Investment Project Analysis Exercises

1.

A company plans to open a new loom production facility for the textile industry, which plans to operate for a period of 3 years on an investment in non-current assets to be fully done at the start of the project, which is expected to amount to € 1,000,000. Under a special scheme, amortization of non-current assets will be made at the annual rate of 25%.

For the period considered, an annual inflation rate of 3% and a tax rate of 25% are expected (the tax is considered to be settled in the year to which it relates).

The company expects to sell 60 units in the first two years and 50 units in the third. As of the first year of the project, each unit will be sold for a unit price of € 50,000, with the company's annual fixed costs € 500,000 and variable unit costs € 25,000. A working capital investment of 5% of sales is expected.

As residual value of the project, the book value of the non-current asset is considered.

1. Calculate cash flows for each of the project years.
2. Calculate the NPV of the investment project, assuming a return of 10%.

2.

Given recent forecasts of rising demand, a semiconductor testing machine manufacturer plans to expand its production capacity with a new manufacturing module in which it will invest in non-current tangible assets 60 M € and non-current assets. intangible current 3 M €.

Under a special scheme, amortization of tangible non-current assets will be made at the annual rate of 25%, and amortization of intangible non-current assets at the annual rate of 50%.

The manufacturer plans to sell the factory module after three years for 10 M €.

Predictions of prices, costs and quantities sold for the project period are presented in the following table:

	Year 1	*Year 2*	*Year 3*
Unitary prices	1.20 M€	1.24 M€	1.29 M€
Unitary variable costs	0.60 M€	0.62 M€	0.64 M€
Fix costs	10.00 M€	10.35 M€	10.71 M€
Units sold	60	40	50

The figures presented already take into account the expected inflation of 3.5% per year, where applicable. During the period considered there should be an income tax rate of 25%. It is anticipated the need for working capital investment that allows it to maintain the level of 5% of sales value.

1. Calculate cash flows for each of the project years, including the initial investment.
2. Say what you understand by the Internal Rate of Return (IRR) of an investment project.

3.

One company plans to open a new textile weaving unit, which plans to operate for a period of 5 years on an investment in non-current assets to be fully realized at the start of the project, which is expected to amount to € 1 000 000.

The forecast results for this period are as follows:

Year	1	2	3	4	5
Sales	309 000 €	318 270 €	327 818 €	337 652 €	347 782 €
Net Earnings	116 300 €	122 789 €	129 472 €	136 356 €	143 447 €

The figures presented already take into account the forecast inflation of 3% per year, where applicable.

It is anticipated that a working capital investment is required to maintain a level of availability of 5% of sales.

As the residual value of the project, the book value of the non-current asset is considered, and the respective amortization is made at the annual rate of 10%. Expected tax rate is 25%

1. Reconstitute cash flows for years 0 (initial investment) to 5 (terminal year).
2. Considering a capital cost of 10%, determine whether or not the project should move forward.

4.

A semiconductor manufacturer plans to purchase a new testing machine for € 1,000,000. Installation and configuration of the machine for use in the manufacturer's production unit should cost € 100,000. Under a special scheme, amortization of non-current assets will be made at the annual rate of 25%. The manufacturer plans to sell the machine after three years for € 300,000. The machine requires an investment of € 20,000 in working capital (spare parts).

The machine is not expected to have an effect on sales, but it is estimated that costs will be reduced due to more accurate defect detection of € 400,000 per year.

For the period considered, an annual inflation rate of 3% and a tax rate of 25% are expected.

1. Calculate cash flows for each of the project years.
2. If the required return on investment (excluding inflation) is 7%, should the machine be purchased? Justify.

5.

One company intends to make an investment in expanding its production capacity by acquiring two production lines, each worth 500,000 Euros. The investment will be made in two parts, the first line being acquired immediately and the second within a year.

The company intends to study the profitability of the project for a period of 4 years.

The forecast results for this period are as follows:

Year	1	2	3	4
Sales	600 000 €	1 100 000 €	900 000 €	600 000 €
Net earnings	30 000 €	250 000 €	150 000 €	40 000 €

The figures presented already take into account inflation forecasts - 3% per year - and tax - 25%. Amortization of production lines is made at the annual rate of 20%.

At the end of the project, the market values of the production lines are: 150 thousand Euros, for the first line to be acquired; 250 thousand Euros, for the second one.

It is anticipated that a working capital investment is required to maintain it at a level of 20% of sales value.

1. Calculate cash flows for each of the project years, including the initial investment.
2. Calculate the NPV of the project, assuming a capital cost (including inflation) of 12%.
3. The company proposes to sell one of the lines at the end of year 3, and to operate during year 4 only with the other. At the end of year 3, the market values of the production lines are: 250 thousand Euros, for the first line to be acquired; 350 thousand Euros, for the second. If so, which of the two production lines should be sold by the end of year 3?

6.

One company intends to make an investment in expanding its production capacity by acquiring a new production line worth 900,000 Euros. The company intends to study the profitability of the project for a period of 4 years.

The forecast results for this period are as follows:

Year	1	2	3	4
Sales	900 000 €	1 200 000 €	1 300 000 €	700 000 €
Net earnings	50 000 €	150 000 €	200 000 €	100 000 €

The figures presented already take into account inflation forecasts - 4% per year - and tax - 35%. Amortization of the production line is made at the annual rate of 33.33%. The residual value of the production line is the book value.

It is anticipated that a working capital investment is required to maintain it at the following levels as a percentage of sales:

Year	1	2	3	4
Net earnings	10%	12%	10%	8%

1. Calculate cash flows for each of the project years, including the initial investment.
2. Calculate the NPV of the project, assuming a capital cost (including inflation) of 15%.
3. Now admit that the working capital assumes a constant percentage of sales throughout the project. Determine the maximum value for this percentage so that the project remains profitable.