

Corporate Finance, Module 18: Weighted Average Cost of Capital

Pre-Tax and After-Tax Cost of Debt Capital

(The attached PDF file has better formatting.)

Question: The textbook says that the pre-tax and after-tax cost of debt capital differ. But the coupon payments on corporate debt are tax deductible. If the firm has \$10,000 of pre-tax coupon payments, its pre-tax wealth decreases by \$10,000 and its after-tax wealth decreases by \$10,000. Why is the after-tax cost of debt capital different from the pre-tax cost of debt capital?

Answer: The terms *pre-tax* and *after-tax* can be confusing. Suppose a firm has a project that returns 10% on the capital invested after paying all costs, including federal income taxes, assuming no form of financing has a tax advantage. The firm needs \$100,000 of capital for the project, which returns a pre-tax profit of \$15,385 each year. It pays federal income taxes of $\$15,385 \times 35\% = \$5,385$, and it has an after-tax profit of $\$15,385 \times (1 - 35\%) = \$10,000$.

The firm can obtain the \$100,000 of required capital either from shareholders or creditors, both of whom require a 12% return, or \$12,000 each year. (In practice, shareholders generally require a higher return.) The providers of capital, whether shareholders or creditors, are not concerned with the firm's pre-tax or after-tax profit or its tax payments; they simply want \$12,000 a year.

- If the firm gets the capital from shareholders, it must give them \$12,000 each year from its after-tax earnings. It has \$10,000 in after-tax earnings, which is not sufficient.
- If the firm gets the capital from bondholders, it pays the them \$12,000 from its \$15,385 pre-tax earnings. It then pays the government $35\% \times (\$15,385 - \$12,000) = \$1,185$ in federal income taxes, leaving it $(1 - 35\%) \times (\$15,385 - \$12,000) = \$2,200$.

Question: Why do we call this the after-tax cost of capital?

Answer: Suppose the debt had no tax exemption and the firm has \$2,200 in after-tax profit after paying the debt coupons? The payment to the providers of capital is $\$10,000 - \$2,200 = \$7,800$, so the cost of capital is 7.80%, or $12\% \times (1 - 35\%) = 7.80\%$.

Question: The textbook speaks of earnings before interest and taxes (EBIT), earnings before interest, taxes, amortization, and depreciation (EBITAD), and earnings before taxes (EBT). Is there some order of payments, as though the firm pays interest on December 28, taxes on December 29, amortization on December 30, and depreciation on December 31?

Answer: The word *before* means *without the deduction for*. Interest is paid throughout the year, not on specific dates. Taxes are paid quarterly in advance, and a final adjustment is made in mid-March of the following year. Amortization and depreciation are accounting entries, not cash flows; they are not paid at any time. The cash flow is usually made when the item is bought or the expense is incurred.

- EBIT says how much *earnings* are available to pay the providers of debt capital.
- EBITAD says how much *cash* is available to pay the providers of debt capital.