

**CMA DECEMBER-2019 EXAMINATION
PROFESSIONAL LEVEL-IV
SUBJECT: 401. FINANCIAL MANAGEMENT**

MODEL SOLUTION

Solution of the Question No. 1

- (a) Market forces-for example, shareholder activism from large institutional investors-can reduce or avoid the agency problem because these groups can use their voting power to elect new directors who support their objectives and will act to replace poorly performing managers. In this way, these groups place pressure on management to take actions that maximize shareholder wealth.

The threat of hostile takeovers also acts as a deterrent to the agency problem. *Hostile takeovers* occur when a company or group not supported by existing management. Under this market force, another firm targets/attempts to acquire the firm. Because the acquirer looks for companies that are poorly managed and undervalued. This threat motivates managers to act in the best interests of the firm's owners.

Institutional investors are a powerful source of shareholder involvement in the monitoring of managers to reduce the agency problem. Institutions hold large quantities of shares in many of the corporations in their portfolio. Managers of these institutions should be active in the monitoring of management and vote their shares for the benefit of the shareholders. The power of institutional investors far exceeds the voting power of individual investors.

(b)

- i. Bad debts

Proposed plan (60,000 x \$20 x 0.04) \$48,000

Present plan (50,000 x \$20 x 0.02) 20,000

- ii. Cost of marginal bad debts \$28,000

- iii. No, because the cost of marginal bad debts of \$28,000 exceeds the savings of \$3,500.

- iv. Additional profit contribution from sales:

10,000 additional units x (\$20 - \$15) \$50,000

Cost of marginal bad debts (ii) (28,000)

Savings 3,500

Net benefit from implementing proposed plan \$25,500

This policy change is recommended because the increase in sales and the savings of \$3,500 exceed the increased bad debt expense.

(c)

i.	OC	= Average age of inventories + Average collection period = 90 days + 90 days = 180 days
ii.	CCC	= Operating cycle - Average payment period = 180 days - 60 days = 120 days

- iii. To calculate the amount of resources needed, you must calculate the amount of inventory, receivables, and accounts payable.

For the inventory balance: \$9.5 million x (90/365) = \$2.34 million

For the receivables balance: \$14 million x (90/365) = \$3.45 million

For the payables balance: \$5 million x (60/365) = \$0.82 million

So, the total resource requirement is \$2.34 + \$3.45 - \$0.82 = \$4.97 million

- iv. Shortening either the AAI without stockouts that results in lost sales or the ACP without losing sales from high-pressure collection techniques, lengthening the APP without damaging the firm's credit rating, or a combination of these can reduce the CCC.

(d)

i.
$$Q^* = \frac{\sqrt{2SO}}{C} = \frac{\sqrt{2(2000)8}}{0.15} = 462 \text{ units}$$

ii. total cost: $(Q/2)C + (S/Q)O$

Ordering once: $(462/2)(0.15) + (2000/462)8 = 34.65 + 34.63 = 69.28$

Ordering 4 times: $(500/2)(0.15) + (2000/500)8 = 37.50 + 32.00 = 69.50$

Solution of the Question No. 2

(a)

i. $Q = FC + (P - VC)Q$ $Q = \$50,000 + (\$6 - \$3.50)Q = 20,000 \text{ latches}$

ii. Sales ($\$6 \times 30,000$) \$180,000

Less:

Fixed costs 50,000

Variable costs ($\$3.50 \times$ 105,000

EBIT 25,000

Less interest expense 13,000

EBT 12,000

Less taxes (40%) 4,800

Net profits \$ 7,200

Net profits - Preference dividends = Earnings available for common stockholders

$\$7,200 - \$7,000 = \$200$

iii.
$$DOL = \frac{[Q \times (P - VC)]}{[Q \times (P - VC)] - FC}$$

$$DOL = \frac{[30,000 \times (\$6.00 - \$3.50)]}{[30,000 \times (\$6.00 - \$3.50)] - \$50,000} = \frac{\$75,000}{\$25,000} = 3.0$$

$$DFL = \frac{EBIT}{[EBIT - I - (PD \times \frac{1}{1-T})]}$$

$$DFL = \frac{\$25,000}{\$25,000 - \$13,000 - [\$7,000 \times (1/(1-0.4))]} = \frac{\$25,000}{\$333.33} = 75.00$$

$DTL = DOL \times DFL = 3 \times 75.00 = 225 \text{ (or } 22,500\%)$

iv. Change in sales = $\frac{15,000}{30,000} = 50\%$

Percentage change in EBIT = % change in sales \times DOL = $50\% \times 3 = 150\%$ New EBIT =

$\$25,000 + (\$25,000 \times 150\%) = \$62,500$

Percentage change in earnings available for common = % change sales \times DTL = $50\% \times 225 = 11,250\%$

New earnings available for common = $\$200 + (\$200 \times 11,250\%) = \$22,700$

(b)

No. An investor cannot control the systematic risk (non-diversifiable) in a portfolio but can control the level of unsystematic (diversifiable) risk.

Systematic or mostly unsystematic Risk

- i. Short term interest rates increase unexpectedly--- systematic risk

- ii. The interest rate a company pays on its short term debt borrowing is increased by its bank-- unsystematic risk
- iii. A manufacturer loses a multimillion dollar product liability suit.---- unsystematic risk
- iv. A Supreme Court decision substantially broadens producer liability for injuries suffered by product users.-systematic risk

(c)

We can summarize the relevant information as follows:

	Base Case	Lower Bound	Upper Bound
Unit sales	500	475	525
Price per nit	2,500	2,375	2,625
Variable cost per unit	1,500	1,425	1,575
Fixed cost per year	200,000	190,000	210,000

Depreciation is 150,000 per year; knowing this, we can calculate the cash flows under each scenario. Remember that we assign high costs and low prices and volume for the worst case and just the opposite for the best case:

	Unit Sales	Unit Price	Unit Variable Cost	Fixed Costs*	Cash Flow
Base case	500	2,500	1,500	200,000	249,000**
Best case	525	2,625	1,425	190,000	341,400
Worst case	475	2,375	1,575	210,000	163,200

*assuming that depreciation is not included in fixed costs.

** $\{[(2,500-1,500)*500]-(2,00,000+1,50,000)\}*(1-0.34)+1,50,000 = 2,49,000$; ; best case and worst case were calculated based on same calculation.

At 17 percent, the five-year annuity factor is 3.19935, so the NPVs are:

Base case NPV = - 750,000 + 3.19935 * 249,000 = 46,638

Best case NPV = - 750,000 + 3.19935 * 341,400 = 342,258

Worst case NPV = - 750,000 + 3.19935 * 163,200 = - 227,866

(d)

MMY has a debt-equity ratio of $.60/.40 = 1.50$. If the entire 5,000 in earnings were reinvested, then $5,000*1.50 = 7,500$ in new borrowing would be needed to keep the debt-equity ratio unchanged. Total new financing possible without external equity is thus $5,000+7,500 = 12,500$.

If planned outlays are 12,000, then this amount will be financed with 40 percent equity. The needed equity is thus $12,000*0.40 = 4,800$. This is less than the 5,000 in earnings, so a dividend of $5,000 - 4,800 = 200$ will be paid.

Solution of the Question No. 3

- i. First determine the percentage composition in the capital structure.

	<i>Dollar amount</i>	<i>Percentage composition</i>
Bonds.....	\$ 6,120,000	34
Preferred stock	1,080,000	6
Common equity	<u>10,800,000</u>	<u>60</u>
	\$18,000,000	100

Then determine the after tax cost of each component (for now assume common equity is in the form of retained earnings).

Cost of Debt

$$K_d = Y (\text{Yield}) (1 - T)$$

$$\text{Approximate yield to maturity (Y}^1\text{)} = \frac{\text{Annual interest payment} + \frac{\text{Principal payment} - \text{Price of the bond}}{\text{Number of years to maturity}}}{\frac{\text{Price of the bond} + \text{Principle payment}}{2}}$$

$$Y^1 = \frac{\$93 + \frac{\$1,000 - \$890}{20}}{(\$890 + \$1,000) / 2}$$

$$= \frac{\$93 + \frac{\$110}{20}}{\$945}$$

$$Y^1 = \frac{\$93 + \$5.50}{\$945} = \frac{\$98.50}{\$945} = 10.42\%$$

$$K_{dt} = 10.42\% \times (1 - 0.35)$$

$$= K_{dt} = 6.77\%$$

Cost of preferred stock

$$K_p = \frac{D_p}{P_p - F}$$

$$\frac{\$4.80}{\$60 - 2.60} = \frac{\$4.80}{\$57.40} = 8.36\%$$

Cost of common equity

(Retained earnings)

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

$$D_1 = \text{Earnings per share} \times 4 = \$3.00 \times 4 = \$1.20$$

$$P_0 = \$25$$

g = The growth rate that will allow \$.82 to grow to \$1.20 over 4 years.

$$FV = PV(FV_{IF})$$

$$FV_{IF} = \frac{FV}{PV} = \frac{\$1.20}{\$0.82} = 1.463$$

The growth rate is approximately 10%.

$$K_e = \frac{D_1}{P_0} + g = \frac{\$1.20}{\$25} + 10\% = 4.80\% + 10\% = 14.80\%$$

Now combine the weights and the costs.

		Cost. (after tax)	Weights	Weighted Cost
Bonds	K_d	6.77%	34%	2.30%
Preferred stock	K_p	8.36	6	.50
Common equity (retained earnings)	K_e	14.80	60	<u>8.88</u>
Weighted average cost of capital	K_a			11.68%

ii. First compute the cost of new common stock.

$$K_a = \frac{D_1}{P_0 - F} + g$$

$$= \frac{\$1.20}{\$25 - \$2} + 10\% = 5.22\% + 10\% = 15.22\%$$

Then recompute the cost of capital.

		Cost. (after tax)	Weights	Weighted Cost
Bonds	K_d	6.77%	34%	2.30%
Preferred stock	K_p	8.36	6	0.50
Common equity (new common stock)	K_n	15.22	60	<u>9.13</u>
Weighted average cost of capital	K_{mc}			11.93%

The size of the capital structure at which the cost of capital goes up is \$7,500,000.

$$\frac{\text{Retained earnings}}{\text{Percent of common equity in the capital structure}} = \frac{\$4,500,000}{.60} = \$7,500,000$$

iii. Based on the capital asset pricing model, the cost of common stock (required return) is 14.75 percent. This is quite close to the value derived using the dividend valuation model (K_e) in question 1 of 14.8 percent.

$$K = R_f + \beta (K_m - R_f)$$

$$6\% + 1.25 (13\% - 6\%)$$

$$6\% + 1.25 (7\%) = 6\% + 8.75\% = 14.75\%$$

The cost of capital of 14.75% using the CAPM technique differs from the rate of 11.68% using the constant divided growth model. It is difficult to make both equivalent as beta (market risk) based CAPM can't be fitted properly to dividend model which uses market price.

Solution of the Question No. 4

i. Average beta

Company	Beta
Armour Holdings	1.40
BE Aerospace	1.65
General Dynamics	.85
Lockheed Martin	.80
Northrop Gruman	.80
	5.50 / 5 = 1.10

ii. $K_f = R_f + \beta (K_m - R_f)$

$$6\% + 1.10 (11\% - 6\%)$$

$$= 6\% + 1.10 (5\%)$$

$$= 6\% + 5.5\% = 11.5\%$$

iii. $K_o = \frac{D_1}{K_i - g} = \frac{\$1.80}{.115 - .055} = \frac{\$1.80}{.06} = \$30$

iv. P/E ratio = Price/EPS = \$30 / \$2.40 = 12.5 times

v. \$30 Stock price
 6 20% Liquidity discount
 \$24 Adjusted stock price
Adjusted **P/E** ratio = Adjusted stock price / EPS
 = \$24 / \$2.40 = 10 times

$$6. \quad \begin{array}{l} \text{New Stock price} = \$30 \times 1.40 = \$42 \\ \text{New P/ E ratio} = \$42 / \$2.40 = 17.5 \text{ times} \end{array}$$

7. The liquidity discount would approach zero as the company begins to enter the public market. This, of course, assumes the shares can be successfully sold.

Solution of the Question No. 5

(a)

Various reasons include:

- (1) Anticipated gains may be smaller than thought;
- (2) Bidding firms are typically much larger , so any gains are spread thinly across shares;
- (3) Management may not be acting in the shareholders' best interest with many acquisitions;
- (4) Competition in the market for takeovers may force prices for target firms up to the zero NPV level; and
- (5) Market participants may have already discounted the gains from the merger before it is announced.

(b)

i.	Cost of tour (EUR)	\$ 2,750
	Current exchange rate	1.3411
	Cost of tour in dollars	3,688
	Round trip airfare	1,490
	Incidental travel expenses	300
	Cost of meals in Italy (EUR)	500
	Cost of meals in Italy (\$)	671
	Miscellaneous expenditures	<u>1,000</u>
	Total cost of trip in dollars	<u>\$ 7.149</u>

ii.	Amount of euros needed in Italy	
	Cost of means in Italy (EUR)	500
	Miscellaneous expenditures	\$ 1,000
	Current exchange rate	0.7456
		746
	Miscellaneous expenditures (EUR)	1,246
	Amount of euros needed in Italy	

- (c) i. Stock transaction:
 $\$70/\text{share} - \$62/\text{share} = \$8/\text{share profit}$
 $\$8/\text{share} \times 100 \text{ shares} = \800

ii.	Option transaction:	
	(\$70/share x 100 shares) =	\$7,000
	(\$60/share x 100 shares)	-6,000
	<u> - \$600 cost of option</u>	- <u>600</u>
	Profit =	\$ 400

iii. \$600 + 100 shares = \$6/share

The stock price must rise to \$68/share to break even.

iv. If Carol actually purchases the stock, she will need to invest \$6,200 (\$62/share x 100 shares) and can potentially lose this full amount. In comparison to the option purchase, Carol only risks the purchase price of the option, \$600. If the price of the stock falls below \$56/share, the option purchase is favored. (Below \$56/share, the loss in stock value of \$600 [(\$62 - \$56) x 100 shares], would exceed the cost of the option.) Due to less risk exposure with the option purchase, the profitability is correspondingly lower. It would take a stock price decline to \$0 for a 100% loss on the stock, but a stock price decline only to the striking price for a 100% loss on the call option.

(d)

- i. False. Although the reasoning seems correct, in general, the new firms do not have monopoly power. This is especially true since many countries have laws limiting mergers when it would create a monopoly.
- ii. True. When managers act in their own interest, acquisitions are an important control device for shareholders. It appears that some acquisitions and takeovers are the consequence of underlying conflicts between managers and shareholders.
- iii. False. Even if markets are efficient, the presence of synergy will make the value of the combined firm different from the sum of the values of the separate firms. Incremental cash flows provide the positive NPV of the transaction.
- iv. False. In an efficient market, traders will value takeovers based on "fundamental factors" regardless of the time horizon. Recall that the evidence as a whole suggests efficiency in the markets. Mergers should be no different.
- v. False. The tax effect of an acquisition depends on whether the merger is taxable or non-taxable. In a taxable merger, there are two opposing factors to consider, the capital gains effect and the write-up effect. The net effect is the sum of these two effects.
- vi. True. Because of the coinsurance effect, wealth might be transferred from the stockholders to the bondholders. Acquisition analysis usually disregards this effect and considers only the total value.

= THE END =