

2081 Model Set Solution BBS 2nd Year Finance

8. ✓ City bank has just issued 10 percent coupon bonds on the market with 15 years to maturity. Bonds have par value Rs. 1000. The bonds make annual payment and currently sell for Rs. 900. What is the current yield?

→ Solⁿ

Given information,

Coupon Rate (C) = 10%

Year to maturity (n) = 15 Years

Par value (M) = Rs. 1000

$$\begin{aligned}\text{Interest rate (I)} &= C \times M \\ &= \frac{10}{100} \times 1000 \\ &= \text{Rs. } 100\end{aligned}$$

Current selling price of bond (V_0) = Rs. 900

Current Yield (C.Y) = ?

Now,

We know that;

$$C.Y = \frac{I}{V_0}$$

$$= \frac{100}{900}$$

$$= 11.11\%$$

Ans/

9. A firm has DOL of 1.2 times and DFL of 2.5 times. What is its degree of total leverage? If sales increases by 10 percent, by what percent net income will increase?

T.C.D

→ Solⁿ Given information,

$$DOL = 1.2 \text{ times}$$

$$DFL = 2.5 \text{ times}$$

$$DTL = ?$$

Now,

$$\begin{aligned} DTL &= DOL \times DFL \\ &= 1.2 \times 2.5 \\ &= 3 \text{ times} \end{aligned}$$

If sales increased by 10%.

$$\begin{aligned} \% \text{ change in Net income} &= \% \text{ change sales} \times DTL \\ &= 10\% \times 3 \\ &= 30\% \quad \text{Ans//} \end{aligned}$$

10. Bagmati Noodles Company's inventory conversion period is 25 days, and an average collection period is 50 days. Account payable is paid approximately 35 days after they arise. Calculate the firm's operating cycle and cash conversion cycle.

→ solⁿ Given information,

Inventory	Conversion period	ICP = 25 days
Average	collection period	ACP = 50 days
Account payable		PDP = 35 days

$$\begin{aligned}\text{Operating cycle} &= \text{ICP} + \text{ACP} \\ &= 25 + 50 \\ &= 75 \text{ days}\end{aligned}$$

$$\begin{aligned}\text{Cash Conversion Cycle} \text{ ccc} &= \frac{\text{ICP} + \text{ACP}}{} - \text{PDP} \\ &= 75 - 35 \\ &= 40 \text{ days}\end{aligned}$$

13. The management of Mountain Resort Pvt. Ltd. decided to buy a printer taking a loan of Rs. 100,000 for 3 years from City bank. The loan bears and annual interest of 10 percent and calls for equal annual instalment payments at the end of each of the 3 years.

- Calculate amount of annual payment.
- Prepare loan amortization schedule.
- Write the equation to calculate the monthly equal instalments.

→ solution Given information,

3122 -

[4+4+2]

Loan of Amount (PV_A) = Rs. 1,00,000

No. of Year (n) = 3 Years

Interest for loan (i) = 10%.

① Amount of Annual payment (Pmt) = ?

③

equation to calculate the monthly Equal instalments.

$$PV_A = Pmt \times PVIFA_{i\%, n \text{ Years}}$$

$$\text{or, } 1,00,000 = Pmt \times PVIFA_{10\%, 3 \text{ Years}}$$

$$\text{or, } 1,00,000 = Pmt \times 2.4869$$

∴ Annual payment Amount is Rs. 40,210.70

$$PV_A = EMI \times PVIFA_{\frac{i\%}{12}, n \times 12 \text{ Years}}$$

② Copy of loan Amortization schedule:

Year	Beginning loan	Pmt	Interest 10%	Principal	Ending loan
1	1,00,000	40,210.70	10,000	30,210.70	69,789.30
2	69,789.30	40,210.70	6,978.93	33,231.77	36,557.53
3	36,557.53	40,210.70	3,655.75	36,554.94	2.5830

∴ The ending balance of loan become 2.5830 because rounding error. Bank will charge on Company.

14. Mega Company recently paid a dividend, D_0 , of Rs. 40. The dividend is expected to grow at the rate of 10 percent per year for the next 3 years. There after dividend is expected to grow at a constant rate of 8 percent per year forever. The firm's cost of equity is 18 percent. (10)

- a. What is the stock's intrinsic value today, P_0 ?
b. Calculate dividend yield and capital gain yield for the first year.

[7+3]

→ solⁿ Given information,

Recently paid (D_0) = Rs. 40

growth rate for year 1 (g_1) = 10%,

" (g_2) = 10%.

" (g_3) = 10%.

growth rate after 3 year ($g_{4-\infty}$) = 8%

cost of Equity (k_s) = 18%

(a) calⁿ of intrinsic value today P_0 = ?

$$P_0 = \frac{D_1}{(1+k_s)^1} + \frac{D_2}{(1+k_s)^2} + \frac{D_3}{(1+k_s)^3} + \frac{P_3}{(1+k_s)^3}$$

$$= \frac{44}{(1.18)^1} + \frac{48.4}{(1.18)^2} + \frac{53.24}{(1.18)^3} + \frac{574.992}{(1.18)^3}$$

$$= 37.288 + 34.76 + 32.40 + 349.957$$

$$= \text{Rs. } 454.41$$

∴ Hence, The value of stock price in present is Rs. 454.41

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

where

$$D_1 = D_0(1+g_1) \\ = 40(1+0.10) = 44$$

$$D_2 = D_1(1+g_2) \\ = 44(1+0.10) = 48.4$$

$$D_3 = D_2(1+g_3) \\ = 48.4(1+0.10) = 53.24$$

$$D_4 = D_3(1+g_4) \\ = 53.24(1+0.08) \\ = Rs. 57.4992$$

$$P_3 = \frac{D_4}{k_s - g_4} \\ = \frac{57.4992}{0.18 - 0.08} \\ = Rs. 574.992$$

⑥ Cal² of Dividend Yield, Capital Gain Yield.

$$\# \text{ Dividend Yield} = \frac{D_1}{P_0} \\ = \frac{44}{454.41} \\ = 0.096 \text{ or } 9.68\%$$

$$\# \text{ Capital Gain Yield} = \frac{P_1 - P_0}{P_0}$$

where

$$P_1 = \frac{D_2}{(1+k_s)^1} + \frac{D_3}{(1+k_s)^2} + \frac{P_3}{(1+k_s)^2} \\ = \frac{48.4}{(1.18)^1} + \frac{53.24}{(1.18)^2} + \frac{574.992}{(1.18)^2} \\ = 41.016 + 38.2361 + 412.950 \\ = Rs. 492.20$$

$$= \frac{492.20 - 454.41}{454.41} \\ = 0.083 \text{ or } 8.3\%$$

Ans!!

→ solⁿ Given information,

weight of debt (w_d) = 0.40

weight of preferred stock (w_{ps}) = 0.10

weight of common equity (w_e) = 0.50

15. Lumbini Hotel has the following capital structure, which it considers to be optimal:

Debt	40%
Preferred stock	10%
Common equity	50%
	<u>100%</u>

Lumbini's current dividend per share is Rs 30. Investors expect future earnings and dividends to grow at a constant rate of 5 percent per year forever. The company's stock currently sells for Rs 300 per share. New common stock can be sold for Rs 250 per share. Preferred stock can be sold with a dividend of Rs 12 to the public at a price of Rs 92 per share.

PTO

Current Dividend (D_0) = Rs. 30

Debt can be sold at an interest rate of 10 percent. Assume the applicable tax rate is 30 percent.

- Calculate the cost of debt, cost preferred stock, cost of internal and external equity.
- Calculate the weighted average cost of capital (WACC) assuming equity requirement is fulfilled from retained earning only. [6+4]

cost of debt before tax (k_d) = 10%.

Tax rate (t) = 30%.

growth rate $g = 5\%$

currently selling price (P_0) = Rs. 300

New price (New Common Stock) NP = Rs. 250

Dividend per share DPS = Rs. 12

New price for preferred stock NP = Rs. 92

Q. calⁿ of cost of debt, cost p.s. and cost c.e

cost of debt after tax (k_{dt}) = $k_d(1-t)$
 $= 10\%(1-0.30)$
 $= 7\%$

cost of preferred stock (k_{ps}) = $\frac{DPS}{NP} = \frac{12}{92} = 13.04\%$

Cost of Common Equity

Internal

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

$$= \frac{D_0(1+g)}{P_0} + g$$

$$= \frac{80(1+0.05)}{300} + 0.05$$

$$= 15.5\%$$

External

$$k_s = \frac{D_1}{NP} + g$$

$$= \frac{D_0(1+g)}{NP} + g$$

$$= \frac{30 \times 1.05}{250} + 0.05$$

$$= 17.6\%$$

⑥ Calⁿ of weighted Average Cost of Capital

$$WACC = k_d \times W_d + k_{ps} \times W_{ps} + k_e \times W_e$$

$$= 7\% \times 0.40 + 13.04\% \times 0.10 + 15.5\% \times 0.50$$

$$= 11.854\%$$

Ans //

16. (a) Himalaya Company expects next year's net income to be Rs. 12 million. The firm's current debt ratio is 60 percent. Himalaya has Rs. 15 million of profitable investment opportunities, and it wishes to maintain its existing debt ratio. According to the residual dividend model, how large should company's dividend payout ratio be next year? [5]

→ Solⁿ

$$\text{Dividend payout ratio} = \frac{\text{Total Dividend}}{\text{Net income}} \times 100\%$$

Given,

Net income = Rs. 12 million.

Current Debt ratio = 60% = 0.60 / Equity = 40% = 0.40

profitable investment opportunity = Rs. 15 million

According to the Residual Dividend model:

$$\begin{aligned} \text{Total Dividend} &= \text{Net income} - \text{Equity Capital} \\ &= 12 \text{ m} - (15 \times 0.40) \text{ m} \\ &= 12 \text{ m} - 6 \text{ m} \\ &= 6 \text{ million} \end{aligned}$$

Then,

$$\text{Dividend payout ratio (DPR)} = \frac{6 \text{ m}}{12 \text{ m}} \times 100\% = 50\% \text{ Ans//}$$

(b) Sahara Company has the following shareholder's equity account:

Common stock (100,000) Share @ Rs. 100	10,000,000
Additional paid-in capital	5,000,000
Retained earnings	15,000,000
Shareholders' equity	30,000,000

The current market price of the stock is Rs. 300 per share. What will happen to this account and to number of shares outstanding if company pays a 20 percent stock dividend? What would be new selling price of common stock after the 20 percent stock dividend? [5]

→ MDC 1

→ sol:

Given,

Current market price of the stock (MPS) = Rs. 300 per share
 Company pay 20% stock dividend.

$$\text{No. of share} = 100000 \times 20\% \\ = 20000 \text{ share}$$

$$20,000 \text{ share} \times \text{Rs. } 300 = \text{Rs. } 60,000,000$$

$$\begin{array}{l} 60,000,000 \left\{ \begin{array}{l} \text{Common stock } (20,000 \times 100) = 20,000,000 \\ \text{Additional paid in capital} \\ (20,000 \times 200) = 40,000,000 \end{array} \right. \end{array}$$

$$\text{Retained Earning} \Rightarrow 15,000,000 + 60,000,000 \\ = \text{Rs. } 75,000,000$$

Re. define Account schedule

Common stock 1,20,000 share @. 100	1,20,000 00
Additional paid up Capital	90,00,000
Retained Earning	90,00,000
total shareholder Equity	<u>3,00,00,000</u>

Calc of selling price After 20% stock dividend.

$$MPS = \frac{MPS \text{ before stock dividend}}{1 + \% \text{ of stock dividend}}$$

$$= \frac{Rs. 300}{1 + 0.20}$$

$$= \frac{300}{1.20}$$

$$= Rs. 250 \quad \text{Ans/}$$

Group - C

18. Consider the probability distribution of alternative rates of return associated with Stock A and Stock B given in the following table.

State of economy	Probability	Stock A	Stock B
1	0.3	0%	35%
2	0.4	10	15
3	0.3	20	-5

- Calculate the expected return and standard deviation of Stock A and Stock B.
- What are the covariance and correlation coefficient between Stock A and Stock B?
- If you form a portfolio of Stock A and Stock B comprising 70 percent wealth in Stock A and the rest in Stock B, calculate the risk and return of your portfolio. Also interpret the results. [5+4+6]

19. You are a financial analyst for the Gaurishanker Herbal Company. The director of capital budgeting has asked you to analyze two proposed capital investments: Project X and Project Y. These projects are independent projects. Each project has a cost of Rs 100,000 and the cost of capital for each project is 10 percent. The expected net cash flows are as follows:

Year	Expected Net Cash Flows	
	Project X	Project Y
0	(Rs 100,000)	(Rs 100,000)
1	40,000	50,000
2	40,000	60,000
3	40,000	40,000
4	40,000	18,000

- Calculate PBP of each project. If firm has set a maximum payback period of three years, suggest as to which project's should be accepted?
- Calculate net present value (NPV) of each project. Which project's should be accepted?
- Calculate the internal rates of return (IRR) of each project's. Evaluate the project on the basis of IRR. (21.86%, 28.96%)
- Which method of evaluating the project is superior? Why? [3+5+5+2]

Q. cal? of pay back period for project x and project y

Project X

$$PBP = \frac{\text{Initial investment}}{\text{Annual cash flow}}$$

$$= \frac{1,00,000}{40,000}$$

$$= 2.5 \text{ Year}$$

Unit - 8
25 marks

Project Y Uneven cash flow

$$PBP = \text{minimum Year} + \frac{\text{Amt. to be Recovered}}{\text{Next Year cash flow}}$$

$$= 1 + \frac{50,000}{60,000}$$

$$= 1.833 \text{ Years.}$$

Project Y

Year	Cash flow c.f	Cumulative c.f
0	(1,00,000)	(1,00,000)
1	50,000	(50,000)
2	60,000	10,000
3	40,000	50,000
4	18,000	68,000

∴ If firm has set a maximum payback period of three years, we should accept firm (project) Y because it has faster return of investment / low PBP.

⑥ calⁿ of Net present value of Project X and Project Y.

For project X

$$\begin{aligned} NPV_x &= \text{Annual c.f} \times \text{PVIFA } 10\%, 4\text{Year} - \text{Initial investment (1400)} \\ &= 40,000 \times \text{PVIFA } 10\%, 4\text{Year} - 1,00,000 \\ &= 40,000 \times 3.1699 - 1,00,000 \\ &= \text{Rs. } 26,796 \end{aligned}$$

For project Y

Year	c.f	PVIF @ 10%	PV
0	(1,00,000)	1	(1,00,000)
1	50,000	0.9091	45,455
2	60,000	0.8264	49,584
3	40,000	0.7513	30,052
4	18,000	0.6830	12,294
NPV _Y =			Rs. 37,385

∴ Hence, According to the Net present value of a Company, I would highly recommend in project Y instead of project X. Because Project Y has high NPV than project X. $[NPV_x = 26796 < NPV_y = 37385]$

© Calc of IRR for project X and project Y.

For project X IRR

Step 1: Fake Factor = PBP = 2.5

Step 2: Referring to PVIFA table, the fake factor 2.5 in 4 years lies between 21% and 22% which corresponding factor 2.5404 and 2.4936.

Step 3: Interpolation:

$$IRR = LR\% + \frac{LR_{factor} - Factor}{LR_{factor} - HR_{factor}} \times (HR - LR)\%$$

$$= 21\% + \frac{2.5404 - 2.5}{2.5404 - 2.4936} \times (22 - 21)\%$$

$$= 21\% + 0.86\%$$

$$= 21.86\% \text{ Ann}$$

∴ Hence, Internal Rate of Return for equal or even cash flow project X 21.86%.

IRR for project Y

$$\text{Step 1: Fake Annuity} = \frac{\text{Total cash flow}}{\text{No. of year}} = \frac{168,000}{4}$$

$$= 42,000$$

Step 2: Fake Factor = $\frac{\text{Initial investment}}{\text{Fake Annuity}}$

$$= \frac{1,00,000}{42,000}$$

$$= 2.3809$$

Step 3: referring to the PVIFA table in 4 years. the fake factor lies between 24% and 25%.

Step 4: Calc of NPV +ve and NPV -ve

Year	C.f	PVIFA _{25%}	PV	PVIFA _{30%}	PV
0	(1,00,000)	1	(1,00,000)	1	(1,00,000)
1	50,000	0.8000	40,000	0.7692	38,460
2	60,000	0.6400	38,400	0.5917	35,502
3	40,000	0.5120	20,480	0.4552	18,202
4	18,000	0.4096	7373	0.3501	6,302
		NPV =	+ 6,253	NPV =	- 1528

Step 5: Interpolation.

$$IRR = LR\% + \frac{NPV_{LR}}{NPV_{LR} - NPV_{HR}} (HR - LR)\%$$

$$= 25\% + \frac{6253}{6253 + 1528} (30 - 25)\%$$

$$= 25\% + 4.0189\%$$

$$= 29.02\%$$

$\therefore$ Hence, IRR for project X $\rightarrow 21.86\%$
IRR for project Y $\rightarrow 29.02\%$.

(d) Net present value (NPV) method is more superior evaluating the project Y because it considers the time value of money.

18. Consider the probability distribution of alternative rates of return associated with Stock A and Stock B given in the following table.

Formula

State of economy	Probability	Stock A	Stock B
1	0.3	0%	35%
2	0.4	10	15
3	0.3	20	-5

- a. Calculate the expected return and standard deviation of Stock A and Stock B.
- b. What are the covariance and correlation coefficient between Stock A and Stock B?
- c. If you form a portfolio of Stock A and Stock B comprising 70 percent wealth in Stock A and the rest in Stock B, calculate the risk and return of your portfolio. Also interpret the results. [5+4+6]

→ 50/2

Given information,

a

$$E(R_A) = \sum R_A \times P, \quad \sum R_B \times P$$

$$\sigma_A = \sqrt{\sum (R_A - E(R_A))^2 \times P} \quad \sigma_B =$$

b

$$COV_{A,B} = \sum (R_A - E(R_A)) (R_B - E(R_B))$$

$$r_{A,B} = \frac{COV_{A,B}}{\sigma_A \cdot \sigma_B}$$

c

weight of stock A (w_A) = 0.70

weight of stock B (w_B) = 0.30

$$R_P = w_A \cdot E(R_A) + w_B \cdot E(R_B)$$

$$\sigma_P = \sqrt{w_A^2 \cdot \sigma_A^2 + w_B^2 \cdot \sigma_B^2 + 2 COV_{A,B} \cdot w_A \cdot w_B}$$

a

State of Economy	P	R_A	R_B	$R_A \times P$	$R_B \times P$	$(R_A - E(R_A))^2 \times P$	$(R_B - E(R_B))^2 \times P$	$(R_A - E(R_A)) (R_B - E(R_B)) \times P$
1	0.3	0%	35%	0	10.5	$(0-10)^2 \times 0.3 = 30$	120	$(0-10) \times (35-15) \times 0.3 = -60$
2	0.4	10%	15%	4	6	$(10-10)^2 \times 0.4 = 0$	0	0
3	0.3	20%	-5%	6	-1.5	$(20-10)^2 \times 0.3 = 30$	$(-5-15)^2 \times 0.3 = 120$	$(20-10) \times (-5-15) \times 0.3 = -60$
				$\sum R_A \times P = 10\%$	$\sum R_B \times P = 15\%$	$\sum (R_A - E(R_A))^2 \times P = 60$	$\sum (R_B - E(R_B))^2 \times P = 240$	$\sum (R_A - E(R_A)) (R_B - E(R_B)) \times P = -120$

Expected return on stock A ($E(R_A)$) = $\sum R_A \times P$
= 10%

Expected return on stock B ($E(R_B)$) = $\sum R_B \times P$
= 15%

Standard deviation of stock A $\sigma_A = \sqrt{\sum (R_A - E(R_A))^2 \times P}$
= $\sqrt{60}$
= 7.75%

standard deviation of stock B $\sigma_B = \sqrt{\sum (R_B - E R_B)^2 \times P}$

$$= \sqrt{240}$$

$$= 15.49\%$$

(b) Co-variance of stock A and stock B $COV_{A,B} = -120$

Correlation between stock A and stock B $r_{A,B} = \frac{COV_{A,B}}{\sigma_A \cdot \sigma_B}$

$$= \frac{-120}{7.75 \times 15.491}$$

$\therefore$ Hence relation status is perfectly negative correlated between stock A and stock B.

(c) Calⁿ of Risk and Return for port folio:

Return $R_p = W_A \cdot E R_A + W_B \cdot E R_B$

$$= 0.70 \times 10\% + 0.30 \times 15\%$$

$$= 11.5\%$$

Risk $\sigma_p = \sqrt{W_A^2 \cdot \sigma_A^2 + W_B^2 \cdot \sigma_B^2 + 2(COV_{A,B} \cdot W_A \cdot W_B)}$

$$= \sqrt{0.70^2 \times 7.75^2 + 0.30^2 \times 15.49^2 + 2 \times -120 \times 0.70 \times 0.30}$$

$$= \sqrt{0.62}$$

$$= 0.787\%$$

