3.1.5 Optimising Capital Structure Exercise Answer

Unit: Unit 1 – Treasury Strategy

Module: Module 3 – Financial strategy

Date: 1 March 2012

Summary: Answers to an exercise to establish minimum WACC and hence an ideal capital structure

It is first necessary to calculate the un-geared ß, using the following formula (Hamada):

ßu = ßg / (1+ ((1-t) x d/e))

ßu = 1.277

The re-gearing formula is then used in the following table:

ßg = ßu x (1+ ((1-t) x d/e))

Leverage	ßu	ßg	Cost of equity	Cost of debt	Post tax cost of debt	WACC
0%	1.277	1.277	8.88%	3.70%	2.5900%	8.88%
10%	1.277	1.376	9.38%	3.75%	2.6250%	8.70%
20%	1.277	1.500	10.00%	4.00%	2.8000%	8.56%
30%	1.277	1.660	10.80%	4.25%	2.9750%	8.45%
40%	1.277	1.872	11.86%	4.25%	2.9750%	8.31%
50%	1.277	2.170	13.35%	4.75%	3.3250%	8.34%
60%	1.277	2.617	15.59%	5.00%	3.5000%	8.33%
70%	1.277	3.362	19.31%	6.00%	4.2000%	8.73%
80%	1.277	4.851	26.76%	7.00%	4.9000%	9.27%
90%	1.277	9.319	49.10%	10.00%	7.0000%	11.21%

Somewhere between 40% and 60% gives the minimum WACC.

The function is not smooth because of the increments in the assumed cost of debt.

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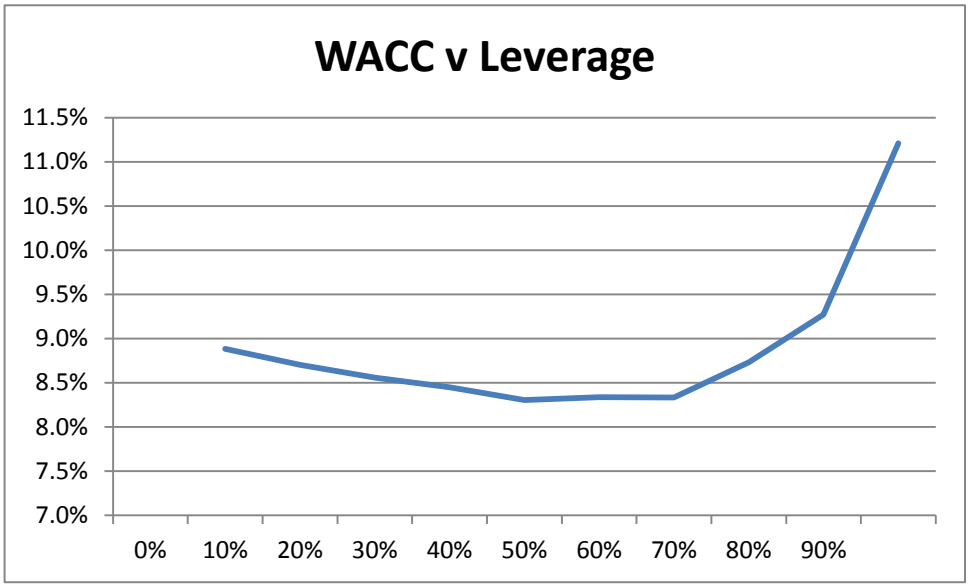
WACC v Leverage
11.5%
11.0%
10.5%
10.0%
9.5%
9.0%
8.5%
8.0%
7.5%
7.0%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%