

## Issues in international taxation (Prof. Parisi, academic year 2023-24)

### Exercises: corporate taxation

1. The table below reports a company's account in a given year.

Revenue from sales	30000
Interest income	300
Salaries	3000
Interest costs	1000
Material goods	2500
Fixed assets purchase	5000
Depreciation	
Profits	
Taxable income	
Corporate tax due	
Net profits	

Assume a fixed depreciation scheme with a rate of 10% and a statutory corporate tax rate of 24%. For tax purposes interest costs are deductible up to the interest income threshold.

Complete the table by calculating:

- a) depreciation;
- b) profits;
- c) taxable income;
- d) the corporate tax; (e) net profits.

**Results:** (a) 500; (b) 18300; (c) 19000; (d) 4560; (e) 13740.

2. The table below reports a company's account in two given years.

	Year t <sub>1</sub>	Year t <sub>2</sub>
Revenue from sales	550000	850000
Interest income (from bonds)		20000
Salaries	350000	400000
Material goods	300000	250000
Machinery purchase	10000	20000
Depreciation		
Profits		
Taxable income		
Corporate tax due		
Net profits		

Assume a fixed depreciation scheme with a rate of 20% and assume the system allows losses to be carried forward up to the profits threshold. Given a statutory corporate tax rate of 24%, calculate for each year:

- a) depreciation;
- b) profits;
- c) taxable income;
- d) the corporate tax;
- e) net profits.

**Results:** (a) 2000; 4000; (b) -112000; 196000; (c) 0; 84000; (d) 0; 20160; (e) 175840

3. Consider again data of the previous exercise. Assuming an interest rate of 5%, calculate the present value of:

- a) taxable income;
- b) the corporate tax;

Also, calculate the effective corporate tax rate.

Hint: present values can be calculated using the method described in the textbook at page 726 (depreciation) which applies also to this case. The effective tax rate can then be calculated as the ratio between the corporate tax and taxable income.

**Results:** (a) 80000; (b) 19200; (c) 0,24-

4. The table below reports a company's account in a given year.

<b>Positive income components</b>	
Revenue from sales	16000
Interest income	800
Dividends	10000
Capital gains	5000
<b>Negative income components</b>	
Salaries	5000
Interest costs	500
Variable costs	5000
Profits	
Taxable income	
Corporate tax due	
Net profits	

For tax purposes, interest costs are deductible up to the interest income threshold. Moreover, dividends are 95% tax exempt (5% of the total amount is included in the tax base). The statutory corporate tax rate of 24%. Calculate:

- a) profits;
- b) taxable income;
- c) the corporate tax;
- d) net profits.

**Results:** (a) 21300; (b) 11800; (c) 2832; (d) 18468.

5. Consider again data of the previous exercise. Assume the company purchases a new machinery which costs 6000 Euros. The investment is financed with debt for which the interest rate is 5%. Again, interest costs are deductible up to the interest income threshold. For tax purposes, the rate of depreciation is 10%. Calculate:
- taxable income;
  - the corporate tax due.

**Results:** (a) 4900; (b) 1176.

6. Consider data of the previous exercise and assume the government introduces a tax credit for new investments, deductible from the tax due, in the amount of 10% of the investment expenditure. Calculate the new amount of the corporate tax.

**Results:** 576.

7. Refer to the last two exercises. Calculate the effective corporate tax rate (Hint: it can be calculated as the ratio between the corporate tax and taxable income). How can you interpret the results?

**Results:** discussion in class.

8. A company sells a good in a perfectly competitive market just using capital ( $K$ ) for which the marginal return is described by the following function:  $\pi = 10 - K$ . The price of the good is 1, there is no depreciation, and the market interest rate (opportunity cost) is 0,05. For now, abstract from the company's financing source. Calculate:
- the cost of capital;
  - the optimal investment;
  - total profits.
  - draw a graph representing the equilibrium point.

**Results:** (a) 0,05; (b)  $K=9,95$ ; (c) 49,5; (d) discussion in class or refer to the textbook.

9. Refer back to data of the previous exercise and assume a corporation tax with a rate of 0,20 is introduced. Again, abstract from the company's financing source. Calculate:
- the after tax cost of capital;
  - the optimal investment;
  - total profits;
  - draw a graph representing the equilibrium point.

**Results:** (a) 0,06; (b)  $K=9,94$ ; (c) 9,94; (d) discussion in class or refer to the textbook.

10. Refer to data of exercise 10. Assume the investment is financed with debt and interest cost is fully deductible from the corporate tax base. Calculate:
- the after tax cost of capital;
  - the optimal investment;
  - total profits;
  - draw a graph representing the equilibrium point.

**Results:** (a) 0,05; (b)  $K=9,95$ ; (c) 9,95; (d) discussion in class or refer to the textbook.

11. Refer to data of exercise 11 and now assume the investment is financed with retained profits (the company uses part of its profits to finance the investment). In this case the investment financing cost is not tax-deductible. Calculate:

- a) the after tax cost of capital;
- b) the optimal investment;
- c) total profits;
- d) draw a graph representing the equilibrium point.

**Results:** (a) 0,06; (b)  $K=9,94$ ; (c) 9,94; (d) discussion in class or refer to the textbook.

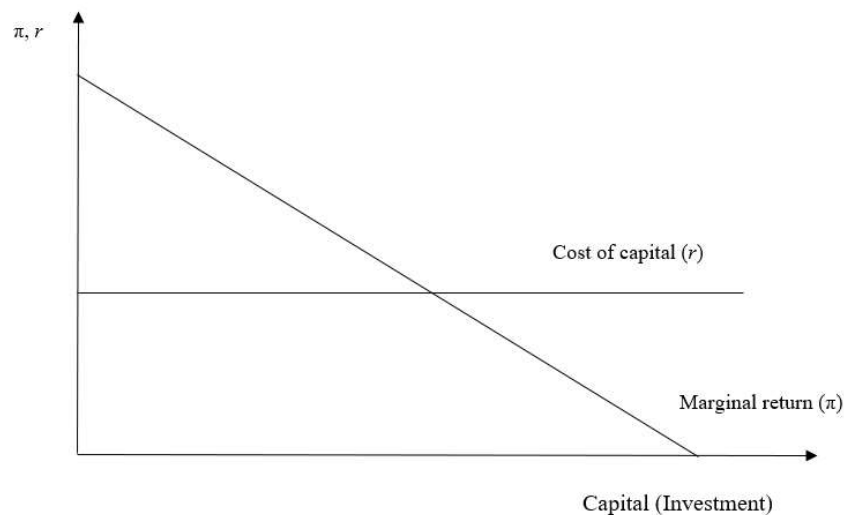
12. As an exercise, repeat again exercises from 8 to 11 using the following function for the marginal return of capital:  $\pi = 10 - 1/2K$ .

**Results:** discussion in class.

13. As an exercise, repeat again exercises from 8 to 11 using the following function for the marginal return of capital:  $\pi = 20 - 2K$ .

**Results:** discussion in class.

14. The graph below illustrates the optimal demand for capital (investment) of a given firm.



- a) How can you interpret the user cost of capital?
- b) Now depict the effects of the introduction of a proportional corporation tax assuming the tax is neutral over investment decisions.
- c) How will the user cost of capital change after the introduction of the corporate tax in case of a neutral tax?
- d) How do you interpret the neutrality conditions?
- e) Does a neutral corporate tax also guarantee neutrality over a firm's financing choices?

**Results:** discussion in class. See the textbook.