2.4.5 Business Supplies Exercise Answer

Unit: Unit 1 – Treasury Strategy

Module: Module 2 – Risk and return

Date: 1 March 2012

Summary: Answer to a practical case study calculating WACC in nominal and real terms.

Illustrative answer

You may have slightly different answers based on slight differences in approach - but the logic of the calculations must be correct.

Completed Assumptions / Inputs:

Medium-dated gilt yield	4.8%
Relatively stable interest rate prospects for next 10 years	
Company's effective interest rate on average cash (20DD Finance Income / average of cash at end 20CC and 20DD)	0.5/((13.2+8.4)/2) = 4.6%
Company's effective interest rate on average debt (20DD Finance Expense / average of debt at end 20CC and 20DD)	4.0/((8.8+13.5+50.0+52.9)/2) = 6.4%
Company's average effective tax rate (P&L) (20AA-DD)	14.6/55.9 = 26.1%
Tax shelter rate on debt (Estimated for US, France)	use 35%
Inflation currently (RPI)	3.0%
Inflation currently (CPI)	2.2%
Equity Risk Premium (historical data, considered view)	4.5%

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Enterprise Value & Capital Structure

	20AA	**20BB**	**20CC**	**20DD**
	£ mill	**£ mill**	**£ mill**	**£ mill**
Market Capitalisation - Common Stock (using year average)	63.4	87.6	92.7	90.2
Market Capitalisation - Preference Stock	1.6	1.6	1.6	1.6
Minority Interests	23.7	22.7	22.9	23.3
Total Debt	53.8	45.6	58.8	66.4
(less Cash)	(16.1)	(9.7)	(13.2)	(8.4)
Enterprise value (EV)	126.4	147.9	162.8	173.1
Total Market Capitalisation	65.0	89.3	94.3	91.8
Total Equity (Market Capitalisation plus Minorities)	88.7	112.0	117.2	115.1
Net Debt	37.7	35.9	45.6	58.0
Total Equity % EV	70%	78%	72%	67%
Total Debt % EV	43%	31%	36%	38%
(Cash % EV)	(13%)	(7%)	(8%)	(5%)
Net Debt % EV	30%	24%	28%	33%

Geared and ungeared betas

We now ungear the betas. Assume t (tax) = 35% throughout. Use net debt for D/E correction to ungear β.

The formula to use here is: $\text{Ungeared Beta} = \dfrac{\text{Geared Beta}}{1 + ((1 - t) \times (D / E))}$

	20AA	20BB	20CC	20DD
β (geared)	1.10	1.11	0.96	0.84
D/E	30/70	24/76	28/72	33/67
β (ungeared)	0.86	0.92	0.77	0.64

The reduced riskiness of the underlying business, independent of gearing, is confirmed by the ungeared betas.

We now re-gear the latest (also the lowest) beta of 0.64. You need to decide which D/E ratio to use and here we have chosen the average D/E ratio for the four years we have been given. We could alternatively choose a prospective ratio if we are aware of future plans. This average (from above) of 29/71 gives (using the same formula above).

$$0.64 \times (1+(0.65 \times 29/71)) = 0.81$$
$$= \text{say } \underline{0.8}$$

Cost of capital calculations

Required return (cost of) equity = risk free rate + (beta * equity premium)	= 4.8 + (0.8 x 4.5)	=	8.4%
After-tax cost of debt = after tax cost	= 6.4 x (1 - 0.35)	=	4.16%
After-tax return on cash = after tax return	= 4.6 x (1 - 0.26)	=	3.40%

Debt fell with the rationalisation but has risen again with the re-investment programme, so a good debt/equity mix to use is, again, the four-year historical average;

Nominal WACC (1)
Based on equity and net debt

Average equity (20AA - 20DD)	=	71%
Average net debt (20AA - 20DD)	=	29%
WACC = (0.71 x 8.4) + (0.29 x 4.16)	=	7.17%

Nominal WACC (2)
Based on equity, total debt and cash

Average equity	=	71%
Average total debt	=	37%
Average cash	=	8%
WACC = (0.71 x 8.4) + (0.37 x 4.16) - (0.08 x 3.4)	=	7.23%

This version is more strictly correct if substantial cash balances are a permanent feature of the financial structure, but here it makes little difference.

The nominal WACC is thus 7.2%.

Real WACC

Use the formula: $1 + \text{Real Rate} = \dfrac{1 + \text{Nominal Rate}}{1 + \text{Inflation Rate}}$

Taking the average of CPI and RPI (no special justification), say inflation = 2.6%

Real WACC $= \dfrac{1.072}{1.026} = 1.0448$ - 1 = 4.5%

The real WACC is thus 4.5%