Simphiwe & Sons Ltd

1   Current capital structure:

- The company has a target D : E ratio of 40% : 60%
- The current market value of debt is R4 million
- The current market value of equity is R9 million
- Cost of equity amounts to 18%
- Cost of pre-tax debt amounts to 16,67771%
- The company tax rate amounts to 28%

2   New investment:

The directors are considering a capital investment in new machinery.

- The cost price equals R2 500 000
- Cash inflow from the new machinery excluding wear and tear-, service- and maintenance cost are as follows:
  - Year 1:   R1 250 000
  - Year 2:   R1 300 000
  - Year 3:   R1 350 000

- Estimated service and maintenance cost:
  - Year 1:   R150 000
  - Year 2:   R175 000
  - Year 3:   R200 000

- Wear and tear allowance:
  - Year 1:   40%
  - Year 2 & Year 3:   30%

- Sale of machinery at the end of Year 3 at a price of: R1 000 000

- **Finance options of new machinery:**

  o Lease finance

  The directors can finance the machinery via a finance lease at an annual cost of R1 150 000 for the first two years and R1 175 000 for the third year. This lease includes all services and maintenance cost. At the end of the three year period ownership of the machinery will transfer to Simphiwe & Sons Ltd. At the end of the three years the company will purchase the machine at a minimal amount.

  o Borrow option (loan):

  The directors can also arrange a medium term loan of 3 equal annual installments at a rate equal to the cost of debt.

- Assume that all tax flows take place at the end of each year.

Required:

(i)   Calculate WACC for the company.

(ii) Determine if the directors should invest in the new machinery.

(iii) **Calculate** how much of the **new machinery** should be **financed** through the introduction of **new debt and new equity** to bring the D : E ratio in line with the targeted D : E ratio.

(iv) Assume that 100% of the new investment will be financed through debt. Based on NPC if the new machinery should be financed through the medium loan or through the finance lease agreement.

Solution

(i)   Calculate target WACC:

k_e =   18%

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

            =   12%

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

              =   10,80% + 4,80%

              =   15,60%

(ii)   Determine if the directors should invest in the new machinery.

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**			

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.

(iii) **Calculate** how much of the **new machinery** should be **financed** through the introduction of **new debt and new equity** to bring the D : E ratio in line with the targeted D : E ratio.

Current value of the company:	R4 000 000 + R9 000 000	=	R13 000 000
New investment		=	R2 500 000.
Company capitalisation after investment		=	R15 500 000.

	Debt	Equity	Total
Existing capitalisation	R4 000 000	R9 000 000	R13 000 000
New capitalisation	①R6 200 000	②R9 300 000	R15 500 000
Finance of new investment	**R2 200 000**	**R300 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.

OR

As 88% of the project should be financed through debt according to the calculation one can also conclude that debt is the more appropriate form of finance for the new machinery.

(iv) **Assume that 100% of the new investment will be financed through debt. Determine by making use of calculations if the new machinery should be financed through the medium term loan or through the finance lease agreement.**

Finance lease option - NPV

Calculate the NPV of the lease finance:

YEAR	0	1	2	3
Lease payments		−1 150 000	−1 150 000	−1 175 000
Maintenance cost included in lease payment but included in NPV of investment (note 1)		**150 000**	**175 000**	**200 000**
Taxation (refer to separate calculation below) ①		–	63 000	63 000
Net cash inflow/outflow	-	-1 000 000	-912 000	-912 000
Fair rate of return @ 12,00% ②		0,893	0,797	0,712
Fair value per periods	-	-893 000	-726 864	-649 344
NPC for new machinery	**-2 269 208**			

① **Taxation on cash flow**

YEAR	0	1	2	3
Lease payments		−1 150 000	−1 150 000	−1 175 000
Maintenance cost included in lease payment but included in NPV of investment (note 1)		150 000	175 000	200 000
Wear and tear forfeited **(Option 2 as per slides)**	-	1 000 000	750 000	750 000
Taxable income	**-**	**0**	**-225 000**	**-225 000**
Taxation at 28%	**-**	**0**	**-63 000**	**-63 000**

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$_0$	**R0**
CF$_1$	**-R1 000 000**
CF$_2$	**-R912 000**
CF$_3$	**-R912 000**
I/YR	**12,00**
COMP NPV	**R2 269 041,55**

The net present cost of the lease finance is R2 269 042

Note 1

Remember that this was included in your investment decision and is therefore treated similarly to the wear and tear opportunity cost of the asset purchased.

Borrowing (loan)

Calculating annual installments:

INPUT in calculator	
PV	**-R2 500 000**
N	**3**
I/YR	**16,67**
FV	**0**
COMP PMT	**R1 125 389**

Amortisation table

Opening capital balance	Installment	Interest portion of installment (16.67% on o/b)	Capital portion of installment	Closing capital balance
R2 500 000	R1 125 389	R416 750	R708 639	R1 791 361
R1 791 361	R1 125 389	R298 620	R826 769	R964 592
R964 592	R1 125 389	R160 797	R964 592	R0

Calculate the NPV of the medium term loan:

YEAR	0	1	2	3
Annual installments		−1 125 389	−1 125 389	−1 125 389
Taxation (refer to separate calculation below) ①		116 690	83 440	45 023
Net cash inflow/outflow		-1 008 699	-1 041 949	-1 080 366
Fair rate of return @ 12,00% ②		0,893	0,797	0,712
Fair value per periods		-900 768	-830 433	-769 221
NPV for new machinery	2 500 422			

① **Taxation on cash flow**

YEAR	0	1	2	3
Interest on payments	-	-416 750	-298 620	-160 797
Taxable income	**-**	**-416 750**	**-298 000**	**-160 797**
Taxation at 28%	**-**	**-116 690**	**-83 440**	**-45 023**

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	R0
CF_1	-R1 008 699
CF_2	-R1 041 949
CF_3	-R1 080 366
I/YR	12,00
COMP NPV	R2 500 243

The net present value of the lease finance is R2 500 242

Therefore the best finance option is the one with the lowest cost = R2 269 042 (lease finance).