Example – Capital Asset Pricing Model (CAPM) and Weighted Average Cost of Capital (WACC)

CAPM

$K_e = R_f + R_p$

R_p = beta x (R_m - R_f)

where:

K_e is the cost of equity capital
R_f is the "risk-free" rate
R_p is the "risk-premium" rate
β (beta) is the measure of systematic risk
R_m is the return rate of a market benchmark, like the S&P 500.

R_f = Risk-free Rate	5%
β (beta) = measure of systematic risk	1.25
R_m = Proportion of equity in capital structure	12%

R_p = beta x (R_m - R_f) = 1.25 (12.0 % - 5%) = 8.75 %
K_e (after-tax) = $R_f + R_p$ = 6.0 % + 8.75 % = 14.75 %
K_e (pre-tax) = 14.75 %/[1 - .35] = 22.7 %

$$WACC = (k_e \times W_e) + (k_d[1-t] \times W_d)$$

WACC

where:

WACC	=	Weighted average cost of capital
k_e	=	Cost of equity capital
k_d	=	Cost of debt capital
W_e	=	Percentage of equity capital in the capital structure
W_d	=	Percentage of debt capital in the capital structure
t	=	Company's effective income tax rate

Assume:

K_d = Cost of debt capital	6%
W_e = Proportion of equity in capital structure	70%
W_d = Proportion of debt in capital structure	30%
Income tax rate	35%

WACC = (22.7 % x 0.7) + (6 % [1 – 0.35)] x 0.3) = 17.1%

The overall CAPM & WACC cost of equity capital in the above example: 17.1 %.

Example – Project Cost of Equity Capital using MDV and Project Premium

Equity Investor's Total Required Return = MDV + P_p

MDV = R_{si} + R_{dp} + E_{vp} R_{si} =4.0 %; R_{dp} = 2.5 %; E_{vp} = 11.0 %.

R_{si} is the sovereign inflation risk	R_{dp} is the default risk premium
E_{vp} is the earnings volatility premium	P_p is the project premium

Criteria (put only one Y in either A, B or C)	A	B	C
Company Specific Criteria			
Relation of company to project: integrate relevant management systems		Y	
Reliance on and impact of success that influences or dictate future choices of company	Y		
Historical information and review: corporate successes and failures, corporate strengths, other project development accomplishments	Y		
Budget constraints		Y	
Entrepreneurial nature of company			Y
Comparables company and industries assessment		Y	
Managerial options		Y	
Project Specific Criteria			
Documented detailed project development studies and plans		Y	
Documented analytical review: product, schedule, and costs		Y	
Trained, qualified and experience personnel (beware excessive reliance on select individuals)	Y		
Project management supervision and controls		Y	
Quality management supervision and controls			Y
Unique aspects of project – e.g. sources of value; spillover effects	Y		
Financial			
Documented sales forecasts		Y	
DCF valuation with proper risk-adjusted discount rate and sensitivity analysis (positive NPV rule)		Y	

Ranking Selection: A – Above Average ف **B – Baseline** Y **C – Concern**

Project Premium – Additional Adjustment to Discount Rate

Project Premium - P_p Ranking	**Project Premium - P_p Additional discount risk adjustment - %**

A	0
B	Equal to MDV R_{dp}
C	Equal to MDV E_{vp}

Project Premium = P_p = additional adjustment to discount rate = MDV R_{dp} = 2.5 %

$MDV = R_{si} + R_{dp} + E_{vp} = \Sigma\ (4.0 + 2.5 + 11.0 + 2.5) = 20.0\ \%$

The MCPM & Project Premium cost of equity capital in the above example: 20.0%