

Weighted Average Cost of Capital (WACC)

Cost associated to the raising Financing/Capital - COST OF CAPITAL

<u>Sources of Capital</u>	<u>Cost</u>
Equity - Common Shares	Cost of Equity
Debt - Bonds & Loans	Cost of Debt
Preferred Shares	Cost of Preferred Stock

Example:

XYZ Company is in the need to raise \$500,000.

Equity - Stocks

Expected Return = 10%

Debt - Loan

Required Return = 7%

Weighted Average Cost of Capital (WACC)

Example:

XYZ company is financed with the following.

Equity: \$600,000

Preferred: \$150,000

Debt: \$250,000

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 1:

What is the company cost of capital for a firm financed with 30 percent debt if the debt requires a 10 percent return and equity requires a 16 percent return? There are no taxes or preferred shares

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 2:

What is the WACC for a firm using 55 percent equity with a required return of 15 percent, 35 percent debt with a required return of 8 percent, 10 percent preferred stock with a required return of 10 percent, and a tax rate of 35 percent?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 3:

Calculate a firm's WACC given that the total value of the firm is \$2,000,000, \$600,000 of which is debt, the cost of debt and equity is 10 percent and 15 percent respectively, and the firm pays no taxes.

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 4:

The WACC for a firm with only debt and equity in its capital structure, a debt-to-equity-ratio of 3/2, 8% before-tax cost of debt, 15% cost of equity, and a 35% tax rate is:

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 5:

What is XYZ Co.'s WACC based on following information?

- Its capital structure consists of 40 percent debt and 60 percent common equity.
- The company has 20-year bonds outstanding with a 9 percent annual coupon that are trading at par.
- The company's tax rate is 40 percent.
- The risk-free rate is 5.5 percent.
- The market risk premium is 5 percent.
- The stock's beta is 1.4

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 6:

Given the following information, what is ABC INC. Corporation's WACC?

Common Stock: 1 million shares outstanding, \$40 per share, \$1 par value per share, beta = 1.3.

Bonds: 10,000 bonds outstanding, \$1,000 face value each, 8% coupon payable *annually*, 22 years to maturity, market price = \$1,101.23 per bond.

Market risk premium = 8.6%, risk-free rate = 4.5%, marginal tax rate = 34%.

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 7:

BestStuff Shop has a cost of debt of 7 percent, a cost of equity of 11 percent, and a cost of preferred stock of 8 percent. The firm has 104,000 shares of common stock outstanding at a market price of \$20 a share. There are 40,000 shares of preferred stock outstanding at a market price of \$34 a share. The bond issue has a total face value of \$500,000 and sells at 102 percent of face value. The company's tax rate is 34 percent. What is the weighted average cost of capital (WACC) for BestStuff Shop?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 8:

Eastman Chemical has 38 million shares of common stock outstanding. The book value per share is \$42 but the stock sells for \$ 58. It also has 700,000, 9 percent semiannual coupon bonds outstanding, par value \$1,000 each. The bonds have 10 years to maturity and sell for 86 percent of par. Eastman's common stock is twice as risky as the market portfolio. The firm has 14 million shares of 5 percent preferred stock outstanding which currently sell for \$63 per share. The face value per preferred share is \$100. The T-bills yield 5.25%, and the market risk premium is assumed to be 4.15%. Eastman is in the 35% corporate income tax bracket.

- Eastman's after-tax cost of debt is:
- Eastman's cost of equity is:
- Eastman's cost of preferred stock is:
- What is the discount rate that Eastman should use to evaluate a project which is very similar to the firm's existing business?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 9:

A company just paid a \$2.00 per share dividend on its common stock ($\text{Div}_0 = \$2.00$). The dividend is expected to grow at a constant rate of 7 percent per year. The stock currently sells for \$42 a share. What is the common equity's cost of capital?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 10:

Bonds with an 8 percent coupon rate, semi-annual payments, \$1,000 par value bond, mature in 20 years, and currently sell at a price of \$686.86. The company's tax rate is 40 percent. What is the firm's component cost of debt for purposes of calculating the WACC?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 11:

Halley Industries' preferred stock pays an annual dividend of \$3 per share. When issued, the shares sold for their par value of \$100 per share. What is the cost of preferred stock if the current price is \$85 per share?

Weighted Average Cost of Capital (WACC)

WACC Formula:

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) r_{\text{debt}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + E.$$

$$\text{WACC} = \left[\frac{D}{V} \times (1 - T_c) \times r_{\text{debt}} \right] + \left[\frac{P}{V} \times r_{\text{preferred}} \right] + \left[\frac{E}{V} \times r_{\text{equity}} \right], \quad \text{where } V = D + P + E.$$

Example 12:

Enterprises has a capital structure which is based on 40 percent debt, 10 percent preferred stock, and 50 percent common stock. The after-tax cost of debt is 6 percent, the cost of preferred is 7 percent, and the cost of common stock is 9 percent. The company is considering a project that is equally as risky as the overall firm. This project has initial costs of \$125,000 and cash inflows of \$76,000 a year for two years. What is the projected net present value of this project?