Exercise 02

A professional services firm intends to project the results of its activity for the 4th quarter of 2024. Let's consider the following assumptions:

- No. of Hours = 900
- Fees Charged / Hour = EUR 100
- Variable Costs / Hour = EUR 70
- Total Fixed Costs = EUR 12,000
- Corporate Tax Rate (IRC) = 21%

Additionally, the firm is considering proposals for two mutually exclusive loans (A) and (B), both: (i) in the amount of EUR 24,000 and (ii) for the period between the following value dates: September 30, 2024, and December 31, 2024.

- Loan (A): interest rate = 6.125% with day count = ACT/360
- Loan (B): interest rate = 6.200% with day count = 30/360

a. Which loan proposal seems to be the best for the firm?

b. If the 900 planned hours are achieved and the most favourable loan is taken:
   1. What will be the firm's operating income for the 4th quarter?
   2. What will be its net income?

c. Which of the following events will reduce net income the most?
   1. 10% decrease in the number of hours
   2. 10% decrease in the value of fees charged per hour
   3. 10% increase in the value of variable costs per hour
   4. 10% increase in the value of fixed costs

d. If the fees charged per hour decline by 10%, what will be the required increase in the number of billed hours for the firm to continue achieving the desired net income?

Solution

a. Wich is the best loan proposal?

Base	Sep.	Oct	Nov.	Dec.	Total	Year
ACT/360	0	31	30	31	92	360
30/360	0	30	30	30	90	360

ACT/360: 92/360 x 6,1% x 24 000 = EUR 374.13
30/360: 90/360 x 6,2% x 24 000 = EUR 372.00

Excel Solution

ACT/360: = YEARFRAC (DATE(2024, 9, 30), DATE(2024, 12, 31), 2) * 6,1% * 24000 → 374,13
30/360: = YEARFRAC (DATE(2024, 9, 30), DATE(2024, 12, 31), 4) * 6,2% * 24000 → 372,00

Loan (B), despite having a higher interest rate, is the most favourable.

b. 4th Quarter Projections: Operational Income and Net Income

4th Quarter 2024 Projections					
	Q	Unit Value	Total		Notes
+ Sales	900	100	90000.00	(1)	= 900 x 100
- Variable Costs	900	75	67500.00	(2)	= 900 x 75
- Fixed Costs			12000.00	(3)	
= Operational Income			10500.00	(4)	= (1) - (2) - (3)
+ Financial Income			0.00	(5)	
- Financial Expenses			372.00	(6)	Calculado em a.
= Income before Taxes			10128.00	(7)	= (4) - (5) - (6)
- Income Taxes (21%)			2126.88	(8)	= 21% x (7)
= Net Income			8001.12	(9)	= (7) - (8)

c. Net income decrease from:

c.1. 10% decrease in the nº hours

4th Quarter 2024 Projections			
	Q	Unit Value	Total
+ Sales	810	100	81000.00
- Variable Costs	810	75	60750.00
- Fixed Costs			12000.00
= Operational Income			8250.00
+ Financial Income			0.00
- Financial Expenses			372.00
= Income before Taxes			7878.00
- Income Taxes (21%)			1654.38
= Net Income			6223.62

c.2. 10% decrease in the value of fees charged per hour

4th Quarter 2024 Projections			
	Q	Unit Value	Total
+ Sales	900	90	81000.00
- Variable Costs	900	75	67500.00
- Fixed Costs			12000.00
= Operational Income			1500.00
+ Financial Income			0.00
- Financial Expenses			372.00
= Income before Taxes			1128.00
- Income Taxes (21%)			236.88
= Net Income			891.12

c.3 10% increase in the value of variable costs per hour

4th Quarter 2024 Projections			
	Q	Unit Value	Total
+ Sales	900	100	90000.00
- Variable Costs	900	82.5	74250.00
- Fixed Costs			12000.00
= Operational Income			3750.00
+ Financial Income			0.00
- Financial Expenses			372.00
= Income before Taxes			3378.00
- Income Taxes (21%)			709.38
= Net Income			2668.62

c.4. 10% increase in the value of fixed costs

4th Quarter 2024 Projections			
	Q	Unit Value	Total
+ Sales	900	100	90000.00
- Variable Costs	900	75	67500.00
- Fixed Costs			13200.00
= Operational Income			9300.00
+ Financial Income			0.00
- Financial Expenses			372.00
= Income before Taxes			8928.00
- Income Taxes (21%)			1874.88
= Net Income			7053.12

The event '10% decrease in the value of fees charged per hour" will reduce the most Net Income.
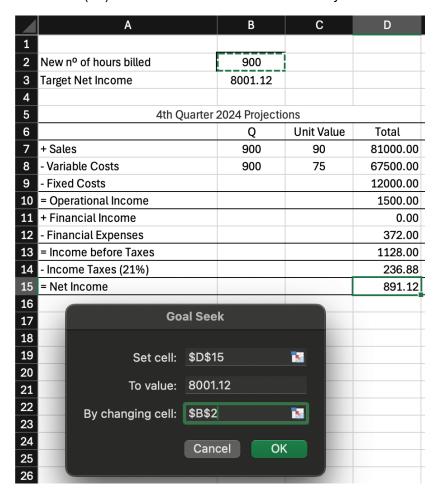
d. If the fees charged per hour decline by 10%, what will be the required increase in the number of billed hours for the firm to continue achieving the desired net income? To answer this question, we will use Excel `Goal Seek` tool.

	A	B	C	D
1				
2	New nº of hours billed	1500		
3	Target Net Income	8001.12		
4				
5	4th Quarter 2024 Projections			
6		Q	Unit Value	Total
7	+ Sales	1500	90	135000.00
8	- Variable Costs	1500	75	112500.00
9	- Fixed Costs			12000.00
10	= Operational Income			10500.00
11	+ Financial Income			0.00
12	- Financial Expenses			372.00
13	= Income before Taxes			10128.00
14	- Income Taxes (21%)			2126.88
15	= Net Income			8001.12

The number of hours will have to increase from 900 to 1500, a percentage increase of 66,7%.

Lets find how this value can be computed using `Goal SeeK`. In the Tools menu we look for the `Goal Seek` item. We will have to define 3 fields:

- `Set cell`The cell that contains the Net Income, that is, cell D15
- `To value`: The target value we want for the Net Income, that is 7053.12. This is the Net Income when the Number of Hours billed is equal to 900.
- `By changing cell`: The cell that will be modified to obtain the target value of the Net Income As Sales and Services Provided and Variable Costs depend on the Number of Hours billed, an auxiliary cell was created in B2, on which cells B7 and B8 depend. It will therefore be this cell (B2) that we instruct Goal Seek to modify!

	A	B	C	D
1				
2	New nº of hours billed	900		
3	Target Net Income	8001.12		
4				
5		4th Quarter 2024 Projections		
6		Q	Unit Value	Total
7	+ Sales	900	90	81000.00
8	- Variable Costs	900	75	67500.00
9	- Fixed Costs			12000.00
10	= Operational Income			1500.00
11	+ Financial Income			0.00
12	- Financial Expenses			372.00
13	= Income before Taxes			1128.00
14	- Income Taxes (21%)			236.88
15	= Net Income			891.12

Goal Seek

Set cell: D15

To value: 8001.12

By changing cell: B2

Cancel   OK

Pressing OK, one gets the updated nº hours billed equal to 1500. All the apreadsheet cells will also updated accordingly.