



Managerial Finance

Hussain A. Al Awami, B.Sc. Pharm., M.Sc., MBA



The Cost of Capital



The Cost of Capital

- Cost of Capital Components
 - Debt
 - Preferred
 - Common Equity
- WACC



What is cost of capital?

- Money has cost
- Investors expects returns in their investments
- Company consider the return required as cost of capital

A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features three arrows: a grey arrow pointing left at the top, a red arrow pointing right below it, and an orange arrow pointing up at the very top.

What types of long-term capital do firms use?

- Long-term debt
- Preferred stock
- Common equity

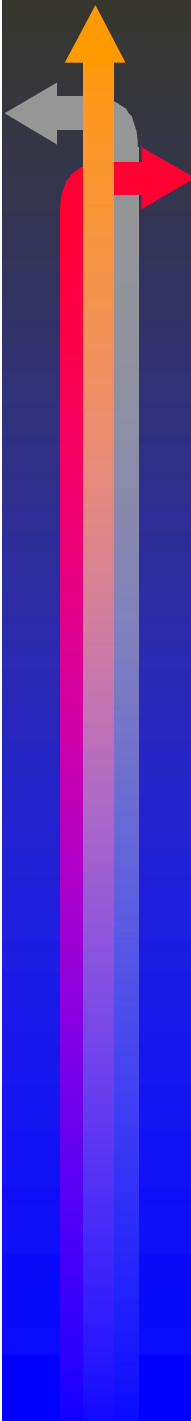
Each should have
different minimum return



Capital components are sources of funding that come from investors

Accounts payable, accruals, and deferred taxes are not sources of funding that come from investors, so they are not included in the calculation of the cost of capital

We do adjust for these items when calculating the cash flows of a project, but not when calculating the cost of capital.



Should we focus on historical
(embedded) costs or new
(marginal) costs?

The cost of capital is used primarily to make decisions which involve raising and investing **new** capital. So, we should focus on **marginal costs**.



Component Cost of Debt

- Interest is tax deductible, so the after tax (AT) cost of debt is:

$$\begin{aligned}r_{d \text{ AT}} &= r_{d \text{ BT}}(1 - T) \\ &= 10\%(1 - 0.40) = 6\%.\end{aligned}$$

- Flotation costs small, so ignore.

A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features a grey arrow pointing left at the top, a red arrow pointing right, and a larger orange arrow pointing up.

Cost of preferred stock r_{ps}

- Not tax deductible
- Flotation cost is higher and need to be incorporated

$$r_{ps} = \frac{D_{ps}}{P_n}$$

Example

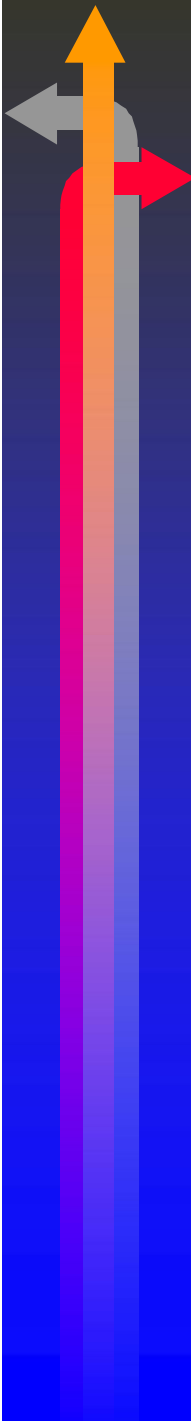
- Price is \$50
- Dividend is \$3.8
- Flotation is 5%
- What is the cost of preferred stock r_{ps} ?

A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features a white arrow pointing up, a grey arrow pointing left, and a red arrow pointing right.

Answer

$$r_{ps} = \frac{D_{ps}^{\$3.8}}{P_{ps}^{\$50} (1 - F_{5\%})}$$

$$r_{ps} = 8\%$$



Preferred stock, need of payment

- Have to be paid before dividends paid to common stockholders
- Difficult to raise funds
- Preferred stockholders can control the firm



Two ways to raise common equity?

- Directly, by issuing new shares of common stock.
- Indirectly, by reinvesting earnings that are not paid out as dividends (i.e., retaining earnings).



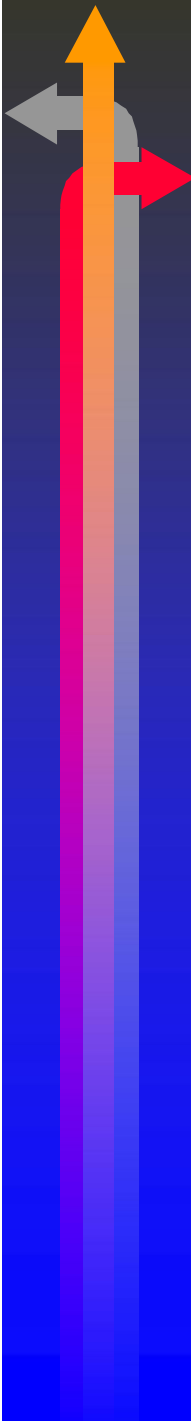
Why is there a cost for reinvested earnings?

- Earnings can be reinvested or paid out as dividends.
- Investors could buy other securities, earn a return.
- Thus, there is an opportunity cost if earnings are reinvested.



Raising new shares

- Flotation cost is high
- Investors perceive “negative sign”
- Increase supply of stock reducing the price



Three ways to determine the cost of equity, r_s :

1. CAPM: $r_s = r_{RF} + (r_M - r_{RF})b$
 $= r_{RF} + (RP_M)b.$

2. DCF: $r_s = D_1/P_0 + g.$

3. Own-Bond-Yield-Plus-Risk Premium:

$$r_s = r_d + \text{Bond RP.}$$



What's the cost of equity
based on the CAPM?

$$r_{RF} = 7\%, \text{RP}_M = 6\%, b = 1.2.$$

$$r_s = r_{RF} + (r_M - r_{RF})b.$$

$$= 7.0\% + (6.0\%)1.2 = 14.2\%.$$

A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features three arrows: a grey arrow pointing left at the top, a red arrow pointing right below it, and an orange arrow pointing up at the very top.

What's the DCF cost of equity, r_s ?

Given: $D_0 = \$4.19$; $P_0 = \$50$; $g = 5\%$.

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

$$= \frac{\$4.19(1.05)}{\$50} + 0.05$$

$$= 0.088 + 0.05$$

$$= \boxed{13.8\%}$$



Example

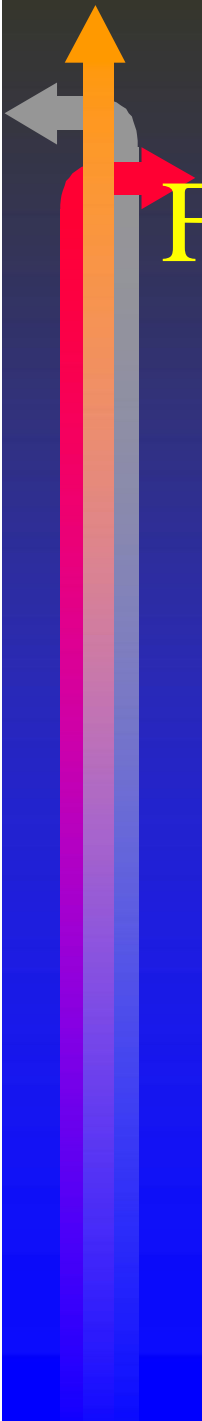
- Price is \$30
- Dividend is \$3
- Growth is 5%
- What is the cost of common equity?

A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features a grey arrow pointing left at the top, a red arrow pointing right at the top, and a red arrow pointing right on the right side of the bar.

Answer

$$r_s = \frac{D_1^{\$3}}{P_0^{\$30}} + g^{5\%}$$

$$r_s = 15\%$$

A decorative vertical bar on the left side of the slide, featuring a gradient from blue at the bottom to orange at the top. It includes a grey arrow pointing left at the top, a red arrow pointing right, and a larger orange arrow pointing up.

Find r_s using the own-bond-yield-plus-risk-premium method.

($r_d = 10\%$, $RP = 4\%$.)

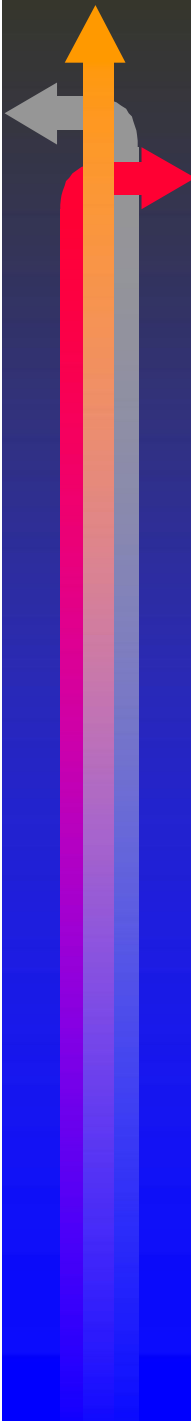
$$r_s = r_d + RP$$

$$= 10.0\% + 4.0\% = 14.0\%$$



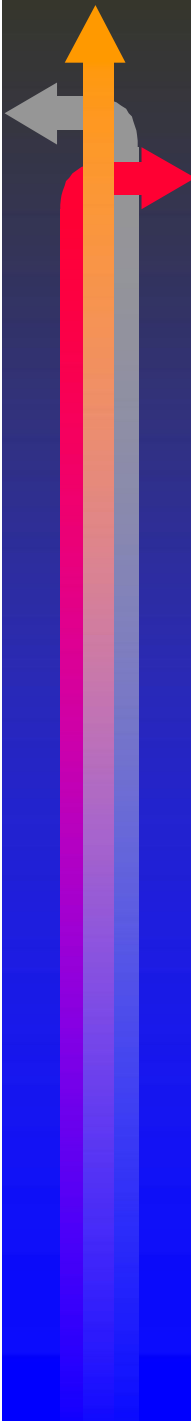
What's a reasonable final estimate of r_s ?

| <u>Method</u> | <u>Estimate</u> |
|---------------|-----------------|
| CAPM | 14.2% |
| DCF | 13.8% |
| $r_d + RP$ | <u>14.0%</u> |
| Average | <u>14.0%</u> |



Determining the Weights for the WACC

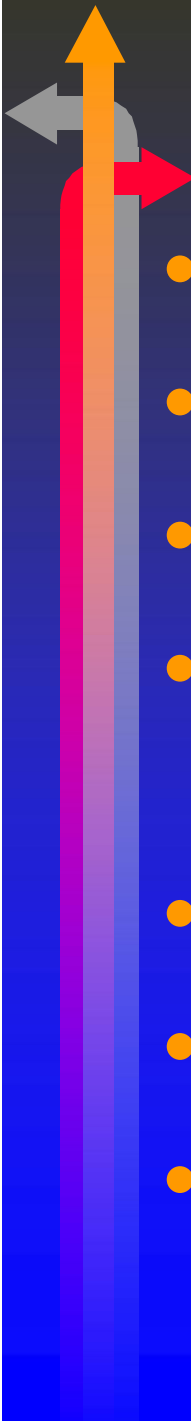
- The weights are the percentages of the firm that will be financed by each component.
- If possible, always use the target weights for the percentages of the firm that will be financed with the various types of capital.



Estimating Weights (Continued)

- Suppose the stock price is \$50, there are 3 million shares of stock, the firm has \$25 million of preferred stock, and \$75 million of debt.

(More...)

- 
- $V_{ce} = \$50 (3 \text{ million}) = \150 million.
 - $V_{ps} = \$25 \text{ million.}$
 - $V_d = \$75 \text{ million.}$
 - Total value = $\$150 + \$25 + \$75 = \250 million.
 - $w_{ce} = \$150/\$250 = 0.6$
 - $w_{ps} = \$25/\$250 = 0.1$
 - $w_d = \$75/\$250 = 0.3$



What's the WACC?

$$\text{WACC} = w_d r_d (1 - T) + w_{ps} r_{ps} + w_{ce} r_s$$

$$= 0.3(10\%)(0.6) + 0.1(9\%) + 0.6(14\%)$$

$$= 1.8\% + 0.9\% + 8.4\% = 11.1\%.$$

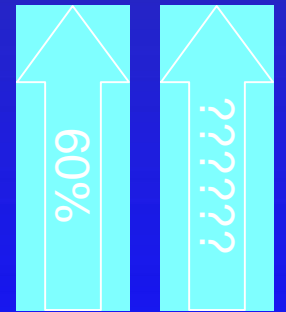
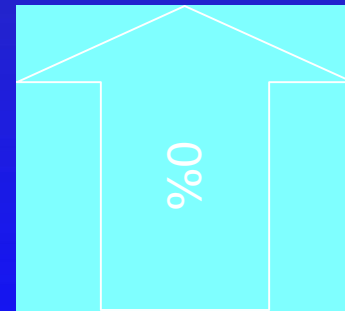
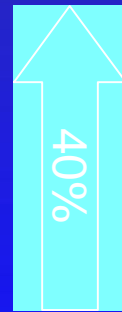
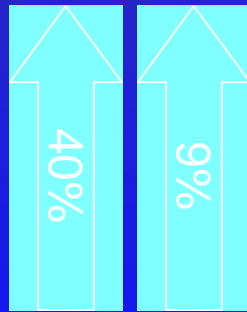


Example

- 40% debt & 60% equity
- Bonds yield is 9% & tax is 40%
- WACC is 9.96%
- What is the cost of equity capital?

Answer

$$WACC = w_d r_d (1 - T) + w_{ps} r_{ps} + w_{ce} r_s$$



A vertical bar on the left side of the slide, transitioning from blue at the bottom to orange at the top. It features a grey arrow pointing left at the top, a red arrow pointing right, and a larger orange arrow pointing up.
$$WACC = w_d r_d (1 - T) + w_{ps} r_{ps} + w_{ce} r_s$$

$$9.96\% = (0.4)(9\%)(1 - 0.4) + (0.6)r_s$$

$$r_s = 13\%$$

A decorative graphic on the left side of the slide. It features a vertical arrow pointing upwards, colored with a gradient from orange at the top to red at the bottom. To the left of this arrow is a grey arrow pointing to the left, and below it is a red arrow pointing to the right.

WACC Estimates for Some Large U. S. Corporations

| Company | WACC | W_d |
|----------------------|------|-------|
| Intel (INTC) | 16.0 | 2.0% |
| Dell Computer (DELL) | 12.5 | 9.1% |
| BellSouth (BLS) | 10.3 | 39.8% |
| Wal-Mart (WMT) | 8.8 | 33.3% |
| Walt Disney (DIS) | 8.7 | 35.5% |
| Coca-Cola (KO) | 6.9 | 33.8% |
| H.J. Heinz (HNZ) | 6.5 | 74.9% |
| Georgia-Pacific (GP) | 5.9 | 69.9% |



Factors affecting WACC

- Factors that firms can control
- Factors that firms cannot control



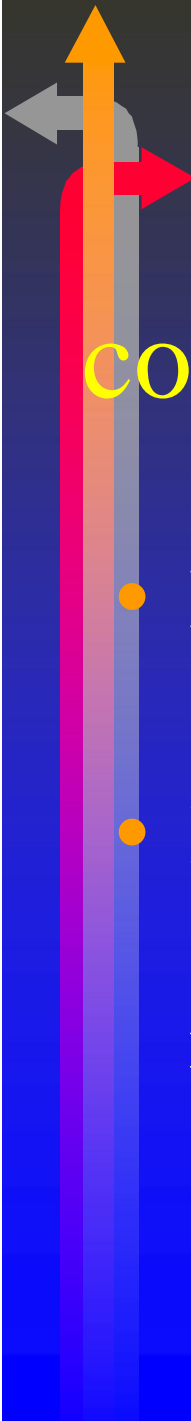
Factors the firm can control

- Capital risk structure
- Dividend policy
- Investment policy



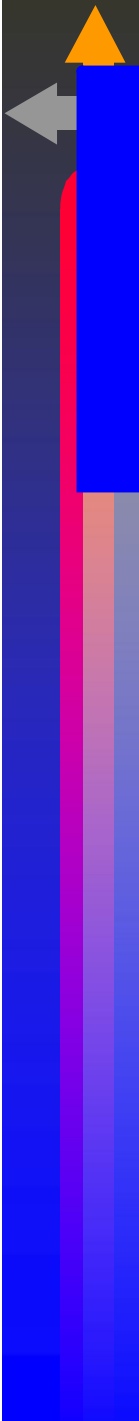
Factors the firm cannot control

- Levels of interest rates
- Market risk premium
- Tax rates



Should the company use the composite WACC as the hurdle rate for each of its divisions?

- NO! The composite WACC reflects the risk of an average project undertaken by the firm.
- Different divisions may have different risks. The division's WACC should be adjusted to reflect the division's risk and capital structure.



What are the three types of project risk?

- Stand-alone risk
- Corporate risk
- Market risk