

Financial Decision Making in a Business Context

Problem Set 2

1. Lumber Associates - PV(Interest Tax Shields) and after-tax WACC under different leverage policies

Investors expect the EBIT¹ of Lumber Associates to remain constant at 100 million euros per year. The company has 50 million of outstanding shares, trading at 8,32 euros per unit, and no debt. The company's effective tax rate is 25%. The firm distributes as dividends all profits not used for investment purposes; however, no dividends have yet been paid out from current profits.

The company has just learned about an investment opportunity requiring an initial investment of 60 million euros, with a similar risk to that of the existing business, and generating a perpetual incremental EBIT of 20 million euros.

- a. What is the company's after-tax WACC before the project?
- b. What would be the NPV of the project if funded with internal funds?
- c. What should be the share price immediately after the company announces the project and discloses that is funding it with internal funds? Assume that the company announces the project before paying out the current dividend.
- d. Show the firm's balance sheet at market values with the project and assuming internal financing, after the current dividend has been paid out.

Suppose that the company decides to borrow funds to cover the cost of the project. Assuming that the debt issued to fund the project is perpetual and constant in absolute value and pays an interest rate of 6%, answer the following questions:

- e. What is the PV of the interest tax shields?
- f. What should be the share price immediately after the company announces the project and discloses that is funding it by taking on debt to cover the initial outlay, which will be kept constant in absolute value? Assume that the company announces the project before paying out the current dividend.
- g. What should be the market value of the firm with the project, after the current dividend has been paid out?
- h. Show the balance sheet of the company at market values with the project, after the current dividend has been paid out.
- i. What is the rate of return required by equityholders?
- j. What is the current after-tax WACC with the project? Is the WACC likely to remain constant in the future?

¹ Also assume that Capex=Depreciation and Net Working Capital remains constant over time, so that EBIT=free cash flow.

Assuming that the debt issued to fund the project is perpetual and constant in relative value (i.e., as a % of the market value of the firm), and pays an interest rate of 6%, answer the following questions:

- k. What is the PV of the interest tax shields?
 - l. What should be the share price immediately after the company announces the project and discloses that is funding it by taking on debt to cover the initial outlay, which will be kept constant in relative value? Assume that the company announces the project before paying out the current dividend.
 - m. What should be the market value of the firm with the project, after the current dividend has been paid out?
 - n. Show the balance sheet of the company at market values with the project, after the current dividend has been paid out.
 - o. What is the rate of return required by equityholders?
 - p. What is the current after-tax WACC with the project? Is the WACC likely to remain constant in the future?
- q. Are the two leverage policies producing the same impact on shareholder wealth? What may account for the difference, if any?

2. Pharma Industry – Firm valuation and cost of capital with corporate taxes

You are in a world with corporate taxes but no personal taxes. The risk-free interest rate is 5% and the market risk premium is 8%.

PharmaBlue is a firm in the pharmaceutical industry. You have the following detailed information about the company:

EBIT one year from today = 133,333 million euros

Growth rate of EBIT = 2%

Current market value of Debt = 205,34 million euros (book value = market value)

Cost of debt = 5%

Current price per share = 82,14 euros

N° of shares outstanding = 10 million

Company tax rate = 25%

Target debt-to-value ratio = Current Debt-to-Value ratio

- a. What is PharmaBlue's after-tax WACC?
- b. What is PharmaBlue's cost of equity?
- c. What is PharmaBlue's PV(Interest Tax Shields)?

There are two privately held firms in the industry, PharmaRed and PharmaPink:

PharmaRed

EBIT one year from today = 50 million euros

Growth rate of EBIT = 0%

Current market value of Debt = 0

Company tax rate = 25%

Target debt-to-value ratio = Current Debt-to-Value ratio

PharmaPink

EBIT one year from today = 200 million euros

Growth rate of EBIT = 0%

Current value of Debt = 632,912 million euros (book value = market value)

Cost of debt = 5%

Company tax rate = 25%

Target debt-to-value ratio = Current Debt-to-Value ratio

Compute for each of the two firms:

- d. The firm's after-tax WACC;
- e. The PV(Interest Tax Shields)
- f. Among the three firms in the pharmaceutical industry, which one is creating more shareholder value through its capital structure policy? Why?