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# Equity Valuation Hexagon

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## **Abstract**

This dissertation seeks to establish the optimal target price for Hexagon, a leading global player within geospatial and industrial technology solutions, offering insights to guide investment decisions—whether to hold, buy, or sell in relation to current market conditions. The central inquiry guiding this study is: "What is the fair value per share of Hexagon as of December 31<sup>st</sup> 2023, and does it result in a hold, buy, or sell recommendation for existing and prospective investors?" The valuation of Hexagon, listed on the Swedish OMX30, entails a comprehensive analysis encompassing company performance, competitor positioning, and market dynamics within the geospatial and industrial technology sectors. This evaluation includes historical performance alongside future projections of Hexagon's financials and industry trends. To conduct the valuation, forecasts have been made for the income statement, balance sheet, and cash flow statement to ensure a well-rounded assessment. The valuation methodologies employed include the Discounted Cash Flow (DCF) approach, incorporating terminal value computations utilizing both the Gordon Growth and Exit multiple methods. Additionally, a relative valuation, benchmarked against industry peers, was considered. The culmination of these valuation techniques yielded a target price range of SEK 128.4 - 148.2 per share. Comparing this range against the closing price of SEK 120.95 on Dec 29<sup>th</sup> 2023, a buy recommendation was issued, accompanied by an estimated upside potential of 6.2% - 22.5%. Moreover, the buy recommendation aligns with the findings of the equity research report published by SEB with a target price of SEK 130.

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**Title:** Equity Valuation – Hexagon

**Keywords:** Hexagon, firm valuation, share price, discounted cashflow analysis, relative valuation, intrinsic valuation, market analysis, industrial technology, geospatial technology

## **Resumo**

Esta dissertação tem como objetivo determinar o preço-alvo ideal para a Hexagon, uma empresa global líder em soluções de tecnologia geoespacial e industrial, fornecendo insights para orientar decisões de investimento em relação às condições de mercado atuais. A pergunta central que guia este estudo é: "Qual é o valor justo por ação da Hexagon em 31 de dezembro de 2023 e qual recomendação isso implica para investidores atuais e potenciais?" A avaliação da Hexagon, listada no OMX30 sueco, envolve uma análise abrangente do desempenho da empresa, posição competitiva e dinâmica do mercado nos setores de tecnologia geoespacial e

industrial, incluindo desempenho histórico e projeções futuras. Foram utilizadas previsões para demonstrações financeiras e várias metodologias de avaliação, incluindo Fluxo de Caixa Descontado (DCF) e avaliação relativa, resultando em uma faixa de preço-alvo de SEK 128.4 – 148.2 por ação. Comparando essa faixa com o preço de fechamento em 29 de dezembro de 2023, uma recomendação de compra foi emitida, com um potencial de upside estimado de 6.2% - 22.5%, alinhada às conclusões de um relatório de pesquisa de equidade publicado pela SEB com um preço-alvo de SEK 130.

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**Título:** Equity Valuation – Hexagon

**Palavras-chave:** Hexagon, avaliação de empresas, preço das ações, análise de fluxo de caixa descontado, avaliação relativa, avaliação intrínseca, análise de mercado, tecnologia industrial, tecnologia geoespacial

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## Table of abbreviations

<b>Additive Manufacturing</b>	3D printing, a process that constructs three-dimensional objects layer by layer from digital models
<b>AI</b>	Artificial Intelligence
<b>Augmented reality (“AR”)</b>	Technology that overlays digital info, such as images, text, or 3D models, onto the real-world environment in real-time
<b>Big Data Analytics</b>	Systematic process of examining large and complex datasets
<b>BIM</b>	Building Information Modelling
<b>CAD</b>	Computer-Aided Design
<b>CAE</b>	Computer-Aided Engineering
<b>CAM</b>	Computer-Aided Manufacturing
<b>Cloud Computing</b>	Enables on-demand access to a shared pool of digital resources, such as servers, storage, and applications
<b>CMM</b>	Coordinate Measuring Machine
<b>EAM</b>	Enterprise Asset Management
<b>Embedded System</b>	Specialized computing system with dedicated functionality, designed to perform specific tasks within electronic devices, machinery, or appliances
<b>Enterprise Resource Planning (ERP)</b>	Comprehensive software system that integrates and manages various core business processes
<b>GES</b>	Hexagon’s operating segment – Geospatial Enterprise Solutions
<b>IES</b>	Hexagon’s operating segment – Industrial Enterprise Solutions
<b>IMU</b>	Inertial Measurement Unit
<b>Laser tracker</b>	A portable measurement system that uses a laser
<b>Machine learning</b>	Artificial intelligence that focuses on the development of algorithms enabling computer systems to learn from data
<b>Material Requirements Planning (MRP)</b>	Inventory management and production planning system that assists organizations in determining the optimal quantity and timing of materials needed for manufacturing processes to meet production demands efficiently
<b>R&amp;D</b>	Research & Development
<b>QMS</b>	Quality Management System
<b>SaaS</b>	Software-as-a-Service
<b>The Internet of Things (IoT)</b>	Is a network of interconnected physical devices, vehicles, appliances, and other objects embedded with sensors, software, and connectivity, enabling them to collect, exchange, and act on data to enhance efficiency
<b>Virtual Reality (“VR”)</b>	Technology that immerses users in a computer-generated environment, often using headsets or other devices

## **1. Introduction**

Understanding a company's financial health goes beyond just its shareholders; it's crucial for all stakeholders involved in the company.

This thesis aims to estimate the fair value of Hexagon, a prominent technology solutions provider listed on the Swedish stock exchange and part of the OMX30 index, specializing in geospatial and industrial segments. The research seeks to establish the target value per share of Hexagon as of December 31<sup>st</sup> 2023, and compare it with the current share price to evaluate its investment appeal to existing and prospective investors. To achieve this, thorough analysis of Hexagon's historical financial reports, press releases, presentations, and prevailing market dynamics, including competitor activities, have been conducted.

In the second chapter, various state-of-art valuation methods to evaluate companies were explored, and those deemed most suitable for valuing Hexagon were selected. Subsequently, in the third chapter, an in-depth analysis of Hexagon's main business areas and their performance were conducted. Following this, an analysis of the markets Hexagon operates in was undertaken to gain a better understanding of the company's position. Chapter five entails the actual equity valuation to determine the value of Hexagon. Finally, in chapter six, an investment recommendation will be provided whether to sell, buy or hold shares of Hexagon.

## **2. Literature Review**

The following chapter will introduce the most suitable valuation methodologies, as identified in current academic literature, for determining an accurate per-share valuation of Hexagon.

### **2.1 Intrinsic Valuation Methods**

Intrinsic value, determined by projected cash flows and a discount rate, reflects a company's true worth. While challenging to estimate, especially for young and volatile businesses, it's expected that market prices will align with intrinsic value over time (Damodaran, 2012). Managers should consistently use methods like DCF analysis for valuation, even amidst market irrationality, as opportunities may arise. Investors seek to find the disparity between market price and their perception of a security's "true" value, focusing on the company's potential to generate cash flows in the future (Koller et al., 2010).

## 2.2 The Discounted Cash Flow Method (DCF)

Two valuation approaches exist: one assesses only equity value, while the other considers the entire business, including equity, bondholders', and preferred stockholders' claims, each utilizing DCF analysis, with variations in cash flows and discount rates (Damodaran, 2012). DCF valuation models, originating from John Burr Williams (1938), have evolved to evaluate common stock's intrinsic value based on anticipated future cash flows, serving as vital tools in investment management and research.

$$PV \text{ of Future Cash Flows} = \sum_{t=1}^n \frac{Cash \ Flow_t}{1 + r_{k \ (post-tax)}^t} + \frac{Terminal \ Value}{1 + r_{k \ (post-tax)}^t} \quad (1)$$

Applying discounted cash flow valuation to equity valuation, despite its straightforward principles, can be complex. Koller et al. (2010) outline four key steps: selecting the DCF model, defining cash flow, forecasting future cash flows, determining the discount rate methodology, and estimating the discount rate.

## 2.3 Equity valuation

The cash flows considered include those from company assets, accounting for expenses like debt repayments, interest, taxes, and growth reinvestments. The discount rate, reflecting the cost of equity financing, determines the present value of equity claims, representing the return demanded by equity investors (Damodaran, 2012).

$$Value \ of \ equity = \sum_{t=1}^{t=n} \frac{FCFE_t}{(1+k_e)^t} \quad (2)$$

$n$  = life of the asset

$FCFE$  = Expected free cash flow to equity in period  $t$

$k_e$  = Cost of equity

## 2.4 Firm valuation

The estimated cash flows are those generated by the company's assets after reinvestment for future growth. The discount rate considers the cost of raising debt and equity financing, proportionally. The present value represents the total value of the company, including all claims such as debt and equity (Damodaran, 2012).

$$EV_0 = \sum_{t=1}^n \frac{FCFF_t}{(1 + WACC)^t} + \frac{TV_n}{(1 + WACC)^n} \quad (3)$$

$n$  = life of the asset

$FCFF$  = expected free cash flow to firm in period  $t$

$WACC$  = Weighted Average Cost of Capital

## 2.5 Free Cash Flows (FCFF)

Represents the total cash flows available to all stakeholders, including common stockholders, bondholders, and preferred stockholders. It's termed "unlevered cash flow" as it occurs before debt payments, and it excludes tax benefits associated with interest payments to avoid double-counting, as the cost of debt in the cost of capital already accounts for it. This method is employed to value the entire firm (Damodaran, 2012).

The relationship between free cashflow to equity and free cashflow to firm:

$$FCFF = FCFE + \text{interest expense} \cdot (1 - t) - (\text{new debt} - \text{debt repayments}) + \text{preferred div} \quad (4)$$

$FCFF$  = Free Cash Flow to the Firm

$FCFE$  = Free Cash Flow to Equity

$t$  = taxes

$div$  = preferred dividend payments

## 2.6 Discounted Free Cash Flows to the Firm (FFCF)

For highly leveraged firms or those experiencing significant changes in leverage structure, the FCFF approach is preferred due to challenges in calculating FCFE arising from debt-related volatility. Equity valuation for such firms becomes complex as equity value is highly sensitive to growth and risk assumptions. However, theoretically, both approaches (FCFF and FCFE) should yield the same equity value (Damodaran, 2012).

Equation 5: FCFF Calculation

<b>Earnings before profit and tax (EBIT)</b> - Tax = <b>Net Operating profit after taxes (NOPAT)</b> + Depreciation + Other non-cash charges and provisions - Net Working Capital (NWC) - Capital Expenditures (CAPEX) = <b>Free Cash Flow from Operations</b> +/- Cash flow from non-operating activities = <b>Free Cash Flow to the Firm (FCFF)</b>
--

## 2.7 Discounted Free Cash Flows to Equity (FFCE)

Free Cash Flow to Equity (FCFE) is derived by deducting capital expenditures from cash flow from operations (FCFF) and adjusting for all debt-related payments. Debt obligations take precedence over distributions to stockholders. The common equity can be valued as the present value of forecasted FCFE (Pinto et al., 2010).

Equation 6: FCFE Calculation

<b>Earnings before profit and tax (EBIT)</b> – Tax = <b>Net Operating profit after taxes (NOPAT)</b> + Depreciation + Other non-cash charges and provisions – Net Working Capital (NWC) – Capital Expenditures (CAPEX) = <b>Free Cash Flow from Operations</b> +/- Cash flow from non-operating activities = <b>Free Cash Flow to the Firm (FCFF)</b> + New Debt Issued – Debt Repayments – Interest Expense = <b>Free Cash Flow to Equity (FCFE)</b>
--

## 2.8 Dividend-Discount-Model (DDM)

The DDM values equity by calculating the present value of anticipated future dividend payments. Investors expect two primary cash flows: dividends during the holding period and an anticipated selling price at the end (Damodaran, 2012). Thus, today's share price equals the expected dividend plus the future share price in one year, discounted by the cost of equity (Koller et al., 2010).

$$P_0 = \frac{DIV_1 + P_1}{(1 + K_e)^1} \quad (7)$$

$P_t$  = Share Price in  $t$

$Div_t$  = Expected Dividend at time  $t$

$P_1$  = Share price in  $t = 1$

$K_e$  = Cost of Equity

The DDM values a share of stock over a finite holding period, extending the formula used for the one-year period. Analysts often forecast dividends over two to five years and estimate the terminal price. This calculation leads to the current price equalling the sum of all expected future dividends, discounted to the present (Koller et al., 2010).

$$P_0 = \frac{DIV_1}{(1 + K_e)^1} + \frac{DIV_2}{(1 + K_e)^2} + \dots + \frac{DIV_t}{(1 + K_e)^t} = \sum_{t=1}^n \frac{DIV_t}{(1 + K_e)^t} \quad (8)$$

$P_t$  = Share Price in  $t$

$Div_t$  = Expected Dividend at time  $t$

$K_e$  = Cost of Equity

The Gordon Growth Model (GGM) is used for calculating perpetual terminal value, especially for stocks with stable dividends, incorporating a constant growth rate (Koller et al., 2010). Additionally, within the dividend discount model, the growth rate in earnings per share can be expressed using the retention ratio and return on equity (Damodaran, 2012).

$$P_0 = \frac{DIV_1}{k_e - g} \quad (9)$$

*Expected growth rate = Retention ratio \* ROE = (1 - Payout ratio) \* ROE*

*P<sub>0</sub> = Current Share Price*

*g = Constant Dividend Growth Rate in Perpetuity*

*DIV<sub>1</sub> = Dividend in t = 1*

*k<sub>e</sub> = Cost of Equity*

The two-stage growth model includes an initial phase with variable growth and a subsequent stable phase expected to persist long term. Initial growth usually surpasses stable growth, but the model can also value firms with initial low or negative growth followed by stability (Damodaran, 2012).

$$P_0 = \sum_{t=1}^n \frac{DIV_0 * (1 + g_1)^t}{(1 + K_e)^t} + \frac{DIV_{n+1}}{k_e - g_2} \quad (10)$$

*P<sub>0</sub> = Current Share Price*

*DIV<sub>0</sub> = Dividend in t = 0*

*k<sub>e</sub> = Cost of Equity*

*g<sub>2</sub> = Constant Dividend Growth Rate in Perpetuity*

*g<sub>1</sub> = Short-term Dividend Growth Rate*

## 2.9 Terminal Value

To determine the enterprise's value at the end of the initial projection period, the preferred method is the capitalized cash flow approach, incorporating a sustainable long-term growth rate. Some appraisers use price multiples in the market approach to calculate the terminal value. (Pinto et al., 2010). When valuing a firm, the terminal value can be calculated using the perpetuity formula, assuming constant cost of capital and growth rate (Damodaran, 2012).

$$TV_T = \frac{FCF_T * (1 + g)}{k - g} \quad (11)$$

*TV<sub>T</sub> = Terminal Value in Perpetuity*

*k = Discount Rate (e.g., Cost of Equity or WACC)*

*FCF<sub>T</sub> = FCF in Perpetuity*

*g = Constant Dividend Growth Rate in Perpetuity*

To analyze whether a company has reached a steady state, several metrics are considered useful. These include steady sales, EBIT, Capex, and operating working capital as a percentage of sales margins. Additionally, the ROIC should be slightly above the WACC, and the replenishment ratio (Capex/depreciation) should be slightly above 1, assuming inflation. The cash conversion

ratio will be higher due to reduced investment requirements, resulting in a lower reinvestment rate. Lastly, the long-term capital structure, such as the mix between debt and equity, is moving closer to the industry average (Mehta, 2021).

## 2.10 Terminal Growth Rate

Estimating the stable growth rate in a discounted cash flow model is challenging due to its significant impact on the terminal value. The perpetual nature of the stable growth rate imposes constraints, limiting it to the overall growth rate of the economy. Determining the stable terminal growth rate involves considering whether the company operates domestically or internationally, the forecasted valuations in nominal or real terms, and the choice of currency for cash flows and discount rates, each influencing growth (Damodaran, 2012).

## 2.11 Adjusted Present Value Method (APV)

Introduced by Myers (1974), the Adjusted Present Value Method (APV) breaks down a firm's value into three components: the value of operations under all-equity financing, the additional value from tax shields linked to debt financing, and the expected bankruptcy costs (Koller, 2010; Damodaran, 2012).

While a constant WACC is often used in DCF models, it may overstate tax shield values during significant capital structure changes. To address this, the APV model offers a valuable alternative, especially when anticipating alterations in debt levels with improved cash flow. The APV method is particularly recommended for cases of deterministic debt financing, where debt plans are certain and not tied to company value. Conversely, the WACC approach is advised when forecasting future debt levels as a percentage of company value (Inselbag & Kaufold, 1997; Schueler, 2017; Berk & DeMarzo, 2014)

$$\text{Value of Levered Firm} = PV(\text{Unlevered EV}) + PV(\text{ITS}) + BC \quad (12)$$

*PV* = Present Value  
*ITS* = Interest Tax Shield

*BC* = Expected Bankruptcy Costs

$$PV(\text{ITS}) = \frac{D * k_d * t_c}{(1 + k_d)^t} \quad (13)$$

*D* = Debt  
*k<sub>D</sub>* = Cost of Debt

*t<sub>c</sub>* = Corporate Tax Rate

$$\text{Expected Bankruptcy Costs} = \text{Probability of Bankruptcy} * \text{Bankruptcy Costs}$$

While the APV method is a valuable alternative to the DCF approach, drawbacks include challenges in accurately estimating a company's default probability and associated bankruptcy costs (Damodaran, 2012).

## 2.12 Weighted Average Cost of Capital (WACC)

The company's cost of capital, calculated as the weighted average cost of debt, equity, and preferred stock, reflects its required rate of return, with accurate weightings based on market value proportions indicating its capital structure. The after-tax cost of debt accounts for default risk, while the cost of equity represents equity investment risk, and the cost of preferred stock balances debt and equity risk attributes, culminating in the weighted average cost of capital (WACC), a pivotal benchmark for financial decision-making and valuation (Damodaran, 2012).

$$WACC = k_E * \frac{E}{V} + k_{ps} \frac{PS}{V} + k_D * \frac{D}{V} * (1 - t) \quad (14)$$

$k_E$  = Cost of Equity

$k_D$  = Cost of Debt

$k_{ps}$  = Cost of Preferred Stock

$t$  = Company's marginal income tax rate

$E/V$  = Target Market Value Equity to Enterprise Value

$PS/V$  = Target Market Value Preferred Stock to Enterprise Value

$D/V$  = Target Market Value of Debt to Enterprise Value

## 2.13 Estimating Cost of Equity

There are two main methods to calculate the cost of equity: the widely used CAPM model and the Fama-French three-factor model (Pinto et al, 2012). The CAPM model is based on Markowitz's mean-variance model of portfolio choice. Sharpe and Litner added key assumptions, resulting in the CAPM model, which offers predictions on the relationship between expected return and risk (Fama and French, 2004). It has been the standard for most practitioners (Damodaran, 2012). Investors require a risk premium in addition to the return of the risk-free asset, and due to diversification, only non-diversifiable systematic risk will be compensated (Koller et al., 2010).

$$k_E = r_f + \beta_i^L * (Er_M) - r_f \quad (15)$$

$$\text{Equity Risk Premium} = \beta_i^L * (Er_M) - r_f$$

$$\text{Market Risk Premium} = (Er_M) - r_f$$

$k_E$  = Cost of Equity

$r_f$  = Risk-free Rate

$\beta_i^L$  = Levered Beta of an Asset  $i$

$r_M$  = Market Return Rate

## 2.14 Risk-free Rate

The risk-free asset must meet two key conditions: no default risk, typically found in government securities, and no reinvestment risk, ensuring actual return matches expected return. It's practical to match the duration of the risk-free asset with the cash flows' duration. Additionally, to ignore potential currency effects and inflation, the selected risk-free assets should be in the same currency as the estimated cash flow (Damodaran, 2012).

## 2.15 Beta

An asset's beta measures its systematic risk, indicating how its returns move in relation to the overall market. It's calculated by comparing the asset's returns to those of the market portfolio. Usually, this is done using a broad equity market index. Beta is estimated through regression analysis of the asset's returns against the index's returns (Koller et al., 2010).

$$\beta_i^L = \frac{Cov(r_i, r_M)}{Var(r_M)} \quad (16)$$

$\beta_i^L$  = Levered Beta of an Asset (i)

$Var(r_M)$  = Market Portfolio Variance ( $\sigma^2$ )

$Cov(r_i, r_M)$  = Covariance of the returns of Asset (i) and Market Portfolio (M)

The market portfolio's covariance with itself is equivalent to its variance, resulting in a beta of one. Assets with higher (lower) return volatility, signaling greater (lesser) risk, will exhibit betas greater (smaller) than one (Damodaran, 2012).

A firm's unlevered beta, or asset beta, is determined by its products, services, and operating leverage. The levered beta, which reflects equity investment risk, is influenced by both business risk and financial leverage. Increasing financial leverage, measured by the debt-to-equity ratio, raises equity beta as investors bear more market risk. Firms with high business risk may be wary of leverage, while stable businesses may use it more. The tax factor in the equation represents tax benefits from interest payments (Damodaran, 2012).

$$\beta_{Peer}^U = \frac{\beta_{Peer}^L}{1 + (1 - t) * \frac{D}{E}} \quad (17)$$

$\beta_{Peer}^U$  = Unlevered Beta of Industry Peers

$t$  = Corporate Tax Rate

$\beta_{Peer}^L$  = Levered Beta of the Industry Peers

$\frac{D}{E}$  = Debt-to-Equity Value

## 2.16 Market Risk Premium (MRP)

The CAPM uses the MRP to assess investors' tolerance for market risk and determine its cost. This premium represents the additional return from the market portfolio, calculated by subtracting the risk-free rate from the expected market portfolio return (Berk & DeMarzo, 2014). Estimating the market risk premium varies, with methods including historical, adjusted historical, and forward-looking approaches. However, discrepancies can arise due to different assumptions such as the choice of market index, time period, proxy for the risk-free asset return, and mean return computation (Pinto et al., 2010).

$$\text{Market Risk Premium} = E[R_{Mkt}] - rf \quad (18)$$

## 2.17 Country Risk Premium (CRP)

Investors seek the Country Risk Premium (CRP) for high-risk countries (Berk & DeMarzo, 2014). The necessity of CRP depends on the diversifiability of risk, with recent trends showing increased correlation between markets, rendering some CRPs non-diversifiable (Damodaran, 2012). The country spread model advises adding CRP to equity premiums to account for emerging market risks (Pinto et al., 2010). Damodaran offers three CRP estimation methods: sovereign bond spreads, equity market volatility versus bond volatility, and a combined approach, with an accessible method involving deriving CRP from a country's debt rating indicating sovereign default risk. Damodaran annually publishes these premiums per country and recommends adding CRP using the specified method (Damodaran, 2012).

$$k_e = rf + \beta_i^L * (E(r_M) - rf) + \lambda_C * CRP_C \quad (19)$$

$k_e$  = Cost of Equity

$Rf$  = Risk-free Rate

$\lambda_C$  = Country's Revenue Share

$\beta_i^L$  = Levered Beta of an Asset (i)

$r_M$  = Return of the Market

$CRP_C$  = Country Risk Premium

## 2.18 Estimating Cost of Preferred Stock

Preferred stock combines features of both debt and equity, with a prespecified dividend paid ahead of common dividends but lacking debt's tax deductibility. Special features like convertibility or callability must be separately valued to determine the cost of preferred stock. It's safer than common equity due to priority in dividend payments but riskier than debt as interest payments come before preferred dividends. Consequently, on a pre-tax basis, it should

have a higher cost than debt but lower than equity. When treated as perpetual, its cost is calculated as follows (Damodaran, 2012):

$$k_{ps} = \frac{\text{Preferred dividend per share}}{\text{Market price per preferred share}} \quad (20)$$

## 2.19 Estimating Cost of Debt

The cost of debt, arising from company borrowing, hinges on three critical factors (Damodaran, 2012):

1. Risk-free interest rate: Higher rates lead to increased debt costs.
2. Default risk and its spread: Elevated default risk escalates borrowing expenses.
3. Tax benefits: Interest deductions impact after-tax debt cost; higher tax rates result in lower after-tax costs.

When a company has actively traded long-term bonds, their cost of debt can be estimated by considering the bond's market price, coupon, and maturity to calculate its yield. This method works well for firms with multiple frequently traded bonds. However, for companies with bonds of limited liquidity, an alternative approach involves using the firm's credit ratings and associated default spreads to estimate their cost of debt (Damodaran, 2012).

In the absence of a credit rating, two alternatives are available:

- 1) Recent borrowing history: Non-rated firms can rely on their recent borrowing transactions with banks and financial institutions to gauge default spreads, helping determine their cost of debt.
- 2) Synthetic rating: Assigns a firm's rating based on financial ratios, often using metrics shared among firms in specific rating classes, such as the interest coverage ratio. The Altman Z score, incorporating five weighted financial ratios, serves as a proxy for default risk, often derived from historical default data to enhance accuracy.

$$k_D(\text{pre-tax}) = rf + \text{default spread} \quad (21)$$

$k_D$  = Cost of Debt  
 $rf$  = Risk-free Rate

$$k_D(\text{after tax}) = k_D(\text{pre-tax}) * (1 - t) \quad (22)$$

$k_D = \text{Cost of Debt}$   
 $t = \text{Corporate Tax Rate}$

## 2.20 Tax-Rate

There are two main tax measurement methods: the effective tax rate and the marginal tax rate (Kumar, 2015). The effective tax rate for a company may deviate from its domestic statutory tax rate due to variations in foreign income taxation, often subject to a different rate than the company's domestic statutory income rate. Discrepancies may also emerge from tax credits unrelated to the current income. The effective tax rate for a company is computed from the financial statement as follows (Damodaran, 2012):

$$t_{\text{effective}} = \frac{\text{Taxes Due}}{\text{Taxable Income}} \quad (23)$$

$t_{\text{effective}} = \text{Effective Tax-Rate}$

## 2.21 Effective versus Marginal Tax rate for valuation purposes

Estimating tax rates presents challenges, especially in choosing between effective and marginal rates for forecasting. Using the marginal tax rate for operating taxes may lead to upward-biased estimates due to varying tax levels on foreign earnings, while the effective rate may yield biased estimates with one-time items included. As capital expenditures decrease and the gap between reported and tax income narrows, companies must settle deferred taxes over time. Initially, it's recommended to use the effective rate for forecasting, transitioning to the marginal rate, particularly for perpetual tax rate assumptions in terminal value calculations (Damodaran, 2012; Pinto et al., 2010).

## 2.22 The Basis of Relative Valuation

Relative valuation compares assets using metrics like earnings, cash flows, or revenues, contrasting with DCF, which focuses on intrinsic value. It assumes market pricing accuracy but acknowledges errors, identifiable through multiples. For instance, a health-care company's low price-earnings ratio compared to its sector average suggests undervaluation. Relative valuation offers simplicity and aids client understanding but may overlook factors like risk and growth. Market sentiment can inflate or deflate values, and its lack of transparency can lead to

manipulation by biased analysts. Common multiples include Price-to-Earnings (P/E), Price-to-Book (P/B), Price-to-Sales (P/S), and EV/EBITDA (Damodaran, 2012).

### **2.23 Literature Review – Conclusion**

After reviewing academic literature, the preferred valuation method for Hexagon is a DCF approach using FCFF. The APV method is particularly recommended for cases of deterministic debt financing and is therefore excluded. Hexagon's changing debt levels and complex debt structure make it more suitable to utilize the DCF WACC approach, which integrates debt levels as a component of company value and considers the associated cost of capital. The DDM is excluded due to Hexagon's growth and reinvestment focus making it an unsuitable valuation method.

## **3. Company and Segment Analysis**

The following chapter offers insights into Hexagon, covering its business model, strategy, and financial outlook. It aims to provide a basis for forecasting and valuation in subsequent sections.

### **3.1 Company Description**

Hexagon AB (“The Company”), headquartered in Sweden, is a global technology leader specializing in IT solutions that optimize productivity across diverse industries, particularly in geospatial and industrial applications. By integrating geospatial and industrial sensors, advanced software, 3D mapping, and 5D visualization tools, the company creates intelligent information ecosystems, offering actionable insights to enhance profitability and efficiency. Hexagon's solutions and technology find applications in various ecosystems such as autonomous mobility, buildings, cities and nations, defence, farms, industrial facilities, infrastructure, manufacturing, and mines. The company operates in over 50 countries with more than 24,000 employees. It is listed on Nasdaq Stockholm and is a part of the OMX30 index. As of 2023, the major shareholder is the investment firm Melker Schörling AB, holding 21.5% of shares and 42.6% of votes (Hexagon, 2023).

### **3.2 Business Segment Overview**

Hexagon operates through two primary segments: Geospatial Enterprise Solutions (GES) and Industrial Enterprise Solutions (IES) which will be deep-dived into in the next section.

*FIG 1 - Revenue Split 2023A*

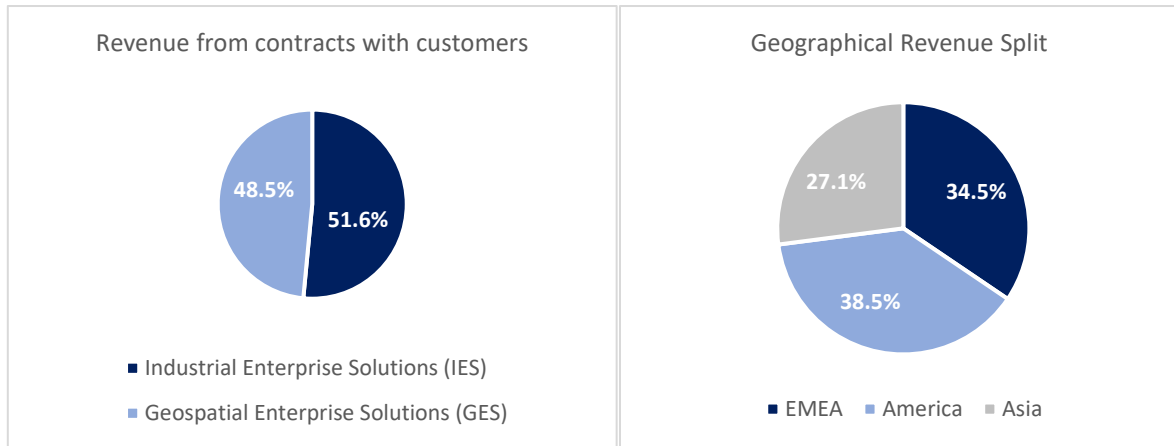
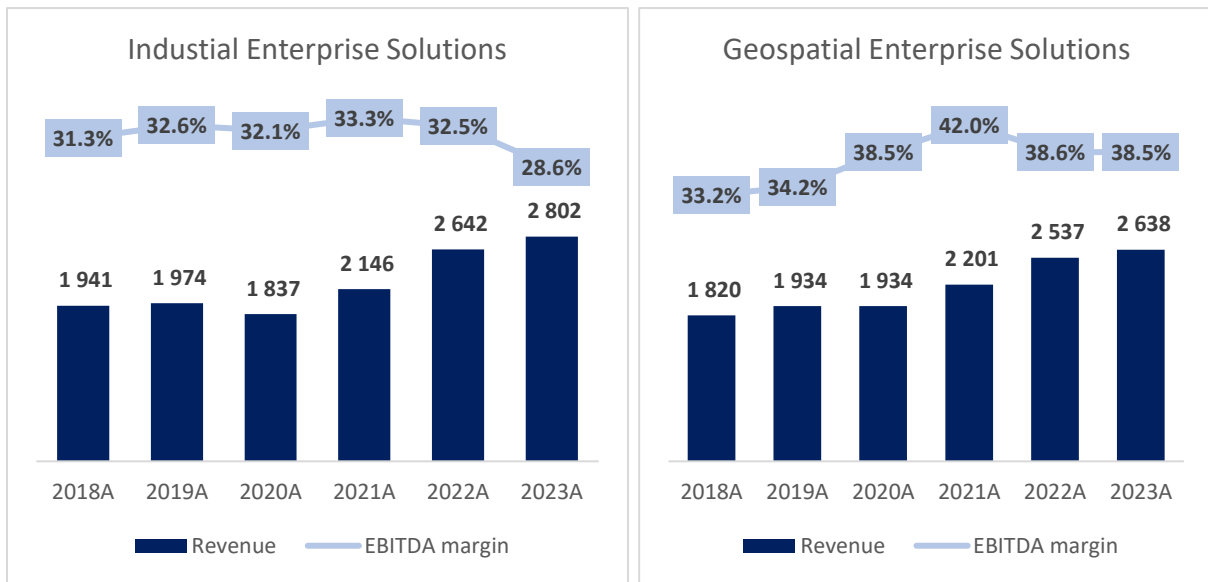


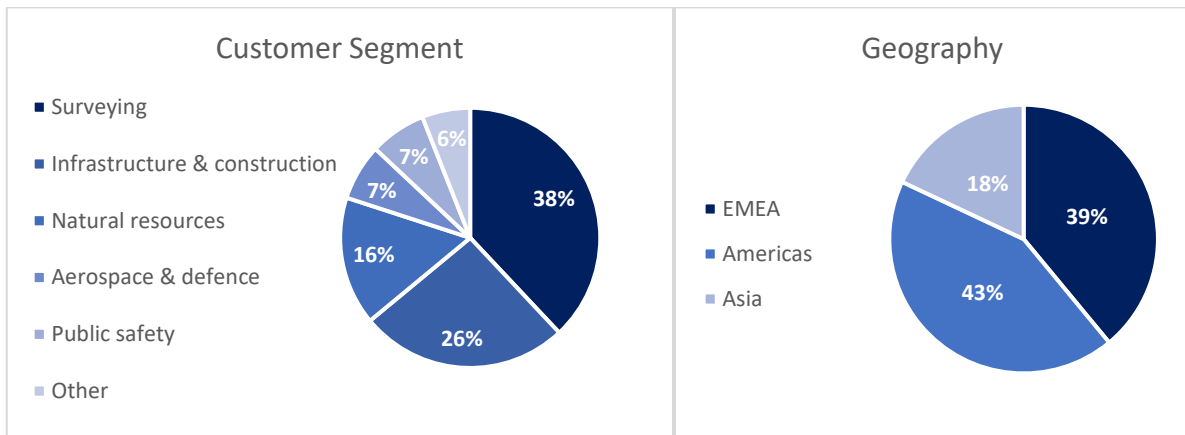
FIG 2 – Segment Revenue Split and EBITDA margin (EURm)



### 3.3 Geospatial Enterprise Solutions (GES)

The GES segment provides reality capture sensors including laser scanners, mobile mapping, and UAVs, along with monitoring equipment and precise positioning tools. Software technology accompanies these sensors to produce 3D maps and models, aiding decision-making in various sectors. Leica Geosystems, a Swiss subsidiary of Hexagon, specializes in high-precision instruments, sensors, and software for construction and agriculture, enhancing efficiency and decision-making through accurate spatial measurement and analysis (Hexagon, 2023).

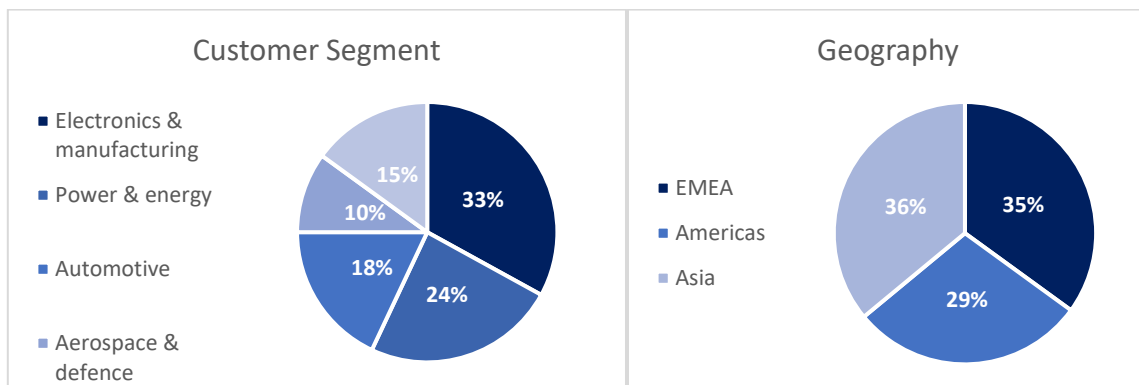
FIG 3 - GES Revenue Split by Customer and Geography 2023A



### 3.4 Industrial Enterprise Solutions (IES)

The segment comprises two divisions: manufacturing intelligence and asset lifecycle intelligence. In manufacturing intelligence, the portfolio includes metrology solutions like coordinate measurement machines (CMM), laser trackers, and scanners to optimize design processes. It also offers computer-aided design (CAD), computer-aided manufacturing (CAM), and computer-aided engineering (CAE) software. Asset lifecycle intelligence software enhances productivity, optimizes design processes, and provides asset management information for industrial plants and processing facilities throughout their lifecycle (Hexagon, 2023).

FIG 4 - IES Revenue Split by Customer and Geography



### 3.5 Core Technologies

Hexagon leads in five core technologies: reality capture, positioning, design and simulation, location intelligence, and autonomous technologies, forming the foundation of its innovation strategy to unlock data's full potential.

### **3.6 Reality Capture**

Digitally capturing the physical world forms the basis for creating precise 3D digital twins. Hexagon provides advanced reality capture solutions for accurate virtual representations. By investing in cutting-edge technology, Hexagon revolutionizes decision-making with on-site data capture and verification through edge computing. Real-time cloud-based information sharing enhances collaboration and decision-making efficiency across geographically dispersed teams (Hexagon, 2023).

### **3.7 Positioning and Measurement Solutions**

Accurate position data is crucial for asset and people tracking, facilitated by Hexagon's PNT (Positioning, Navigation, and Timing) solutions across industries. Their portfolio includes advanced surveying instruments, GPS/GNSS equipment, 3D laser scanning, and utility mapping solutions, alongside relevant software. Receiver devices determine precise locations via signals from GNSS systems, while IMUs enhance accuracy by measuring motion (Hexagon, 2023).

### **3.8 Design and Simulation**

Hexagon's Design and Simulation technologies offer sophisticated problem-solving tools, enabling exploration and prediction of real-world outcomes. Their Plant Design Software optimizes engineering processes and enhances data utilization and reusability. Additionally, Hexagon's Engineering Design Software provides a comprehensive solution for various engineering tasks, ensuring precision and efficiency. Moreover, Hexagon's Comprehensive Planning and Simulation portfolio simulates virtual real-world scenarios across applications from manufacturing to autonomous driving (Hexagon, 2023).

### **3.9 Location Intelligence**

Hexagon's Location Intelligence utilizes geospatial technology and data analytics for informed decision-making. Their diverse situational awareness technologies span various industries, offering real-time intelligence to detect issues proactively. Crucial for emergency response and disaster management in factories, manufacturing sites among others, these solutions enable proactive problem-solving (Hexagon, 2023).

### **3.10 Autonomous Technologies**

Autonomous Technologies extend beyond self-driving cars, including farming, factory operations, military equipment, construction machinery, and logistics. Hexagon's solutions capture, connect, and integrate data for advanced autonomous mobility. Augmenting automated systems with sensors and AI enables independent task execution, reducing human intervention, often integrated with autonomous machines (Hexagon, 2023).

**3.11 Innovation and Acquisition Strategy**

As of 2022-2026 business plan, Hexagon's growth strategy focuses on organic expansion through R&D, innovation, and leveraging existing technologies, alongside strategic acquisitions. The plan prioritizes customer-centric solutions, aiming for an annual growth rate of 8-12%. New offerings, enhanced customer-focused solutions, and increased software-based earnings are expected to boost recurring revenue.

*FIG 5 - Hexagon's Financial Plan 2022-2026*

<b>8-12%</b>	<b>5-7%</b>	<b>3-5%</b>	<b>&gt;30%</b>
<b>Average total growth per year</b>	<b>Average organic growth per year</b>	<b>Average growth from M&amp;A per year</b>	<b>Adjusted operating margin</b>

**3.12 M&A strategy**

Acquisitions are essential to Hexagon's long-term growth strategy, targeting 3-5% annual inorganic growth since 2016. Focusing on acquisitions near core business segments, they aim to expand the product portfolio and distribution network while enhancing synergies and mitigating integration risks. While larger acquisitions like Brown and Sharp, Leica Geosystems, Novatel, Intergraph, MSC, and Infor EAM are emphasized, smaller additions are also incorporated. These acquisitions support Hexagon's divisional operations, with a focus on software acquisitions to boost recurring revenues. Hexagon is utilizing earnouts aligns buyer and seller interests, particularly in uncertain performance scenarios. Hexagon has completed over 180 M&A transactions since 2000.

*FIG 6 - Recent Large Acquisitions between 2017-2022 with disclosed deal value*

Company	Description	Disclosed Revenues (In €m)	Disclosed Purchase Price (In €m)	Implied EV/Sales multiple
MSC (2017)	A US-based provider of computer-aided engineering (CAE) solutions	209	780	3.7x

Infor EAM (2021)	A provider of Enterprise Asset Management and APM software	151	2422	16.1x
ETQ (2022)	A leading provider of SaaS-based quality management (QMS) software	65	1063	16.4x

### 3.13 Shareholder Structure and Share Price Development

Hexagon's Series B shares have traded on Nasdaq Stockholm since 1988 and are listed on the Large Cap list. Series A shares hold 10 votes each, while Series B shares hold 1 vote. Hexagon is part of the OMX Stockholm 30 (OMXS30), the primary equity index for the Stockholm Stock Exchange.

FIG 7- Hexagon's Shareholders by Sector and Shareholder Structure as of Dec 2023

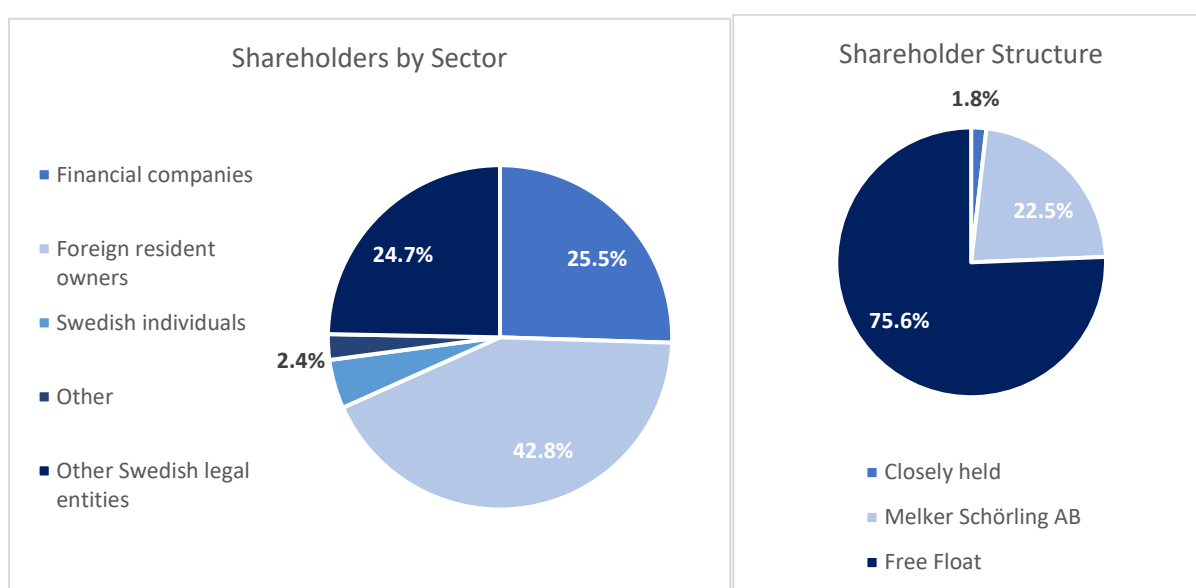
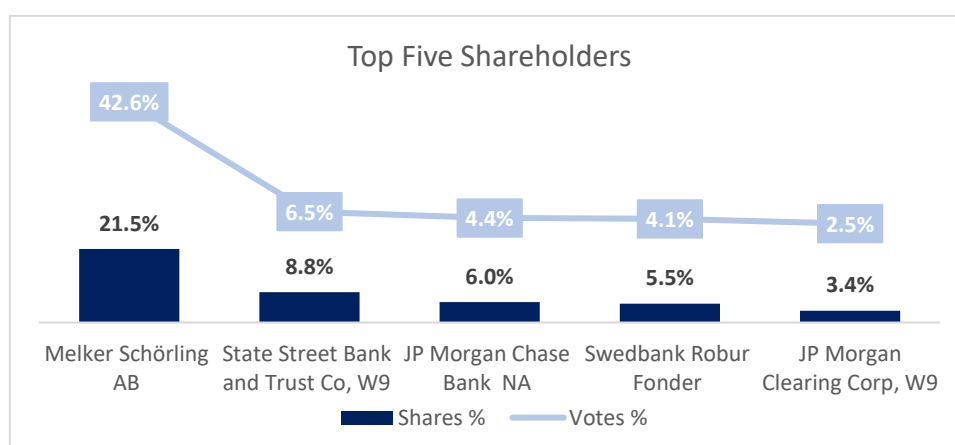


FIG 8 - Hexagon's Top Five Shareholders



### 3.14 Melker Schörling AB (“MSAB”) - The largest shareholder

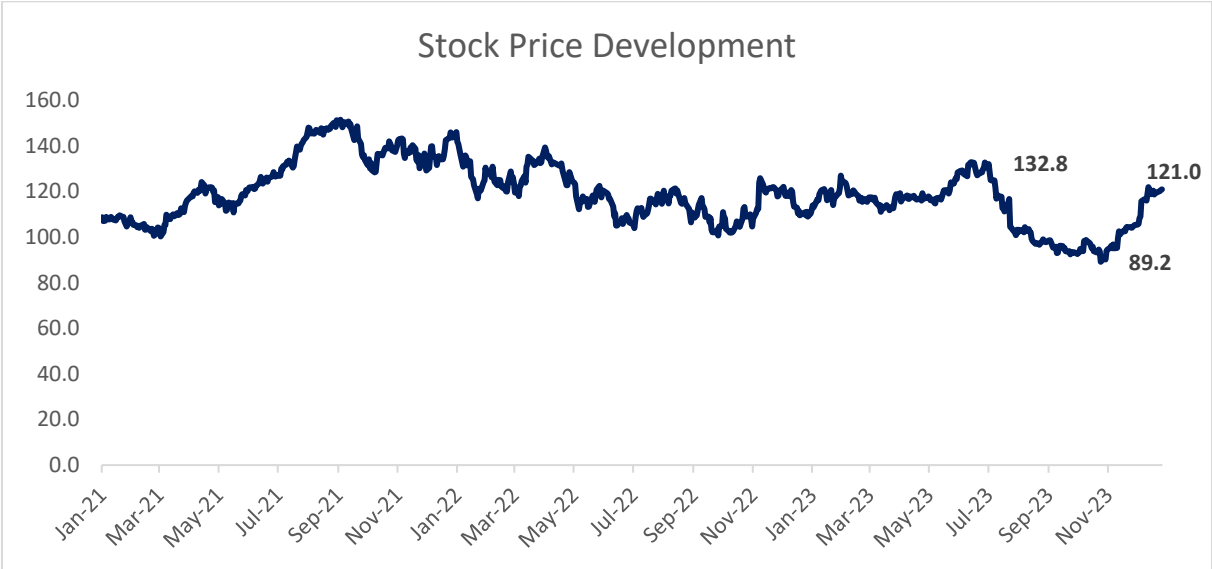
In 1987, Melker Schörling became CEO of Securitas and heavily invested in the company. He later founded Melker Schörling AB (MSAB), an investment firm focused on developing

industrial companies. Today, the second generation actively participates as major shareholders and serves on boards to shape strategic decisions, including capital structure and growth strategies. MSAB holds significant stakes in publicly listed firms like Anticimex, Assa Abloy, and Securitas.

**3.15 The shortselling report by Viceroy Research Group**

On July 19th, 2023, Viceroy Research issued a report questioning Hexagon's corporate governance, organic growth assertions, and alleged related party dealings. Known for its aggressive approach, Viceroy accused Hexagon of fraudulent practices, highlighting irregularities in its growth reporting and investments. Hexagon countered these allegations on August 2nd, defending the accuracy of its growth records and refuting claims of related party transactions, particularly concerning its investment in Divergent Technologies (Viceroy, 2023; Hexagon, 2023).

FIG 9 - Stock Price Development as of end of Dec 2023



Source: Capital IQ

Before the publishing of the shortselling report by Viceroy Research, the Hexagon stock was traded at a price of SEK 132.8. The market reacted to the report with a drop in the stock price to the lowest at SEK 89.2. However, as of 29<sup>th</sup> of December 2023, the stock was closing at SEK 120.9 which shows that the market restored faith in Hexagon.

**4.0 Market Analysis & Competitive Landscape**

The next chapter provides a detailed overview of Hexagon's competitive landscape and market analysis for its two primary segments: Industrial Enterprise Solutions ("IES") and Geospatial

Enterprise Solutions ("GES"), offering insights into key trends and considerations for each segment.

FIG 10 - Expected Future Market CAGR for Hexagon’s segments and subsegments

Hexagon Segments	Weight % of Total Revenue	CAGR		Market CAGR	Estimation Period
		2017A-2019A	2019A-2022A		
<b>Industrial Enterprise Solutions (IES)</b>	<b>51%</b>	<b>6.4%</b>	<b>19.8%</b>	<b>20.7%</b>	2023-2028
<b>Geospatial Enterprise Solutions (GES)</b>	<b>49%</b>	<b>6.5%</b>	<b>14.5%</b>	<b>12.8%</b>	2023-2028
Surveying	18.8%	3.7%	14.3%	6.4%	2022-2028
Power & Energy	12.2%	15.9%	14.4%	19.7%	2021-2030
Infrastructure & Construction	13.6%	12.0%	21.1%	16.9%	2023-2033
Automotive	9.5%	5.7%	19.2%	13.1%	202X-2027
Public Safety	3.4%	-28.5%	6.6%	10.8%	2023-2028
Electronics & Manufacturing	16.7%	12.5%	22.1%	7.0% - 14.9%	2023-2030
Aerospace & Defence	8.7%	24.0%	-0.5%	8.6%	2023-2029
Natural Resources	8.1%	20.8%	24.8%	4.4%	2023-2028

The IES and GES segment have historically shown strong performance in terms of CAGR compared to expected future CAGR, indicating Hexagon's favourable market position for revenue growth. Within key subsegments like Surveying, Power & Energy, Infrastructure & Construction, and Electronics & Manufacturing, each has consistently outperformed expected future CAGR for their respective industries. Considering market growth alone, Hexagon is well positioned to maintain and expand market share, irrespective of peer market concentration.

**4.1 Business Evolution in the Metaverse Era**

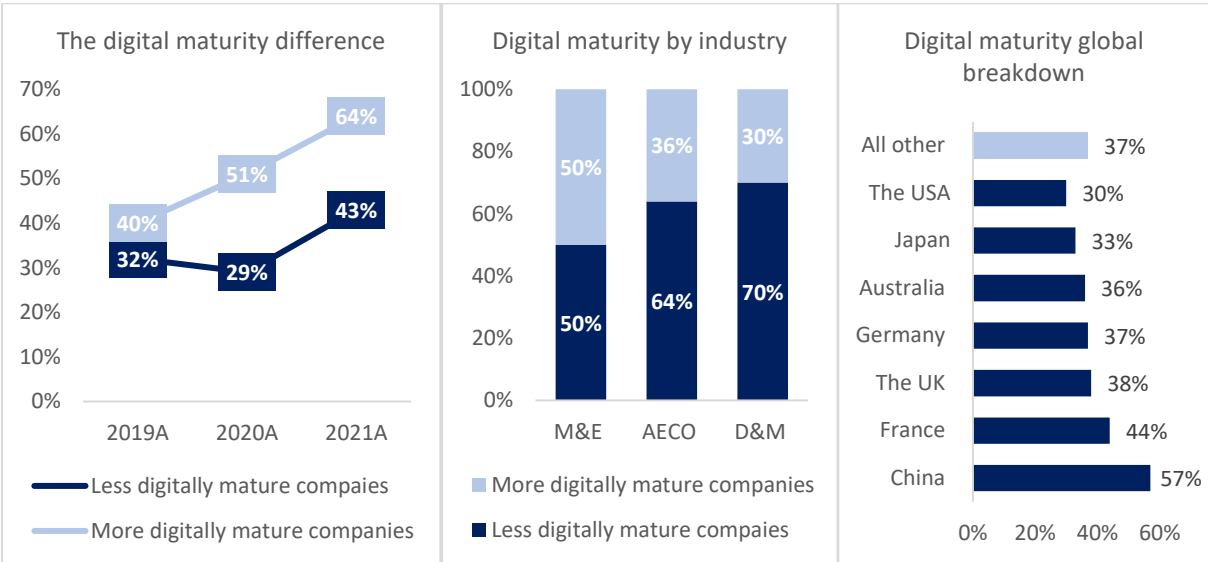
The fusion of physical and digital realms is reshaping organizations. McKinsey (2023) predicts a rise in virtual workspaces by 2030, while The Economist forecasts a \$900 billion metaverse market. This shift necessitates adopting mixed and extended reality technology (Bain & Company, 2023; Deloitte, 2023). The metaverse also offers cost-saving opportunities, notably in aviation (Deloitte, 2023). In this landscape, Hexagon's Smart Digital Reality™ and digital twin technology, bolstered by the LocLab acquisition, position it to exploit metaverse opportunities and reshape business models (Hexagon, 2023).

**4.2 Market Analysis Introduction - Digital Maturity**

Autodesk, a peer of Hexagon, conducted a global study interviewing over 2,500 industry leaders to assess their organizations' digital transformation progress. Participants rated their status as "early stage," "midway," "approaching," or "achieving" transformation goals. Higher digital

maturity corresponded to better performance, with more mature companies consistently outperforming less mature ones over three years, and the performance gap continues to widen (Autodesk, 2023).

FIG 11 - Digital Maturity Illustration



AEEO- Architecture, Engineering, Construction and Building services, D&M- Design and Manufacturing, M&E - Media and Entertainment

The survey above indicates companies plan to invest in technology, innovation, and data management to tap untapped opportunities and achieve digital maturity. From the respondents of the survey, the following areas are in which companies plan to invest in the coming years.

<b>74%</b>	<b>73%</b>	<b>70%</b>
<b>in technology to deliver and improve project outcomes</b>	<b>in innovation of products and services</b>	<b>in data management and analytics</b>

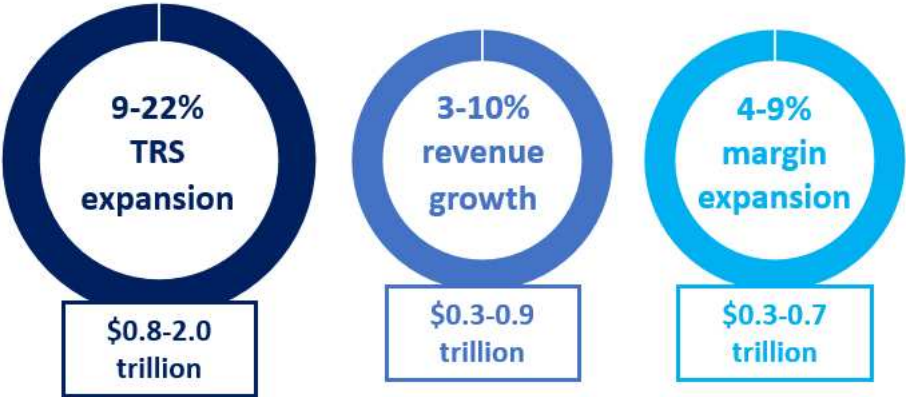
Hexagon's comprehensive technologies and Smart Digital Reality™ strategy directly align with the key areas of business investment—improving project results, product innovation, and data analytics.

**4.3 Market Analysis Introduction – Unlocking value through adoption**

The industrial sector leverages technology to enhance productivity and quality while meeting demands for automation and digitization (Hexagon, 2023; McKinsey, 2018). Manufacturers embrace automation and end-to-end solutions for informed decision-making across product life

cycles, aiming for efficiency gains and cost reduction. Process industries, such as oil and chemicals, seek productivity enhancements and risk mitigation, crucial in addressing project completion deadline challenges (Hexagon, 2023).

FIG 12 - Tech Driven Transformation in Industry: Unlocking Value

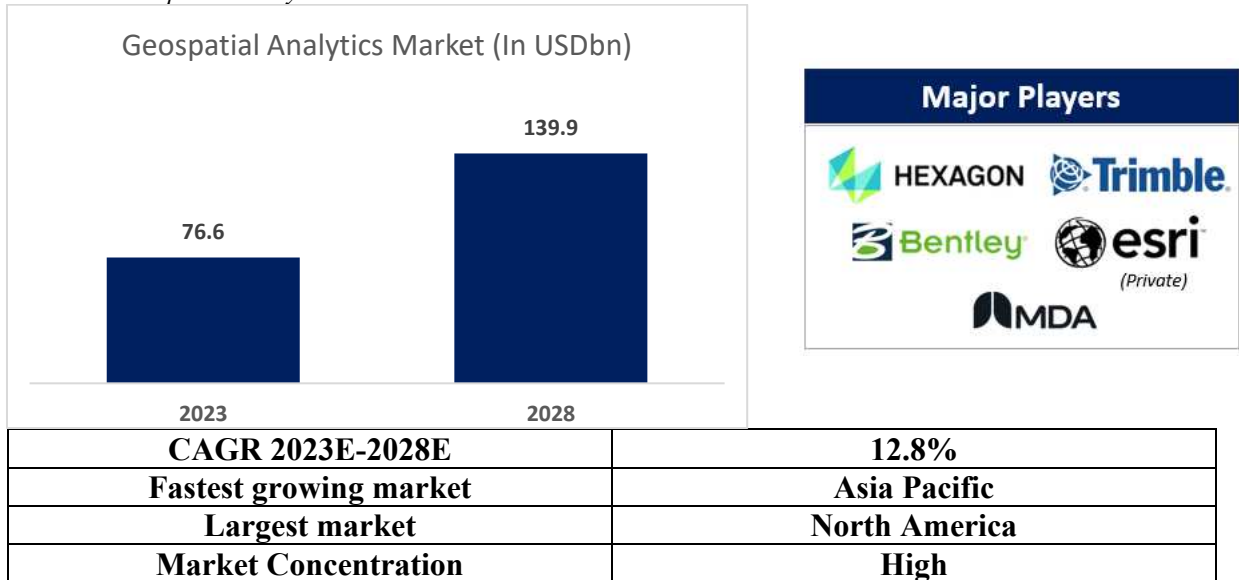


Tech-driven transformation in the industrial sector can generate a significant shareholder return of \$0.8-\$2 trillion (9%-22% increase) through revenue growth and margin expansion. Revenue growth, totaling \$0.3-\$0.9 trillion (3%-10% improvement), is fueled by innovative business models, personalized offerings, expanded e-commerce, and optimized pricing. Margin expansion, ranging from \$0.3-\$0.7 trillion (4%-9% improvement), is achieved through efficiency gains via automation, analytics, and digital tools, alongside product-customization techniques to optimize non-labor costs (McKinsey, 2018).

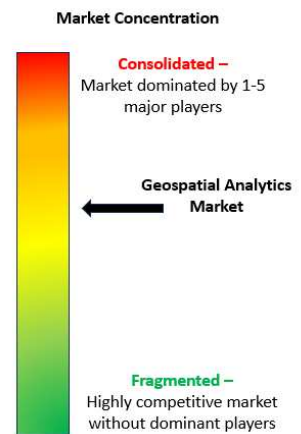
#### 4.4 The Geospatial Analytics Market

Hexagon's Geospatial analytics segment utilizes GIS and GPS data to create infrastructure, graphs, and statistics for various tasks like climate monitoring and retail logistics (Hexagon, 2023). Augmented reality, AI, and 3D tools are employed to transform business practices and gain a competitive edge through advanced data visualization. The growing demand for geospatial services, driven by smart city growth, spans consumer, business, and societal sectors. The geospatial technology market is projected to grow from USD 76.6bn to USD 139.9bn with a CAGR of 12.81% from 2023 to 2028 (Mordor Intelligence, 2023).

FIG 13 - Geospatial Analytics Market Outlook



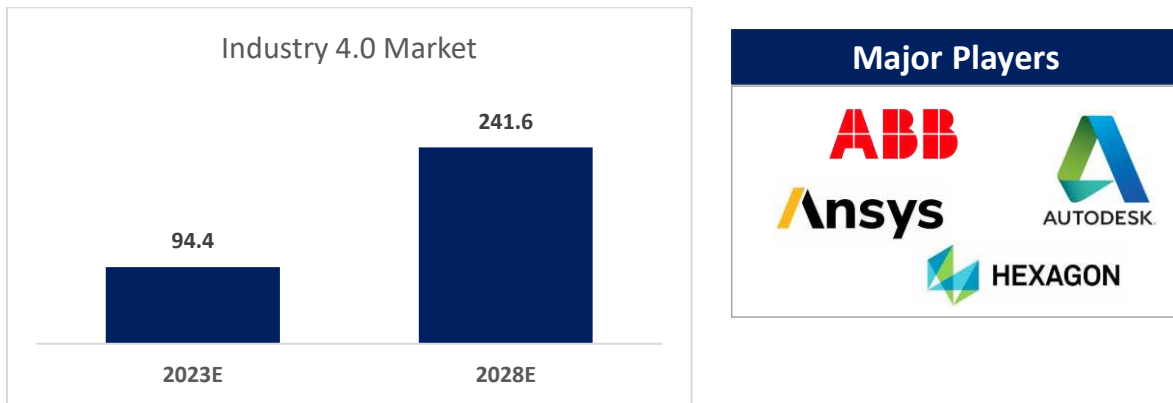
Hexagon strategically positions itself in the growing geospatial analysis and smart city development sectors. Expertise in reality capture, sensor-software integration, and Smart Digital Reality™ aligns with the rising demand for geospatial technologies, augmented reality, and 3D modeling crucial for urban planning, disaster management, and environmental sustainability. This positions Hexagon to capitalize on increasing demand for sophisticated geospatial solutions across industries, driving digital transformation and global sustainability goals.



#### 4.6 The Industrial 4.0 Market

Hexagon's IES segment, aligning with the Industry 4.0 market, drives digital transformation in manufacturing with a focus on disruptive technologies. The market is projected to grow from USD 94.4bn to USD 241.6bn with a CAGR of 20.7% 2023E-2028E (Mordor Intelligence, 2023)

FIG 14 - Industry 4.0 Market



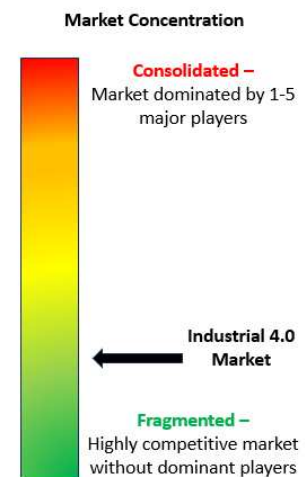
<b>CAGR 2023E-2028E</b>	<b>20.7%</b>
<b>Fastest growing market</b>	<b>Asia Pacific</b>
<b>Largest market</b>	<b>Europe</b>
<b>Market Concentration</b>	<b>Low</b>

In Industry 4.0, four disruptive technologies are reshaping the entire value chain. The first segment encompasses Connectivity, Data, and Computational Power, with cloud tech, blockchain, the Internet, and sensors driving connectivity, leading to a surge in multicloud adoption by up to 85% of companies, with 25% using at least five platforms.

The second segment, Analytics and Intelligence, highlights the importance of advanced analytics, machine learning, and artificial intelligence, with challenges in utilization and trust,

alongside the emergence of generative AI tools like GPT-3. Human-Machine Interaction, the third segment, incorporates virtual reality, augmented reality, robotics, automation, and autonomous guided vehicles, promising revolutionary advancements in data visualization and utilization, impacting sectors from healthcare to retail.

Lastly, additive manufacturing, notably 3D printing, addresses supply chain challenges by enabling distributed, cost-effective production, particularly valuable in aerospace and medical technology sectors. Hexagon's offering in digital reality solutions aligns perfectly with these critical technologies, boasting capabilities in reality capture, sensor-software systems, precise positioning, advanced design, simulation, and autonomous technologies, making it a key player

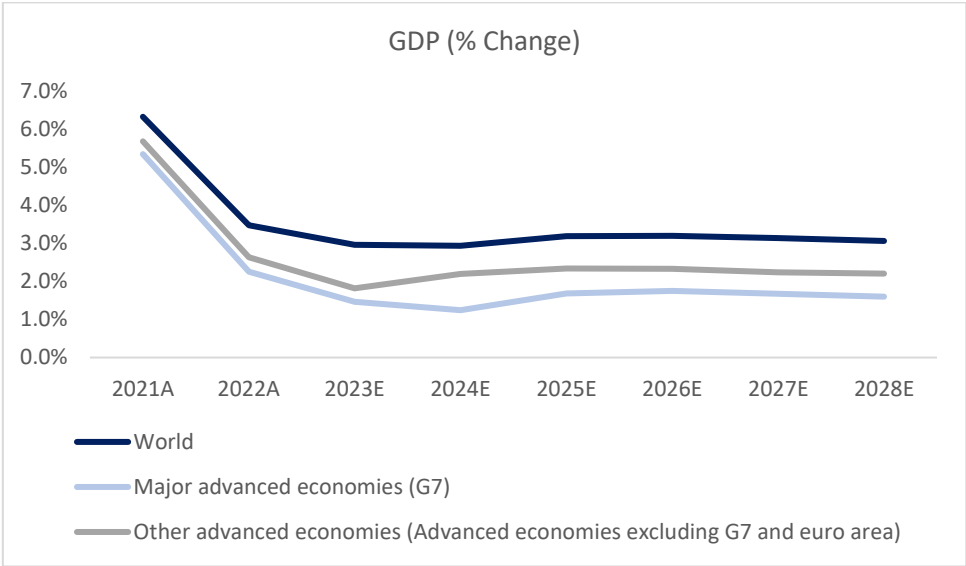


in the Industry 4.0 landscape. (Sources: McKinsey, 2023; Deloitte, 2023; BCG, 2023; BCG, 2022; Hexagon, 2023)

### 4.8 Macroeconomic Environment

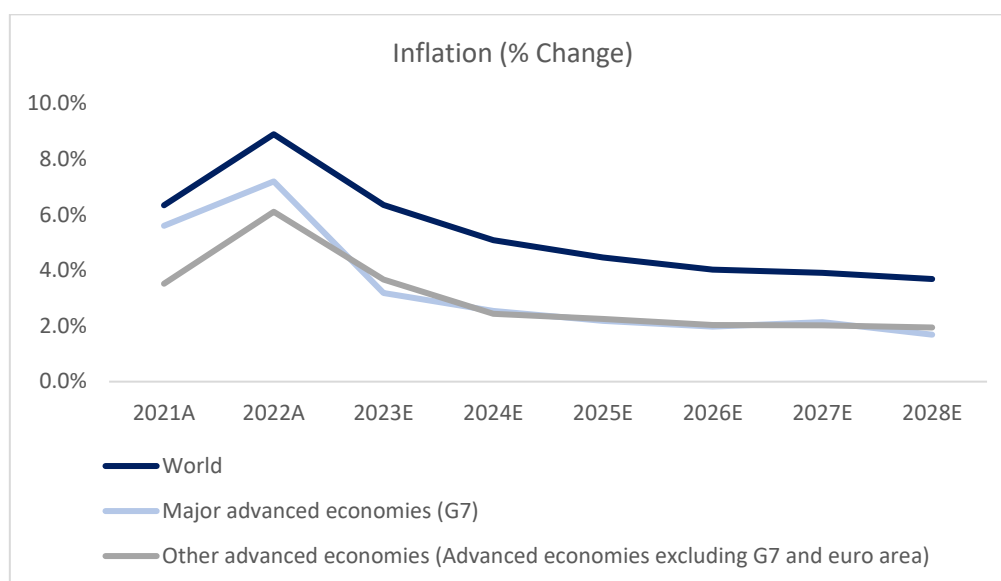
The global recovery from the COVID-19 pandemic and Russia's invasion of Ukraine is slow and uneven. Economic activity is below pre-pandemic levels, especially in emerging markets. Various factors, including long-term pandemic consequences, the war in Ukraine, and monetary policy tightening, are impeding recovery. Global growth is forecasted to slow, with advanced economies slowing from 2.6% in 2022 to 1.4% in 2024 and emerging markets declining from 4.1% in 2022 to 4.0% in 2024, due to the property sector crisis in China (IMF, 2023).

FIG 15 - GDP growth outlook



Global inflation is expected to decline but not return to target until 2025. Risks remain tilted to the downside, including China's property crisis, inflation pressures, climate, and geopolitical shocks, and debt distress in low-income countries. Policymakers need to focus on price stability, fiscal responsibility, structural reforms, and multilateral cooperation to address these challenges (IMF, 2023).

FIG 16 - Inflation growth outlook



## 5. Valuation

Valuation and share price estimation were conducted as of December 31<sup>st</sup> 2023, incorporating forecasted financial statements. Revenue predictions were weighted by sub-segment size within IES and GES. Due to a lack of segment-specific disclosures COGS and SG&A, including sales, administration, R&D, and other costs, were estimated at the group level. Resulting EBIT and EBITDA figures were also derived at the group level. As previously stated in the literature review, the DCF method and relative valuation techniques were applied for the valuation of Hexagon. DDM was excluded due Hexagon's growth and reinvestment focus, making DDM unsuitable. APV-method due to difficulty in estimating the present value of tax shields of Hexagon's changing debt levels. The valuation is done in EURm.

### 5.1 Discounting Cash Flow (DCF) Valuation

The forthcoming valuation is based on firstly analysing historical performance, followed by an explicit forecast of relevant items of the DCF for a thorough assessment. The DCF valuation includes two methods to calculate the terminal value: the Gordon Growth Method and the Relative Multiple Approach.

### 5.2 Explicit period

Based on Damodaran's growth curve analysis, Hexagon is expected to soon be transition into the mature growth stage. During this phase, operating profits are expected to grow, reinvestment rates are projected to decline, and the FCFF to be positive and growing (Damodaran, 2023).

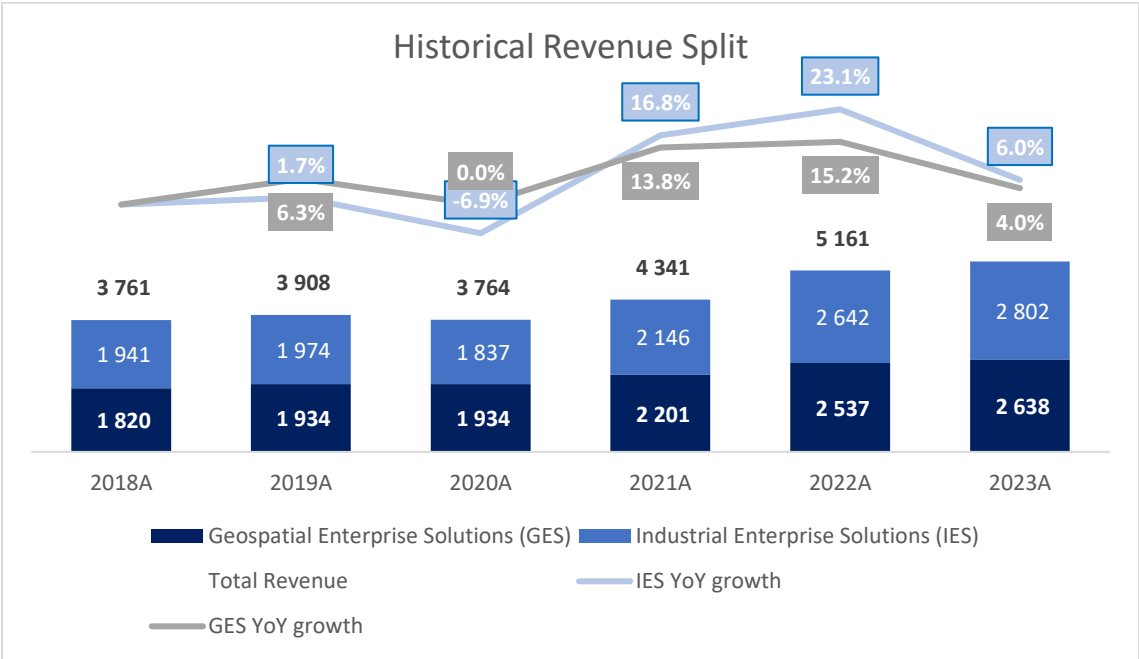
The higher growth period is lasting five years and after follows a transition into stable growth of five years, leading to a total explicit forecasting period of ten years.

### 5.3 Revenue Recognition

Hexagon recognizes revenue when control of goods or services from customer contracts is transferred, including installations, services, training, licenses, and software subscriptions. Service revenue is recognized at delivery, and license revenue is based on the type of license—either upon granting of right-to-use or over time for right-to-access. Software subscription revenue is recognized evenly over the period. Hexagon does not enter into contracts that delay payment for goods/services beyond one year.

### 5.4 Historical Revenue Development

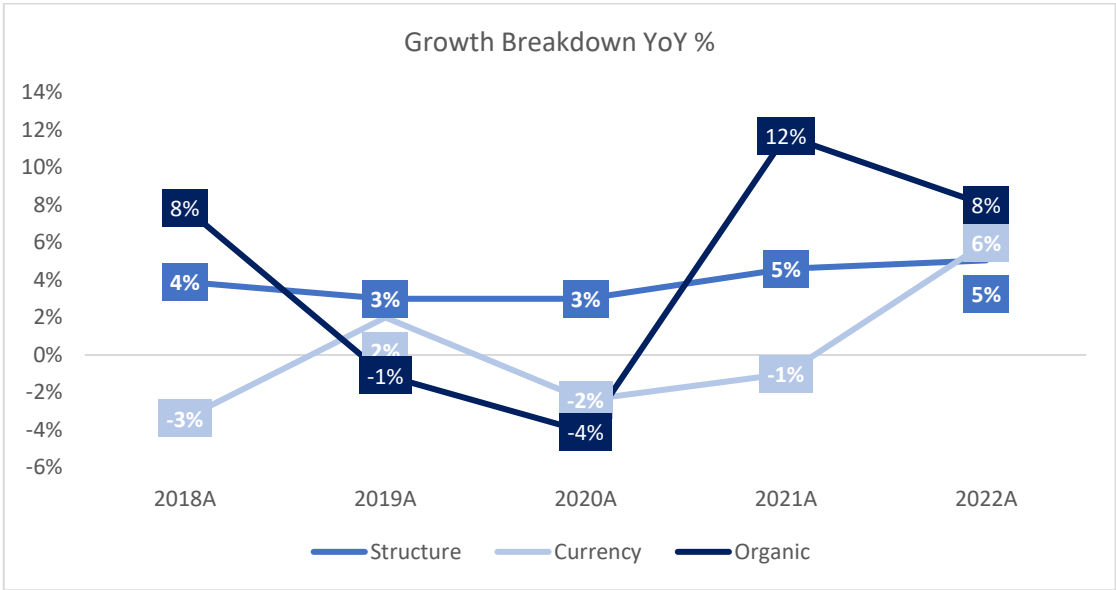
FIG 17 - Historical Revenue Split



In 2018A, Hexagon saw significant organic growth driven by technology solutions and software investments. However, in 2019A, a -1% dip in organic growth occurred due to slowing end-markets, geopolitical uncertainties, and challenges in automotive and construction sectors, particularly in China. The COVID-19 pandemic in 2020A resulted in a -4% drop in organic growth due to global lockdowns and restrictions impacting market demand. Despite this, strategic focus on autonomy and technology bolstered revenue in 2021A, with further growth in 2022 driven by strong demand. However, challenges such as supply constraints and halting operations in Russia were noted throughout the year. While Hexagon didn't achieve the

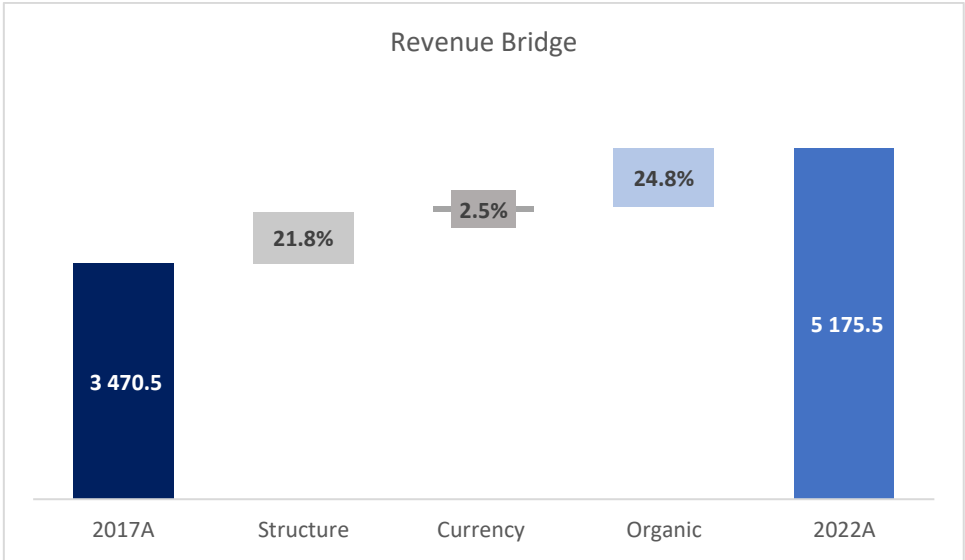
business plan target of revenue between EUR 4,600m and 5,100m by 2021A, mainly due to the COVID-19 pandemic in 2020A, its strategic efforts continue to drive growth.

FIG 18 – Growth Breakdown YoY %



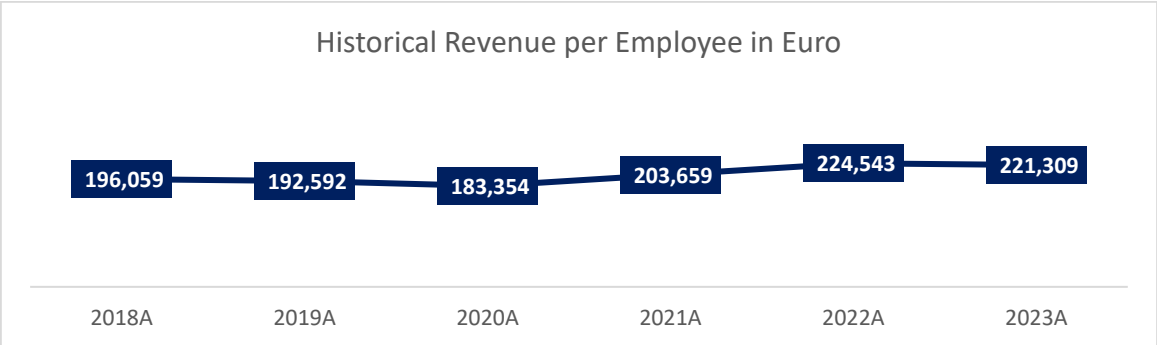
Revenue from acquisitions and divestments initially falls under "Structure" but becomes organic growth after twelve months. From 2018A to 2022A, structure growth ranged between 3% - 5% annually, driven by the M&A strategy. Hexagon met growth objectives outlined in its 2017A-2021A business plan through acquisitions, achieving targeted 3% and 5% annual growth rates in base and optimistic scenarios, validating its successful execution of the M&A strategy.

FIG 19 – Revenue Bridge



Between 2017A-2022A, the company revenue has grown at similar rates for organic and inorganic growth, maintaining a close to 50%/50% balance. This approach offers diversification and rapid expansion benefits. Acquisitions can yield unique assets and synergies, enhancing competitiveness. However, it also entails integration and financial challenges, potential loss of focus on the core business, and risks of overpaying for acquisitions.

FIG 20 - Historical Revenue per employee



The graph above showing Hexagon’s revenue per employee shows an overall upward trend despite some fluctuations. The dip 2020A is due to impacts caused by the pandemic, while the substantial recovery in 2021A and peak in 2022A reflect successful post-crisis strategies or operational efficiencies. Given Hexagon's M&A strategy, the increase in revenue per employee could be indicative of revenue synergies from these acquisitions. The data points to a general pattern of growth and efficiency post acquisitions.

**5.5 Forecasted Revenue Development**

With Hexagon's business spread geographically and across a broad customer base, the potential negative effects of a downturn in developed markets may be partially offset by growth in emerging markets and vice versa. Therefore, focus is placed on the global growth of each subsegment

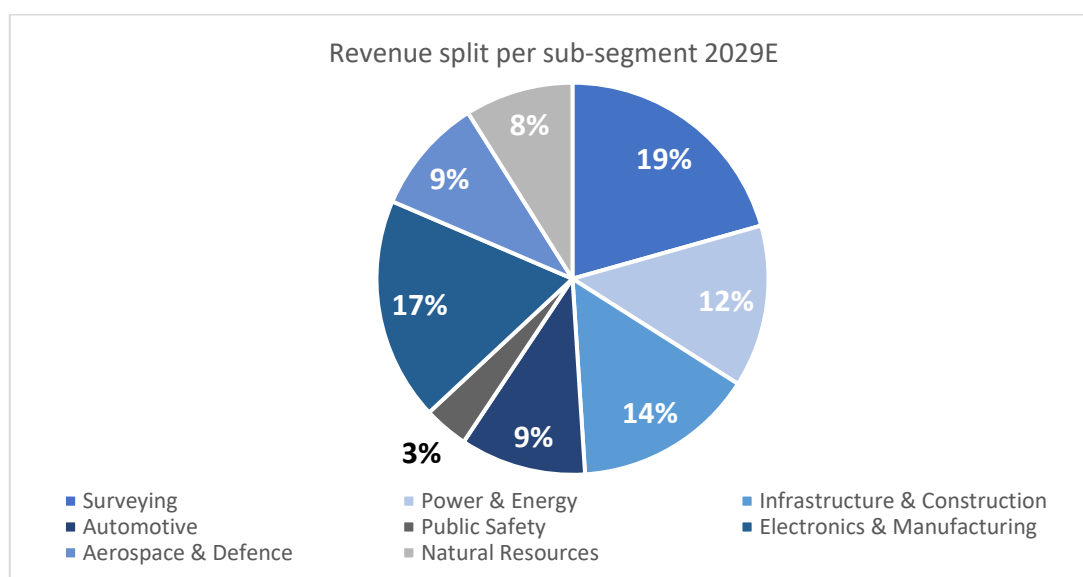
FIG 21 – Historical CAGR vs Future Market CAGR

Hexagon Segments	Weight % of Total Revenue	Hist. CAGR 2021A-2023A	Estim. CAGR		Market CAGR	Estimation Period
			2024E-2028E	2029E-2033E		
<b>Industrial Enterprise Solutions (IES)</b>	<b>51%</b>	<b>14.3%</b>	<b>9.4%</b>	<b>3.0%</b>	<b>20.7%</b>	<b>2023-2028</b>
<b>Geospatial Enterprise Solutions (GES)</b>	<b>49%</b>	<b>9.5%</b>	<b>9.0%</b>	<b>3.1%</b>	<b>12.8%</b>	<b>2023-2028</b>
Surveying	18.8%	6.3%	6.0%	3.2%	6.4%	2022-2028
Power & Energy	12.2%	13.7%	13.0%	3.5%	19.7%	2021-2030
Infrastructure & Construction	13.6%	3.3%	10.9%	3.2%	16.9%	2023-2033
Automotive	9.5%	6.9%	10.9%	3.2%	13.1%	202X-2027
Public Safety	3.4%	13.8%	8.2%	2.8%	10.8%	2023-2028
Electronics & Manufacturing	16.7%	13.2%	7.5%	2.7%	7.0% - 14.9%	2023-2030
Aerospace & Defence	8.7%	16.5%	11.7%	3.1%	8.6%	2023-2029
Natural Resources	8.1%	24.5%	13.0%	3.0%	4.4%	2023-2028

Sources: Markets.us (2023), Delvens (2022), Guidehouse Insights (2022), Future Market Insights (2023), Markets & Markets (2023), Global Market Estimates (2023), Fortune Business Insights (2023), Precision Business Insights (2023), Grandview Research (2022), Precedence Research (2023)

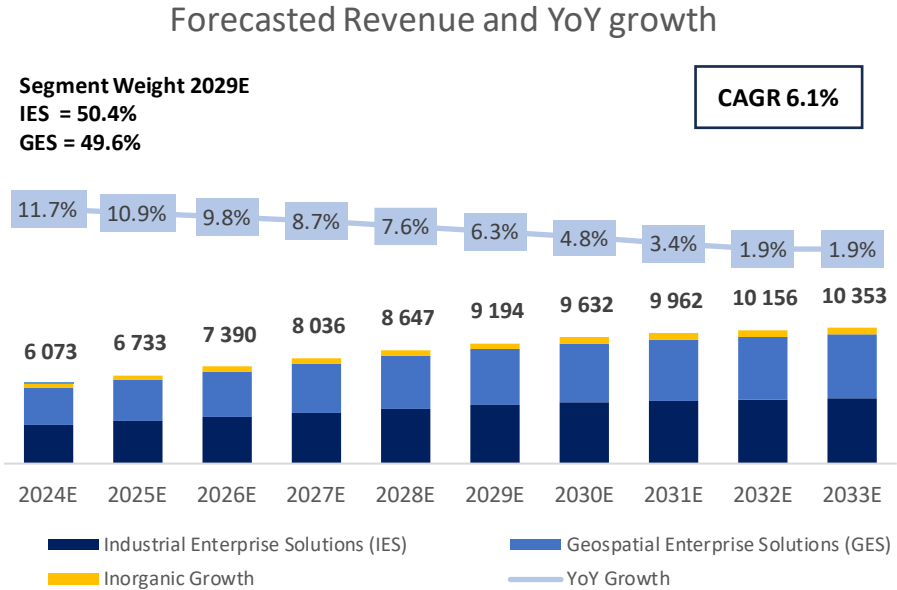
For revenue forecasting, each sub-segment within both IES and GES are individually forecasted. These segments are further divided into eight sub-segments each. Following the forecast, each segment are categorized into IES and GES based on their respective weights within the segment. This forecasting process focuses on Hexagon's organic growth, divided into two phases: an initial growth period and a subsequent phase of moderate revenue growth. The expansion period aligns between historical growth rates and projected trajectories for each sub-segment, as depicted in the table above.

FIG 22 - Weight of each subsegment revenue



Nearly half of Hexagon's historical revenue growth comes from inorganic sources through M&A. This percentage of inorganic growth is added to total organic revenue for a clearer assessment of how a slowdown in M&A activity might affect the company's stock price.

FIG 23 - Forecasted revenue overview

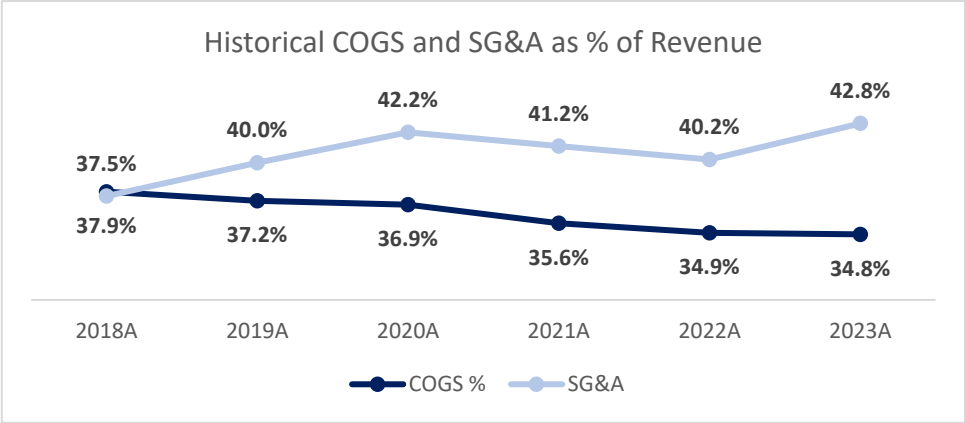


The acquisition of ETQ by Hexagon is projected to yield approximately 40 MUSD in revenue synergies by 2026E, driven by its alignment with Hexagon's manufacturing and process industries and its potential for geographical expansion, leading to increased margins. Consequently, the forecasted year-over-year growth for 2024E is estimated at 11.7%, factoring in both inorganic growth and the impact of the ETQ acquisition.

**5.6 Cost of goods sold and SG&A**

To analyze COGS and SG&A, these items were measured as a percentage of revenue. Hexagon's cost structure is undergoing changes, driven by increased investments in R&D to cater to a more solution-centric business model. This shift has seen a rise in sales expenses while administrative costs have been trimmed, which are non- accretive to profitability. The transition towards emphasizing software-and solution-selling has positively impacted operating margins but has also led to adjustments in the cost structure. Hexagon has now a lower COGS, but higher R&D and amortisation compared to 2018A.

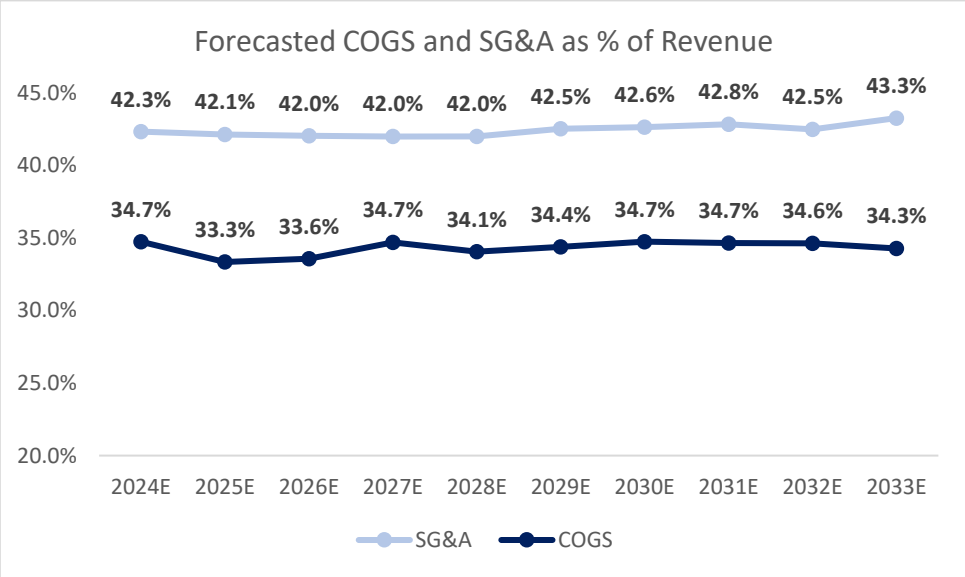
Figure 24 - Historical COGS and SG&A comparison



**5.7 Forecasted COGS and SG&A**

During the explicit forecasting period, COGS is forecasted to gradually decrease further to 34.3% of revenue 2033E. Considering the change towards software -as a solution business model, the SG&A is expected to increase and stand at 43.3% in 2033E which will offset the decrease of COGS.

FIG 25 - Forecasted COGS and SG&A

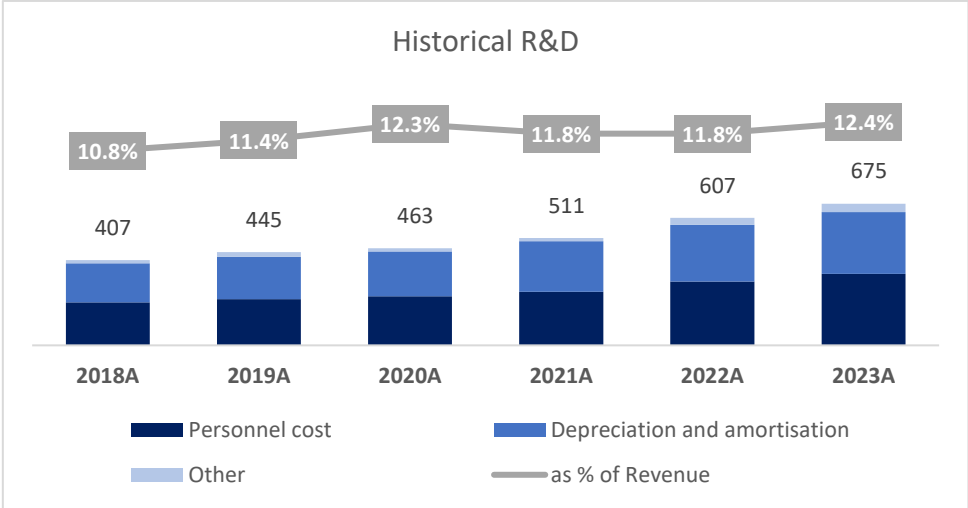


**5.8 Subcategory of SG&A - Research & Development**

Hexagon invests in R&D to sustain innovation leadership and foster organic growth, operating primary units in Switzerland, China, India, and the USA. With 5,000 employees dedicated to R&D, accounting for 10 to 12% of revenues, the company focuses on enhancing existing

products, exploring new applications, and expanding its market. Development expenses are capitalized if they contribute to new products with anticipated future economic benefits, aligning with industry standards for R&D expenditure.

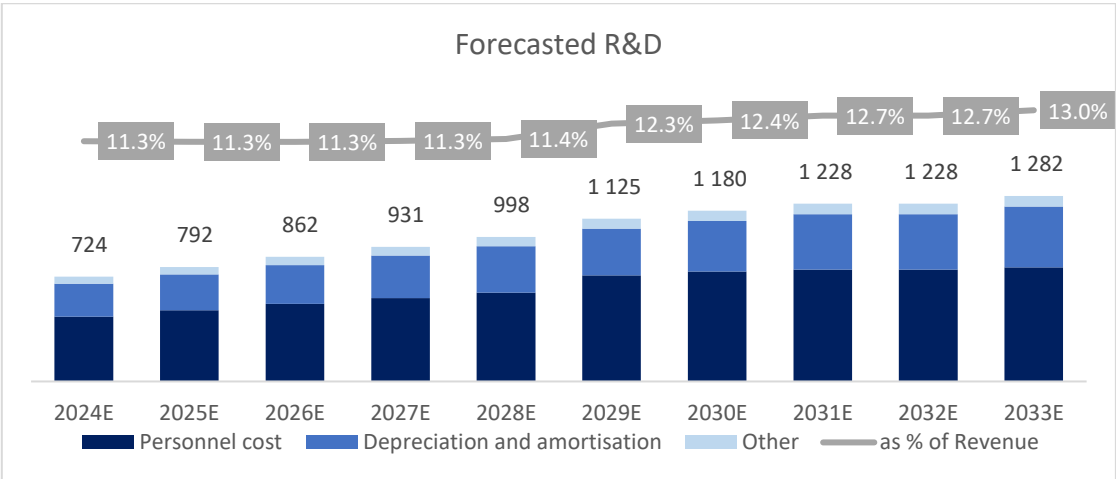
FIG 26 - Historical R&D Expenses



### 5.9 Forecasted Research & Development

In the dynamic tech industry, increasing R&D spending is crucial for maintaining competitiveness. Forecasted growth in R&D expenditures is expected to reach 13.0% by the end of the specified period, slightly surpassing Hexagon's target of allocating 10-12% of revenue to R&D annually.

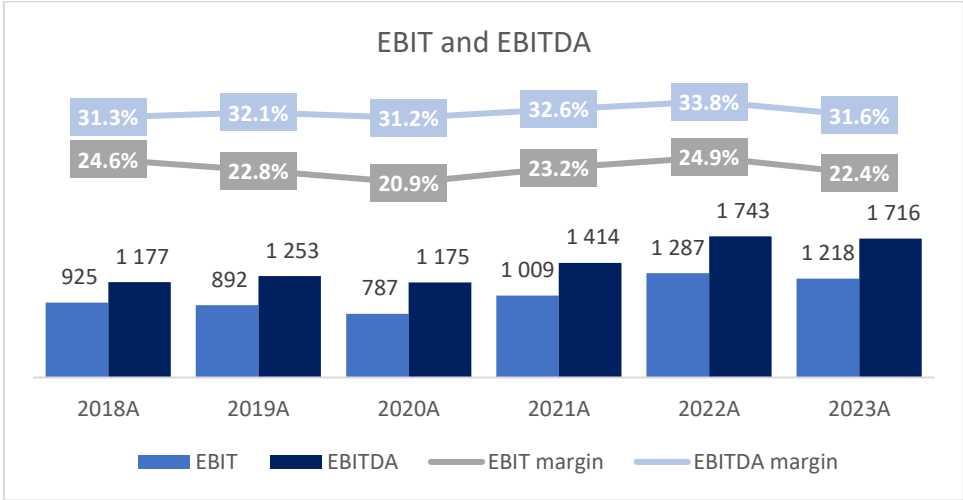
FIG 27 – Forecasted R&D expenses



**5.10 EBIT and EBIT-margin**

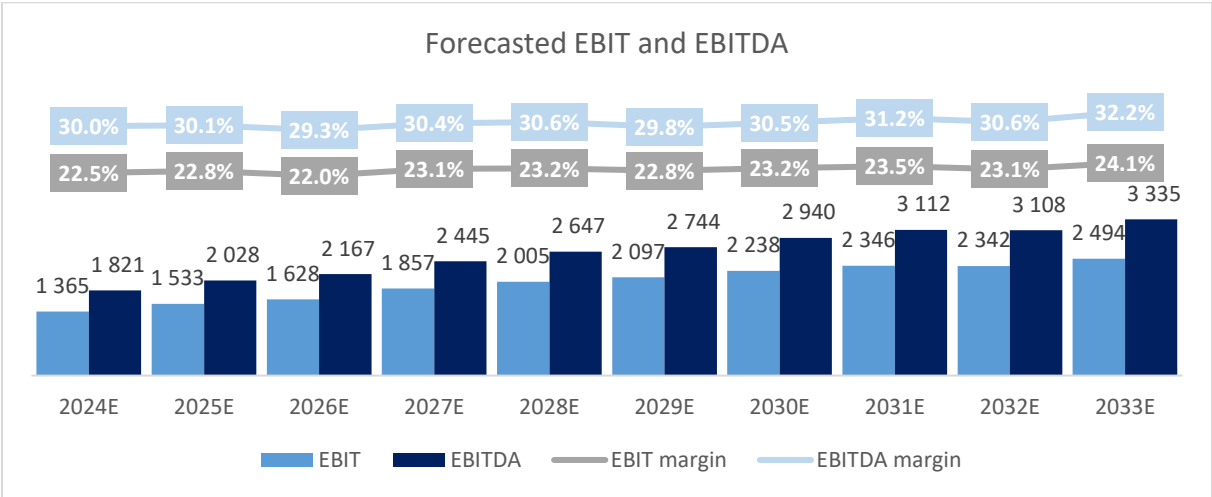
Looking historically, Hexagon’s has been able to produce stable EBIT and EBITDA margins despite some headwinds caused by Covid-19 until 2022A. However, EBIT and EBITDA margins in 2023A was influenced by a combination of currency headwinds, costs associated with a rationalisation programme, continued investments in innovation, the impact of adjustments including non-recurring items, and the broader global economic environment.

Figure 28 – Historical EBIT and EBITDA development



Due to the change of the revenue mix of software and new product generations to account for greater share of revenue a slight increase in EBIT and EBITDA margin is forecasted. This due to the offsetting effect of lower COGS and higher SG&A. The aforementioned is forecasted to be achieved through a higher proportion of revenue from new-high margin applications and software, with a higher level of recurring revenue. According to Hexagon’s business plan, the company forecasted EBIT margin to reach 30% by 2026E on an adjusted basis. However, for this forecast, a more modest estimation of EBIT due to SG&A and COGS estimation to reach 24.1% by the end of the explicit forecasting period in 2033E on a non-adjusted basis. The modest estimation of EBITDA is a result of stabilisation of D&A as a % of revenue which will be further discussed later in the thesis.

FIG 29 - Forecasted EBIT and EBITDA development



**5.11 Forecasted Balance Sheet Items**

Tangible assets, intangible assets, right-of-use leased assets, debt, and other balance sheet items, along with subsequent capex, D&A, and NWC forecasting, are managed through a projected balance sheet. These assets are recorded at acquisition cost, adjusted for new investments, D&A, and impairment losses. Capex is the difference between opening and closing balances of acquisition costs. D&A and impairments are calculated based on the forecasted useful life of each asset class. The financing structure and a detailed examination of intangible assets, Hexagon's major asset class, will be provided in the next section, along with a D&A and capex analysis. For information on other balance sheet items, please refer to the projected balance sheet in Appendix 4.

**5.12 Financing Structure**

Hexagon's financing philosophy and capital structure, as depicted in the annual report, emphasize a prudent and strategic approach to managing financial risks, particularly refinancing risk. Hexagon maintains its financial health by keeping a balanced debt structure, targeting an equity ratio of at least 25% and striving to maintain a net debt to EBITDA ratio of 2.5x or below. At the end of 2023, the equity ratio was at 60% (previously 60%), and the net debt to EBITDA ratio was at 2.1x (previously 2.0x), indicating a solid equity position and manageable leverage.

FIG 30 - Historical Financial Structure

Group's capital structure	2018A	2019A	2020A	2021A	2022A	2023A
<b>Shareholder's Equity</b>	<b>5 319.2</b>	<b>6 076.9</b>	<b>5 949.2</b>	<b>8 764.7</b>	<b>9 864.6</b>	<b>10 046.1</b>
Interest bearing liabilities and provisions	2 463.9	2 584.0	2 773.3	3 012.9	3 928.0	4 140.3
Cash, bank and short-term investments	394.6	468.3	397.4	472.1	486.3	547.1
<b>Net Debt</b>	<b>2 069.3</b>	<b>2 115.7</b>	<b>2 375.9</b>	<b>2 540.8</b>	<b>3 441.7</b>	<b>3 593.2</b>
<b>Capital Structure Ratios</b>						
<b>Net Debt/EBITDA</b>	<b>1.2x</b>	<b>1.2x</b>	<b>1.4x</b>	<b>1.5x</b>	<b>2.0x</b>	<b>2.1x</b>
<b>Interest Coverage</b>	<b>31.7x</b>	<b>26.6x</b>	<b>23.4x</b>	<b>32.2x</b>	<b>27.1x</b>	<b>7.2x</b>
<b>Equity - Ratio</b>	<b>56%</b>	<b>58%</b>	<b>56%</b>	<b>63%</b>	<b>60%</b>	<b>60%</b>
<b>Net Debt/Equity</b>	<b>39%</b>	<b>35%</b>	<b>40%</b>	<b>29%</b>	<b>35%</b>	<b>36%</b>
<b>Return on Equity</b>	<b>13.9%</b>	<b>11.7%</b>	<b>10.5%</b>	<b>9.2%</b>	<b>10.3%</b>	<b>10.0%</b>
<b>Return on Assets</b>	<b>7.7%</b>	<b>6.8%</b>	<b>5.9%</b>	<b>5.8%</b>	<b>6.2%</b>	<b>5.2%</b>
<b>Return on Invested Capital</b>	<b>14.2%</b>	<b>12.6%</b>	<b>11.1%</b>	<b>10.3%</b>	<b>11.3%</b>	<b>10.3%</b>

For the equity valuation, the balance sheet as well as the cashflow statement of Hexagon has been forecasted so Hexagon ends up with range of the Net Debt/EBITDA ratio between 2.1x 0.8x. In the forecasted financial structure the equity remains ~57%-63% with a similar return on invested capital %. The net debt lowers due to a build-up of cash and conservative debt philosophy.

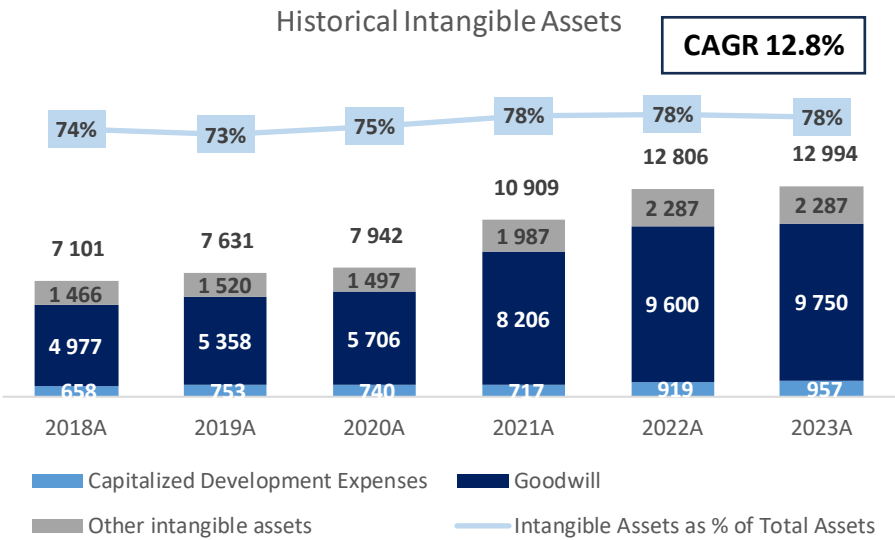
FIG 31 - Forecasted Financial Structure

Group's capital structure	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
<b>Shareholder's Equity</b>	<b>10 695.0</b>	<b>11 367.3</b>	<b>12 095.1</b>	<b>12 971.1</b>	<b>13 944.1</b>	<b>14 944.0</b>	<b>16 021.8</b>	<b>17 182.5</b>	<b>18 332.9</b>	<b>19 562.9</b>
Interest bearing liabilities and provisions	4 696.3	5 245.1	5 590.1	5 945.3	6 301.5	6 670.8	7 061.4	7 444.8	7 748.8	8 147.5
Cash, bank and short-term investments	990.0	1 568.9	1 979.9	2 469.1	2 969.3	3 583.6	4 227.6	4 825.0	4 696.2	5 430.7
<b>Net Debt</b>	<b>3 706.3</b>	<b>3 676.2</b>	<b>3 610.2</b>	<b>3 476.2</b>	<b>3 332.2</b>	<b>3 087.2</b>	<b>2 833.8</b>	<b>2 619.8</b>	<b>3 052.6</b>	<b>2 716.8</b>
<b>Capital Structure Ratios</b>										
<b>Net Debt/EBITDA</b>	<b>2.1x</b>	<b>1.9x</b>	<b>1.7x</b>	<b>1.5x</b>	<b>1.3x</b>	<b>1.2x</b>	<b>1.0x</b>	<b>0.9x</b>	<b>1.0x</b>	<b>0.8x</b>
<b>Interest Coverage</b>	<b>13.7x</b>	<b>13.4x</b>	<b>13.8x</b>	<b>14.9x</b>	<b>15.2x</b>	<b>15.1x</b>	<b>15.3x</b>	<b>15.3x</b>	<b>14.6x</b>	<b>14.9x</b>
<b>Equity - Ratio</b>	<b>58%</b>	<b>57%</b>	<b>57%</b>	<b>57%</b>	<b>57%</b>	<b>57%</b>	<b>58%</b>	<b>58%</b>	<b>63%</b>	<b>63%</b>
<b>Net Debt/Equity</b>	<b>35%</b>	<b>32%</b>	<b>30%</b>	<b>27%</b>	<b>24%</b>	<b>21%</b>	<b>18%</b>	<b>15%</b>	<b>17%</b>	<b>14%</b>
<b>Return on Equity</b>	<b>10.1%</b>	<b>10.5%</b>	<b>11.4%</b>	<b>11.5%</b>	<b>11.2%</b>	<b>11.1%</b>	<b>10.9%</b>	<b>10.1%</b>	<b>9.5%</b>	<b>9.5%</b>
<b>Return on Assets</b>	<b>5.5%</b>	<b>5.4%</b>	<b>5.6%</b>	<b>6.0%</b>	<b>6.1%</b>	<b>6.0%</b>	<b>6.0%</b>	<b>5.9%</b>	<b>5.9%</b>	<b>5.9%</b>
<b>Return on Invested Capital</b>	<b>10.2%</b>	<b>10.2%</b>	<b>10.6%</b>	<b>11.4%</b>	<b>11.5%</b>	<b>11.3%</b>	<b>11.3%</b>	<b>11.1%</b>	<b>10.5%</b>	<b>10.5%</b>

### 5.13 Intangible Assets

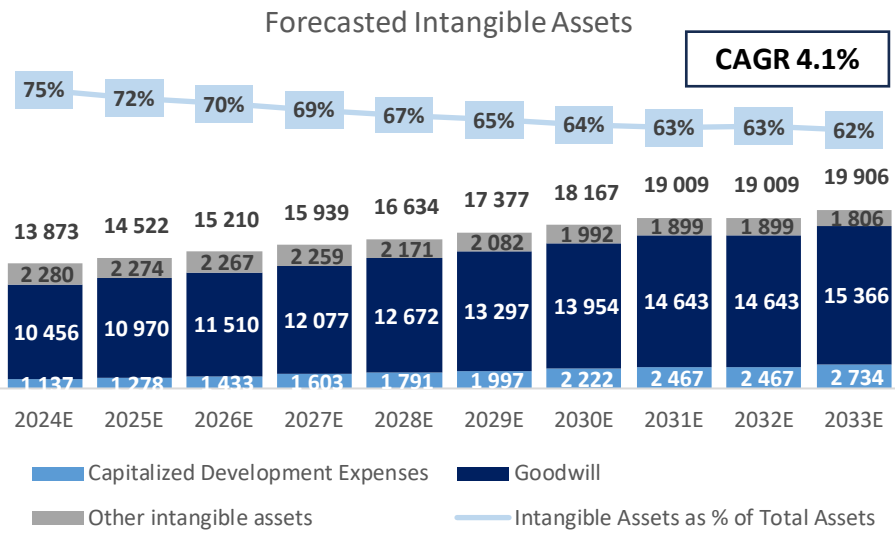
In 2023A, intangible assets comprised 78% of total assets, valued at EUR 12,944m. Hexagon's intangible assets primarily consist of goodwill, trademarks, and acquired assets like customer relationships and technology. Goodwill and other indefinite-lived intangible assets do not undergo annual amortization, while other intangible assets are amortized. Goodwill hasn't been subject to amortization or impairment from 2018A-2023A. However, if operational performance declines, impairment may be required. Impairment tests are conducted at least annually.

FIG 32 - Historical Intangible Assets



The graph above illustrates Hexagon's rising investment in intangible assets, notably through internal development (seen in capitalized development expenses) and acquisitions (indicated by increasing goodwill). This shift towards intangible assets suggests a move towards an asset-light, intellectual property-driven business model, potentially leading to higher margins and returns on assets if effectively monetized. However, it also highlights the importance of realizing value from these assets to avoid impairment if they underperform.

FIG 33 - Forecasted Intangible Assets



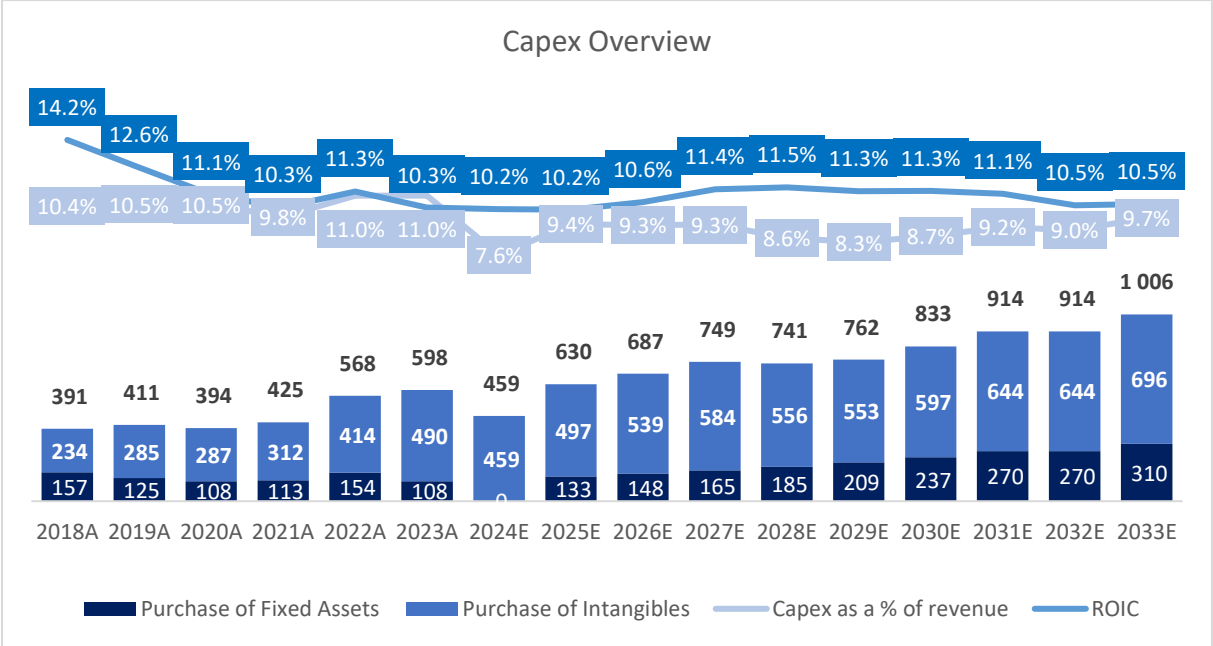
The graph forecasting a decrease in the proportion of intangible assets relative to total assets over the explicit period, with goodwill remaining as the predominant category of intangible

assets throughout the period. The decrease as a % of total assets is mainly due to a build-up of cash on the asset side of the balance sheet. The overall CAGR during the explicit period is lower than historically, mainly due to the transition phase to a mature company in the later stage of the explicit period.

**5.14 Capital Expenditures and Acquisitions spending**

The consistency of Capex spending as a percentage of revenue has ranged from 10-11% over the past six years. While an increase in Capex spending in 2018A coincided with a rise in ROIC, subsequent years saw a decline in ROIC despite consistent Capex spending, suggesting potentially lower-than-expected returns or other operational factors at play. However, the uptick in ROIC in 2022A indicates that previous investments may be starting to yield better returns or that operational efficiencies have improved.

Figure 34 - Historical and Forecasted Capex overview

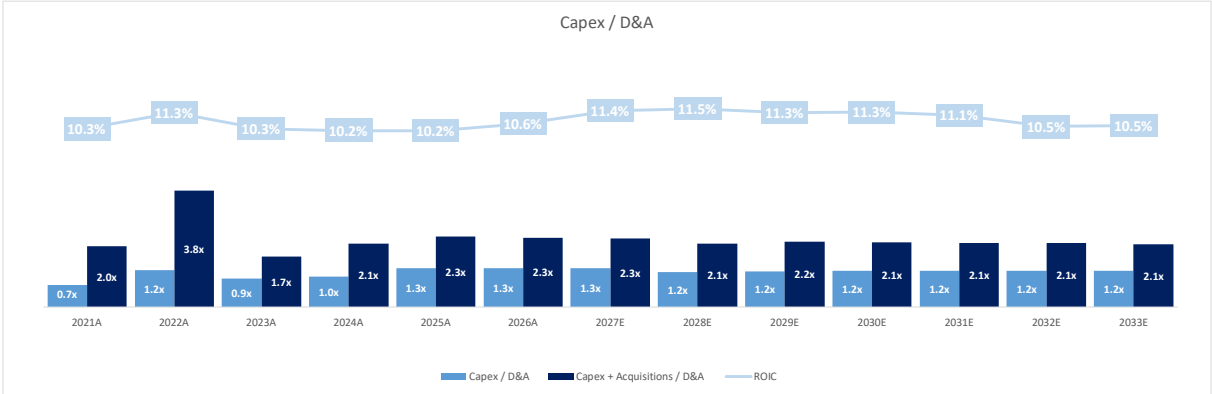


Given the rapid development in the technology industry, sustained capex investment is crucial for competitiveness. Forecasted from 2024E-2033E, Capex as % of revenue is expected to range from ~10%-11%. The slight increase in ROIC during the explicit period suggests improving returns from operational efficiencies.

Hexagon's investment pattern shows correlations with its ROIC trends. Heavy investment in 2017A, notably acquisitions, led to a peak in ROIC the following year. A decrease in the Capex

+ Acquisitions / D&A ratio in 2020A and 2021A aligns with lower ROIC, likely reflecting underperforming investments or Covid-19 impacts. However, a significant increase in the ratio in 2022A indicates a return to aggressive investment, potentially leading to higher returns if ROIC improves. Despite the lag effect of investments on ROIC, the company's investment efficiency appears to be improving as of 2022A, possibly validating its strategy.

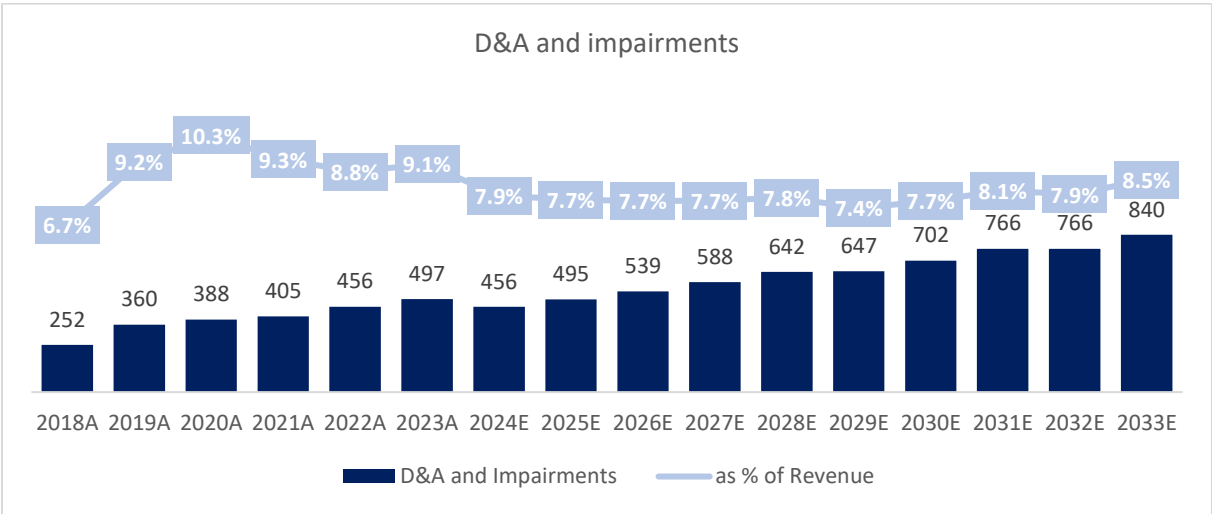
FIG 35- Historical and Forecasted Capex / D&A



The forecasted period is done with a conservative approach to capital investment, with the company maintaining a Capex/D&A ratio around the replacement level. This is mainly driven by valuation purposes, since Hexagon has been conservative, especially in regards of amortisation of its intangible assets.

**5.15 D&A and Impairments summary**

FIG 36 – Historical and Forecasted D&A and Impairments



A stabilisation of D&A and impairments as a % of revenue is forecasted since a more conservative approach to acquisitions and capex have been forecasted throughout the report which leads to relative lower D&A as a % of revenue.

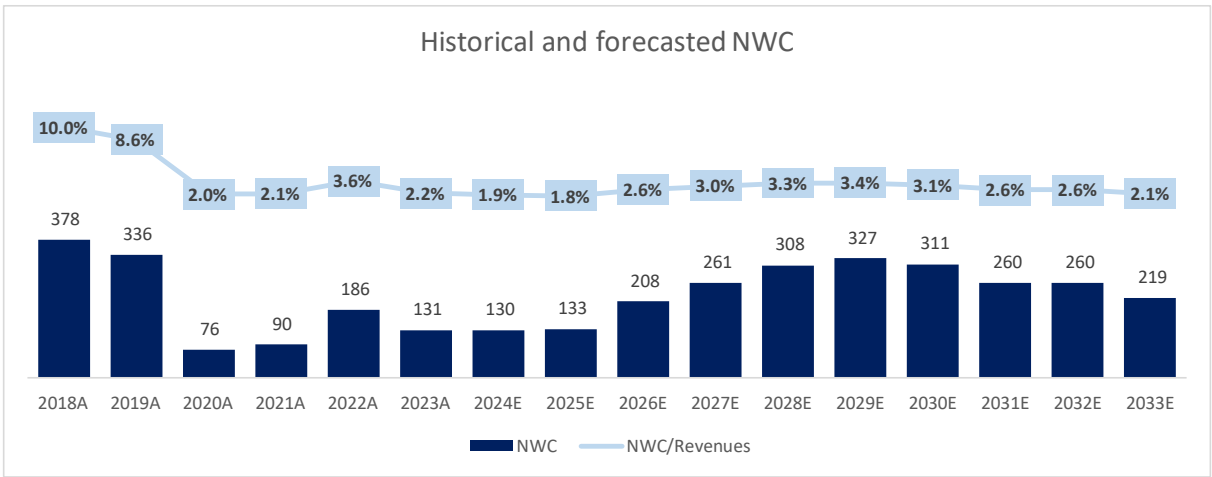
**5.16 Net working Capital**

Inventory is managed using the FIFO (first-in, first-out) method, where the cost of older inventory is expensed first, reflecting the order of inventory usage. Inventory includes raw materials, work in progress, and finished goods. Current receivables primarily comprise customer receivables, referring to amounts due from customers under sales contracts. Payables represent Hexagon's liabilities to suppliers or vendors for goods or services received but not yet paid for.

**5.17 Historical and Forecasted Net Working Capital**

For the FCFE calculation, the NWC is defined as defined as current assets – current liabilities – cash. Each item that belongs in the NWC calculation have been forecasted separately with regards to historical trends. These items were either calculated with days such as days payables outstanding or as a % of revenue. The NWC as a % of revenue peaked in 2018A-2019A, which was due to higher account payable during these years. Hence the forecast are based with regards due 2020A-2022A numbers due to improved overall working capital management. The total NWC as used in the FCFE forecast yielded as follows:

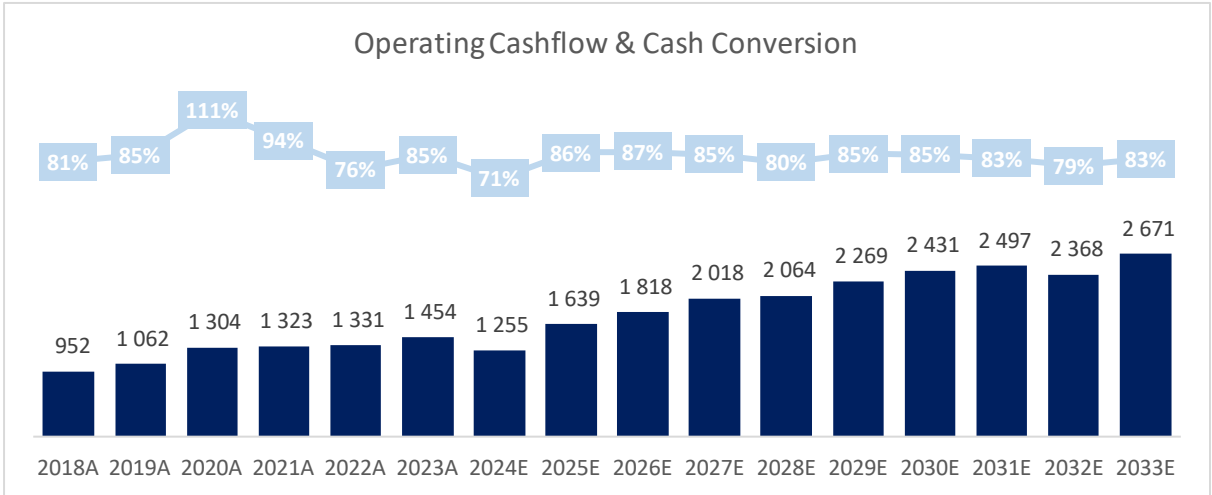
FIG 37 – Historical and forecasted NWC



**5.18 Operational Cash Flow and Cash Conversion**

Looking historically, Hexagon’s been able to generate a healthy cash conversion which is calculated by operational cashflow/EBITDA . The decrease in 2022A was driven by an increase in NWC with an increase in inventories and account receivables but is still considered to be on a healthy level.

FIG 38 - Operational Cashflow and Cash Conversion



Overall, the graph shows that the company’s operating cash flow is forecasted to increase in nominal terms meanwhile maintaining a stable rate of cash conversion, albeit with some fluctuations. This indicates overall positive financial health with effective cash management practices of the company’s historical buy also expected future operations.

**5.19 Discount Rate**

To determine the present value of FCFF, you must first compute the discount rate, which is represented by the WACC in the DCF analysis. The cost of equity component within the WACC calculation was obtained using the CAPM formula, resulting in a value of 8.3%.

Figure 39 - Calculation summary of Cost of Equity

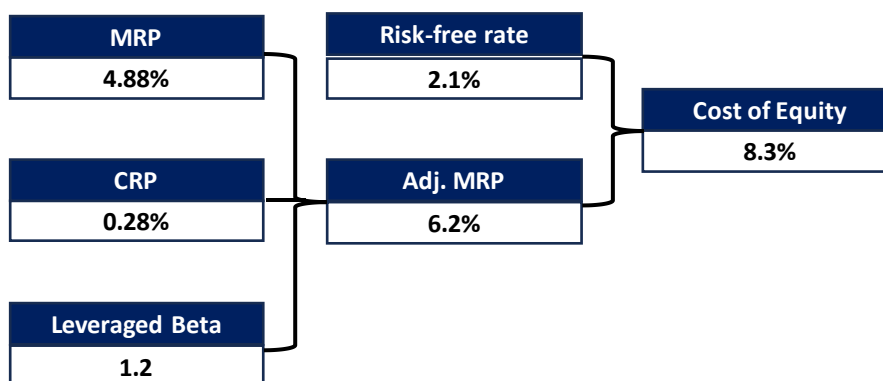
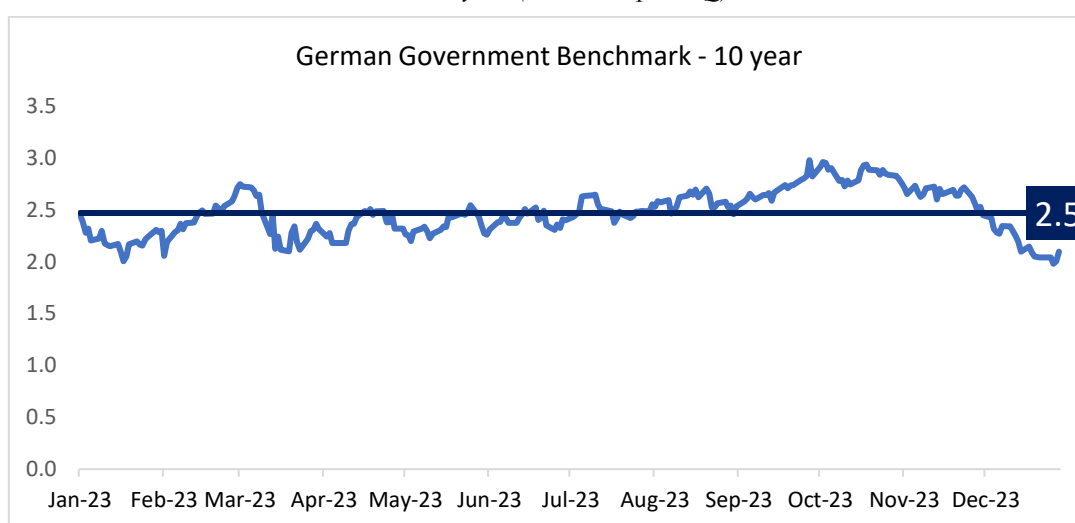


FIG 40 – German Government Benchmark – 10 year (Source Capital IQ)



The 10-year German Government Benchmark serves as Hexagon's proxy for the risk-free interest rate, reflecting the stability, low default risk, and liquidity of the euro currency. As of December 31st, 2023, the benchmark yielded 2.1%, down from its 1-year average of 2.5%, with expectations of rate cuts by the European Central Bank (ECB) in 2024 (Morningstar, 2023). Money markets suggest less than a 50% chance of rate cuts starting as early as April 2024. Therefore, a conservative approach is taken for forecasting, using the risk-free rate as of December at 2.1%, considering anticipated rate cuts (Euronews, 2023; Morningstar, 2023).

FIG 41 - Market risk premium & country risk premium

	Market Risk Premium	Country Risk Premium	Revenue 2022A
EMEA	4.60%	0%	1 772
America (USA)	4.60%	0%	1 996
Asia	5.63%	1.03%	1 409
<b>Weighted Average</b>	<b>4.88%</b>		

To adjust for country market risk exposure, the Country Risk Premium (CRP) is obtained from Damodaran's database (Damodaran, 2024). Hexagon's revenue distribution by region is used to weight the CRP, with Germany, the USA, and China serving as proxies for EMEA, America, and Asia, respectively. The resulting weighted market risk premium before beta adjustment is 4.88%.

Figure 42- Unlevered Beta to Levered Beta – Peer comparison summary

Name	Average Tax Rate (5YR)	Revenue 2022A	Levered Beta	Total Debt	Mkt. Val. Equity	Pref Equity	Debt/Equity	Pref/Equity	Unlevered Beta
ANSYS, Inc.	12.4%	2 004	1.0977	773.0	28 113.9	0.0	2.7%	0.0%	1.07
Dassault Systèmes SE	24.3%	5 892	0.6768	3 600.9	54 769.1	0.0	6.6%	0.0%	0.64
Nemetschek SE	18.5%	835	0.9616	76.3	10 388.1	0.0	0.7%	0.0%	0.96
Sandvik AB (publ)	24.6%	11 018	1.5013	4 055.6	27 050.5	0.0	15.0%	0.0%	1.35
Autodesk, Inc.	18.1%	5 422	1.2914	2 506.3	52 018.2	0.0	4.8%	0.0%	1.24
Bentley Systems, Incorporate	17.7%	1 231	0.8274	1 421.0	15 097.5	0.0	9.4%	0.0%	0.77
<b>Average Value Weighted Unlevered Beta of Comps (By Revenue)</b>									<b>1.11</b>
Hexagon D/E									14.3%
Hexagon P/E									0.0%
Hexagon Tax Rate (5 Year Average)									20.1%
<b>Hexagon Levered Beta ("peer" beta)</b>									<b>1.24</b>
<b>Hexagon 5 Year Actual Beta</b>									<b>1.20</b>

To find Hexagon's levered beta, peers' unlevered beta was calculated using the method outlined in the literature review. An average unlevered beta was then estimated through a value-weighting approach, with revenue used for weighting due to peers' substantial market capitalizations and low debt-to-equity ratios. This choice ensures a balanced assessment capturing industry financial nuances. Hexagon’s current 5-year actual beta stands at 1.2, which only deviates 0.04 from the comparison with the peers at 1.24. Hence for the valuation, Hexagon’s 5-year actual beta is reasonable and will be used.

FIG 43 - Market Value of Debt and Cost of Debt

Hexagon Market Value of Debt	Face Value	Maturity (Yrs)
Leasing	207.9	9
Revolving Credit	40	7
Commercial Paper	741.8	1
Term Loan	1 700.0	4
Bond	1 165.1	7
Interest Expense	92.8	
Cost of Debt (Weighted YTM)	4.50%	
<hr/>		
Total Debt	3 855	
Weighted Average Maturity (Yrs)	5	
<hr/>		
<b>Market Value of Debt</b>	<b>3 524.4</b>	

To determine the Market Value of Debt, analysts can equate the Total Debt on a firm’s financial statements to a single coupon bond. Here, the coupon payment mirrors the total interest expenses on all debt, while the maturity is established as the weighted average maturity of all outstanding debt obligations. The Cost of Debt of 4.5% is calculated by taking the weighted YTM of Hexagon’s current bonds outstanding. The bond pricing formula is as follows:

$$\text{Market Value of Debt} = \frac{C * (1 - \frac{1}{(1 + Kd)^t})}{Kd} + \frac{FV}{(1 + Kd)^t}$$

Where:

C = Interest expense

Kd =Weighted Yield to Maturity (YTM)

T = Weighted maturity (in years)

FV = Face value of the Total Debt

FIG 44 - Weighed Average Cost of Capital (WACC)

Weighted Average Cost of Capital	
Total Equity (Market Cap)	301 029
Market Value of Debt	3 524
Debt-to-Total Capital	1.16%
Equity-to-Total Capital	98.84%
Marginal Tax Rate	20.60%
Cost of Equity	8.30%
Cost of Debt	4.50%
<b>WACC</b>	<b>8.25%</b>

**5.20 Terminal / Perpetual Growth**

To determine the terminal growth, two methods were computed and compared. Firstly the method calculating terminal growth by multiplying the company’s retention ratio with its ROE.

FIG 45 - Perpetual growth calculation

Hexagon's Perpetual Growth Rate	
Payout Ratio (10-year average)	31%
Retention Ratio	69%
ROE (2033E)	11.9%
Growth Rate	8.2%
Inflation	4.1%
<b>Final Terminal Growth Rate</b>	<b>4.1%</b>

The retention ratio is determined by applying the 10-year historical average payout ratio of dividends. The ROE utilized is for the end of the explicit period, 2032E. To maintain consistency, inflation of EMEA of 4.1% is subtracted from the valuation as the currency is euro (IMF, 2023). Since the above resulted in a considerable high terminal growth rate, a second method was applied.

Figure 46 - Hexagon's Revenue Weighted Nominal Growth Rate

Hexagon's Revenue Weighted Nominal Growth Rate						
	Inflation Rate	Real GDP growth	Nominal GDP	Revenue 2022	% of Group Revenue	
EMEA	4.10%	1.40%	5.50%	1 772	34%	
America (USA)	2.80%	1.50%	4.30%	1 996	39%	
Asia	5.40%	4.10%	9.50%	1 409	27%	
<b>Total (before adj).</b>				<b>6.1%</b>	<b>5 177</b>	<b>100%</b>
Inflation				4.10%		
<b>Total (after adj).</b>				<b>2.0%</b>		

The implied terminal growth rate was estimated using the projected long-term nominal GDP for 2024, weighted by Hexagon's revenue share per region in 2023A, sourced from the International Monetary Fund (IMF). Adjusted for inflation, the real GDP, often seen as an upper boundary for long-term growth rate (LTGR), stood at 2.0%. Maintaining a stable terminal growth rate below or in line with the economy's growth rate ensures consistency and remains under the discount rate, converging on the real growth rate in the long term (Damodaran, 2024). Thus, the weighted nominal growth rate deducted by inflation which resulted in real 2.0% which is used in the valuation.

## 5.21 Discounted FCFF, Terminal Value and Equity Bridge



financials statements are in EUR, valuation done in EUR and share price converted to SEK since Hexagon is listed on the Swedish stock exchange.

### 5.22 Sensitivity Analysis

A sensitivity analysis was conducted to assess the impact of deviations in two critical assumptions: WACC and perpetual growth rates, along with adjustments in exit multiples. Specifically, variations of +/- 0.2% in the WACC and perpetual growth rates were examined, as well as adjustments of +/- 0.2 in exit multiples. Results showed a price range of SEK 74-89 for perpetual growth and SEK 172-202 for exit multiples. Additionally, considering acquisitions' impact on FCFF highlighted potential downside risks, resulting in a range of SEK 37-46 for the perpetual growth method and SEK 142-170 for the exit multiple approach. The exit multiple approach yields a higher share price due to Hexagon's significant discount compared to peers, as discussed later.

FIG 49 – Sensitivity Analysis

Share Price (Perpetual growth)						Share Price (Exit Multiple)							
Perpetual growth						Exit Multiple							
1.6% 1.8% 2.0% 2.2% 2.4%						23x 24x 25x 26x 27x							
WACC	7.8%	81	80	80	81	86	WACC	7.8%	171	165	165	171	184
	8.0%	85	83	83	85	89		8.0%	174	168	168	174	187
	8.2%	85	83	83	85	89		8.2%	174	168	168	174	187
	8.4%	81	80	80	81	86		8.4%	171	165	165	171	184
	8.6%	75	74	74	75	79		8.6%	165	159	159	165	177
Share Price (Perpetual growth ) after acquisitions						Share Price (Exit Multiple ) after acquisitions							
Perpetual growth						Exit Multiple							
1.6% 1.8% 2.0% 2.2% 2.4%						23x 24x 25x 26x 27x							
WACC	7.8%	41	40	40	41	43	WACC	7.8%	154	148	148	154	167
	8.0%	43	42	42	43	46		8.0%	157	151	151	157	170
	8.2%	43	42	42	43	46		8.2%	157	151	151	157	170
	8.4%	41	40	40	41	43		8.4%	154	148	148	154	167
	8.6%	37	37	37	37	40		8.6%	148	142	142	148	161

### 5.23 Relative Valuation – Peer Analysis

When selecting peers for the relative valuation of Hexagon, several metrics were taken into consideration such as business areas, size, D/E, profitability, and growth rate. To compose a balanced peer table, both peers that operate within the GES and IES segment were included. Among selected peers like Autodesk and Dassault Systems, which operate globally within similar segments, there's a trend of high valuation multiples and goodwill percentages alongside low debt-to-equity (D/E) ratios. Hexagon, with a moderate D/E ratio of 14.6%, indicating a balanced use of debt financing in its capital structure compared to its peers.

Figure 50 - Peer Comparison – Table 1

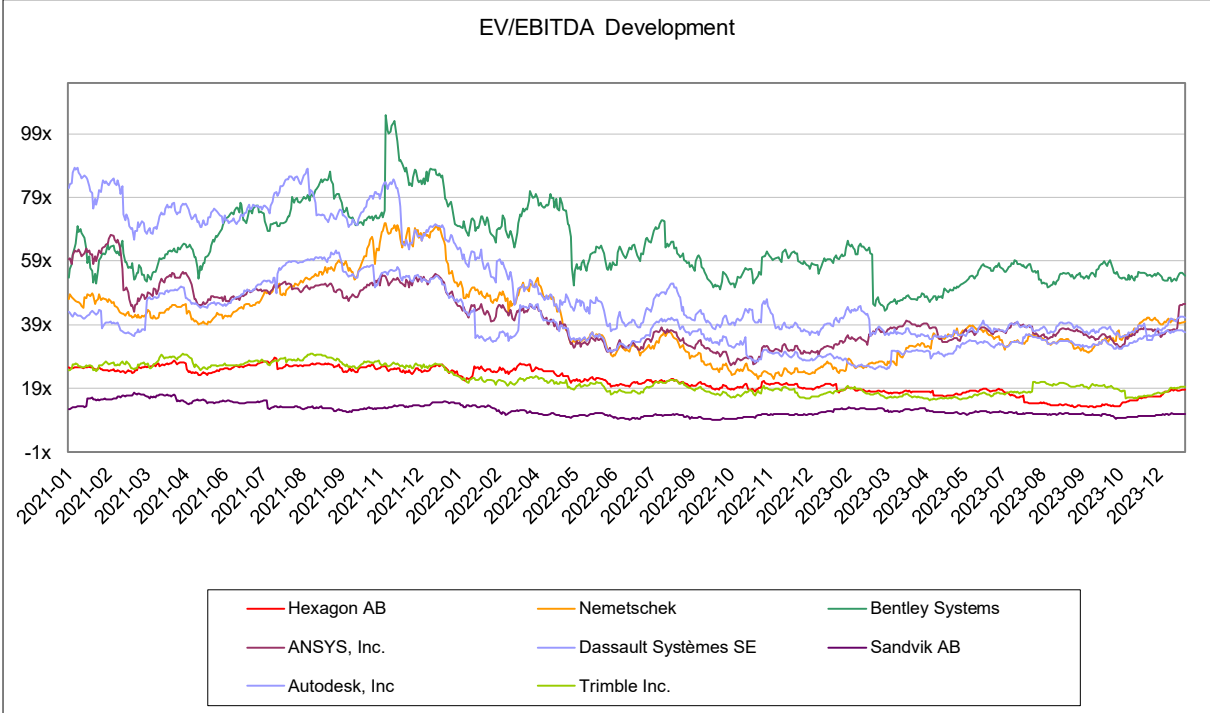
Company	Country HQ	Geospatial Technology	Industrial Technology	Free Float (in %)	Revenue 2022A (in EURm)	Market Cap (in EURm)	EV (in EURm)	Debt / Equity (in %)
Hexagon	Sweden	X	X	75.6%	5 160.5	20 852	24 737.0	13.8%
<b>Comparable Companies</b>								
Ansys	USA		X	99.7%	1 948	22 022	22 130	2.7%
Autodesk	USA	X	X	99.8%	4 780	40 551	40 746	4.9%
Dassault Systemes	France		X	50.4%	5 665	52 641	52 275	6.9%
Trimble	USA	X		99.4%	3 498	9 759	12 426	20.1%
Nemetschek SE	Germany		X	49.0%	802	8 631	8 517	0.8%
Sandvik	Sweden		X	97.0%	10 053	21 370	25 443	15.7%
Bentley Systems	USA	X	X	73.9%	1 046	14 399	15 801	9.6%

Hexagon exhibits satisfactory revenue growth rates, although peers like Autodesk and Ansys show higher rates. However, Hexagon's EBITDA and EBIT margins are competitive, indicating strong profitability, albeit some peers, notably Autodesk, have shown remarkable recent growth in EBIT margin. In essence, Hexagon is a solid performer with moderate growth and strong profitability. While not the fastest-growing in revenue, its robust EBITDA and EBIT margins underscore efficient operations and sound financial health relative to peers.

Figure 51 – Peer Comparison – Table 2

	Growth in Revenue		EBITDA- margin		Growth in EBITDA		EBIT- margin		Growth in EBIT	
	2020A-2022A	2017A-2019A	2020A-2022A	2020A-2022A	2017A-2019A	2020A-2022A	2020A-2022A	2020A-2022A		
Hexagon	10.2%	31.7%	32.5%	32.5%	23.7%	23.0%	14.6%			
<b>Comparable Companies</b>										
Ansys	13.4%	36.6%	29.2%	7.9%	35.5%	28.4%	8.1%			
Autodesk	17.9%	-4.1%	17.7%	47.2%	-5.1%	16.8%	51.3%			
Dassault Systemes	12.2%	27.0%	27.5%	18.0%	21.6%	19.7%	20.8%			
Trimble	6.6%	12.6%	16.7%	16.1%	10.2%	15.1%	20.3%			
Nemetschek SE	13.0%	30.3%	31.2%	10.9%	24.3%	23.5%	11.8%			
Sandvik	4.0%	18.0%	18.5%	15.9%	17.2%	16.6%	15.5%			
Bentley Systems	17.0%	18.7%	15.8%	35.9%	18.7%	15.8%	37.6%			

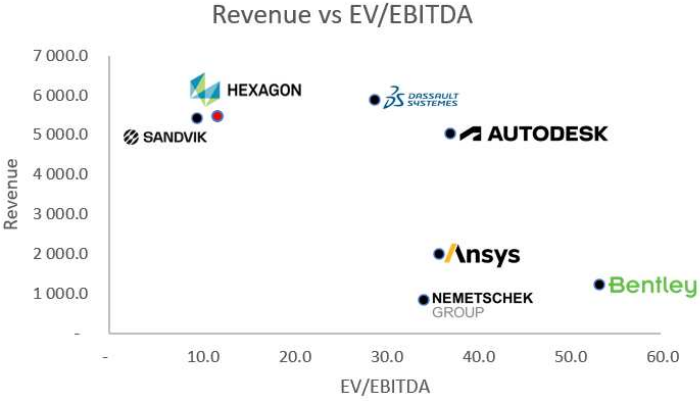
FIG 52 - Peer Comparison – EV/EBITDA Development



Source: Capital IQ

Despite Hexagon's strong financial performance, its valuation, indicated by historical EV/EBITDA multiples, remains lower than its peers'. This indicates potential undervaluation of Hexagon by the market, influenced by factors such as market sentiment favoring peers for their growth prospects or sector-specific advantages. The higher multiples of its peers may suggest market overenthusiasm, potentially leading to overvaluation, particularly if based on short-term trends. Overall, Hexagon's valuation may reflect a conservative market outlook on its growth and risk profile compared to its peers, especially post the short-selling report by Viceroy in July (Viceroy, 2023).

Figure 53 - Peer Revenue vs EV/EBITDA illustration



The graph shows Hexagon's revenue relative to EV/EBITDA compared to peers. Despite its higher revenue, Hexagon's lower EV/EBITDA suggests potential undervaluation, possibly due to underappreciation of its earnings or operational efficiency. Conversely, Autodesk, with higher EV/EBITDA despite lower revenue, may receive a premium due to growth expectations. This suggests Hexagon's financial health may not be fully reflected, possibly due to conservative growth expectations or favorable sentiment toward peers.

**5.24 Relative Valuation – Multiple Valuation**

The relative valuation utilized LTM trading valuation multiples of the listed peers, including EV/EBIT, EV/EBITDA, and EV/Revenue ratios. EV/EBIT multiples assess operating performance using earnings before interest and taxes (EBIT), providing insight into a company's core profitability, though they may not explicitly exclude non-operating factors. EV/EBITDA ratios emphasize operating performance by excluding non-cash expenses like D&A, useful for comparing entities at different growth stages or capital intensities. EV/Revenue multiples offer simple size-based comparisons, providing insights into market positioning and revenue efficiency. Utilizing these multiples, the analyst gains a holistic understanding of Hexagon's relative valuation, considering operational efficiency, financial structure, and competitive positioning within the market.

The multiples were categorized into three groups: the weighted average (weighted by revenue), the 25th percentile, and the 75th percentile, providing a nuanced outlook and a price range. As seen in the table below, peer tech companies are currently trading at high multiples, as expected given the industry's tendency for higher multiples compared to other sectors. These high multiples reflect positive market sentiment and the industry's overall growth outlook.

*FIG 54 - Relative Valuation Multiple Table*

LTM	EV/EBIT Multiple	EV/EBITDA Multiple	EV/Revenue Multiple
Weighted average	32.2x	25.1x	6.8x
Multiple (25th Percentile)	34.6x	24.1x	6.9x
Multiple (75th Percentile)	51.0x	41.1x	12.2x

The share price is calculated by multiplying multiples with the 2023 actuals for EBIT, EBITDA, and Revenue, determining Hexagon's projected enterprise value. Then, the equity value is computed using the "equity bridge" method, subtracting net debt, minority interests, and adding

back preferred share proceeds from 2023. Finally, the share price range shown in the table is derived by dividing the equity value by diluted shares outstanding.

Figure 55 – Trading Multiples – Share Price Summary

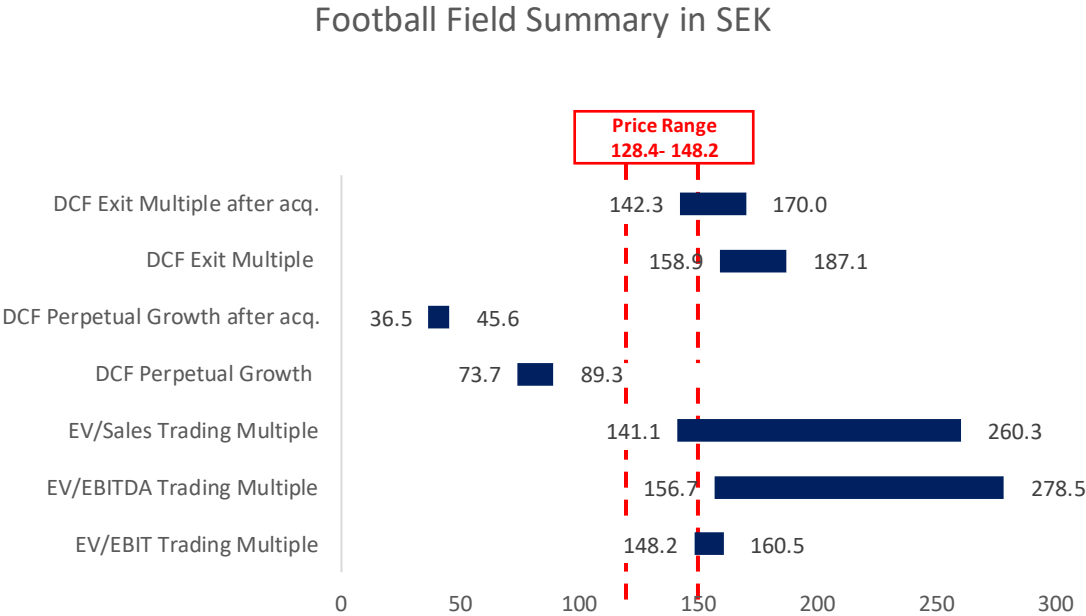
Share Prices Summary Table			
Trading Multiples	25th	Weighted average	75th
EV/EBIT Trading Multiple	148.2	148.2	160.5
EV/EBITDA Trading Multiple	156.7	164.3	278.5
EV/Sales Trading Multiple	141.1	138.9	260.3

## 6. Valuation Summary and Conclusion

### 6.1 Valuation Summary – Football field

The football field chart highlights variations in valuation methods used for Hexagon. Due to its M&A strategy, the downside case DCF valuation was conducted on post-acquisition free cash flow, revealing potential dampening effects on valuation from non-accretive acquisitions. Narrow EV/EBIT ranges suggest consensus on operational profitability, while wide EV/Sales and EV/EBITDA ranges indicate differing views on growth and profitability. DCF with perpetual growth yielded lower estimated share prices, reflecting Hexagon's current discount to peers and market growth expectations in relation to trading multiples. Valuation suggests a price range of SEK 128.4 (average) - 148.2 (median), with forecasted upsides of 6.2% and 22.5% respectively, which results in a buy recommendation.

FIG 56 - Football Field Valuation Summary in SEK



## 6.1 Comparison with Investment Bank

A comparative analysis with an equity report from SEB on October 27th, 2023, showed a fair value per share of SEK 130, with a trading price of 93.70, suggesting a potential upside of 38% and a buy recommendation. The report highlights Hexagon's market position and software integration, projecting robust growth and improved financials through 2025. Forecasted rising sales, EBIT, and EPS underscore strong revenue growth and margins. Valuation leans on DCF and peer comparisons, noting Hexagon's significant discount to peers. Risks include market fluctuations and product launches, while growth catalysts may arise from global infrastructure construction. Continued focus on software/services is expected to enhance Hexagon's financial profile, reinforcing its potential undervaluation against peers. Comparatively, Hexagon's valuation metrics reveal its potential undervaluation against peers, reinforcing the investment thesis of the report.

FIG 57 - Differences in important assumptions – Valuation vs Equity Research report

Differences in Major Assumptions		
	SEB	Thesis
<b>Estimated Fair Price per Share 2023E (SEK)</b>	<b>130</b>	<b>128.4-148.2</b>
Underlying Valuation Date	27/10-2023	31/12-2023
Method	DCF	DCF
Compared traded Share Price (SEK)	93.7	120.95
Upside/Downside	38.7%	6.2%-22.5%
Recommendation	BUY	BUY
Explicit Forecast Period (Years)	20	10
Risk-free interest rate	3.0%	2.1%
Risk premium	5.1%	6.20%
Cost of Equity	8.1%	8.30%
After-tax cost of debt	2.5%	3.6%
WACC	7.4%	8.25%
Long-run Tax Rate	18.0%	20.6%
Perpetuity Growth Rate	1.5%	2%
Net Debt	3,509	3,593

## 6.2 Conclusion

Hexagon, a leading company in the industry, holds a formidable market presence in both the geospatial and industrial technology sectors. Both of these sectors are witnessing substantial growth, and Hexagon's expertise and offerings are playing a pivotal role in meeting the evolving demands of these expanding markets.

Utilizing intrinsic and relative valuation methods were used to evaluate Hexagon's fair value. Employing the DCF method resulted in a price range of SEK 74-89 for perpetual growth and SEK 159-187 for exit multiples, with stress testing of key assumptions. However, despite its strong operational profitability in relation to peers, Hexagon's lower EV/EBITDA ratio suggests potential undervaluation, possibly due to underestimation of its earnings or operational efficiency, and lingering effects from the shortselling report. Therefore, relative valuation using EV/Revenue, EV/EBIT, and EV/EBITDA multiples yields a share price range of SEK 138.9-278.5, reflecting the higher valuations of its peers.

Comparing this with the last closing price of SEK 120.95 on December 29th, 2023, investors could potentially see an upside. Valuation suggests a price range of SEK 128.4 (average) - 148.2 (median), with forecasted upsides of 6.2% and 22.5% respectively, warranting a buy recommendation. This recommendation aligns with the equity research report by SEB, which sets a target price of SEK 130, indicating that the current share price falls below the estimated range.

## Appendix 1) Standardised Historical Income Statement

Standardised Historical Income Statement							CAGR
MEUR	2018A	2019A	2020A	2021A	2022A	2023A	2018A-2023A
<b>Total Revenue</b>	<b>3 761</b>	<b>3 908</b>	<b>3 764</b>	<b>4 341</b>	<b>5 161</b>	<b>5 435</b>	<b>7.6%</b>
<i>YoY growth %</i>	<i>n/a</i>	<i>3.9%</i>	<i>-3.7%</i>	<i>15.3%</i>	<i>18.9%</i>	<i>5.4%</i>	
Industrial Enterprise Solutions (IES)	<b>1 941</b>	<b>1 974</b>	<b>1 837</b>	<b>2 146</b>	<b>2 642</b>	<b>2 802</b>	<b>7.6%</b>
<i>YoY growth %</i>	<i>n/a</i>	<i>1.7%</i>	<i>-6.9%</i>	<i>16.8%</i>	<i>23.1%</i>	<i>6.0%</i>	
<i>as % of revenue</i>	<i>51.6%</i>	<i>50.5%</i>	<i>48.8%</i>	<i>49.4%</i>	<i>51.2%</i>	<i>51.6%</i>	
Geospatial Enterprise Solutions (GES)	<b>1 820</b>	<b>1 934</b>	<b>1 934</b>	<b>2 201</b>	<b>2 537</b>	<b>2 638</b>	<b>7.7%</b>
<i>YoY growth %</i>	<i>n/a</i>	<i>6.3%</i>	<i>0.0%</i>	<i>13.8%</i>	<i>15.2%</i>	<i>4.0%</i>	
<i>as % of revenue</i>	<i>48.4%</i>	<i>49.5%</i>	<i>51.4%</i>	<i>50.7%</i>	<i>49.2%</i>	<i>48.5%</i>	
Inorganic Growth							
<i>as % of revenue</i>							
<b>COGS</b>	<b>(1 424)</b>	<b>(1 454)</b>	<b>(1 390)</b>	<b>(1 544)</b>	<b>(1 800)</b>	<b>(1 890)</b>	<b>5.8%</b>
<i>YoY growth %</i>	<i>n/a</i>	<i>2.1%</i>	<i>-4.4%</i>	<i>11.1%</i>	<i>16.5%</i>	<i>5.0%</i>	
<i>as % of revenue</i>	<i>37.9%</i>	<i>37.2%</i>	<i>36.9%</i>	<i>35.6%</i>	<i>34.9%</i>	<i>34.8%</i>	
<b>Gross Profit</b>	<b>2 337</b>	<b>2 454</b>	<b>2 374</b>	<b>2 797</b>	<b>3 361</b>	<b>3 546</b>	<b>8.7%</b>
<i>YoY growth %</i>	<i>n/a</i>	<i>5.0%</i>	<i>-3.2%</i>	<i>17.8%</i>	<i>20.2%</i>	<i>5.5%</i>	
<i>as % of revenue</i>	<i>62.1%</i>	<i>62.8%</i>	<i>63.1%</i>	<i>64.4%</i>	<i>65.1%</i>	<i>65.2%</i>	

<b>SG&amp;A</b>	<b>(1 412)</b>	<b>(1 562)</b>	<b>(1 587)</b>	<b>(1 788)</b>	<b>(2 074)</b>	<b>(2 327)</b>	<b>10.5%</b>
<i>YoY growth %</i>	<i>n/a</i>	10.6%	1.6%	12.6%	16.0%	12.2%	
<i>as % of revenue</i>	37.5%	40.0%	42.2%	41.2%	40.2%	42.8%	
Sales expenses	(704.3)	(764.1)	(687.3)	(797.4)	(1 019.3)	(1 159.3)	10.5%
<i>YoY growth %</i>	<i>n/a</i>	8.5%	-10.1%	16.0%	27.8%	13.7%	
<i>as % of revenue</i>	18.7%	19.6%	18.3%	18.4%	19.8%	21.3%	
Administration expenses	(309.3)	(322.1)	(328.2)	(357.4)	(416.7)	(481.2)	9.2%
<i>YoY growth %</i>	<i>n/a</i>	4.1%	1.9%	8.9%	16.6%	15.5%	
<i>as % of revenue</i>	8.2%	8.2%	8.7%	8.2%	8.1%	8.9%	
Research and development expenses	(406.5)	(444.8)	(462.7)	(510.8)	(607.1)	(674.5)	10.7%
<i>YoY growth %</i>	<i>n/a</i>	9.4%	4.0%	10.4%	18.9%	11.1%	
<i>as % of revenue</i>	10.8%	11.4%	12.3%	11.8%	11.8%	12.4%	
Other operating income	96.6	70.4	152.2	207.0	187.7	190.0	14.5%
<i>YoY growth %</i>	<i>n/a</i>	-27.1%	116.2%	36.0%	-9.3%	1.2%	
<i>as % of revenue</i>	2.6%	1.8%	4.0%	4.8%	-3.6%	-3.5%	
Other operating expenses	(88.3)	(101.2)	(261.3)	(329.2)	(218.9)	(202.2)	18.0%
<i>YoY growth %</i>	<i>n/a</i>	14.6%	158.2%	26.0%	-33.5%	-7.6%	
<i>as % of revenue</i>	2.3%	2.6%	6.9%	7.6%	4.2%	3.7%	
<b>EBIT</b>	<b>925</b>	<b>892</b>	<b>787</b>	<b>1 009</b>	<b>1 287</b>	<b>1 218</b>	<b>5.7%</b>
<i>YoY growth %</i>	<i>n/a</i>	-3.6%	-11.8%	28.2%	27.5%	-5.3%	
<i>as % of revenue</i>	24.6%	22.8%	20.9%	23.2%	24.9%	22.4%	

<b>Financial income and expenses</b>	<b>(22.8)</b>	<b>(26.9)</b>	<b>(27.4)</b>	<b>(26.2)</b>	<b>(38.7)</b>	<b>(155.3)</b>	<b>46.8%</b>
Financial income	6.4	6.6	6.3	5.1	8.8	13.1	
YoY growth %	n/a	3.1%	-4.5%	-19.0%	72.5%	48.9%	
as % of revenue	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%	
Financial expenses	(29.2)	(33.5)	(33.7)	(31.3)	(47.5)	(168.4)	
YoY growth %	n/a	14.7%	0.6%	-7.1%	51.8%	254.5%	
as % of revenue	-0.8%	-0.9%	-0.9%	-0.7%	-0.9%	-3.1%	
<b>Earnings before tax</b>	<b>902.3</b>	<b>865.3</b>	<b>759.6</b>	<b>983.1</b>	<b>1 248.0</b>	<b>1 063</b>	<b>3.3%</b>
YoY growth %	n/a	-4.1%	-12.2%	29.4%	26.9%	-14.8%	
as % of revenue	24.0%	22.1%	20.2%	22.6%	24.2%	19.6%	
Tax on earnings for the year	(164.2)	(156.7)	(134.9)	(173.6)	(228.9)	(189.2)	
YoY growth %	n/a	-4.6%	-13.9%	28.7%	31.9%	-17.3%	
as % of EBT	-18.2%	-18.1%	-17.8%	-17.7%	-18.3%	-17.8%	
Current Tax	(172.0)	(179.8)	(144.7)	(208.3)	(255.5)	(218.0)	
YoY growth %	n/a	4.5%	-19.5%	44.0%	22.7%	-14.7%	
as % of EBT	-19.1%	-20.8%	-19.0%	-21.2%	-20.5%	-20.5%	
Deferred Tax	7.8	23.1	9.8	34.7	26.6	28.8	
YoY growth %	n/a	196.2%	-57.6%	254.1%	-23.3%	8.3%	
as % of EBT	0.9%	2.7%	1.3%	3.5%	2.1%	2.7%	
<b>Net earnings</b>	<b>738</b>	<b>709</b>	<b>625</b>	<b>810</b>	<b>1 019</b>	<b>874</b>	<b>3.4%</b>
YoY growth %	n/a	-4.0%	-11.8%	29.6%	25.9%	-14.2%	
as % of revenue	19.6%	18.1%	16.6%	18.6%	19.7%	16.1%	
<b>Average number of shares, thousands</b>	<b>3 609.4</b>	<b>3 649.0</b>	<b>3 675.4</b>	<b>2 588.3</b>	<b>2 693.0</b>	<b>2 684.4</b>	
<b>Average number of shares after dilution, thousand</b>	<b>3 623.0</b>	<b>3 652.4</b>	<b>3 677.0</b>	<b>2 606.3</b>	<b>2 706.3</b>	<b>2 706.1</b>	
<b>Basic EPS</b>	<b>0.20</b>	<b>0.19</b>	<b>0.17</b>	<b>0.31</b>	<b>0.38</b>	<b>0.33</b>	
<b>Diluted EPS</b>	<b>0.20</b>	<b>0.19</b>	<b>0.17</b>	<b>0.31</b>	<b>0.38</b>	<b>0.32</b>	

## Appendix 2) Standardised Forecasted Income Statement

MEUR	Forecasted Income Statement										CAGR
	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2024E-2033E
<b>Total Revenue</b>	<b>6 073</b>	<b>6 733</b>	<b>7 390</b>	<b>8 036</b>	<b>8 647</b>	<b>9 194</b>	<b>9 632</b>	<b>9 962</b>	<b>10 156</b>	<b>10 353</b>	<b>6.1%</b>
<i>YoY growth %</i>	11.7%	10.9%	9.8%	8.7%	7.6%	6.3%	4.8%	3.4%	1.9%	1.9%	
Industrial Enterprise Solutions (IES)	2 921.6	3 249.5	3 577.0	3 894.0	4 189.3	4 451.4	4 661.6	4 816.8	4 909.5	5 003.9	6.2%
<i>YoY growth %</i>	4.3%	11.2%	10.1%	8.9%	7.6%	37.0%	4.7%	3.3%	1.9%	1.9%	
<i>as % of revenue</i>	48.1%	48.3%	48.4%	48.5%	48.4%	48.4%	48.4%	48.4%	48.3%	48.3%	
Geospatial Enterprise Solutions (GES)	2 862.2	3 162.6	3 461.1	3 759.1	4 045.8	4 304.5	4 511.4	4 670.6	4 762.5	4 856.2	6.0%
<i>YoY growth %</i>	8.5%	10.5%	9.4%	8.6%	7.6%	6.4%	4.8%	3.5%	2.0%	2.0%	
<i>as % of revenue</i>	47.1%	47.0%	46.8%	46.8%	46.8%	46.8%	46.8%	46.9%	46.9%	46.9%	
Inorganic Growth	289.2	320.6	351.9	382.7	411.8	437.8	458.6	474.4	483.6	493.0	6.1%
<i>as % of revenue</i>	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	
<b>COGS</b>	<b>(2 138)</b>	<b>(2 362)</b>	<b>(2 656)</b>	<b>(2 804)</b>	<b>(3 011)</b>	<b>(3 187)</b>	<b>(3 288)</b>	<b>(3 350)</b>	<b>(3 500)</b>	<b>(3 380)</b>	<b>5.2%</b>
<i>YoY growth %</i>	13.2%	13.2%	10.5%	12.4%	5.6%	7.4%	5.9%	3.2%	1.9%	0.9%	
<i>as % of revenue</i>	34.7%	33.3%	33.6%	34.7%	34.1%	34.4%	34.7%	34.7%	34.6%	34.3%	
<b>Gross Profit</b>	<b>3 935</b>	<b>4 370</b>	<b>4 734</b>	<b>5 232</b>	<b>5 636</b>	<b>6 006</b>	<b>6 344</b>	<b>6 612</b>	<b>6 655</b>	<b>6 973</b>	<b>6.6%</b>
<i>YoY growth %</i>	11.0%	11.1%	11.1%	8.3%	10.5%	7.7%	6.6%	5.6%	4.2%	0.7%	
<i>as % of revenue</i>	64.8%	58.4%	59.1%	58.9%	60.5%	61.3%	62.4%	63.7%	65.1%	64.3%	

<b>SG&amp;A</b>	<b>(2 570)</b>	<b>(2 837)</b>	<b>(3 107)</b>	<b>(3 374)</b>	<b>(3 631)</b>	<b>(3 909)</b>	<b>(4 106)</b>	<b>(4 266)</b>	<b>(4 314)</b>	<b>(4 479)</b>	<b>6.4%</b>
<i>YoY growth %</i>	10.4%	10.4%	10.4%	9.5%	8.6%	7.6%	7.7%	5.0%	3.9%	1.1%	
<i>as % of revenue</i>	42.3%	42.1%	42.0%	42.0%	42.0%	42.5%	42.6%	42.8%	42.5%	43.3%	
Sales expenses	(1 251.1)	(1 385.5)	(1 520.1)	(1 653.2)	(1 780.3)	(1 887.5)	(1 981.2)	(2 055.0)	(2 092.8)	(2 142.4)	6.2%
<i>YoY growth %</i>	10.8%	10.7%	9.7%	8.8%	7.7%	6.0%	5.0%	3.7%	5.6%	4.2%	
<i>as % of revenue</i>	19.5%	19.7%	19.9%	20.1%	20.3%	20.6%	20.9%	21.2%	21.6%	21.7%	
Administration expenses	(582.1)	(645.0)	(709.1)	(772.8)	(833.9)	(877.6)	(923.9)	(961.6)	(971.3)	(1 032.8)	6.6%
<i>YoY growth %</i>	21.0%	10.8%	9.9%	9.0%	7.9%	5.2%	5.3%	4.1%	5.1%	7.4%	
<i>as % of revenue</i>	8.8%	9.1%	9.2%	9.3%	9.4%	9.5%	9.6%	9.7%	9.9%	10.5%	
Research and development expenses	(723.9)	(792.1)	(861.5)	(930.9)	(998.4)	(1 124.6)	(1 180.0)	(1 228.1)	(1 228.1)	(1 281.6)	6.6%
<i>YoY growth %</i>	7.3%	9.4%	8.8%	8.1%	7.3%	12.6%	4.9%	4.1%	4.1%	4.4%	
<i>as % of revenue</i>	12.4%	11.3%	11.3%	11.3%	11.3%	11.4%	12.3%	12.4%	12.7%	13.0%	
Other operating income	202.2	224.1	246.0	267.5	287.9	306.1	320.7	331.7	338.1	344.7	6.1%
<i>YoY growth %</i>	6.4%	10.9%	9.8%	8.7%	7.6%	6.3%	4.8%	3.4%	5.4%	3.9%	
<i>as % of revenue</i>	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Other operating expenses	(215.2)	(238.5)	(261.8)	(284.7)	(306.4)	(325.7)	(341.3)	(352.9)	(359.8)	(366.8)	6.1%
<i>YoY growth %</i>	6.4%	10.9%	9.8%	8.7%	7.6%	6.3%	4.8%	3.4%	5.4%	3.9%	
<i>as % of revenue</i>	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	-3.7%	
<b>EBIT</b>	<b>1 365</b>	<b>1 533</b>	<b>1 628</b>	<b>1 857</b>	<b>2 005</b>	<b>2 097</b>	<b>2 238</b>	<b>2 346</b>	<b>2 342</b>	<b>2 494</b>	<b>6.9%</b>
<i>YoY growth %</i>	6.1%	12.3%	6.1%	14.1%	7.9%	4.6%	6.7%	4.8%	-0.2%	6.5%	
<i>as % of revenue</i>	22.5%	22.8%	22.0%	23.1%	23.2%	22.8%	23.2%	23.5%	23.1%	24.1%	

<b>Financial income and expenses</b>	<b>(84.4)</b>	<b>(92.9)</b>	<b>(99.9)</b>	<b>(105.6)</b>	<b>(111.3)</b>	<b>(117.2)</b>	<b>(123.2)</b>	<b>(129.4)</b>	<b>(135.9)</b>	<b>(142.4)</b>	<b>6.0%</b>
Financial income	10.7	11.9	13.0	14.2	15.2	16.2	17.0	17.6	17.9	18.3	
YoY growth %	21.7%	10.9%	9.8%	8.7%	7.6%	6.3%	4.8%	3.4%	1.9%	1.9%	
as % of revenue	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	
Financial expenses	(95.1)	(104.8)	(113.0)	(119.8)	(126.6)	(133.4)	(140.2)	(147.0)	(153.8)	(160.6)	
YoY growth %	100.3%	10.1%	7.8%	6.0%	5.7%	5.4%	5.1%	4.9%	4.6%	4.4%	
as % of revenue	-1.6%	-1.6%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.6%	
<b>Earnings before tax</b>	<b>1 280</b>	<b>1 440</b>	<b>1 528</b>	<b>1 752</b>	<b>1 894</b>	<b>1 980</b>	<b>2 115</b>	<b>2 216</b>	<b>2 206</b>	<b>2 352</b>	<b>7.0%</b>
YoY growth %	2.6%	12.5%	6.1%	14.7%	8.1%	4.6%	6.8%	4.8%	-0.5%	6.6%	
as % of revenue	21.1%	21.4%	20.7%	21.8%	21.9%	21.5%	22.0%	22.2%	21.7%	22.7%	
Tax on earnings for the year	(227.9)	(256.4)	(271.9)	(311.8)	(337.0)	(352.4)	(376.4)	(394.5)	(392.6)	(418.7)	
YoY growth %	-0.4%	12.5%	6.1%	14.7%	8.1%	4.6%	6.8%	4.8%	-0.5%	6.6%	
as % of EBT	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	-17.8%	
Current Tax	(263.8)	(296.7)	(314.7)	(360.9)	(390.1)	(407.9)	(435.6)	(456.6)	(454.4)	(484.5)	
YoY growth %	3.2%	12.5%	6.1%	14.7%	8.1%	4.6%	6.8%	4.8%	-0.5%	6.6%	
as % of EBT	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	-20.60%	
Deferred Tax	35.9	40.3	42.8	49.1	53.0	55.4	59.2	62.1	61.8	65.9	
YoY growth %	24.5%	12.5%	6.1%	14.7%	8.1%	4.6%	6.8%	4.8%	-0.5%	6.6%	
as % of EBT	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	
<b>Net earnings</b>	<b>1 053</b>	<b>1 184</b>	<b>1 256</b>	<b>1 440</b>	<b>1 556</b>	<b>1 627</b>	<b>1 738</b>	<b>1 822</b>	<b>1 813</b>	<b>1 933</b>	<b>7.0%</b>
YoY growth %	3.3%	12.5%	6.1%	14.7%	8.1%	4.6%	6.8%	4.8%	-0.5%	6.6%	
as % of revenue	17.3%	17.6%	17.0%	17.9%	18.0%	17.7%	18.0%	18.3%	17.9%	18.7%	
<b>Average number of shares, thousands</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	<b>2 684.4</b>	
<b>Average number of shares after dilution, thousand</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	<b>2 706.1</b>	
<b>Basic EPS</b>	<b>0.39</b>	<b>0.44</b>	<b>0.47</b>	<b>0.54</b>	<b>0.58</b>	<b>0.61</b>	<b>0.65</b>	<b>0.68</b>	<b>0.68</b>	<b>0.72</b>	
<b>Diluted EPS</b>	<b>0.39</b>	<b>0.44</b>	<b>0.46</b>	<b>0.53</b>	<b>0.58</b>	<b>0.60</b>	<b>0.64</b>	<b>0.67</b>	<b>0.67</b>	<b>0.71</b>	

### Appendix 3) Standardised Historical Balance Sheet

Standardised Balance Sheet	2017A	2018A	2019A	2020A	2021A	2022A	2023A
<b>ASSETS</b>							
<b>Current assets</b>							
Cash and Short Term Investments	309.4	394.6	468.3	397.4	472.1	486.3	547.1
Account receivables	895.5	959.1	999.2	884.7	1 090.8	1 285.8	1 303.1
Inventories	431.8	463.0	409.3	371.1	443.5	577.2	584.7
Other current assets	133.4	207.0	214.2	205.9	238.8	281.1	317.2
<b>Total current assets</b>	<b>1 770.1</b>	<b>2 023.7</b>	<b>2 091.0</b>	<b>1 859.1</b>	<b>2 245.2</b>	<b>2 630.4</b>	<b>2 752.1</b>
<b>Fixed assets</b>							
Intangible fixed assets	6 408	7 101	7 631	7 942	10 909	12 806	12 994
Capitalized Development Expenses	600	658	753	740	717	919	957
Goodwill	4 412	4 977	5 358	5 706	8 206	9 600	9 750
Other intangible assets	1 396	1 466	1 520	1 497	1 987	2 287	2 287
Tangible fixed assets	281.2	384	485	480	537	593	600
Right-of-use lease assets	0.1	0.0	223.2	205.1	201.7	198.0	200.4
Other financial assets	40.3	53.9	56.3	80.4	69.6	114.5	158.1
<b>Total fixed assets</b>	<b>6 729.9</b>	<b>7 538.9</b>	<b>8 396.1</b>	<b>8 707.4</b>	<b>11 717.4</b>	<b>13 711.0</b>	<b>13 952.4</b>
<b>TOTAL ASSETS</b>	<b>8 500.0</b>	<b>9 562.6</b>	<b>10 487.1</b>	<b>10 566.5</b>	<b>13 962.6</b>	<b>16 341.4</b>	<b>16 704.5</b>

**Current liabilities**

Accounts payable	189.3	251.1	226.2	207.4	263.2	309.8	288.5
Advance payments from customers	51.6	45.9	50.6	76.0	99.9	124.3	-
Current tax liabilities (net)	55.0	72.8	82.2	26.0	45.4	63.8	-
Short-term interest bearing debt	301.8	541.8	425.9	437.4	<b>582.3</b>	<b>633.8</b>	<b>1040.2</b>
Revolving Credit					-	-	
Term loan					250.0	400.0	700.0
Bond loans					316.6	214.6	321.0
Commercial paper'					-	-	-
Other lenders					15.7	19.2	19.2
Lease liabilities	-	-	61.3	61.6	62.7	62.4	59.5
Other liabilities — non-interest bearing	119.0	123.1	129.0	189.7	135.3	176.4	280.4
Other provisions	28.1	21.5	36.5	48.3	54.8	59.2	159.4
Other current liabilities	692.3	737.1	762.6	838.3	1 084.4	1 224.4	1 256.6
<b>Total current liabilities</b>	<b>1 437.1</b>	<b>1 793.3</b>	<b>1 774.3</b>	<b>1 884.7</b>	<b>2 328.0</b>	<b>2 654.1</b>	<b>3 084.6</b>

**Long-term liabilities**

Provisions for pensions	82.3	108.2	97.2	125.4	75.0	53.9	56.9
Other provisions	8.5	8.6	9.7	14.7	13.9	9.5	8.1
Deferred tax (net)	358.9	365.1	371.7	358.1	372.1	459.5	400.7
Long-term interest bearing debt	1 960.2	1 813.9	1 831.3	1 995.4	<b>2 143.0</b>	<b>3 032.4</b>	<b>2 831.7</b>
Revolving Credit						40.0	40.0
Term loan					350.0	1 300.0	1 100.0
Bond loans					976.4	950.5	960.0
Commercial paper'					816.4	741.8	731.6
Other lenders					0.2	0.1	0.1
Lease liabilities	-	-	168.3	153.5	149.9	145.5	152.0
Other long-term liabilities	48.6	154.3	157.7	85.5	116	121.9	124.4
<b>Total long-term liabilities</b>	<b>2 458.5</b>	<b>2 450.1</b>	<b>2 635.9</b>	<b>2 732.6</b>	<b>2 869.9</b>	<b>3 822.7</b>	<b>3 573.8</b>

**Shareholders equity**

Share capital	80.0	80.5	81.6	81.6	85.8	85.8	85.8
Other capital contributions	1 397.8	1 481.3	1 631.2	1 631.2	3 378.4	3 378.4	3 378.4
Reserves	64.4	175.7	288.9	156.3	333.1	733.0	733.0
Retained earnings	3 050.3	3 567.8	4 062.1	4 378.3	4 934.8	5 633.0	5 816.7
<b>Shareholders' equity attributable to Pa</b>	<b>4 592.5</b>	<b>5 305.3</b>	<b>6 063.8</b>	<b>5 934.8</b>	<b>8 732.1</b>	<b>9 830.2</b>	<b>10 013.9</b>
Non-controlling interest	11.9	13.9	13.1	14.4	32.6	34.4	32.2
<b>Total shareholders' equity</b>	<b>4 604.4</b>	<b>5 319.2</b>	<b>6 076.9</b>	<b>5 949.2</b>	<b>8 764.7</b>	<b>9 864.6</b>	<b>10 046.1</b>

**Appendix 4 ) Standardised Forecasted Balance Sheet**

<b>Standardised Balance Sheet</b>	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
<b>ASSETS</b>										
<b>Current assets</b>										
Cash and Short Term Investments	1 086.1	1 692.4	2 135.7	2 670.9	3 206.2	3 869.0	4 562.9	5 210.7	5 081.9	5 867.4
Account receivables	1 531.0	1 594.1	1 733.4	1 865.2	1 983.1	2 077.6	2 148.8	2 190.6	2 190.6	2 233.2
Inventories	653.8	722.5	812.2	857.6	920.8	974.7	1 005.5	1 024.5	1 024.5	1 070.4
Other current assets	358.9	396.6	445.9	470.8	505.4	535.1	552.0	562.4	562.4	587.6
<b>Total current assets</b>	<b>3 629.9</b>	<b>4 405.5</b>	<b>5 127.1</b>	<b>5 864.4</b>	<b>6 615.6</b>	<b>7 456.4</b>	<b>8 269.2</b>	<b>8 988.2</b>	<b>8 859.3</b>	<b>9 758.7</b>
<b>Fixed assets</b>										
Intangible fixed assets	13 873	14 522	15 210	15 939	16 634	17 377	18 167	19 009	19 009	19 906
Capitalized Development Expenses	1 137	1 278	1 433	1 603	1 791	1 997	2 222	2 467	2 467	2 734
Goodwill	10 456	10 970	11 510	12 077	12 672	13 297	13 954	14 643	14 643	15 366
Other intangible assets	2 280	2 274	2 267	2 259	2 171	2 082	1 992	1 899	1 899	1 806
Tangible fixed assets	563	608	658	714	776	845	922	1 007	1 007	1 101
Right-of-use lease assets	254	289	329	375	429	490	561	642	642	736
Other financial assets	158	158	158	158	158	158	158	158	158	158
<b>Total fixed assets</b>	<b>14 848.4</b>	<b>15 577.1</b>	<b>16 355.2</b>	<b>17 186.6</b>	<b>17 997.3</b>	<b>18 870.1</b>	<b>19 808.0</b>	<b>20 816.4</b>	<b>20 816.4</b>	<b>21 900.9</b>
<b>TOTAL ASSETS</b>	<b>18 478.2</b>	<b>19 982.7</b>	<b>21 482.3</b>	<b>23 051.1</b>	<b>24 612.9</b>	<b>26 326.5</b>	<b>28 077.2</b>	<b>29 804.6</b>	<b>29 675.8</b>	<b>31 659.6</b>

**Current liabilities**

Accounts payable	347.9	384.5	432.2	456.4	490.0	518.7	535.1	545.2	545.2	569.6
Advance payments from customers	103.7	113.9	123.8	133.2	141.6	148.4	153.5	156.5	156.5	159.5
Current tax liabilities (net)	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8
Short-term interest bearing debt	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>	<b>1040.2</b>
Revolving Credit										
Term loan	700.0	700.0	700.0	700.0	700.0	700.0	700.0	700.0	700.0	700.0
Bond loans	321.0	321.0	321.0	321.0	321.0	321.0	321.0	321.0	321.0	321.0
Commercial paper'	-	-	-	-	-	-	-	-	-	-
Other lenders	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Lease liabilities	73.04	83.02	94.53	107.79	123.06	140.67	160.95	184.31	184.31	211.22
Other liabilities — non-interest bearing	317.3	350.6	394.1	416.1	446.8	473.0	487.9	497.1	497.1	519.4
Other provisions	176.7	194.0	210.9	227.0	241.3	252.8	261.5	266.6	266.6	271.7
Other current liabilities	1 413.2	1 483.9	1 558.1	1 636.0	1 717.8	1 803.7	1 893.9	1 988.6	1 988.6	2 088.0
<b>Total current liabilities</b>	<b>3 921.2</b>	<b>4 176.6</b>	<b>4 605.0</b>	<b>4 904.9</b>	<b>5 179.3</b>	<b>5 494.5</b>	<b>5 747.7</b>	<b>5 903.2</b>	<b>4 267.3</b>	<b>4 595.4</b>

**Long-term liabilities**

Provisions for pensions	70.0	84.0	89.0	98.0	101.0	109.0	129.0	131.0	135.0	140.0
Other provisions	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Deferred tax (net)	133.7	86.0	59.5	70.2	0.0	0.0	0.0	0.0	0.0	0.0
Long-term interest bearing debt	<b>3 331.7</b>	<b>3 831.7</b>	<b>4 131.7</b>	<b>4 431.7</b>	<b>4 731.6</b>	<b>5 031.6</b>	<b>5 331.6</b>	<b>5 631.6</b>	<b>5 931.6</b>	<b>6 231.6</b>
Revolving Credit	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Term loan	1 300	1 500	1 700	1 900	2 100	2 300	2 500	2 700	2 900	3 100
Bond loans	1260.0	1560.0	1660.0	1760.0	1860.0	1960.0	2060.0	2160.0	2260.0	2360.0
Commercial paper'	731.6	731.6	731.6	731.6	731.6	731.6	731.6	731.6	731.6	731.6
Other lenders	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Lease liabilities	181.4	206.1	234.7	267.6	305.6	349.3	399.6	457.7	457.7	524.5
Other long-term liabilities	124.40	124.40	124.40	124.40	124.40	124.40	124.40	124.40	124.40	124.40
<b>Total long-term liabilities</b>	<b>3 849.2</b>	<b>4 340.3</b>	<b>4 647.4</b>	<b>5 000.0</b>	<b>5 270.7</b>	<b>5 622.4</b>	<b>5 992.8</b>	<b>6 352.8</b>	<b>6 656.7</b>	<b>7 028.5</b>

<b>Shareholders equity</b>										
Share capital	85.8	85.8	85.8	85.8	85.8	85.8	85.8	85.8	85.8	85.8
Other capital contributions	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4	3 378.4
Reserves	733.0	733.0	733.0	733.0	733.0	733.0	733.0	733.0	733.0	733.0
Retained earnings	6 478.4	7 236.4	8 000.6	8 916.8	9 933.5	10 980.2	12 107.3	13 319.2	14 522.4	15 806.3
<b>Shareholders' equity attributable to Pa</b>	<b>10 675.6</b>	<b>11 433.6</b>	<b>12 197.8</b>	<b>13 114.0</b>	<b>14 130.7</b>	<b>15 177.4</b>	<b>16 304.5</b>	<b>17 516.4</b>	<b>18 719.6</b>	<b>20 003.5</b>
Non-controlling interest	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
<b>Total shareholders' equity</b>	<b>10 707.8</b>	<b>11 465.8</b>	<b>12 230.0</b>	<b>13 146.2</b>	<b>14 162.9</b>	<b>15 209.6</b>	<b>16 336.7</b>	<b>17 548.6</b>	<b>18 751.8</b>	<b>20 035.7</b>
<b>Total Shareholders' Equity and Liabilite</b>	<b>18 478.2</b>	<b>19 982.7</b>	<b>21 482.3</b>	<b>23 051.1</b>	<b>24 612.9</b>	<b>26 326.5</b>	<b>28 077.2</b>	<b>29 804.6</b>	<b>29 675.8</b>	<b>31 659.6</b>
<i>Balance Sheet Balance Check</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>	<i>TRUE</i>

## Appendix 5) Standardised Historical Cashflow Statement

Standardised Cash Flow Statement in EURm	Note	2018A	2019A	2020A	2021A	2022A	2023A
<b>Cash flow from Operating Activities</b>							
<b>Operating earnings (EBIT)</b>		<b>925.1</b>	<b>892.2</b>	<b>787.0</b>	<b>1 009.3</b>	<b>1 286.7</b>	<b>1 218.5</b>
Adjustments for items not affecting cash flow							
(+) Depreciation, amortisation and impairment		284.0	387.7	534.2	578.9	467.0	636.5
(+) Non-Cash Items		(21.1)	0.5	(50.8)	(25.6)	24.8	100.0
Changes in Working Capital		<b>(60.7)</b>	<b>(21.9)</b>	<b>221.3</b>	<b>(21.4)</b>	<b>(173.8)</b>	<b>(78.2)</b>
Other Operating Cash Flow		<b>(175.4)</b>	<b>(196.2)</b>	<b>(187.7)</b>	<b>(218.1)</b>	<b>(273.9)</b>	<b>(422.7)</b>
(+) Interest received		5.9	6.3	6.9	4.9	8.6	10.3
(-) Interest paid		(28.0)	(29.3)	(31.4)	(33.6)	(46.6)	(157.4)
(-) Tax paid		(153.3)	(173.2)	(163.2)	(189.4)	(235.9)	(216.8)
(+) Deferred Taxes							(58.8)
<b>Cash from Operating Activities</b>		<b>952</b>	<b>1 062</b>	<b>1 304</b>	<b>1 323</b>	<b>1 331</b>	<b>1 454.1</b>
<b>Capital Expenditures</b>							
Purchase of Fixed Assets		(156.5)	(125.4)	(107.5)	(112.7)	(153.6)	(108.3)
Purchase of Intangibles		(234.3)	(285.1)	(286.6)	(312.2)	(413.9)	(490.0)
<b>Other Investing Cash Flow Items</b>		<b>(436.5)</b>	<b>(343.8)</b>	<b>(784.2)</b>	<b>(741.2)</b>	<b>(1 230.1)</b>	<b>(462.0)</b>
Acquisition of Business		(426.6)	(349.8)	(760.5)	(748.4)	(1 194.8)	(375.8)
Sale of Business		4.0	0.0	0.0	0.3	0.0	(45.1)
Sale of Fixed Assets		1.7	11.4	10.8	5.5	14.8	2.5
Divestments (Investments) of financial fixed assets		(15.6)	(5.4)	(34.5)	1.4	(50.1)	(43.6)
<b>Cash from Investing Activities</b>		<b>(827.3)</b>	<b>(754.3)</b>	<b>#####</b>	<b>(1 166.1)</b>	<b>(1 797.6)</b>	<b>(1 060.3)</b>

**Cash flow from Financing Activities**

Net Borrowings	93.5	(166.3)	92.7	219.9	868.7	52.1
Issuance (Retirement of stock)	<b>84.0</b>	<b>151.0</b>	<b>(47.3)</b>	<b>(62.2)</b>	<b>(71.0)</b>	<b>(47.1)</b>
Repurchase of treasury shares	84.0	0.0	(47.3)	(62.2)	(71.0)	(47.1)
New share issues, net of expenses	0.0	151.0	0.0	0.0	0.0	0.0
Total Dividends Paid	<b>(196.5)</b>	<b>(222.8)</b>	<b>(234.1)</b>	<b>(244.2)</b>	<b>(304.4)</b>	<b>(335.8)</b>
<b>Cash flow from Financing Activities</b>	<b>(19.0)</b>	<b>(238.1)</b>	<b>(188.7)</b>	<b>(86.5)</b>	<b>493.3</b>	<b>(330.8)</b>
<b>Cash flow for the year</b>	<b>105.6</b>	<b>69.9</b>	<b>(63.0)</b>	<b>70.5</b>	<b>26.5</b>	<b>63.0</b>
<b>Cash and cash equivalents, beginning of year</b>	<b>309.4</b>	<b>394.6</b>	<b>468.3</b>	<b>397.4</b>	<b>472.1</b>	<b>486.3</b>
Effect of translation differences on cash and cash equivalents	(20.4)	3.8	(7.9)	3.7	(12.3)	0.0
Cash flow for the year	105.6	69.9	(63.0)	70.5	26.5	63.0
<b>Cash and cash equivalents, end of year (2)</b>	<b>394.6</b>	<b>468.3</b>	<b>397.4</b>	<b>471.6</b>	<b>486.3</b>	<b>549.3</b>

## Appendix 6) Standardised Forecasted Cashflow Statement

Standardised Cash Flow Statement in EURm	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
<b>Cash flow from Operating Activities</b>										
<b>Operating earnings (EBIT)</b>	<b>1 533.3</b>	<b>1 627.6</b>	<b>1 857.5</b>	<b>2 004.8</b>	<b>2 097.1</b>	<b>2 238.0</b>	<b>2 345.8</b>	<b>2 341.5</b>	<b>2 341.5</b>	<b>2 494.3</b>
Adjustments for items not affecting cash flow										
(+) Depreciation, amortisation and impairmen	456	495	539	588	642	647	702	766	766	840
(+) Non-Cash Items	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Changes in Working Capital	<b>9.7</b>	<b>(1.5)</b>	<b>(85.9)</b>	<b>(52.6)</b>	<b>(47.0)</b>	<b>(19.0)</b>	<b>16.3</b>	<b>50.9</b>	<b>(71.1)</b>	<b>40.6</b>
Other Operating Cash Flow	<b>(612.9)</b>	<b>(435.0)</b>	<b>(438.7)</b>	<b>(453.5)</b>	<b>(569.5)</b>	<b>(523.1)</b>	<b>(557.1)</b>	<b>(584.5)</b>	<b>(591.3)</b>	<b>(625.7)</b>
(+) Interest received	11.9	13.0	14.2	15.2	16.2	17.0	17.6	17.9	17.9	18.3
(-) Interest paid	(95.1)	(104.8)	(113.0)	(119.8)	(126.6)	(133.4)	(140.2)	(147.0)	(153.8)	(160.6)
(-) Tax paid	(262.6)	(295.5)	(313.5)	(359.7)	(388.9)	(406.7)	(434.4)	(455.4)	(455.4)	(483.3)
(+) Deferred Taxes	(267.0)	(47.7)	(26.4)	10.7	(70.2)	0.0	0.0	0.0	0.0	0.0
<b>Cash from Operating Activities</b>	<b>1 386</b>	<b>1 686</b>	<b>1 872</b>	<b>2 086</b>	<b>2 123</b>	<b>2 342</b>	<b>2 507</b>	<b>2 574</b>	<b>2 445</b>	<b>2 750</b>
<b>Capital Expenditures</b>										
Purchase of Fixed Assets	(0.4)	(133.0)	(148.0)	(165.3)	(185.4)	(208.9)	(236.6)	(269.8)	(269.8)	(309.9)
Purchase of Intangibles	(458.5)	(496.8)	(538.5)	(584.1)	(555.6)	(552.9)	(596.7)	(644.3)	(644.3)	(696.1)
<b>Other Investing Cash Flow Items</b>	<b>(499.2)</b>	<b>(524.2)</b>	<b>(550.4)</b>	<b>(577.9)</b>	<b>(606.8)</b>	<b>(637.1)</b>	<b>(669.0)</b>	<b>(702.4)</b>	<b>(702.4)</b>	<b>(737.6)</b>
Acquisition of Business	(499.2)	(524.2)	(550.4)	(577.9)	(606.8)	(637.1)	(669.0)	(702.4)	(702.4)	(737.6)
Sale of Business	-	-	-	-	-	-	-	-	-	-
Sale of Fixed Assets	-	-	-	-	-	-	-	-	-	-
Divestments (Investments) of financial fixed a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Cash from Investing Activities</b>	<b>(958.1)</b>	<b>(1 154.0)</b>	<b>(1 237.0)</b>	<b>(1 327.3)</b>	<b>(1 347.7)</b>	<b>(1 398.9)</b>	<b>(1 502.3)</b>	<b>(1 616.5)</b>	<b>(1 616.5)</b>	<b>(1 743.5)</b>

**Cash flow from Financing Activities**

Net Borrowings	500.0	500.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
Issuance (Retirement of stock)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repurchase of treasury shares	-	-	-	-	-	-	-	-	-	-
New share issues, net of expenses	-	-	-	-	-	-	-	-	-	-
Total Dividends Paid	<b>(390.9)</b>	<b>(426.0)</b>	<b>(491.5)</b>	<b>(523.8)</b>	<b>(539.7)</b>	<b>(580.8)</b>	<b>(611.2)</b>	<b>(609.9)</b>	<b>(609.9)</b>	<b>(649.4)</b>
<b>Cash flow from Financing Activities</b>	<b>109.1</b>	<b>74.0</b>	<b>(191.6)</b>	<b>(223.8)</b>	<b>(239.7)</b>	<b>(280.8)</b>	<b>(311.2)</b>	<b>(309.9)</b>	<b>(309.9)</b>	<b>(349.5)</b>
<b>Cash flow for the year</b>	<b>536.8</b>	<b>606.2</b>	<b>443.3</b>	<b>535.3</b>	<b>535.3</b>	<b>662.8</b>	<b>693.8</b>	<b>647.9</b>	<b>519.0</b>	<b>656.7</b>
<b>Cash and cash equivalents, beginning of year (2)</b>	<b>549.3</b>	<b>1 086.1</b>	<b>1 692.4</b>	<b>2 135.7</b>	<b>2 670.9</b>	<b>3 206.2</b>	<b>3 869.0</b>	<b>4 562.9</b>	<b>4 562.9</b>	<b>5 210.7</b>
Effect of translation differences on cash and cas	-	-	-	-	-	-	-	-	-	-
Cash flow for the year	536.8	606.2	443.3	535.3	535.3	662.8	693.8	647.9	519.0	656.7
<b>Cash and cash equivalents, end of year (2)</b>	<b>1 086.1</b>	<b>1 692.4</b>	<b>2 135.7</b>	<b>2 670.9</b>	<b>3 206.2</b>	<b>3 869.0</b>	<b>4 562.9</b>	<b>5 210.7</b>	<b>5 081.9</b>	<b>5 867.4</b>

## Appendix 7) Peer table

	ROE	ROIC	Reinvestment Rate	Goodwill to Assets	Goodwill to Equity
	2022A	2022A	Average 2020A-2022A	2022A	2022A
<b>Hexagon</b>	<b>10.9%</b>	<b>8.0%</b>	<b>6.9%</b>	<b>58.7%</b>	<b>97.3%</b>
<b>Comparable Companies</b>					
<b>Ansys</b>	<b>11.2%</b>	<b>9.2%</b>	<b>11.1%</b>	<b>54.7%</b>	<b>75.2%</b>
<b>Autodesk</b>	<b>82.5%</b>	<b>16.4%</b>	<b>82.5%</b>	<b>38.4%</b>	<b>316.6%</b>
<b>Dassault Systemes</b>	<b>13.8%</b>	<b>8.4%</b>	<b>9.6%</b>	<b>34.1%</b>	<b>90.8%</b>
<b>Trimble</b>	<b>11.2%</b>	<b>7.7%</b>	<b>11.2%</b>	<b>56.9%</b>	<b>102.2%</b>
<b>Nemetschek SE</b>	<b>27.5%</b>	<b>23.4%</b>	<b>18.6%</b>	<b>46.5%</b>	<b>85.3%</b>
<b>Sandvik</b>	<b>16.2%</b>	<b>10.4%</b>	<b>8.3%</b>	<b>26.9%</b>	<b>58.6%</b>
<b>Bentley Systems</b>					

	Goodwill to Revenue	Goodwill to Operating Cashflow	Revenue per Employee (in EUR)	Operating Cash Return on Assets	Cash Conversion Operating CF/EBITDA
	2022A	2022A	2022A	2022A	2022A
Hexagon	1.9x	#REF!	224 543	8%	76%
<b>Comparable Companies</b>					
Ansys	1.7x	5.7x	360 758	9.6%	103.7%
Autodesk	0.7x	1.7x	353 966	22.8%	201.3%
Dassault Systemes	1.2x	4.0x	263 386	10.7%	89.5%
Trimble	1.1x	10.4x	289 201	5.5%	59.6%
Nemetschek SE	0.7x	2.6x	241 947	17.8%	83.2%
Sandvik	0.4x	4.3x	238 355	6.2%	49.8%
Bentley Systems					109.9%

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