

# Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

## Paper-14: ADVANCED FINANCIAL MANAGEMENT

Time Allowed: 3 Hours

Full Marks: 100

The figures in the margin on the right side indicate full marks.

Answer Question No. 1 which is compulsory.

From Section A: Answer any two questions.

From Section B: Answer any one question.

From Section C: Answer any one question.

From Section D: Answer any one question.

Working Notes should form part of the answer.

“Whenever necessary, suitable assumptions should be made and indicated in answer by the candidates.”

1. (a) A one day repo is entered into on Jan 10, 2013 on an 11.99% 2014 security, maturing on April 7, 2014. The face value of the transaction is ₹ 5 Crores. The price of the security is ₹ 115.00. Assume that RBI has lent securities in the first leg to PNB. If the repo rate is 6%, what is the settlement amount on Jan 10, 2013? [Use 360 days convention] [3]
- (b) Write the limitations of Social Cost Benefits Analysis? [3]
- (c) RBI sold a 91 days T-Bill of face value of ₹ 100 at an yield of 7%. What was the issue price? [3]
- (d) Mr. Y on 01.07.2011, during the initial offer of some Mutual Fund invested in 20,000 units having face value of ₹ 10 for each unit. On 31.03.2012 the dividend operated by the M.F. was 10% and Mr. Y found that his annualized yield was 153.33%. On 31.03.2013, 20% dividend was given. On 31.03.2014 Mr. Y redeemed all his balances of 22,592.23 units when his annualized yield was 73.52%. What are the NAVs as on 31.03.2012, 31.03.2013 and 31.03.2014? [5]
- (e) Calculate the price of 3 months ADS futures, if ADS (FV ₹10) quotes ₹ 440 on NSE and 3 months future price quotes at ₹430 and the 1 month borrowing rate is given as 15% and the expected annual dividend yield is 25% per annum payable before expiry. Also examine arbitrage opportunities. [3]
- (f) What are the steps involved in calculation of stock market index on a particular date? [3]

**Solution:**

1. (a) In the first leg RBI has lent securities and receives money from PNB

**Stage I:**

G Sec pays bi-annual coupons;

Interests are paid on April 7 & October 7.

G Sec Maturity on April 7, 2014;

Days elapsed from October 8, 2012 till Jan 10, 2013 = 24 + 30 + 31 + 9 = 94 days

Accrued Interest: 5 Crores x 0.1199 x 94/360 = ₹ 1565361

Transaction Value = ₹ 5 Crores x 115/100 = ₹ 57500000

Total Settlement amount = ₹ 59065361 = Money receive by RBI from PNB

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- (b) Social Cost Benefit Analysis is a systematic evaluation of an organization's social performance as distinguished from its economic performance. Social Cost Benefits Analysis is an approach for evaluation of projects. It assesses gains/losses to society as a whole from the acceptance of a particular project.
- (i) Successful application depends upon reasonable accuracy and dependability of the underlying forecasts as well as assessment of intangibles.
  - (ii) Technique does not indicate whether given project evaluated on socio-economic considerations is best choice to reach national goals or whether same resources if employed in another project would yield better results.
  - (iii) Cost of evaluation by such technique could be enormous for smaller projects.
  - (iv) Social Cost Benefit Analysis takes into consideration those aspects of social costs and benefits which can be quantified.

- (c) Issue price of T-bill is at discounted value and redeemed at face value.

Maturity Period    91 days  
Face Value         ₹ 100  
Yield Rate         7% or 0.07  
Let the issue price of T-Bill be 'x'. Then,

$$0.07 = \frac{100 - x}{x} \times \frac{365}{91} \times 100$$

$$0.07 = \frac{100 - x}{x} \times 4.011$$

$$0.07x = 401.10 - 4.011x$$

$$4.081x = 401.10$$

$$X = 401.10/4.081 = 98.28$$

The issue price of T-Bill was ₹ 98.28.

- (d) Yield for 9 months =  $153.33\% \times 9/12 = 115\%$

Amount receivable as on 31.03.2012  
= 2,00,000 + (2,00,000 × 115/100)  
= 2,00,000 + 2,30,000  
= 4,30,000.

$$\text{NAV as on 31.03.2012} = \frac{\text{₹}(4,30,000 - 20,000)}{20,000 \text{ units}} = \text{₹} 20.50$$

$$\text{Units as on 31.03.2012} = \frac{\text{₹} 4,30,000}{\text{₹} 20.50} = 20,975.61 \text{ units}$$

$$\text{Dividend as on 31.03.2013} = 20,975.61 \text{ units} \times \text{₹} 10 \times 20/100 = \text{₹} 41,951.22$$

$$\text{NAV as on 31.03.2013} = \frac{\text{₹} 41,951.22}{22,592.23 - 20,975.61} = \text{₹} 25.95$$

$$\begin{aligned} \text{NAV as on 31.03.2014} &= \frac{\text{₹} 2,00,000 + (2,00,000 \times 73.52/100 \times 33/12)}{22,592.23 \text{ units}} \\ &= \frac{\text{₹} 2,00,000 + \text{₹} 4,04,360}{22,592.23 \text{ units}} \\ &= \text{₹} 26.75 \end{aligned}$$

- (e) Future Price = Spot Price + Cost of Carry - Dividend  
= 440 + (440 × 0.15 × 0.25) - (10 × 0.25)  
= 440 + 16.50 - 2.50  
= 454

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The future price is ₹454 which is now quoted at ₹430 in the exchange. The fair value of Futures is more than the actual future price. So, no arbitrage opportunities exist.

- (f) Following steps are involved in calculation of stock market index on a particular date:
- Calculate market capitalization of each individual company comprising the index.
  - Calculate the total market capitalization by adding the individual market capitalization of all companies in the index.
  - Computing index of next day requires the index value and the total market capitalization of the previous day and is computed as follows:  
$$\text{Index Value} = \text{Index on previous day} \times \frac{\text{Total market capitalization for current day}}{\text{Total Capitalization of the previous day}}$$
  - It should also be noted that Indices may also be calculated using the price weighted method. Here the share price of the constituent companies form the weights. However, almost all equity indices world-wide are calculated using the market capitalization weighted method.

### SECTION A

(Answer any two of the following.)

2. (a) Explain briefly Call Money in the context of financial market. [4]
- (b) Describe the role of RBI as Governments' Debt Manager [3]
- (c) You are required to compute the annualized cost of fund to XYZ Bank Ltd., Given;  
Face value of CD – ₹ 15 lakhs  
Issue price – ₹ 14,45,000  
Tenure – ₹ 5 months  
Stamp duty – ₹ 0.25% of face value. [5]

#### Solution:

2. (a) **Call Money:** The Call Money is a part of the money market where, day to day surplus funds, mostly of banks, are traded. Moreover, the call money market is most liquid of all short-term money market segments.

The maturity period of call loans vary from 1 to 14 days. The money that is lent for one day in call money market is also known as 'overnight money'. The interest paid on call loans are known as the call rates. The call rate is expected to freely reflect the day-to-day lack of funds. These rates vary from day-to-day and within the day, often from hour-to-hour. High rates indicate the tightness of liquidity in the financial system while low rates indicate an easy liquidity position in the market.

In India, call money is lent mainly to even out the short-term mismatches of assets and liabilities and to meet CRR requirement of banks. The short-term mismatches arise due to variation in maturities i.e. the deposits mobilized are deployed by the bank at a longer maturity to earn more returns and duration of withdrawal of deposits by customers vary. Thus, the banks borrow from call money markets to meet short-term maturity mismatches.

Moreover, the banks borrow from call money market to meet the cash Reserve Ratio (CRR) requirements that they should maintain with RBI every fortnight and is computed as a percentage of Net Demand and Time Liabilities (NDTL).

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(b) In this role, RBI set policies, in consultation with the government and determine the operational aspects of rising money to help the government finance its requirements:

- Determine the size, tenure and nature (fixed or floating rate) of the loan
  - Define the issuing process including holding of auctions
  - Inform the public and potential investors about upcoming government loan auctions
- The Reserve Bank also undertakes market development efforts, including enhanced secondary market trading and settlement mechanisms, authorization of primary dealers and improved transparency of issuing process to increase investor confidence, with the objective of broadening and deepening the government securities market.

(c) Face Value = ₹ 15 lakhs  
Issue Price = ₹ 14,45,000

To find the annualized rate we first find the inherent rate for 5 months and compound the same to find the annualized rate. The five month rate is given by  $r$  which satisfies the following equation:

$$D = 100 \times \frac{r}{100} \times \frac{n}{365}, \text{ where } D = ₹ 55000 \text{ for an investment of ₹ 15 lakhs i.e., ₹ 3.67 for an}$$

investment of ₹ 100. Thus, we get  $r$  as follows:

$$3.67 = 100 \times \frac{r}{100} \times \frac{5}{12} \text{ which implies } r = 8.8\%$$

A CD paying 8.8% p.a. would pay monthly  $8.8\% / 12 = 0.733\%$

This when compounded 12 times we get annualized rate:

$$\text{Amount} = 100 \times (1 + 0.00733)^{12} = ₹ 109.157$$

i.e. 9.16% on an investment of ₹ 100.

$$\begin{aligned} \text{Cost of funds to the Bank} &= \text{Effective interest rate} + \text{Stamp duty} \\ &= 9.16\% + 0.25\% \\ &= 9.41\% \end{aligned}$$

**3. (a) What are the benefits of hedge funds? [4]**

**(b) ASN Ltd. has total sales of ₹4.50 crores and its average collection period is 120 days. The past experience indicates that bad debt losses are 2% on sales. The expenditure incurred by the company in administering its receivable collection efforts are ₹6,00,000. A factor is prepared to buy the company's receivables by charging 2% commission. The factor will pay advance on receivables to the company at an interest rate of 18% per annum after withholding 10% as reserve. Assume 360 days in a year.**

**You are required to calculate effective cost of factoring to the company. [8]**

**Solution:**

3. (a) Benefits of Hedge Funds:

- (a) Seek higher returns: Hedge funds strategies generate positive returns in both rising and falling equity and bond markets.
- (b) Investment styles: Huge variety of hedge fund investment styles – may uncorrelated with each other – provides investors with a wide choice of hedge funds strategies to meet their investment objectives.
- (c) Long term Solution: Hedge funds provide an ideal long-term investment solution, eliminating the need to correctly time entry and exit from markets.
- (d) (i) Inclusion of hedge funds in a balanced portfolio reduces overall portfolio risk and volatility and increases returns.

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- (ii) Adding hedge funds to an investment portfolio diversification not otherwise available in traditional investing.

(b)

### MSN Ltd.

Particulars	₹
Average level of Receivables ₹ 4,50,00,000 x 120 / 360	1,50,00,000
Factoring commission ₹ 1,50,00,000 x 2%	3,00,000
Factoring Reserve ₹ 1,50,00,000 x 10%	15,00,000
Amount available for advance ₹ 1,50,00,000 – (3,00,000 + 15,00,000)	1,32,00,000
Factor will deduct interest @ 18%	
Interest (₹ 1,32,00,000 x 18 x 120) / 100 x 360	7,92,000
Advance to be paid = ₹ 1,32,00,000 – 7,92,000	1,24,08,000
Annual cost of factoring to the firm:	
Factoring commission (₹ 3,00,000 x 360 / 120)	9,00,000
Interest Charges (₹ 7,92,000 x 360 / 120)	23,76,000
	32,76,000
Firms savings on taking factoring service:	
Cost of credit administration saved	6,00,000
Cost of bad debts (₹ 4,50,00,000 x 2%)	9,00,000
Total savings	15,00,000

Net cost to the firm = ₹ 32,76,000 – ₹ 15,00,000 = ₹ 17,76,000

Effective rate of interest to the firm = ₹ 17,76,000 x 100 / ₹ 1,24,08,000 = 14.31%

Note: The number of days in a year is assumed to be 360 days.

4. (a) Find delta of the following individual positions of a stock X, given that delta of call = + 1 and of put = - 1;
- 4 long calls
  - 5 short calls
  - 4 long puts and 4 shares
  - 30 short calls and 3 shares
- [4]

- (b) Mr. A is planning for making investment in bonds of Company X. The details of the bond are as follows:

Company	Face Value	Coupon Rate	Maturity Period
X	₹10,000	6%	5 years

The current market price of X Ltd's bond is ₹10,796.80. Calculate the duration of the bond? [8]

**Solution:**

4. (a)

Position	Details	Net Delta
4 long calls	Delta of Call Positive, Delta of Long Position Positive	+ 4 x + 1 = + 4
5 short calls	Delta of Call Positive, Delta of Short Position Negative	- 5 x + 1 = - 5
4 long puts & 4 shares	Delta of: Put Negative; Long Position Negative; Underlying Positive	- 4 + 4 = 0
30 short calls & 3 shares	Delta of: Call Positive; Short Position Negative; Underlying Positive	- 30 + 3 = - 27

- (b) To Calculate duration of bond we need YTM, which shall be calculated as follows:

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Let us try NPV @ 5%

$$= \frac{600}{(1.05)^1} + \frac{600}{(1.05)^2} + \frac{600}{(1.05)^3} + \frac{600}{(1.05)^4} + \frac{10,600}{(1.05)^5} - 10,796.80$$

$$= ₹ 571.43 + ₹ 544.22 + ₹ 518.30 + ₹ 493.62 + ₹ 8,305.38 - ₹ 10,796.80 = - ₹ 363.85$$

Let us now try NPV @ 4%

$$= \frac{600}{(1.04)^1} + \frac{600}{(1.04)^2} + \frac{600}{(1.04)^3} + \frac{600}{(1.04)^4} + \frac{10,600}{(1.04)^5} - 10,796.80$$

$$= ₹ 576.92 + ₹ 554.73 + ₹ 533.40 + ₹ 512.88 + ₹ 8,712.43 - ₹ 10,796.80 = - ₹ 93.56$$

Let us now interpolation formula

$$= 4\% + \frac{93.56}{93.56 - (-363.85)} \times (5\% - 4\%)$$

$$= 4\% + \frac{93.56}{93.56 + 363.85}$$

$$= 4\% + \frac{93.56}{457.41} = 4.20\%$$

Duration of X Ltd.'s Bond

Year	Cash flow	P.V. @ 4.2%		Proportion of bond value	Proportion of bond value x time (years)
1	600	0.9597	575.82	0.0533	0.0533
2	600	0.9210	552.60	0.0512	0.1024
3	600	0.8839	530.34	0.0491	0.1473
4	600	0.8483	508.98	0.0472	0.1888
5	10600	0.8141	8,629.46	0.7992	3.9960
			10,797.20	1.0000	4.4878

Duration of the Bond is 4.4878 years .

### SECTION B

(Answer any one of the following.)

5. (a) (i) The rate of inflation in USA is likely to be 3% per annum and in India it is likely to be 6.5%. The current spot rate of US \$ in India is ₹ 43.40. Find the expected rate of US \$ in India after 1 year and 3 years from now using purchasing power parity theory.
- (ii) On April 1, 3 months interest rate in the UK £ and US \$ are 7% and 3% per annum respectively. The UK £ /US \$ spot rate is 0.7570. What would be the forward rate for US \$ for delivery on 30<sup>th</sup> June? [4+4]
- (b) The dollar is currently trading at ₹ 40. If Rupee depreciates by 10%, what will be the spot rate? If dollar appreciates by 10% what will be the spot rate? [4]

(c) The following market data is available:

Spot USD/JPY 116

Deposit rates p.a.	USD	JPY
3 months	4.50%	0.25%
6 months	5.00%	0.25%

Forward Rate Agreement (FRA) FOR Yen is Nil.

1. The 6&12 months LIBORS are 5% & 6.5% respectively. A bank is quoting 6/12 USD FRA at 6.50-6.75%. Is any arbitrage opportunity available? Calculate profit in such case. [8]

**Solution:**

5. (a) (i) According to Purchasing Power Parity forward rate is

$$\text{Spot rate} \left[ \frac{1+r_H}{1+r_F} \right]^t$$

So spot rate after one year

$$= ₹ 43.40 \left[ \frac{1+0.065}{1+0.03} \right]^1$$

$$= ₹ 43.40 (1.03399)$$

$$= ₹ 44.8751$$

After 3 years

$$₹ 43.40 \left[ \frac{1+0.065}{1+0.03} \right]^3$$

$$= ₹ 43.40 (1.03398)^3$$

$$= ₹ 43.40 (1.10544) = ₹ 47.9761$$

- (ii) As per interest rate parity

$$S_1 = S_0 \left[ \frac{1+in A}{1+in B} \right]$$

$$S_1 = £0.7570 \left[ \frac{1+(0.075) \times \frac{3}{12}}{1+(0.035) \times \frac{3}{12}} \right]$$

$$= £0.7570 \left[ \frac{1.01875}{1.00875} \right]$$

$$= £0.7570 \times 1.0099 = £0.7645$$

$$= \text{UK } £0.7645 / \text{US\$}$$

- (b) To find appreciation or depreciation of a rupee, we need to have a quote of ₹. Since we are given \$ quote, we need to convert the same to ₹ Quote. (which is simply the inverse) i.e., ₹ 1 = \$ 1/40 = \$ 0.025

If rupee depreciates by 10%, then = 0.025 – 0.0025 = 0.0225

The new spot rate would be ₹ 1 = \$0.0225.

And, if dollar appreciates by 10%, then we can apply 10% directly to the given \$ quote.

Therefore, 40 + 40 x 0.1 = 44.

The new spot rate would be \$1 = ₹44.

- (c) 6 Months Interest rate is 5% p.a. & 12 Months interest rate is 6.5% p.a.

Future value 12 month from now is a product of Future value 6 months from now and 6 Months Future value from after 6 Months.

$$(1+0.065) = (1+0.05 \times 6/12) \times (1+i_{6,6} \times 6/12)$$

$$i_{6,6} = [(1+0.065/1.025) - 1] \times 12/6$$

6 Months forward 6 month rate is 7.80% p.a.

The Bank is quoting 6/12 USD FRA at 6.50 – 6.75%

Therefore there is an arbitrage Opportunity of earning interest @ 7.80% p.a. & Paying @ 6.75%

Borrow for 6 months, buy an FRA & invest for 12 months





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$\sigma$  = Standard deviation of continuously compounded annual return.

$\ln$  = natural logarithm

$$\begin{aligned}d_1 &= \frac{\ln 1.0667 + (12\% + 0.08)0.5}{0.40\sqrt{0.5}} \\ &= \frac{0.0646 + (0.2)0.5}{0.40 \times 0.7071} \\ &= \frac{0.1646}{0.2828} \\ &= 0.5820\end{aligned}$$

$$d_2 = 0.5820 - 0.2828 = 0.2992$$

$$N(d_1) = N(0.5820)$$

$$N(d_2) = N(0.2992)$$

$$\begin{aligned}\text{Price} &= SN(d_1) - K_e^{-rt} N(d_2) \\ &= 80 \times N(d_1) - (75/1.062) \times N(d_2)\end{aligned}$$

Value of option

$$= 80 N(d_1) - \frac{75}{1.062} \times N(d_2)$$

$$N(d_1) = N(0.5820) = 0.7197$$

$$N(d_2) = N(0.2992) = 0.6176$$

$$\begin{aligned}\text{Price} &= 80 \times 0.7197 - \frac{75}{1.062} \times 0.6176 \\ &= 57.57 - 70.62 \times 0.6176 \\ &= 57.57 - 43.61 \\ &= ₹ 13.96\end{aligned}$$

### (b) Leading and Lagging

It refers to the adjustment of the times of payments that are made in foreign currencies. Leading is the payment of an obligation before due date while lagging is delaying the payment of an obligation past due date. The purpose of these techniques is for the company to take advantage of expected devaluation or revaluation of the appropriate currencies. Lead and lag payments are particularly useful when forward contracts are not possible.

It is more attractive to use for the payments between associate companies within a group. Leading and lagging are aggressive foreign exchange management tactics designed to take the advantage of expected exchange rate changes. Buckley (1988) supports the argument.

### (c) Cost of Call and Put Options

$$\begin{aligned}&= (\text{₹ } 2 \text{ per share}) \times (100 \text{ share call}) + (\text{₹ } 1 \text{ per share}) \times (100 \text{ share put}) \\ &= ₹ 2 \times 100 + ₹ 1 \times 100 \\ &= ₹ 300\end{aligned}$$

(i) Price increases to ₹ 44. Since the market price is higher than the strike price of the put, the investor will exercise it.

$$\begin{aligned}\text{Ending position} &= (-₹ 300 \text{ cost of 2 option}) + (\text{₹ } 2 \text{ per share gain on call}) \times 100 \\ &= -₹ 300 + 200\end{aligned}$$

$$\text{Net Loss} = -₹ 100$$



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Portfolio beta =  $0.088 \times 0.45 + 0.166 \times 1.50 + 0.249 \times 1.15 + 0.497 \times 1.85 = 1.3036$   
 Thus the portfolio return =  $7 + 1.3036 \times (14 - 7) = 16.13\%$

(b) (i) Cost of Equity of B Ltd.

Cost of Equity ( $K_E$ ) =  $\text{Equity Earnings} \div \text{Market Value of Equity}$   
 = ₹ 396 Crores  $\div$  ₹ 1,850 Crores = 21.40%

(ii) Beta Value of Equity of B Ltd.

- Beta of B Ltd. – Beta of its Assets
- Since, A Ltd. and B Ltd. are in the same industry and in the same risk class, Beta of B Ltd. = Beta of A Ltd.
- Since A Ltd is an all equity Company, Beta of A Ltd. = Beta of Equity Shares of A Ltd. = 1.20.
- Therefore, Beta of Assets of B Ltd. = 1.20; Beta of Debt = 0

$$\Rightarrow \beta_A = \frac{\beta_{\text{Equity}} \times \text{Equity}}{\text{Equity} + \text{Debt} (1 - \text{Tax})} + \frac{\beta_{\text{Debt}} \times \text{Debt} \times (1 - \text{Tax})}{\text{Equity} + \text{Debt} (1 - \text{Tax})}$$

$$\Rightarrow 1.20 = \beta_E \times 1,850 \div [1,850 + 250 \times (1 - 33\%)] + 0$$

$$\Rightarrow 1.20 = \beta_E \times 1,850 \div [1,850 + 250 \times (1 - 33\%)]$$

$$\Rightarrow 1.20 = \beta_E \times 1,850 \div [1,850 + 250 \times 0.67]$$

$$\Rightarrow 1.20 = \beta_E \times 1,850 \div [1,850 + 167.50]$$

$$\Rightarrow 1.20 = \beta_E \times 1,850 \div 2,017.50$$

$$\Rightarrow 1.20 = \beta_E \times 0.917$$

$$\Rightarrow \beta_E = 1.20 \div 0.917 = 1.309$$

(c) We decided whether SAIL is overvalued or undervalued by comparing the returns.

$$\text{One year return of SAIL} = \frac{(P_1 - P_0) + D}{P_0} = \frac{(158.60 - 126.80) + 2.75}{126.80} = 27.25\%$$

However, the fair return as per CAPM can be found to be

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

$$= 8 + 0.6 \times (20 - 8) = 15.2\%$$

Therefore, the actual return i.e. 27.25% far exceeds the fair value of return i.e. 15.2%, thereby signifying that SAIL is a good stock to invest and considered undervalued.

8. (a) What are the components of risk? [2]

(b) Good Luck Ltd. has been enjoying a substantial cash inflow, and until the surplus funds are needed to meet tax and dividend payments, and to finance further capital expenditure in several months time, they have been invested in a small portfolio of short-term equity investments.

Details of the portfolio, which consists of shares in four UK listed companies, are as follows.

Company	Number of shares held	Beta equity coefficient	Market price per share (₹)	Latest Dividend yield (%)	Expected return on equity in the next year (%)
A Ltd.	60,000	1.20	4.29	6.10	19.50
B Ltd.	80,000	2.30	2.92	3.40	24.00
C Ltd.	1,00,000	0.85	2.17	5.70	17.50
D Ltd.	1,25,000	1.28	3.14	3.30	23.00

The current market return is 20% a year and the Risk free rate is 12% a year.

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- (i) On the basis of the data given, calculate the risk of Good Luck Ltd's short term investment portfolio relative to that of the market.  
 (ii) Recommend, with reasons, whether Good Luck Ltd., should change the composition of its portfolio. [4+4]

(c) Following information is available in respect of dividend, market price and market condition after one year.

Market Condition	Probability	Market Price (₹)	Dividend per share (₹)
Good	0.25	115	9
Normal	0.50	107	5
Bad	0.25	97	3

The existing market price of an equity share is ₹106 which is cum 10% bonus debenture of ₹6 each, per share. M/s. X Finance Company, has offered the buy-back of debentures at face value.

Find out the expected return and variability of returns of the equity shares. [3+3]

**Solution:**

8. (a) Components of Risk

Total Risk = Systematic Risk + Unsystematic Risk

- Systematic Risk: It represents that portion of Total Risk which is attributable to factors that affect the market as a whole. Beta is a measure of Systematic Risk.
- Unsystematic Risk: It is the residual risk or balancing figure, i.e., Total Risk Less Systematic Risk.

(b) (i) Computation of Weighted Beta

Security	No. of shares held	MPS (₹)	Market value of investments	Proportion	Beta	Portfolio Beta
[1]	[2]	[3]	[4]	[5]	[6]	[7]=[5]x[6]
A	60,000	4.29	2,57,400	$2,57,400 \div 11,00,500 = 0.2339$	1.20	0.28068
B	80,000	2.92	2,33,600	$2,33,600 \div 11,00,500 = 0.2123$	2.30	0.48829
C	1,00,000	2.17	2,17,000	$2,17,000 \div 11,00,500 = 0.1972$	0.85	0.16762
D	1,25,000	3.14	3,92,500	$3,92,500 \div 11,00,500 = 0.3567$	1.28	0.45658
			11,00,500	1	5.63	1.39317

(ii)

Security	Valuation under CAPM $= R_F + [\beta \times R_M - R_F]$	Expected $K_e$ in the next year %	Evaluation	Strategy
A	$12\% + 1.20 (20\% - 12\%) = 21.60$	19.50	Overpriced	Sell
B	$12\% + 2.30 (20\% - 12\%) = 30.40$	24.00	Overpriced	Sell
C	$12\% + 0.85 (20\% - 12\%) = 18.80$	17.50	Overpriced	Sell
D	$12\% + 1.28 (20\% - 12\%) = 22.24$	23.00	Under priced	Buy

(c) Existing market price of equity share

= ₹106 (which is cum 10% bonus debenture of ₹6 each per share)

Ex-market price of equity share

= ₹106 - ₹6 = ₹100

Total return = Market price + Dividend per share

Good = ₹115 + ₹9 = ₹124

Normal = ₹107 + ₹5 = ₹112

## Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

$$\text{Bad} = ₹97 + ₹3 = ₹100$$

Calculation of expected Return

Market condition	Probability	Total return	Cost (₹)	Net return (₹)
Good	0.25	124	100	24
Normal	0.50	112	100	12
Bad	0.25	100	100	0

Expected Return

$$= (24 \times 0.25) + (12 \times 0.50) + (0 \times 0.25) = ₹12$$

$$= \frac{\text{Net return}}{\text{Cost}} \times 100 = \frac{₹12}{₹100} \times 100 = 12\%$$

Calculation of Variability of Return

$$\text{Variance} = \sqrt{\text{S.D.}}$$

$$\begin{aligned} \sqrt{\text{S.D.}} &= 0.25 (24 - 12)^2 + 0.50 (12 - 12)^2 + 0.25 (0 - 12)^2 \\ &= 0.25(12)^2 + 0.50 (0)^2 + 0.25 (-12)^2 \\ &= 36 + 0 + 36 \end{aligned}$$

$$\text{S.D.} = \sqrt{72}$$

$$\text{S.D.} = 8.485$$

### SECTION D

(Answer any one of the following.)

9. (a) Explain briefly the concept of bridge financing. [3]

(b) SD Limited is engaged in large retail business in India. It is contemplating for expansion into a country of Africa by acquiring a group of stores having the same line of operation as that of India.

The exchange rate for the currency of the proposed African country is extremely volatile. Rate of inflation is presently 40% a year. Inflation in India is currently 10% a year. Management of SD Limited expects these rates likely to continue for the foreseeable future.

Estimated projected cash flows, in real terms, in India as well as African country for the first three years of the project are as follows:

	Year - 0	Year - 1	Year - 2	Year - 3
Cash flows in Indian ₹(000)	-50,000	-1,500	-2,000	-2,500
Cash flows in African Rands (000)	-2,00,000	+50,000	+70,000	+90,000

SD Ltd. assumes year 3 nominal cash flows will continue to be earned each year indefinitely. It evaluates all investments using nominal cash flows and a nominal discounting rate. The present exchange rate is African rand 6 to ₹ 1.

You are required to calculate the net present value of the proposed investment considering the following:

- (i) African rand cash flows are converted into rupees and discounted at a risk adjusted rate.
- (ii) All cash flows for these projects will be discounted at a rate of 20% to reflect its high risk.
- (iii) Ignore Taxation.

## Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

	Year -1	Year-2	Year-3
PVIF @ 20%	.833	.694	.579

[10]

- (c) ABC Limited has decided to go in for a new model of Mercedes Car. The cost of the vehicle is 40 lakhs. The company has two alternatives: (i) taking the car on finance lease or (ii) borrowing and purchasing the car.

BMN Limited is willing to provide the car on finance lease to ABC Limited for five years at an annual rental of ₹ 8.75 lakhs, payable at the end of the year.

The vehicle is expected to have useful life of 5 years, and it will fetch a net salvage value of 10 lakhs at the end of year five. The depreciation rate for tax purpose is 40% on written-down value basis. The applicable tax rate for the company is 35%. The applicable before tax borrowing rate for the company is 13.8462%.

What is the net advantage of leasing for ABC Limited?

The present value interest factor at different rates of discount are as under:

Rate of Discount	Y-1	Y-2	Y-3	Y-4	Y-5
0.138462	0.8784	0.7715	0.6777	0.5953	0.5229
0.09	0.9174	0.8417	0.7722	0.7084	0.6499

[7]

### Solution:

9. (a) **Meaning:** Bridge Finance refers to loans taken by a company usually from commercial banks, for a short period, pending disbursement of loans sanctioned by financial institutions.

### Sanction:

- (a) When a promoter or an enterprise approaches a financial institution for a long-term loan, there may be some normal time delays in project evaluation, administrative & procedural formalities and final sanction.
- (b) Since the project commencement cannot be delayed, the promoter may start his activities after receiving "in-principle" approval from the term lending institution.
- (c) To meet his temporary fund requirements for starting the project, the promoter may arrange short-term loans from commercial banks or from the term lending institution itself.
- (d) Such temporary finance, pending sanction of the long term loan, is called as "Bridge Finance".
- (e) This Bridge Finance may be used for - (i) paying advance for factory land/machinery acquisition, (ii) purchase of equipments, etc.

### Terms:

- (a) **Interest:** The interest rate on Bridge Finance is higher when compared to term loans.
- (b) **Repayment:** These are repaid or adjusted out of the term loans as and when disbursed by the concerned institutions.
- (c) **Security:** These are secured by hypothecating movable assets, personal guarantees & promissory notes.

(b)

### Calculation of NPV

Year	0	1	2	3
Inflation factor in India	1.00	1.10	1.21	1.331
Inflation factor in Africa	1.00	1.40	1.96	2.744
Exchange Rate (as per IRP)	6.00	7.6364	9.7190	12.3696

## Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

Cash Flows in ₹'000				
Real	-50000	-1500	-2000	-2500
Nominal (1)	-50000	-1650	-2420	-3327.50
Cash Flows in African Rand '000				
Real	-200000	50000	70000	90000
Nominal	-200000	70000	137200	246960
In Indian ₹'000 (2)	-33333	9167	14117	19965
Net Cash Flow in ₹'000 (1)+(2)	-83333	7517	11697	16637
PVF @ 20%	1	0.833	0.694	0.579
PV	-83333	6262	8118	9633

NPV of 3 years =  $(-83333+6262+8118+9633)=-59320$  (₹'000)

NPV of Terminal Value =  $\frac{16637}{0.20} \times 0.579 = 48164$  (₹'000)

Total NPV of the Project =  $-59320$  (₹'000) +  $48164$  (₹'000) =  $-11156$  (₹'000)

(c) Calculation of NPV if car is acquired on Finance Lease

Year	Lease rentals	Tax shield gained on lease rental @ 35%	Tax shield lost on depreciation @ 35%	Net cash outflow	Discount factor @ 9%	P.V. of cash outflows
	(a)	(b)	(c)	(a)-(b)+(c)		
1	8,75,000	3,06,250	5,60,000	11,28,750	0.9174	10,35,515
2	8,75,000	3,06,250	3,36,000	9,04,750	0.8417	7,61,528
3	8,75,000	3,06,250	2,01,600	7,70,350	0.7722	5,94,864
4	8,75,000	3,06,250	1,20,960	6,89,710	0.7084	4,88,591
5	8,75,000	3,06,250	72,576	6,41,326	0.6499	4,16,798
5 Loss of salvage value				10,00,000	0.6499	6,49,900
Net Present Value of Cash Outflows						39,47,196

Calculation of Depreciation of WDV Basis

Year	1	2	3	4	5
WDV at the beginning of the year	40,00,000	24,00,000	14,40,000	8,64,000	5,18,400
Depreciation @ 40% WDV	16,00,000	9,60,000	5,76,000	3,45,600	2,07,360
WDV at the end of year	24,00,000	14,40,000	8,64,000	5,18,400	3,11,040
Tax shield on depreciation @ 35%	5,60,000	3,36,000	2,01,600	1,20,960	72,576

Net Benefit of Leasing = ₹40,00,000 – ₹39,47,196 = ₹52,804

Suggestion – Since the NPV of leasing is lower than the cost of purchase, it is suggested to acquire the car on finance lease basis.

10. (a) Skylark Airways is planning to acquire a light commercial aircraft for flying class clients at an investment of ₹ 50,00,000. The expected cash flow after tax for the next three years is as follows:

Year 1		Year 2		Year 3	
CFAT	Probability	CFAT	Probability	CFAT	Probability
14,00,000	0.1	15,00,000	0.1	18,00,000	0.2
18,00,000	0.2	20,00,000	0.3	25,00,000	0.5
25,00,000	0.4	32,00,000	0.4	35,00,000	0.2
40,00,000	0.3	45,00,000	0.2	48,00,000	0.1

The Company wishes to take into consideration all possible risk factors relating to an airline operation. The company wants to know:

(i) The expected NPV of this venture assuming independent probability distribution with 10% risk free rate of interest.

## Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

(ii) The possible deviation in the expected value. [4+6]

(b) A expect to receive (in nominal terms) the following cash flows. Viz. 250, (422) 1,067. What is the present value, if the real discount rate is 5% and inflation is expected to be 4%, 3.5% and 5% for the following years? [3]

(c) A Ltd has the following book-value capital structure as on 31<sup>st</sup> March

Equity Share Capital (2,00,000 Shares)	₹40,00,000
11.5% Preference Shares	₹10,00,000
10% Debentures	₹30,00,000
<b>Total</b>	<b>₹80,00,000</b>

The Equity Shares of the company sell for ₹20. It is expected that the Company will pay a dividend of ₹ 2 per share next year, this dividend is expected to grow at 5% p.a. forever. Assume 35% corporate tax rate.

1. Compute the Company's WACC based on the existing Capital Structure.
2. Compute the new WACC if the company raises an additional ₹40 lakhs debt by issuing 12% debentures. This would result in increasing the expected Equity dividend to ₹2.40 and leave the growth rate unchanged, but the price of equity share will fall to ₹16 per share. [4+3]

**Solution:**

10. (a) (i) Expected NPV (₹ In lakhs)

Year I			Year II			Year III		
CFAT	P	CF x P	CFAT	P	CF x P	CFAT	P	CF x P
14	0.1	1.4	15	0.1	1.5	18	0.2	3.6
18	0.2	3.6	20	0.3	6.0	25	0.5	12.5
25	0.4	10.0	32	0.4	12.8	35	0.2	7.0
40	0.3	12.0	45	0.2	9	48	0.1	4.8
$\bar{x}$ or $\overline{CF}$		27.0	$\bar{x}$ or $\overline{CF}$		29.3	$\bar{x}$ or $\overline{CF}$		27.9

NPV	PV factor @ 10%	Total PV
27	0.9090	24.54
29.3	0.8264	24.21
27.9	0.7513	20.96
	PV of cash inflow	69.71
	Less: Cash outflow	50.00
	<b>NPV</b>	<b>19.71</b>

(ii) Possible deviation in the expected value

Year I				
$X - \bar{X}$	$X - \bar{X}$	$X - \bar{X}^2$	$P_1$	$X - \bar{X}^2 P_1$
14 - 27	-13	169	0.1	16.9
18 - 27	-9	81	0.2	16.2
25 - 27	-2	4	0.4	1.6
40 - 27	13	169	0.3	50.7
				85.4



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$$\sigma_1 = \sqrt{85.4} = 9.241$$

Year II				
$X - \bar{X}$	$X - \bar{X}$	$X - \bar{X}^2$	$P_2$	$X - \bar{X}^2 P_2$
15 - 29.3	-14.3	204.49	0.1	20.449
20 - 29.3	-9.3	86.49	0.2	25.947
32 - 29.3	2.7	7.29	0.4	2.916
45 - 29.3	15.7	246.49	0.2	49.298
				98.61

$$\sigma_2 = \sqrt{98.61} = 9.930$$

Year III				
$X - \bar{X}$	$X - \bar{X}$	$X - \bar{X}^2$	$P_3$	$X - \bar{X}^2 P_3$
18 - 27.9	-9.9	98.01	0.2	19.602
25 - 27.9	-2.9	8.41	0.5	4.205
35 - 27.9	7.1	50.41	0.2	10.082
48 - 27.9	20.1	404.01	0.1	40.401
				74.29

$$\sigma_3 = \sqrt{74.29} = 8.619$$

Standard deviation about the expected value:

$$\delta = \sqrt{\frac{85.4}{(1.10)^2} + \frac{98.61}{(1.10)^4} + \frac{74.29}{(1.10)^6}} = \sqrt{70.58 + 67.35 + 41.94} = 13.4115.$$

(b)

Nominal Cash Flows	Inflation Rate	Real Cash Flows	PV factor of real discount rate 5%	NPV
250	4%	250 / 1.04 = 240.38	0.952	228.84
-422	3.5%	-422 / (1.035 x 1.04) = -392.05	0.907	-355.59
1067	5%	1067 / (1.035 x 1.04 x 1.05) = 944.06	0.864	815.67
Total NPV				688.92

Note: We need to take the cumulative effect of inflation in the second year & third year.

- (c) (i)  $K_e = \frac{\text{Dividend per Share}}{\text{Market Price per Share}} + g = \frac{₹2.00}{₹20.00} + 5\% = 10\% + 5\% = 15.00\%$
- (ii)  $K_d = \frac{\text{Net Proceeds of Issue}}{\text{Net Proceeds of Issue}} = 10\%(1 - 0.35) = 6.50\%$
- (iii)  $K_p = \frac{\text{Preference Dividend}}{\text{Net Proceeds of Issue}} = 11.50\%$  i.e. ₹ 1,15,000

1. Computation of WACC under present capital structure:

Particulars	Amount	%	Individual Cost	WACC
Debt	30,00,000	37.50%	$K_d = 6.50\%$	2.44%
Preference Capital	10,00,000	12.50%	$K_p = 11.50\%$	1.44%
Equity Capital	40,00,000	50.00%	$K_e = 15.00\%$	7.50%

## Answer to PTP\_Intermediate\_Syllabus 2012\_Jun2014\_Set 3

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Total	80,00,000	100%	WACC = K <sub>0</sub> =	11.38%
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2. Computation of WACC under revised capital structure:

Component	Amount	%	Individual Cost	WACC
Present Debt	30,00,000	25%	K <sub>d</sub> = 6.50%	1.63%
New Debt at 12%	40,00,000	33.33%	K <sub>d</sub> = 7.80%	2.60%
Preference Capital	10,00,000	8.33%	K <sub>p</sub> = 11.50%	0.96%
Equity Capital	40,00,000	33.34%	K <sub>e</sub> = 20.00%	6.67%
<b>Total</b>	<b>1,20,00,000</b>	<b>100%</b>	<b>WACC = K<sub>0</sub> =</b>	<b>11.86%</b>

$$\text{Revised } K_e = \frac{\text{Dividend per Share}}{\text{Market Price per Issue}} + g = \frac{\text{₹}2.40}{\text{₹}16.00} + 5\% = 15\% + 5\% = 20.00\%$$

$$\text{New Debt } K_d = 12\% (1 - 0.035) = 7.8\%$$