Mergers & Acquisitions Master Class Education Series

Cost of Capital & Net Present Value Analysis

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BARNES DENNIG
Accounting • Tax • Business Insight

E-TAP
Prepare and acquire a small business

Basic Formula

WACC = (cost of equity x % equity) + [(cost of debt x % debt) x (1 - tax rate)]

Where…

(a) Cost of Equity = risk free rate + (beta x (expected return on market – risk free rate)) + size premium ?

(b) Cost of Debt = after-tax interest rate on senior debt or yield-to-maturity on bonds

- Risk free rate = 10-year treasury bond
- Expected return on market = public expectations for yield on all public equity securities
- Size premium – published statistics for completed deals at different sizes…Duff & Phelps
- Beta – published figure: levered vs unlevered

Illustration of High vs. Low Weighted Average Cost of Capital

Example 1

Same Capital Structures			
Company	**Company A**		**Company Z**
% Debt	75%		75%
Cost of Debt	4%		5%
Tax Rate	28%		28%
After Tax Cost of Debt	2.88%		3.60%
% Equity	25%		25%
Expected Return on Market	12%		12%
Size Premium	n/a		6%
Unsystematic Risk Premium			2%
Risk free rate	1.50%		1.50%
Beta	1.20		2.50
Cost of Equity	14.10%		35.75%
WACC	5.7%		11.6%
Total Debt	6,000,000		6,000,000
Total Equity	2,000,000		2,000,000
Total Capitalization	8,000,000		8,000,000
Annual Free Cash Flow	1,500,000		1,500,000
Annual Debt Service	719,754		746,582
Return on Equity	780,246		753,418
ROE %	39%		38%
Ke (Expected Return on Equity)	282,000		715,000
FCF Excess / (Shortfall)	498,246		38,418

Illustration of High vs Low Weighted Average Cost of Capital

Example 2

Different Capital Structures			
Company	**Company A**		**Company Z**
% Debt	75%		60%
Cost of Debt	4%		5%
Tax Rate	28%		28%
After Tax Cost of Debt	2.88%		3.60%
% Equity	25%		40%
Expected Return on Market	12%		12%
Size Premium	n/a		6%
Unsystematic Risk Premium			2%
Risk free rate	1.50%		1.50%
Beta	1.20		2.50
Cost of Equity	14.10%		35.75%
WACC	5.7%		16.5%
Total Debt	6,000,000		4,800,000
Total Equity	2,000,000		3,200,000
Total Capitalization	8,000,000		8,000,000
Annual Free Cash Flow	1,500,000		1,500,000
Annual Debt Service	719,754		597,265
Return on Equity	780,246		902,735
ROE %	39%		28%
Ke (Expected Return on Equity)	282,000		1,144,000
FCF Excess / (Shortfall)	498,246		(241,265)

WACC			
Cost of Equity	**With Premium**	**W/O Premium**	
Risk Free Rate of Return	1.66%	1.66%	
Long-Term Equity Risk Premium	7.15%	7.15%	
Industry Beta	2.09	0.98	
Beta-adjusted Equity Risk Premium	14.94%	7.01%	
Size Premium	10.91%		
Marketability Premium			
Execution Risk Premium			
Other Premium - ??			
Total Equity Rate	27.51%	8.67%	
Cost of Debt			
Average Cost of Debt	4.0%	4.0%	
Tax Rate	28.0%	28.0%	
After-tax Debt Rate	2.88%	2.88%	
Capital Structure			
Debt to Equity	3.00	0.67	
Equity/ Invested Capital	25.00%	59.88%	
Debt/ Invested Capital	75.00%	40.12%	
Total Invested Capital	100.00%	100.00%	
			Implied Premium
Weighted Average Cost of Capital	9.04%	6.35%	**29.78%**

Beta Adjustment				
Industry beta	0.98	Published	Unlevered beta	0.66
Industry Tax Rate	28%		Buyer Tax Rate	28%
Industry Debt %	40%		Buyer Debt %	75%
Industry Equity %	60%		Buyer Equity %	25%
To Unlever beta				
Levered beta	Tax Rate	Wd	We	Unlevered Beta
1.0	28%	40%	60%	0.66
To Relever beta				
Unlevered beta	Tax Rate	Wd	We	Levered beta
0.66	28%	75%	25%	2.1
			Analyst Estimate	2.1

To Unlever and Relever Beta

Assume you have the levered beta from Yahoo or similar source for your peer group industry publicly held companies:

To unlever beta:

$B_u = B_L / [1 + (1 - t) X (W_d / W_e)]$

Where

B_u = unlevered beta

B_L = levered beta

t = tax rate

W_d = percentage of debt in the capital structure

W_e = percentage of equity in the capital structure

To relever beta

$B_L = B_u \times [1 + (1 - t) X (W_d / W_e)]$