Role of the CFO

The Chief Financial Officer (CFO) is involved in the following decisions:

- Management Decisions
- Financing Decisions
- Investment Decisions
Here are some measures of performance a company can use:

- Earnings per share (EPS), growth in EPS
- Return on invested capital (ROIC)
- Return on equity
- Economic profit (EP)

What is ROIC?

*Pre-tax ROIC: \( \frac{\text{EBIT}}{\text{Invested capital}} \)
*After-tax ROIC: \( \frac{(1 - t)\text{EBIT}}{\text{Invested capital}} \),

where invested capital is the sum of (the book values of) notes payable, long-term debt, preferred stock and common equity, and \( t \) is the company’s tax rate.
The firm’s economic profit, on the other hand, is given by

\[ EP = (ROIC - WACC) \times \text{Invested capital}. \]

**Weighted Average Cost of Capital (WACC)**

What is the WACC?

Projects of levered firms are simultaneously financed with both debt and equity.

The cost of a firm’s capital is a weighted average of the cost of debt and the cost of equity.

Since interest is a tax-deductible expense, we must use the after-tax cost of debt.
Weighted Average Cost of Capital (WACC)

The equation for a firm’s WACC is

\[ WACC = w_d \times (1 - t)k_d + w_{ps} \times k_{ps} + w_e \times k_e, \]

where \( d, ps \) and \( e \) stand for debt, preferred stock and common equity, respectively, \( w_i \) stands for the weight of item \( i \) in the firm’s capital structure, \( i = d, ps, e \), and \( k_i \) stands for the cost (in \%) of item \( i \).

What weights must be used in WACC calculations?

How to calculate the cost of debt and the cost of equity?
A firm’s balance sheet can be represented as follows:

\[
\begin{array}{c|c|c}
\text{Operating Assets} & \text{Invested Capital} \\
\hline
\text{NOWC} & \text{Short-Term Debt} \\
\text{Fixed Assets} & \text{Long-term Debt} \\
\end{array}
\]

In the previous slide,

\[
\text{NOWC} = \text{Net Operating Working Capital} = \text{Current Operating Assets} - \text{Non-Interest-Bearing Current Liabilities}.
\]

The value of the firm, \( V \), can then be defined as

\[
V = \text{NOWC} + \text{Fixed Assets} = D + E
\]
Weighted Average Cost of Capital (WACC)

A firm has a book value and a market value.

Book Value: Value on the balance sheet (total assets or total liabilities and equity).

Market Value: Calculated using market values (market value of equity (stock price \( \times \) number of shares) + market value of debt).

When considering equity, market and book values are usually very different.

Market and book values of debt are often very similar.

In WACC calculations, it is preferable to use market-value weights.

Is it even more preferable to use target weights: If the company has a target debt-equity ratio in mind, it should be taken into account when computing the WACC.
The cost of debt of a firm is its current after-tax borrowing rate. A firm’s debt usually consists of many different bond and/or note issues. When computing the WACC, however, the analyst may mostly be interested in the firm’s borrowing cost in terms of long-term debt.

Dofasco, for example, had a total of $498.4 million in long-term debt as of December 31, 2003. $440.0 million of the LTD was under Dofasco’s name and the rest consisted of borrowings through subsidiaries, partnerships and joint ventures. Dofasco also had $12.2 million in bank borrowings
The $440 million in LTD was composed of

- $175 million of 7.50% notes maturing in June 2005, the price and yield being approximately 105.80 and 2.95%, respectively, in January 2004;

- $125 million of 7.55% notes maturing in October 2008, the price and yield being approximately 112.00 and 4.65%, respectively, in January 2004;

- $140 million of 9.81% notes maturing in 2007, the price and yield of this issue being unavailable.

We can see that the yield on Dofasco’s debt depends on the time to maturity of the issue.

If the company were to issue debt today, we could assume a time to maturity of at least 5 years and thus the return offered by the issue would have to be at least 4.65%.

A pre-tax cost of debt of 5.5-6.0%, say, may then seem reasonable. Note that this depends on the firm’s credit rating and the shape of the yield curve.
Another way to compute Dofasco’s cost of debt would be to compute the yield to maturity of a bond with the following characteristics:

- A coupon rate \( (i) \) equal to the ratio \( \frac{\text{interest expense}}{\text{total debt}} \).
- A time to maturity \( (T) \) equal to the face-value weighted average maturity of the firm’s debt.
- A price \( (P) \) equal to Dofasco’s market value of debt.
- A face value \( (F) \) equal to the book value of Dofasco’s debt.

The total book value of Dofasco’s debt was $510.6 million as of December 31, 2003, and the interest expense in 2003 was $48.6 million, which gives an average coupon rate of

\[
i = \frac{48.6}{510.6} = 9.52\%.
\]
WACC: Cost of Debt

The time to maturity of each of Dofasco’s debt issues (as of January 1, 2004) was

<table>
<thead>
<tr>
<th>Book Value</th>
<th>Years to Maturity</th>
</tr>
</thead>
<tbody>
<tr>
<td>175.0</td>
<td>1.5</td>
</tr>
<tr>
<td>125.0</td>
<td>5.0</td>
</tr>
<tr>
<td>140.0</td>
<td>4.0</td>
</tr>
<tr>
<td>9.0</td>
<td>1.0</td>
</tr>
<tr>
<td>40.4</td>
<td>5.0</td>
</tr>
<tr>
<td>9.0</td>
<td>0.0</td>
</tr>
<tr>
<td>12.2</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The average time to maturity is then

\[
T = \frac{175.0 \times 1.5 + 125.0 \times 5.0 + 140.0 \times 4.0 + 9.0 \times 1.0 + 40.4 \times 5.0}{510.6}
\]

\[
= 3.25 \text{ years.}
\]
The total book value of Dofasco’s debt was $510.6 million as of December 31, 2003, and we have market values for only $300 million.

The average price, using market value weights, of the two issues for which a market value is available is

\[
\frac{(1.0580 \times 175) \times 1.0580 + (1.1200 \times 125) \times 1.1200}{1.0580 \times 175 + 1.1200 \times 125} = 1.0847.
\]

Let’s use 1.0847 to determine the market value of Dofasco’s debt. This gives

\[
P = 1.0847 \times 510.6 = $553.85 \text{ million.}
\]
The yield on Dofasco’s debt as of December 31, 2003, was then such that

\[
553.85 = \frac{48.6}{y} \left( 1 - \left( \frac{1}{1+y} \right)^{3.5} \right) + \frac{510.6}{(1+y)^{3.5}},
\]

which gives \( y = 6.52\% \). Let’s use this value of the firm’s pre-tax cost of debt.

Dofasco’s tax rate can be calculated as follows:

\[
t = \frac{\text{Tax expense}}{\text{Income before taxes}} = \frac{85.7}{205.1} = 41.78\%.
\]
The CAPM will be used to find Dofasco’s cost of common equity.

Regressing Dofasco’s stock monthly return on the TSE 300 monthly return, we find $\beta = 0.67$ for Dofasco.

Using a risk premium of 7.0% (arithmetic mean over T-bonds 1926-1995) and a risk-free rate of 5.1% (GOVT. OF CANADA MARKETABLE BONDS, AVG. YIELD: 5-10 YEAR), we find

$$k_e = 5.1 + 0.67 \times 7.0 = 9.8\%.$$
Dofasco’s WACC was then

\[
\text{WACC} = \frac{553.85}{553.85 + 2,474.03} \times (1 - .4178) \times 6.52% \\
+ \frac{2,474.03}{553.85 + 2,474.03} \times 9.8% = 8.70%.
\]

Note that the contribution of debt to the company’s WACC is very small (.69%).

---

**WACC: Cost of Preferred Shares**

Preferred shares are often negligible in the firm’s capital structure.

They are usually considered perpetuities and their cost is calculated as follows:

\[
P_{ps} = \frac{D_{ps}}{k_{ps}} \quad \Rightarrow \quad k_{ps} = \frac{D_{ps}}{P_{ps}}.
\]
Best Practices: Survey Results

DCF and Weights

- 89% of corporations use discounted cash flow techniques as a primary tool to evaluate investment opportunities.
- 52% of corporations and 90% of financial advisors use target weights.
- 59% of corporations and 90% of financial advisors use market weights.

Cost of Debt

- 52% of corporations use marginal (before-tax) cost of debt, 37% use current average.
- 52% of corporation use marginal tax rate, 37% use historical average.
Best Practices: Survey Results

Cost of Equity Capital

- 81% of corporations use the CAPM.
- Risk-free rate: 70% of corporations use government bonds with 10 or more years to maturity, of corporation use 90-day T-Bill.
- 52% of corporations use beta from published source, 30% calculate their own.
- Risk premium: Varies a lot.

Total Return to Shareholders and Firm Performance

What is the relationship between measures of firm performance and total return to shareholders (TRS)?
See figures 13.2, 13.3 and 13.4.
Incentive Design

- Why Maximize Shareholder Wealth?
- Alignment of Pay with Performance
- Total CEO Compensation

Financing Decisions

See survey.