

## Financial Management. Chapter 2. Exercises on capital budgeting

1. TIP Inc. is analyzing an investment in a machine to produce headphones. The cost of the investment is 120 million \$ (fully depreciated straight-line during its economic life of five years, with salvage value of 10 million \$). The expected annual sales of headphones (in millions of units) for the next five years are: 5, 6, 7, 9 and 10. The price of each headphone is 20 \$. The production cost per headphone is 12 \$ and the project will have annual fixed costs of 16 million \$ (without including depreciation). It is expected that the working capital generated by the project will be 10% of the sales. Tax rate is 30% and the cost of capital is 8%.

- a) Calculate the payback of the project.
- b) Should the investment be made according to the Net Present Value?
- c) Should the investment be made according to the Modified Internal Rate of return.

2. At the end of 2016 we are analyzing an investment project that will generate the expected profits and losses and working capital requirements shown by the next tables (figures in million €). The project requires an immediate payment of 45 million € and, it will be depreciated by the straight-line method with salvage value of 5 million €. At the end of 2021 the investment will have a salvage value of 5 million € and a book value of 0 €. The cost of capital is 12%.

	2017	2018	2019	2020	2021
Sales	45	50	52	54	56
Cost of sales	28	31	31	31	34
Depreciation	9	9	9	9	9
Operating costs	2	1	2	3	2
Interests	3	3	4	4	5
Earnings before taxes	3	6	6	7	6
Taxes (30%)	0.9	1.8	1.8	2.1	1.8
Net Income	2.1	4.2	4.2	4.9	4.2

### Working capital

	2016	2017	2018	2019	2020
Stocks	10	12	12	14	14
Receivables	20	18	19	21	21
Payables	12	9	11	12	13

- a) Calculate the payback of the project.
- b) Should the investment be made according to the Net Present Value?
- c) Should the investment be made according to the Modified Internal Rate of return?

3. Our company is considering to invest in a new machine that is expected to generate the sales and costs shown in the table below (figures in € million). The cost of the machine is 60 million € (depreciated straight-line during its economic life of five years. Book value of 2 million € at the end of 2022 and salvage value of 5 million €).

	2018	2019	2020	2021	2022
Sales	45	50	52	54	56
Cost of goods sold	28	31	31	31	34
Other operating expenses	3	3	4	4	5
Interest expenses	2	2	2	2	2

Customers pay at 90 days, we pay our suppliers at 60 days and inventories represent 10% of the sales. The tax rate is 30% and the cost of capital is 8%.

- Calculate the Payback.
- Should the investment be made according to the Net Present value?
- Should the investment be made according to the Modified Internal Rate of Return? (reinvestment rate: 6%).

4. The Yurdone Corporation wants to set up a private cemetery business. According to the CFO, Barry M. Deep, business is "looking up." As a result, the cemetery project will provide a net cash inflow of \$60,000 for the firm during the first year, and the cash flows are projected to grow at a rate of 4.5 percent per year forever. The project requires an initial investment of \$694,000.

- If Yurdone requires a 12.5 percent return on such undertakings, should the cemetery business be started?
- The company is somewhat unsure about the assumption of a 4.5 percent growth rate in its cash flows. At what constant growth rate would the company just break even if it still required a return of 12.5 percent on investment?

5. Anderson International Limited is evaluating a project in Erewhon. The project will create the following cash flows:

Year	Cash-Flow
0	-\$690,000
1	243,000
2	175,000
3	256,000
4	231,000

All cash flows will occur in Erewhon and are expressed in dollars. In an attempt to improve its economy, the Erewhonian government has declared that all the intermediate cash flows created by a foreign company are "blocked" and must be reinvested with the government during the project's life. The reinvestment rate for these funds is 3 percent. If Anderson uses a required return of 7 percent on this project, what are the NPV and IRR of the project?

6. A project under consideration costs \$750,000, has a five-year life, and has no salvage value. Depreciation is straight-line to zero. The required return is 17 percent, and the tax rate is 34 percent. Sales are projected at 500 units per year. Price per unit is \$2,500, variable cost per unit is \$1,500, and fixed costs (excluding depreciation) are \$200,000 per year. Our customers pay on average at 60 days and we pay to our suppliers (variable costs) at 40 days. We want to maintain a level of stock equivalent to 20 days of sales.

Compute the NPV of the project if the company's cost of capital is 9%.

7. Books&Coffee is considering adding a café to its bookstore. The café, it is hoped, will make the bookstore a more attractive destination for would-be shoppers.

The following information relates to the proposed café:

- The initial cost of remodeling a portion of the store to make it a café and of buying equipment is expected to be \$150,000. This investment is expected to have a life of five years, during which period it will be depreciated using straight-line depreciation. None of the cost is expected to be recoverable at the end of the five years.
- The revenues in the first year are expected to be \$60,000, growing at 10% a year for the next four years.
- There will be one employee, and the total cost for this employee in year one is expected to be \$30,000 growing at 5% a year for the next four years.
- The cost of the material (food, drinks, etc.) needed to run the café is expected to be 40 percent of revenues in each of the five years.
- An inventory amounting to 5% of the revenues has to be maintained; investments in the inventory are made at the beginning of each year.
- The tax rate for Books&Coffee as a business is 40% and its cost of capital is 12.37%.

Calculate the Payback, NPV, IRR and MIRR of this investment. Should it be made?