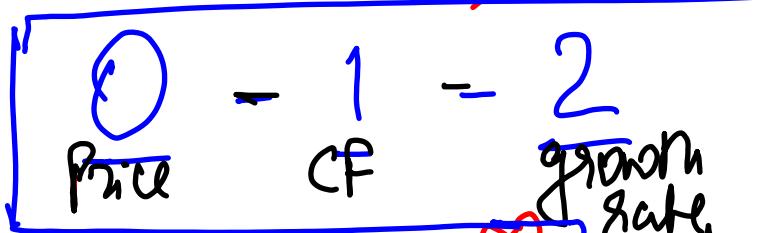
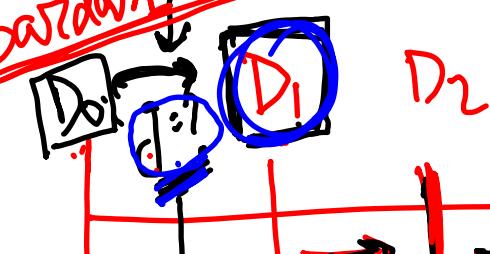
$$= b \times \sigma$$

= retention x return on investment

$$D_1 = D_0 (1+g) \quad [D_0 = \text{Last yr's dividend}]$$

(Limit! Not to be used when $k_e < g$)

~~Zabardast Notes~~



y_0

growth rate is constant

If nothing mentioned, we assume same 'g' rate

2.2.4 The Gordon Growth Model

The Gordon Growth Model assumes that dividends will increase at a constant rate for an indefinite period. When applying the present value concepts, this would mean that dividend amount would change every year (grow at a constant rate every year) and each year's cash flow need to be discounted at a discount rate.

$$V_0 = \frac{D_0 \times (1+g)^1}{(1+r)^1} + \frac{D_0 \times (1+g)^2}{(1+r)^2} + \dots + \frac{D_0 \times (1+g)^n}{(1+r)^n}$$

Mathematically, this translates into a simpler equation as follows:

$$V_0 = \frac{D_1}{(r-g)}$$

V_0 = Value of shares at present date

D_0 = dividend just paid in current period

D_1 = dividends expected to be received at end of Year 1

r = required return on equity

g = dividend growth rate

Fundamentally, the perpetual growth rate should be lower than the required return on equity. It is unrealistic to assume that any company can continue to grow indefinitely at a rate higher than the long-term growth rate in real gross domestic product (GDP) plus the long-term inflation rate.

Advantages of Gordon Growth Model:

- It is applicable to stable, mature, dividend-paying companies.
- It is appropriate for valuing market indices and listed companies.
- It is easy to understand and is straightforward
- It can be used to determine price-implied growth rates and required rates of return
- It can be used to supplement other, more complex valuation methods.

Limitations of Gordon Growth Model:

- Gordon Growth model is highly sensitive to estimated values such as dividend expectations, growth rates and required rates of return. These are all difficult to estimate with precision.
- The model cannot be easily applied to non-dividend-paying companies.
- In case of unstable companies with unpredictable growth patterns, the model is difficult to apply, and the resulting valuations can be highly unreliable.

Q11

Ex book No - Pg No -

Ms Alka hopes that A Ltd will give dividend of ₹ 3 per share next year and this is expected to grow at a constant rate of 6 % forever. *Y₂ to N₀*

Find the value of A Ltd today (V_0) for Ms Alka. *if Ke is 12 %*

Reference

Value of Equity Shares
What's New
Gordon's Model

Look to Q12 Pg No -

Answer

$$V_0 = \frac{3}{12\% - 6\%} = ₹50 \text{ per share}$$

$$P_0 = \frac{D_1}{Ke - g} = \frac{3}{0.12 - 0.06} = ₹50$$

2.2.5 Multi-stage model

For most companies, the Gordon growth model assumption of constant dividend growth that continues into perpetuity may not be realistic. For example, many companies experience high growth rates for short periods of time because of a competitive advantage. Eventually, the high growth rates fade away and the companies earn normal growth rates in maturity stage.

Most companies go through a pattern of growth that includes several phases:

- **Initial growth phase**, where the company has increasing profits, little or no dividends, and heavy reinvestment.
 - **Transition phase**, in which profits and dividends are still increasing but at a slower rate as competitive forces reduce profit opportunities and the need for reinvestment.
 - **Mature phase**, in which profits grow at a stable but slower rate, and dividend pay-out ratios are stabilizing as reinvestment matches depreciation and asset maintenance requirements.
- (a) **Two-Stage Dividend Discount Model:** The two-stage DDM assumes that the company will grow at a high rate for a relatively short period of time (the first stage) and will then revert to a long-run perpetual growth rate (the second stage). The length of the high-growth phase is a function of the visibility of the company's operations to the valuer.
- (b) **H-Model:**

The problem with the basic two-stage DDM is that it is usually unrealistic to assume that a company will experience high growth for a short period, then immediately fall back to a perpetual growth level. The H-model utilizes a more realistic assumption: the growth rate starts at a high and then declines 'linearly' over the high-growth stage until it reaches the long-run average growth rate. For example, consider a company that has a first mover

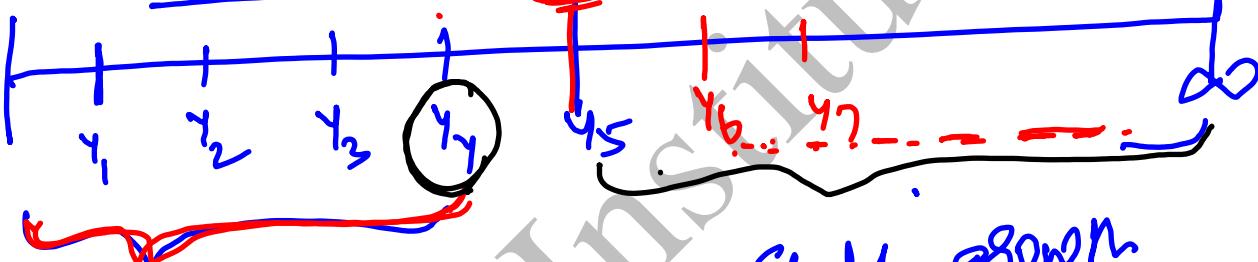
5. Multi - Stage Model

Two Phase
or
Two Stage

Three Phase
↓
H-Model

(a) Two Stage Model

Period 1



No Growth

or

High growth

or

Inconsistent growth

Stage 1

Stable growth
or
constant growth

Stage 2

- $V_4 = PV \text{ from } Y_5 \text{ to } \infty$
- $\cancel{V_0 = V_4 (1+k_e)^4}$

Step 1	PV of Stage 1 -	$\frac{Y_r}{1}$	$\frac{CF}{\checkmark}$	$\frac{DFL}{\checkmark}$	$\frac{PV}{\checkmark}$
		1	✓		✓
		2	✓		✓
		3	✓		✓
		4	✓		✓

Step 2 for Stage 2

Terminal Value = PV from y_5 to ∞
at y_4

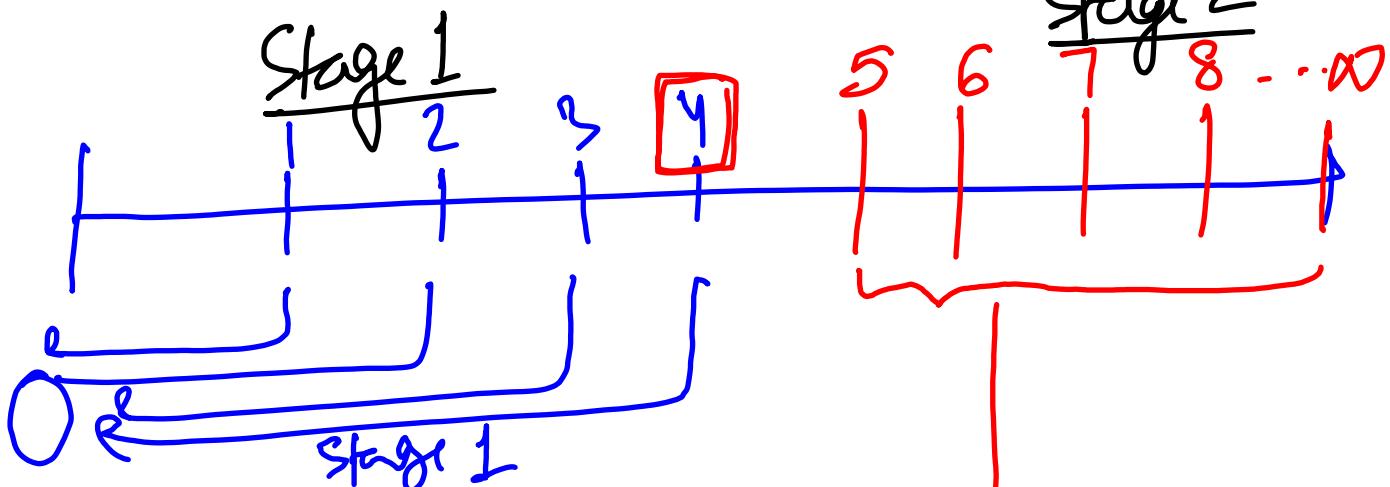
$$= \frac{CF_5}{Ke - g}$$

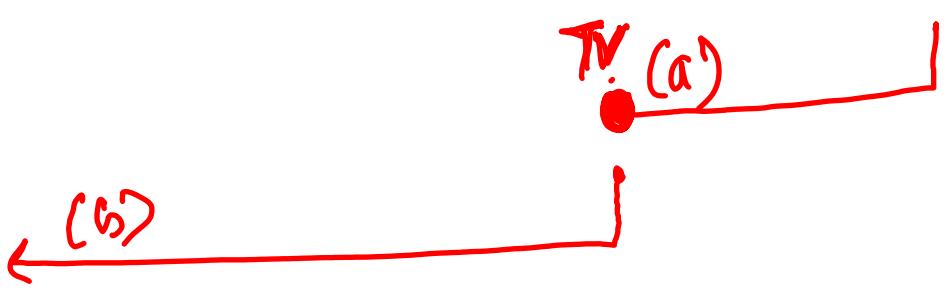
g = Constant growth rate

Ke = Cap rate of Stage 2
(if not given, use Stage 1 Ke)

$$CF_5 = CF_4 \times (1+g)$$

$$PV \text{ of TV} = \frac{TV \text{ at } y_4}{(1+Ke)^4} [Ke \text{ of stage 1}]$$





~~Step 3~~ Value of Shares : Stage 1 + Stage 2

advantage and thus generates high profit margins, faces little competition, and is currently growing at 25%. We might forecast that the company's growth rate will decline by 5% per year as competitors enter the market until it reaches 5% at the end of the fourth year, when the industry matures, and growth rates stabilize.

While the multi-stage model can be further extended into three stage model, all these models would apply the same concept of Gordon Growth model with different periods of growth.

Q12

D

Python Ltd currently pays a dividend of ₹2 per share. A valuer forecasts growth of 15% for the next three years, followed by 4% growth in perpetuity thereafter. The required return is 13%.

Calculate the current value per share.

Reference

Value of Equity Shares

What's New

Two Phase

Answer

Value per share of Python Ltd would be given by the following equation:

$$V_0 = \frac{D_0 \times (1+g)^1}{(1+r)^1} + \frac{D_0 \times (1+g)^2}{(1+r)^2} + \frac{D_0 \times (1+g)^3}{(1+r)^3} + \frac{D_0 \times (1+g)^4}{(1+r)^4 (r-g_2)}$$

The Present Value Factors for the first 3 years are as follows:

Year 1: 0.8850

Year 2: 0.7832

Year 3: 0.6931

$$V_0 = \frac{2.30}{(1.13)^1} + \frac{2.65}{(1.13)^2} + \frac{3.04}{(1.13)^3} + \frac{3.50}{(1.13)^4} \times \frac{3.16}{(0.13 - 0.04)}$$

The value would be given by:

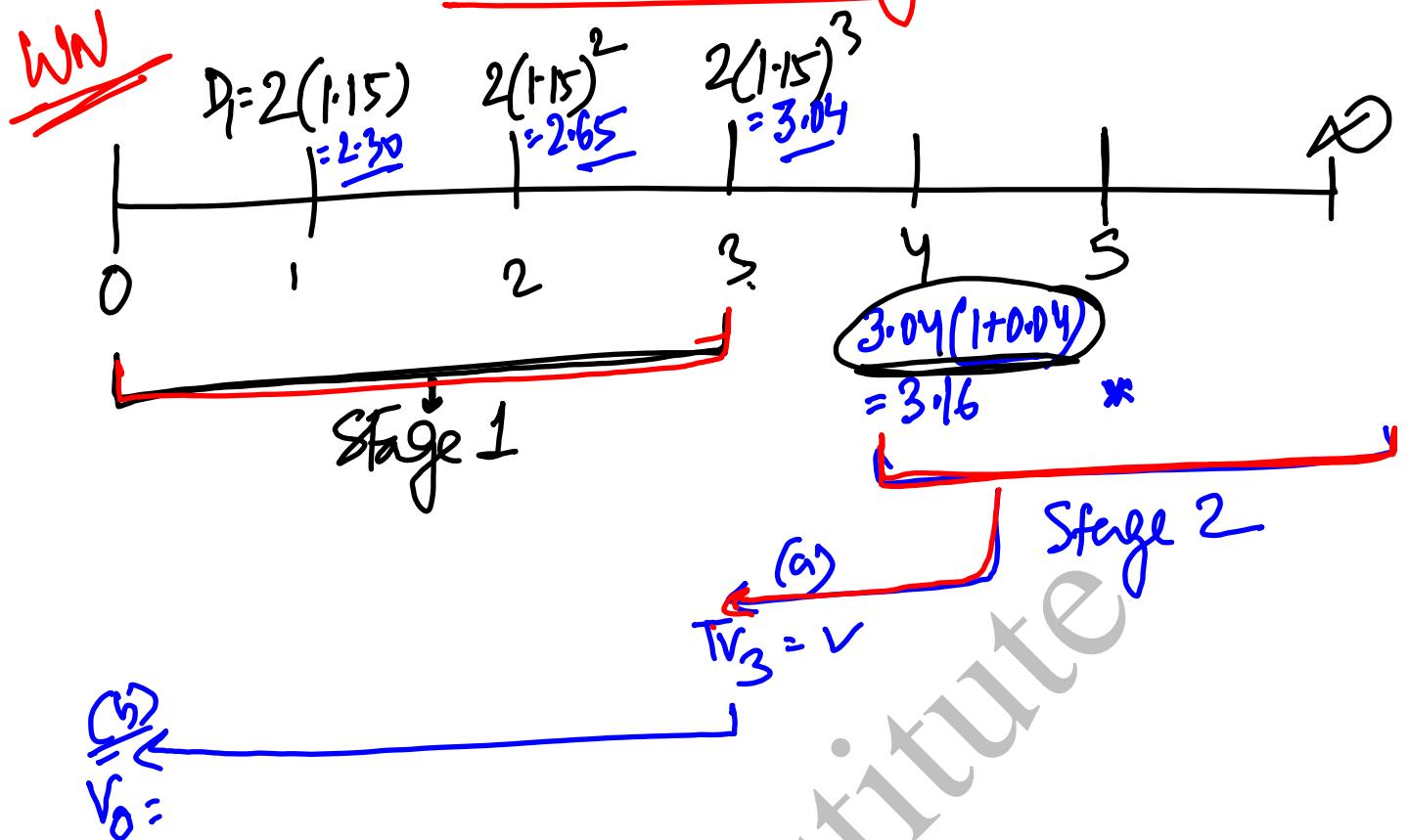
3.16

$$V_0 = (2.30 \times 0.8850) + (2.65 \times 0.7832) + (3.04 \times 0.6931) + ((3.50 \times 0.6931) \div 0.09)$$

$$V_0 = 2.04 + 2.07 + 2.11 + 26.94 \quad 24.33$$

$$V_0 = 33.15 \quad 30.55$$

Soln to Q12 Pg -



Stage 1 PV_0 13%

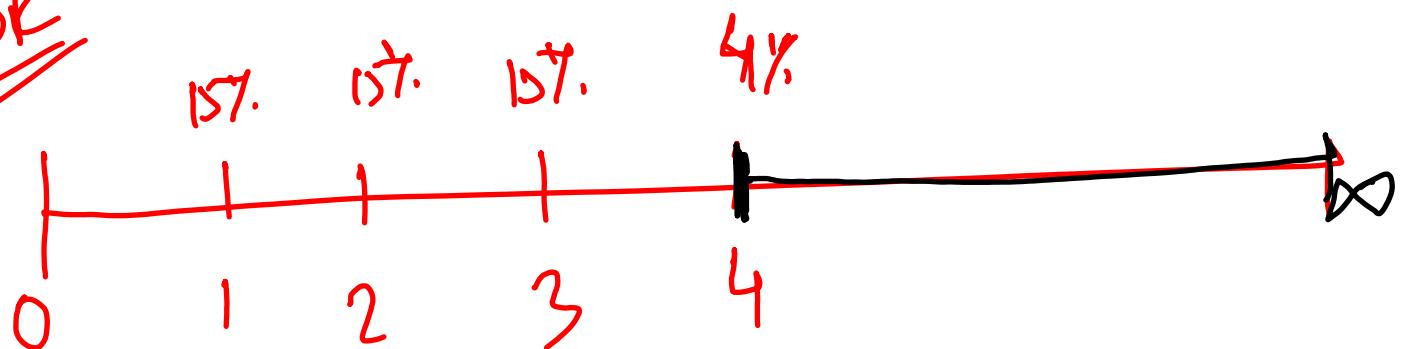
<u>Yr</u>	<u>CF</u>	<u>DF</u>	<u>PV</u>
1	$2(1.15) = 2.30$	0.885	2.04
2	2.65	0.783	2.07
3	3.04	0.693	2.11
			<u>6.22</u>

Stage 2 (a) $\frac{\text{TV}}{\text{at } Y_3} = \frac{\text{CF}_4}{k_e - g} = \frac{3.04(1+0.04)}{0.13 - 0.04} = \frac{3.16}{0.09} = 35.11$

(b) $\text{PV of TV} = \frac{35.11}{(1+k_e)^3} = \frac{35.11}{(1+0.13)^3} = 35.11 \times 0.693 = 24.33$

$$\therefore PV = 6.22 + 24.33 = 30.55$$

OR



Final

0 \rightarrow Price

1 \rightarrow CF

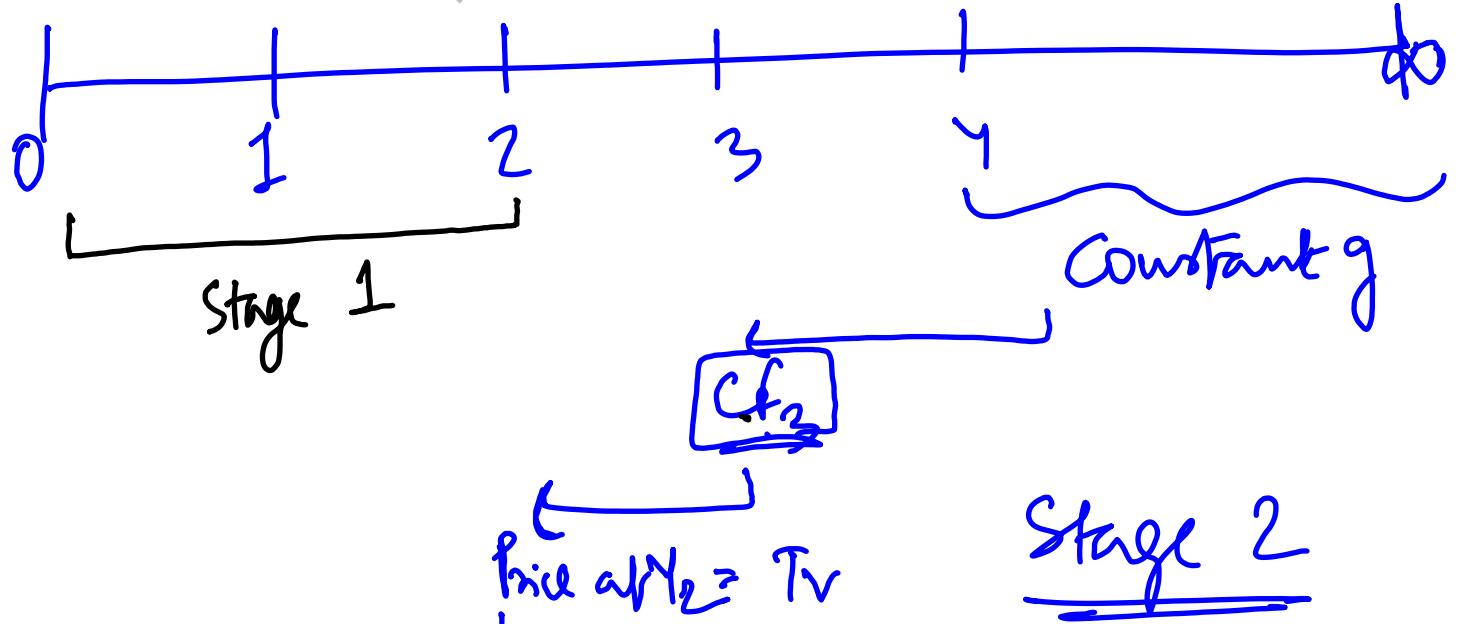
2 \rightarrow g

$$\frac{\ln Q_1 Q_2}{4r}$$

$\frac{1}{2} = \text{Price at } Y_2$

3. \rightarrow CF at Y_3

4 \rightarrow growth Rate Constant



Stage 1

<u>Yr</u>	<u>CF</u>	<u>DF</u>	<u>PV</u>
1	2.30	0.885	<u>$\frac{2.30}{0.885}$</u>
2	2.65	<u>0.783</u>	<u>$\frac{2.65}{0.783}$</u>
			<u>4.11</u>

Stage 2 • TV at $\gamma_2 = \frac{CF_3}{k_e - g} = \frac{2.65(1+0.15)}{0.13 - 0.04} = \frac{3.04}{0.09} = 33.78$

• PV at $\gamma_0 = \frac{33.78}{(1+0.13)^2} = 33.78 \times 0.783 = 26.45$

Value of Shares = $4.11 + 26.45 = 30.56$
--

Q13

Ex Book No - Pg No -

Super Shakti Ltd. is trying to buy Beta India Ltd. Beta India Ltd., is a small biotechnology firm that develops products that are licensed to major pharmaceutical firms. The development costs are expected to generate negative cash flows of ₹10 lakh during the first year of the forecast period. Licensing fee is expected to generate positive cash flows of ₹ 5, ₹10, ₹15 and ₹20 lakhs during 2-5 years respectively. Due to the emergence of competitive products cash flows are expected to grow annually at a modest 5% after the fifth year. The discount rate for the first five years is estimated to be 15% and then drop to 8% beyond the fifth year.

Calculate the value of the firm.

Reference	CF	What's New
Value of Firm	Y ₁ (10)	Two Phase → Stage 1
	2 5	DF P 1ST.
	3 10	
	4 15	
	5 20	DF C 8% → Stage 2

Answer

$$\text{Total sum of present value} = ₹20.185$$

$$\text{CF from Y6} = ₹ 20(1 + 0.05) = 21 \text{ Lakh}$$

$$\text{PV of Terminal Value}_t = \frac{\text{Cash flow}_{t+1}}{r - g_{\text{stable}}}$$

$$\text{PV of Terminal Value} = 21 / (0.08 - 0.05)$$

$$(\text{at Y9}) = ₹700 \text{ Lakh.}$$

$$\text{Present value of terminal value} = ₹700 \times 0.497 = ₹348.08$$

$$\text{Value of the firm} = ₹(20.185 + 348.08) = ₹368.265 \text{ lakh}$$

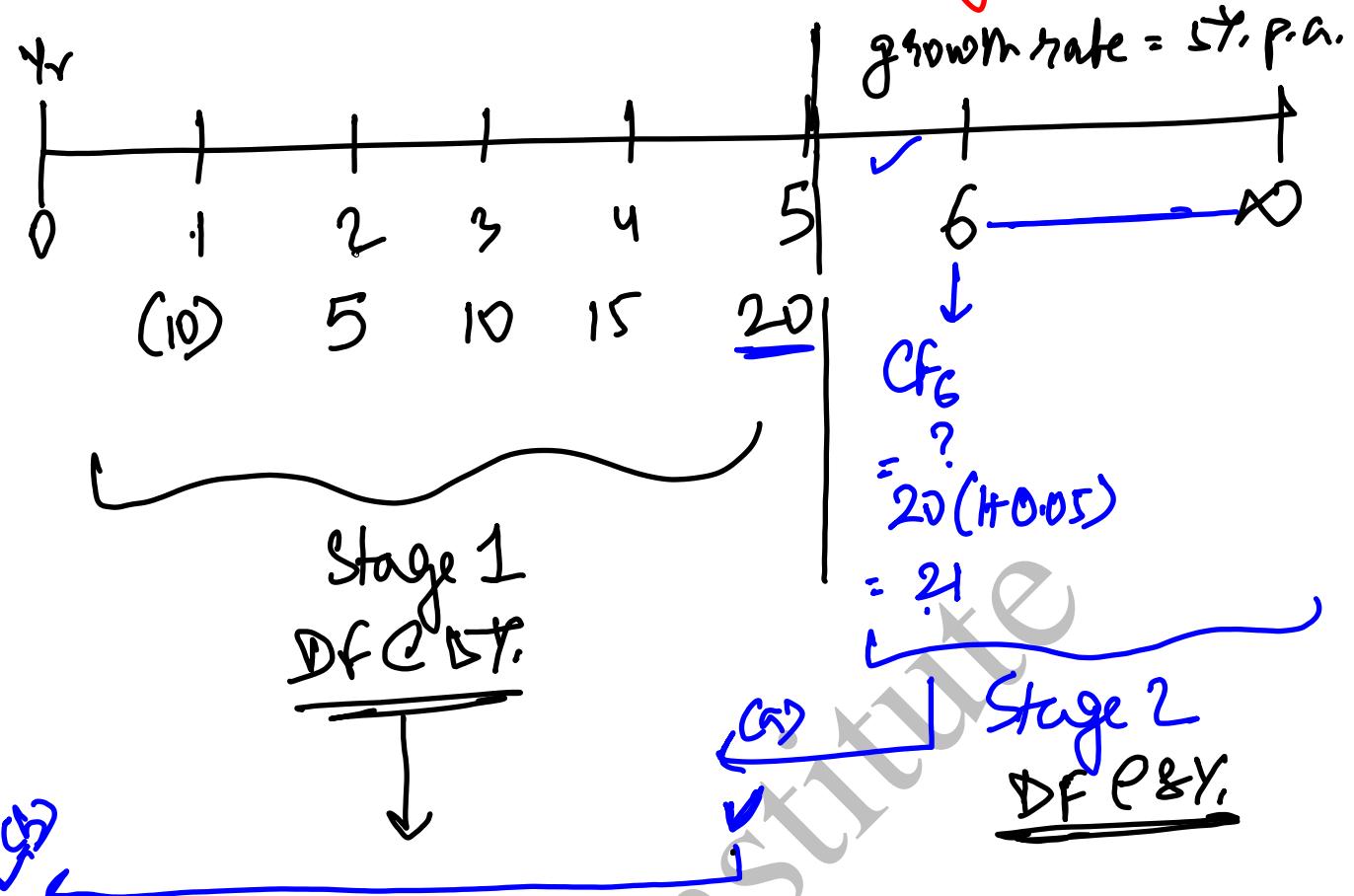
H.W Try
@14

Golden Sr ⇒ Koshib. Karne Walo Ki Kalbi: Main Nahi Hoh.

The free cash flow of Suvision Ltd is projected to grow at a compound annual average rate of 35% for the next 5 years. Growth is then expected to slow down to a normal 5% annual growth rate. The current year's cash flow of Suvision Ltd is ₹ 4 lakhs. Suvision Ltd.'s cost of capital during the high growth period is 18% and 12% beyond the fifth year, as growth stabilizes.

Calculate the value of the Suvision Ltd.

Solution to Q13 Pg -



<u>Stage 1</u>	<u>Yr</u>	<u>CF</u>	<u>DF @ 15%</u>	<u>FV</u>
1	(10)		0.870	(8.7)
2	5		0.756	3.78
3	10		0.658	6.58
4	15		0.572	8.58
5	<u>20</u>		<u>0.497</u>	<u>9.94</u>
				<u>20.18</u>

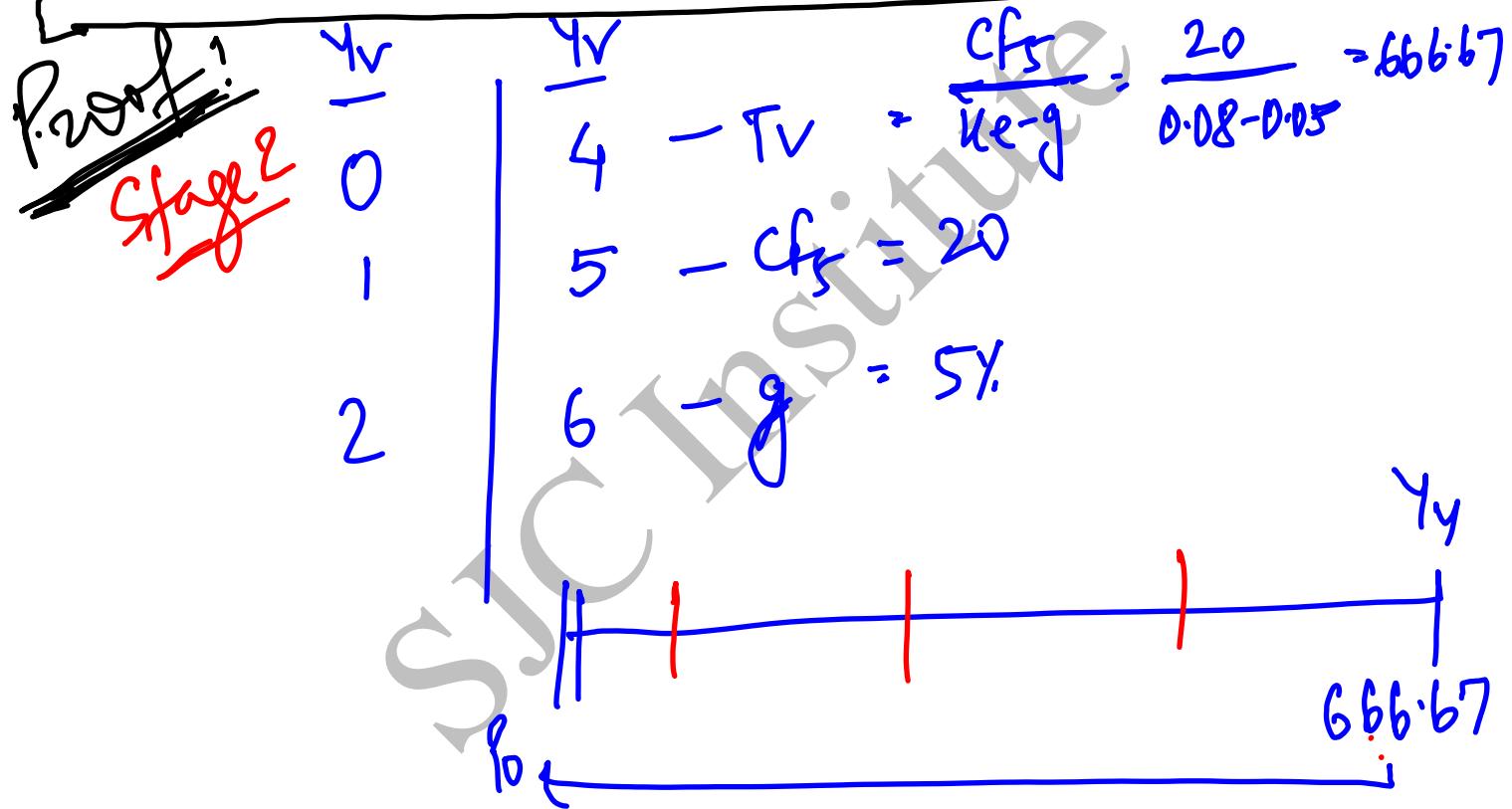
Stage 2 $TV \text{ at } Y_5 = \frac{Cf_6}{k_e - g} = \frac{20(1+0.05)}{0.08 - 0.05} = 700$

$PV \text{ at } Y_0 = \frac{TV_5}{(1+k_e)^5} = \frac{700}{(1+0.15)^5} = 700 \times 0.497 = 347.9$

$$\therefore PV \text{ at } Y_0 = 20.18 + 347.9 = 368.08$$

Zabcdast Notes

0 - 1 - 2 Concept cannot be applied here because of 2 diff disc rates



$$= 666.67 \times \frac{1}{(1+k_e)^4}$$

$$= 666.67 \times \frac{1}{(1.15)^4}$$

$$= 666.67 \times 0.572 = 381.33$$

Stage 1 $\gamma_1 \text{ to } 3 = (8.7) + 3.78 + 6.58 = 1.66$

$$f_0 = 381.33 + 1.66 = 382.99$$

Reference

Value of Firm

What's New

Two Phase → 2 disc rates

Answer

Present Value of Cash Flows during the Forecast Period

$$\begin{aligned}
 PV_{1-t} &= [FCFE_0 \times (1 + g_t)^t] / (1 + WACC)^t \\
 &= [(4 \times 1.35) / 1.18] + [4 \times (1.35)^2] / (1.18)^2 + [4 \times (1.35)^3] / (1.18)^3 + [4 \times (1.35)^4] / (1.18)^4 \\
 &\quad + [4 \times (1.35)^5] / (1.18)^5 \\
 &= 5.4 / 1.18 + 7.29 / (1.18)^2 + 9.84 / (1.18)^3 + 13.29 / (1.18)^4 + 17.93 / (1.18)^5 \\
 &= 4.58 + 5.24 + 5.99 + 6.85 + 7.84 \\
 &= ₹ 30.50 \text{ lakh}
 \end{aligned}$$

Calculation of Terminal Value

$$\begin{aligned}
 \text{Where } P_n &= FCFE_n \times (1 + g) / (k_e - g) \\
 &= (17.93 \times 1.05) / (0.12 - 0.05) \\
 &= 18.83 / 0.07 \\
 &= ₹ 269 \text{ lakh}
 \end{aligned}$$

$$PV \text{ of Terminal Price} = 269 / (1.18)^5 = 117.58$$

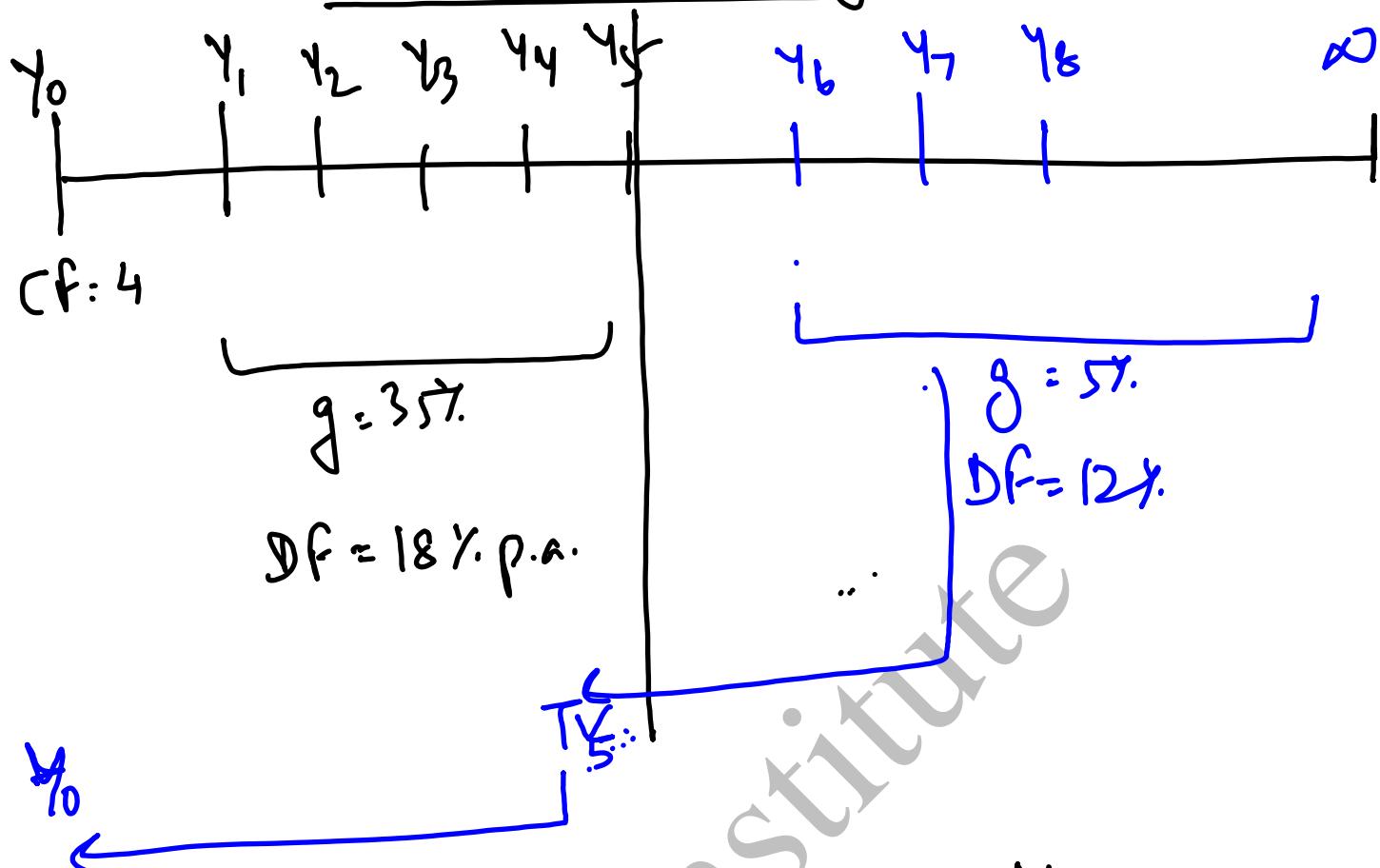
$$\begin{aligned}
 P_{0, FCFE} &= PV_{1-5} + PV_T \\
 &= 30.50 + 117.58 = ₹ 148.08 \text{ lakh.}
 \end{aligned}$$

2.2.6 Discounted Cash Flow Models - FCFF & FCFE

Free cash flow is the actual cash that would be available to the company's investors after making all investments necessary to maintain the company as an ongoing enterprise. These are internally generated funds that can be distributed to the company's investors (e.g., shareholders and bondholders) without impairing the value of the company.

The free cash flow method can be applied to most types of companies regardless of their dividend policies and capital structures. However, companies that have significant capital requirements (or investments) may have negative free cash flows for multiple years during the explicit forecast period. This negative free cash flow complicates the DCF method and makes it less reliable. The value of such companies, if positive, is largely embedded into the Terminal Value. Free cash flow method is most appropriate:

Soln to Q14 Pg -



Stage 1 PV of CF from y_1 to y_5			
Year	CF	DF 1.18%	PV
1	$4(1.35) = 5.4$	0.847	4.57
2	$4(1.35)^2 = 7.29$	0.718	5.23
3	$4(1.35)^3 = 9.64$	0.609	5.99
4	$4(1.35)^4 = 13.29$	0.516	6.86
5	$4(1.35)^5 = 17.94$	0.437	7.84
			<u>30.50</u>

Stage 2 PV of CF from y_6 to ∞

$$(a) TV_5 = \frac{Cf_6}{k_e - g} = \frac{17.91(1+0.05)}{0.12 - 0.05} = 269.1$$

$$(b) PV_{at\ y_0} = \frac{TV_5}{(1+k_e)^5} = \frac{269.1}{(1+0.18)^5}$$
$$= 269.1 \times 0.437$$
$$= 117.59$$

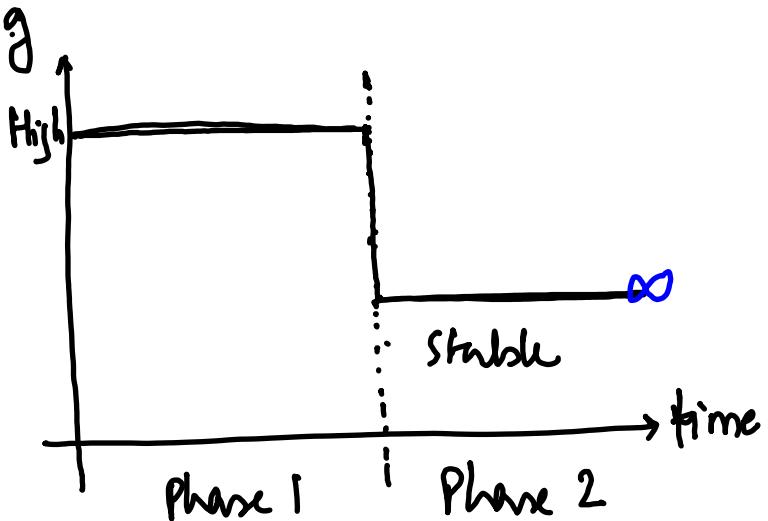
∴ Value of Sunseren Ltd (\mathbb{E})

$$= 30.50 + 117.59$$

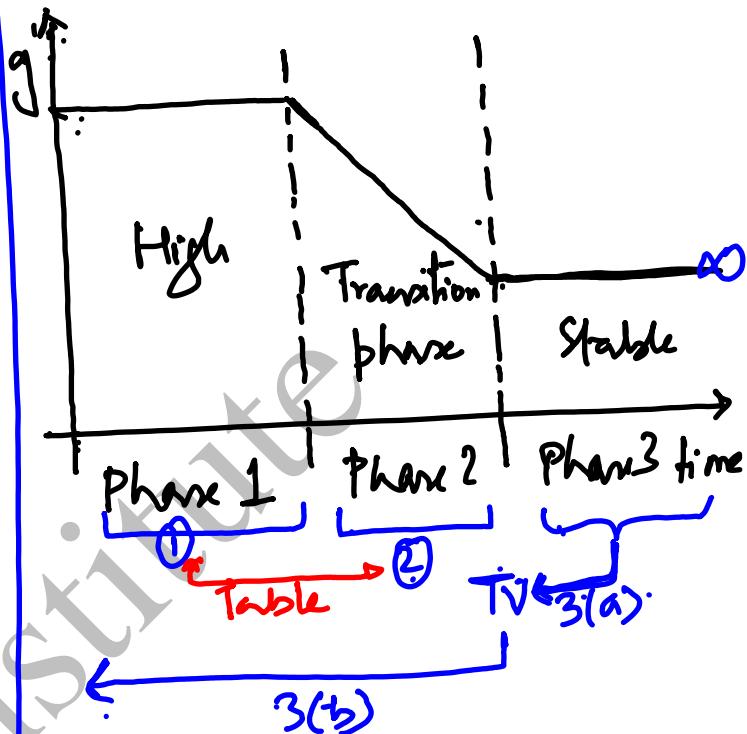
$$= 148.09$$

(b) Three Stage Model / H-Model

2 Stage Model



3 Stage Model



Assumes, transition from high to stable growth rate is instant & at once.

[Not in Br]
In SfM - it is there

6. Free Cash Flow Method

Free cash flow for the firm
(FCFF)

Free cash flow for Equity (FCFE)

Small lot \Rightarrow Constant div model - D/ke

Controlling int \Rightarrow Earnings Gap Model - E/ke

Acquisition/Merger \Rightarrow FCF Method - FCFE/ke or Fcff/k₀

Growth Model

Multi Stage Model

(a) $\frac{FCFF}{FCAT}$:-

Synopsis

① Based on CFAT

FCFF

Sales	✓	100
(+) VF	(✓)	50
FC/Dep ⁿ	(✓)	20
Op PB.T	✓	30
(-) Tax	(✓)	15
Op PAT	✓	15
(+) Depr	✓	20
CFAT	✓	35

* Int is not chgd

CFAT

\rightarrow Reinvestment

- Cap Ex

- Inc in Non Cash WC

free cash flow for
the firm

(✓)

(✓)

✓

② Based on PAT

<u>Inc St (PAT)</u>		<u>fcff</u>
Sales.	✓ 100	
VC	✓ 50	
fcf/Depn $\cdot \frac{(-t)}{(-)}$	✓ 20	
EBIT	✓ 30	
(→ Int)	✓ 10	
EBT	✓ 20	
(→ Tax $\rho - \%$)	✓ 10	
PAT	✓ 10	
		PAT ✓ 10
		(H) Depn ✓ 20
		(+) Int(1-t) ✓ 5
		(→ Reinv ✓ 3)
		- CapEx ✓ 0
		- Inc Inv ✓ 0
		Non Cash Wk _____
		fcff ✓

(3) Based on EBITDA

<u>EBITDA</u>		<u>fcff</u>
Sales.	✓ 100	
(→ VC)	✓ 50	

$$50(1-0.5) = 25$$

<u>EBITDA</u>	<u>✓</u>	50
(+) Depn	<u>✓</u>	20
Op EBT	<u>✓</u>	30
(-) Tax	<u>✓</u>	15
Op PAT	<u>✓</u>	15
(+) Depn	<u>✓</u>	20
CFAT	<u>✓</u>	35

<u>EBITDA (1-t)</u>	<u>✓</u>
(+) Depn \times tax rate	<u>✓</u>
	<u>$20 \times 0.5 = 10$</u>
CFAT	<u>✓</u>
(-) Reinv	
- CapEx	<u>✓</u>
- Inc in Non Cash WC	<u>✓</u>
	<u>✓</u>

(4) Based on cash flow from operations

<u>CFO</u>	<u>FF</u>
Op PAT	
(+) Depn	
CFAT	
(-) Inc in WC	<u>(✓)</u>
CFO	<u>✓</u>

If "int" is an operating item,
CFO is derived after considering
the net interest cost $[I(1-t)]$

<u>CFO</u>	<u>✓</u>
(+) Int $(1-t)$	<u>✓</u>
(-) Cap Exp	<u>(✓)</u>
FF	<u>✓</u>

Note 1 : Capital Expt $\Delta = \text{change}$

= New Cap Ex

= $\Delta \text{ in Gross FA} + \Delta \text{ Cap WIP} + \Delta \text{ operating inv.}$

Note 2 :- Non Cash WC - Increase (being used in the operations)

$\therefore \text{Non. Cash WC}_n = \text{Non Cash WC}_{n-1}$

Non Cash WC = CA end Cash ✓

$\hookrightarrow \text{CL end Short term Debt}$

x Prov]. (✓) ✓

→ it is a financing activity

not used in the WC

Value of firm $\Rightarrow \frac{\text{fcff}}{K_0}$

or

Two Stage Model

Disc rate with fcff = K_0

- For companies that do not pay dividends or whose dividend policies are not related to earnings
- Since dividends are paid at the discretion of the board of directors, it may reflect poorly on the company's long-run profitability.

Valuers usually use the following two definitions of free cash flow (FCF) for valuation purposes:

- Free cash flow to the firm (FCFF) and
- Free cash flow to the equity (FCFE)

FREE CASH FLOW TO THE FIRM (FCFF)

Free cash flow to the firm (FCFF) is the cash flow available to all the company's suppliers of capital after operating expenses (excluding interest expense, net of taxes) have been paid, and necessary investments in fixed and working capital have been made. In other words, it represents the cash flow available to be distributed to a company's debt holders (in the form of interest payments or debt repayments), equity shareholders, and even preference shareholders.

To calculate the value of the company, FCFF are discounted at the company's weighted average cost of capital (WACC), that is the cost of both Equity and Debt.

Value of the firm is given by the following equation

$$\text{Firm Value}_0 = \frac{\text{FCFF}_1}{(1+kc)^1} + \frac{\text{FCFF}_2}{(1+kc)^2} + \dots + \frac{\text{FCFF}_n}{(1+kc)^n} + \frac{\text{Terminal Value}}{(1+kc)^n}$$

FCFF is the Free Cash Flow to the Firm for each period

Kc represents Weighted Average Cost of Capital (WACC)

n represents the explicit forecast period

Terminal Value is the value for the perpetual period.

FCFF is calculated as follows:

Profit After Tax	✓
Add: Non-Cash Charges	✓
Less: Capital Expenditure	✓
Less: Working Capital Investment	✓
Add: Tax Adjusted Interest Expense	✓
Free Cash flows to the Firm (FCFF)	

Profit After Tax (PAT) is the bottom line of the Profit & Loss Statement. It represents profit after depreciation, amortization, interest expense, income taxes, and preference dividends (but not equity dividends).

Non-cash charges (NCC) reflect the net effect of non-cash expenses and non-cash gains on net profit.

Non-cash expenses are those that do not result in an outflow of cash but are subtracted from revenue to arrive at net profit. Since the objective is to determine cash flows, non-cash charges must be added back to net profit. E.g., Depreciation, Amortization, Losses on sales of assets, non-cash restructuring charges, and increases in non-reversible deferred tax liabilities.

Non-cash gains are those that do not result in an inflow of cash but are added to revenue to arrive at net profit. Non-cash gains should be subtracted from net profit. E.g., Gains on sales of assets, reversals of restructuring charges, and increases in non-reversible deferred tax assets.

Capital Expenditure, also referred to Investment in fixed capital over the period refers to outflows of cash to purchase fixed assets (e.g., Property, plant and equipment or P&E, trademarks, research, and development among others). Investments in fixed assets must be netted off with the amount of cash proceeds from sales of fixed assets.

The net amount spent on acquiring fixed capital cannot be distributed to the company's providers of capital, hence it should be deducted from net profit in calculating FCFF.

For calculations, Capital expenditure may be assessed from the Cash Flow Statement (Investing Activities) that contains the amount of cash spent on fixed assets and operating investments. Alternatively, the Capital Expenditure may be calculated as the Change in Gross Fixed Assets between the two period. Or it may be calculated as the difference between the Net Fixed Assets between the two periods plus, depreciation charged during the period.

Q15

With the given the financial statement extracts, **calculate** Capital Expenditure for Years 2 and 3.

Balance sheet extracts	Year 1	Year 2	Year 3
Fixed Assets - Gross Block	1,588	1,773	1,837
Accumulated Depreciation	408	478	551
Fixed Assets - Net Block	1,180	1,295	1,286
Capital Work in Progress	185	121	123
Operating Investments	0	0	0
Total	1,365	1,416	1,409

Reference

Capital Expenditure (FCFF)

What's New

Solu to Q15 pg -

Yr 2

Yr 3

Δ FA - Given Block

$$1773 - 1588 \\ = 185$$

$$1837 - 1773 \\ = 64$$

(+) Change in Cap WIP

$$121 - 185 \\ = (64)$$

$$123 - 121 \\ = 2$$

(+) Change in Op Inv

$$\begin{array}{r} - \\ \hline 121 \end{array}$$

$$\begin{array}{r} - \\ \hline 66 \end{array}$$

Answer

(using Gross Fixed Assets):

	Year 2	Year 3
Change in Gross Block	185	64
Change in Capital Work in Progress	- 64	3
Change in Operating Investment	-	-
Capital Expenditure	121	66

(using Net Fixed Assets):

Depreciation should be available in the Profit & Loss Statement. It can also be calculated as difference between Accumulated Depreciation of the two periods.

	Year 2	Year 3
Depreciation	70	73
Change in Net Block	115	-9
Change in Capital Work in Progress	-64	3
Change in Operating Investment	-	-
Capital Expenditure	121	66

Working capital Investment refers to the changes in Non-Cash Working Capital. It is net increase (or decrease) in working capital over the period. Although working capital is generally defined as current assets minus current liabilities, for the valuation purposes, we exclude cash and short-term debt (Short term debt and current portion of long-term debt) from the calculation to compute investment in working capital.

Non-Cash Working capital = Current assets (exc. cash) - Current liabilities (exc. short-term debt & Provision)

Working capital Investment = Non-Cash Working Capital_(n) – Non-Cash Working Capital_(n-1)

Note that Cash and cash equivalents are excluded because it is the change in cash that we are trying to explain. Short Term Debt and current portion of long-term debt are excluded because they are liabilities that carry explicit interest costs and are therefore financing rather than operating items. Amounts spent on acquiring additional working capital cannot be distributed to the company's providers of capital, hence should be deducted from net profit in calculating FCFF.

Q16

With the given the financial statement extracts, **calculate Working Capital Investment for Years 2 and 3.**

Projected Balance sheet as on	Year 1	Year 2	Year 3
<u>Current Liabilities</u>			
Short Term Borrowing ✕	243.23	468.75	471.63
Other Current Liabilities	60.92	47.65	48.25
Trade Payables	193.07	169.99	176.24
Provisions ✕	0.32	0.26	0.26
Total Current Liabilities	497.55	686.65	696.38
<u>Current Assets</u>			
Trade Receivables •	97.46	132.54	140.40
Inventory •	634.52	807.60	830.61
Other current assets •	65.57	70.00	85.00
Cash and Cash Equivalents ✕	38.02	40.89	111.49
TOTAL CURRENT ASSETS	835.57	1,051.02	1,167.50

Reference
Working Capital
What's New

Excl STB, Prov, Cash

Answer

	Year 1	Year 2	Year 3
Total Current Assets	835.57	1,051.02	1,167.50
Less: Cash and Cash Equivalents	38.02	40.89	111.49
Non-Cash Current Assets (A)	797.55	1,010.13	1,056.01
Total Current Liabilities	497.55	686.65	696.38
Less: Short term Borrowings	243.23	468.75	471.63
Less: Provisions	0.32	0.26	0.26
Non-Cash Current Liabilities (B)	253.99	217.64	224.49
Non-Cash Working Capital (A - B)	543.55	792.50	831.52
Change in Non-Cash Working Capital		248.94	39.02

Tax Adjusted interest expense on net profit must be added because it is already deducted while calculating Profit After Tax. Since we are trying to calculate FCFF (which represents cash flow available to all the company's providers of capital) and interest payments are due to one

Solution to Q16 Pg -

	$\frac{Y_1}{\text{Non Cash WC}}$	$\frac{Y_2}{(835.57 - 38.02)}$	$\frac{Y_3}{(1167.5 - 111.49)}$
<u>CA (excl Cash)</u>	= 797.55	1010.13	= 1056.01
<u>CL</u>	60.92	47.65	48.25
Trade Payables	<u>193.07</u>	<u>169.99</u>	<u>176.24</u>
	<u>253.99</u>	<u>217.64</u>	<u>224.49</u>
WC	<u>543.56</u>	<u>792.49</u>	<u>831.52</u>
Inc in-NC	-	(792.49 - 543.56)	(831.52 - 792.49)
		= 248.93	= 39.03

Relevant Notes

- No Operating Improvement due to growth
 - (mentioned in the question)
 - Assume that
 - Cap Ex will be offset by depn (or AM's is mentioned in the question)
 - No. addl WC will be reqd for growth
- ie growth is increasing the Profits. (not the Cash flow directly)

[If nothing as above is mentioned, assume growth will increase the CF directly]

2. Terminal Cash flow \Rightarrow [As per ICMAT, it is the CF of first yr of Phase 2]
[However, the literal meaning is Phase 1 last year's cash flow.]

of the company's capital providers (bondholders) who have already received it (as per PAT). Therefore, interest expense net of the interest tax shield, or after-tax interest expense, Interest (1 – Tax rate), is added back to net profit to determine FCFF to avoid providing this amount twice to lenders.

Valuers may use Cash Flow from Operating Activities (CFOA) taken from the Cash Flow Statement as a starting point to calculate FCFF because CFOA already accounts for adjustments for non-cash charges and investment in working capital.

Thus, FCFF while calculating from Cash Flow from Operating Activities may be calculated as:

$$\text{FCFF} = \text{Cash Flows from Operations} + \text{Interest} \times (1 - \text{Tax Rate}) - \text{Capital Expenditure}$$

Depending on Accounting regulations, Interest paid may be classified as an operating or a financing activity in the Cash Flow Statement. If it is classified as a financing activity, after-tax interest expense has not been deducted from CFOA, so no interest-related adjustment to CFOA is required. **If it is classified as an operating activity, after tax interest expense must be added back to CFOA to calculate FCFF.**

FREE CASH FLOW TO EQUITY (FCFE)

Free cash flow to equity (FCFE) represents the potential amount of cash that could be paid out to equity shareholders. That is, FCFE reflects the company's capacity to pay dividends. FCFE is also useful for companies that do not currently pay dividends. FCFE is defined as the cash remaining after a company meets all its debt obligations and provides for the capital expenditures necessary to maintain existing assets and to purchase the new assets needed to support the assumed growth of the company. In other words, it is the cash available to the company's equity shareholders after it meets all its other obligations. FCFE for a period is often calculated as:

FCFE is calculated as follows:

Profit After Tax	✓
Add: Non-Cash Charges	✓
Less: Capital Expenditure	✓
Less: Working Capital Investment	✓
Add: Net Borrowing	✓
Free Cash flows to the Equity (FCFE)	✓

If you observe between FCFF and FCFE, the key difference here is that instead of adding tax adjusted Interest Expense, we are adding the Net Borrowing. Net borrowing is the increase in debt during the period (i.e., amount borrowed minus amount repaid) and is assumed to be available to shareholders. Since the starting point is Profit After Tax, that is, interest for the period has already been paid off, for the current period, the amount is freely available to equity shareholders.

FCFE can also be calculated from Cash Flows from Operating Activities and would be given by:

FCFE = Cash Flows from Operations – Capital Expenditure + Net borrowing

FCFE can also be calculated from FCFF and would be given by:

$$\text{FCFE} = \text{FCFF} - \text{Tax Adjusted Interest Expense} + \text{Net borrowing}$$

Terminal Value

The Terminal Value as calculated is calculated as at the end of the explicit forecast period (year n). We need to calculate the present value of the Terminal Value and the same needs to be added to the Present Value of explicit forecast period.

Companies that reinvest substantial portions of their profits and earn high returns on these investments should be able to grow at high rates. However, companies cannot grow at very high rates for a prolonged period. As the business grows, it becomes more difficult for it to maintain high growth and it eventually will grow at a rate less than or equal to the growth rate of the economy in which it operates. There are various methods to assess the Terminal Value.

No Growth:

If the company is not expected to grow beyond the explicit forecast period, the terminal value is given by:

$$\text{Terminal Value} = \frac{\text{FCF}}{r}$$

Where, r

FCF is the applicable Free Cash Flow i.e., FCFF or FCFE.

r is the applicable discount rate i.e., WACC in case the cash flows are FCFF and Cost of Equity if the cash flows are FCFE

Stable growth

Normally, companies may be expected to grow in line with the expected long-term inflation or GD growth rate of the economy in which the company operates. In such stable growth case, Terminal Value may be given by:

$$\text{Terminal Value} = \frac{\text{FCF}_{n+1}}{r - g}$$

Where,

FCF_{n+1} is the applicable Free Cash Flow for the terminal period

r is the applicable discount rate and

g is the expected growth rate for perpetual period.

You should observe that mathematically, the perpetual growth rate should be lower than the discount rate.

Difference between the application of FCF Models and Dividend Discount Models

FCF Models consider the “controlling interest” perspective as Free Cash Flows reflects cash flow that can be redeployed by the controlling interest without affecting the company’s capital investments. A minority interest may also use the free cash flow approach when there is a chance that the company will be acquired, in which case the stock price would be expected to reflect the price that the acquirer (prospective controlling interest) will pay for the company. The dividend discount model takes the perspective of a minority shareholder who does not have any control over the timing and amount of dividend payments. If an acquirer is willing to pay a premium for control over the firm, there may be a difference in the values obtained from the discounted dividend and FCF models.

Adjustment for Cash, and Non-Operating Assets

The present value of explicit forecast period and present value of terminal value provides the value of the company. To arrive at the equity value, valuers should add Cash and Cash Equivalents as this cash will be available to the acquirer. Also, since the FCF model values the Operating assets of the company, any non-operating assets, not covered in Free Cash Flows, should be added to the company’s value.

FCFF Approach	FCFE Approach
Profit After Tax	Profit After Tax
Add: Non-Cash Charges	Add: Non-Cash Charges
Less: Capital Expenditure	Less: Capital Expenditure
Less: Investment in Non-Cash Working Capital	Less: Investment in Non-Cash Working Capital
Add: Interest (post of tax)	Add: Net Borrowing
Free Cash flows to the Firm (FCFF)	Free Cash flows to Equity (FCFE)
PV of FCFF Discounted at WACC	PV of FCFE Discounted at Cost of Equity
PV of Terminal Value	PV of Terminal Value
Add: Cash and Cash equivalents	Add: Cash and Cash equivalents
Add: Value of Non-Operating Assets	Add: Value of Non-Operating Assets
Value of the Firm (Company)	N.A.
Less: Debt (Current Value)	N.A.
Value of Equity	Value of Equity

(Q) 17 th June

PAT

A valuer Super Ltd has anticipated that the expected profit of Super Ltd at the end of 5 years from now would be ₹293.26 million. The company is expected to grow at 4.5 % for perpetual period after that. The Post Tax interest expense is expected to be ₹45.50 million. Non-Cash charges includes Depreciation of ₹118.97 million that will be offset against Capital Expenditure. The investment in Non-Cash Working Capital is expected to be ₹2.6 million.

$$\begin{aligned} & \text{Y5} \\ & \cdot \\ & g = 4.5\% \text{ in PAT} \\ & \text{PAT} = 293.26 \end{aligned}$$

↳ : No
Op imp.

$$I(t-t) = 45.5$$

$$\text{Depr} = 118.97$$

$$\hookrightarrow \text{NC NC} = (2.6)$$

(a) Term CF
(at y_6)

$$\text{PAT}_-$$

$$I(t-t)$$

$$\text{Depr}$$

$$293.26 \xrightarrow{(1+0.045)} 306.16$$

$$45.5$$

$$118.97$$

$$\hookrightarrow \text{Cap Ex}$$

$$\hookrightarrow \text{NC WC}$$

$$(118.97)$$

$$(2.6)$$

$$f_{eff}$$

$$349.36$$

(b) Term Value (at y_5)

PV of CF from y_6 to ∞

$$= \frac{f_{eff} \cdot f_{eff}}{k_0 - g} = \frac{349.36}{0.10 - 0.045} = \frac{349.36}{0.055}$$

$$= 6352$$

(c) PV of TV (at y_0)

$$= \frac{TV}{(1+k_0)^5} = \frac{6352}{(1.1)^5} = 3944.09$$

Q10

Assuming the Discount rate of 10%.

You are required to calculate

- (a) Terminal Cash Flows (Y_6)
 (b) Terminal Value $(Y_5) \Rightarrow [Y_6 \rightarrow \infty]$
 (c) Present Value of Terminal Value
 $\Rightarrow [Y_0]$

Reference**FCFF****What's New****Two Phase**

- Depn affects Capex
- No operating trap
- growth is in Ppts

Answer

Particulars	Workings	Amount (` Million)
Net profit After Tax	293.26×1.045	306.46
Add: Net Non-Cash Charges (Depreciation)		118.97
Add: Interest Expense $\times (1 - \text{Tax Rate})$		45.50
Less: Capital Expenditure		118.97
Less: Investment in Non-Cash Working Capital		2.60
Terminal Cash Flows		349.36
Terminal Value	$349.36 / (0.10 - 0.045)$	6374.59
PV of Terminal Value	$6374.59 / (1.1^5)$	3944.09

Q18 Ex Book No. Pg No -

Strip Fund, an Indian-based globally diversified equity mutual fund, is considering adding Alpha Energy Ltd. to its portfolio. Alpha is an independent upstream oil and gas company headquartered in Delhi. It is one of the largest oil and gas companies in India and has operations in several countries. Vivek Anand, an analyst at the mutual fund, has been assigned the task of estimating a fair value of Alpha. Anand is aware of several approaches that could be used for this purpose. After carefully considering the characteristics of the company and its competitors, he believes the company will have extraordinary growth for the next few years and normal growth thereafter. So, he has concluded that a two-stage FCFF model is the most appropriate for valuing the stock.

2 phase fcff

The Free Cash Flows to the firm during 2016, 2017 and 2018 have been ₹ 114, ₹ 150, and ₹ 175, respectively. These imply a growth rate of 31.57 percent in 2017 and 16.66 percent in 2018. Anand believes that the growth rate will be 14 percent in the next year. He has estimated that the first stage will include the next eight years.

2016	FCFF
2017	150
2018	175

2019 ITS (1.14)¹

ITS (1.14)²

$$r_e = R_f + (R_m - R_f) \times \beta$$

$$\begin{aligned} \beta &= 0.84 \\ R_f &= 4.1\% \\ R_m - R_f &= 5.5\% \end{aligned}$$

Anand is using the CAPM to estimate the required return on equity for Alpha. He has estimated that the beta of Alpha as measured against the BSE Index is 0.84. The Indian risk-free rate, as measured by the annual yield on the 10-year government bond, is 4.1 percent. The equity risk premium for the Indian market is estimated at 5.5 percent. Based on these data, Anand has estimated that the required return on Alpha stock is $4.1 + 0.84(0.055) = 0.0872$ or 8.72 percent. Anand is doing the analysis in January 2009 and the stock price at that time is ₹ 2500.

Anand realizes that even within the two-stage FCFF model, there could be some variations in the approach. He would like to explore how these variations affect the valuation of the stock. Specifically, he wants to estimate the value of the stock for each of the following approaches separately.

- App 1**
- The growth rate will be 14 percent throughout the first stage of eight years. The growth rate thereafter will be 7 percent.
- App 2**
- Instead of using the estimated stable growth rate of 7 percent in the second stage, Anand wants to use his estimate that eight years later Austen's stock will be worth 17 times its share price.
- App 3**
- In contrast to the first approach above in which the growth rate declines abruptly from 14 percent in the eighth year to 7 percent in the ninth, the growth rate would decline linearly from 14 percent in the first year to 7 percent in the ninth.

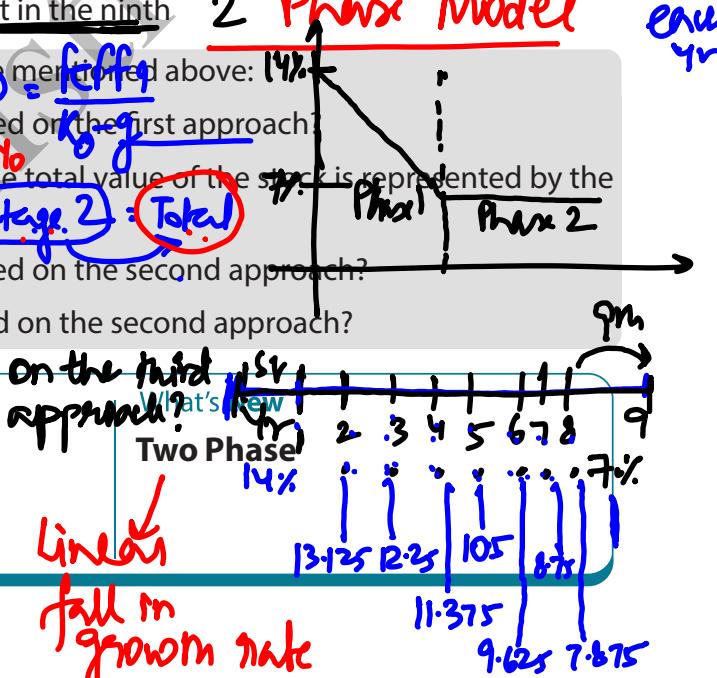
Solve the following questions related to the case mentioned above:

- What is the terminal value of the stock based on the first approach?
- In the first approach, what proportion of the total value of the stock is represented by the value of second stage?
- What is the terminal value of the stock based on the second approach?
- What is the current value of the stock based on the second approach?

5. What is the current value based on the third approach?

Reference

$$\text{FCFF} \quad \frac{14 - 7}{8} = 0.875$$



Answer

- The following table provides the calculations needed to compute the value of the stock using the first approach, including the calculations for the terminal value V8. As the table shows, the terminal value V8 = ₹31.0550.

Time	Value	Calculation	FCFF(t)	PV of FCFF
1	Fcff 1	175×1.14	199.5	183.50
2	Fcff 2	$175 \times (1.14)^2$	227.43	192.41
3	Fcff 3	$175 \times (1.14)^3$	259.27	201.75

Solution to Q18 Pg -

part (i)

Approach 1: Terminal Value (V_8)

<u>Yr</u>	<u>FCFF</u>	<u>DF $\frac{1}{(1+g)^t}$</u>	<u>PV</u>
1	$175(1.14) = 199.5$	0.920	183.54 M ⁺
2	$175(1.14)^2 = 227.43$	0.846	192.41
3	$175(1.14)^3 = 259.27$	0.778	201.7
4	$175(1.14)^4 = 295.57$	0.716	211.63
5	$175(1.14)^5 = 336.95$	0.658	221.71
6	$175(1.14)^6 = 384.12$	0.606	232.78
7	$175(1.14)^7 = 437.90$	0.557	243.91
8	$175(1.14)^8 = 499.20$	<u>0.512</u>	<u>$\frac{255.59}{1743.28}$</u> MRC

Value of
Phase I

TV = V_8 = PV of Y_9 to ∞

$$= \frac{FCffq}{k_0 - g}$$

$FCffq = f_{effg}(1+g)$
 $= 499.2(1+0.07)$
 $= 534.14$

$$= \frac{534.14}{0.0872 - 0.07}$$

$k_0 = k_e = 8.72\%$

$$= 31054.88$$

Part II) Approach 1 : Total Value of Stock

$$\text{Stage 1} = \text{Value of Stock} = 1743.28$$

$$\text{Stage 2} \Rightarrow TV_8 = 31054.88$$

$$V_0 = \frac{31054.88}{(1.0872)^8}$$

$$= \frac{31054.88 \times 0.512}{17,643}$$

$$= \underline{\underline{15,900}}$$

$$\text{Prof'n of Value from Stage 2} = \frac{15900}{17643} = 90.12\%$$

Part (ii)

Approach 2: TV of Stock (V_8)

$$V_8 = 17 \times 2,500 = \text{£ } 42,500$$

part (iv)

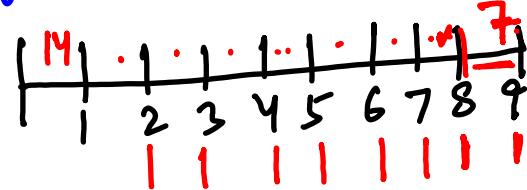
Approach 2: Current Value of Stock (V_0)

$$V_0 = \frac{42500}{(1+0.0872)^8} = \frac{42500 \times 0.572}{= \text{£ } 21,760}$$

Part (v)

Approach 3: Total Value

Growth rate is falling linearly from 1st yr to 9th yr
 from 14% to 7% over 8 yrs



$$\text{fall in 'g'} = \frac{14 - 7}{8} = 0.875\% \text{ each yr}$$

<u>Phase</u>	<u>Yr</u>	<u>g</u>	<u>F_{eff}</u>	<u>DF</u> (8.72%)	<u>PV</u>
	1	14%	$175 \times 1.14 = 199.5$	0.920	183.54
2	2	$14 - 0.875 = 13.125\%$	$199.5 \times 1.125 = 225.68$	0.846	190.93
3	3	$13.125 - 0.875 = 12.25\%$	$225.68 \times 1.125 = 253.33$	0.778	197.09
4	4	$12.25 - 0.875 = 11.375\%$	$253.33 \times 1.11375 = 282.15$	0.716	202.02

5	$11.375 - 0.875$ $= 10.5\%$	282.15×1.105 $= 311.77$	0.658	205.14
6	$10.5 - 0.875$ $= 9.625\%$	311.77×1.09625 $= 341.78$	0.606	207.12
7	$9.625 - 0.875$ $= 8.75\%$	341.78×1.0875 $= 371.69$	0.557	207.03
8	$8.75 - 0.875$ $= 7.875\%$	371.69×1.07875 $= 400.96$	0.512	205.29

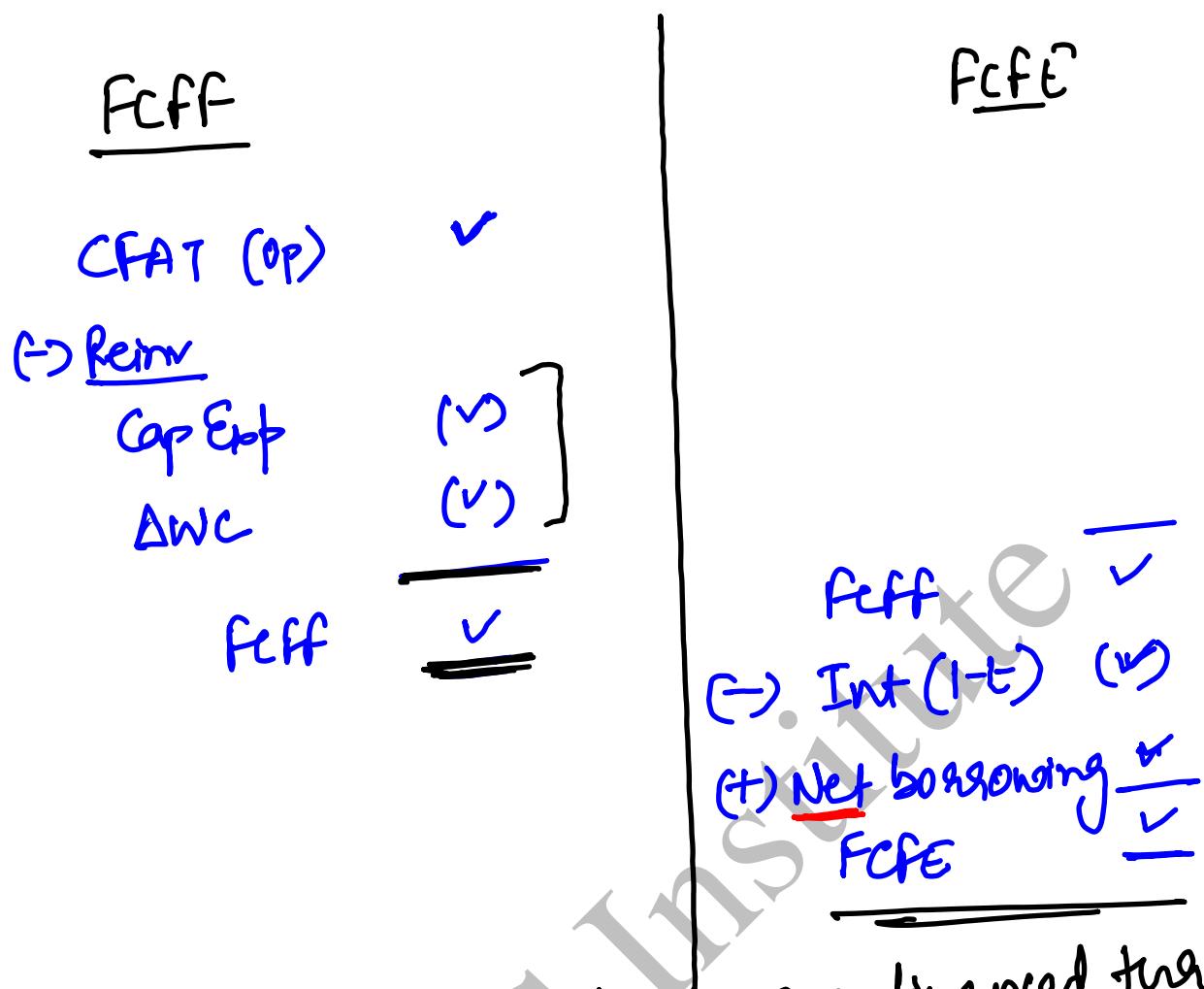
9 77.

$$\text{Phase 2} \Rightarrow V_0 = \frac{\text{FCFF}_0}{k_0 - g} = \frac{400.96(1+0.07)}{0.0872 - 0.07} = 24,943.44$$

$$V_0 = 24,943.44 \times 0.512 = 12,771.04$$

$$\therefore \text{Value of Stock} = 1598.16 + 12,771.04 \\ \underline{\underline{=}} 14,369.20$$

(b) Free Cash flow for Equity (FCFE)



If a portion of reinvestment are financed through net borrowings, the cash flow for equity shareholders will increase.

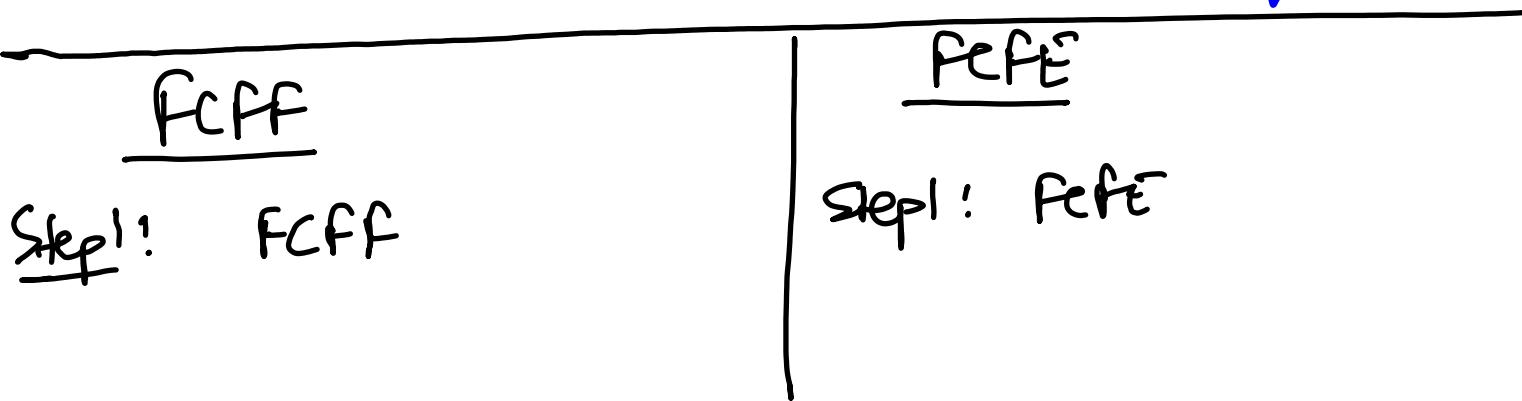
As the disc rate used with FCFE is 'ke', the effect of net interest is adjusted from FCFE itself as an outflow.

Other ways to Compute FCFE

$$\begin{aligned}
 \underline{\text{FCFE}} &= \text{FCFF} - I(1-t) + \text{Net Borrowings} \\
 &= (\text{CIFAT} - \text{Reinv}) - I(1-t) + \text{Net bor} \\
 &= \text{CIFAT} - I(1-t) - [\underbrace{\text{Reinv} - \text{Net bor}}_{\text{Net return from equity sh holder funds}}] \\
 &\quad \downarrow \\
 &= \underline{\text{Op PAT} + \text{Depn}} - I(1-t) - [\underline{\text{Cap Ex} + \Delta \text{WC} - \text{Net Bor}}] \\
 &= \text{PAT}_{\text{(after int)}} - [\underbrace{(\text{Cap Ex} - \text{Depn}) + \Delta \text{WC}}_{\text{Reinv}} - \text{Net Bor}] \\
 &= \boxed{\text{PAT}_{\text{after int}} - [(\text{Cap Ex} - \text{Depn}) + \Delta \text{WC}] \left(1 - \frac{\text{Debt ratio}}{\text{Equity}}$$

Net borrowing :-

$$\text{New Debt Issued} - \text{Debt Repaid} + \frac{\text{Net Issue}}{\text{of Pref Sh}} - \text{Pref dividend}$$



Step 2: Disc rate = k_0

Step 3: $V_{\text{firm}} = \frac{\text{FCFF}}{k_0}$

$$= \frac{\text{FCFF}(1+g)}{k_0 - g}$$

= Two Phase Model

Step 2 :- k_e

Step 3: V_E = (Value of Equity)

$$= \frac{\text{FCFE}}{k_e}$$

[or]

$$\frac{\text{FCFE}(1+g)}{k_e - g}$$

[or]

Two Phase Model

Step 4

Value of Equity

$$= \text{Value of firm} - \text{Value of debt}$$

$$\boxed{\text{Value of Debt} = \frac{I(1-t)}{\alpha_d}}$$

$= \text{BV of Debt}$

Step 4 Value of firm

$$= \text{Value of Equity} + \text{Value of Debt}$$

4	Fcff 4	$175 \times (1.14)^4$	295.57	211.55
5	Fcff 5	$175 \times (1.14)^5$	336.95	221.83
6	Fcff 6	$175 \times (1.14)^6$	384.12	232.60
7	Fcff 7	$175 \times (1.14)^7$	437.90	243.90
8	Fcff 8	$175 \times (1.14)^8$	499.20	255.74
8	Fcff 8	{ $175 \times (1.14)^8 \times (1.07)}/(0.0872 - 0.07)$	31055.01	15909.48
Total				17652.78

(2) As shown in the above table, the value of the second stage = PV of V8 = ₹ 15909.48. The total value is ₹ 17652.78. As a proportion, the second stage represents $15909.48/17652.78 = 0.90$ of the total value.

(3) **the terminal value of the stock based on the second approach**

the stock price is ₹ 2500.

Austen's stock will be worth 17 times its share price.

So, the terminal value = 2500×17

$$= ₹ 42,500.$$

(4) As computed earlier, $V_8 = 17 \times 2500 = ₹ 42500$.

$$PV \text{ of } V_8 = 42500/1.0872^8 = 21772.754$$

From the table with the calculation details, Sum of PV of FCFF 1 through FCFF 8 = 1743.3

$$\text{So, the value of stock } V_0 = 21772.754 + 1743.3 = ₹ 23516.05.$$

Q19

The following information is available for Panther Ltd.

Particulars	0	1	2	3	4	5	6	7-10
Revenue (INR Million)	25.00	33.15	✓	✓	✓	✓	✓	
Revenue Growth (%)		35.0%	30.0%	25.0%	20.0%	15.0%	10.0%	
Net profit Margin (%) (PAT after tax)		8.5%	8.0%	7.5%	7.0%	6.5%	6.0%	
Capital Expenditure as a % of Increase in Sales (adjusted for Depreciation) (Cap Ex - Depn)	25.0%	8.75 x 2.7 = 2.19						
Investment in Working Capital as a % of Increase in Sales	8.0%	8.75 x 8% = 0.7						
Long Term constant growth rate	6.0%	-	-	-	-	-	-	16%
Cost of Equity	13.0%							
Debt Ratio	30.0%							

Compute Value of Equity using FCFE

Soln to Q 19 Pg -

Particulars	Phase 1					7
	1	2	3	4	5	
Revenue	(257135) (33.75 x 130%) = 33.75	(33.75 x 125%) 43.88	(43.88 x 120%) 54.85	(54.85 x 115%) 65.82	(65.82 x 110%) 75.69	(75.69 x 110%) 83.26
Net Profit (PAT after Int)	(33.75 x 8.5%) 2.87	(43.88 x 8%) 3.51	(54.85 x 7.5%) 4.11	(65.82 x 7%) 4.61	(75.69 x 6.5%) 4.92	(83.26 x 6%) 5.00
Reinv						
Net CapEx (CapEx - Dep)	(33.75 - 25) x 25% = 2.19	(43.88 - 33.75) x 25% = 2.53	(54.85 - 43.88) x 25% = 2.74	(65.82 - 54.85) x 25% = 2.74	(75.69 - 65.82) x 25% = 2.47	(83.26 - 75.69) x 25% = 1.89
Inc in WC	(33.75 - 25) x 8% = 0.7	0.81	0.88	0.88	0.79	0.60
Total Reinv	2.89	3.34	3.62	3.62	3.26	2.49
→ Net borrowing (30%)	(0.87)	(1.00)	(1.09)	(1.09)	(0.98)	(0.75)
Net Reinv	2.02	2.34	2.53	2.53	2.28	1.74
FCFE	(2.87 - 2.02)					
(PAT - Net Reinv)	= 0.85	1.17	1.58	2.08	2.64	3.26
DF @ $k_p = 13\%$.	0.885	0.783	0.693	0.613	0.543	0.480
PV of fcfE	0.75	0.92	1.09	1.28	1.43	1.56
Total:	7.04					

Phase 2

$$\begin{aligned}
 \text{Phase 2 : } TV_6 &= \frac{FCFE_7}{k_e - g} \\
 &= \frac{FCFE_6(1+g)}{k_e - g} \\
 &= \frac{3.26(1+0.06)}{0.13 - 0.06} = 49.37
 \end{aligned}$$

$$PV_0 = 49.37 \times 0.480 = 23.70$$

$$\begin{aligned}
 \therefore \text{Value of Equity} &= \text{Phase 1} + \text{Phase 2} \\
 &= 7.04 + 23.70 \\
 &= \underline{\underline{30.74}}
 \end{aligned}$$

$$\text{OK Phase 1} = Y_1 \text{ to } Y_5 = PV : \quad \checkmark$$

$$\text{Phase 2} = Y_6 \text{ to } \infty = \frac{3.26}{0.13 - 0.06} = \checkmark$$

0	1	2
Price CF	g	
5	6	7

$$Y_0 = \quad = \quad \checkmark$$

~~✓~~

\therefore disc rate is same in both phases

Reference
Value of Equity - FCFE
What's New

Debt Ratio

Answer

Particulars (₹ Million)	0	1	2	3	4	5	Terminal
Revenue	25.00	33.75	43.88	54.84	65.81	75.68	83.25
Net Profit		2.87	3.51	4.11	4.61	4.92	5.00
Less: Capital Expenditure		2.19	2.53	2.74	2.74	2.47	1.89
Less: Investment in Working Capital		0.70	0.81	0.88	0.88	0.79	0.61
Add: Net Borrowing (Note 1)		0.87	1.00	1.09	1.09	0.98	0.75
FCFE		0.85	1.17	1.58	2.07	2.64	3.25
Terminal Value (Note 2)							46.38
PV Factor @ 13%	0.885	0.783	0.693	0.613	0.543		
PV of Cash Flows	0.750	0.917	1.095	1.272	26.609		
Value of Equity	30.642						

Note 1:

Net Borrowing is calculated as (Capital Expenditure + Working Capital Investment) x Debt Ratio

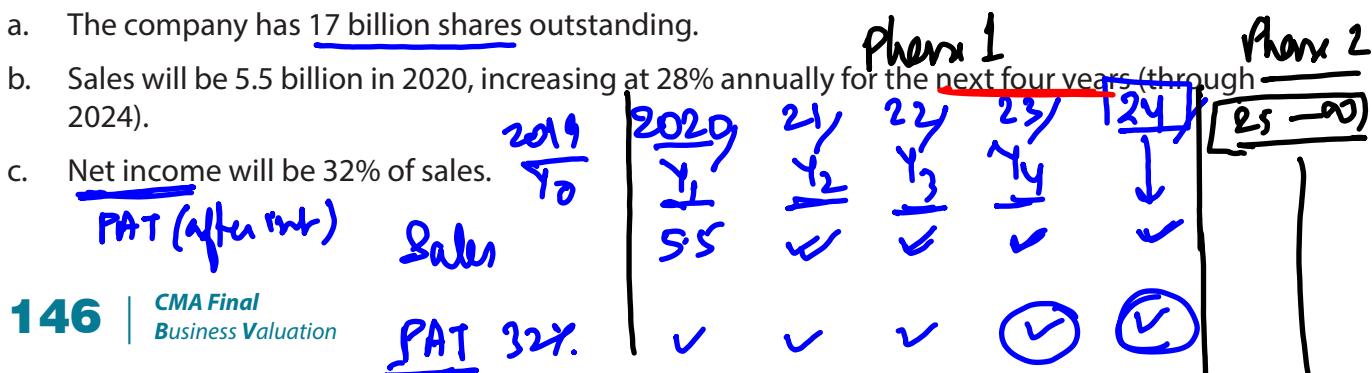
Note 2:

Terminal Value is calculated as FCFE for 6th Year discounted at ($K_e - g$) i.e., $3.25 / (0.13 - 0.06) = 46.38$. This value is arrived at Year 5.

(Q) 20

Quinton Johnston is evaluating TMI Manufacturing Company, Ltd., which is headquartered in Taiwan. In 2019, when Johnston is performing his analysis, the company is unprofitable. Furthermore, TMI pays no dividends on its common shares. Johnston decides to value TMI Manufacturing by using his forecasts of FCFE. Johnston gathers the following facts and assumptions.

- The company has 17 billion shares outstanding.
- Sales will be 5.5 billion in 2020, increasing at 28% annually for the next four years (through 2024).
- Net income will be 32% of sales.



$NC = 6\%$ $Net book (20\%)$

- d. Investment in fixed assets will be 35% of sales; investment in working capital will be 6% of sales; depreciation will be 9% of sales.

- e. 20% of the investment in assets will be financed with debt.

- f. Interest expenses will be only 2% of sales.

- g. The tax rate will be 10%. TMI Manufacturing's beta is 2.1; the risk-free government bond rate is 6.4%; the equity risk premium is 5%.

- h. At the end of 2024, Johnston projects TMI will sell for 18 times earnings.

$$TV = 18 \times PAT_{2024}$$

What is the value of one ordinary share of TMI Manufacturing Company?

Reference

Free Cash Flow for Equity

What's New

2 phase

Answer

The required rate of return found with the CAPM is

$$k_e = R_f + (R_m - R_f) \times \beta$$

$$k_e = 6.4\% + 5\% \times 2.1$$

$$k_e = 16.9\%$$

The following table shows the values of sales, net income, capital expenditures less depreciation, and investments in working capital. FCFE equals net income less the investments financed with equity:

$FCFF = \text{Net income} - (1 - DR) (\text{Capital Expenditure} - \text{Depreciation}) - (1 - DR) (\text{Investment in Working Capital})$

Where DR is the Debt Ratio (debt financing as a percentage of debt and equity). Because 20 percent of new investments are financed with debt, 80 percent of the investments are financed with equity, which reduces FCFE by 80 percent of (Capital expenditures – Depreciation) and 80 percent of the investment in working capital.

Particulars (in billions)	2020	2021	2022	2023	2024
Sales (growing at 28%)	5.5	7.04	9.01	11.53	14.76
Net income = 32% of sales	1.760	2.253	2.884	3.691	4.724
Investment in Fixed asset - Dep = $(35\% - 9\%) \times \text{sales}$	1.43	1.830	2.343	2.999	3.839
Working capital investment = 6% of sales	0.33	0.422	0.541	0.692	0.886
.80 × (Investment in Fixed asset – Dep + Working capital investment)	1.408	1.802	2.307	2.953	3.780

Solution to Q20 Pg -

<u>Phase I</u>	St	St	FCFE		₹ in billion
<u>Particulars</u>	<u>2020</u> y_1	<u>2021</u> y_2	<u>2022</u> y_3	<u>2023</u> y_4	<u>2024</u> y_5
Sales	5.5	$(5.5 \times 12\%)$	$(7.04 \times 12\%)$	$(9.01 \times 12\%)$	$(11.53 \times 12\%)$
PAT (32% of Sales)	1.76	2.25	2.88	3.69	4.72
(-) Reinvestment [Cap Exp - Depn] $(35\% - 9\%) = 26\%$ of Sales	1.43	1.83	2.34	3	3.84
Inc in WC (6% of Sales)	0.33	0.42	0.54	0.69	0.89
Total Revn	1.76	2.25	2.88	3.69	4.73
(+) Net b/w (20% of Revn)	(0.352)	(0.45)	(0.58)	(0.79)	(0.95)
Net Revn	1.408	1.8	2.3	2.95	3.78
FCFE = (PAT - Net Revn)	0.352	0.45	0.58	0.74	0.94
DF @ 16.9%	0.855	0.732	0.626	0.535	<u>0.458</u>
PV of FCFE	0.30	0.33	0.36	0.40	0.43
				Total = 1.82	

Phase 2

$$\begin{aligned}TV_{2024} &= \underline{TV_5} = 18 \times PAT_{2024} \\&= 18 \times 4.72 \\&= 84.96\end{aligned}$$

$$TV_0 = 84.96 \times 0.458 = 38.91$$

$$\therefore \text{Value of Equity} = 1.82 + 38.91 = 40.73 \text{ (billion ₹)}$$

$$\text{Value / Eq Share} = \frac{40.73}{17} = ₹2.40/\text{share}$$

Note 1 $\underline{K_e} = \text{CAPM}$

$$\begin{aligned}&= R_f + (R_m - R_f) \times \beta \\&\Rightarrow 6.4 + 5 \times 2.1 \\&= 16.9 \%\end{aligned}$$

FCFE = Net income - .80 x (Investment in Fixed asset - Dep + Working capital investment)	0.352	0.451	0.577	0.738	0.945
PV of FCFE discounted at 16.9%	0.302	0.333	0.360	0.402	0.442
Terminal Value (4.724×18)					85.04
PV of Terminal Value discounted at 16.9%					39.7979
Total PV of FCFE					1.845
Total value of firm					41.643

The present value of the terminal value plus PV of first five year's FCFE is ~~41.643~~ billion. Because TMI Manufacturing has 17 billion outstanding shares, the value per ordinary share is ~~₹ 2.45~~.

H.W Q 21

An aggressive financial planner who claims to have a superior method for picking undervalued stocks is courting one of your clients. The planner claims that the best way to find the value of the stock is to divide EBITDA by the risk-free bond rate. The planner is urging your client to invest in NewMarket, Inc. The planner says that NewMarket's EBITDA of 1,580 million divided by the long-term government bond rate of 7% gives a total value of 22,571.4 million. With 318 million outstanding shares, NewMarket's value per share found by using this method is ₹ 70.98. Shares of NewMarket currently trade for 36.50

A. **Provide** your client with an alternative estimate of NewMarket's value per share based on a two-stage FCFE valuation approach. Use the following assumptions:

- Net income is currently ₹ 600 million. Net income will grow by 20% annually for the next three years. $\text{PAT} \rightarrow Y_0$ $\text{PAT } 600 \rightarrow Y_1$ $720 \rightarrow Y_2$ $864 \rightarrow Y_3$
- The net investment in operating assets (capital expenditure less depreciation plus investment in working capital) will be 1,150 million next year and grow at 15% for the following two years.
- 40% of the net investment in operating assets will be financed with new debt financing. $\text{PAT} \rightarrow Y_0$ $\text{Net Inv} \rightarrow Y_1$ $1150 \rightarrow Y_2$ $1322.5 \rightarrow Y_3$
- NewMarket's beta is 1.3; the risk-free bond rate is 7%; the equity risk premium is 4%. $\beta = 1.3$ $R_f = 7\%$ $EPR = 4\%$

After three years, the growth rate of net income will be 8% and the net investment in operating assets (capital expenditures minus depreciation plus increase in working capital) each year will drop to 30% of net income.

Debt is, and will continue to be, 40% of total assets.

NewMarket has 318 million shares outstanding.

B. **Criticize** the valuation approach that the aggressive financial planner used.

1. Interest
2. Taxes
3. Return
4. Bond Rate
5. Cost not rep eq sh holders

$$TV_0 = \frac{C_{F4}}{R_e - g} = \frac{C_{F4}}{10\% - 8\%} = \frac{C_{F4}}{2\%}$$

Reference**Free Cash Flow for Equity****What's New****Answer**

- A. The required rate of return found with the CAPM is

$$k_e = R_f + (R_m - R_f) \times \beta$$

$$k_e = 7\% + 4\% \times 1.3$$

$$k_e = 12.2\%$$

To estimate FCFE, we use Equation 15:

$$\text{FCFE} = \text{Net income} - (1 - \text{DR}) (\text{FCInv} - \text{Depreciation}) - (1 - \text{DR}) (\text{WCInv})$$

Which can be written

$$\text{FCFE} = \text{Net income} - (1 - \text{DR}) (\text{FCInv} - \text{Depreciation} + \text{WCInv})$$

$$= \text{Net income} - (1 - \text{DR}) (\text{Net investment in operating assets})$$

The following table shows that net income grows at 20% annually for Years 1,2 and 3 and then grows at 8% for Year 4. The net investment in operating assets is ₹ 1,150 million in year 1 and grows at 15% annually for Years 2 and 3. Debt Financing is 40% of this investment. FCFE is Net Income – Net investment in operating assets + New Debt financing. Finally, the present value of FCFE for years 1,2 and 3 is found by discounting at 12.2%.

Particulars	Year 1	Year 2	Year 3	Year 4
Net Income	720	864	1036.8	1119.744
Net Investing in operating assets	1150	1322.50	1520.88	335.92
New Debt Financing	460	529	608.35	134.37
FCFE	30	70.5	124.28	918.19
PV of FCFE discounted at 12.2%	26.74	56.00	87.98	

In year 4, net income is 8% larger than in year 3. In year 4, the investment in operating assets is 30% of net income and debt financing is 40% of this investment. The FCFE in year 4 is 918.19 million. The value of FCFE after year 3 is found by using the constant-growth model;

$$V = \frac{\text{FCFE}_4}{r - g} = \frac{918.19}{0.122 - 0.08} = 21,861.67 \text{ million}$$

The present value discounted at 12.2% is ₹ 15,477.64 million. The total value of equity, the present value of the first three year's FCFE plus the present value of Terminal Value is 15,648.36 million. Dividing this by the number of outstanding shares (318 million) gives a value of per share of ₹ 49.21. For the first three years, NewMarket has a small FCFE because

Zabardast

Notes

FCFF

	<u>Op CFAT</u>	<u>CFO</u>
PAT		
(+) I (1-t)		
(+) Depn / Net Cash Exp		
(-) Inv in WC		
(-) Cap Ex		

$$[(\text{FO} + \text{I}(1-t)) - \text{Cap. Ex}]$$

When it
is treated as
Op item

FcFE

<u>fcff</u>	<u>(✓)</u>
<u>(-) I (1-t)</u>	<u>(✓)</u>
<u>(+) Net b orn</u>	<u>✓</u>

CFS

(1) CF from Op Activities

PAT		
(+) PFI	[will set off tax paid]	
(+) Int		
(+) Non Cash Exp (Depn)		
FFO		
(-) Inv in WC		
CFO		
(-) Tax Paid		
Net CFO		

(2) CF from Inv Act

CapEx { Purch. of FA
- Sale

(3) CF from Fin Act

Int paid
Loan taken

Assuming Int is a fin item

FcFE

$$\begin{aligned} \text{FcFE} &= [\underline{\text{CFO}} - \underline{\text{Cap Ex}}] - \underline{\text{I}(1-t)} \\ &\quad + \text{Net b orn} \\ &= \underline{\text{CFO}} - \underline{\text{I}(1-t)} - \underline{\text{Cap Ex}} \\ &\quad + \text{Net b orn} \end{aligned}$$

FCFE (assuming Int is an operating item in CFS)

$$= [CFO + I(1-t) - \text{CapEx}] - I(1-t) + \text{Net Borrow}$$

$$= \boxed{CFO - \text{CapEx} + \text{Net borrow}} \quad \checkmark$$

QRS, assume Int is an Op item in CFS

2. FCFE is preferred when:-

- (a) Controlling Interest
- (b) Dividend not paid upto full capacity
- (c) Stable Capital structure

Int is fin item

$$FCFF = CFO - \text{CapEx}$$

$$FCFE = CFO - I(1-t) - \text{CapEx} + \text{Net borrow}$$

Int is op item

$$FCFF = CFO + \underline{I(1-t)} - \text{CapEx}$$

$$FCFE = \textcircled{CFO} - \underline{\text{CapEx}} + \underline{\text{Net borrow}}$$

of the large investment it is making during high-growth phase. In the normal growth phase, FCFE is much larger because the investments required are much smaller.

- B. The planner's estimate of the share value of ₹ 70.98 is much higher than the FCFF model estimate of ₹ 49.21 for several reasons. **First, taxes and interest expenses** have a prior claim to the company's cashflow and should be taken out of the cashflows used in estimating the value of equity because these amounts are not available to equity shareholders. The planner did not do this.

Second, EBITDA does not account for the company's **reinvestments** in operating assets. So, EBITDA overstates the funds available to stockholders if reinvestment needs exceed depreciation charges, which is the case for growing companies such as NewMarket.

Third, EBITDA does not account for the **company's capital structure**. Using **EBITDA** to represent a benefit to stockholders (as opposed to stockholders and bondholders combined) is a mistake.

Finally, dividing EBITDA by the **bond rate** commits a major error. The risk-free bond rate is an inappropriate discount rate for risky equity cash flows; the proper measure is the required rate of return on the company's equity. Dividing by a fixed perpetuity. EBITDA cannot be perpetual stream because if it were distributed, the stream would eventually decline to zero (lacking capital investments). NewMarket is actually a growing company, so assuming it to be a non-growing perpetuity is a mistake.

Q22

Parvati Tiwari manages a dividend growth strategy for a large asset management firm. Tiwari meets with her investment team to discuss potential investments in three companies: Company A, Company B, and Company C. Statements of cash flow for the three companies are presented in Exhibit 1.

Exhibit 1. Statements of Cashflow, Most Recent Fiscal Year End (Amounts in Millions)

	Company A	Company B	Company C
Cash Flow from Operating Activities			
Net Income	4,844	1,212	15,409
Adjustments			
Depreciation	500	288	3,746
Other non-cash expenses	(3,000)	—	—
Changes in working capital			
(Increase) Decrease accounts	(452)	(150)	(536)
(Increase) Decrease inventories	—	(200)	(803)
Increase (Decrease) accounts payable	(210)	100	(3)
Increase (Decrease) other current	540	14	350

Net cash from operating activities	<i>- CFFO</i>	6,222	1,264	18,163
Cash Flow from Investing Activities				
(Purchase) Sale of fixed assets	<i>Cap Ex</i>	✓ 2,379	(1,000)	(3,463)
Net cash from investing activities		2,379	(1,000)	(3,463)
Cash Flow from Financing Activities				
Increase (Decrease) notes payable	<i>Net long</i>	25	3000	1,238
Increase (Decrease) long-term debt		(1,500)	(1,000)	(1,379)
Payment of common stock dividends		(1,000)	(237)	(15,000)
Net cash from financing activities		(2,475)	1,763	(15,141)
Net change in cash and cash equivalents		6,126	2,027	(441)
Cash and equivalents at beginning of year		50	100	3,000
Cash and equivalents at end of year		6,176	2,127	2,559
Supplemental Cash Flow Disclosures				
Interest		(353)	(50)	(552)
Income taxes	<i>] assumed up item</i>	(1,605)	(648)	(3,787)

Tiwari's team first discusses key characteristics of Company A. The company has a history of paying modest dividends relative to FCFE, has a stable capital structure, and is owned by a controlling investor.

The team also considers the impact of Company A's three non-cash transactions in the most recent year on its FCFE, including the following:

Transaction 1: A ₹ 900 million loss on a sale of equipment

(+) 900

Transaction 2: An impairment of intangibles of ₹ 400 million

(+) 400

Transaction 3: A ₹ 300 million reversal of a previously recorded restructuring charge

(-) 300

In addition, Company A's annual report indicates that the firm expects to incur additional non-cash charges related to restructuring over the next few years.

To value the three companies' shares, one team member suggests valuing the companies' shares using net income as a proxy for FCFE. Another team member proposes forecasting FCFE using a sales-based methodology based on the following equation:

$$\text{FCFE} = \text{NI} - (1 - \text{DR}) (\text{FCInv} - \text{Dep}) - (1 - \text{DR}) (\text{WCInv})$$

$$\rightarrow \text{FCFE} = \text{PAT} - \text{ReInv} + \text{NetInv} \\ = \text{PAT} - (\text{ReInv}) / (1 - \text{Debt Ratio})$$

Tiwari's team ultimately decides to use actual free cash flow to value the three companies' shares. Selected data and assumptions are provided in Exhibit 2.

*Only Non
Cash item
is Depn*

Exhibit 2. Supplemental Data and Valuation Assumptions

	Company A	Company B	Company C
Tax rate .	35%	35%	30%
Beta .	1.00	0.90	1.10
Before-tax cost of debt .	6%	7%	6%
Target debt ratio .	50%	30%	40%

Risk-free rate: 3%; Market risk premium: 7%

Co. B

The team calculates the intrinsic value of Company B using a two-stage FCFE model. FCFE growth rates for the first four years are estimated at 10%, 9%, 8%, and 7%, respectively, before declining to a constant 6% starting in the fifth year. Phase 2

Co. C

To calculate the intrinsic value of Company C's equity, the team uses the FCFF approach assuming a singlestage model where FCFF is expected to grow at 5% indefinitely.

FCFF
10%

Solve the following questions related to the case mentioned above:

1. Based on Company A's key characteristics, which discounted cash flow model would most likely be used by the investment team to value Company A's shares?
2. **Which** non-cash transaction should be subtracted from net income in arriving at Company A's FCFE? (300 m)
3. Based on Exhibit 1, Company A's FCFE for the most recent year is **closest to**?
4. Based on Exhibit 1, using net income as a proxy for Company B's FCFE would result in an intrinsic value that is? No calculuⁿ of IV reqd
5. Based on Exhibit 1, using the proposed sales-based methodology to forecast FCFE would produce an inaccurate FCFE projection for which company?

Reference
Free Cash Flow for Equity
What's New
Answer

- (1) Company A has a history of paying modest dividends relative to FCFE. An FCFF or FCFE model provides a better estimate of value over a DDM model when dividends paid differ significantly from the company's capacity to pay dividends. Also, Company A has a controlling investor; with control comes discretion over the uses of free cash flow. Therefore, there is the possibility that the controlling shareholder could change the dividend policy. Finally, Company A has a stable capital structure; using FCFE is a more direct and simpler method to value a company's equity than using FCFF when a company's capital structure is stable.

Sol'n to Q22 Pg -

part(1) for Co. A - FCFE method would be the most appropriate method to value its shares.

FCFE is best when:-

(a) Co. has a controlling shareholder.

As the Controlling shareholder has ability to alter the dividend policy, dividend based valuation would not be appropriate.

(b) Co. is paying modest dividend. It may imply that the Co. is not paying dividend to its full capacity. Hence, div based valuation would not be correct.

(c) Co. is having stable capital structure for which FCFE is more direct & simple.

part(2) To arrive at Co. A's FCFE, reversal of restructuring charges would be subtracted
= ₹ 300m.

part(3)

FCFE of Co. A

Particulars

* (after adj by Non Cash items)

	Amt
Cash from Operations	6,222
(+) Cap Ex / (-) Sale of FA	2,379
(+) Net borrow / (-) Repayment (1500 - 25)	(1,475)
	<u>7,126</u>

Other Non Cash Erf

$$* +900 +400 -300 = 1000$$

part(4)

fcfe of Co. B

CFO

(-) Inv in Cap Ex

(+) Net Borrowing

1,284

(1,000)

2,000

2,264

1,212

Net Inc of Co. B

As Net income is quite lower than FCFE, the intrinsic value will also be lower, if Net income is used as a proxy of FCFE.

part (5) In proposed Sales based approach, Only Depn has been considered as the Non Cash Expenses. As per given details, Co. A has additional non cash expense.

Hence, if the proposed approach for FCFE is used, it will result into very unrealistic value in case of Co. A.

3. Market Approach

Value is taken as a relative value compared with similar assets/co./shares whose price is available.

E.g. Market Info
Co. A = ₹ 100 / share
(MPS)

Earnings / Share = ₹ 20
(EPS)

Co. X \Rightarrow Value / Share = ?

↓
Similar Co. A \rightarrow Price is available
 \rightarrow ₹ 100 / share

Earnings / share : ₹ 30

$$\frac{100}{20} \times 30 = \checkmark$$

P/E Ratio of Co. A \times EPS of Co. X = \checkmark

Steps 1: Search for a similar Co./and/or firm from the market

2. Pick up a basis for adjustment

E.g. Earnings per share $\rightarrow \frac{MPS}{EPS} = P/E \text{ Ratio}$

Sales $\rightarrow \frac{MV}{Sales} = P/S \text{ Ratio}$

BV/share $\rightarrow \frac{MPS}{BV/\text{Sh}} = P/BV \text{ Ratio}$

EBITDA $\rightarrow \frac{MV}{EBITDA} = P/EBITDA \text{ Ratio}$

No. of users $\rightarrow \frac{MV}{No. \text{ of users}} = \text{Price/User}$

3. Adjustment factors can be applied on above ratios by the values -

Reasons: lack of degree of control] - used as discount or
lack of marketability premium

4.

$MV = \text{Ratio} \times \text{Adj factor} \times \frac{\text{Basis}}{\text{of any}} \text{ of the Co. being valued}$

Note 1: When multiple comparable Cos are available :-

We take Avg of all Ratios - (Simple Avg / Weighted Avg)

[Prefer Simple Avg if nothing is mentioned]

Note 2 Relative Valn can be used fully or partly.

Fully \Rightarrow For Value / Share

Partly \Rightarrow For only Phase 1 or Phase 2 (Two stage Model)

$$TV = \text{Ratio} \times \text{Basis}$$

Note 3

Enterprise Value

$$= \text{MV of Equity} + \text{MV of Prefs} + \text{MV of Debt} - \text{Cash} - \text{Short term investments}$$

(EV/EBITDA Ratio may be given \rightarrow Hence, EV concept is reqd)

- (2) The applicable non-cash adjustments to net income in arriving at FCFE are as follows

Non cash Item	Adj to NI	Amount (in millions)
Transaction 1: Loss on sale of equipment	Added back	900
Transaction 2: Impairment of intangibles	Added back	400
Transaction 3: Reversal of restructuring charge	Subtracted	300

In the case of Transaction 1, a loss reduces net income and thus must be added back in arriving at FCFE. Similarly, an impairment of intangibles (Transaction 2) reduces net income and thus must be added back in arriving at FCFE. Transaction 3 (reversal of a restructuring charge) would increase net income and thus must be subtracted in arriving at FCFE.

- (3) FCFE for Company A for the most recent year is calculated as follows:

Net income	₹ 4,844
Plus: Net non-cash charges	₹ 1,500
Less: Investment in working capital	₹ 122
Plus: Proceeds from sale of fixed capital	₹ 2,379
Less: Net borrowing repayment	₹ 1,475
FCFE (millions)	₹ 7,126

Net non-cash charges are found by adding depreciation to other non-cash expenses:

$$\text{₹ 500 million} + \text{₹ 1,000 million} = \text{₹ 1,500 million.}$$

Investment in working capital is calculated by netting the increase in accounts receivable, the decrease in accounts payable, and the increase in other current liabilities:

$$\text{₹ 452 million} - \text{₹ 210 million} + \text{₹ 540 million} = -\text{₹ 122 million (outflow).}$$

Net borrowing repayment is calculated by netting the increase in notes payable and the decrease in longterm debt:

$$\text{₹ 25 million} - \text{₹ 1,500 million} = -\text{₹ 1,475 million (outflow).}$$

- (4) FCFE is significantly higher than net income for Company B: Net income = ₹ 1,212 million.

FCFE for Company B is calculated as

Net income	₹ 1,212
Plus: Net non-cash charges	₹ 288
Less: Investment in WC	₹ 236
Less: Investment in fixed assets	₹ 1,000
Plus: Net borrowing	₹ 2,000
FCFE (millions)	₹ 2,264

Investment in working capital is calculated by adding the increase in accounts receivable, the increase in inventories, the increase in accounts payable, and the increase in other

current liabilities: ₹ (150) million – ₹ 200 million + ₹ 100 million + ₹ 14 million = ₹ (236) million.

Net borrowing is calculated by adding the increase in notes payable to the decrease in long-term debt: ₹3,000 million – ₹ 1,000 million = ₹ 2,000 million.

Therefore, using net income of ₹ 1,212 million as a proxy for FCFE (₹ 2,264 million) for Company B would result in a much lower valuation estimate than if actual FCFE were used.

- (5) In addition to significant non-cash charges other than depreciation in the most recent year, the annual report indicates that Company A expects to recognize additional non-cash charges related to restructuring over the next few years. The given equation for forecasting assumes that the only non-cash charge is depreciation. When the company being analyzed has significant non-cash charges other than depreciation expense, this sales-based methodology will result in a less accurate estimate of FCFE than one obtained by forecasting all the individual components of FCFE.

3. RELATIVE VALUATION / COMPARABLE COMPANIES MULTIPLE METHOD

The market approach provides an indication of value by comparing the asset with identical or comparable (that is similar) assets for which price information is available. This approach is also known as Relative Valuation approach.

When should Market approach be applied?

The market approach should be applied and afforded significant weight under the following circumstances:

- the subject asset has recently been sold in a transaction appropriate for consideration under the basis of value,
- the subject asset or substantially similar assets are actively publicly traded, and/or
- there are frequent and/or recent observable transactions in substantially similar assets.

In some instances, a valuer may consider using other valuation approaches instead of Market approach or in combination with Market approach, such as:

- the business to be valued or its market comparable are not traded in the active market.
- where the business has fewer identical or comparable assets (market comparable).
- sufficient information on the comparable transaction is not available.
- there is no recent transaction either in the business or in the market comparable; or
- there are material differences between the business to be valued and the market comparable, which require significant adjustments.

Methods of Valuation under Market Approach

There are two basic types of market multiple models that can be used to estimate values.

- In the first type, the ratio of stock price to such fundamentals as earnings, sales, book value, or cash flow per share is used to identify a company's value.
- The second type of market multiple models is based on the ratio of enterprise value to either earnings before interest, taxes, depreciation, and amortization (EBITDA) or revenue.

Enterprise Value = MV of Equity – Cash – Short Term Investments + Value of Debt + Value of Preference Shares

Value of Equity = Enterprise Value – Value of Liabilities – Value of Preference Shares

Q23

Ashiana Ltd currently earns a Revenue of INR 20 million. It is expected to grow at a compounded Annual Growth Rate of 15 % for the next 5 years. After 5 years, it is expected that comparable companies will trade at a Price to Sales Multiple of 6x. Calculate the Terminal Value. What is the Present Value of Terminal Value assuming a discount rate of 14 %?

Reference Relative Value Multiple - Price to Sales	$\frac{P/S}{S} = 6$ $Sales = 20 \times (1.15)^5 = 45$ $P/S = 45 \times 6 = 270$ $Price = 270 \times 0.5194 = 140.23$
---	---

Answer

The expected Revenue of Ashiana Ltd after 5 years is given by $20 \times 1.15^5 = 20 \times 2.0114$ that is, ₹40.23 million.

Given the P/Sales Multiple of 6x, the Terminal Value is given by $40.23 \times 6 = ₹241.38$ million.

$$PV \text{ of Terminal Value} = \frac{241.38}{(1.41)^5} = 241.38 \times 0.5194 = ₹125.37 \text{ million}$$

EARNINGS MULTIPLE (PRICE / EARNINGS RATIO)

The P/E ratio (price-to-earnings ratio) of a company (also called its "P/E") is a measure of the price paid for a share relative to the annual net income or profit earned by the company per share. It is a financial ratio used for valuation: a higher P/E ratio means that investors are paying more for each unit of net income, so the stock is more expensive compared to one with lower P/E ratio. The P/E ratio indicates the number of years of earnings to pay back purchase price, ignoring the time value of money. In other words, P/E ratio shows current investor demand for a company share.

Soln to Q23 Pg -

1. P/S Ratio of Comparable Co. is 6 times

2. Revenue after 5 years of Ashiana Ltd

$$= .20(1+0.15)^5$$

$$= 40.23$$

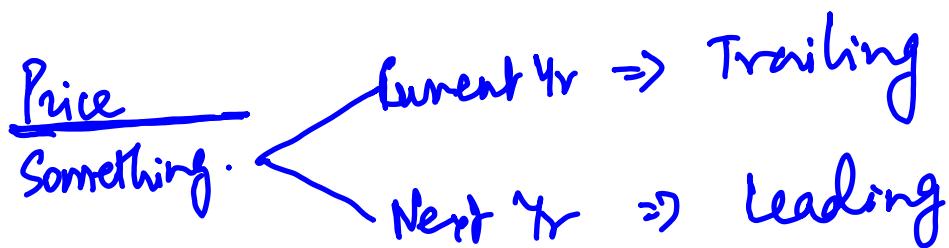
3. TV at Y5 = P/S Ratio \times Revenue at Y5

$$= 6 \times 40.23$$

$$\Rightarrow 241.38$$

4. Pv of TV at Y0 = $\frac{241.38}{(1.14)^5} = 241.38 \times 0.519$
 $= 125.28$ million

Note 4: Trailing & Leading Price Multiple Ratios



Eg. Trailing Price Earnings Ratio

$$= \frac{\text{Price}}{\text{Earnings}} = \frac{P_0}{E_0}$$

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

$$= \frac{\frac{E_0(1-b)(1+g)}{ke-g}}{E_0}$$

$$= \frac{(1-b)(1+g)}{ke-g}$$

$$\left. \begin{array}{l} D_1 = D_0(1+g) \\ D_0 = EPS_0 \times \text{Payout ratio} \\ \text{Payout ratio} = 1 - \text{Retention ratio} (b) \end{array} \right\}$$

$$D_0 = E_0 \times (1-b)$$

$$D_1 = E_0 \times (1-b)(1+g)$$

Leading Price Earnings Ratio

$$\therefore \frac{\text{Price}}{\text{Earnings}} = \frac{P_0}{E_1}$$

$$= \frac{\frac{D_1(1-b)}{ke-g}}{E_1}$$

$$= \frac{1-b}{ke-g}$$

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

$$D_1 = E_1 \times (1-b)$$

The reciprocal of the PE ratio is known as the earnings yield. The earnings yield is an estimate of expected return to be earned from holding the stock.

PE multiple = Market Price per Share / Earnings Per Share (EPS)

Conversely, Market Price per share = EPS x PE multiple

There are several variants on the basic PE ratio in use. They are based upon how the price and the earnings are defined.

Price: is usually the current price is sometimes the average price for the year

Earnings Per Share (EPS) can be either:

- EPS in most recent financial year
- EPS in trailing 12 months (Trailing PE)
- forecasted EPS next year (Forward PE)
- forecasted EPS in future year

Trailing P/E or P/E TTM: Earnings per share is the net income of the company for the most recent 12-month period, divided by number of shares outstanding. This is the most common meaning of PE ratio if no other qualifier is specified. The previous four quarterly earnings reports are used, and EPS is updated quarterly. Where available, valuers should use "Trailing P/E from continued operations" instead of net income, which exclude earnings from discontinued operations, extraordinary items (e.g., one-off windfall gains or write-downs), or accounting changes.

Forward P/E or Estimated P/E: Instead of net income, valuers sometimes use 'estimated' net earnings over next 12 months. In times of rapid economic changes, such estimates become less relevant as "the situation changes" (e.g., new economic data is published and/or the basis of their forecasts become obsolete) more quickly than analysts adjust their forecasts.

Fundamental P/E

We know that according to Gordon Growth Model the price per share is given by

$$V_0 = \frac{D_1}{(r - g)}$$

If we divide both sides of the equation by next year forecasted earnings, we would get

$$\frac{V_0}{E_1} = \frac{D_1}{\frac{E_1}{(r - g)}}$$

This is the leading P/E for this stock if it is valued in the market according to the constant growth dividend discount model. This P/E based on fundamentals is also referred to as a justified P/E. It is "justified" because, assuming we have the correct inputs for D_1 , E_1 , r , and g , the equation

above will provide a P/E ratio that is based on the present value of the future cash flows. We refer to this as a leading P/E ratio because it is based on expected earnings next period not on actual earnings for the previous period, which would produce a lagging or trailing P/E ratio. One advantage of this approach is that it makes clear how the firm's P/E ratio should be related to its fundamentals. It illustrates that the P/E ratio is a function of:

D_1 / E_1 = expected dividend payout ratio.

r = required rate of return on the stock.

g = expected constant growth rate of dividends

The justified P/E ratio serves as a benchmark for the price at which the stock should trade.

Q24

Turtle Ltd.'s EPS for the year is INR 100. The current price is INR 2200. Assuming that the EPS is expected to grow by 12 percent in the next one year, what should be the price after a year from now?

Reference Trailing P/E - Multiple	E_0 Go to Q24 P/E $P/E = \frac{2200}{100} = 22$ (Trailing)	What's New $\therefore MPS = P/E \times \text{Earnings}$ $= 22 \times \frac{100(1+0.12)}{=}$ $= 2464$
--	---	---

Answer

Note! $P/E \text{ Leading} = \frac{2200}{112} = \checkmark$

Trailing PE multiple can be calculated as Price / EPS of the last one year = $2200 / 100 = 22x$

The expected EPS for the next year would be Current EPS \times (1 + growth rate) = $100 \times 1.12 = 112$

Assuming the same PE multiple of 22x (Forward P/E) for the next year, the target price would be $112 \times 22 = \text{INR } 2464$ per share.

Q25

Jack Ltd has an expected dividend payout ratio of 20%, a required rate of return of 14%, and an expected dividend growth rate of 10%. Calculate the Jack Ltd's fundamental (justified) leading P/E ratio.

Reference Leading P.E Ratio	g $\text{Leading P/E Ratio} : \frac{P_0}{E_1} \cdot \frac{D_1 / r_e - g}{E_1}$	$r_e = k_e$ $= \frac{(E_1 \times \text{Payout}) / k_e - g}{k_e - g}$
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Sol'n to Q25 Pg -

$$\text{Leading P/E Ratio} = \frac{\text{Payout Ratio}}{r_e - g} = \frac{0.20}{0.14 - 0.10}$$

$$= \frac{0.20}{0.04}$$

$$= 5 \text{ times}$$

Note 5: Avg Valn based on Comparable Multiples

<u>Comparable Cos-</u>	<u>Price Earnings Ratio</u>	<u>Price Sales Ratio</u>
A	✓	✓
B	✓	✓
C	✓	✓

Avg. $\frac{S_{Avg}}{W_{Avg}}$

Avg = $\sqrt{\frac{S_{Avg}}{W_{Avg}}}$

Co. to be Valued \rightarrow Earnings: ✓

Value



Avg Value

(as per question)

Sales = ✓

Answer

Expected P/E ratio: $0.2 / (0.14 - 0.10) = 5$

BOOK VALUE MULTIPLES (PRICE / BOOK VALUE RATIO)

A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current share price by the latest book value per share that is available from the Balance Sheet. A lower P/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. As with most ratios, this varies by industry.

Price to book value ratio is a widely used ratio especially in case of asset heavy industries like Banks. It is also heavily influenced by accounting principles since it is based on the Balance sheet values. It is necessary to estimate the end-year-book value per share for the next period. This can be derived from the historical growth rate by the sustainable growth formula ($g=ROE \times \text{retention rate}$).

The Book Value of an equity security is given by the book value of assets minus the book value of the liabilities.

However, some adjustments may be made to make the Book Values look more reflective of shareholders' investments.

- The book value of assets (e.g., PP&E) should be adjusted to reflect fair values
- Off balance sheet items like contingent liabilities and guarantees should be added to liabilities to the extent they represent reasonable liabilities
- Intangible assets such as Goodwill should be removed. However, operating intangibles such as patents and copyrights should not be removed.

REVENUE MULTIPLES (PRICE/SALES RATIO)

While most of the relative valuation measures consider profits (Net profit or EBITDA) for valuation, there are companies (e.g., start-ups) who are promising but have not started earning profits yet. Others may be valuable but may be incurring losses. In such cases, one ratio that can be used is Price to Sales or P/S ratio. This metric looks at the current stock price relative to the total sales per share. You calculate the P/S by dividing the market cap of the stock by the total revenues of the company.

$$\frac{\text{Price}}{\text{Sales}} = \frac{\text{Current Stock Price}}{\text{Trailing Sales per share for last 12 months}} = \frac{\text{Market Capitalisation}}{\text{Total Revenue (for last 12 months)}}$$

Students must remember that in case the numerator is Share price per share, the denominator should also be per share to get the appropriate ratio.

The lower the P/S, the better the value, at least that's the conventional wisdom. However, this is not a number

you want to use in isolation. When dealing with a young company, there are many questions to answer and the P/S supplies just one answer. Price to sales ratio is relatively volatile in comparison to other ratios. This ratio is suitable for growth companies. A requirement for a growth company is strong consistent sales growth.

~~H.W~~ Q 26

PAS Steel is a privately held company with Revenues of ₹ 122,000 Million and a reported Net Profit of ₹ 12,000 Million in the latest period. The company has 2800 million shares outstanding.

A valuer has identified the following comparable companies along with their respective data.

Comparable Companies	Revenue ₹ Million	EPS ₹	No. of shares Million	Average Price ₹	P/E
P Ltd	17,376.80	13.08	304.74	30.64	2.34
Q Ltd	22,406.10	6.35	180.22	30.70	4.83
R Ltd	14,197.84	30.25	43.76	213.80	7.07

You are required to calculate:

Value of PAS Steel based on Average P/E Multiple of comparable companies

Value of PAS Steel based on Average P/Sales Multiple of comparable companies

Reference

Average P/E Multiple and P/S Multiple

What's New

$\text{P/E} = \frac{\text{Earnings}}{\text{Pft/Sh}}$

Answer

Calculation of P/E Multiple and P/Sales multiple can be explained in the table below.

Comparable Companies	Revenue	EPS	No. of shares	Average	Price P/E Ratio	P/Sales Ratio
	₹ Million	₹	Million	₹		
Column Ref	a	b	c	d	d / b	d / (a / c)
P Ltd	17,376.80	13.08	304.74	30.64	2.34	0.54
Q Ltd	22,406.10	6.35	180.22	30.70	4.83	0.25
R Ltd	14,197.84	30.25	43.76	213.80	7.07	0.66
Average					4.75	0.48

Soluⁿ to Q26 Pg -

Computation of Avg P/E & Avg P/S

Comparable Cos.	P/E	P/S
	Rev/share	P/S
P Ltd	$30.64/13.08 = 2.34$	57.02 $30.64/57.02 = 0.54$
Q Ltd	$30.70/6.35 = 4.83$	124.33 $30.70/124.33 = 0.25$
R Ltd	$213.8/30.25 = 7.07$	324.44 $213.8/324.44 = 0.66$
	<u>Avg = 4.75</u>	<u>Avg = 0.48</u>

Value / Share of PAs

Based on P/E : $\text{Avg P/E} \times \text{EPS of PAs}$

$$= 4.75 \times \frac{12000}{2800}$$

$$= ₹20.36$$

Based on P/S : $\text{Avg P/S} \times \text{Sales/Share of PAs}$

$$= 0.48 \times \frac{122000}{2800} = ₹20.91$$

Calculation of Value of PAS Steel	P/E Multiple method	P/Sales Multiple method
Reported Values of PAS Steel (₹ Million)	12,000	1,22,000
Corresponding multiplier	4.75x	0.48x
Value of the Company (₹ Million)	56,980	58,691
Number of Shares (₹ Million)	2,800	2,800
Value Per Share (₹)	20.35	20.96

Students should be careful that While calculating Price to Sales Ratio, Sales must be calculated on a per share basis. Alternatively, Price must be multiplied with Number of million shares to get to Total Market Capitalisation in millions. Observe that values under different methods may not be same. However, if applied consistently, they should not be too far apart as well.

PRICE TO CASH FLOW (P/CF) RATIO

Another multiple that is used for valuation is Price to Cash Flow (P/CF) Multiple. There are at least four definitions of cash flow available for use in calculating the P/CF ratio:

- (i) PAT + Non-Cash Charges (CF);
- (ii) Adjusted cash flow from operations (adjusted CFO);
- (iii) Free cash flow to equity (FCFE); and
- (iv) Earnings before interest, taxes, depreciation, and amortization (EBITDA).

The simplest version of CF is PAT plus Non cash charges. However, it fails to incorporate other non cash revenues and expenses. EBITDA is a measure of operating profit but is subject to accrual concept and thus, is not a good measure of Cash Flows. The most appropriate version of Cash Flow is FCFE

Current Stock Price = Market Capitalisation

Cash Flow per share Total Cash Flow for the period

$$\frac{\text{Price}}{\text{Cash Flow}} = \frac{\text{Current Stock Price}}{\text{Cash Flow per share}} = \frac{\text{Market Capitalisation}}{\text{Total Cash Flow for the period}}$$

ENTERPRISE VALUE/EBITDA RATIO

EV/EBITDA (Enterprise Value / Earnings before interest, taxes, depreciation and amortisation or enterprise multiple) is a valuation multiple that is often used in valuing cash-based businesses.

Enterprise value (EV) attempts to measure the value of a company's business rather than the company. It answers the question "what would it cost to buy this business free of its debt and other liabilities?" Think of EV as the theoretical takeover price in an acquisition. In the event of a buyout, an acquirer would be liable to pay the company's debt but would also have the right to use its cash.

EV = Market Capitalisation + Debt + Minority Interest + Preference Capital – Cash

EBITDA measures profits before interest and before the non-cash costs of depreciation and amortisation. EBITDA can be used to analyse and compare profitability between companies and industries because it eliminates the effects of financing and accounting decisions. It is important to note that EBITDA is not a measure of Cash flow as it comes from the Profit & Loss Statement and is subject to accrual accounting. Further, EBITDA is prone to manipulation by the accountants who can dress it up concealing some important information.

EBITDA = Profit After Tax + Interest + Taxes + Depreciation and Amortisation.

EV/EBITDA is harder to calculate than PE. It does not consider the cost of assets or the effects of tax. As it is used to look at the value of the business in EV terms it does not break this value down into the value of the debt and the value of the equity. Also, it assumes that market value of debt Equity can then be assumed to be worth EV less the value of the debt.

Equity = EV – Debt

The main advantage of EV/EBITDA over the PE ratio is that it is unaffected by a company's capital structure. It compares the value of a business, free of debt, to earnings before interest. EV includes the cost of paying off debt.

Q27

A valuer has obtained the following information regarding Infolink Ltd:	₹
Number of equities shares outstanding	<u>3,00,000</u>
Market price per share	20
Market value of Preference Shares	15,00,000
Market value of debt	35,00,000
Cash and short-term investments	8,00,000
Revenues	95,00,000
Depreciation and amortization expense	6,00,000
Interest expense	1,00,000
Taxes	3,50,000
Net Profit <i>(PAT)</i>	14,00,000

NL
EV = [MV of Eq Sh]
MV of Prf Sh
MV of Debt
to Cash

- (i) Calculate the EV/EBITDA Ratio
- (ii) E-Link Ltd has reported an EBITDA of ₹27,00,000 and is a comparable company to Infolink Ltd. Calculate the Enterprise Value of E-Link Ltd.

Reference EBITDA Multiple	What's New <i>PST</i> <i>TAX</i> <i>PAT</i>
--	---

Soln to Q27 Pg -

N1 Enterprise Value

MV of Eq shares (32×20)

₹
60,00,000

MV of pref Shares

15,00,000

MV of Debt

35,00,000

Rev! Cash & Short term investments (8,00,000)

102,00,000

N2 EBITDA

Net Profit (after tax)

14,00,000

(+) Taxes

3,50,000

PBT

17,50,000

(+) Interest

1,00,000

EBIT

18,50,000

(+) Depn & Amortisation

6,00,000

EBITDA

24,50,000

Part (i)

EV/EBITDA of Info link

$$= \frac{102,00,000}{24,50,000} = 4.16$$

Part (ii)

EV of E-link

$$= \text{EV/EBITDA of Comp Co.} \times \text{EBITDA of Elink}$$

(Info link)

$$= 4.16 \times 27,00,000$$

$$= ₹ 112,32,000$$

Note 6:- Comparable Transactions Method

When Earnings or Sales or EBITDA of a Co. are not available for valuations, (E.g - New technology) then in such cases a comparable transaction is identified as basis and that trans can be based on any

unique basis such as - no. of active users, no of website visitors, etc.

This value is represented as:-

$$\boxed{\text{Sector Specific Multiple} \times \frac{\text{Param's} \times \text{Adj Factor}}{}}$$

Sector Specific Multiple = $\frac{\text{Value of Comparable Co. [EV]}}{\text{No of Subscribers, etc.}}$

Answer
Calculation of EV/EBITDA Ratio of Infolink Ltd

Enterprise Value	₹
Market Value of Equity	60,00,000
Add: Value of Debt	35,00,000
Add: Value of Preference Capital	15,00,000
Less: Cash and Cash Equivalents	8,00,000
Enterprise Value	1,02,00,000

Ebitda	₹
Net profit after tax	14,00,000
Add: Taxes	3,50,000
Add: Interest Expense	1,00,000
Add: Depreciation and Amortisation	6,00,000
EBITDA	24,50,000

The EV to EBITDA multiple is given by $\text{₹}1,02,00,000 / 24,50,000 = 4.16$

Calculation of EV of E-Link Ltd.

$$\begin{aligned}\text{Enterprise Value} &= V/\text{EBITDA} \text{ Multiple} \times \text{EBITDA} \\ &= 4.16 \times 27,00,000 \\ &= 1,12,32,000\end{aligned}$$

ENTERPRISE VALUE TO SALES (EV/SALES) RATIO

EV/Sales ratio is one of the more refined valuation metrics used. EV to sales ratio is a valuation measure that compares the enterprise value of a company to the company's sales. EV/sales gives investors an idea of how much it costs to buy the company's sales. This measure is an expansion of the price-to-sales valuation, which uses market capitalisation instead of enterprise value. Since enterprise value and sales both consider debt and equity holders, EV/sales is sometimes considered superior to price/sales ratio.

$$\frac{\text{Enterprise Value}}{\text{Sales}} = \frac{\text{MV of Equity} + \text{MV of Debt} - \text{Cash}}{\text{Total Revenue}}$$

COMPARABLE TRANSACTIONS METHOD

Comparable Transactions Method, is also known as 'Guideline Transaction Method', involves valuing an asset based on transaction multiples derived from prices paid in transactions of asset to be valued / market comparable (comparable transactions). Usually, companies in specialised business where there may not be exchange-traded comparable, but comparable assets are having transactions in over the counter (private transactions), the valuation multiples may be

taken from such transactions. It is important to consider recent and orderly transactions to avoid significant biases in valuation.

Steps:

- Identify comparable transaction appropriate to the asset to be valued.
- Select and calculate the transaction multiples from the identified comparable transaction.
- Compare the asset to be valued with the market comparable account where differences, if any existed;
- Apply the adjusted transaction multiple to the relevant parameter of the asset to be valued to arrive at the value of such asset; and
- If valuation of the asset is derived by using transaction multiples based on different metrics or parameters, the valuer shall consider the reasonableness of the range of values and exercise judgement in determining a final value.

Example, If a valuer is valuing an Ed Tech Company in India, where there is no listed company in Ed-Tech industry, value drivers from Private Equity transactions such as Think & Learn Pvt Ltd (Byju's), Vedantu etc. may be considered. If the subject company is at a very early stage, a size-discount may be applied to ensure that the valuation is not over-stated.

SECTOR SPECIFIC MULTIPLES

The value of a company can be standardized using several sector specific multiples. The value of steel companies can be compared based upon market value per ton of steel produced and the value of electricity generators can be computed based on kwh of power produced. Sector specific multiples can often be computed with no reference to accounting statements or measures. Consequently, they can be estimated for firms where accounting statements are non-existent, unreliable or just not comparable.

- The numerator is usually enterprise value – the market values of both debt and equity netted out against cash and marketable securities.
- The denominator is defined in terms of the operating units that generate revenues and profits for the firm.

For example, for subscription-based firms such as cable companies, internet service providers and information providers (such as Netflix), revenues come from the number of subscribers to the base service provided. Here, the value of a firm can be stated in terms of the number of subscribers.

$$\text{Value per Subscriber} = \frac{\text{MV of Equity} + \text{MV of Debt}}{\text{Number of subscribers}}$$

For internet companies generating revenue from advertisement that are based on traffic on the site, the valuation may be driven by value per site visitor.

$$\text{Value per Site Visitor} = \frac{\text{MV of Equity} + \text{MV of Debt}}{\text{Number of visitors/site}}$$

Q28

Monika is trying to value ChatApp, a Chat messaging app that currently has 16 million users but does not generate any revenues. She has identified that WhatsApp was recently valued at USD 17.5 Billion while having 450 million users. Considering the difference in size, Monika believes that a size discount of 95 percent should be applied while valuing ChatApp. The foreign exchange is INR 65 per USD. *Add Factor*

Calculate the value of Chat App

Reference

Comparable Transaction Method

What's New

1 billion = 1000 millions

Answer

Value As Per Comparable Transactions Method	Amount
Enterprise Value of WhatsApp (USD) as part of acquisition	17,50,00,00,000
Daily Active Users of WhatsApp	45,00,00,000
Value per Daily Active User (USD)	38.89
Exchange Rate	65
Value per Daily Active User (INR)	2,527.78
Less: Adjustment for Size (95%)	2,401.39
Adjusted value per Daily Active User (A)	126.39
Daily Active Users of CHATAPP (B)	1,60,00,000
Value of CHATAPP (A) x (B)	2,02,22,22,222

Thus ChatApp may be valued at ₹202.22 Crore.

VOLUME WEIGHTED AVERAGE PRICE

In case of Market price method, valuers should consider the **Volume weighted average** price over a reasonable period to remove the effects of value on a specific day. For example, the market prices were significantly down on 31st March 2020 when the Covid-19 pandemic had just hit the world reducing the values of most traded stocks globally. However, over a period, the stocks regained momentum and values were normalised.

A valuer should consider the volume weighted average price (VWAP) observed **over a reasonable trading period** while valuing assets which are traded in the active market. In case the asset is traded in more than one market, the valuer should consider the market where the trading volume is highest.

Soln to Q28 Pg -

Sector Specific Multiple = Value per user of whatapp

$$= \frac{\text{Enterprise Value} \times \text{Exch Rate}}{\text{No of Users}}$$

$$\text{EBITDA} = \frac{17.5 \times 1000}{450} \times 65$$

$$= 2527.78$$

Value of Chatapp = $\left[2527.78 / \text{user} \times 5\% \right] \times 16m$

$$= ₹ 2022.22 \text{ million}$$

95% disc

Note 7: Volume Weight Method

⇒ Shares are listed on stock exchange

$$\Rightarrow \text{Volume Wt. Avg Price} = \frac{\sum (\text{Closing Price}^{(a)} \times \text{Traded Volume}^{(b)})}{\sum (\text{Total Volume})^{(c)}}$$

[weight = volume]

⇒ This can be considered as a fair price

- No. of Trading days should be reasonable for any
- If the shares are traded in more than one market, the valuer should consider the market where trading volume is highest.

Annual report — Must Read

Q29

Aditya has been assigned to value the investment portfolio of ABC Corp Ltd for financial reporting purposes as on 31-Dec-2021. The portfolio consists of the following securities.

	Cost per scrip (₹)	Number of units (₹)	Cost (₹)
Reliance Industries Ltd	2,315.00	1,500	34,72,500
Mahindra & Mahindra Ltd	809.00	2,000	16,18,000
Total			50,90,500

Aditya has collected the share price information for last 10 trading sessions for both the stocks.

Date	Reliance Industries Ltd			Mahindra & Mahindra Ltd		
	Close Price	No. of Shares	Total Turnover	Close Price	No. of Shares	Total Turnover
20-12-2021	2,277.20	11,04,898	2,55,83,34,263	817.00	1,17,794	9,53,84,794
21-12-2021	2,310.10	1,65,141	38,30,16,503	812.30	65,875	5,38,67,211
22-12-2021	2,365.95	2,44,736	57,44,95,500	818.30	46,089	3,78,01,018
23-12-2021	2,364.65	1,27,047	30,08,15,532	826.65	33,502	2,77,44,935
24-12-2021	2,372.25	1,82,225	42,95,88,525	812.50	27,113	2,20,93,258
27-12-2021	2,369.80	79,886	18,90,87,708	818.30	36,395	2,97,70,016
28-12-2021	2,397.70	1,00,293	23,95,08,195	838.70	63,038	5,24,96,078
29-12-2021	2,403.05	1,36,021	32,62,53,956	832.35	63,001	5,27,33,904
30-12-2021	2,356.45	3,95,909	93,83,57,613	830.10	47,793	3,97,35,973
31-12-2021	2,368.15	1,81,300	42,96,07,659	837.30	60,849	5,11,24,466
Total	27,17,150	6,36,00,65,151	63,69,06,5454		5,61,449	46,27,51,653

Compute price per share and value of companies as per weighted average method.

Reference

Value of Equity Share - Volume Weighted Average Method

What's New

Answer

The Volume Weighted Average Price (VWAP) is given by the sum of Total Turnover divided by Sum of total number of shares.

$$\text{Volume Weighted Average Price} = \frac{\text{Sum of Total Traded Turnover}}{\text{Sum of Total Number of Shares}}$$

Sdn to Q29 Pg No. —

N1 Volume Weighted Avg Price

$$RIL = \frac{6,36,90,65,454}{27,17,456} = \underline{\underline{2343.76}} \text{ /share}$$

$$MKM = \frac{46,27,51,653}{5,61,449} = \underline{\underline{824.21}}$$

Value of Portfolio

<u>Stock Name</u>	<u>Qty</u>	<u>WA Price</u>	<u>Value</u>
RIL	1,500	2343.76	35,15,640
MKM	2,000	824.21	16,48,420
			<u><u>51,64,060</u></u>

4. Book VALUE METHOD / Cost Approach

Liquidation Value

Estimated sale value
of assets owned

Replacement Cost

Est current cost
of replacing the
assets owned

Sometimes professional
valuers are considered
(Actuaries)

Holding Co.

Capital ✓ Shares - LT Inv at Cost ✓

=

=

MV = ✓
= 600' times

Book Value = Net Assets Value

B/S Approach

P/L Approach



Net assets

⇒ Rep loss / lig. Value of Assets ✓
(excl fict assets)

Less: Value of External liab

Loan	✓
CL	✓
PSC	<u>✓</u> (✓)

Net Assets attributable to
Equity Shareholders

(+) Notional call on partly
paid up eq shares
(assumed cash recd)

Add Net assets for fully
paid up equity shares

No. of Eq shares (fully
paid up
+
partly paid up)

Value / fully paid up share ✓

Value / partly paid up share ✓
= (Fully paid up - Notional call)

PL Approach

Future Maintainable Profits (post tax) ✓

Capitalisation Rate (post tax) ✓

$$\text{value of Equity} = \frac{\text{FMP}}{\text{Cap Rate}}$$

(+) National Call on partly paid up shares

Total value of Equity

[No. of partly + No. of fully paid up shares]

Value / Eq share fully paid up

Value / Eq share partly paid up

(Fully Bid Value - National Call)

FMP: Avg Profit before tax (Note) ✓

↪ Additional Exp ✓

(+) Additional income ✓

Avg Adj PBT ✓

↪ Tax (v)

Ang Adj PBT

(\rightarrow) Pref Dividend

FNP after tax

✓

✓

✓

Ang PBT

Simple Ang = $\frac{\sum \text{PBT}}{n}$ (no trend)

Weighted Ang \Rightarrow When Pfts shows an increasing trend.

\Rightarrow Weight \Rightarrow 1, 2, 3 ...

with higher weights to recent years.

<u>Yr</u>	<u>PBT</u>	<u>weight</u>	<u>PBT x W</u>
2021	2L	1	2L
2022	3L	2	6L
2023	4L	3	12L
		<u>6</u>	<u>20L</u>

$$\therefore \text{WA PBT} = \frac{20}{6} = 3.33$$

$$\text{Volume Weighted Average Price (RIL)} = \frac{6,36,90,65,254}{27,17,456} = 2343.76$$

$$\text{Volume Weighted Average Price (M&M)} = \frac{46,27,51,653}{5,61,449} = 824.$$

	Cost per scrip	Number of units	Cost	FV Rate	Fair Value
Reliance Industries Ltd	2,315.00	1,500	34,72,500	2,343.76	35,15,640
Mahindra & Mahindra Ltd	809.00	2,000	16,18,000	824.21	16,48,419
Total			50,90,500		51,64,060

Observe that we did not consider the closing price as on the valuation date, but we assessed the Volume Weighted Average price for the purposes of valuation. In the absence of volume weighted average price, the traded price as on the valuation date may be taken as a proxy. Often, the clients provide holding statements as prepared by the depository participants. These values may also be considered for the purposes of valuation.

4. BOOK VALUE METHOD

The asset-based approach has many other common names such as the asset accumulation method, the net asset value method, the adjusted book value method, and the asset build-up method. The purpose of the model is to evaluate the company's assets and liabilities and thus arrive at the Equity Valuation. The basic idea is that the **company's value could be determined by looking at the Balance Sheet**. Unfortunately, the values on the balance sheet cannot be used because the book value seldom is the same as the real value, except for the case of liabilities that is often accounted in real value.

The problem is when following the principles of accounting, assets often are depreciated over their life expectancy and when the asset-based approach is applied the real value for these assets must be determined. In this case, the real value is equivalent to the fair market value that is value of the asset on a free market or present value of the future earnings from the asset or a group of assets.

Two methods are used here:

- (a) The **Liquidation Value**, which is the sum as estimated sale values of the assets owned by a company.
- (b) **Replacement Cost**: The current cost of replacing all the assets of a company at times for specific purposes professional valuers also consider depreciated replacement cost of the asset(s).

It is generally not used to value going concerns because

- (a) limited market data is available for valuing their intangible assets,
- (b) it can be difficult to value some of their tangible assets (e.g., special-use PP&E), and

(c) it is easier to find comparable data at the firm level than at the individual asset level.

Of all the available methods for private company valuation, the asset-based approach typically yields the lowest value. The **asset-based approach may be used in the following circumstances:**

- Companies that are making **minimal profits** relative to the value of their assets and have doubtful prospects for growth. The liquidation value of such companies may be greater than their going-concern values as purchasers of their assets may be able to use them more productively.
- Banks and financial companies** as market prices of their assets and liabilities are readily available or can be reliably estimated.
- Natural resource companies** whose assets can be valued using market prices of their output.
- Small or early-stage companies** with negligible intangible assets.

HW Q30

Arvind has been assigned to value VG Pvt Ltd. The company is privately held and does not have major operations. Accordingly, the market comparable companies were not identified and the management has not been able to provide any meaning forecast about the company. The extract of financials of VG Ltd is as follows.

Summary Balance Sheet (in INR Lakhs)		31-Mar-22
Liabilities		
Equity & Liabilities		
Equity Share Capital		26.44
Other Equity		608.07
Long Term Borrowings		1,252.39
Short Term Provisions		1.18
Total Equity & Liabilities		1,888.08
Assets		
Property, Plant & Equipment		441.39
Investments		1,000.00
Cash & Cash Equivalents		0.41
Loans & Advances		429.00
Other Current Assets		17.27
Total Current Assets		446.69
Total Assets		1,888.08

Additional information:

The company records PP&E and Investments at cost.

Property, Plant & Equipment contains land of ₹220.70 in the books. Based on the assessment, the land value has appreciated by 15 percent from the book value.

Investments include 40,000 shares of Reliance Industries and 10,000 shares of Infosys. As on the valuation date, they are trading at ₹2300 per share and ₹1800 per share respectively.

The number of shares outstanding is 264,400

You are **required** to calculate:

- (a) Book value of the company.
- (b) Net Asset Value of the company on fair value basis.
- (c) Value per share

Reference



BV, Net Asset Value, Value per Sahre

What's New

Answer

Note 1: Calculation of Fair Value of PP&E

Property, Plant & Equipment (INR Lakhs)	Book Value	Market Value
Plant & Machinery	220.70	220.70
Land	220.70	$220.70 \times 1.15 = 253.80$
	441.39	474.50

Note 2: Calculation of Fair Value of Investments

Scrip Name	Value per share	No. of shares	Market Value
Scrip	Rate (₹)	Units ₹	Lakhs
RIL	2,300	40,000	920.00
Infosys	1,800	10,000	180.00
Total			1,100.00

Particulars	31-Mar-x1	
	₹ Lakhs	₹ Lakhs
Book Value of Assets		1,888.08
Book Value of Liabilities		1,253.57
Book Value of Equity		634.51

Less: Book Value of Investments	1,000.00	
Less: Book Value of PP&E	441.39	
Add: Fair Value of Investments (Note 2)	1,100.00	
Add: Fair Value of PP&E (Note 1)	474.50	
Adjustment for change in fair values		133.10
Net Asset Value (Fair Value basis)		767.61
Number of Shares		2,64,400
Value per share (INR)	767.61 × 1,00,000 / 2,64,400	290.32

- (a) The book Value of the company is INR 634.51 Lakhs
- (b) The Net Asset Value of the company on fair value basis is INR 767.61 Lakhs
- (c) Value per share on Fair value basis is INR 290.32 per share

Q31

The Directors of Astadurga Private Ltd are planning to sell the Company. For this purpose, they want you to **put a value** on the equity share of the Company using the methods which a prospective purchaser might apply. The following information should be considered in valuing the shares under each method, commenting briefly on each method adopted –

1. Balance Sheet as on 31st March 2022.

Equity and Liability	Amount (₹)	Assets	Amount (₹)
(1) Shareholders Fund:		(1) Non-Current Assets:	
(a) Share Capital		(a) Fixed Assets: (Tangible):	
Equity Share Capital of ₹10 each	2,00,000	Land and Building	5,00,000
(b) Reserve & Surplus		Plant and Machinery	2,75,000
Revenue Reserve	5,95,000	Motor Vehicles	55,000
(2) Non-Current Liabilities:		(b) Other Non-Current Assets	
Long Term Borrowings		Preliminary Expenses	2,000
Secured Loan against Land & Building	1,50,000		
(3) Current Liabilities:		(2) Current Assets:	
(a) Sundry Creditors	1,35,000	(a) Inventories	1,33,000
(b) Short Term Provision		(b) Sundry Debtors	1,45,000
Provision for Taxation	45,000	(c) Cash and Cash Equivalents	15,000
Total	11,25,000	Total	11,25,000

2. Profit/ Dividend record: The Profit record after tax and interest but before dividends over the last five years have been as follows:

Year	2018	2019	2020	2021	2022
Profit	80,000	N 75,000	95,000	80,000	85,000

The average dividend has been ₹30,000 (gross) for the last ten years.

3. The operating budget shows that estimated after tax profit for the next year will be 85,000 and thereafter it is estimated that this will increase by 5% p.a. over the next four years.
4. In the light of recent developments in the field of financial reporting, the Company has had its Fixed Assets valued by an independent expert whose report discloses the following values – Land & Building - ₹ 6,10,000, Plant & Machinery- ₹ 2,88,000, Motor Vehicles - ₹ 1,02,000.
5. A study of three public companies in the same market as Astadurga Private Ltd shows that the average dividend yield and price earnings ratio of these over last three years have been-

Year	Tribhuvan Ltd		Dhanasha Ltd		Shakti Ltd	
	Dividend Yield %	P/E Ratio	Dividend Yield %	P/E Ratio	Dividend Yield %	P/E Ratio
2020	17.00	8.00	17.00	8.50	16.50	9.00
2021	17.00	8.00	15.00	9.00	17.00	10.00
2022	17.00	9.00	18.00	10.00	17.50	11.50
Average	17.00	8.33	16.70	9.17	17.00	10.17

6. One of the Directors has indicated that after tax cost of capital is now 17½%. The estimated net cash flow of the Company after taking into consideration taxation and capital expenditure over next five years in order to achieve/ and as a result of, the five years profit plan, are as follows:

Year	2023	2024	2025	2026	2027
CF (₹)	1,00,000	1,20,000	1,40,000	10,000	1,50,000

Another Director is of the view that profitability be measured at 12 ½% on Tangible Capital and 17 ½% on Intangible Capital.

Reference

Valuation of Equity shares

What's New

Net Asset Method, Dividend Yield Method, PE Multiple, Earning Capitalisation, Discounted Cash Flows

Answer

1. Net Assets Method

Particulars	Amount (₹)	Amount (₹)
Land and Building (at revalued amount)		6,10,000
Plant and Machinery (at revalued amount)		2,88,000
Motor Vehicles (at revalued amount)		1,02,000
Stock in trade (at Balance Sheet Value)		1,33,000
Sundry Debtors (at Balance Sheet Value)		1,45,000
Cash at Bank (at Balance Sheet Value)		15,000
Total Assets		12,93,000
Less: Outside Liabilities		
Secured Loans	(1,50,000)	
Sundry creditors	(1,35,000)	
Provision for Taxation	(45,000)	3,30,000
Net Tangible Assets		9,63,000
Number of Equity Shares		20,000
Value per Equity Share ($9,63,000 \div 20,000$)		48.15

2. Dividend Yield Method

a. Actual Dividend Rate of the Company = Average Dividend \div Paid Up Capital = $30,000 \div 2,00,000$	15.00%
b. Average Industry Dividend Rate = $(17\% + 16.70\% + 17\%) \div 3$	16.90%
c. Value per Equity Share = $(\text{Face Value} \times \text{Actual Yield}) / \text{Industry Dividend Rate} = (10 \times 15.00\%) \div 16.90\%$	8.88

3. PE Multiple Method (based on Projected Earnings)

Note: Industry Average PE Ratio = $(8.33 + 9.17 + 10.17) / 3 = 9.22$ times

Year	Profit after Tax	Weights*	Product
2021	85,000	5	4,25,000
2022	$85,000 \times 1.05 = 89,250$	4	3,57,000
2023	$89,250 \times 1.05 = 93,713$	3	2,81,139
2024	$93,713 \times 1.05 = 98,399$	2	1,96,798
2025	$98,399 \times 1.05 = 1,03,319$	1	1,03,319
Total	4,69,681	15	13,63,256
a. Average Profits (Simple/Weighted)	$4,69,681 \div 5 = 93,936$		$13,63,256 \div 15 = 90,884$
b. Number of Equity Share	20,000 shares		20,000 shares

c. Projected Earnings per Share	4.70		4.54
d. Value per Share (on PE Multiple) = Co EPS × Industry average PE Ratio	$4.70 \times 9.22 \text{ times} = 43.33$		$4.54 \times 9.22 = 41.86$

Note:

Also, PAT for the year ending on the B/s date i.e., 2020 can be taken as a Future Earning Capacity i.e., at 85,000. Hence, EPS = 4.25 and Value per share = $4.25 \times 9.22 \text{ times} = 39.19$.

Higher weightage is given to the near future years than far further future years.

4. Projected Earnings Capitalization Method

Particulars	Simple Average	Weighted Average
a. Projected Earnings (PAT) of the Company	93,936	90,884
b. Normal Rate of Return of the Industry = $1 \div \text{PE Ratio}$	$(1 \div 9.22) = 10.85\%$	$(1 \div 9.22) = 10.85\%$
c. Capitalized Value of Projected Earnings (a ÷ b)	8,65,770	8,37,641
d. Value per share = (c ÷ 20,000 Shares)	43.29	41.88

Note: The valuation under PE Multiple and Earnings Capitalization Method (at 10.85%) is effectively the same. The difference is due to rounding – off aspect in calculations.

5. Discounted Cash Flow Method

Year	PFV at 17.5%	Cash Flows	Present Value
2021	0.85	1,00,000	85,000
2022	0.72	1,20,000	86,400
2023	0.62	1,40,000	86,800
2024	0.52	10,000	5,200
2025	0.45	1,50,000	67,500
2026 onwards (See Note below)	0.45	$1,50,000 \div 10.85\% = 13,82,488$	6,22,120 13,82,488
Present Value of Future Cash Flows till perpetuity			9,53,020
Value per Share [9,53,020 ÷ 20,000 shares]			47.65

Note:

Cash Flows of Year 2025 ₹1,50,000 are assumed to continue till perpetuity. Hence, it is divided by the Industry Normal Rate of Return, to estimate the cash flows till perpetuity. These are discounted to the present value, to ascertain the total discounted cash flows.

Cash Flows of year 2024 is not in tune with the other years. This may be because of Capital Expenditure proposed during the year. In the absence of information of Capital Expenditure, no adjustment has been made.

6. Summary of Value per Share

Method	Value per Share	Remarks
1. Net Assets Method	48.15	Reports the Fair Values of assets available to Equity Shareholders. Provides basis for negotiating prices
2. Dividend – Yield Method	8.88	Suitable only for purchase of small lots and not for acquisition of controlling interest.
3. Earnings – Yield (PE Multiple)		
(a) On Simple Average	43.33	Recognizes market / industry expectations
(b) On Weighted Average	41.86	Company's future performance. However, weighted average
(c) On B/s Year Profits	39.19	Based calculations are more appropriate.
4. Earnings Capitalization Method		
(a) On Simple Average	43.29	Only a variant of the PE Multiple method. Weighted Average
(b) On Weighted Average	41.88	Based calculations are more appropriate.
5. Discounted Cash Flows	47.65	Most suited for acquisition of controlling interest.

Q32

The Balance Sheet of Moti Industries Ltd as at 31st December 2021 was as under –

Equity and Liability	Amount	Assets	Amount
(1) Shareholders Fund:		(1) Non-Current Assets:	
(a) Share Capital		(a) Fixed Assets	
(i) Equity Share of 10 each		(i) Tangible Assets:	
– 10 paid up per share	3,00,000	– Building	2,00,000
– 5 paid up per share	2,00,000	– Plant and Machinery	4,00,000
(ii) 9% Preference Shares Capital (100)	1,00,000	(2) Current Assets:	
(b) Reserve & Surplus	3,00,000	(a) Inventories	2,50,000
(2) Current Liabilities:		(b) Trade Receivables	

(a) Trade Payables – Sundry Creditors	2,00,000	– Sundry Debtors	2,10,000
		(c) Cash and Cash Equivalents	40,000
Total	11,00,000	Total	11,00,000

Profit and Dividend in the last several years were as under:

Year	Profit	Equity Dividend
2019	₹ 2,20,000	12%
2020	₹ 2,50,000	15%
2021	₹ 3,20,000	18%

Land and Buildings are worth ₹ 4,00,000. Managerial remuneration is likely to go up by ₹ 20,000 p.a. Income- Tax may be provided at 50%. Equity Shares of Companies in the same industry with a dividend rate of 10% are quoted at par. Ignore Goodwill value depreciation adjustment for revaluation and the need of transfer to General Reserve.

Find the most appropriate value of an Equity Share assuming that-

1. Controlling interest is transferred;
2. Only a few shares are to be transferred.

Reference

**Valuation of Equity Sahres based on
Controlling Interest - Equity Capitalisation
Method and Net Asset Value Method**

What's New

Partly paid up shares

Answer

1. Computation of Future Maintainable Profits

Year	PBT	Weights	Product (₹)
2019	₹ 2,20,000	1	2,20,000
2020	₹ 2,50,000	2	5,00,000
2021	₹ 3,20,000	3	9,60,000
Total	6	16,80,000	
Weighted Average Profits ($16,80,000 \div 6$)		2,80,000	
Less: Additional Managerial Remuneration payable		(20,000)	
Net Adjusted Profits before Tax		2,60,000	
Less: Tax Expense at 50%		(1,30,000)	
Net Adjusted Profits after Tax, but before Preference Dividend		1,30,000	

Less: Preference Dividend ($\text{₹}1,00,000 \times 9\%$)		(9,000)	
Future Maintainable PAT available for Equity Shareholders		1,21,000	

Notes:

It is assumed that the Profits given in the Question are Profits before Tax.

Since Profits show an increasing trend, weighted average is more appropriate. Hence, more weights are assigned to the profits of the most recent years.

2. Valuation of Shares under Earnings Capitalization Method

Particulars	Amount (₹)
Future Maintainable Profits for Equity Shareholders	1,21,000
Capitalized Value of Equity (Maintainable Profit \div Normal Return) i.e., $1,21,000 \div 10\%$	12,10,000
Add: Notional Call on Party Paid Shares ($\text{₹} 5 \times 40,000$ Shares)	2,00,000
Total Value of Equity	14,10,000
Total Number of Equity Shares	70,000 shares
a. Fully Paid Share = $\text{₹} 3,00,000 \div \text{₹} 10 = 30,000$ Shares;	
b. Partly Paid Shares = $\text{₹} 2,00,000 \div \text{₹} 5 = 40,000$ Shares	
Value per Fully Paid Share [Adjusted Equity Value \div Total No. of Shares]	₹20.14
Value per Partly Paid Share [$\text{₹} 20.14 - \text{₹} 5$ unpaid]	₹15.14

Note:

1. Unpaid amount on partly paid-up shares is assumed to be called soon. In the absence of specific information, additional income on Notional Calls, is ignored.
2. Normal Rate Return is assumed to Post Tax Expectation.

3. Valuation of Shares under Net Asset Method

Particulars	Amount (₹)
Buildings (Revalued Amount)	4,00,000
Plant & Machinery	4,00,000
Sundry Debtors	2,10,000
Stock in Trade	2,50,000
Cash and Bank	40,000
Total Assets	13,00,000
Less: External Liabilities - Sundry Creditors	2,00,000
Net Assets	11,00,000
Less: Preference Share Capital	1,00,000
Net Assets Attributable to Equity Shareholders	10,00,000

Add: Notional Call on Shares	2,00,000
Adjusted Net Assets Attributable to Equity Shareholders	12,00,000
Number of Equity Shares (Fully Paid + Partly Paid) as calculated above	70,000 Shares
Value per Fully Paid Share ($\text{₹ } 12,00,000 \div 70,000$)	17.14
Value per Partly Paid Share ($\text{₹ } 17.14 - \text{Notional Call of ₹ } 5$)	12.14

4. Summary of value per share for Controlling Acquisition

Particulars	Fully Paid Share	Partly Paid Share
a. Earnings Capitalization Method	₹20.14	₹15.14
b. Net Assets Method	₹17.14	₹12.14
c. Fair Value (Average of the above)	$(20.14 + 17.14) \div 2 =$ ₹18.64	$(15.14 + 12.14) \div 2 =$ ₹13.64

5. Computation of Value per Share for Small Lot Acquisition

Year	Dividend Rate	Weights	Product
2019	12%	1	12%
2020	15%	2	30%
2021	18%	3	54%
Total	6	96%	
Weighted Average Dividend Rate ($96\% \div 6$)	16%		

Year	Dividend Rate	Weights	Product
Value per Share for Small Lot Acquisition = (Paid Up Value per Share \times Company's Dividend Rate) \div Market Dividend Rate			
For Fully Paid-Up Share: $(10 \times 16\%) \div 10\%$			16.00
For Partly Paid-Up Share: $(5 \times 16\%) \div 10\%$			8.00

Note:

When small shareholders acquire shares based on dividend expectation, shares are to be valued only on basis of paid-up value of shares since, generally, dividends are declared only on the paid-up value of shares and not on the notional full value of shares. Here, merely reducing the value of a fully paid share by unpaid amount

is not appropriate. Students should carefully observe the distinction in valuation principles between majority acquisition and small lot buying.

Practice Questions

Q1

Shivam Ltd is proposing to acquire Megha Ltd and has retained you as a valuer to assess the estimated value of Megha Ltd. There have been some recent Mergers and Acquisitions in the same industry and you believe that valuation of Megha Ltd would be appropriate using the comparable transaction approach. You have identified the following information with respect to the comparable Companies X Ltd, Y Ltd, and Z Ltd and their respective deal prices and financial statistics.

Particulars	Megha Ltd	X Ltd	Y Ltd	Z Ltd
Deal price per share (₹)	-	50.50	25.00	108.00
EPS (₹)	3.90	2.20	2.80	5.50
Book Value per share (₹)	22.20	11.50	6.50	26.50
Sales per share (₹)	39.60	21.75	11.70	46.60

Suggest the value of Megha Ltd using:

- (i) Price to Earnings multiple
- (ii) Price to Book Value multiple
- (iii) Price to Sales multiple

What is your take on the control premium in this case?

Reference

P/E, P/BV, P/S, Multiple

What's New

Answer

Particulars	X Ltd	Y Ltd	Z Ltd	Average
P/E Ratio (Price per share/EPS)	22.95	8.93	19.64	17.17
P/Book Value Ratio (Price per share/book value per share)	4.39	3.85	4.08	4.10
P/Sales Ratio (Price per share/sales per share)	2.32	2.14	2.32	2.26

Particulars	Megha Ltd (₹)	Average Multiple	Value per share (₹)
P/E Ratio	3.90	17.17	66.96
P/Book Value Ratio	22.20	4.10	91.02
P/Sales Ratio	39.60	2.26	89.50

Here, since we have used actual transaction prices, there may not be any need to adjust the control premium in this case and this may be treated as a fair price for the deal.

Q2

AK has been assigned to value MS Pvt Ltd. The company is privately held and does not have any major operations, due to which the market comparable companies were not identified and the management has not been able to provide any meaningful forecast about the company. The extract of financials of MS Ltd. is as follows.

Summary of Balance Sheet as on March 22, 2023

Equity and Liabilities	Amount (₹ in lakhs)
Equity Share Capital	150.43
Other Equity	732.06
Long Term Borrowings	1376.38
Short Term Borrowings	125.17
Total	2384.04
Assets	
Property, Plant and Equipment	540.67
Investments	1099.28
Cash and Cash Equivalents	99.69
Loans	528.28
Other Current Assets	116.22
Total	2384.04

2384 + 319.97 = 573.78
1186

Additional information:

- The company records PP&E and Investments at cost.
- Property, Plant & Equipment contains land of ₹220.70 in the books. Based on the assessment, the land value has appreciated by 15 percent from the book value.
- Investments include 35,000 shares of Wipro and 18,000 shares of TCS. As on the valuation date, they are trading at ₹2,000 per share and ₹2,700 per share respectively.
- The number of shares outstanding is 3,28,000

You are **required** to calculate:

- (i) Book value of the company.
- (ii) Net Asset Value of the company on fair value basis.
- (iii) Value per share.

Reference
BV, NAV, Value per share
What's New
Answer
Calculation of Fair Value of Property, plant and Equipment:

Property, Plant and Equipment	Book Value ₹ in lakhs)	Market Value ₹ in lakhs)
Plant and Machinery	319.97	319.97
Land	220.70	220.71 + 15% = 253.80
Total	540.67	573.77

Calculation of Fair Value of Investments:

Investments	Value per share (₹)	No. of shares (units)	Market value ₹ in lakhs)
Wipro	2,000	35,000	700
TCS	2,700	18,000	486
Total			1,186

Particulars	(₹ in lakhs)	March 31, 2022 (₹ in lakhs)
Book value of assets		2,384.04
Book value of liabilities		1,501.55
Book Value of Equity		882.49
Less: Book value of Investments	1,099.28	
Less: Book value of PPE	540.67	
Add: Fair Value of Investments	1,186	
Add: Fair value of PPE	573.77	
Adjustment for change in fair values		+ 119.82
Net Asset Value (Fair Value basis)		<u>1002.31</u>
Number of shares		3.28
Value per share (₹)		305.58

- (i) Book Value of the Company is ₹882.49 lakhs.
- (ii) Net Asset Value of the company on fair value basis ~~₹752.67 lakhs.~~ ₹ 1002.31
- (iii) Value per share on fair value basis is ~~₹22.50~~ ₹ 305.58

Q3

Mr. Tarak wishes to acquire shares of M/s Raghuvans Ltd. to hold them for long term as sound investment, at the current market price of ₹ 50 per share. The price is expected to go upto a high of 55 per share in short run.

He has obtained the following information:

Recent EPS = INR 2.00

Growth rate (constant) = 5%

Dividend Payout Ratio = 50%

Required Rate of Return = 10%

After five years the P/E ratio is expected to be 10.5

Please **advise** whether Mr. Tarak should buy the shares at proposed price?

$$\frac{2(1+0.05) \times 0.5}{0.10 - 0.05} = 21$$

Reference

Gordon's Model

What's New

Over Priced / Under Priced

Answer

The current intrinsic value of the share = ₹ ~~22~~ 21

The share is much overpriced and Mr. Tarak should wait for price to stabilize if he wants to hold it for long term as investment.

The expected market value after five years is likely to be = ₹ 33.81

$$21 \times (1.10)^5 = 33.81$$

Thus he will lose if he buys at ₹50 per share for holding shares for long term. Therefore he should wait for price to fall to below ₹30 per share, before he buys the shares. $21 \times (1.05)^5 \times 10.5 = 26.8$

Q4

Company X has paid a dividend of ₹ 10 per share last year (D) and its dividend is expected to grow at 5% every year. If an investor's expected rate of return from Company X share is 7%, **estimate** the market price of the share as per the dividend discount model.

Reference	What's New
Gordon's Model	MP / Share

Answer

$$\frac{10(1.05)}{0.07 - 0.05} = 525$$

The market price of Company X share as per the dividend discount model with constant growth rate is ₹ 525.

Q5

Consider the following information extracted from the records of Global Logistic Limited.

(₹ in Crores)

	Actual	Projected				
		2022-23	2023-24	2024-25	2025-26	2026-27
Total Revenue	88.04	95.54	111.33	119.96	133.35	138.6
Cost of Goods Sold	26.62	38.31	42.59	52.11	52.06	51.3
Gross Profit	61.42	57.23	68.74	67.85	81.29	87.3
Administrative Expenses	5.44	8.66	7.3	9.37	11.67	9.47
Selling and Distribution Expenses	19.98	24.96	32.08	35.38	37.73	40.72
Depreciation	9.71	8.2	4.2	3.61	5.69	3.44
EBIT	26.29	15.41	25.16	19.49	26.20	33.67
Additional Information:						
Marginal Tax Rate	33.00%	33.00%	33.00%	33.00%	33.00%	33.00%
Increase In Operating Working Capital	5.04	6.13	5.02	7.08	6.78	6.95
Capital Expenditure	2.33	2.18	2.40	2.46	3.56	1.90

Assuming that the Company has 5 crores of equity shares with a face value of ₹ 10 each, Debt of ₹ 60 crores, steady growth rate of 8% in free cash flows after 2027-28 and Weighted Average Cost of Capital (WACC) of 12.5%

EPS/T (1-tax)	17.61	10.32	16.86	13.06	17.55	22.56
(+) Depn	9.71	8.2	4.2	3.61	5.69	3.44
(-) Inc in WC	(5.04)	(6.13)	(3.02)	(7.08)	(6.78)	(6.95)
(-) Cap Exp	(2.33)	(2.18)	(2.40)	(2.46)	(3.56)	(1.90)
FCFF	19.95	10.21	13.64	7.13	12.9	17.15

Phase 1:

DF (12.5%)	0.889	0.7901	0.7023	0.6243	0.5579	
PV	-	-	-	-	-	42.43

Phase 2

$$TV_6 = \frac{17.15(1.08)}{0.125 - 0.08} = 411.60$$

$$PV_0 = 411.60 \times 0.5549 = 228.40$$

$$\text{Total PV} = 42.43 + 228.40 = 270.83$$

(-) V_D

$$\frac{(60)}{210.83}$$

No of sh 5

Value of sh 42.17

Determine the value per share using free cash flow valuation method.

	1	2	3	4	5	6	7
Discounting Factor @12.50%	0.8889	0.7901	0.7023	0.6243	0.5549	0.4933	0.4385

Reference

Free Cash Flow for the Firm

What's New

Value / Share

Answer

Value per share using free cash flow valuation method = ₹ 42.17

Q6

You have been engaged to value Excel Ltd. which is a potential target for Gama Ltd.

You have received the management forecasted financial statements the extract of which is given below.

Amount in INR Lakhs	2023	2024	2025	2026	2027
Revenues	12000	12960	13997	15117	16326
Cost of Goods sold	7200	7776	8475	9238	10069
Gross Profit	4800	5184	5522	5879	6257
General Expenses	1344	1452	1582	1725	1880
Depreciation	420	454	494	539	587
EBIT	3036	3278	3446	3615	3790
Net Interest Expenses	556	528	502	477	453
EBT	2480	2750	2944	3138	3337
Taxes	868	963	1030	1098	1168
PAT	1612	1788	1914	2040	2169

Additional Information:

Change in Non-Cash Working Capital	384	415	452	493	537
Capex	1104	1192	1300	1417	1544

On further inquiry and assessment, you discovered that applicable tax rate would be 35%, the cost of capital that may be used for discounting is 9.5% and the long- term growth forecast for the company may be taken at 6%.

Analyse the Enterprise Value of Gama Ltd.

Reference

Free Cash Flow for the firm

What's New

Enterprise Value

Answer

Particulars (INR Lakhs)	2023	2024	2025	2026	2027
Profit After Tax	1612	1788	1914	2040	2169
Add: Net Interest x (1-Tax)	361	343	326	310	294
Unlevered Net Income	1973	2131	2240	2350	2464
Add: Depreciation	420	454	494	539	587
Less: Change in Non-Cash Working Capital	384	415	452	493	537
Less: Capex	1104	1192	1300	1417	1544
Free Cash Flows	905	978	982	979	970

The free cash flows should be discounted using cost of capital to arrive at the present value of free cash flows.

Particulars (INR Lakhs)	2023	2024	2025	2026	2027
Free Cash Flows	905 / 1.095	978 / 1.095	982 / 1.095	979 / 1.095	970 / 1.095
Present Value	827	815	748	681	616

The Terminal Value can be calculated as:

$$\text{Free cash Flows 2027} \times (1 + \text{Growth Rate}) / \text{Cost of Capital} - \text{Growth Rate} = 970 \times (1 + 0.06) / (0.095 - 0.060) = 29,362$$

However, this value is arrived as on the end of year 2027. This needs to be further discounted to arrive at the Present Value.

Accordingly, this value should be further discounted to bring the cash flows to their present values.

$$\text{PV of Terminal Value} = 29362 / (1 + 0.095)^5 = 18,652 \text{ Lakhs}$$

The Enterprise Value is given by: $(827 + 815 + 748 + 681 + 616 + 18,652) \text{ Lakhs} = 22,339 \text{ Lakhs}$

Q7

There is a privately held company XYZ Pvt. Ltd. that is operating into the retail space, and is now scouting for angel investors. The details pertinent to valuing XYZ Pvt. Ltd. are as follows:

The company has achieved break even this year and has an EBITDA of ₹ 90 crores. The beta based on the industry in which it operates is 1.8, and the average debt to equity ratio is hovering at 40:60. The rate of return provided by liquid bonds is 5%. The EV is to be taken at a multiple of 5 on EBITDA. The accountant has informed that the EBITDA of ₹ 90 crore includes an extraordinary gain of ₹ 10 crore for the year, and a potential write off of preliminary sales promotion costs of ₹ 20 crore are still pending. The internal assessment of rate of market return for the industry is 11%. The FCFs for the next 3 years are as follows:

	Y1	Y2	Y3
Future cash flows (₹ In Crore)	100	120	150

The cost of debt will be 12%. Assume a tax regime of 30%.

Calculate the potential value to be placed on XYZ Pvt. Ltd.?

Reference



What's New

Value of Co.

Answer

The beta is 1.8.

The adjusted EBITDA would be ₹ (90 – 10 – 20) crores = ₹60 crores.

The EV will be multiple of 5 of ₹60 crores obtained above = ₹300 crore.

The Cost of equity in accordance with CAPM = $R_f + \beta(R_m - R_f)$

$$= 0.05 + 1.8 (0.11 - 0.05) = 0.158 \text{ or } 15.8\%$$

The WACC = Cost of Equity + Cost of Debt

$$= 15.8 (60/100) + 12.0 (1-0.3) (40/100)$$

$$= 12.84\%.$$

Finally, the future cash flows can be discounted at the WACC obtained above as under-

(₹ in crores)

	Y1	Y2	Y3
Future Cash flows	100	120	150
Discount factor	0.89	0.79	0.70
PVs of cash flows	89	95	105
Value of the Firm			289

Discount factor, Year 1 = $(100/112.84) = 0.89$ Year 2 = $(100/112.84)^2 = 0.79$ Year 3 = $(100/112.84)^3 = 0.70.$

Q8

The following information of Achal Ltd. are given:

Current dividend = ₹ 2.50 per share

Discount rate = 10.5%

Growth rate = 2%

Based on the above information of Achal Ltd, you are **required** to

- (i) **Calculate** the present value of stock of Achal Ltd.
- (ii) Assess stock of Achal Ltd. whether it is overvalued if the stock price is ₹ 35, ROE is 9% and EPS is ₹ 2.25. Support your answer with complete workings.

Reference

Gordon's Model

What's New

Over Valued / UnderValued

Answer

- (i) Present value of the stock of Achal Ltd. = ₹ 30

- (ii) Using the constant growth model, the value will be = ₹ 21.52

This value is less than the stock price of ₹ 30 as calculated above or ₹ 35 as given in the question which indicates that stock of Achal Ltd is overvalued.

$$\frac{2.5(1.02)}{0.105 - 0.02} = 30.$$

$$\frac{2.25}{0.09} = 25$$

Q 9

The below information is given about 3 Companies:

Particulars	Company A	Company B	Company C
Debt	1,00,000	50,000	-
Equity (Opening Balance)	1,00,000	1,50,000	2,00,000
Enterprises Value	2,00,000	2,00,000	2,00,000
EBIT	30,000	30,000	30,000
Applicable Interest Rate is 9%			
Applicable Tax Rate is 25%			

Company A trades at a lower P/E Multiple than its peers Company B and Company C. The management of Company A believes that the lower P/E of the Company is not justified. The management team believes the market just doesn't understand its strategy or performance.

Assuming book values are representative of market values **calculate** the P/E and EV/ EBIT of each Company and **assess** whether the management is right in their thought process.

Reference

PE, EV / EBIT

What's New

EBIT	30000	30000	30000
Inv. Int (9% of Debt)	9000	4500	
EBIT	21000	25500	30000
Inv. Tax @ 25%	5250	6375	7500
EAT	<u>15750</u>	<u>11125</u>	<u>22500</u>
EV (c) Debt Value	<u>115750</u>	<u>161125</u>	<u>212500</u>
P/E	7.35	8.84	9.89
EV / EBIT	7.19	7.30	7.42

Answer

Particulars	Company-A	Company-B	Company-C
P/E	7.35	8.84	9.89
EV / EBIT	7.19	7.30	7.42

High debt, high risk, low P/E

The management's belief that the markets doesn't understand the reason for lower P/E of Company A is incorrect. The EV/EBITDA multiple of Company A is in line with the peers. The reason for the difference is that Company A has much more debt relative to equity than the other companies. Possibly, if Company A has the same level of D/E Ratio, the P/E would be higher and in line with peers. Except for very high growth companies, a company with higher debt relative to peers has a lower P/E Ratio because more debt translates to higher risk for shareholders and a higher cost of equity. Therefore, each rupee of earnings (and cash flow to shareholders) is worth less to an investor.

Since Price-to-earnings ratio mixes capital structure and non-operating items with expectations of operating performance, a comparison of P/Es is less reliable guide to companies' relative value than a comparison of enterprise value (EV) to EBIT.

Q10

The free cash flow of Suvision Ltd is projected to grow at a compound annual average rate of 35% for the next 5 years. Growth is then expected to slow down to a normal 5% annual growth rate. The current year's cash flow of Suvision Ltd is ₹ 4 lakhs. Suvision Ltd.'s cost of capital during the high growth period is 18% and 12% beyond the fifth year, as growth stabilizes.

Calculate the value of the Suvision Ltd.

Reference

Free Cash Flow for Equity

What's New

Two Phase Model

- Two disc
rate

Answer

Present Value of Cash Flows during the Forecast Period

$$\begin{aligned}
 PV_{1-t} &= \{[FCFE_0 \times (1 + g_t)] / (1 + WACC)_t\} \\
 &= [(4 \times 1.35) / 1.18] + [(4 \times (1.35)^2) / (1.18)^2] + [(4 \times (1.35)^3) / (1.18)^3] + [(4 \times (1.35)^4) / (1.18)^4] + [(4 \times (1.35)^5) / (1.18)^5] \\
 &= 5.4 / 1.18 + 7.29 / (1.18)^2 + 9.84 / (1.18)^3 + 13.29 / (1.18)^4 + 17.93 / (1.18)^5 \\
 &= 4.58 + 5.24 + 5.99 + 6.85 + 7.84 \\
 &= ₹30.50 lakh
 \end{aligned}$$

Calculation of Terminal Value

$$\begin{aligned}
 \text{Where } P_n &= FCFE_n \times (1 + g) / (k_e - g) \\
 &= ₹(17.93 \times 1.05) / 0.12 - 0.05 \\
 &= ₹18.83 / 0.07 \\
 &= ₹269 Lakh
 \end{aligned}$$

$$PV \text{ of Terminal Price} = 269 / (1.18)^5 = 117.58$$

$$\begin{aligned}
 P_{0 \text{ FCFE}} &= PV_{15} + PV_T \\
 &= ₹30.50 + ₹117.58 = ₹148.08 lakh.
 \end{aligned}$$

Yr	Phase 1 =		DF	PV
	CF			
1	4(1.35)	= 5.4	0.847	4.57
2	4(1.35)^2	= 7.29	0.718	5.23
3	4(1.35)^3	= 9.84	0.609	5.99
4	4(1.35)^4	= 13.29	0.516	6.86
5	4(1.35)^5	= 17.94	0.437	7.84
				30.50

Phase 2

$$\begin{aligned}
 TV_5 &= 4G_{t=10} = \frac{17.94(1.05)}{0.12 - 0.05} \\
 &= 269.1
 \end{aligned}$$

$(@18\%)$

$$\begin{aligned}
 TV_0 &= 269.1 \times 0.437 = 117.60
 \end{aligned}$$

$$V_F = 30.50 + 117.60 = 148.10$$

Zabardast Notes:

Holding Period Return: $\Rightarrow \left[\frac{SV - PC}{PC} \right]$

SV = Sale Value
PC = Purchase Cost

↑
for entire period of holding

Fwd looking Equity Risk Premium ($R_m - R_b$)

$[Expected Div Yield + long term growth rate] - R_f$ rate
 ↓
 in terms
 of price

↓
 Govt Sec.
 rate of
 return

Beta of a Pvt Ltd Co./Unlisted Co. using Proxy beta

Pvt Co.
 ↓
 Beta = ??

Similar Co. - listed Co.

↓
Beta = Levered beta of proxy firms = 1.2 (Say)

$$\text{financial risk} = \frac{D}{E} = \frac{70}{30} \\ = 2.33$$

$$\text{Financial risk} = \frac{\text{Debt}}{\text{Equity}}$$

$$= \frac{60}{40} \\ = 1.5$$

High fin risk \rightarrow High beta.

Total Beta = Op risk + fin risk

Step 1 Unlevering beta \Rightarrow find B_{UL} (using proxy data)

$$B_L = \boxed{B_{UL}} \times \left[1 + \frac{D}{E} (1-t) \right]$$

[Unlevered beta = Operational risk]

$$1.2 = B_{UL} \times [1 + 1.5]$$

$$B_{UL} = \frac{1.2}{2.5} = 0.48$$

Step 2 Assume, B_{UL} is same in both the Cos.

Step 3 Levered beta = Total beta = after incorporating the financial risk of the Co. under calculation

$$B_L = B_{UL} \times \left[1 + \frac{D}{E} \right]$$

$$= 0.48 \times [1 + 2.33]$$

$$= 1.60$$

lower infln, higher productivity = Lower risk premium

In case of proxy firm based Re Calculation

using levered beta, an adjustment may be made for size effect, mktability effect, controllability effect, etc.

$$\text{Value of Growth Opp} = V_0 - \frac{EPS}{k_e}$$

Q11

Raj Prakash is the primary portfolio manager of the global equity's portfolio at Organic Asset Management. Rina Kapoor, a recently hired valuation analyst, has been assigned to Prakash to assist him with the portfolio. Prakash recently sold shares of Cap Gemini, Inc. from the portfolio. Prakash tasks Kapoor with assessing the return performance of Cap-Gemini, with specific trade information provided in Exhibit 1.

Exhibit 1 Cap-Gemini, Inc. Trade Details

1. Cap-Gemini shares were purchased for ₹ 20.75 per share. P_0
2. At the time of purchase, research by Prakash suggested that Cap Gemini shares were expected to sell for ₹ 29.00 per share at the end of a 3-year holding period. P_3 estimated
3. At the time of purchase, the required return for Cap Gemini based upon the capital asset pricing model (CAPM) was estimated to be 12.6% on an annual basis.
4. Exactly 3 years after the purchase date, the shares were sold for ₹ 30.05 per share. P_3 actual
5. No dividends were paid by Cap Gemini over the 3-year holding period.

Prakash explains to Kapoor that, at the time of purchase, the CAPM used to estimate a required return for Cap Gemini incorporated an unadjusted historical equity risk premium estimate for the Indian equity market. Prakash notes that the Indian equities market has experienced a meaningful string of favorable inflation and productivity surprises in the past. He asks Kapoor whether the historical equity risk premium should have been adjusted before estimating the required return for Cap Gemini. For another perspective on the reward to bearing risk, Prakash asks Kapoor to calculate a forward-looking equity risk premium for the Indian equity market using data on the BSE index in Exhibit 2.

Exhibit 2 BSE Index Data

Dividend yield, based on year-ahead aggregate forecasted dividends 1.2%

Consensus long-term earnings growth rate 4%

20-year Indian government bond yield 3% (R_f)

Fwd looking equity risk prem

\Rightarrow Exp div yield + long term growth rate

- 20 yrs Indian govt bond yield.

Prakash is now considering adding shares of TCS, to the portfolio. Prakash asks Kapoor to calculate TCS's weighted average cost of capital using the CAPM with the information provided in Exhibit 3.

Exhibit 3 TCS

Pre-tax cost of debt 4.9%

$$K_d = 4.9(1-t)$$

K_d

Long-term debt as a percent of total capital, at market value 25%

$$K_d = 4.9 \times 0.7 = 3.43$$

Marginal tax rate 30%

TCS beta 2.00

$$K_e = 3 + 5.5 \times 2 = 14$$

K_e

Estimated equity risk premium 5.5% $(\text{Ln}-4)$

$$K_C = 3.43 + 0.25 + 14 \times 0.75 \\ = 11.36$$

Risk-free rate 3.0%

Relevancy of Beta

Lastly, Prakash asks Kapoor to evaluate Tara Industries, a privately owned Indian company that may initiate a public stock offering. Kapoor decides to adapt CAPM to estimate the required return on equity for Tara Industries. Kapoor identifies a publicly traded peer company with an estimated beta of 1.09 that is much larger but otherwise similar to Tara Industries. Tara Industries is funded 49% by debt while the publicly traded peer company is funded 60% by debt.

$$D = 60, E = 40$$

- i. Based upon Exhibit 1, the expected three-year holding period return for Cap Gemini Inc. at the time of purchase was closest to:

- a. 39.76%
- b. 42.76%
- c. 44.82%

$$\frac{\text{Exp SV - PC}}{\text{PC}} = \frac{29 - 20.75}{20.75} = 39.76\%$$

- ii. Based upon Exhibit 1, the realized three-year holding period return for Cap Gemini Inc. was closest to:

- a. 39.76%
- b. 42.76%
- c. 44.82%

$$\frac{\text{Act SV - PC}}{\text{PC}} = \frac{30.05 - 20.75}{20.75} = 44.82\%$$

- iii. Based on the historical record of surprises in inflation and productivity, the historical equity risk premium for the Indian equity market, if it is used as an estimate of the forward-looking equity risk premium, should most likely be:

- a. left unchanged.
- b. adjusted upward.
- c. adjusted downward.

ZN
[favourable infl & high productivity = lower risk prem]

- iv. Based on Exhibit 2, the forward-looking estimate for the Indian equity risk premium is closest to:

- a. 2.2%
- b. 5.8%
- c. 8.2%

$$= 1.2 + 4 - 3 = 2.2$$

- v. Based on Exhibit 3, and assuming interest on debt is tax-deductible, the weighted average cost of capital (WACC) for TCS is closest to:

- a. 10.87%
- b. 11.36%
- c. 13.61%

$$K_E = 11.36\%$$

- vi. The estimate of beta for Tara Industries is closest to:

- a. 0.44
- b. 0.85
- c. 0.89

$$\begin{aligned}
 S_1: 1.09 &= \rho_{BL} \times [1 + 1.5] \\
 \rho_{BL} &= \frac{1.09}{2.5} = 0.436 \\
 S_2: \rho_{BL} \text{ of Tara} &= 0.436 \\
 S_3: \rho_{BL} &= 0.436 \times [1 + 0.49 \times \frac{0.51}{0.49}] \\
 &= 0.85
 \end{aligned}$$

- vii. A potential weakness of Kapoor's approach to estimating the required return on equity for Tara Industries is that the return estimate:
- does not include a size premium.
 - may overstate potential returns over the long-term.
 - does not consider systematic risk arising from the economics of the industry.

Reference
Case Study - Evaluation using HPR, WACC, Beta
What's New
Answer

- A is correct. This is the expected 3-year holding period return, calculated as: 3 year expected return = $(₹ 29.00 - ₹ 20.75)/₹ 20.75 = 39.76\%$.
- C is correct. The realized holding period return (note that no dividends were paid during the 3-year holding period) is 44.82%. Specifically, the realized 3-year holding period is calculated as calculated as: 3 year realized return = $(30.05 - 20.75)/20.75 = 44.82\%$.
- C is correct. A string of favorable inflation and productivity surprises may result in a series of high returns that increase the historical mean estimate of the equity risk premium. To mitigate that concern, the analyst may adjust the historical estimate downward based on an independent forward-looking estimate.
- A is correct. Given the data presented, the equity risk premium can be estimated as: Equity risk premium = dividend yield on the index based on year-ahead aggregate forecasted dividends and aggregate market value + consensus long-term earnings growth rate - current long-term government bond yield. The equity risk premium = $1.2\% + 4.0\% - 3.0\% = 2.2\%$.
- B is correct. The weighted average cost of capital is taking the sum product of each component of capital multiplied by the component's after-tax cost. First, estimate the cost of equity using the CAPM: Cost of equity = Risk-free rate + [Equity Risk Premium \times Beta] Cost of equity = $3.0\% + [5.5\% \times 2.00] = 14\%$

Now, calculate TCS's WACC:

	Equity	Debt	WACC
Weight	0.75	0.25	
After Tax Cost	14%	$(1-0.30) \times 4.9\%$	
Weight \times After Tax Cost	10.5%	0.8575%	11.36%

- vi. B is correct. The steps to estimating a beta for a non-traded company are: Step 1 Select the comparable benchmark Step 2 Estimate benchmark's beta Step 3 Un-lever the benchmark's beta Step 4 Lever the beta to reflect the subject company's financial leverage The

beta of the benchmark peer company data is given as 1.09. Next, this beta needs to be unlevered, calculated as:

- vii. A is correct. Kapoor intends to estimate a required return on equity using a modified CAPM approach. Tara Industries is stated to be smaller than the chosen proxy benchmark being used and there is no size premium adjustment in the CAPM framework; the framework adjusts the beta for leverage differences but this does not adjust for firm size differences. The build-up method may be more appropriate as it includes the equity risk premium and one or more additional premia, often based on factors such as size and perceived company specific risk.

Q12

A firm has 10,000 shares of ₹ 100 each listed on Bombay Stock Exchange. The Earnings per share is ₹ 19 and the market price of the shares is ₹ 140 per share. All shares are outstanding. Capital structure of the firm is divided into equity and debts. Book value of debts is ₹ 4,00,000 while the market value of debts was ₹ 4,50,000. The firm maintains cash and equivalent to cash ₹ 40,000. The profit of the firm was ₹ 1,50,000 without considering the depreciation of ₹ 30,000. Current assets and fixed assets are ₹ 7,00,000. All information about the firm is related to the financial year 2023-24.

You are required to **compute** the enterprise value.

$$\text{MV of Eq} + \text{MV of Debt} - \text{Cash}$$

$$= 140 \times 10000 + 450000 - 40000$$

Reference Enterprise Value	$\text{EPS} = 19$ $\text{MPS} = 140$	What's New = ₹ 18,10,000 Book Value Approach
Answer	$\text{Cap} \leftarrow \text{Eq}$ $\text{Debt} = \frac{\text{Bv}}{4C} \frac{\text{Mv}}{4.5}$ $\text{Cash} \quad 40000$	

Enterprise value (EV) = ₹ 18,10,000

Notes
Book value is not considered for computing enterprise value.

Profit before depreciation or after depreciation has no meaning in computing enterprise value.

Fixed and current assets are not part of enterprise value.

Only market values are considered in enterprise value.

Q13

PAT

Laxmi Electronics Ltd. reported a profit of ₹ 105 lakh after 30% tax for the financial year 2023-24. An analysis of the accounts revealed that the income included extraordinary items of ₹ 42 lakh and an extraordinary loss of ₹ 4 lakh. The existing operations, except the extraordinary items, are expected to continue in the future. In addition, the results of the launch of the new product 'Raghu TV' are expected to be as follows:

Sales ₹ 70 lakh; Material and Labour cost as variable costs ₹ 25 lakh; Fixed cost ₹ 17 lakh. **EBIT = ✓**

You are required to -

- Assess the value of business given that the capitalization rate is 14%.
- If the EPS of Laxmi Electronics Ltd is ₹ 4.7 and the price earnings ratio is 10 times, then what would be the market price of share?

Reference	What's New
Value of Business	Earning Capitalisation and P/E Multiple
(i) $\frac{\text{Net Earnings}}{\text{KE}}$	$\text{PAT} = 105$ $\text{PBT} = \frac{105}{70\%}$ 150
$= \frac{98}{14\%}$	(+) Extra Divd income (42)
$= 700$	(+) Extra Ord loss 4
(ii) 4.7×10	Addl Pft 28 $(70 - 25 - 17)$
$= 47$	FMP b4 tax 140
	→ Tax @ 30% (42)
	FMP After tax 98

Multiple Choice Questions

Income, Mkt, Cost

1. Which of the following is not one of the three fundamental methods of firm valuation
 - (a) Discounted Cash flow = Inc
 - (b) Income or earnings - where the firm is valued on some multiple of accounting income or earnings. = Mkt
 - (c) Balance sheet - where the firm is valued in terms of its assets. = Cost
 - Market Share
2. What is the value of the firm usually based on
 - The value of debt and equity
 - The value of equity. (CMAI)
 - (c) The value of debt
 - (d) The value of assets plus liabilities.
3. Shareholders wealth increases with the increase in _____
 - (a) EPS
 - (b) Market value of the firm
 - Dividend & market value of the firm (CMAI)
 - Market price of the equity share
4. Which of the following has Net profit as basis for calculation
 - (a) Net present value
 - Average rate of return
 - (c) Internal rate of return
 - (d) Payback period
5. Internal rate of return is _____
 - (a) Rate at which discounted cash inflow is more than discounted cash outflow
 - (b) Rate at which discounted cash inflow is less than discounted cash outflow
 - Rate at which discounted cash inflow is equal to the discounted cash outflow
 - (d) Either a or b
6. Corporate wealth maximization is the value maximization for _____
 - Equity shareholders
 - Stakeholders (CMAI)
 - (c) Employees

Cap Bond

Cap Bond

- (d) Debt capital owners
7. Listed companies can be valued at
- Book Value
 - Market value
 - Salvage value
 - Liquidation value
8. Unlisted company can be valued at
- Net asset Method
 - Market value method
 - Both a & b
 - None of the above
9. Which of the following valuation methods is based on "Going concern concept"
- Market value method
 - Book value method
 - Liquidation method
 - Salvage value method
10. A company has a profit attributable to ordinary shareholders of ₹ 100,000. The number of ordinary shares of ₹ 1 in issue during the year was 3,00,000. The market value of the shares at the year end was ₹ 6.50. The Price/earnings ratio for this company is:
- 0.05 times
 - 0.33 times
 - 6.5 times
 - 19.5 times
11. What does the price/earnings (PE) ratio measure?
- The multiple that the stock market places on a company's earnings = P/E Ratio
 - The number of times that dividends paid are covered by profits = Div Cov ratio
 - The return received by way of dividends as a percentage of current share price = Div Yield
 - The amount of profits available to ordinary shareholders = EPS
12. What does the price-to-earnings ratio (P/E) tell you?
- How much each of a company's products sells for on average. = SP
 - How much investors are willing to pay per unit of a company's earnings.
 - How much tax per unit investors are willing to pay. = Tax
 - None of the above

Books of Acos

$$\text{EPS} = \frac{\text{Net Profit}}{\text{No of Sh}} = \frac{100,000}{3,00,000} = 0.3333$$

$$P/E = \frac{6.5}{0.3333} = 19.50$$

13. How is the P/E ratio calculated?

- (a) Market value/quick ratio
- (b) Earnings per share/market capitalization
- (c) Market value per share/earnings per share
- (d) None of the above

14. Which of the following is the most important use of the P/E ratio for investors? *Exp Price*

- (a) It helps investors decide how much profit a company is likely to make in future.
- (b) It helps investors decide whether a company's shares are overpriced or underpriced.
- (c) It helps investors decide on the most appropriate risk to reward ratio.
- (d) None of the above

15. Which of the following most likely represents an interpretation of a high P/E ratio of a stock?

- (a) A company shares are currently overpriced.
- (b) A company shares are currently underpriced.
- (c) A company shares are currently fairly priced.
- (d) None of the above

16. High P/E ratios tend to indicate that a company may _____

- (a) grow quickly
- (b) grow at the same speed as the average company
- (c) grow slowly
- (d) not grow

ESG + RIS

17. _____ is equal to (common shareholders' equity)/common shares outstanding)

- (a) Book value per share
- (b) Liquidation value per share
- (c) Market value per share
- (d) Tobin's Q

Replace Cost of Assets / BV of Assets

18. The _____ is defined as the present value of all cash proceeds to the investor in the stock.

- (a) dividend payout ratio
- (b) intrinsic value
- (c) market capitalization rate
- (d) plowback ratio

19. Companies may adopt an aggressive or a conservative working capital policy. An aggressive policy means that a company

WCM

- (a) holds high levels of cash and inventories
 (b) expects a lower level of profitability
 (c) has a low level of flexibility
 (d) faces a low level of risk
20. Permanent working capital
 (a) Varies with seasonal needs
 (b) Includes long term property, plant & equipment
 (c) is the amount of current assets required to meet a firm's long-term minimum needs
 (d) Includes shareholders' funds
21. Which of the performance evaluation methods takes into consideration tax effects?
 (a) Economic value added (Tax effect is mandatory)
 (b) Return on sales
 (c) Residual income $[Pft - Cc]$
 (d) Return on investment
22. Which of the following best describes "Market Value Added"?
 (a) The value added to the product the firm produces above and beyond the costs of the inputs.
 (b) The difference between the book value of equity and debt versus the market value of the firm.
 (c) The difference between the market value of the firm and the amount of contributed capital $[MV - BV]$
 (d) None of the above
23. Market price per share of a firm having equity capital of ₹ 100,000 consisting of shares of ₹ 10 each, profit after tax of ₹ 82,000 & P/E ratio of 8 is
 (a) ₹65.70
 (b) ₹10.25
 (c) ₹65.60
 (d) ₹1.025
- $P_{AT} = 82000$ $P/E = 8$
 $No\ of\ sh = 10000$ $MPS = 8 \times 8.2$
 $EPS = 8.2$ $= 65.60$
24. Which of the following are commonly cited reasons for M&As?
 (a) Synergy
 (b) Market power
 (c) Strategic realignment
 (d) All of the above

- Time Value of Money*
25. Which theory describes money received in the current time it has more worth than money received in future
- Cash value of money
 - Time value of money
 - Storage value of money
 - Lead value of money
- Cap Bondy*
26. A project assumed monetary gain or loss by discounting entire cash inflows and outflows by utilising the necessary rate of return is listed as
- Net recorded cash value
 - Net discounted value
 - Net future value
 - Net present value
- Cap Bondy*
27. As per the net present value, any projects to be acceptable should have a
- Positive net present value
 - Zero net present value
 - Negative net present value
 - Both A and B
- Cap Bondy*
28. The cash flows method, utilized by the internal rate of return and net present value method are
- Future cash flows
 - Lean cash flows
 - Discounted cash flows
 - Vertical cash flows
- Cap Bondy*
29. Which method in a capital budgeting is based on the discounted cash flow?
- Net equity budgeting method
 - Net capital budgeting method
 - Net future value method
 - Net present value method
- Cap Bondy*
30. Cash flows are a project's revenue and are indicated by
- Positive numbers
 - Negative numbers
 - Relative number
 - Hurdle number

31. In which payback period a due cash flows are discounted with the cost of capital of the project is categorised as

- Cap Bondy*
- (a) Discounted Project cost *(CIMA)* → ignore
 - (b) Discounted cash Flows
 - (c) Discounted rate of return
 - (d) Discounted payback period

32. Which cash flow is accessible for a firm's investors?

- (a) Free cash flow
- (b) Investing cash
- (c) Net profit
- (d) Cash Balance

33. The cost of funds used for financing the business is known as

- (a) Cost of equity
- (b) Cost of debt
- (c) Cost of capital *(CIMA)*
- (d) WACC .

34. The rate of return that the suppliers of capital (bondholders and owners) require as compensation for their contributions of capital is

- (a) Cost of equity
- (b) Cost of debt
- (c) Cost of capital *(CIMA)*
- (d) WACC

35. Under IFRS / Ind AS environment, Depending on their terms of issue Preference Shares are being classified as

- IFRS
Chp-6*
- (a) Debt
 - (b) Equity
 - (c) Either a or b
 - (d) Neither a nor b

36. As the risk-free rate increases, the cost of debt for companies will

- (a) Increase
- (b) Decrease
- (c) Remain unchanged
- (d) Nothing can be concluded

37. If the rate at which the company can borrow funds from the financial institutions is 11 percent and the tax rate applicable to the company is 30 percent. The Post Tax Cost of Debt would be

- (a) 15.71 percent
- (b) 7.7 percent
- (c) 0.3 percent
- (d) 3.3 percent

$$K_d = 11 (1 - 0.3) = 7.7$$

38. If the 10 Year Government bond yield is 7.5% and the BSE Sensex return over the last one ~~year~~ is 15%. Assuming the company's ~~Beta is 1.2~~, what is the Required return on Equity?

- (a) 15.6 Percent
- (b) 16.6 Percent
- (c) 16.5 Percent
- (d) 17 Percent

$$R_E = R_B + \frac{R_P - R_B}{P} \times \beta$$

$$R_E = 7.5 + (15 - 7.5) \times 1.2 \\ = 16.5$$

39. The risk that is eliminated by diversification is called

- (a) unsystematic risk } **Cumulative**
- (b) diversifiable risk }
- (c) market risk
- (d) systematic risk

40. The risk inherent to the entire market or market segment is called

- (a) Diversifiable risk
- (b) unique risk
- (c) firm-specific risk
- (d) systematic risk

41. If a company has a P/E ratio of 20 and a ROE (Return on Equity) of 15% then the Market to Book Value Ratio is-

- (a) 3 times
- (b) 0.03
- (c) Cannot be calculated from the given information
- (d) None of the above

$$P/E = \frac{MVE}{EPS} = 20 \quad \frac{EPS}{BV} = 15\%$$

$$\frac{MVE}{BV} = P/E \times EPS/BV \\ = 20 \times 15\% = 3$$

42. If an all equity firm has cash from operating Activities amounting to ₹ 60 lakhs, Depreciation ₹ 30 lakhs, increase in non-cash working capital ₹25 lakhs and capital expenditure ₹ 20 lakhs ~~and capital expenditure ₹20 lakhs~~, its Free cash flows to Equity amounts to (in ₹ Lakhs)

- (a) ₹40 lakhs
- (b) ₹45 lakhs

$$FCF = 60$$

$$\hookrightarrow FCF_{Eq} = \frac{(20)}{40}$$

- (c) ₹60 lakhs
 (d) ₹90 lakhs
43. Assume that in a stock market, the CAPM is working. A company has presently beta of 0.84 and its going to finance its new project through debt. This would increase its Debt/Equity Ratio to 1.56 from the existing 1.26. Due to increased Debt/Equity Ratio, the company's beta would
 (a) Increase
 (b) Decrease
 (c) Remain unchanged (circular mark)
 (d) Nothing can be concluded
44. Which one is the advantage of DCF valuation
 (a) Its not based upon an asset's fundamentals
 (b) It is not the right way to think about what an investor would get when buying an asset
 (c) it forces an investor to think about the underlying features of the firm and understand its business
 (d) All of these
45. Estimated fair value of an asset is based on the _____ value of operating cash flows.
 (a) Current
 (b) Discounted
 (c) Future
 (d) none of these
46. X Ltd's share beta factor is 1.40. The risk free rate of interest on government securities is 9%.
 The expected rate of return on the company equity shares is 16%. The cost of equity capital based on CAMP is -
 (a) 15.8 Percent
 (b) 16 Percent
 (c) 18.8 Percent
 (d) 9 Percent
- unclear language*
- $\beta = 1.4$ $R_f = 9\%$ $E(R) = 16\% = R_m$ $R_e = 9 + (16-9) \times 1.4 = 18.8$
- unclear language*
47. The sensitivity of an asset's return to the return on the market index is referred to as its _____
 (a) Beta
 (b) Delta
 (c) gama
 (d) alpha

48. The additional return required by investors to invest in equities rather than a risk-free asset is known as

- (a) Equity risk premium
- (b) unique risk
- (c) firm-specific risk
- (d) systematic risk

49. Which theory describes money received in the current time it has more worth than money received in future

~~Repeat~~
~~TVM~~

- (a) Cash value of money
- (b) Time value of money
- (c) Storage value of money
- (d) Lead value of money

50. A project assumed monetary gain or loss by discounting entire cash inflows and outflows by utilising the necessary rate of return is listed as

~~Repeat~~

- (a) Net recorded cash value
- (b) Net discounted value
- (c) Net future value
- (d) Net present value

51. The cash flows method, utilized by the internal rate of return and net present value method are

~~Repeat~~

- (a) Future cash flows
- (b) Lean cash flows
- (c) Discounted cash flows
- (d) Vertical cash flows

52. Which method in a capital budgeting is based on the discounted cash flow?

~~Repeat~~

- (a) Net equity budgeting method
- (b) Net capital budgeting method
- (c) Net future value method
- (d) Net present value method

53. Cash flows are a project's revenue and are indicated by

~~Repeat~~

- (a) Positive numbers
- (b) Negative numbers
- (c) Relative number
- (d) Hurdle number

54. In which payback period a due cash flows are discounted with the cost of capital of the project is categorised as

- (a) Discounted project cost
- (b) Discounted cash flows
- (c) Discounted rate of return
- (d) Discounted payback period

Repear

55. If business is financed solely through equity, then cost of capital is the same as ____.

- Cost of Equity

$$k_o = k_e$$

- (b) Cost of Debt
- (c) Cost of Retained earnings
- (d) None of the above

56. If a company is having higher price to Book Value Ratio than those of the peers in the industry, it may be due to the fact that ____.

- (a) it enjoys better goodwill in the market
- (b) it has strong brands of its products
- (c) it may have a lot of intangibles not reflected in its Balance Sheet
- (d) All the above statements are true

57. If earnings per share of a company is ₹10 and the price earnings ratios of other similar companies is 5, then market value of share of the company will be ₹ ____.

- (a) 50
 (b) 2
 (c) 0.5
 (d) 7.5

$$\text{EPS} = 10$$

$$\text{MPS} = 10 \times 5$$

58. If stock A has a beta of 1.6 and stock B has a beta of 1.2, they make up the portfolio in the ratio of 70 : 30. What would be the beta of the portfolio ____?

- ~~SFM~~
~~PLF Mgmt~~
 = weighted
 Avg beta
 (a) 1.48
 (b) 2.48
 (c) 1.92
 (d) Beta cannot be calculated

	Pkt	Weight	β_{Wt}
Stock A	1.6	0.70	1.12
Stock B	1.2	0.30	0.36
			<u>1.48</u>

59. Assume that the following details are given for a company: Sales- ₹ 1,00,000; Costs - ₹ 75,000; Depreciation- ₹ 20,000; Tax- 35%; Change in Net Working Capital- ₹1,000; Change in Capital Spending- ₹ 10,000. The Free Cash Flow to Firm (FCFF) for the given data would be:

- (a) ₹ 10,000
- (b) ₹ 12,250

$$\text{FCFF} = \frac{\text{Sales} = 1L}{\rightarrow \text{Cost} = 75000}$$

$$\rightarrow \text{Depn} = \frac{20000}{\text{PBT}}$$

$$\rightarrow \text{Tax} @ 35\% = \frac{(17500)}{50000}$$

PAT	3250
(+) Depn	20000
(-) Net WC	(10000)
(-) Cap Ex	(10000)
	<u>12250</u>

- (c) ₹ 13,500
(d) ₹ 15,000

60. X Ltd.'s share beta factor is 1.40. The risk free rate of interest on government securities is 9%. The expected rate of return on the company equity shares is 16%. The cost of equity capital based on CAPM is:

- (a) 15.8%
(b) 16%
(c) 18.8%
(d) 9%

This is R_f - language is unclear

CAPM
Error in
language

61. Given: The growth rate in the dividends is expected to be 8%. The Beta of the stock is 1.60 and the return on the market index is 13%. The required rate of return would be

- (a) 14%
(b) 16%
(c) 18%
(d) 20%

$$R_f = 8\% \\ \beta = 1.6 \\ R_m = 13\%$$

$$R_e = R_f + (R_m - R_f) \times \beta \\ = 8 + (13 - 8) \times 1.6 \\ = 16$$

62. RICO Ltd. has PAT of ₹ 40.20 lakh with extra ordinary income of ₹ 7.00 lakh. If the cost of capital is 20% and the applicable tax rate is 40% the value of Rico Ltd. will be

- (a) ₹ 250 lakh
(b) ₹ 180 lakh
(c) ₹ 150 lakh
(d) Insufficient information

$$PAT = 40.2$$

$$PBT = PAT / (1 - t) = (40.2 / 1 - 0.4) = 67 \\ \Rightarrow \text{Extra Ord inc} \\ \text{Adj fm PBT} = \frac{67}{60}$$

$$\text{Adj fm PAT} = \frac{36}{60}$$

$$\therefore V_F = 36 / 0.2 = 180$$

$$\text{Tax} = 33\%$$

$$= \frac{\text{EPS}}{\text{MPI}}$$

$$= \frac{25}{50} = 5\%$$

- (a) 5%
(b) 10%
(c) 15%
(d) 2%

* R/s A company with PAT of ₹ 60 Crores, Tax Rate 30% plus a cess of 3%, Return on Equity is 20%, Other Equity ₹ 225 Crores, PAT of the company is growing by 8% per year then equity share with a par value of ₹ 10 will have EPS of _____.

- (a) ₹ 2
(b) ₹ 8
(c) ₹ 10
(d) Insufficient information

$$PAT = 60$$

$$ROE = 20\%$$

$$\frac{PAT}{Eq} = 20\%$$

$$Eq$$

$$\frac{60}{Eq} > 20\%$$

$$Eq = \frac{60}{20\%} = 300$$

$$R/s > 225$$

$$Eq = ESC + R/s \\ 300 = ESC + 225$$

$$ESC = 75$$

$$\text{No. of Sh} = \frac{75}{10} = 7.5$$

$$\therefore EPS = \frac{PAT}{No. of Sh} = \frac{60}{7.5} = 8$$

65. Market price of share ₹ 50, earnings per share ₹ 22.20, dividend per share ₹ 12.5 then what would be the price earnings ratio?

- (a) 2.25
- (b) 4
- (c) 6.25
- (d) 10.25

$$MPS = 50 \quad EPS = 22.2$$

$$P/E = 50 / 22.2$$

66. A Company has reported Profit Before Tax ₹ 1,000 crore. The applicable tax rate is 30% and it has ROE (Return on Equity) of 14%. If it has Other Equity of ₹ 4,000 crore and the face value of the share is ₹ 10, then its EPS (Earnings Per Share) is

- (a) ₹ 2
- (b) ₹ 5
- (c) ₹ 7
- (d) Insufficient Information

$$PBT = 1000$$

$$Tax = 30\%$$

$$PAT = 700$$

$$ROE = 14\%$$

$$PAT = 14\%$$

$$Eq$$

$$700 / Eq = 14\%$$

$$R/S = 4000$$

$$Eq = ESC + R/S$$

$$5000 = ESC + 4000$$

$$ESC = 1000$$

$$\frac{No\ of\ Eq\ sh}{10} = \frac{1000}{10} = 100$$

67. A Company's share is currently trading in the market at ₹ 450. It is estimated that its cost of equity is 18% and the value of growth opportunities is ₹ 250. Then, its Price/Earnings Ratio will be

- (a) 11.11
- (b) 12.25
- (c) 12.50
- (d) None of the above

$$MPS = 450 \text{ (with growth)}$$

$$ke = 18\%$$

$$\therefore EPS = \frac{PAT}{\text{No of Sh}} = \frac{700}{100} = 7$$

2N Value of growth opp: 250

P/E Ratio

68. Which of the following would impact DCF more and why?
- (a) Discount rate. (more impact)
 - (b) Sales growth.
 - (c) Both above.
 - (d) None of the above.

$$= \frac{MPS}{EPS} = \frac{450}{36} = 12.50$$

69. Mr. X is evaluating the investment merits of Bing Corp., a successful motorcycle manufacturer. X is forecasting a dividend in year 1 of INR 120 per share, a dividend in year 2 of INR 240 per share, and a dividend in the year 3 of INR 360 per share. After year 3, X expects dividends to grow at a rate of 6% per year. X calculates a beta of 1.3 for Bing. X expects the BSE index return 8%. The risk free rate of return is 2%. Using the multistage dividend discount model, X's intrinsic value is closest to:

- (a) INR 8166.4
- (b) INR 2366.6
- (c) INR 9166.4
- (d) None of the above.

Yr	Div	D/F @ 8%	PV
1	120	0.911	109.32
2	240	0.829	198.96
3	360	0.755	271.8
			580.08

$$\text{Value of Growth Opp} = \frac{P_0}{ke} - \frac{EPS}{ke}$$

Value with growth - Value without growth

$$250 = \frac{450}{1.18} - \frac{EPS}{1.18}$$

$$Beta = 1.3 \quad R_m = 8\% \quad R_f = 2\% \\ Re = 2 + (8 - 2) \times 1.3 \\ \rightarrow 9.8\%$$

$$Y_4 = 360 \times 1.06 = 381.6 \rightarrow TV_3 = \frac{360 \times 1.06}{0.098 - 0.06} = 10042.10$$

70. The following details are given for a company: Sales - INR 1,00,000; Operating Expenses - INR 75,000; Depreciation - INR 20,000; Tax - 35%; Change in net working capital - INR 1,000; capital spending - INR 10,000. The free cash flow to firm (FCFF) for the given data would be:

- repeat ✓*
 (a) INR 10,000
 (b) INR 12,250
 (c) INR 13,500
 (d) INR 15,000

$$\begin{aligned} \text{Sales} &= 1L & \text{PAT} & 3250 \\ \text{Op Exp} &= 75000 & (+) \text{Dep} & 20000 \\ \text{Depr} &= 20000 & \Rightarrow \text{WC} & 1000 \\ \text{PBT} &= 50000 & \Rightarrow \text{Cap Sp} & 10000 \\ \Rightarrow \text{FCFF} &= 17500 & & 12250 \end{aligned}$$

71. Anita, a valuer is evaluating Axis Ltd and expects that the company will give its first dividend of ₹15 after 2 years from now. In the subsequent year, the dividend is expected at ₹16 which is expected to grow at 7 percent. The Risk-Free rate is assessed at 6 percent. The Equity Risk Premium is 7 percent and the Beta applicable to Axis Ltd is 0.95. According to Anita, which of the following would be the value of Axis Ltd?

- 2-3 | 4-10*
1-CF | 3
0-P | 2
 $Re = 6 + 7 \times 0.95$
 $= 12.65$
 (a) ₹235
 (b) ₹247
 (c) ₹295

Yr	Div	DF _{t+1} 12.65%	PV
1	-	-	0
2	15	0.788	11.52

$$TV_2 = \frac{16}{0.1265 - 0.07} = 283.19$$

$$PV_0 = \frac{15}{0.1265 - 0.07} = 223.15$$

72. A firm has an expected dividend payout ratio of 60% and an expected future growth of 7%. What should the firm's fundamental price-to-earnings (P/E) ratio be if the required rate of return on stocks of this type is 15%?

- (a) 5.0x
 (b) 7.5x
 (c) 10.0x

$$\begin{aligned} \text{Payout} &= 0.6 \\ g &= 7\% \\ D_E &= 15\% \\ &= \frac{0.6}{0.15 - 0.07} = 7.5 \end{aligned}$$

73. An analyst wishes to calculate the WACC for a company. The company's debt is twice that of the equity. The required returns on the company's debt and equity are 8% and 10%, respectively. The company's marginal tax rate is 30%. The WACC is closest to:

- D/E = 2*
 $\therefore E_D = E_1$
 $\therefore g = 7\% \times 2 = 14\%$
 $\therefore D_E = 15\%$
 (a) 6.07%
 (b) 7.07%
 (c) 8.67%

$$\underline{\text{WACC}} = \frac{D}{E} = 2$$

$$K_d = 8\% \times (1 - 0.3) = 5.6$$

$$K_e = 10\%$$

$$\begin{aligned} \text{WACC} &= 5.6 \times \frac{2}{3} + 10 \times \frac{1}{3} \\ &= 7.0667\% \end{aligned}$$

74. Reliance Motors shares are expected to pay dividends of ₹1.50, ₹1.60, and ₹1.75 at the end of each of the next three years, respectively. The investor expects the price of the shares at the end of this 3-year holding period to be ₹54.00. The investor's required rate of return is 15%. The current value of Reliance Motors' shares is closest to.

- (a) ₹37.00
 (b) ₹39.17
 (c) ₹41.00

Yr	Div	Disc PV _{t+1}	PV
1	1.5	0.869	
2	1.6	0.756	
3	1.75	0.658	39.19

75. Aura Mines Ltd is trading at a price of ₹245 per share. Its recent dividend was ₹11 per share. If the investors expect a return of 14 percent on the share, what is the implied growth rate of the stock.

$$\begin{aligned} MPS &= 245 \\ D_0 &= ₹11 \\ Re &= 14\% \\ 245 &= 11(1+g) \end{aligned}$$

$$g = ? \quad | \quad \begin{array}{l} 0.14 - g \\ 245(0.14 - g) = 91(1 + g) \\ 34.3 - 245g = 11 + 91g \\ 23.3 = 256g \\ g = 9.10\% \end{array}$$

- (a) 7.1 percent
 (b) 8.1 percent
 (c) 9.1 percent

Answer:

1	d	2	b	3	c	4	b	5	c	6	b	7	b	8	a
9	b	10	d	11	a	12	b	13	c	14	b	15	a	16	a
17	a	18	b	19	c	20	c	21	a	22	c	23	c	24	d
25	b	26	d	27	d	28	c	29	d	30	a	31	a	32	a
33	c	34	c	35	c	36	a	37	b	38	c	39	a	40	d
41	a	42	a	43	c	44	c	45	b	46	c	47	a	48	a
49	b	50	d	51	c	52	d	53	a	54	a	55	a	56	d
57	a	58	a	59	b	60	c	61	b	62	b	63	a	64	b
65	a	66	c	67	c										

Sl. No.	Answer	Justification
68	(a)	Both discount rate and sales growth rate will be sensitive in a proper DCF model. But Discount rate's impact would far exceed that of operational assumption such as sales growth rate.
69	(a)	<p>Explanation: $D_1 = 120$ $D_2 = 240$ $D_3 = 360$ $g = 0.06$</p> <p>Required Return $= R_f + (R_m - R_f)\beta$ $= 0.02 + (0.08 - 0.02) \times 1.3$ $= 0.098$</p> $P_3 = \frac{360 \times (1.06)}{(0.098 - 0.06)} = 10042.11$ $V_0 = \frac{120}{(1.098)^1} + \frac{240}{1.098^2} + \frac{360 + 10,042.11}{1.098^3} = 8166.4$

70	(b)	FCFF is given by: PAT + Depreciation – Change in Working Capital – Capital Expenditure																				
		<table border="1"> <tr> <td>Sales – Costs - Depreciation</td><td>1,00,000</td></tr> <tr> <td>Less: Operating Expenses</td><td>75,000</td></tr> <tr> <td>Less: Depreciation</td><td>20,000</td></tr> <tr> <td>Profit Before Tax</td><td>5,000</td></tr> <tr> <td>Less: Tax</td><td>1,750</td></tr> <tr> <td>PAT</td><td>3,250</td></tr> <tr> <td>Add: Depreciation</td><td>20,000</td></tr> <tr> <td>Less: Change in working capital</td><td>1,000</td></tr> <tr> <td>Less: Change in capital spending</td><td>10,000</td></tr> <tr> <td>Free Cash Flow to Firm (FCFF)</td><td>12,250</td></tr> </table>	Sales – Costs - Depreciation	1,00,000	Less: Operating Expenses	75,000	Less: Depreciation	20,000	Profit Before Tax	5,000	Less: Tax	1,750	PAT	3,250	Add: Depreciation	20,000	Less: Change in working capital	1,000	Less: Change in capital spending	10,000	Free Cash Flow to Firm (FCFF)	12,250
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Free Cash Flow to Firm (FCFF)	12,250																					

71. Correct Answer is A) ₹235

The discount rate is calculated as

$$\begin{aligned} K_e &= R_f + \text{Equity Risk Premium} \times \text{beta} \\ &= 6\% + 7\% \times 0.95 \\ &= 12.65\% \end{aligned}$$

The PV factor for 12.65% for 2 years is 0.7880

The value of Axis Ltd would be given by.

$$\text{Value} = \frac{1}{1.1265^2} = \frac{16}{(0.1265 - 0.07)} = \frac{16}{0.1265^2}$$

72. Correct Answer is B) 7.5x

Using the earnings multiplier model, $0.6 / (0.15 - 0.07) = 7.5x$

73. Correct Answer is B) 7.07%

Calculate the percentage of debt and equity in the capital structure.

Debt-to-equity ratio of 2 to 1

Thus, proportion of Debt = $2/3 = 66.7\%$

Proportion of Equity = $1/3 = 33.3\%$ equity.

$$\begin{aligned} \text{Then, WACC} &= (W_e \times K_e) + [W_d \times K_d \times (1 - \text{tax rate})] \\ &= (0.333 \times 10\%) + [0.667 \times 8\% \times (1 - 30\%)] \\ &= 7.07\% \end{aligned}$$

74. Correct answer is B) 39.17

The value of the shares is given by

$$\text{Value} = \frac{1.5}{1.15^1} + \frac{1.6}{1.15^2} + \frac{1.75 + 54.0}{1.15^3}$$

75. Correct answer is C) 9.1 percent

The valuation equation is given by

$$34.3 - 245g = 11 + 11g$$

Or $23.3 = 256g$

Or $g = 0.091$ or 9.1 percent

$$\text{Price} = \frac{D_0 \times (1+g)}{k_e - g}$$

$$245 = \frac{11 \times (1+g)}{0.14 - g}$$

$$34.3 - 245g = 11 + 11g$$

Or, $23.3 = 256g$

Or, $g = 0.091$ or 9.1 percent