Université Catholique de Louvain
Finance – LECGE1332

Exercise session: 1

Exercise 1:

Adam received 3,000 Euros by his grandfather. He decided not to spend the money, but to put it into a saving account, earning 1.2% each year. How much is going to be available on his bank account after 20 years? (Use both simple and compound interest formulas; explain why the two results are different)

Assumption: the interest rate does not change over the time span considered (keep this assumption for all the exercises unless differently specified).

Exercise 2:

John decides to save some money. He deposits 700 euros at the end of each month for 10 years. The effective annual interest rate is 1.25%.

- Compute the monthly interest rate.
- Compute the amount of money that will be available on his bank account after 20 years (assuming no deposit after year 10).

Exercise 3:

You have decided to buy a flat. It costs 150,000 €, so that you decide to ask your bank for a mortgage. They offer you an annual interest rate of 4%. You can reimburse the debt over a time span of 10 years. How much do you have to pay at the end of each year if you accept this deal?

Exercise 4:

You have a mortgage of 100,000 euros to pay back in 10 years. You make annual payments (at the end of each year) and the interest rate is 2%.

Compute the annual payment. Moreover, determine the amount of capital and interest that you pay (included in the annuity) for the first 3 years.

Hint: even if you do not find this information in the slides, it is easy to search the explanation of how to compute it online: google it, understand it, and write your reasoning.

Exercise 5:

You are the CEO of a company that decides to fund itself on the bond market, as it needs 100,000 euros. You decide to issue a bond with the following characteristics:

- The maturity is 5 years.
- At the end of each year you will pay a coupon of 10% of the total amount of debt issued (that is 100,000 euros)
- At the end of the fifth year, you will pay back 100,000 euros.

Moreover, in order to enter successfully the bond market, you decide to get help from an investment bank. The fee they ask you is 2%, to be paid at the beginning of the transaction.

Taking into account that the cost of the debt is 10% without fees, what is the cost of the debt if the investment bank is involved?

Exercise 6:

You want to start saving an amount of money now (at the end of each year) for 20 years in order to enter a pension program with the following characteristics:

- The first pension payment will be at the end of the 21st year
- The annual payment you will receive is 10,000 (at the end of each year)

How much do you have to save at the end of each year, during the first 20 years?

The saving rate is 5% and the discount rate used by the bank in order to compute the annuity is 4%.