

Assignment 1

Ideal & Co. operates under ideal conditions of uncertainty. It has decided to purchase a new machine, but the management does not know how much to pay for the machine. The payment will take place at the beginning of the first year. The interest rate in the economy is 5 % p.a. The machine is expected to last for two years, after which time it will have zero salvage value.

The new machine is an experimental model, and its suitability for use in Ideal's operations is not completely known.

The first year:

Ideal assesses a 0.20 probability that there will be a major machine failure during the first year of operations, and a 0.80 probability that the machine will operate without a failure. If there is a major failure, cash flow for the year will be €2,000. If the machine operates without a failure, cash flow will be €4,000 for the year.

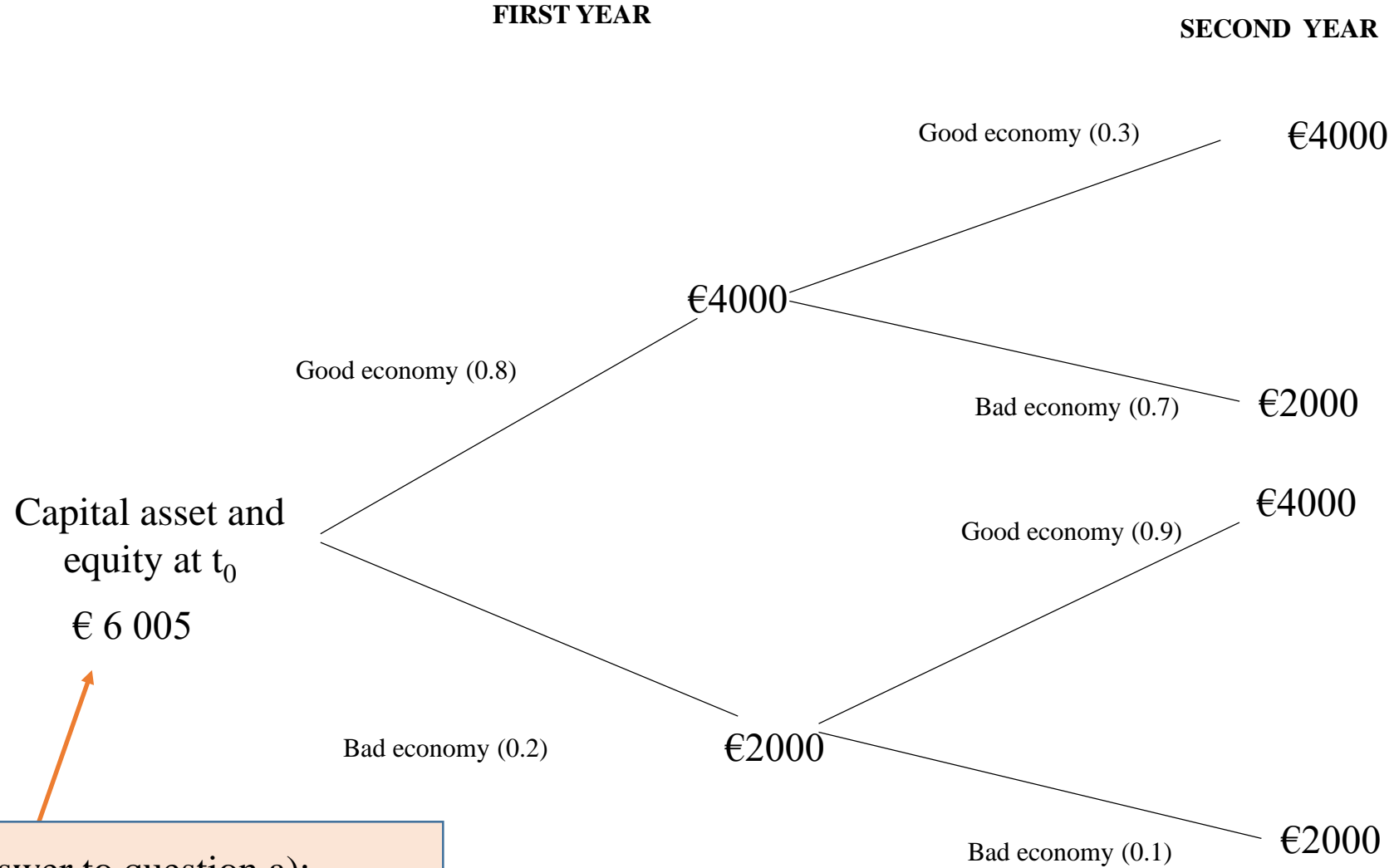
The second year:

If there is no major failure in the first year, the probability of a major failure in the second year is 0.70. If there is a major failure in the first year, the probability of a new major failure in the second year is 0.10. If there is a major failure in the second year, cash flow for the year will be €2,000. Cash flow for the second year will be €4,000 in case of no major failure in the second year.

It turns out that there is a major failure in the first year.

- a) Assess what is an appropriate purchase price, provide calculations.
- b) Prepare an income statement for year 1 and the balance sheet at the end of year 1 considering the major failure during the first year.

The beginning balance



Answer to question a):
appropriate purchase price is € 6 005

Accretion of discount	300
Abnormal earning, year 1	-1 600
Abnormal earning, year 2	914
Total	-385

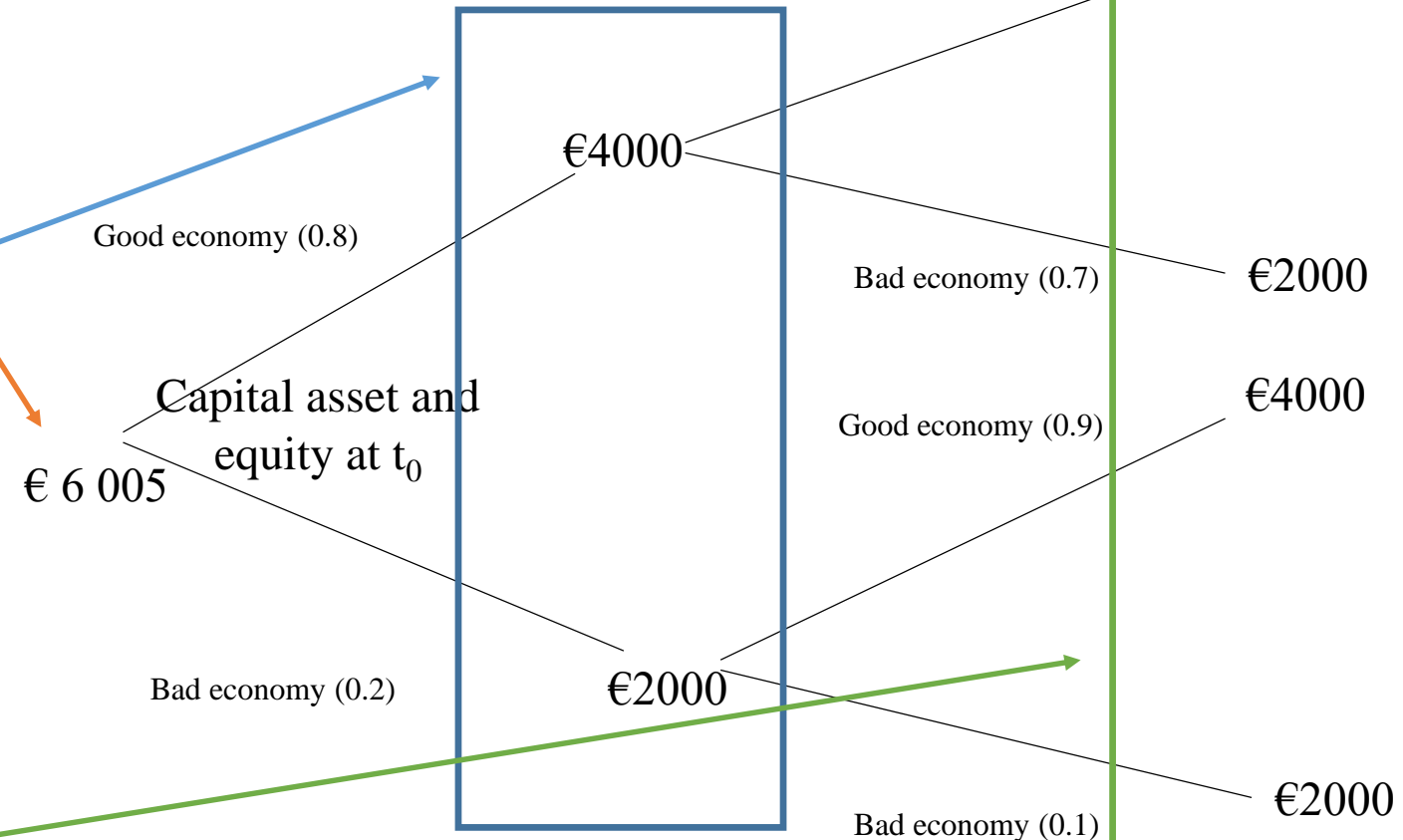
Accretion of discount
 $0.05 * 6005 = \text{€ } 300.3$

”It turns out that there is a major failure in the first year.”
First year abnormal earning:
 $2000 - (0.8 * 4000 - 0.2 * 2000) = - \text{€ } 1600$

In this example also
Second year abnormal earning:
 $(0.9 * 4000 + 0.1 * 2000 - 0.8 * 0.3 * 4000 - 0.8 * 0.7 * 2000 - 0.2 * 0.9 * 4000 - 0.2 * 0.1 * 2000) / 1.05 = \text{€ } 914.3$

FIRST YEAR

SECOND YEAR



b) "Prepare an income statement for year 1 and the balance sheet at the end of year 1 considering the major failure during the first year."

Balance Sheet at the end of year 1

Financial assets: cash	€ 2000	Shareholders' equity, opening value	€6005
Capital assets: present value	€ 3619	Net income	-€385
	€ 5619		€ 5619





Income statement for year 1 (Hick's)

Cash flow = €2000
Change in capital assets (NVP) = -€2385
Net income = -€385

Income statement for year 1 (Scott)

Accretion of discount 5% x 6005€ = €300.3
Abnormal earnings year 1 = -€1600
Abnormal earnings year 2 = €914.3
Net income = -€385

Geogebra

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a() = 4000	
b() = 2000	
c() = 1.05 → $\frac{21}{20}$	
$\text{Asset0}() = 0.2 \left(\frac{b}{c} + \frac{0.1 b + 0.9 a}{c^2} \right) + 0.8 \left(\frac{a}{c} + \frac{0.7 b + 0.3 a}{c^2} \right)$ $\approx 6004.535147392291$	
$\text{Asset1}() = \frac{0.1 b + 0.9 a}{c}$ $\approx 3619.0476190476188$	
$\text{Profit}() = \text{Asset1} - \text{Asset0} + b$ $\approx -385.4875283446709$	