JMC vLearning
"your virtual learning partner"

Weighted Average Cost of Capital (WACC)

Questions

Chartered Accountancy
Strategic Level
Corporate Finance & Risk Management (CFRM)

Samira Anthony
BB. Mgt. (Finance) Sp., ACA, Reading for MBA., CA Prize Winner

JMC ජයසේකර කළමනාකරණ මධ්‍යස්ථානය
JAYASEKERA MANAGEMENT CENTRE (PVT) LTD
Estd. 1972

JMC Jayasekera Management Centre (Pvt) Ltd
Pioneers in Professional Education
65/2A, Chittampalam Gardiner Mawatha, Colombo 02 | T: +94 112 430451 | E: info@jmc.lk | F: +94 115 377917

Question 01.

Nile Inc is considering an investment of capital to be raised from the issue of new ordinary shares and debentures in a mix which will hold its gearing ratio approximately constant. It wishes to estimate its weighted average cost of capital.

The company has an issued share capital of 1 million ordinary shares of $1 each; it has also issued $800,000 of 8% debentures. The market price of ordinary shares is $4.76 per share and debentures are priced at $77 per cent(interest included mkt price). Dividends and interest are payable annually. An ordinary dividend has just been paid; the next instalment of interest is payable in the near future. Debentures are redeemable at par in 15 years' time.

A summary of the most recent statement of financial position runs as follows.

	$'000		$'000	$'000
Ordinary share capital	1,000	Non-current assets		1,276
Reserves	1,553	Current assets	4,166	
Deferred taxation	164	Less current		
Debentures	800	liabilities	1,925	
				2,241
	3,517			***3,517***

Dividends and earnings have been as follows.

	Dividends (excluding tax credit) $'000	*Earnings before tax* $'000	*Earnings after tax* $'000
20X4	200	575	350
20X5	230	723	452
20X6	230	682	410
20X7	260	853	536
20X8	300	906	606

Assume that there have been no changes in the system or rates of taxation during the last five years, that the rate of corporation tax is 35% and that the standard rate of income tax is 30%. Assume that 'now' is 20X8.

Required

(a) Calculate Nile Inc's weighted average cost of capital. (12 marks)

(b) Discuss briefly any difficulties and uncertainties in your estimation. (3 marks)

(Total = 15 marks)

Cost of Equity using dividend growth model

Ke= (do(1+g)/po) +g

(0.3(1+0.1067)/4.76) +0.1067

17.64%

Kd = IRR = 9.12%

Year	NCF $	DCF1 8%	PV1	DCF2 10%	PV2
0	(69)	1	(69)		
1-15 (interest)	8 (1- 0.35) = 5.2	8.559	44.51		
15 (capital)	100	0.315	31.5		
			+ 7.01		-5.51

Computation WACC

Ordinary share capital 4.76mn x 17.64%

(1000000 x $4.76)

Debentures 0.552mn x 9.12%

($88,000/100) x $69

$$\frac{4.76}{(4.76+0.552)} \times 17.64\% + \frac{0.552}{(4.76+0.552)} \times 9.12\% = 16.75\%$$

difficulties and uncertainties in estimation

1. dividend policy may change with the new strategies
2. Corporate tax rate changes
3. whether entity pay interest and capital without defaults
4. Market price fluctuations.

Learning outcome:

if debenture interest payable in near future we need to take interest deducted mkt price

when adjusting tax for the interest income we need to use corporate tax rate

Question 02.

The following figures have been extracted from the most recent accounts of Crystal Inc.

STATEMENT OF FINANCIAL POSITION AS AT 30 JUNE 20X9

	$'000	$'000
Non-current assets		10,115
Investments		821
Current assets	3,658	
Less current liabilities	1,735	
		1,923
		12,859
Ordinary share capital		
Authorised: 4,000,000 shares of $1		
Issued: 3,000,000 shares of $1		3,000
Reserves		6,542
Shareholders' funds		9,542
7% debentures		1,300
Deferred taxation		583
Corporation tax		1,434
		12,859

SUMMARY OF PROFITS AND DIVIDENDS

Year ended 30 June	*20X5*	*20X6*	*20X7*	*20X8*	*20X9*
	$'000	$'000	$'000	$'000	$'000
Profit after interest and before tax	1,737	2,090	1,940	1,866	2,179
Less tax	573	690	640	616	719
Profit after interest and tax	1,164	1,400	1,300	1,250	1,460
Less dividends	620	680	740	740	810
Added to reserves	544	720	560	510	650

The current (1 July 20X9) market value of Crystal Inc's ordinary shares is $3.27 (ex. div price $3/ dividend per share 810,000/3,000,000 = $0.27) per share cum div. An annual dividend of $810,000 is due for payment shortly. The debentures are redeemable at par in 10 years' time. Their current market value is $77.10 per cent (Price after the payment of interest – ex. Int price). Annual interest has just been paid on the debentures. There have been no issues or redemptions of ordinary shares or debentures during the past five years. (dividend growth rate = 7%)

The current rate of corporation tax is 30%, and the current basic rate of income tax is 25%. Assume that there have been no changes in the system or rates of taxation during the last 5 years.

Required

(a) Estimate the cost of capital which Crystal Inc should use as a discount rate when appraising new investment opportunities. (10 marks)

(b) Discuss any difficulties and uncertainties in your estimates. (5 marks) (Total = 15 marks)

Cost of Equity using dividend growth model

Ke= (do(1+g)/po) +g

(0.27(1+0.07)/3) +0. 7

16.63%

Kd = IRR = 8.47%

Year	NCF $	DCF1 7%	PV1	DCF2 10%	PV2
0	(77.10)	1	(77.1)		
1-10 (interest)	7 (1- 0.30) = 4.9	7.024			
10 (capital)	100	0.508			

Computation WACC

Ordinary share capital 4.76mn x 17.64%

(1000000 x $4.76)

Debentures 0.552mn x 9.12%

($88,000/100) x $69

$$\frac{4.76}{(4.76+0.552)} \times 17.64\% + \frac{0.552}{(4.76+0.552)} \times 9.12\% = 16.75\%$$

difficulties and uncertainties in estimation

1. dividend policy may change with the new strategies
2. Corporate tax rate changes
3. whether entity pay interest and capital without defaults
4. Market price fluctuations.

Learning outcome:

if debenture interest payable in near future we need to take interest deducted mkt price

when adjusting tax for the interest income we need to use corporate tax rate

Question 03.

Espondera Inc is a small unquoted company that needs to raise funds in order to invest in a new project. The company wants to issue ten-year bonds and its finance director is trying to work out the cost of debt in order to assess the profitability of the company.

The following information is available for the company.

Total assets	$120 million
Net income	$6 million
Type of proposed debt	Subordinated
Long-term debt	$14 million
Income before interest and taxes	$8 million
Interest payments	$1.0 million

The earnings of the company for the last five years are as follows.

Year	Earnings
20X6	$5m
20X5	$4.2m
20X4	$3.2m
20X3	$3.8m
20X2	$2.2m

The finance director has decided to use the Kaplan-Urwitz model for unquoted companies to assess the cost of debt.

The Kaplan-Urwitz model for unquoted companies is given by

$$Y = 4.41 + 0.001SIZE + 6.40PROFITABILITY - 2.56DEBT - 2.72LEVERAGE + 0.006INTEREST - 0.53COV$$

The classification of companies into credit rating categories is done in the following way.

Score (Y)	*Rating category*
$Y > 6.76$	AAA
$Y > 5.19$	AA
$Y > 3.28$	A
$Y > 1.57$	BBB
$Y > 0$	BB

The following table gives the yield to maturity for ten-year corporate bonds by credit category.

Rating	Cost of debt (Yield to maturity)
AAA	6.8%
AA	7.3%
A	7.8%
BBB	8.4%
BB	9.4%
B	10.5%

Calculate the cost of debt for Espondera Inc. **(10 marks)**

Question 04.

The following information has been taken from the statement of financial position of Corfe Co, a listed company:

	$m	$m
Non-current assets		50
Current assets		
Cash and cash equivalents	4	
Other current assets	16	20
Total assets		70
Equity and reserves		
Ordinary shares	15	
Reserves	29	44
Non-current liabilities		
6% preference shares	6	
8% loan notes	8	
Bank loan	5	19
Current liabilities		7
Total equity and liabilities		70

The ordinary shares of Corfe Co have a nominal value of $1 per share and a current ex-dividend market price of $6·10 per share. A dividend of $0·90 per share has just been paid. The 6% preference shares of Corfe Co have a nominal value of $0·75 per share and an ex-dividend market price of $0·64 per share. The 8% loan notes of Corfe Co have a nominal value of $100 per loan note and a market price of $103·50 per loan note.
Annual interest has just been paid and the loan notes are redeemable in five years' time at a 10% premium to nominal value. The bank loan has a variable interest rate. The risk-free rate of return is 3·5% per year and the equity risk premium is 6·8% per year. Corfe Co has an equity beta of 1·25. Corfe Co pays corporation tax at a rate of 20%. Investment in facilities Corfe Co's board is looking to finance investments in facilities over the next three years, forecast to cost up to $25m. The board does not wish to obtain further long-term debt finance and is also unwilling to make an equity issue. This means that investments have to be financed from cash which can be made available internally. Board members have made a number of suggestions about how this can be

done: Director A has suggested that the company does not have a problem with funding new investments, as it has cash available in the reserves of $29m.

If extra cash is required soon, Corfe Co could reduce its investment in working capital. Director B has suggested selling the building which contains the company's headquarters in the capital city for $20m. This will raise a large one-off sum and also save on ongoing property management costs. Head office support functions would be moved to a number of different locations rented outside the capital city. Director C has commented that although a high dividend has just been paid, dividends could be reduced over the next three years, allowing spare cash for investment.

Required:

(a) Calculate the after-tax weighted average cost of capital of Corfe Co on a market value basis. (11 marks)

(b) Discuss the views expressed by the three directors on how the investment should be financed. (9 marks) (20 marks)

Question 05.

Tin Co is planning an expansion of its business operations which will increase profit before interest and tax by 20%. The company is considering whether to use equity or debt? finance to raise the $2m needed by the business expansion.

If equity finance is used, a 1 for 5 rights issue will be offered to existing shareholders at a 20% discount to the current ex dividend share price of $5·00 per share ($4). The nominal value of the ordinary shares is $1·00 per share. If debt finance is used, Tin Co will issue 20,000 8% loan notes with a nominal value of $100 per loan note.

Financial statement information prior to raising new finance:

	$'000
Profit before interest and tax	1,597
Finance costs (interest)	(315)
Taxation	(282)
Profit after tax	1,000

	$'000
Equity	
Ordinary shares	2,500
Retained earnings	5,488
Long-term liabilities: 7% loan notes	4,500
Total equity and long-term liabilities	12,488

The current price/earnings ratio of Tin Co is 12·5 times (PE = Current Mkt price $5 / Current EPS 0.4). Corporation tax is payable at a rate of 22%. Companies undertaking the same business as Tin Co have an average debt/equity ratio (book value of debt divided by book value of equity) of 60·5% and an average interest cover of 9 times.

Required:

(a) (i) Calculate the theoretical ex rights price per share. (2 marks)

TERP = ((1x$4) +(5x$5))/6 = $4.83

(ii) Assuming equity finance is used, calculate the revised earnings per share after the business expansion. (4 marks)

(iii) Assuming debt finance is used, calculate the revised earnings per share after the business expansion. (3 marks)

(iv) Calculate the revised share prices under both financing methods after the business expansion. (1 mark)

(v) Use calculations to evaluate whether equity finance or debt finance should be used for the planned business expansion. (4 marks)

(b) Discuss TWO Islamic finance sources which Tin Co could consider as alternatives to a rights issue or a loan note issue. (6 marks)

(20 marks)

Financing options	PAT	EPS	Share Price	D/E ratio Industry 60.5%
Current	1000	0.4	5	4500/2500+5488 =56%
Equity	1250	0.42	5.25	4500 / 2500+2000+5488+250 = 51.5%
Debt	1125	0.45	5.63	4500 +2000 / 2500+5488+ 125 = 80.1%

Question 06.

The following statement of financial position information relates to Tufa Co, a company listed on a large stock market which pays corporation tax at a rate of 30%.

	$m	$m
Equity and liabilities		
Share capital	17	
Retained earnings	15	
Total equity		32
Non-current liabilities		
Long-term borrowings	13	
Current liabilities	21	
Total liabilities		34
Total equity and liabilities		66

The share capital of Tufa Co consists of $12m of ordinary shares and $5m of irredeemable preference shares. The ordinary shares of Tufa Co have a nominal value of $0·50 per share, an ex dividend market price of $7·07 per share and a cum dividend market price of $7·52 per share (dividend for the year 2017 = 7.52-7.07 = $ 0.45). The dividend for 20X7 will be paid in the near future.

Dividends paid in recent years have been as follows:

Year	20X6	20X5	20X4	20X3
Dividend ($/share)	0·43	0·41	0·39	0·37

The 5% preference shares of Tufa Co have a nominal value of $0·50 per share and an ex dividend market price of $0·31 per share. The long-term borrowings of Tufa Co consist of $10m of loan notes and a $3m bank loan. The bank loan has a variable interest rate.

The 7% loan notes have a nominal value of $100 per loan note and a market price of $102·34 per loan note. Annual interest has just been paid and the loan notes are redeemable in four years' time at a 5% premium to nominal value.

Required:

(a) Calculate the after-tax weighted average cost of capital of Tufa Co on a market value basis. (11 marks)

(b) Discuss the circumstances under which it is appropriate to use the current WACC of Tufa Co in appraising an investment project. (3 marks)

(c) Discuss THREE advantages to Tufa Co of using convertible loan notes as a source of long-term finance. (6 marks)

(20 marks)