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**Question 1: Corporate Finance****(34 points)**

In Europe, aging industrialized societies are widespread and the proportion of elderly people in the population is increasing. Hearing Aid Solutions (HAS) SE is a corporation in the high-tech medical device industry. The core business of HAS is manufacturing hearing aids which are lightweight, barely visible, and produce sound close to reality. Thus, these hearing aids improve user experience. The equity shares of HAS are actively traded on the European stock exchanges. You are supporting the CFO of HAS with a series of analyses.

- a) HAS plans to start a new production line, at the beginning of 2026, which will be operational for 5 years from 2026 to 2030. The CFO of HAS is interested in the NPV of the new production line.
- a1) The CFO of HAS wants to consider the cost of a marketing analysis carried out by a consulting agency in 2025 to decide on the investment of the new production line. Should the cost for the marketing analysis be considered? If yes, explain how, if no explain why not. (2 points)
- a2) If the new production line starts at the beginning of 2026, an additional net working capital of EUR 10 million is required initially. Throughout each year of the production line operation, the net working capital must be 7.5% of annual revenues. The projected revenues in 2030 amount to EUR 200 million. Once the life of the production line ends in 6 years, HAS will sell the final balance of net working capital at the end of 2031. The WACC of HAS equals 8.0%. Calculate the value in EUR contributed to the NPV with the initial investment and the final liquidation of net working capital. You can ignore all other cash flows. (6 points)
- b) At the beginning of 2025, an investment bank completed a company valuation of HAS. The detailed planning horizon spans 10 years being years 2025 to 2034. After 2034, the annual free cash flows to the firm (FCFF) of HAS is assumed to grow at a constant rate forever.

The company valuation of HAS equals EUR 2,250 million. The present value of the FCFFs after 2034 gives 80% of the company value. The investment bank projected the FCFF of HAS in 2034 to be EUR 80 million. The WACC of HAS equals 8.0%. Determine the annual growth rate of the FCFFs after 2034, which the investment bank assumed. (6 points)

- c) The management of HAS projected income statements for 2026 and 2027 in euro (EUR). Table 1 shows these projections. Additionally, HAS's management plans to have capital expenditures and changes of net working capital in 2026 and 2027 as summarized in Table 2. HAS's relevant corporate tax rate amounts to 25%.

**Table 1: HAS income statement (figures in EUR)**

Income statement	2026	2027
Revenues	9,000,000	7,000,000
Cost of goods sold	3,500,000	3,000,000
Depreciation	600,000	700,000
<b>EBIT</b>	<b>4,900,000</b>	<b>3,300,000</b>
Interest expense	500,000	500,000
<b>EBT</b>	<b>4,400,000</b>	<b>2,800,000</b>
Taxes	1,100,000	700,000
<b>Net income (NI)</b>	<b>3,300,000</b>	<b>2,100,000</b>

**Table 2: HAS Capex and changes to NWC**

	2026	2027
Capital expenditures (CE)	600,000	700,000
Changes in net working capital ( $\Delta$ NWC)	-90,000	110,000

- c1) Calculate HAS's expected free cash flow to the firm (FCFF) in the fiscal years 2026 and 2027. (4 points)
- c2) Calculate HAS's expected free cash flow to equity (FCFE) in the fiscal years 2026 and 2027. (4 points)
- d) In the European money market, the nominal risk-free rate of return equals 2% p.a. The expected return of the European stock market equals 10% p.a. HAS's relevant corporate tax rate amounts to 25%. The systematic risk of unlevered equity of HAS, the unlevered beta, equals 1.2. HAS's management intends to increase financial leverage to a debt-to-total assets ratio equal to 75% (target capital structure) to finance new growth opportunities.
- d1) What is asset beta? Calculate HAS's asset beta. (4 points)
- d2) Assume that, due to the planned high leverage, HAS's debt beta increases to 0.25. Calculate HAS's equity beta and the equity cost of capital under the target capital structure. Do not ignore the effect of tax shield. (8 points)