

Financial Decision Making in a Business Context

Problem Set 1

1. Equity Financing

Zeta Corp generates annual earnings of 350 million, which are entirely distributed to shareholders as dividends (the dividend for the current year is going to be paid soon). There are 10 million shares outstanding, trading each at 175 euros. You are in an efficient market in which all relevant public information is reflected on the value of traded securities.

The company is planning to invest 150 million in a project with a NPV equal to 130 million. This plan, however, has not yet been disclosed to the market.

1. What is the rate of return required by the firm's shareholders?
2. What should be the value of a share after the firm discloses the project, but before it pays the current dividend?

Suppose that the firm decides to fund the project with internal funds, reducing the current dividend paid to shareholders.

3. What is the impact on the per-share wealth of shareholders? How much of it consists of cash gains/losses? How much consists of capital gains/losses?

Suppose that the firm decides to raise the initial investment outlay for the project entirely through a rights offering occurring after the current dividend has been paid out. For each share held, shareholders will receive one right, and ten rights will be required to buy a new share at a discounted price. New shares will be offered for sale at the discounted price during a 4 week period; during that period, shareholders not interested in exercising their rights will be able to sell them in the market.

4. What should be the subscription price of new shares?
5. What should be the value of a share after the rights' offering has finished?
6. At what price should a right trade during the 4-week subscription period?
7. Consider a shareholder who exercises his rights. What should be the impact on the per-share wealth of shareholders? How much of it consists of cash gains/losses? How much consists of capital gains/losses?
8. Consider a shareholder who sells his rights. What should be the impact on the per-share wealth of shareholders? How much of it consists of cash gains/losses? How much consists of capital gains/losses?
9. How would you change your answers to questions 4 to 8 if the rights' offering featured an exchange ratio of 4 (i.e., 4 rights are required to buy a new share)?

Suppose that the Zeta Corp decided to fund the project with a general cash offer for shares.

10. How many new shares should the company sell? At what price?
11. What should be the impact on the per-share wealth of shareholders? How much of it consists of cash gains/losses? How much consists of capital gains/losses?

Suppose now that the direct costs associated with a rights' offering – i.e., underwriting fees paid to investment banks, fees paid to auditors and lawyers for due diligence, costs with prospectus and registration – are equal to 3% of the amount of money raised; the corresponding direct costs associated with a general cash offer are equal to 5% of the new money raised. A dividend cut, in contrast, entails no direct costs.

Additionally, you know that the announcement of a dividend cut triggers a permanent reduction of 3% in the share price. On the other hand, the announcement of a rights' offering triggers a permanent reduction in the share price of 3% whereas the announcement of a general cash offer prompts a permanent reduction in the share price of 2%.

12. Under such assumptions, which is the best way to finance the project?

2. Home leveraging and deleveraging

Part I – perfect capital market

PaperInk is a company in the paper industry, operating in a perfect capital market. The company has an annual EBIT of 500000 euros (expected to remain constant over time¹) and 1 million euros of debt, on which it pays an interest rate of 10%. The rate of return appropriate for the business risk of the paper industry is 20%.

1. What should be the value of the company? How much is debt? How much is equity? Show the company's balance sheet at market values.
2. What is the rate of return required by the company's equityholders?
3. What is the overall cost of capital borne by the company?

Suppose that PaperInk borrows an additional 500000 euros at 10% annual interest, to fund a project in the paper industry that will generate a perpetual and constant increment to the existing EBIT, with a NPV=0.

4. What are the new values for questions 1, 2, and 3 if the firm undertakes the project?

(in the rest of the problem assume that PaperInk has undertaken the project)

PaperBlot is a close competitor of PaperInk that only uses equity in its capital structure. PaperBlot generates perpetual and constant EBIT of 400000 annually.

5. Answer questions 1, 2, and 3 for PaperBlot.
6. Suppose that the market capitalization of PaperBlot is 1,5 million euros. If you own 12500 euros in shares of Paper Ink, can you make money by trading the securities issued by the two companies? How?
7. Suppose that the market capitalization of PaperBlot is 2,5 million euros. If you own 12500 euros in shares of PaperBlot, can you make money by trading the securities issued by the two companies? How?
8. Could you still implement the trading strategies delineated in questions 6 and 7 if you don't own any shares to start with? How? Answer only qualitatively.

Part II – imperfect capital market (corporate taxes)

Suppose the two companies have values consistent with equilibrium. The government introduces corporate taxes at a flat rate of 25%.

9. Answer again questions 1, 2 and 3 for PaperInk and PaperBlot;
10. What happens to the relative value of the two companies?
11. What happen to the relative overall cost of capital borne by the two companies?

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

3. Leverage recap

Part I – perfect capital market

Electronix Inc is a company in the electronics industry, operating in a perfect capital market. The company's EBIT² is drawn, every year and in an independent fashion, from the following distribution:

	Recession	Normal	Boom
Probability	0,25	0,50	0,25
EBIT	50	150	250

(in million euros)

The company has 500 million of perpetual debt outstanding, on which it pays an interest rate of 6%. The number of currently outstanding shares is 2 million. The required rate of return for assets in the electronic industry is 12%.

1. What should be the value of the company? How much is debt? How much is equity? Show the company's balance sheet at market values.
2. What should be the company's price per share?
3. Plot the earnings-per-share of the company as a function of the realization of the EBIT. What are the company's expected EPS?

Suppose the firm issues an additional 200 million of perpetual debt (also at 6%), using the proceeds to buy back shares.

4. At what price should the company repurchase its shares? How many shares will the company buy back?
5. Answer again question 3, comparing the new results with those obtained earlier. What happened to the company's expected EPS? What kind of impact should that have on the market value of a share?
6. Show that the value of a share after the leverage recapitalization should be the same as the value before.

Part II – imperfect capital market (corporate taxes and transaction costs)

Redo questions 1 to 5 under the following assumptions:

- Electronix pays corporate taxes at a 30% rate;
- There are no personal taxes;
- Investment banks charge 10 million euros plus a variable of 5% (assessed on the euro amount of the leverage recap) to organize and execute the leverage recapitalization.

² Also assume that Capex=Depreciation and Net Working Capital remains constant, so that EBIT=free cash flow.