TP 4: Investment Decisions

Exercise 1:

These are the cash flows generated by the project A:

Project	**0**	**1**	**2**
A	-100	60	60

1) Compute the Net Present Value (NPV) of this project assuming that appropriate discount rate is (i) 10% and (ii) 20%. Illustrate graphically your computations (Vertical axis: NPV and horizontal rate: discount rate)
2) Using the graph that you constructed in the previous exercise, determine the approximate internal rate of return (IRR) of this project.
3) Compute algebraically the exact IRR of this project.

Exercise 2:
A firm wants to buy a new machine with the aim to increase the level of production. This machine costs 20.000 euros and it will increase the cash flows by 4.000 euros each year for the next eight years.

1) If the opportunity cost of capital is 9%, what is the *Net Present Value* (NPV) of this project equal to? Do you advice the managers of this firm to invest in this new machine?
2) What is the *Payback Period*?
3) If the opportunity cost of capital is now 14%, what is the NPV of the project equal to? What conclusions can you draw?
4) Which is the maximum discounting rate that can be applied before we decide to give up from investing in this project? What represents it?

Exercise 3:
A firm wants to replace a machine that is arrived at the end her lifetime. Two different new machines can be bought: a high quality one or a low cost one. The technical features of this two equipment are reported in the following table:

Type of machine	**Acquisition Cost (euros)**	**Lifetime (years)**	**Operating costs (per year)**
High quality	15.000	10	5% of the acquisition cost
Low cost	10.000	7	7% of the acquisition cost

The low cost machine will have to be revised after 4 years at the cost of 4.000 euros. The opportunity cost of capital is 12%.
From the financial point of view and forgetting about taxation effects, which machine you advice the managers to buy?

Exercise 4:
Company A consider a new project, Table 1 below gives the forecasts without the project and Table 2 shows the forecasts with the project.
Table 1

Year	**1**	**2**	**3**	**4**
Revenues	100.000	110.000	120.000	130.000
-COGS	40.000	44.000	48.000	52.000
-Depreciation	40.000	30.000	20.000	10.000
=EBIT	20.000	36.000	52.000	68.000

Table 2

Year	**1**	**2**	**3**	**4**
Revenues	110.000	121.000	132.000	143.000
-COGS	44.000	48.400	52.800	57.200
-Depreciation	44.000	33.000	22.000	11.000
EBIT	22.000	39.600	57.200	74.800

This project requires an initial investment of 15.000 euros in fixed assets (in year 0) and a further investment of 2.000 euros at the end of the second year.
The Net Working Capital is estimated to be 10% of Revenues.
It is assumed that this need in working capital must be fully funded at beginning of period and is recovered at the end of 4 years.
The different Fixed Assets that have been bought will be resold at the end of the fourth year at their net book value without any capital gains.
The corporate tax rate is 40%.

1) Estimate the different cash flows related to this project;
2) If the opportunity cost of capital is 12%, what is the Net Present Value (NPV) of this project? Is it profitable to invest in this project?
