FN 201 : Lecture Note 8
Cost of Capital

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Outline

- Estimate the components of cost of capital:
  - Cost of equity
  - Cost of debt
  - Cost of preferred stock
- Calculate the weighted average cost of capital of the firm (WACC)

Cost of Capital

The Cost of Capital

- The terms ***required return, discount rate,*** and ***cost of capital*** all refer to the cost of capital in an investment project
- The cost of capital represents **the overall cost of financing** to the firm

  - use “Weighted Average Cost of Capital: WACC”

- Cost of capital estimates are used for:
  - capital budgeting decisions
  - financing decisions
  - operating decisions

Cost of Capital vs. Capital Structure

- A firm's financial policy is about **choosing its capital structure** – the mixture of debt and equity
- For now, we **assume the firm has a fixed debt to equity ratio** – its target capital structure
- A firm's **overall cost of capital reflects the required return on the firm's assets as a whole** – a mixture of the returns needed to compensate its creditors and its shareholders

Components of Capital

- Cost of Equity
  - Retained Earning
  - New Common Stock
- Cost of Debt
- Cost of Preferred Stock

Cost of Equity

- Common stock equity is available through retained earnings (R/E) or by issuing new common stock:

  Common equity = Retained Earning + New common stock

- Why is there a cost for **retained earnings**?
  - Earnings can be **reinvested or paid out** as dividends
  - Investors could **buy other securities**, and earn a return.
  - Thus, there is an ***opportunity cost*** if earnings are retained
- The cost of **new common stock** is ***higher*** than the cost of retained earnings because of **flotation costs**

  - selling and distribution costs (such as sales commissions)

Cost of Equity

- Dividend Growth Model Approach
- Capital Asset Pricing Model (CAPM)

Cost of Equity – Dividend Growth Model Approach

- PV of dividend growing perpetuity
- According to the *constant growth (Gordon)* model

From: $P_o = \frac{D_1}{R_E - g}$ Rearranging:

Note:

Cost of Equity – Dividend Growth Model Approach

Example:

1) Summerdahl Resort's common stock is currently trading at $36 a share. The stock is expected to pay a dividend of $3.00 a share at the end of the year (D1 = $3.00), and the dividend is expected to grow at a constant rate of 5% a year. What is its cost of common equity?

2) Radon Homes' current EPS is $6.50. It was $4.42 five years ago. The company pays out 40% of its earnings as dividends, and the stock sells for $36.

a. Calculate the historical growth rate in earnings.

b. Calculate the next expected dividend per share, D_1.

Assume that the past growth rate will continue.

c. What is Radon Homes' cost of equity, R_E?

Cost of Equity – Dividend Growth Model Approach

Cost of equity with "**flotation cost**"

selling and distribution costs (such as sales commissions) of new securities

Flotation cost will cause stock price decrease and thus total money received

Example:

Messman Manufacturing will issue common stock to the public for $30. The expected dividend and the growth in dividends are $3.00 per share and 5%, respectively. If the flotation cost is 10% of the issue's gross proceeds, what is the cost of external equity, R_E?

Cost of Equity – Dividend Growth Model Approach

- **Advantages:**

  - Very Simple

- **Disadvantages:**

  - Applicable only for **dividend paying firms**

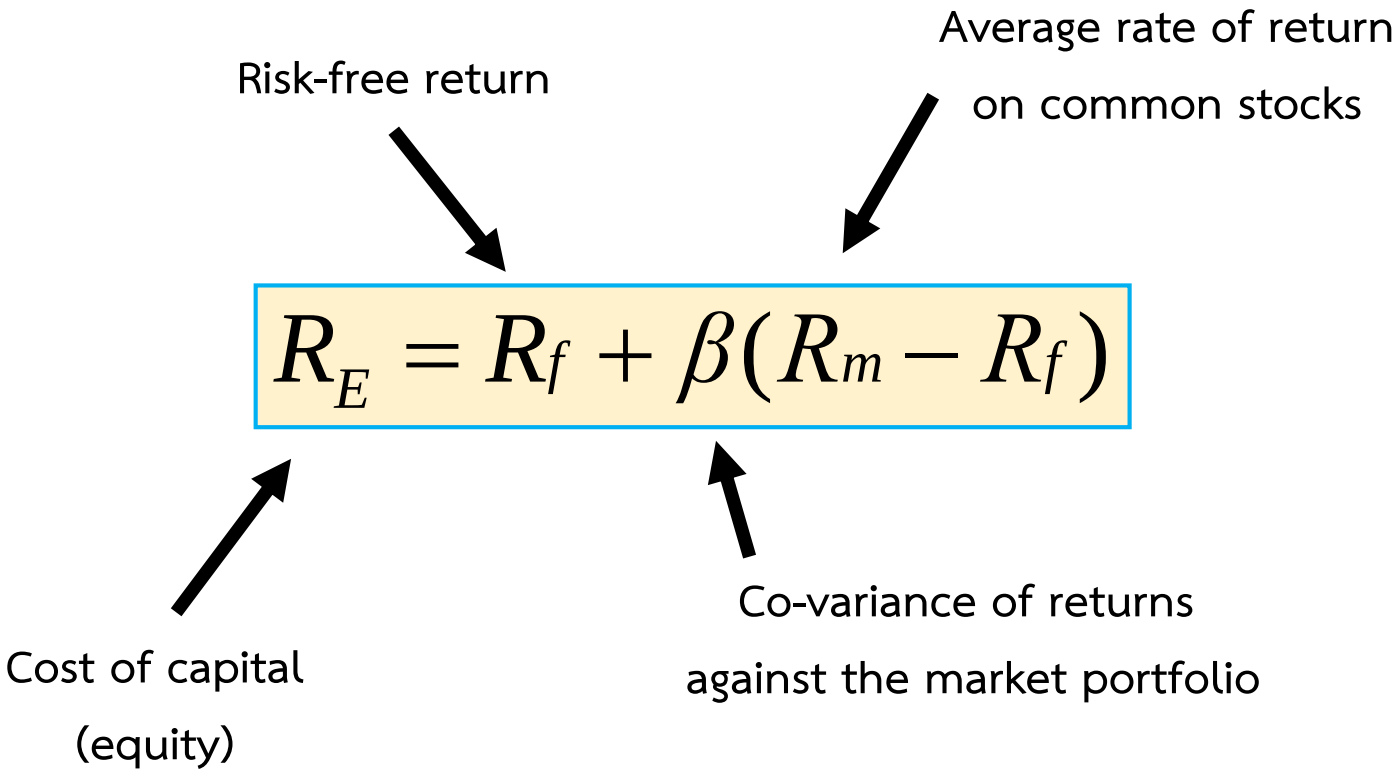
    (otherwise can use earnings growth)

  - Uses **historical data** to predict future growth

  - Very **sensitive to the estimated growth rate**

  - The approach does **not explicitly consider risk**

Cost of Equity – CAPM



Cost of Equity – CAPM

Example:

- Booher Book Stores has a beta of 0.8. The yield on a 3-month T-bill is 4% and the yield on a 10-year T-bond is 6%. The market risk premium is 5.5%. What is the estimated cost of common equity using the CAPM?
- The earnings, dividends, and stock price of Shelby Inc. are expected to grow at 7% per year in the future. Shelby's common stock sells for $23 per share, its last dividend was $2.00, and the company will pay a dividend of $2.14 at the end of the current year.

    a. Using the discounted cash flow approach, what is its cost of equity?

    b. If the firm's beta is 1.6, the risk-free rate is 9%, and the expected return on the market is 13%, then what would be the firm's cost of equity based on the CAPM approach?

Cost of Equity – CAPM

- **Advantages:**

  - It explicitly **adjusts for risk**

  - It is **more applicable** to companies other than those with steady dividend growth / do not pay dividend

- **Disadvantages:**

  - If the estimates of **the market risk premium and beta are poor**, the resulting cost of equity can be *inaccurate*

  - **Uses historical data** to predict future returns

Cost of Debt – Tax Effect on Debt Financing

	with stock	with debt
EBIT	400,000	400,000
- interest expense	0	(50,000)
EBT	400,000	350,000
- taxes (34%)	(136,000)	(119,000)
EAT	264,000	231,000

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- dividends	(50,000)	0

Cost of Debt

- The cost of debt is the return required by lenders (observable)

  = **yield to maturity** on the firm's bonds outstanding.

  Note that the coupon rate is not the cost of debt!

- Since interest is tax deductible to the firm, the actual cost of debt is less than the yield to maturity:

➢ The cost of debt should also be **adjusted for flotation costs** (associated with issuing new bonds)

Cost of Debt

Example:

- LL Incorporated's currently outstanding 11% coupon bonds have a yield to maturity of 8%. LL believes it could issue new bonds at par that would provide a similar yield to maturity. If its marginal tax rate is 35%, what is LL's after-tax cost of debt?
- XYZ Company has bonds outstanding with 7 years left before maturity. The bonds are currently selling for $804.38 per $1,000 face value. The interest is paid annually at a rate of 12 percent. The firm's tax rate is 40 percent. Calculate the after-tax cost of debt.

Cost of Debt

Cost of debt with "**flotation cost**"

Example:

- Suppose a company will issue new 20-year debt with a par value of $1,000 and a coupon rate of 9%, paid annually. The tax rate is 40%. If the flotation cost is 2% of the issue proceeds, then what is the after-tax cost of debt?
- Prescott Corporation issues a $1,000 par, 20 year bond paying the market rate of 10%. Coupons are annual. The bond will sell for par since it pays the market rate, but flotation costs amount to $50 per bond. What is the pre-tax and after-tax cost of debt for Prescott Corporation?

Cost of Preferred Stock

- Preferred stocks are stocks **with dividend priority over common stocks**.
- They pay **a fixed dividend rate**, every period, as long as the firm exists.
- A share of preferred stock is essentially **a perpetuity**.

The cost of preferred stock, R_P, is therefore:

$$P_0 = \frac{D}{R_{PS}} \quad \Rightarrow$$

Cost of Preferred Stock

Example:

- In its capital structure, ABC Corporation has preferred stock paying a dividend of $5 per share and selling for $23. The company's tax rate is 40 percent. Calculate (*a*) the before-tax cost preferred stock, and (*b*) the after-tax cost of preferred stock.
- Duggins Veterinary Supplies can issue perpetual preferred stock at a price of $50 a share with an annual dividend of $4.50 a share.

Cost of Preferred Stock

Cost of debt with "**flotation cost**"

Example:

- Burnwood Tech plans to issue some $60 par preferred stock with a 6% dividend. A similar stock is selling on the market for $70. Burnwood must pay flotation costs of 5% of the issue price. What is the cost of the preferred stock?
- Nortel Networks also has 10,000 preferred shares outstanding. These preferred shares have a market value of $56 per share and pay a 10 percent dividend rate on a par value of $100. What is the required rate of return by preferred shareholders? What is the market value of preferred shares?

Weighted Average Cost of Capital: WACC

Weighted Average Cost of Capital: WACC

- The company cost of capital is the **weighted average** of required returns from all source of firm's capital (WACC)

Weighted Average Cost of Capital: WACC

Example:

- *Gallagher Corporation estimates the following costs for each component in its capital structure:*

Source of Capital	*Cost*
Bonds (after tax)	**R_D = 6.0%**
Preferred Stock	**R_{PS} = 11.9%**
Common Stock	**R_S = 16.25%**

Assume that Gallagher's desired capital structure is 40% debt, 10% preferred and 50% common equity. Given **Gallagher's tax rate is 40%.** What is firm's WACC?

Weighted Average Cost of Capital: WACC

Q: Market values or book values?

A: always use market values!

- **Market value of equity:**

  E = number of shares × market price per share

- **Market value of debt:**

  D = number of bonds outstanding × market price per bond

  - If there are multiple bonds, do the same for each bond and add.

  - If debt is not publicly traded, then find a similar publicly traded bond and use the yield to discount the bond's payments

Weighted Average Cost of Capital: WACC

Example: Market Value vs. Book Value

Suppose the Schoof Company has this *book value* balance sheet:

Current assets	$30,000,000	Current liabilities	$10,000,000
Fixed assets	50,000,000	Long-term debt	30,000,000
		Common equity	
		Common stock (1 million shares)	1,000,000
		Retained earnings	39,000,000
Total assets	$80,000,000	Total claims	$80,000,000

The current liabilities consist entirely of notes payable to banks, and the interest rate on this debt is 10%, the same as the rate on new bank loans. These bank loans are not used for seasonal financing but instead are part of the company's permanent capital structure. The long-term debt consists of 30,000 bonds, each with a par value of $1,000, an annual coupon interest rate of 6%, and a 20-year maturity. The going rate of interest on new long-term debt, r_d, is 10%, and this is the present yield to maturity on the bonds. The common stock sells at a price of $60 per share. Calculate the firm's *market value* capital structure.

Weighted Average Cost of Capital: WACC

Longstreet Communications Inc. (LCI) has the following capital structure, which it considers to be optimal: debt = 25%, preferred stock = 15%, and common stock = 60%. LCI's tax rate is 40%, and investors expect earnings and dividends to grow at a constant rate of 6% in the future. LCI paid a dividend of $3.70 per share last year (D0), and its stock currently sells at a price of $60 per share. Ten-year Treasury bonds yield 6%, the market risk premium is 5%, and LCI's beta is 1.3. The following terms would apply to new security offerings.

Preferred: New preferred could be sold to the public at a price of $100 per share, with a dividend of $9. Flotation costs of $5 per share would be incurred.

Debt: Debt could be sold at an interest rate of 9%.

Common: New common equity will be raised only by retaining earnings.

a. Find the component costs of debt, preferred stock, and common stock.

b. What is the WACC?

Question?