Question 1 – TPS (3 points)

Company X has two Divisions: A and B. Division A makes a mechanical component that is highly customized and can be sold only to Division B. The transfer price between the two divisions for the mechanical components is determined based on the marginal cost plus a mark-up of +70%, where the marginal costs are intended as the variable production costs.

You know the following information about the cost structure of the two Divisions:

The production costs of Division A, at a standard volume of 1,000,000 mechanical components per year, are:

- Direct material costs, including all the materials employed to manufacture the component = 0.65 €/u.
- Direct labour costs, including the cost of all the manual operations by workers, and that can be traced directly to the component = 0.3 €/u.
- Direct manufacturing overheads, which include 0.1 €/u of depreciation cost of the production machines, 0.1 €/u for the plant supervisor, and 0.15 €/u of energy costs that directly depend on the production volumes.

The production costs of Division B, at a standard volume of 1,000,000 finished products per year, are:

- Additional direct material costs, including the cost of materials used for assembling and refining the final product = 0.3 €/u.
- Direct labour costs, including the cost of all the manual operations by workers, and that can be traced directly to the product = 0.8 €/u.
- Direct manufacturing overheads, which include 0.1 €/u of depreciation cost of the production machines, 0.15 €/u for the plant supervisor and 0.1 €/u of energy costs that directly depend on the production volumes.

You also know that the selling price of the finished product sold by Division B is 5 €/u and that all the workers of Company X are permanently hired. Based on the available information, which of the following statements is CORRECT?

A. The contribution margin per unit of the finished product of Division B is equal to 1.93 €/u
B. The contribution margin per unit of the finished product of Company X is equal to 3.80 €/u
C. The contribution margin per unit of the finished product of Company X is equal to 3.24 €/u
D. None of the other answers

SOLUTION

Cv(up) = 0,65 €/u + 0,15 €/u = 0,8 €/u

TP = Cv (1+mu) = 1,36 €/u*

Cv(down) = 0,3 + 0,1 €/u = 0,4 €/u

Unitary contribution margin (Division B) = P – TP– Cv(down)= 5 – 1,36 – 0,4 = 3.24 €/u

Unitary contribution margin (Company X) = P – Cv(up) – Cv(down) = 5 – 0,8 – 0,4 = 3.8 €/u

Question 2 – Budget (2 points)

Which of the following statements about the Revenue Budget is TRUE:

A. It defines the volume of finished goods that the company will manufacture in the next year.
B. It defines the cash inflows from sales in the next year.
C. None of the answers
D. It is typically forecasted through an incremental approach even if a zero-based approach should be preferred.

SOLUTION

a) False. This is the production budget.

b) False. The revenues budget defined the expected value of revenues from an economic perspective.

c) Correct

d) False. The incremental approach and the zero-based budget are typically used for the forecast of period costs.

Question 3 – FCFF/FCFE (4 points)

You have the following data extracted from Company Alpha 2020 financial statements:

- Change in Receivables, Inventories and Payables (initial - final) = - 300 k€
- New debt = 200 k€
- Debt repaid = 100 k€
- New capital issued = 0 €
- Dividends paid = 150 k€
- D&A = 1,200 k€
- Net CAPEX = 2,400 k€
- EBIT = 3,200 k€
- FCFE = 780 k€
- Financial expenses = 70 k€
- Financial income = 30 k€

All balance sheet values are ending values (i.e., at the end of the year)

Based on this information, the income tax rate in 2020 was:

A. 26.27%
B. 45.25%
C. 19.94%
D. None of the other answers

SOLUTION

Since: FCFE= EBIT(1-t) + D&A + Change NWC (i-f) - Net Capex - Net Int * (1-t) + New Debt - Debt repaid + Capital Issued – Dividends*

*780 = 3,200 * (1-t) + 1.200 - 300 - 2,400 - (70 - 30)*(1-t) + 200 - 100 - 150*

Solving the equation in t you get the solution (t = 26.27%)

Wrong solutions:

b) wrong sign Change in NWC

c) wrong sign (New Debt – Debt repaid)

Question 4 – Financial planning (2 points)

Factoring with recourse:

A. is riskier for the factor than factoring without recourse.
B. is riskier for the creditor (i.e., the company that sells the commercial credits) than factory without recourse.
C. is riskier for the debtor (i.e., the company who must pay the commercial debt).
D. none of the other answers.

SOLUTION

a) wrong (the factor can ask the original creditor to pay the debt in case of insolvency of the debtor)
b) correct
c) wrong (for the debtor it is indifferent)
d) wrong (there is a correct answer)

Question 5 – Financial accounting Recap (4 points)

Alpha is a large multinational company that competes in the sector of power generation and trading of energy on a global scale. In the last years, the company has developed a strong focus on renewables and decarbonization technologies.

The following data (in million €) as of December 31st, 2020, are available:

- Revenues: 70,000 M€
- Other operating income: 0
- Cost of consumption of energy and fuels:30,000 M€
- Cost of consumption of raw materials: 10,000 M€
- Personnel cost: 10,000 M€
- Depreciation & Amortization: 7,000 M€
- Impairment: 2,000 M€
- Financial Income: 5 M€
- Financial Expenses: 55 M€
- Tax rate=30%
- Income taxes paid = 7,000 M€
- Interests paid: 40 M€
- Financial income collected: 0 M€
- Changes in inventories of raw materials (initial - final): -8 M€
- Changes in receivables (initial-final): -1,400 M€
- Changes in payables (final - initial): 700 M€

Considering the above data, which one of the following statements is CORRECT?

A. Net Profit 2020 = 7,665 M€; Net cash flow from operating activities 2020 = 12,252 M€
B. Net Profit 2020 = 7,665 M€; Net cash flow from operating activities 2020 = 13,668 M€
C. Net Profit 2020 = 7,637 M€; Net cash flow from operating activities 2020 = 13,618 M€
D. Net Profit 2020 = 3,950 M€; Net cash flow from operating activities 2020 = -5,748 M€

Solution
Net profit = EBT – Income taxes:

Revenues	70,000 M€
- Energy and fuel costs	30,000 M€
- Raw material costs	10,000 M€
- Personnel cost	10,000 M€
- Depreciation and Amortization	7,000 M€
- Impairment	2,000 M€
EBIT	11,000 M€
+ Financial Income	5 M€
- Financial Expenses	55 M€
EBT	10,950 M€
- Income taxes	0,30 * 10,950 = 3,285 M€
Net Profit	**EBT – Income taxes = 7,665 M€**

To calculate the net cash from operating activities:

EBIT	11,000 M€
+ D&A and impairment	9,000 M€
+ Changes in inventories (i-f)	-8 M€
+ Changes in receivables (i-f)	- 1,400 M€
+ Changes in payables (f-i)	700 M€
- interests paid	40 M€
- income taxes paid	7,000 M€
Net cash from operating activities	**12,252 M€**

A. Correct
B. Wrong signs in changes in inventories, receivables and payables
C. In calculating both net cash and net profit, interests paid, financial expenses and financial income are always all considered
D. Detracting D&A while calculating Net cash flow and considering income taxes paid in calculating Net profit

Question 6 – Corporate Cost Allocation (2 points)
Beta is a research center that manages various facilities that are used jointly by different departments in which the research center is organized. The costs of these facilities are treated as corporate costs and allocated to the departments that use them.
One of these facilities is the Visual Lab which has a weekly capacity of 50 hours and an overall weekly cost of 135,000€. These costs do not depend by the hours actually delivered to the Departments.
For Week 26, the cost of the Visual Lab should be divided between Dep A, Dep B, and Dep C, which in the reference period, used 5 hours, 15 hours, 20 hours of the Visual Lab respectively.
Based on the available information, which of the following statements is **CORRECT**:

A. Based on the proportional allocation method, 13,500 € will be allocated to Dep A.
B. If Dep A uses 10 hours more, all being equal, 54,000 € will be allocated to Dep C either using the fee allocation method or the proportional allocation method.

C. If Dep A uses 5 hours less all being equal, costs allocated to Dep C based on the proportional allocation method will be 67,500.
D. If Dep B uses 10 hours less, all being equal, costs allocated to Dep C based on the fee allocation method will be 67,500.

SOLUTION
Fee = 135,000 / 50 = 2,700 €/h → Cost allocated to A = 13,500€; Cost allocated to B = 40,500€; Cost allocated to C = 54,000€
Proportional = 135,000 /40 = 3,375 €/h → Cost allocated to A = 16,875€; Cost allocated to B = 50,625€; Cost allocated to C = 67,500€

A. Wrong, based on the proportional allocation method, Dep A will be allocated 16,875 €
B. Correct. If Dep A uses 10 hours more, the hours employed are equal to the hours available. This means that the two approaches (i.e., the fee and proportional methods) allocate the same portion of corporate costs to Dep C.
C. Wrong, if Dep A uses 5 hours less (meaning 0 hours), all being equal, costs allocated to Dep C based on the proportional allocation method will be around 77,143 €. In fact, the allocation coefficient would be equal to 135,000 € / (15+20) hours = 3,857 €/hour
D. Wrong. If Dep B uses 10 hours less, the cost allocated to Dep C based on the fee allocation method will be 54,000 €

Question 7 – Financial Statements Analysis (4 points)
You are analysing the annual report of the company delta. You have extracted the data below from income statement and annual report of the year 2020 (data are reported in million €):

- Inventories: 2.70 M€
- cost of goods sold: 72.00 M€
- period costs: 7.20 M€
- EBIT: 88.20 M€
- current liabilities: 16.20 M€ (of which, financial current liabilities: 3.60 M€)
- long term financial liabilities: 49.50 M€
- other long-term liabilities: 31.50 M€
- cash and cash equivalents: 5.40 M€
- current ratio (current assets / current liabilities): 1.89
- other current financial assets: 0.90 M€
- VAT: 0%
- Other operating income = 0

Considering the available data and rounding calculations at the second digit, which of the following sentences is correct?

A. DSO = around 47.14 days
B. NFP = around 60.30 M€
C. NFP = around 79.20 M€
D. None of the answers

SOLUTION

Revenues = EBIT+ period costs+ cost of good sold= 167.40 M€
*current ratio = CA/CL → CA = current ratio*CL = 30.62 M€*
CA = receivables + cash and cash equivalents + inventories + other current financial assets →receivables = 21.62 M€
*DSO=(receivables/revenues)*365= 47.14 days*

a) *correct*
b) *60.30 is wrong since all current liabilities are included in the calculation of NFP (rather than only the non-financial ones)*
c) *79.20 is wrong since both financial and non-financial liabilities have been included in the calculation*
d) *Wrong since there is a correct ratio*

Question 8 – Value Drivers (2 points)
Company A is developing a dashboard to monitor the performance of its organizational functions. The dashboard includes, among the others, the following indicator: **(Orders delivered on time) / (Orders shipped)**. This indicator can be considered generally as:

A. A revenue driver related to Time.
B. A cost driver related to Time.
C. A cost driver related to Quality.
D. A resource state driver related to Organization.

SOLUTION
The indicator (Orders delivered on time) / (Orders shipped) measures the punctuality in the delivery and therefore quantifies a performance of time. It can be considered as revenue driver because a company that has a higher punctuality can increase its revenues (and thus its enterprise value) by either increasing the price (i.e., customers will pay a premium price because of the higher punctuality) or increasing the market share, and thus sales (i.e., customers would prefer to buy from this company being other performance factors the same). The company might also exploit a strategy by combining a premium price with higher sales.

Question 9 – Cost of Capital (5 points)
Company B is based in US. The company is not listed but some comparable companies have been identified by the Chief Financial Officer.

Comparable companies	**Bank Debts (Mln $)**	**Equity (Mln $)**	**β_L (equity beta)**	**Corporate Tax rate**
Comparable X	437.5	250	1.20	35%
Comparable Y	700	400	1.10	32%

You have available the Balance Sheet of Company B in 2020, whose main data are the following:

- Total Assets = 970 M$

- Equity = 270 M$
- Bank Debts = 500 M$
- Payables = 200 M$

You have also available the Income Statement of Company B in 2020, whose main data are the following:

- EBIT = 100 M$
- Financial costs = 25 M$
- EBT = 75 M$
- Net Income = 45 M$

Knowing that:

- WACC for Company B is equal to 7%
- risk-free rate is equal to 2%

What is the market return for the US market?

A. About 14%
B. About 16%
C. About 13%
D. None of the other answers

SOLUTION

*WACC = E/(E+D) * ke + D/(E+D) * (1 – tax) * kd*

WACC = 7%
E = 270 M$
D = 500 M$
kd = financial costs / bank debts = 25 / 500 = 5%
tax = taxes / EBT = 30 / 75 = 40%
→ ke = 14.4%

*ke = risk-free-rate + equity B * (rm – risk-free-rate)*
risk-free-rate = 2%

equity-beta can be computed using the comparable companies

Comparable	Bank Debts	Equity	levered beta	Tax rate	D/E	unlevered beta
Comparable X	437.5	250	1.2	35%	1.75	0.56
Comparable Y	700	400	1.1	32%	1.75	0.50
					average	0.53

equity-beta (company B) = 1.12
→ *Market return = 13%*

Question 10 – Relative Valuation (2 points)

Mr Q is a financial analyst, and he is running a valuation of Company A through relative valuation. Company A is a well-established family company that produces and sells pottery. The business model is based on the production of very large volumes to minimize the full product cost per unit. Equipment is continuously updated to improve efficiency. Assets Turnover Ratio (ATR) is one of the most relevant accounting-based indicators in the company's dashboard. Based on this information and reasonable assumptions, which one of the following statements is **TRUE**:

A. Mr Q should prefer assets-based multiples because equity-based multiples would work better with companies whose business models are based on revenue-drivers.
B. Mr Q should prefer equity-based multiples because assets-based multiples would not capture how this company generates value.
C. Mr Q should prefer assets-based multiples because equity-based multiple would not capture how this company generates value.
D. Mr Q should prefer equity-based multiples because assets-based multiples would work better with companies whose business models are based on revenue-drivers.

SOLUTION

Company A has a business model based on the exploitation of relevant assets. Assets are relevant because of the very large volumes of production. They are continuously updated to increase efficiency. Efficiency in asset management is key for Company A. This means that assets-based multiple should be preferred, and the value of Company A should be assessed passing through the calculation of the Enterprise Value.