CMA JUNE2019 EXAMINATION

STRATEGIC LEVEL

SUBJECT: F3. FINANCIAL STRATEGY

Model Solution

Solution to the question No. 1

(b) (i) The rates of return are ($90/$80) - 1 = 0.125 and ($110/$80) - 1 = 0.375. The expected rate of return is
E(R) = ½ * (12.5%) + 1/2 * (37.5%) = 25%
and because this expected return exceeds the riskless interest rate, we know that this investor is a risk averter.
(ii) The risk premium is equal to the expected return less the riskless rate or 25% - 15% = 10%.

(c) The statement is false. The investment process is dynamic and never-ending. Investor characteristics change as time passes. For example, older investors tend to be more risk-averse than younger investors. Even if one can identify an optimal portfolio at a given point in time, the portfolio's characteristics may change over time. Suppose an investor determines that his or her optimal asset allocation is 30% cash, 50% bonds, and 20% stocks. If stocks subsequently perform very well, their values will increase, causing stocks to represent more than 20% of the investor's wealth. As investor characteristics, economic factors, and market factors change, it will be necessary for investors to adjust their investment strategies. The processes of strategy development, implementation, and monitoring go on continuously.

(d) The share of capital expenditure following present debt-equity ratio = 40% of $5.0 million
= $2.0 million
Therefore, payout ratio = (Net Income – Equity Contribution to Capital Expenditure)/Net Income
= ($3.0 million - $2.0 million)/$3.0 million
= 0.3333

(e) This statement is not true for any bond with annual coupons larger than zero (C>0). Suppose we have a bond with one year to maturity, with a par value of $1000 and an annual coupon of C=$100. If y=0, then by Equation (), we have

$$P = \frac{\$100}{1.0} + \frac{\$1000}{1.0} = \$1{,}100$$

which is greater than Par = $1000. This statement is true only if the annual coupon is zero because then the sum of the future coupons is zero, and the price will equal the par value (because there is no discounting).

(f) CR = CA/CL; CA=2.5 x Tk.800 million = Tk.2,000 million;
QR = (CA – Inventory)/CL; Inventory = Tk.2.000 – (2 x Tk.800) = Tk.400 million

(g) This statement is not true. If the yield curve is flat, all the forward rates are equal to the spot rate. If the spot rate is 8% and the yield curve is flat. The expected rate for next year will also be 8%. By the formula for the relationship between forward rates and spot rates we see

$$(1.08)^2 = (1.08)(1+f_n)$$

$$(1.08) = (1+f_n)$$

$$f_n = 0.08 \text{ or } 8\%$$

(h) Kp = div/P_0 = Tk.0.6/Tk.6.5 = 9.2%

Solution to the question No. 2

(a) **(i)** Noodles' model predicts that $E(R) = 3Z$. The expected return for Stock A is simply 3(8%) = 24%. Calculations for the rest of the stocks follow the same pattern.

The CAPM predicts that $E(R) = r + \beta[E(R_M - r]$. The expected return for Stock A is 4% + 2(20% – 4%) = 36%. Calculations for the rest of the stocks follow the same pattern. The following table contains expected returns for each stock as predicted by each model.

	Expected Return	
Stock	**Noodles' Model**	**CAPM**
A	24%	36.0%
B	72	32.0
C	21	23.2
D	12	12
E	9	8

(ii) An abnormal return is equal to actual return minus expected return. Whether or not a stock earned an abnormal return depends on the expected return, which depends on the pricing model used.

The following table compares actual returns with expected returns and indicates whether abnormal return is positive, negative, or zero.

	Expected Return			Abnormal Return	
Stock	**Noodles' Model**	**CAPM**	**Actual Return**	**Noodles' Model**	**CAPM**
A	24%	36.0%	32.0%	Positive	Negative
B	72	32.0	32.0	Negative	Zero
C	21	23.2	24.0	Positive	Positive
D	12	12	12.0	Zero	Zero
E	9	8	8.5	Negative	Positive

(b) WACC = (.55/1.55)(.055) + (1/1.55)(.13) = .1034 or 10.34%
Project discount rate = 10.34% + 2% = 12.34%
PV of future cash flows = 3,500,000/(.1234-.04) = 41,972,921
The project should only be undertaken if its cost is less than Tk. 41,972,921 since costs less than this amount will result in a positive NPV.

(c) According to MM proposition I with taxes, the increase in the value of the company will be the present value of the interest tax shield. Since the loan will be repaid in equal installments, we need to find the loan interest and the interest tax shield each year. The loan schedule will be:

Year	Loan balance	Interest	Tax shield
0	1,800,000		
1	900,000	144,000	50,400
2	0	72,000	25,200

So, the increase in the value of the company is:
Value increase = 50,400/1.08 + 25,200/$(1.08)^2$= Tk. 68,271.60

(d) We will calculate cash flows from the depreciation tax shield first. The depreciation tax shield is:
Depreciation tax shield = (540,000/5)(0.35) = Tk. 37,800
The after tax cost of the lease payments will be:
After tax lease payment = 145,000(1-0.35) =Tk. 94,250
So, the total cash flows from leasing are:
OCF = 37,800 + 94,250 = Tk. 132,050
The after tax cost of debt is:
Debt cost = .09(1-0.35) = .0585
Using all of this information, we can calculate the Net Advantage of Leasing (NAL) as:
NAL = Tk. 540,000 – Tk. 132,050 ($PVIFA_{5.85\%,5}$) = (Tk. 18,519.82)

The NAL is negative, so the company should not lease.

(e) Confidence Company: Alternative Balance Sheets and Income Statement

	Restricted (40%)	Moderate (50%)	Relaxed (60%)
Current assets (% of sales)	1,200,000	1,500,000	1,800,000
Fixed assets	600,000	600,000	600,000
Total assets	1,800,000	2,100,000	2,400,000
Debt	900,000	1,050,000	1,200,000
Equity	900,000	1,050,000	1,200,000
Sales	3,000,000	3,000,000	3,000,000
EBIT (15% on sales)	450,000	450,000	450,000
Interest (10% on debt)	90,000	105,000	120,000
EBT	360,000	345,000	330,000
Taxes (40%)	144,000	138,000	132,000
Net income	216,000	207,000	198,000
ROE	24.0%	19.7%	16.5%

Solution to the question No. 3

(i) Under MM I, the total value of With and Without must be the same.

Value (Without) = 1,000,000 × $24 = $24 million
Value (levered equity) = value (With) - debt = $24 M - $12M = $12 M
Price per share = $\frac{\$12M}{2M}$ = $6.00

(ii) Under MM I, the total value of With and Without must be the same.

Value (Without) = 1,000,000 × $24 = $24 million
Value (levered equity) = value (With) - debt = $24 M - $12M = $12 M

So, the leverage ratio of with is 50% equity to 50% debt. To duplicate this in homemade leverage we need to have equal proportions in our portfolio, this means we need 50% equity and 50% from a margin loan. So $5000 is our equity, and we need to match it with $5000 in a margin loan.

(iii) Under MM I, the total value of With and Without must be the same.

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So, the leverage ratio of with is 50% equity to 50% debt. To duplicate this in homemade leverage we need to have equal proportions in our portfolio, this means we need 50% equity and 50% from a margin loan. So $5000 is our equity we need to match it with $5000 in a margin loan. So the total invested is $10,000/$6 per share = 1667 shares

(iv) Under MM I, the total value of With and Without must be the same.

Value (Without) = 1,000,000 × $24 = $24 million
Value (levered equity) = value (With) - debt = $24 M - $12M = $12 M

So, the leverage ratio of with is 50% equity to 50% debt. To duplicate this in homemade

leverage we need to have equal proportions in our portfolio, this means we need 50% equity and 50% fin the risk free asset. So $5000 is our total portfolio we need $2500 in equity (With stock) and $2500 in the risk free asset.

(v) Under MM I, the total value of With and Without must be the same.

Value (Without) = 1,000,000 × $24 = $24 million
Value (levered equity) = value (With) - debt = $24 M - $12M = $12 M
Price per share = $\frac{\$12\text{M}}{2\text{M}}$ = $6.00

So the leverage ratio of with is 50% equity to 50% debt. To duplicate this in homemade leverage we need to have equal proportions in out portfolio, this means we need 50% equity and 50% fin the risk free asset. So $5000 is our total portfolio we need $2500 in equity (With stock) and $2500 in the risk free asset.

$\frac{\$2500}{\$6 \text{ per share}}$ = 417 shares

Solution to the question No. 4

1. Expected value of the net present value (standard)

Outcome		*Probability*		*Expected Value*
$1,050	x	.40	=	420
630		.40		252
(200)		.20		(40)
				632

Expected value = $632,000

2. Expected value of the net present value (expanded)

Outcome		*Probability*		*Expected Value*
$2,812	x	.40	=	1,124.8
740		.40		296
(900)		.20		(180)
				1,240.8

Expected value = $1,240,800

3. The expanded size restaurant alternative clearly has the higher net present value. ($1,240,800 vs. $632,000).

4. Standard deviation $= \sqrt{\Sigma(D-\overline{D})^2 P}$

$D =$ Outcome

$\overline{D} =$ Expected value

$P =$ Probability

D	−	$\overline{D}$	=	$(D-\overline{D})$	$(D-\overline{D})^2$	x	P	=	$(D-\overline{D})^2 P$
1,050		632		418	174,724		.40		69,889.6
630		632		–2	4		.40		1.6
–200		632		–832	692,224		.20		138,444.8
									208,336.0

$\sqrt{208{,}336.0} = 456.4$

σ = $456,400 vs. $1,415,800 expanded

5. Coefficient of variation $(V) = \dfrac{\text{Standard deviation}}{\text{Expected value}}$

	Standard size restaurant	**Expanded restaurant**
$\dfrac{\text{Standard deviation}}{\text{Expected value}}$	$\dfrac{\$456{,}400}{632{,}000} = .722$	$\dfrac{\$1{,}415{,}800}{\$1{,}240{,}800} = 1.141$

6. Based on the coefficient of variation, the standard size restaurant is much less risky (.722 versus 1.141).
   Earlier in question three, the preference was clearly for expanded size restaurants. The general principle is that you may not wish to always go with the highest return. Risk must be considered as well.

7. Coefficient of variation

4 standard, 1 expanded	$ 641,630 / 753,760	=	.851
3 standard, 2 expanded	832,460 / 875,420	=	.951
2 standard, 3 expanded	1,025,800 / 997,280	=	1.028
1 standard, 4 expanded	1,220,400 / 1,119,040	=	1.091

   Based on the answer to question five as well as this question, the lowest-risk alternative is still the five standard restaurants with a coefficient of variation of .722.

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