- **Ôn lại nội dung Chi phí sử dụng vốn bình quân Weighted average cost of capital (WACC)**

$$\mathrm{WACC} = (1 - \mathrm{T_C}) * \mathrm{R_D} * \frac{\mathrm{D}}{\mathrm{V}} + \mathrm{R_E} * \frac{\mathrm{E}}{\mathrm{V}}$$

With: T_C: marginal corporate tax rate

V = D + E

V: Market value of the Firm

D: Market value of Debt

E: Market value of Equity

R_D: Cost of Debt

R_E: Cost of Equity

- **Ôn lại công thức giá trái phiếu để xác định R_D (tìm YTM: yield-to-maturity có thể kí hiệu r như công thức)**

$$P_0 = \frac{C}{(1+r)^1} + \frac{C}{(1+r)^2} + \frac{C}{(1+r)^3} + \quad + \frac{C}{(1+r)^n} + \frac{F}{(1+r)^n}$$

$$= C * \frac{1-(1+r)^{-n}}{r} + \frac{F}{(1+r)^n}$$

With: P_0: Bond price

F: face value

c: coupon rate

C: Coupon payment = c*F

r: yield to maturity

- **Ôn lại công thức Capital Asset Pricing Model (CAPM) để xác định R_E:**

$$\mathbf{R_E = R_f + \beta * (R_M - R_f)}$$

- R_E: expected rate of return of the security

- R_M: expected rate of return of the market
- R_f: risk-free rate
- β: Beta of the security

- **Công thức tính Asset Beta**

$$\beta_{\text{assets}} = \beta_{\text{D}} * \frac{\text{D}}{\text{V}} + \beta_{\text{E}} * \frac{\text{E}}{\text{V}}$$

Bài tập trên lớp

1) Corporation A has a beta of the stock of 1.1 and a debt-to-equity ratio of 0.3. The market rate of return is 13 percent, the tax rate is 35 percent, and the risk-free rate is 3 percent. The pre-tax cost of debt is 9 percent. What is the WACC?
2) Corporation TNF went public by issuing 2,000,000 shares of common stock at 10,000 VND per share. The shares are currently trading at 55,000 VND per share. Current risk free rate is 6% and market risk premium is 8% and the company has a beta coefficient of 1.2. During last year, TNF issued 500,000 bonds, the face value of bonds is 1,000,000 VND and the bonds are currently trading at 800,000 VND. If the tax rate is 35%, the cost of debt is 12%. What is the WACC?
3) Calculate WACC. Tax rate is 20%. Know that:

Sources of fund	The amount of each source of fund	Figures
Long-term debt from bank	2 bil VND	Interest rate is 12%
Bond	3 bil VND	Consider to issue 10% coupon bond with a face value of 1,5 mil VND, price of bond is 1,2 mil VND, and 5 years to maturity.
Common stock	4 bil VND	The risk-free rate is 4%, the expected market rate of return is 8%, and the company's stock beta is 1.62.

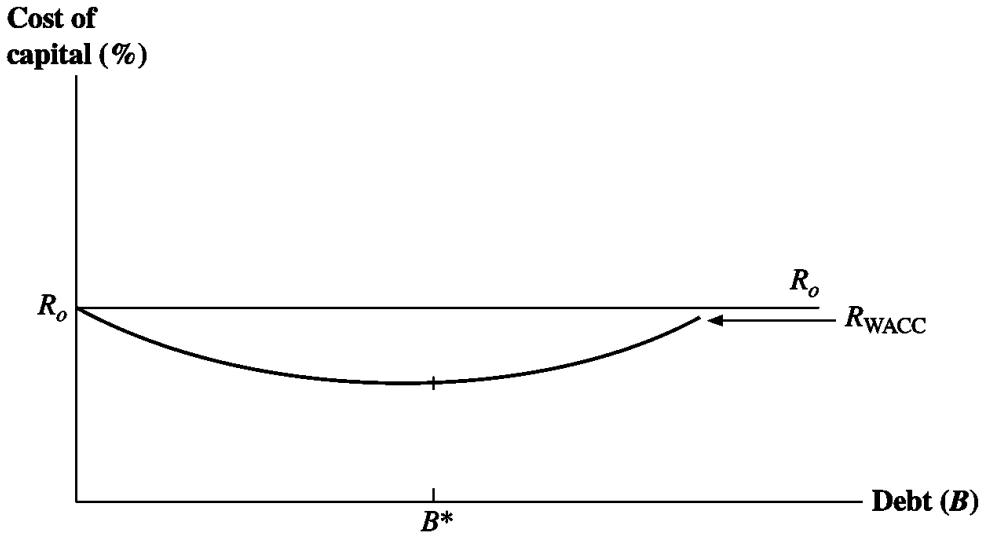
4) Calculate WACC. Tax rate is 35%. Know that:

Sources of fund	The amount of each source of fund	Figures
Bond	$3 billion	Consider to issue 10% coupon bond with a face value of $1,500, price of bond is $1,200, and 5 years to maturity.
Common stock	$4 billion	The risk-free rate is 4%, the expected market rate of return is 8%, and the company's stock beta is 1.62.
Preferred stock	$0.5 billion	Expect to pay dividend $5 per share and current price is $80

5) As a summer intern, you are asked to prepare a spreadsheet calculating the project free cash flow associated with a project your employer is considering. Initially your boss assumes that no debt will be used to fund the project. During your presentation to the committee that evaluates projects, you learn that, in fact, the project will be financed with 25% debt. Determine whether the following statements are true or false, and explain your answer:
   a) You need to go back to your office and adjust the project's free cash flows to include the interest on the debt.
   b) You need to go back to your office and adjust the project cash flows to update the taxes paid due to the tax shield provided by taking on debt.
   c) Your cash flow model does not need to be updated because the financing of the project does not affect the free cash flow calculation.
6) Nestlé Enterprises is estimating its cost of capital for the first time and has made the following estimates: The firm's debt carries a AAA rating, which is currently yielding 6%; the firm pays taxes at a rate of 30%; the cost of equity is estimated to be 14%; and the firm's debt is equal to 20% of its enterprise value.
   a) What is Nestlé's estimated WACC?
   b) If Nestlé were to increase its debt level to 40% of enterprise value, the firm's investment banker has told the firm that its credit rating would drop to AA and correspondingly its cost of debt financing would rise to 7%. If the cost of equity corresponding to this new capital structure were to rise to 16%, what would be the firm's estimated WACC?

- Câu hỏi thêm:

R_D is cheaper than R_E. Should businesses raise capital with debt as much as possible? Why? (Hint: risk of default, risk to equityholders increase → R_D, R_E increase when W_D



According to the static theory, the R_{WACC} falls initially because of the tax advantage of debt. Beyond point B^*, it begins to rise because of financial distress costs.

7) Smaltz Enterprises is currently involved in its annual review of the firm's cost of capital. Historically, the firm has relied on the CAPM to estimate its cost of equity capital. The firm estimates that its equity beta is 1.25, and the yield to maturity on long-term US Treasury bonds is 4.28%. The firm's CFO is currently in a debate with one of the firm's advisers at its investment bank about the level of the market risk premium. Historically, Smaltz has used 7% to approximate the market risk premium. However, the investment banker argues that this premium has shrunk dramatically in recent years and is more likely to be in the 3% to 4% range.

a) Estimate Smaltz's cost of equity capital using a market risk premium of 3.5%.

b) Smaltz's capital structure is comprised of 75% equity (based on current market prices) and 25% debt on which the firm pays a yield of 5.125% before taxes at 25%. What is the firm's WACC using both a 3% and 4% market risk premium?

Xem qua slide mô hình Fama-French 3 nhân tố

BT thêm về mô hình Fama-French 3 nhân tố:

8) The CFO of Sterling Chemical is interested in evaluating the cost of equity capital for his firm. However, Sterling uses very little debt in its capital structure (the firm's debt-to-equity capitalization ratio is only 20%), while larger chemical firms use substantially higher amounts of debt. The following table shows the levered equity betas, debt-to-equity ratios, and debt betas for three of the largest chemical firms:

Company Name	Levered Equity Betas	Debt/Equity Capitalization	Assumed Debt Betas
Eastman Chemical Co. (EMN)	1.79	30.77%	0.30
Celanese Corp. (CE)	1.98	23.55%	0.30
Dow Chemical Company (DOW)	1.71	21.60%	0.30

a) Use the information given above to estimate the unlevered equity betas for each of the companies.

b) If Sterling's debt-to-equity capitalization ratio is .20 and its debt beta is .30, what is your estimate of the firm's levered equity beta?

Xem thêm về slide ước tính Beta unlevered và Beta của dự án thông qua Beta unlevered.