Cost of Capital

Issue

What does it cost the firm to raise the next $1 (or $1 million)?

Importance

Value Maximization	minimize input costs
Capital Budgeting	appropriate discount rate
Capital Structure	optimum minimizes WACC

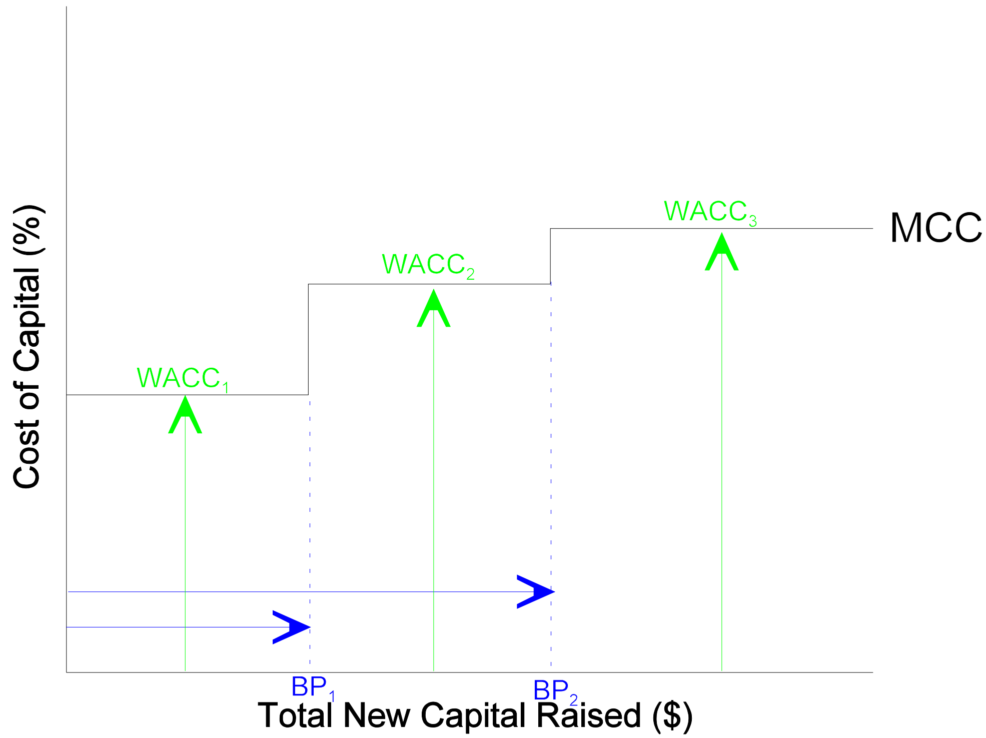
Essential Properties of Estimate

Marginal	*new* funds
Average	*all permanent* financing target capital structure
Market-based	investors' opportunity costs firm's floatation costs
After-tax	

MCC Schedule

Cost of Funds Depends on Amount Raised
MCC vs. WACC
Breakpoint: Total can raise before cost rises

Capital Components Involved
New Debt
New Preferred Stock
New Common Equity
  Retained Earnings (“Internal”)
  Newly Issued Shares (“External”)



Limitations of Estimated MCC
Estimate valid only for given
  capital structure
  capital budget
  dividend policy

Estimating MCC

WACC

$$WACC = k_a = w_d(1-T)k_d + w_{ps}k_{ps} + w_{cs}k_{cs}$$

$$w_i = \frac{\text{value of new capital of type } i}{\text{value of all new capital}}$$

Breakpoint

$$BP_i = \frac{\text{\$ amount available of capital of type } i}{w_i}$$

Keeping Track of Estimates

Total New $ Raised	Component Cost of: Debt	Preferred	Common	WACC
Weight	w_d	w_{ps}	w_{cs}	

Cost of New Debt

Interest Deductible

Firm pays only after-tax cost: $k_d^{AT} = \hat{k}_d(1-T)$

Coupon Bond

Find like YTM (except for flotation cost f_d)

$$P_0^{net} = P_0(1-f_d) = \sum_{t=1}^{2n} \frac{\text{Int}/2}{\left(1+\frac{\hat{k}_d}{2}\right)^t} + \frac{M}{\left(1+\frac{\hat{k}_d}{2}\right)^{2n}}$$

Zero-Coupon Bond

$$P_0^{net} = \frac{M}{\left(1+\hat{k}_d\right)^n}$$

Perpetual Bond

$$k_d = \frac{Int}{P_0^{net}}$$

Cost of New Preferred Shares

Perpetual Preferred Stock
Find like expected return (except for floatation cost f_{ps})

$$k_{ps} = \frac{D_p}{P_0^{net}} = \frac{coupon\ rate \times par\ value}{P_0(1-f_{ps})}$$

Sinking Fund Preferred Stock
Find like cost of debt

$$P_0^{net} = \sum_{t=1}^{n} \frac{D_p}{(1+\hat{k}_{ps})} + \frac{par\ value}{(1+\hat{k}_{ps})^n}$$

Cost of Common Equity: Retained Earnings

Opportunity Cost
No flotation cost, but not free capital

Constant Growth

CAPM

$$k_{cs} = k_{RF} + (k_m - k_{RF})\beta_{cs}$$

DCF

$$k_{cs} = \frac{D_1}{P_0} + g = \frac{D_0(1+g)}{P_0} + g$$

BYPRP

$$k_{cs} = k_d + RP_{cs}$$

Non-Constant Growth

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1+\hat{k}_{cs})^t} + \frac{D_{n+1}}{\hat{k}_{cs} - g}\left[\frac{1}{1+\hat{k}_{cs}}\right]^n$$