

THE INSTITUTE OF CHARTERED ACCOUNTANTS OF PAKISTAN

Business Finance Decisions

Examiners' comments and Suggested answers

**Certified Finance and Accounting Professional (CFAP) – Summer 2017
Examinations**

Overall General Comments:

25.97% candidates passed as compared to 21.47% in the previous attempt. Poor performance in Question # 2 affected the overall performance adversely. The topic of divisional transfer pricing has been an area where the performance has been low over the past many attempts. Since most situations are significantly different, it requires a lot of practice which the candidates seem to lack.

Question-wise comments:

Question 1

General comments:

43.61% candidates secured passing marks in this question.

Common errors:

1. Cost of revenue percentage used to arrive at contribution margin was applied on Revenue net of discounts instead of applying it on gross revenue.
2. Discounts and free treatment percentages were applied on contribution margin instead of Revenue.
3. Lab and radiology were also taken into consideration while calculating pharmacy income.
4. In calculating the cash flows over the years, increase in volume of business was ignored.

*Examiners' comments and Suggested answers on Business Finance Decisions, CFAP
Examination Summer 2017*

Suggested answer:

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
	----- Rs. in '000 -----					
Initial investment	(500,000)	-	-	-	-	-
Contribution margin other than pharmacy $37,440(W-1) \times 1.10 \times 1.08$	-	37,440	44,479	52,841	62,775	74,577
Donations (W-2)	-	11,064	13,144	18,738	22,261	26,446
Shortfall coverage by NGO (W-2)	-	7,344	8,000	7,242	8,000	8,000
Share of pharmacy $2,069(W-3) \times 1.10 \times 1.08$	-	2,069	2,458	2,920	3,469	4,121
General and administrative expenses ($12,000 \times 1.08$)	-	(12,000)	(12,960)	(13,997)	(15,117)	(16,326)
Terminal value	-	-	-	-	-	1,000,000
	(500,000)	45,917	55,121	67,744	81,388	1,096,818
Discount factor [$@16.6\%$ (W-4)]	1.0000	0.8576	0.7355	0.6308	0.5410	0.4640
PV	(500,000)	39,378	40,541	42,733	44,031	508,924
NPV (Sum of all cash flows)		175,607				

W-1: Revenue for each type of room and ICU

	Private	Semi private	General Wards	ICU	Lab / Rad	OPD	Total
	----- Rs. in '000 -----						
Gross revenue A	10,512 <small>($20 \times 9,000 \times 16\% \times 365$)</small>	9,198 <small>($30 \times 7,000 \times 12\% \times 365$)</small>	25,550 <small>($70 \times 2,000 \times 50\% \times 365$)</small>	48,180 <small>($30 \times 11,000 \times 40\% \times 365$)</small>	7,200 <small>($9,000 \times 800$)</small>	10,000 <small>($20,000 \times 500$)</small>	110,640
Less: Discount to Corporate Clients [$A \times 15\% \times 10\%$]	158	138	383	723	N/A	N/A	1,402
Less: 25% free medical treatment of gross revenue ($A \times 25\%$)	N/A	N/A	6,388	12,045	1,800	2,500	22,733
Revenue net of free treatment & discount B	10,354	9,060	18,779	35,412	5,400	7,500	86,505
Cost of revenue % ($1 - CM\%$) C	58%	54%	48%	25%	86%	75%	-
Less: Cost of revenue ($A \times C$)	6,097	4,967	12,264	12,045	6,192	7,500	49,065
Contribution margin	4,257	4,093	6,515	23,367	(792)	-	37,440

W-2: Financing of free treatment

	Year 1	Year 2	Year 3	Year 4	Year 5
	----- Rs. in '000 -----				
Gross revenue [$110,640(W-1) \times 1.10 \times 1.08$]	110,640	131,440	156,151	185,508	220,383
Free treatment [$22,733(W-1) \times 1.10 \times 1.08$]	22,733	27,007	32,084	38,116	45,282
Charity 5% of revenue net of free treatment and discount ($86,506(W-1) \times 5\% \times 1.10 \times 1.08$)	(4,325)	(5,138)	(6,104)	(7,252)	(8,615)
Donations (Gross revenue $\times 10\%$, 12% from year 3 onwards)	(11,064)	(13,144)	(18,738)	(22,261)	(26,446)
Deficit ($22,733 - 4,325 - 11,064$) $\times 1.1 \times 1.08$	7,344	8,725	7,242	8,603	10,221
Less: Shortfall paid by NGO (Subject of max Rs. 8 million)	7,343	8,000	7,242	8,000	8,000
Deficit to be borne by hospital	-	725	-	603	2,221

W-3: Revenue for Pharmacy

	Rs. in '000
Hospital room revenue ($10,512 + 9,198 + 25,550 + 48,180$)	93,440
OPD Revenue	10,000
	103,440
20% Sehat pharmacy revenue ($103,440 \times 20\%$)	20,688
Share of hospital 10% ($20,688 \times 10\%$)	2,069

W-4: Cost of capital

$$\begin{aligned}
 R_s &= [R_f + \beta_s (R_m - R_f)] + \text{market premium} \\
 &= [11\% + 1.2 (14\% - 11\%)] + 2\% \\
 &= 16.6\%
 \end{aligned}$$

Since the project is equity financed, the asset beta will be equal to its equity beta i.e. $\beta_s = \beta_a$

Question 2

General comments:

05.15% candidates secured passing marks in this question.

Common errors:

The question required to determine the existing production plan based on the profits of Divisions and compare it with the optimum production plan based on Organizational profitability keeping in view the interdependency of the Divisions. Very few of the students worked on these lines. Most common mistakes were:

1. The requirement was to determine the optimum production plan which would maximize the profit at the organisational level. The right approach could not be adopted. Answers were undertaken without proper planning resulting in irrelevant calculations where ultimately no choice was left but to abandon the question.
2. Pricing options were compared instead of determining the optimum production plan.
3. Total costs including fixed costs were used to determine the CM.
4. Bonus to division managers was calculated at 20% of the profit before bonus instead of 20% of profit after bonus.

Suggested answer:

		Rupees
Profit under existing conditions	(W-1)	6,928,000
Profit if the suggestion of CEO is followed	(W-3)	7,496,000
Increase in profit		(568,000)

W-1: Profit under existing conditions

	Division A	Division B
	----- Rupees -----	
CM from external sales of DE-55 [25.24 (W-1.1)×100,000 (W-1.1)]	2,524,000	-
CM from internal sales		
DE-55 [15.19 (W-1.1)×40,000 (W-1.1)]	607,600	-
Gamma [150 - 113.15 (W-1.1)×40,000 (W-1.1)]	-	1,474,000
CM from AB-41 and external sales Alpha (15.24 (W-1.1)×200,000 (W-1.1))	3,048,000	-
[(170 - 139.20 (W-1.1))×200,000 (W-1.1)]	-	6,160,000
Total CM	6,179,600	7,634,000
Less: Fixed costs	(2,800,000)	(2,700,000)
Net profit before bonus	3,379,600	4,934,000
Less: Bonus (Profit × 20 ÷ 120)	(563,267)	(822,333)
Net profit after bonus	2,816,333	4,111,667
	6,928,000	

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W-1.1: Determination of units of each product to be produced in Division A

	Division A				
	External sales - DE55		Internal sales - DE55		AB-41
Demand	150,000	100,000	150,000	100,000	200,000
Sales price per unit	80.00	100.00	75.95 <small>60.76×1.25</small>	75.95 <small>60.76×1.25</small>	102.00 <small>170×0.6</small>
Variable cost per unit (W-2)	(74.76)	(74.76)	(60.76)	(60.76)	(86.76)
Contribution margin per unit	5.24	25.24	15.19	15.19	15.24
Total contribution margin	786,000	2,524,000	2,278,500	1,519,000	3,048,000
Priority of production		2	3		1
Units to be produced for Division A	100,000		40,000		200,000
	Total capacity of Division A 340,000				
Units to be produced for Division B			40,000		200,000
	Total capacity of Division B 250,000				

W-2: Determination of total variable costs per unit

	Division A			Division B		HL as a whole			
	External sales DE-55	Internal sales - DE-55	AB-41	Gamma	Alpha	DE-55	Gamma	Alpha	
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f = a</i>	<i>g = b + d</i>	<i>h = c + e</i>	
	Rupees								
Material cost	39.00	39.00	50.00	19.00	16.00	39.00	58.00	66.00	
Conversion cost	30.00	30.00	45.00	15.00	15.00	30.00	45.00	60.00	
Variable selling expense	14.00	-	-	14.00	17.00	14.00	14.00	17.00	
Internal transfer price	-	-	-	75.95	102.00	-	-	-	
Total costs	83.00	69.00	95.00	123.95	150.00	83.00	117.00	143.00	
Less: Fixed conversion costs	(8.24)	(8.24)	(8.24)	(10.80)	(10.80)	(8.24)	(19.04)	(19.04)	
	<small>(2.8÷0.34)</small>	<small>(2.8/0.34)</small>	<small>(2.8/0.34)</small>	<small>(2.7÷0.25)</small>	<small>(2.7÷0.25)</small>	<small>(2.8÷0.34)</small>			
Total variable costs	74.76	60.76	86.76	113.15	139.20	74.76	97.96	123.96	

W-3: Profit if suggestion of CEO is followed

		HL (Rs.)
CM from external sales of DE-55	[25.24×90,000] (W-3.1)	2,271,600
External sales Gamma (100,000 units)	(W-3.1)	5,204,000
External sales Alpha	[46.04×150,000] (W-3.1)	6,906,000
Total contribution margin		14,381,600
Less: Fixed costs	(2,800,000+2,700,000)	(5,500,000)
Net profit before bonus		8,881,600
Less: Bonus Division A	(W-1)	(563,267)
Less: Bonus Division B	(W-1)	(822,333)
Net profit after bonus		7,496,000

W-3.1: Determination of each unit to be produced if suggestion of CEO is followed

	HL as a whole				
	External sales - DE55		Gamma		AB-41
Demand level	150,000	100,000	150,000	100,000	200,000
	Rupees				
Sales price	80.00	100.00	135.00	150.00	170.00
Less: Variable costs	(74.76)	(74.76)	(97.96)	(97.96)	(123.96)
Contribution margin per unit	5.24	25.24	37.04	52.04	46.04
Total CM	786,000	2,524,000	5,556,000	5,204,000	9,208,000
Priority of production		3	2		1
Units to be produced for Division A	90,000.00		100,000.00		150,000
	Total capacity of Division A 340,000				
Units to be produced for Division B	-		100,000.00		150,000
	Total capacity of Division B 250,000				

Question 3

General comments:

56.67% candidates secured passing marks in this question.

Part (a)

Common errors

1. The 30% decline in the difference between future and spot prices was ignored while calculating closing future prices.
2. Calculations were made for the month of August only and it was concluded that decision in respect of September and October should be made on the same basis.

Suggested answer:

Payments due in	USD
August (2,500 × 150)	375,000
September (2,500 × 200)	500,000
October (2,500 × 250)	625,000

Hedge using money market

Step 1 : Determine the USD to be deposited in a USD deposit account for period of payment and purchase the required USD at spot

Month	Payment amount USD	No. of months	Annualized deposit interest rate	Amount of deposit needed (USD)	Equivalent PKR required at current spot rate
	a	b	c	d = a ÷ (1+c × b ÷ 12)	e = d × 104.5
Aug	375,000	3	4%	371,287	38,799,491
Sep	500,000	4	4%	493,421	51,562,494
Oct	625,000	5	4%	614,754	64,241,793
	1,500,000				

Step 2: Borrowed equivalent PKR amount:

Month	PKR Amount to be borrowed	No. of months	Annualized borrowing rates	Amount of interest	Cumulative repayment amount (PKR)
	e	f	g	h = e × g × f ÷ 12	i = e + h
Aug	38,799,491	3	7.75%	751,740	39,551,231
Sep	51,562,494	4	7.75%	1,332,031	52,894,525
Oct	64,241,793	5	7.75%	2,074,475	66,316,268
					158,762,024

Total payments under money market hedge

Hedge using currency futures (Buy and sell future)

Future market (profit) / loss

	August	September	October
	----- PKR -----		
Opening future prices	105.11	105.41	105.70
Closing future prices (W-1)	106.71	105.22	106.40
Difference	(1.60)	0.19	(0.70)
Future market (profit) / loss	(600,000)	95,000	(437,500)
	<i>(1.60 × 375,000)</i>	<i>(0.19 × 500,000)</i>	<i>(0.70 × 625,000)</i>

Net outcome

Spot market payment	39,937,500 <i>(106.50 × 375,000)</i>	52,500,000 <i>(105.00 × 500,000)</i>	66,375,000 <i>(106.20 × 625,000)</i>
Future market (profit) / loss	(600,000)	95,000	(437,500)
	39,337,500	52,595,000	65,937,500

Total payments under future option

157,870,000

Conclusion:

Hedging through futures market requires less payment and is the preferred option for hedging.

W-1: Future closing rates

Future closing rate = Expected spot rate + [(Future rate – current spot rate) × (1 – decline %)^m]

$$\begin{aligned}
 \text{August future closing rate} &= [106.50 + (105.11 - 104.50) \times (0.7)^3] &= 106.71 \\
 \text{September future closing rate} &= [105.00 + (105.41 - 104.50) \times (0.7)^4] &= 105.22 \\
 \text{October future closing rate} &= [106.20 + (105.70 - 104.50) \times (0.7)^5] &= 106.40
 \end{aligned}$$

Part (b)

Common error:

There were two requirements of this part of the question i.e. to explain how the interest rate future can be used to hedge exposure to interest rate risk and to determine whether it would be beneficial to hedge in the given situation. The first requirement was often ignored.

Suggested answer:

Hedge using interest rate futures

Step 1: JML will sell three months interest rate future contracts at 92.4 and buy at 92.2 for a gain of 0.2%.

Step 2: JML will need to sell 240 contracts ($3,000 \div 50 \times 12 \div 3$).

If interest rate rises to 7.5% and 3-months future prices decreases to 92.2, the net hedging position of the interest rate future would be as follows:

	Rs. in million
Payment in spot market ($\text{Rs. } 3,000,000,000 \times 7.5\%$)	(225)
Future receipts (Gain) ($0.2\% \times \text{Rs. } 50,000,000 \times 240 \times 3 \div 12$)	6
Net interest payment	(219)
Effective interest rate ($219 \div 3,000$)	7.3%

Question 4

General comments:

23.78% candidates secured passing marks in this question.

Common errors:

1. Expected revenue was calculated instead of expected contribution margin.
2. Expected contribution margin was computed on the basis of the option with the highest joint probabilities instead of computing a weighted average on the basis of different possible outcomes and probabilities.
3. All the nine possible situations were considered ignoring the probabilities altogether. Consequently, no final conclusion was provided.

Suggested answer

Mi Cola	ASL		BSL		Expected sales (million bottles)	CM per Bottle [W-1] (Rs.)	Total CM (Rs. in million)	Joint probability	Expected value Rs. in million
Selling Price	Selling price (Rs.)	Probability	Selling Price (Rs.)	Probability					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = [6 × 7]	(9) = [3 × 5]	(8 × 9)
20.00	20.00	0.40	20.00	0.70	27.00	11.20	302.40	0.28	84.67
	20.00	0.40	19.00	0.30	24.00	11.20	268.80	0.12	32.26
	19.00	0.60	20.00	0.70	23.00	11.20	257.60	0.42	108.19
	19.00	0.60	19.00	0.30	22.00	11.20	246.40	0.18	44.35
								1.00	269.47
19.00	19.00	0.80	20.00	0.20	28.00	10.20	285.60	0.16	45.70
	19.00	0.80	19.00	0.80	27.00	10.20	275.40	0.64	176.26
	18.00	0.20	20.00	0.20	26.00	10.20	265.20	0.04	10.61
	18.00	0.20	19.00	0.80	24.00	10.20	244.80	0.16	39.17
								1.00	271.74
18.00	18.00	1.00	18.00	1.00	29.00	9.20	266.80	1.00	266.80

Conclusion:

SBL should keep selling price at Rs. 19 per bottle.

W-1: Contribution margin per bottle

	----- Rs. per unit -----		
Selling price	20.00	19.00	18.00
Variable cost	8.80	8.80	8.80
CM	11.20	10.20	9.20

Question 5

General comments:

57.73% candidates secured passing marks in this question.

Part (a)

Common errors:

1. Price of IPO was computed by dividing the present values of future cash flows by the existing number of shares instead of preparing appropriate simultaneous equations and
2. Terminal value at the end of year 5 was ignored.
3. Tax savings on the cost of IPO was ignored.
4. In computing the cost of equity, equity beta was used without un gearing it.
5. Only cash flows were computed. All or most of the remaining calculations were ignored.

Suggested answer:

Determination of IPO price and number of shares to be offered

Let 'x' be the no. of shares to be issued and 'y' be IPO price

Then

$$xy = 2,652 \rightarrow \text{Equation 1 (2x + 0.7y)}$$

$$(200 + x)y = 7,826 \text{ (W-1)} \rightarrow \text{Equation 2}$$

By simplifying the equation 2:

$$200y + xy = 7,826$$

$$200y + 2,652 = 7,826$$

$$200y = 4,694$$

$$y = 23 \text{ share issue price}$$

Substituting value of y in equation 1 to determine the number of new shares to be issued

$$23x = 2,652$$

$$x = 114 \text{ million}$$

W-1: Value of company after IPO

	Years					
	0	1	2	3	4	5
	----- Rs. in million -----					
Profit before tax (1,025 × 1.20)	-	1,230	1,476	1,771	2,125	2,550
Tax depreciation	-	(350)	(315)	(284)	(256)	(230)
Profit before tax	-	880	1,161	1,487	1,869	2,320
Tax @ 30%	-	(264)	(348)	(446)	(561)	(696)
Net profit after tax	-	616	813	1,041	1,308	1,624
Add back tax depreciation	-	350	315	284	256	230
Initial investment	(2,500)	-	-	-	-	-
*Cost of IPO (2,500 ÷ 95% × 5%)	(132)	-	-	-	-	-
Tax savings on cost of IPO (132 × 30%)	-	40	-	-	-	-
Terminal value (1,624 + 230) ÷ 15.8%	-	-	-	-	-	11,734
Cash inflows / (outflows)	(2,632)	1,006	1,128	1,325	1,564	13,588
Discount factor 15.8% (W-2)	1.0000	0.8636	0.7457	0.6440	0.5561	0.4802
PV	(2,632)	869	841	853	870	6,533
DF value of the company (Sum of all present values)						7326

* It is assumed that cost of IPO was also paid before the start of project.

W-2: Computation of discount factor

Ungeared the equity beta of industry

$$B_u = [B_e \times (E + D) + D(1 - T_c)]$$

$$= [(1.90 \times 0.6 \div \{0.6 + 0.4(1 - 0.3)\}) + Nil] \Rightarrow 1.90$$

Since the company is 100% equity financed, its asset beta is equal to its equity beta

Cost of equity by using CAPM

$$K_e = R_f + B_e(R_m - R_f)$$

$$= [8\% + 1.30 \times (14\% - 8\%)] \Rightarrow 13.8\%$$

Part (b)

Common error:

This part of the question was either attempted well or was left un-attempted. Those who did not attempt should refer to the suggested answer.

Suggested Answer

Date: 6 June 2017
To: Board of Directors
From: Financial Consultant

Subject: Effect of leverage on the valuation of the company

Dear Sirs

Congratulations on being awarded such a large project which will open new avenues of growth for your company.

I was given the assignment to determine the price for initial public offering in line with the Board's directive. According to the working attached as Appendix, the price has been worked out at Rs. 23 per share. This is based on the Board's directive whereby the project would be 100% equity financed. However, before taking final decision in respect of the IPO, I suggest that the management should also consider some of the advantages of leveraged financing which are enumerated below:

- Introducing leverage helps the company to get tax benefit on debt servicing cost which ultimately reduces the overall cost of capital for the company.
- Weighted average cost of capital is used to discount the cash flows of the company for valuation and a lower cost of capital means higher valuation.

Yours truly

Financial Consultant

(THE END)