2.4.3 Investment Appraisal Exercise Answer

Unit: Unit 1 – Treasury Strategy

Module: Module 2 – Risk and return

Date: 1 September 2015

Summary: Answers to an exercise demonstrating how adjusting for different project risk can lead to different investment appraisal outcomes.

Background

You are responsible for evaluation of investment projects throughout the group. You have three projects awaiting evaluation which you intend to use to explore the impact of the three different methods of calculating WACCs.

Assumptions for all methods

Risk free rate	5%
Equity risk premium	5%
Geared beta	0.91
Marginal tax rate	30%
Cost of debt	6%
Group gearing policy	70% equity, 30% debt

	Project A	**Project B**	**Project C**
Initial cost of project	1600	1600	1600
Sustainable cash flow	90	100	130
Growth rate	2%	2%	2%
Risk category	Low	Average	High
Risk rating (ungeared	risk	risk	risk
non-diversifiable risk)	71.4%	100%	171.4%
Suggested gearing (D/E) for method	50/50	30/70	10/90

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Answer - Method 1

Group WACC, based on group gearing (30/70) and group beta (0.91), is applied to all projects

Cost of equity (Ke) = 5 + (0.91 x 5) = 9.55%
Cost of debt (Kd) = 6 x 0.7 = 4.2%
WACC = (0.7 x 9.55) + (0.3 x 4.2) = 7.95%

NB Ungeared β = $0.91 / \left(1+\left(0.7\times\frac{3}{7}\right)\right)$ = 0.7 (used in Q2 below)

	Project A	Project B	Project C
SCF	90	100	130
WACC	7.95%	7.95%	7.95%
Value	1,543	1,714	2,229

Answer - Method 2

Use group gearing but incorporate the riskiness of the project to calculate a different WACC for each project based on different geared and ungeared betas.

Project ungeared betas are each [risk factor] x group ungeared beta.

	Project A	Project B	Project C
Ungeared beta	0.5	0.7	1.2
Geared beta	0.65	0.91	1.56
Cost of equity	8.25	9.55	12.80
WACC	7.035%	7.95%	10.22%
Value	1,823	1,714	1,613

Answer - Method 3

Use different betas to allow for higher equity risk but also increase the level of gearing for low-risk projects and decrease it for high-risk projects.

	Project A	Project B	Project C
Ungeared beta as per Q2	0.5	0.7	1.2
Gearing	50/50	30/70	10/90
Geared beta	0.85	0.91	1.293
Cost of equity	9.25	9.55	11.467
WACC	6.725%	7.95%	10.74%
Value	1,943	1,714	1,517

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Summary of Project Values

	Project A	Project B	Project C
Cash flow	90	100	130
Values:			
Method 1	1,543	1,714	2,229
Method 2	1,823	1,714	1,613
Method 3	1,943	1,714	1,517

Answer - Preference

Implications: The choice of method changes the values and the rankings - the three methods cannot all be correct, so we can make the wrong decision!

Preferred method: Under Method 1 the low-risk projects subsidise the high-risk projects. Method 2 adjusts for the different risk in each project and is arguably a better approach. Although method 3 incorporates the ideal capital structure for each project, the capital structure in the WACC should only be changed if the project changes the company's WACC going forward. Given the size of the projects this seems unlikely.

Method 2 is preferred.

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