



# The Cost of Capital

Gestão Financeira I  
Gestão Financeira  
Corporate Finance I  
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Licenciatura  
Undergraduate Program

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# Outline

1. The Firm's Costs of Debt, Preferred Stock, and Equity Capital
2. The Weighted Average Cost of Capital
3. Using the WACC to Value a Project

# A simplified balance sheet with the capital structure of the firm

## Assets

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Current Assets

Long-Term Assets

## Liabilities and Equity

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Debt

Preferred Stock

Equity

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# The Firm's Costs of Debt

- Yield to Maturity and the Cost of Debt ( $r_D$ )
  - The Yield to Maturity is the yield that investors demand to hold the firm's debt (new or existing)
- Taxes and the Cost of Debt
  - Effective Cost of Debt

$$r_D (1 - T_C)$$

where  $T_C$  is the corporate tax rate.

**Example:** By using the yield to maturity on DuPont's debt, we found that its **pre-tax cost of debt is 2.81%**. If DuPont's tax rate is 35%, what is its effective cost of debt?

$$r_D = 2.81\% \text{ (pre-tax cost of debt)}$$

$$T_C = 35\% \text{ (corporate tax rate)}$$

$$\text{DuPont's effective cost of debt is } 0.0281 (1 - 0.35) = 0.01827 = 1.827\%.$$

# The Firm's Costs of Preferred Stock Capital

- Cost of Preferred Stock Capital

$$\text{Cost of Preferred Stock Capital} = \frac{\text{Preferred Dividend}}{\text{Preferred Stock Price}} = \frac{Div_{pfd}}{P_{pfd}}$$

**Example:** Assume DuPont's class A preferred stock has a price of \$66.67 and an annual dividend of \$3.50.

Its **cost of preferred stock**, therefore, is:

$$\$3.50 \div \$66.67 = 5.25\%$$

# The Firm's Cost of Equity (common stock)

- Cost of Common Stock Capital
  - Capital Asset Pricing Model (from Chapter 12):
    1. Estimate the firm's beta of equity, typically by regressing 60 months of the company's returns against 60 months of returns for a market proxy such as the S&P 500
    2. Determine the risk-free rate, typically by using the yield on Treasury bills or bonds
    3. Estimate the market risk premium, typically by comparing historical returns on a market proxy to contemporaneous risk-free rates
    4. Apply the CAPM: **Cost of Equity = Risk-Free Rate + Equity Beta × Market Risk Premium**

Example: Assume the equity beta of DuPont is 1.37, the yield on ten-year Treasury notes is 3%, and you estimate the market risk premium to be 6%.

DuPont's cost of equity is  $3\% + 1.37 \times 6\% = 11.22\%$



# The Firm's Cost of Equity (common stock)

- Cost of Common Stock Capital
  - Constant Dividend Growth Model

$$\text{Cost of Equity} = \frac{\text{Dividend (in one year)}}{\text{Current Price}} + \text{Dividend Growth Rate} = \frac{Div_1}{P_E} + g$$

- Example: Assume in mid-2013, the average forecast for DuPont's long-run earnings growth rate was 7.9%. With an expected dividend in one year of \$1.80 and a price of \$57.66, the CDGM estimates DuPont's cost of equity as follows:

$$\text{Cost of Equity} = \frac{Div_1}{P_E} + g = \frac{\$1.80}{\$57.66} + 0.079 = 0.110 \text{ or } 11.0\%$$

# The Weighted Average Cost of Capital

## WACC

$$r_{wacc} = \frac{E}{E + P + D} r_E + \frac{P}{E + P + D} r_P + \frac{D}{E + P + D} r_D (1 - T_C)$$

where E is the market value of equity, P is the market value of preferred stock, D is the market value of (net) debt,  $r_E$  is the cost of equity,  $r_P$  is the cost of preferred stock,  $r_D$  is the cost of debt, and  $T_C$  is the corporate tax rate.

- For a company that does not have preferred stock, the WACC condenses to:

$$r_{wacc} = \frac{E}{E + D} r_E + \frac{D}{E + D} r_D (1 - T_C)$$



# The Weighted Average Cost of Capital **WACC**

**Example:** In mid-2013, the market values of DuPont's common stock, preferred stock, and debt were \$53,240 million, \$221 million, and \$14,080 million, respectively.

Its total value was, therefore, \$53,240 million + \$221 million + \$14,080 million = \$67,541 million.

Given the costs of common stock, preferred stock, and debt we have already computed, DuPont's WACC in late mid-2013 was:

$$\begin{aligned} WACC &= 11.22\% \left( \frac{53,240}{67,541} \right) + 5.25\% \left( \frac{221}{67,541} \right) + 2.81\% (1 - 0.35) \left( \frac{14,080}{67,541} \right) \\ &= 9.24\% \end{aligned}$$

# WACC in real companies: examples (2013)

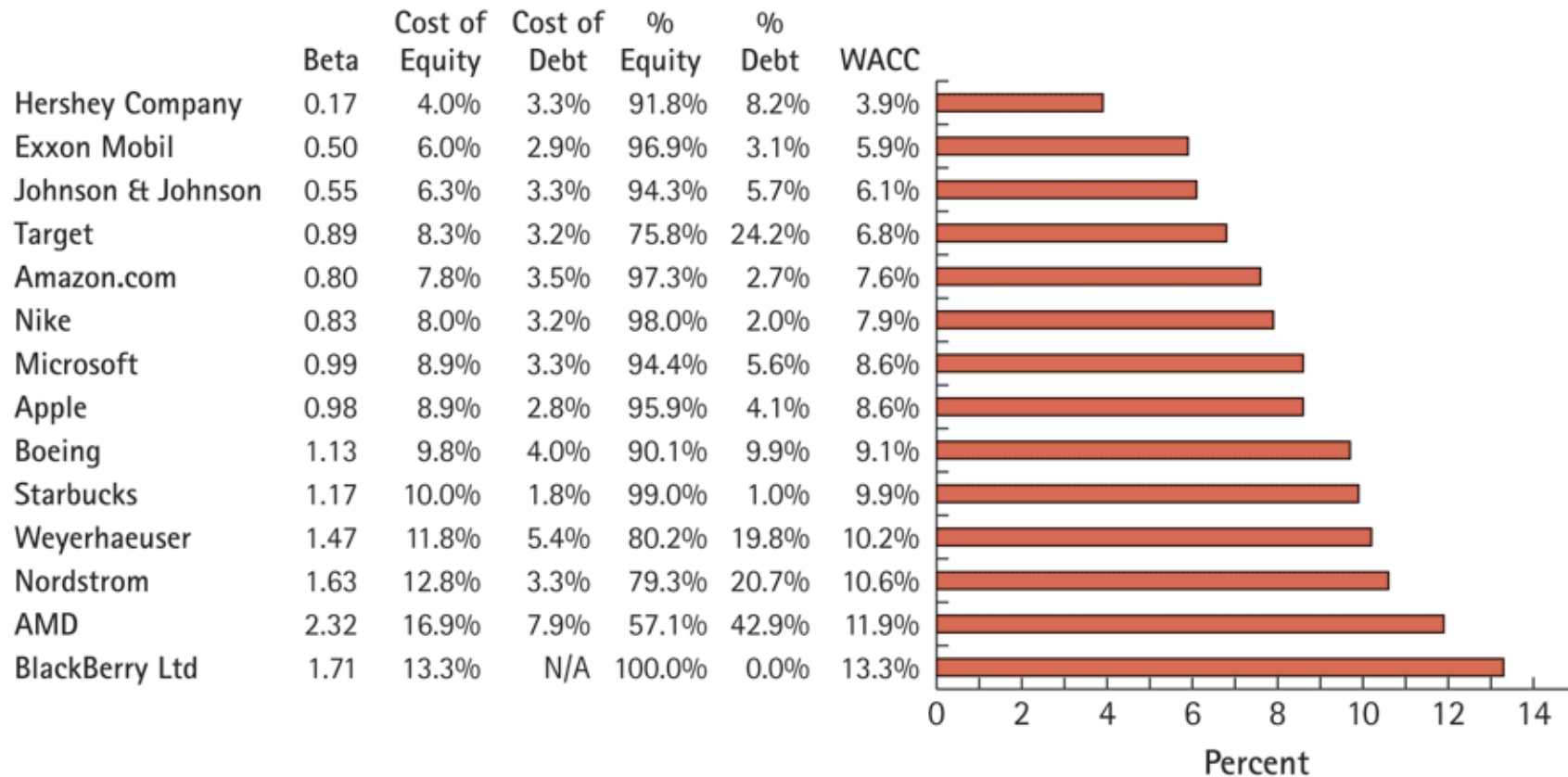


Figure 13.3 WACCs for Real Companies