

## Chapter 6: Valuing levered projects

### Exercises

1. ZXco is a mature, established company. Over the years, it acquired capital from different sources and the right hand side of its balance sheet currently has the following items:

- Common shares: 10 million outstanding shares, currently priced at €6 to give 12% return.
- Preferred shares: 1 million outstanding shares, currently priced at €5 to give 15% return.
- Bonds: 4 million outstanding zero coupon bonds; the bonds have a face value of €10, and mature 5 years from now; they currently trade at €6.806.
- Long term bank loan: €20 million, secured by ZXco's buildings; interest rate is 7% but is adjusted every year.
- Short term bank loan: €20 million in a rolling line of credit (i.e. automatically renewed), 9% interest.
- Accounts payable: €10 million outstanding.

(a) ZXco pays 25% taxes. Calculate its WACC.

2. TeleSør considers investing in a new mobile broadband network in Trøndemark. The company wants to finance the project with 25% debt, which it can borrow at 5% interest. The rest would be financed with equity, on which TeleSør expects a 15% return. Together with the corporate tax rate of 28% this gives the project a WACC of 12.15% ( $WACC = (1 - \tau)r_d \frac{D}{V} + r_e \frac{E}{V} = (1 - .28) \times .05 \times .25 + .15 \times .75 = .1215$ ). However, calculations show that the project is unprofitable if the discount rate is higher than 10%. The project's chief engineer suggests to finance the project with 50% debt because that would bring the WACC below 10%:  $(1 - .28) \times .05 \times .5 + .15 \times .5 = 0.093$ .

(a) Is the chief engineer's argument correct? Explain.

3. A firm is considering investing in a new line of business. As preparation for the decision, a junior financial manager collected the following data on the 4 main competitors in the business:

Firm	$r_e$	$r_d$	D/V
1	16.0%	5.2%	0.6
2	14.5%	4.9%	0.5
3	13.6%	4.6%	0.5
4	12.4%	4.3%	0.4

All debt is continuously rebalanced.

- (a) Use the data of the 4 firms to calculate the Opportunity Cost of Capital ( $r_a$ ) in the industry.

4. A company obtained a €400 000 loan from its bank. The loan has to be paid back in amounts of €100 000 after each of the following four years. The interest on the loan is 10% and the company has a tax rate of 30%

(a) Calculate the value of the tax savings on the loan, assuming that the interest and taxes are paid at the end of each year.

Suppose the company knows it will have to settle an old conflict with the tax authorities. It therefore agreed with the bank to double the loan in year 2 on the same conditions. The extra money will be paid back in year 3. This will make the tax advantage go up and down strongly.

(b) Is this volatility in the tax savings a reason to adjust the discount rate? Explain.

5. E-razor Corp. is considering the introduction of a new product. The introduction requires an immediate investment of €1000 and the product is expected to generate an after tax cash flow of €333 per year for 4 years starting 1 year from now. E-razor estimates the risk of the project to be such that the company would require a return of 12.5% if it financed the projects exclusively with equity. For this project, E-razor plans to raise 50% of the investment by issuing new shares. The issue costs are 5%. The remaining 50% of the investment is financed with a loan. E-razor agreed with its bank to pay 8% interest at the end of each of the following 4 years. The loan will be redeemed in 1 payment together with the last interest payment. E-razor has a tax rate of 30%.

(a) Should E-razor go ahead with the project or not? Use APV calculations to support your answer.

(b) Explain why APV is the preferred method in this case.

6. Korkla AS is a large conglomerate active in, among other things, soft drinks, heavy metals and financial services. As a well diversified firm that has excellent relations with its banks, it has a low company average costs of capital. Although 60% of its total value is financed with debt, its cost of debt is only 7%, or 1% over the risk free rate of 6%. It is now considering a project to enter the NO-WITS (Norwegian wireless internet telephone service) business, the latest development in telecommunication. This will require an immediate investment of 750 million and is expected to produce a perpetual after tax cash flow of 100 million per year starting 1 year from now. Korkla plans to finance the investment with 25% debt, for which the bank has made an offer at 8% interest. At present there is only one firm active in the NO-WITS industry, the Checkers company. Checkers is financed with equal parts of debt and equity, its debt has a 9% interest rate and its equity has a  $\beta$  of 1.4. The market risk premium is 8% and the corporate tax rate for all firms is 40%. All debt is rebalanced.

(a) Should Korkla accept the NO-WITS project or not? Use calculations to support your answer and make additional assumptions if necessary.