Tutorial letter 201/1/2015

MAC3702

APPLICATION OF FINANCIAL MANAGEMENT TECHNIQUES

Semesters 1

Department of Management Accounting

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SOLUTION TO COMPULSORY ASSIGNMENT 01/2015 FOR THE FIRST SEMESTER ASSESSMENT PLAN

QUESTION	CORRECT OPTION	SOLUTION
1	1	58,76%
2	3	27,56%
3	5	31,20%
4	1	4,29:1
5	3	1,10:1
6	3	14,7%
7	2	R0,45
8	2	Labour unrest, power outages, foreign exchange risk due to export of coal and reliance on large customer
9	1	15,60%
10	1	NPV is positive; therefore, invest
11	4	Debt = R1 200 000 and equity = R1 300 000
12	5	R522 000
13	2	R753 000
14	1	Debt finance, as NPV of debt is lower than the NPV of the lease finance
15	1	Cost of capital = 22,10% Market value = R250 000 000
16	2	Cost of capital = 12,00% Market value = R37 500 000
17	3	Cost of capital = 7,02% Market value = R72 300 000
18	4	Cost of capital = 8,00% Market value = R46 700 000
19	5	16,92%
20	3	R796 000

QUESTION 1

Calculate the return on equity ratio:

ROE $=$ $\dfrac{\text{Net profit after tax}}{\text{Total shareholder funds}}$

$=$ $\dfrac{\text{R1 475 000}}{\text{R2 510 000}}$

$=$ 58,76%

Therefore, option (1) is correct.

QUESTION 2

Calculate the return on asset ratio:

ROA $=$ $\dfrac{\text{EBIAT}}{\text{Total assets}}$

$=$ $\dfrac{\text{R1 475 000} + (\text{R85 000 x 0,72})}{\text{R5 575 000}}$

$=$ $\dfrac{\text{R1 536 200}}{\text{R5 575 000}}$

$=$ 27,56%

Therefore, option (3) is correct.

QUESTION 3

Calculate the financial leverage:

Financial leverage $=$ ROE – ROA

$=$ 58,76% – 27,56%

$=$ 31,20%

Therefore, option (5) is correct.

QUESTION 4

Calculate the current ratio:

Current ratio $\quad=\quad \dfrac{\text{Current assets}}{\text{Current liabilities}}$

$\qquad\qquad\quad=\quad \dfrac{\text{R1 695 000}}{\text{R395 000}}$

$\qquad\qquad\quad=\quad$ 4,29:1

Therefore, option (1) is correct.

QUESTION 5

Calculate the ACID test ratios:

ACID test ratios $\quad=\quad \dfrac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$

$\qquad\qquad\qquad=\quad \dfrac{\text{R1 695 000} - \text{R1 260 000}}{\text{R395 000}}$

$\qquad\qquad\qquad=\quad \dfrac{\text{R435 000}}{\text{R395 000}}$

$\qquad\qquad\qquad=\quad$ 1,10:1

Therefore, option (3) is correct.

QUESTION 6

Calculate the cost of equity using the CAPM formula:

$k_e \quad = \quad R_f + \beta_i(R_m - R_f)$

$\qquad = \quad 7,5\% + 1,2(6\%)$

$\qquad = \quad 7,5\% + 7,2\%$

$\qquad = \quad 14,7\%$

Therefore, option (3) is correct.

QUESTION 7

Calculate the value of the right per share:

N = 3

Theoretical ex-rights price = $\frac{1}{N+1}$ x ((N x Cum rights price) + Issue price)

$\qquad\qquad\qquad\qquad\qquad$ = (1/(3 + 1)) x ((3 x R12) + R11,40)

$\qquad\qquad\qquad\qquad\qquad$ = R11,85

Value of the right $\qquad$ = R11,85 – R11,40

$\qquad\qquad\qquad\qquad\qquad$ = R0,45 per new share

Therefore, option (2) is correct.

QUESTION 8

Evaluate the statements:

Financial risk is risk that relates to the borrowing of long- and short-term debt.

(1) The company uses a mix of debt and equity finance to finance new projects.

(4) Interest on long-term loans and low production volumes.

Business risks include risks that are directly associated with the type of business, the operating leverage, state of the physical assets, competition, etc.

(2) Labour unrest, power outages, foreign exchange risk due to export of coal, and reliance on large customer.

Therefore, option (2) is correct.

QUESTION 9

Weighted average cost of capital (WACC):

k_e =   18%

k_d =   (16,67% x 0,72)

           =   12%

WACC   =   (18% x 0,60) + (12% x 0,40)

           =   10,80% + 4,80%

           =   15,60%

Therefore, option (1) is correct.

QUESTION 10

Calculate the NPV of the new machinery by using the WACC and determine if the company should invest in new machinery:

YEAR	0	1	2	3
Investment	−2 500 000			
Sale at end of useful life				1 000 000
Cash inflows		1 250 000	1 300 000	1 350 000
Service and maintenance cost		−150,000	−175 000	−200 000
Taxation (refer to separate calculation below) ①		−28 000	−105 000	−392 000
Net cash inflow/outflow	**−2 500 000**	**1 072 000**	**1 020 000**	**1 758 000**
Fair rate of return @ 15,60% ☐ ②	1,000	0,865	0,748	0,647
Fair value per periods	**−2 500 000**	**927 280**	**762 960**	**1 137 426**
NPV for new machinery	**327 666**			

QUESTION 10 (continued)

① **Taxation on cash flow**

YEAR	0	1	2	3
Net cash inflows		1 100 000	1 125 000	1 150 000
Wear and tear		−1 000 000	−750 000	−750 000
Tax recoupment on sale				1 000 000
Taxable income	-	**100 000**	**375 000**	**1 400 000**
Taxation at 28%	-	**28 000**	**105 000**	**392 000**

② **PV factor formula**

PV factor		Year 1		Year 2		Year 3
	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$
	=	$\dfrac{1}{(1+0,156)^1}$	=	$\dfrac{1}{(1+0,156)^2}$	=	$\dfrac{1}{(1+0,156)^3}$
	=	0,865	=	0,748	=	0,647

INPUT in calculator	
CF_0	−R2 500 000
CF_1	R1 072 000
CF_2	R1 020 000
CF_3	R1 758 000
I/YR	15,60
COMP NPV (HP10bII)	R328 624.87

The net present value is positive and therefore, the company should invest in the new machinery.

Therefore, option (1) is correct.

QUESTION 11

Current value of the company: R5 000 000 + R8 000 000 =   R13 000 000

New investment   =   R2 500 000.

Company capitalisation after investment   =   R15 500 000.

	Debt	Equity	Total
Existing capitalisation	R5 000 000	R8 000 000	R13 000 000
New capitalisation	①R6 200 000	②R9 300 000	R15 500 000
Finance of new investment	**R1 200 000**	**R1 300 000**	**R2 500 000**

① (R15 500 000 x 40%) =   R6 200 000
② (R15 500 000 x 60%) =   R9 300 000

The company should consider financing the new project using equity finance or a mix that moves towards the desired D:E ratio.

Therefore, option (4) is correct.

QUESTION 12

Calculate the NPV of the debt finance:

YEAR	0	1	2	3
Investment	−2 500 000			
Sale at end of useful life				1 000 000
Cash inflows		1 250 000	1 300 000	1 350 000
Service and maintenance cost		−150,000	−175 000	−200 000
Taxation (refer to separate calculation below) ①		−28 000	−105 000	−392 000
Net cash inflow/outflow	−2 500 000	1 072 000	1 020 000	1 758 000
Fair rate of return @ 12,00% ⌷②	1,000	0,893	0,797	0,712
Fair value per periods	−2 500 000	957 296	812 940	1 251 696
NPV for new machinery	**521 932**			

QUESTION 12 (continued)

① **Taxation on cash flow**

YEAR	0	1	2	3
Net cash inflows		1 100 000	1 125 000	1 150 000
Wear and tear		−1 000 000	−750 000	−750 000
Tax recoupment on sale				1 000 000
Taxable income	-	**100 000**	**375 000**	**1 400 000**
Taxation at 28%	-	**28 000**	**105 000**	**392 000**

② **PV factor formula**

PV factor		Year 1		Year 2		Year 3
	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$
	=	$\dfrac{1}{(1+0,12)^1}$	=	$\dfrac{1}{(1+0,12)^2}$	=	$\dfrac{1}{(1+0,12)^3}$
	=	0,893	=	0,797	=	0,712

INPUT in calculator	
CF_0	**−R2 500 000**
CF_1	**R1 020 000**
CF_2	**R1 072 000**
CF_3	**R1 758 000**
I/YR	12
COMP NPV (HP10bll)	**R521 590,29**

The net present value of the debt finance is R522 000.

Therefore, option (5) is correct.

QUESTION 13

Calculate the NPV of the lease finance:

YEAR	0	1	2	3
Sale at end of useful life				1 000 000
Lease payments		−1 150 000	−1 150 000	−1 175 000
Cash inflows		1 250 000	1 300 000	1 350 000
Taxation (refer to separate calculation below) ①		−28 000	−42 000	−329 000
Net cash inflow/outflow	-	72 000	108 000	846 000
Fair rate of return @ 12,00% ②		0,893	0,797	0,712
Fair value per periods	-	64 296	86 076	602 352
NPV for new machinery	752 724			

① Taxation on cash flow

YEAR	0	1	2	3
Net cash inflows		100 000	150 000	175 000
Tax recoupment on sale	-			1 000 000
Taxable income	-	100 000	150 000	1 175 000
Taxation at 28%	-	28 000	42 000	329 000

② PV factor formula

PV factor		Year 1		Year 2		Year 3
	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$	=	$\dfrac{1}{(1+i)^n}$
	=	$\dfrac{1}{(1+0,12)^1}$	=	$\dfrac{1}{(1+0,12)^2}$	=	$\dfrac{1}{(1+0,12)^3}$
	=	0,893	=	0,797	=	0,712

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QUESTION 13 (continued)

INPUT in calculator	
CF_0	R0
CF_1	R72 000
CF_2	R108 000
CF_3	R846 000
I/YR	12,00
COMP NPV	R752 548

The net present value of the lease finance is R753 000

Therefore, option (2) is correct.

QUESTION 14

Determine the finance option to use:

NPV of debt finance   =   R522 000

NPV of lease finance   =   R753 000

The NPV of the debt finance is lower than the NPV of the lease finance; therefore the debt finance is cheaper than the lease finance.

Therefore, option (1) is correct.

QUESTION 15

Calculate the market value and cost of capital of the ordinary shares:

Market value of the shares:

MV   =   Number of shares x Current share price

         =   2 000 000 x R125

         =   R250 000 000

Cost of capital:

Calculate the growth of dividends:

$$g \quad = \quad \frac{D_0}{D_{-1}} - 1$$

$$= \quad \frac{R13,75}{R12,50} - 1$$

$$= \quad 1,10 - 1$$

$$= \quad 10\%$$

2015 dividends (D_1) =   R13,75 x 1,10

                           =   R15,125

$$K_0 \quad = \quad \frac{D_1}{P_0} + g$$

$$= \quad \frac{R15,125}{R125} + 0,10$$

$$= \quad 0,121 + 0,10$$

$$= \quad 0,221$$

$$= \quad 22,10\%$$

QUESTION 15 (continued)

Market value   =   R250 000 000

Cost of capital   =   22,10%

Therefore, option (1) is correct.

QUESTION 16

Calculate the market value and cost of capital of preference shares:

Market value of preference shares   =   500 000 x R75

                                                 =   R37 500 000

Dividend = Total preference shares capital / Number of preference shares x Dividend %

            = R25 000 000 / 500 000 x 18%

            = R9,00

Preference yield   = $\dfrac{D}{MV}$

                       = $\dfrac{R9,00}{R75}$

                       =   12%

Market value   =   R37 500 000

Cost of capital   =   12,00%

Therefore, option (2) is correct.

QUESTION 17

Calculate the market value and cost of capital of a long-term loan:

Long-term loan

After-tax cost of debt   =   9,75% x 0,72

                                =   7,02%

Interest after tax on long-term loan   =   R80 000 000 x 7,50% x 0,72%

                                                 =   R4 320 000

PV of the interest expense for 8 years at an after-tax cost of debt of 7,02%

PV of interest   =   R4 320 000 x 5,969

                =   R25 786 080

PV of future capital portion at maturity date at an after-tax cost of debt of 7,02%

PV of capital portion   =   R80 000 000 x 0,581

                          =   R46 480 000

Total PV of the long-term loan   =   R25 786 080 + R46 480 000

                                     =   R72 266 080

QUESTION 17 (continued)

Annuity factor $= \dfrac{1 - \frac{1}{(1+i)^n}}{i}$

$= \dfrac{1 - \frac{1}{(1+0,0702)^8}}{0,0702}$

$= 5{,}969$

PV factor – Capital portion $= \dfrac{1}{(1+i)^n}$

$= \dfrac{1}{(1+0,0702)^8}$

$= 0{,}581$

INPUT in calculator	
N	8
I/YR	7,02
PMT	R4 320 000
FV	R80 000 000
COMP PV (HP10bII)	R72 267 191,55

Market value = R72 300 000

Cost of capital = 7,02%

Therefore, option (3) is correct.

QUESTION 18

Calculate the market value and cost of capital of debentures:

Debentures

| After-tax cost of debt | = | 11,11% x 0,72 |
| | = | 8% |

| Interest after tax on debentures | = | R50 000 000 x 10% x 0,72% |
| | = | R3 600 000 |

PV of the interest income for 5 years at an after-tax cost of debt of 8%

| PV of interest | = | R3 600 000 x 3,99 ① |
| | = | R14 364 000 |

PV of future capital portion at maturity date at an after-tax cost of debt of 8%

| Capital portion at the maturity | = | R50 000 000 x 0,95 |
| | = | R47 500 000 |

| PV of capital portion | = | R47 500 000 x 0,68 ② |
| | = | R32 300 000 |

| Total PV of the debentures | = | R14 364 000 + R32 300 000 |
| | = | R46 664 000 |

①	Annuity factor	=	$\dfrac{1 - \dfrac{1}{(1+i)^n}}{i}$
		=	$\dfrac{1 - \dfrac{1}{(1+0,08)^5}}{0,08}$
		=	3,99

QUESTION 18 (continued)

② PV factor – Capital portion $= \dfrac{1}{(1+i)^n}$

$= \dfrac{1}{(1+0{,}08)^5}$

$= 0{,}68$

INPUT in calculator	
N	5
I/YR	8
PMT	R3 600 000
FV	R47 500 000
COMP PV (HP10bII)	R46 701 457,99

Cost of capital $=$ 8%

Market value $=$ R46 700 000

Therefore, option (4) is correct.

QUESTION 19

Calculate the WACC:

Capital structure	Market value of instruments	Portion of capital structure	Cost of capital	Weighted cost of capital
Ordinary shares	R250 000 000	0,62	22,10%	13,70%
Preference shares	R37 500 000	0,09	12,00%	1,08%
Long-term loan	R72 300 000	0,18	7,02%	1,26%
Debentures	R46 700 000	0,11	8,00%	0,88%
Total	**R406 500 000**	**1 / 100%**		**16,92%**

Therefore, option (5) is correct.

QUESTION 20

Calculate the value of a minority share of 10%

Description	Calculation	2014 Rand	2015 Rand	2016 Rand	2017 Rand
Dividends	R250 000 x 1,05		262 500		
	R262 500 x 1,10			288 750	
	R288 750 x 1,15				332 063
Annuity	①				12 729 067
Total			**262 500**	**288 750**	**13 061 130**
Fair rate of return @ 18%			0,847	0,718	0,609
Fair value per period			**222 338**	**207 323**	**7 954 228**
NPV					**8 383 889**

Note

①	2018 dividends	=	R332 063 x 1,15
		=	R381 872

Calculate the share price at the beginning of 2017 using the Gordon dividend growth model:

P_0 = D_1 / (r – g)

= 381 872 / (0,18 – 0,15)

= R12 729 067

QUESTION 20 (continued)

② **PV factor formula:**

PV factor		Year 1		Year 2		Year 3
	=	$\frac{1}{(1+i)^n}$	=	$\frac{1}{(1+i)^n}$	=	$\frac{1}{(1+i)^n}$
	=	$\frac{1}{(1+0,18)^1}$	=	$\frac{1}{(1+0,18)^2}$	=	$\frac{1}{(1+0,18)^3}$
	=	0,847	=	0,718	=	0,609

INPUT in calculator	
CF_0	**R0**
CF_1	**R262 500**
CF_2	**R288 750**
CF_3	**R13 061 130**
I/YR	**18,00**
COMP NPV (HP10bII)	**R8 379 240,33**

100% shareholding	=	R8 383 889	=	R8 379 240

5% minority discount	=	R8 383 889 x 95%	=	R8 379 240 x 0,95
	=	R7 964 695	=	R7 960 278

10% minority holding	=	R796 470 (rounded)	=	R796 028

Rounded to nearest R1 000   =   R796 000

Therefore, option (3) is correct.