Risk, Return, and Capital Budgeting

What should be the appropriate Required Rate of Return (RROR) for discounting CFs of CB Projects?

Cost of Equity Capital

- Use CAPM: $\bar{R}_S = R_F + \beta_S (\bar{R}_M - R_F)$
  - Assume 100% equity financed firm
  - also assume **$Project_{risk} = Firm_{risk}$**
- Review: $\beta_i = Cov (R_i , R_m)/\sigma_m^2$
- Beta: A function of riskiness of CFs
  - Variability of CFs that is **RELATED** to the market

Determinants of Beta

- 2 components of the variability of CFs:
  - **Business Risk**:
    - variability in CFs stemming from sales fluctuations (as economy ⇑ ⇓)
    - *Operating Leverage* (from ⇑ fixed costs) magnifies business risk.
  - **Financial Risk** (Financial Leverage):
    - ⇑ if the firm/project has ⇑ debt. WHY??
    - Debt exacerbates CF variability
      - Because Interest is a fixed cost

Weighted Average Cost of Capital (WACC)

- If $\mathbf{Project_{risk} \neq Firm_{risk}}$??
  - Use the beta of the project
- RROR= weighted average cost of equity and debt
- Cost of Equity: CAPM
- Cost of Debt: $r_B * (1-T_C)$
  - r_B is the firm's borrowing rate

WACC-- Continued

- Debt = $ B; Equity = $ S;
  - Thus: **Assets = B + S**
- Wt. of debt = B/(S+B) Wt. of equity = S/(S+B)
- WACC = $S/(S+B) * r_S + B/(S+B) * r_B * (1-T_C)$

Real-World Betas

- *Problems with Beta Estimation:*
  - Betas may vary over time
  - Betas are influenced by changing financial leverage and business risk.
- *Solutions:*
  - Adjust for changes in financial/business risk
  - Look at average beta estimates of several comparable firms in the industry
- H.W. 1, 3, 9, 12, 15