



# **The Acquisition of Novanta by ABB: Another Step in the Transformation of a Global Engineering Giant**

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Dissertation written under the supervision of professor  
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## **Abstract**

This dissertation aims to determine whether or not the acquisition of Novanta is a beneficial next step for ABB in its ongoing transformative state. For this purpose, both companies will be valued separately as well as jointly upon a hypothetical acquisition to determine whether the value of Novanta to ABB outweighs the costs of an acquisition.

In addition, a review of the current literature on the most important aspects of mergers and acquisitions is provided. Introductory chapters to the industrial automation and medical device industries as well as to ABB and Novanta individually shall provide an overview of the firms' respective businesses and targeted sectors.

The results of the analysis show that the proposed transaction could create value of USD 3.0 bn for ABB shareholders at a proposed transaction price of USD 220.21 per share.

**Keywords:** ABB, Advanced Industrial, Electrification, Industrial Automation, Medical Device, Motion Control, Novanta, Photonics, Precision Motion

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Benedikt Brandes  
01 June 2023

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## Resumo

A presente dissertação tem por objectivo determinar se a aquisição da Novanta é ou não um passo benéfico para a ABB na sua actual fase de transformação. Para o efeito, ambas as empresas serão avaliadas separadamente e em conjunto numa hipotética aquisição para determinar se o valor da Novanta para a ABB compensa os custos de uma aquisição.

Além disso, é apresentada uma análise da literatura actual sobre os aspectos mais importantes das fusões e aquisições. Os capítulos introdutórios sobre os sectores da automatização industrial e dos dispositivos médicos, bem como sobre a ABB e a Novanta individualmente, apresentam uma panorâmica das actividades respectivas das empresas e dos sectores visados.

Os resultados da análise revelam que a operação proposta poderia criar um valor de 3.0 mil milhões de dólares para os accionistas da ABB a um preço de transacção proposto de 220.21 dólares por acção.

**Palavras-chave::** ABB, Advanced Industrial, Electrification, Industrial Automation, Medical Device, Motion Control, Novanta, Photonics, Precision Motion

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## List of Abbreviations

AMEA	Asia, Middle East and Africa
APV	Adjusted Present Value
$\beta^l$	Levered Beta
$\beta^u$	Unlevered Beta
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CF	Cash Flow
CHF	Swiss Franc
COGS	Cost of Goods Sold
COV	Covariance
D	Debt
D&A	Depreciation and Amortization
DCF	Discounted Cash Flow
E	Equity
EBT	Earnings before Taxes
EBIT	Earnings before Interest and Taxes
EBITA	Earnings before Interest, Taxes and Amortization
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization
EBITDAR	Earnings before Interest, Taxes Depreciation, Amortization and Rent
EUR	Euro
EV	Enterprise Value
FCFF	Free Cash Flow to the Firm
g	Terminal Growth Rate
GDP	Gross Domestic Product
HMI	Human Machine Interfaces
k	Cost of Capital
$k^d$	Cost of Debt
$k^e$	Cost of Equity
LTM	Last Twelve Months
M&A	Mergers and Acquisitions

MRP	Market Risk Premium
NOPLAT	Net Operating Profit Less Adjusted Taxes
NTM	Next Twelve Months
NWC	Net Working Capital
OEM	Original Equipment Manufacturer
P/E	Price-Earnings
PGR	Perpetual Growth Rate
PLC	Programmable Logic Controller
PV	Present Value
RCF	Revolving Credit Facility
$r_i$	Return of the Individual Stock
$r_m$	Return of the Market
$r_f$	Risk-free Rate
$\tau$	Tax Rate
TV	Terminal Value
USD	USD Dollar
VAR	Variance
WACC	Weighted Average Cost of Capital
WC	Working Capital

# 1 Introduction

The aim of this Master thesis is to offer a comprehensive analysis of a potential acquisition of Novanta by ABB. This work includes a literature review that explores various valuation methodologies, such as discounted cash flow analysis, trading multiples, and comparable transactions. Additionally, the concept of synergies is examined, identifying different types and their potential impact on the value of the merged entity. The industrial automation and medical device markets are analyzed in order to gain a comprehensive understanding of their dynamics. Such insights provide a context for evaluating the strategic positioning of both ABB and Novanta within their respective markets. An overview of both ABB and Novanta is provided, highlighting their core competencies, market presence, financial performance, and strategy for the future.

The second part of this work is comprised of a valuation of the individual companies as well as the merged entity using both intrinsic and relative valuation methods. Further, potential synergies and ultimately the overall potential additional value shall be quantified. This analysis serves as a basis for evaluating the fairness of the proposed acquisition and the potential value creation for shareholders.

## 2 Literature Review

### 2.1 Valuation Techniques

#### 2.1.1 Intrinsic Valuation

The Discounted Cash Flow techniques are used to evaluate a company's worth based on its intrinsic capability to generate cash available to equity or equity, debt and other non-equity investors (Goedhart et al. 2010). They all have in common to estimate a company's future cash flows and to discount them back to the time of valuation.

$$PV = \sum_{t=1}^n \frac{E(CF_t)}{(1+k)^t}$$

*2-1 Present Value of Cashflows*

##### 2.1.1.1 WACC-method

With the WACC-method being specified through its name-lending discount factor, it is valuing the firm as a whole and therefore using the free cash flows available to all investors as numerator. The WACC-method is most accurate for companies with a fix target debt-to-value ratio (Pearl and Rosenbaum 2013). Contrary to a theoretical valuation, in practice, projecting cash flows into eternity is impossible, therefore the valuation is split into a forecasting period where cash flows are estimated for each period and a terminal value giving the firms value after the last projected cash flow was recognized.

$$Firm\ Value = \sum_{t=1}^T \frac{FCFF_t}{(1+WACC)^t} + \frac{TV}{(1+WACC)^T}$$

$$TV = \frac{FCFF_{T+1}(1+PGR)}{(WACC - PGR)} \text{ or Exit Multiple}$$

*2-2 Firm Value and Terminal Value*

It is calculated in 2-2 using a perpetual growth assumption, as the last forecasted cash flow continues to grow at the perpetual growth rate PGR (Levin and Olsson 2000). Another widely used method is to apply an exit multiple on the free cash flow or normalized EBITDA/EBIT of the terminal period to end up at the terminal value (Pearl and Rosenbaum 2013). The multiple valuation is further described in chapter 2.1.2.

### 2.1.1.1.1 Free Cash Flows

The free cash flows available to the firm can either be derived in a bottom-up approach from the net income or top-down starting with the EBIT. The top-down approach is preferable, because it avoids forecasting all income statement items below the EBIT line. In a first step corporate taxes are deducted based on the effective tax rate the firm faces. The resulting difference is not the net operating profit after taxes as included in the P&L, but the NOPLAT instead, as interest expenses are not deducted from the tax base to reflect that interest is part of the cash flows available to all financial investors and therefore shall be taxed as well (Koller et al. 2010). The inaccuracy of not considering the tax advantage of deducting interest expenses from the taxable base is counterbalanced by including this advantageous, so called, interest tax shield in the discount factor instead.

<b>EBIT</b>
- Corporate Taxes ( $EBIT \times \text{corporate tax rate}$ )
<b>= Net Operat Profit Less Adjusted Taxes (NOPLAT)</b>
+ Depreciation & Amortization (D&A)
- Capital Expenditures (Capex)
± Changes in NWC
<b>=Free Cash Flow to the Firm (FCFF)</b>

2-3 Calculation of Free Cash Flows to the Firm

Further adjustments to account for cash reinvestment needs and to mitigate priorly deducted non-cash D&A, which have no tax effect, are undertaken as shown in exhibit 2-3 (Damodaran 2002, Kaplan and Ruback 1994).

### 2.1.1.1.2 Discount Factor (WACC)

All of the expected future cash flows and the terminal value need to be discounted back from each period they occur to the point in time of the valuation. This valuation period, from here on, shall be period  $t = 0$ . The name for the discount rate, weighted average cost of capital, is misleading in the sense that it is not actually a cost. In fact, it weights, based on the value relationship between equity and debt financing, the cost of debt and the required return to equity, making the WACC a tradeoff between an actual cost and a required return (Fernandez 2011). Further, it is necessary to point out the effect of taxes, visible in the visualization of the formula in 2-4 (Fernandez 2002). Any interest expenses are deducted before the taxable base and accordingly create a shield on the taxable earnings when compared to cash distributions towards equity investors, which are not tax

deductible. The savings on taxes, as mentioned in chapter 2.1.1.1.1, are considered by reducing the cost of debt the firm faces by the tax rate.

$$WACC = k_e \frac{E}{(D + E)} + k_d \frac{D}{(D + E)} (1 - tax\ rate)$$

*2-4 Formula Weighted Average Cost of Capital*

Of course, required return on equity and cost of debt cannot be simply summed up, as they refer only to their respective portion of financing, not to the total capital employed by the firm. Instead, they weigh in with their share of the firm's total capital. For this purpose, the market values of equity and debt need to be consulted, the book value would be incorrect to use, since the aim is to value the firm at market price and consequently all components shall be included at market price to make the approach consistent (Fernandez 2011).

#### 2.1.1.1.2.1 Cost of Equity

The cost of equity needed for the WACC formula is captured best by the capital asset pricing model (CAPM). As mentioned above, common equity generally does not have an explicit cost for the firm. There may be voluntary commitments by the firm to pay out a certain amount of cash to its equity investors, either via dividends or by share buybacks. None of these, however, are contractual obligations, making these distributions an implicit cost. Nevertheless, investors would not invest in equity if there was no payoff expected and being the most subordinated asset class, expectations of the equity investors will be higher to compensate for the additional amount of risk they face compared to less risky asset classes (Sharpe 1964).

The CAPM values the premium demanded relatively to a theoretical risk-free rate. This rate is the minimum demanded by investors, when there is zero risk for an investment of any kind to default and only the time value difference, of receiving cash in the future rather than possessing it today, is compensated for. The risk of being exposed to the actions of countries' laws and authorities is included by a risk premium for each country. The premium reflecting the business risk consists of a general premium an average firm in the relevant market would need to pay as well as a firm specific factor, called the beta-factor, which scales the premium appropriately to the firm's idiosyncratic riskiness. The beta-factor, likewise, uses a relative approach, comparing the riskiness of the specific firm to the relevant market on average.

$$k^e: CAPM = r_f + \beta^l * MRP + Country Risk Premium$$

*2-5 Formula Cost of Equity*

In the derivation of the CAPM inputs in practice, all of them face some degree of compromise and ambiguity. The beta factor, for a listed firm, can be estimated in two ways. First, it can directly be calculated using historic stock and market returns for the covariance of the firm with the market returns per variance of the firm's returns as following:

$$\beta^l = \frac{cov(r_i, r_m)}{var(r_m)}$$

*2-6 Formula Betafactor*

Secondly, a relative approach using an appropriate publicly traded peer group may be used, which is handy if the firm itself is not traded. The peer group needs to be as comparable as possible to the firm at hand in order for the beta factor to be meaningful. Once, the peer group is constructed, the betas can be calculated with the same approach as above using historic stock market information. It is essential to note, that these peer betas are reflecting the firms risk based on their business, but also based on their capital structure, which may differ vastly from the one of the firm to be valued. Therefore, to ensure consistency all peer betas need to be freed of their firm specific impacts of capital structure decisions. This process is called unlevering beta and depicted below (Hamada 1972, Mandelker and Rhee 1984):

$$\beta^u = \frac{\beta^l}{(1 + (1 - \tau)(\frac{D}{E}))}$$

*2-7 Formula Unlevered Betafactor*

To find the risk-free rate in practice, a definition is necessary first: As investors expect a return for any investment in finance, the risk is the unfavorable variance of actual returns around those expectations. Consequently, a riskless investment's actual returns will always equal its expected returns. This requires twofold prerequisites: The risk of default has to be zero and no reinvestment risk can exist. Having no default risk implies that only government securities are usable as proxy in practice, because even companies with the best credit ratings still have default risk while governments may be relief themselves through their power of collecting higher taxes or due to spiking inflation through an increase of the money supply by the relevant central bank easing the

debt payments (Damodaran 2008, Bodie et al. 2018). Generally, central banks are by law independent, but evidence for varying degrees of influence of governments on their monetary policy have been found (Alesina and Summers 1993, Eijffinger and De Haan 1996). It is argued that short-term securities are more accurate to use as they are less sensitive to interest rate fluctuations others argue in valuation long-term securities are more appropriate since they are used for discounting cash flows which carry on into infinity (Bodie et al. 2018, Damodaran 2002, Pearl and Rosenbaum 2013). Longer-term securities should, nevertheless, only be used as long as they are sufficiently liquid, otherwise the quotes obtained may not reflect their current value (Goedhart et al. 2010).

Lastly the market risk premium, defined as  $(r_m - r_f)$ , where  $r_m$  is the expected excess return of the relevant market over the risk-free rate averaging the compensation of equity investors for facing additional risk compared to investors in riskless assets, in terms of default risk and subordination relative to debt lenders (Levy and Levy 1996). Using either forward- or backward-looking data are two different approaches to estimate the required market return (Fernández 2004). One highly regarded source for the U.S. market by researchers and practitioners under the use of historic data is Ibbotson Associates, using data dating back to 1926 (Fernández 2004, Damodaran 2002, Rosebaum and Pearl, Welch 2000). A common argument for a long historic horizon is that abnormal premiums of specific years are averaged out most effectively. However, a simplification is that the approach assumes markets to behave in the future like they have in the past, without evidence for it.

Another approach consists of a forward-looking perspective, where expectations of investors for future risk compensations are incorporated. This theoretically is the better approach. However, it is an elusive measure as investors have diverging expectations for the return of the market.

Economic models, which are e.g., estimating the expected market return based on dividends or earnings growth, have shown a large downward discrepancy from historical realized market premiums. Researchers argue, that realized returns may decrease in the future to align with the modelled expected returns as surprisingly high growth in equity prices, especially in the U.S., due unique circumstances such as to outlier stocks and historic events (e.g. cold war) that, in a process of mean reversion, are not expected to persist in the future (Fama and French 2002, Goyal and

Welch 2003, Siegel 1999). Damodaran argues a survivorship bias may be imposed, if only data from single historically strong markets, such as the US, are used (2002).

#### 2.1.1.1.2.2 Cost of Debt

One approach for the cost of debt estimation is to utilize the yield to maturity of liquid long-term straight bonds as cost of debt proxy for investment-grade firms (Goedhart et al. 2010, Larrabee and Voss 2013). Another would be to build a value weighted average of all outstanding debt components, no matter whether public or private. Even though all debt is considered in this approach, one associated issue is for many private instruments, e.g., bank loans, to retrieve forward-looking information, since, as with the cost of equity, the WACC uses the expected cost of debt. Based on the target capital structure and the current credit rating, it is also feasible to estimate a long-term credit rating. In a next step, the common credit spread for that rating is used to build the cost of debt. (Pearl and Rosenbaum 2013). A synthetic rating can, likewise, be achieved by calculating often used rating metrics, such as interest coverage ratio, and comparing it to rating agencies' cut-off values (Damodaran 2002).

#### 2.1.1.2 APV-Method

The adjusted present value (APV) method is a variation of the discounted cash flow method, initially valuing the firm as if it was debt-free. The present value of the debt effect, discounting the value of the tax shield using the cost of debt, is then added in a following step (Damodaran 2002). The major advantage compared to the WACC-method is that it does not rely on a constant target leverage ratio assumption (Goedhart et al. 2010). Even though possessing theoretical advantages in valuing companies with dynamic capital structures, such occasions are rare and consequently the APV has never developed into a frequently used valuation method (Meyer 2016).

#### 2.1.1.3 Equity Bridge

The result of the discounted cash flows using the WACC-method is the value of the whole firm. Interest lies, however, largely in knowing the value of the equity portion of the firm, as this reflects the fair price investors should be willing to pay, whereas debt investors do not gain shares in the firm and therefore are less interested in the value but the company's ability to repay. Therefore, deducting financial debt is intuitive, but a view on the liabilities on a firm's balance sheet shows comparable items that may need consideration. Items that are adjusted in order to reach the equity value make up the, so called, equity bridge. Prior to any detailed description, it is essential to state

that these items cannot represent a definitive list. The appropriate items to include need to be identified for every firm individually, because, even though being listed under the same category, they might have financial debt character for one firm and working capital character for the other. The former is relevant in the equity bridge, the latter is not, since it is part of the normal business operations meaning its impact is already reflected in the free cash flows to the firm. The valuation itself is based on operating cash flows, thus investment income is also not included so far. To reflect the value of these assets they need to be added on to the enterprise value.

**Enterprise Value**

- + *Non-operating Assets (e.g. excess cash, unutilized real estate)*
- *Financial Debt (short-term debt, long-term debt)*
- *Debt Equivalents (e.g. unfunded pension liabilities, leasing liabilities)*
- *Hybrid Securities (e.g. employee stock options, preferred stock)*
- *Minority Interest*

**= Equity Value**

*2-8 Bridge from Enterprise Value to Equity*

The first item group to add are non-operating assets, to which belongs any excess cash not needed in normal business operations, near-cash investments with very low risk, other equity and debt investments and lastly unutilized assets such as vacant real estate or equity investments (Damodaran 2002, Goedhart et al. 2010). Typical debt equivalents to be considered beyond financial debt are pension liabilities not covered by a pension fund. Further, lease liabilities with a maturity above twelve months are recognized on the balance sheet, except if the underlying asset is of low value, and are treated as debt (IFRS 2023). Provisions are generally another item with debt character (Goedhart et al. 2010). Hybrid securities are more difficult to account for as their value usually changes with the enterprise value. Convertible debt is one common type and may be turned into equity when investors exercise their attached call option, but are still part of the firm's debt until then. Another frequent instrument are employee stock options. Their classification as equity or debt is substance to discussion. The treatment as equity is justified, however, due to high equity-like risk reward features (Barth et al. 2013, Kirschenheiter et al. 2004). Lastly, minority interest has to be deducted to reach the equity value, since it represents the value of subsidiaries that have been fully consolidated, but are not fully owned by the company (Goedhart 2010).

### 2.1.2 Relative Valuation

The relative valuation is a common approach valuing the company based on a benchmark of comparable companies (Pearl and Rosenbaum 2013). There are different categories of relative valuations. Trading multiples are calculated based on listed firms' market value, whereas transaction multiples use precedent transaction valuations to create its multiples. Notably, transaction multiples are usually higher as they include a premium, acquirers are often required to pay on top of the market value, in order to gain control over the firm. In terms of measures used, there are earnings, book value of equity (BV), revenue and sector specific multiples. Earnings multiples can either be a multiple of the equity value using the net income available to equity investors (P/E) or a multiple of the firm value using earnings available to all investors such as EBIT (EV/EBIT) or EBITDA (EV/EBITDA) (Damodaran 2002). Multiples can either be calculated using forward-looking or historical data. The selection of an appropriate peer group is key for this method to yield meaningful results (Damodaran 2002, Goedhart et al. 2010).

<b>Earnings Multiples</b> P/E EV/EBITDA EV/EBIT	<b>Book Value Multiples</b> P/BV	<b>Revenue Multiples</b> EV/Sales	<b>Sector Specific Multiples</b> e.g. EV/Subscribers EV/EBITDAR
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*2-9 Valuation Multiples by Type*

There is no multiple that clearly outperforms all others. According to Liu et al. (2002) the most accurate are forward earnings measures, while historical earnings measures rank second. They trump cash flow and book value of equity multiples on third as well as sales multiples in the last position. These results were found largely consistent over 81 industries, indicating no essential need for industry specific multiples. Lie and Lie (2002) found the book value multiple to produce the best estimates, followed by forward P/E and EV/EBITDA multiples. The bottom three consisted of EV/EBIT, historic P/E and lastly EV/Sales. Even though here book value places first, generally both studies are still in line regarding the value of forward-looking data, the solidity of earnings multiples and EV/Sales being the least precise multiple. The valuations were also more accurate for large market value companies than for smaller firms.

### 2.1.3 Contingent Claim Valuation

The last technique to value a company originates from the field of financial economics employing option valuation methods under the premise that the cashflows of the firm are contingent on the (non-)occurrence of an event. The rationale is to think of equity as a call option (long) and debt as

a put option (short) with the face value of the firm's debt being the option's strike price and the term of the debt being the option's maturity. Just like an option, the value can be determined using the Black-Scholes option pricing model including variations, which, e.g., cater for dividend payments (Damodaran 2002, Larrabee and Voss 2013).

## 2.2 Motivation to Conduct M&A

There are two main explanations for mergers to be executed in waves developed by Jensen and Ruback (1983). First, firms may engage in M&A whenever they observe stock market misvaluations of their own or the target firm which creates a benefit for the firm against the respective shareholders, but does not create additional business value. The other would be the reoccurring need for restructuring whenever drastic economic or technological changes are faced. Here, synergies are realized through improvements of efficiency. This hypothesis is backed by Mitchell and Mulherin (1996). Profiting from mispricing seems straight forward in its definition, synergies, however, are not. Jensen and Ruback (1983) only view reductions of operating expenses as synergies, while Damodaran (2005) defines them as “the additional value that is generated by combining two firms, creating opportunities that would not been available to these firms operating independently”. The latter definition will be used henceforth as it is more overarching.

The categorization of synergies is even more diverging. Devos et al. (2009) differentiate between operating synergies, increases in tax shield benefits and market power gains against customers and suppliers. Jensen and Ruback (1983) identify operating cost reductions, increase of market power allowing for price increases, elimination of inefficient target management and also financial synergies (tax synergies, avoidance of bankruptcy costs, increased leverage) as relevant categories. Damodaran (2005) defines operating and financial synergies as the supercategories, but is more exhaustive in terms of subcategories which comprise of cost and growth synergies (operating) as well as debt capacity increase, cash and taxation synergies. As the other categories can be fitted into this framework and it appears more complete, this structure is utilized with management synergies being the only missing category. However, considering all improvements by the management will ultimately manifest in one of the other categories, it can be dropped.

### 2.2.1 Operating Synergies

Cost synergies increase operating income by reducing costs and/or increasing revenue. Economies of scale are a typical example and occur normally when buyer and target operate in the same sector, optimizing the usage of existing assets. Growth synergies ultimately increase the top line by creating strategic advantages. These advantages may be realized through longer growth of business, higher returns from new investments or simply an increased number of investment opportunities (Damodaran 2005). A greater pricing power is another type of growth synergy, allowing the firm to impose higher prices on its customers (Berger 1995).

Generally, operating synergies seem to be the dominant motive for managers above financial synergies in M&A being primary goal for 69% of the deals, with profiting from the target's product offering and geographic footprint being of most desire (Rabier 2017). In their study of 264 large mergers Devos, Kadapakkam and Krishnamurthy (2008) found an average creation of synergies of around 10.0%. The majority, equaling 8.4%, were related to operating synergies while the other 1.6% came from tax savings.

Brush (1996) finds significant increases in the market share in a sample of manufacturing firm transactions as a proxy for growth synergies. A significant correlation with profits was determined in addition, providing likewise evidence for cost synergies. Eckbo (1981) finds overall no evidence for synergies through the market power hypothesis. It describes that abnormal returns should occur for the merging firms due to an expected increase in pricing power, however this is likewise the case for their rivals as they can follow suit to the new industry standard. The direct effect of mergers on product prices was examined in the airline industry by multiple studies. Kim and Singal (1993) found an average price increase of 9% until completion over a set of 14 mergers, while the quality of offering did not improve.

### 2.2.2 Financial Synergies

Financial synergies are benefits realized through increased cash flows and/or an improved cost of capital. The first type of synergy is the cash slack, which is excess cash, in a firm with limited quality investment opportunities. Merging this firm with a firm that has higher-return investments available, but is not able to make them due to lacking funds, creates additional value. Also, a combination may reduce volatility of earnings and cash flows resulting in a higher debt capacity as banks and rating agencies value business stability. This additional debt, creates an increased tax

shield ultimately lowering the cost of capital overall (Damodaran 2005). Additionally, direct tax benefits may be collected if loss carry forwards of the target firm are deductible or its asset basis can be stepped-up, creating further, tax-deductible, depreciations (Hayn 1989). Lastly, for investors unable to diversify themselves, a merger of private firms may add value to them by increasing their diversification. For diversified investors or publicly traded firms there is no such diversification synergy (Damodaran 2005).

As mentioned, priorly, Devos et al. (2008) provide empirical evidence for tax synergies of 1.6% on average. These tax savings appear to be more substantial in diversifying instead of horizontal mergers. Hayn (1989) found evidence supporting tax synergies as target firms' tax attributes, such as loss carry forwards or tax credits, have significant explanatory power for abnormal returns of buyer and target firms. No evidence for tax synergies in cross-border transactions is detected by Harris and Ravenscraft (1991).

The financial synergies may indeed be positive, but also destroy value in some cases as Leland (2007) finds. Equity investors always benefit from both separated firms' limited liability, increasing the danger of losing higher after combination.

### 2.3 Cross-Border Mergers

Transactions across borders are becoming ever more popular, creating an all-time high in global transactions in the first nine months of 2021, with a relative cross-border share of 36% of all deals (Jones 2021). Naturally, such deals take additional effort to bridge differences in for example, legal, cultural and geographic differences (Erel and Weisbach 2012).

In their paper examining cross-border deals with U.S. targets, Harris and Ravenscraft (1991) find that these mergers create value, by 10.2% significantly higher than domestic takeovers, reflecting in a 46.4% average bid premium over the target's share price before offer. Premise of targets incorporating large parts of the value creation. In tendency, R&D intensive industries pay higher premiums. Over 70% of buyers were in related lines of operations to the targets. Others, such as Datta and Puia (1995) do not find evidence for value creation, which is why, in their literature review of cross-border M&A studies, Hitt et al. (2004) conclude that the value-creation of cross-border deals, just like domestic ones, remains a controversy. Lastly, Pettit et al. (2002) argue specific managerial motives for cross-border M&A need to be accounted for. They provide

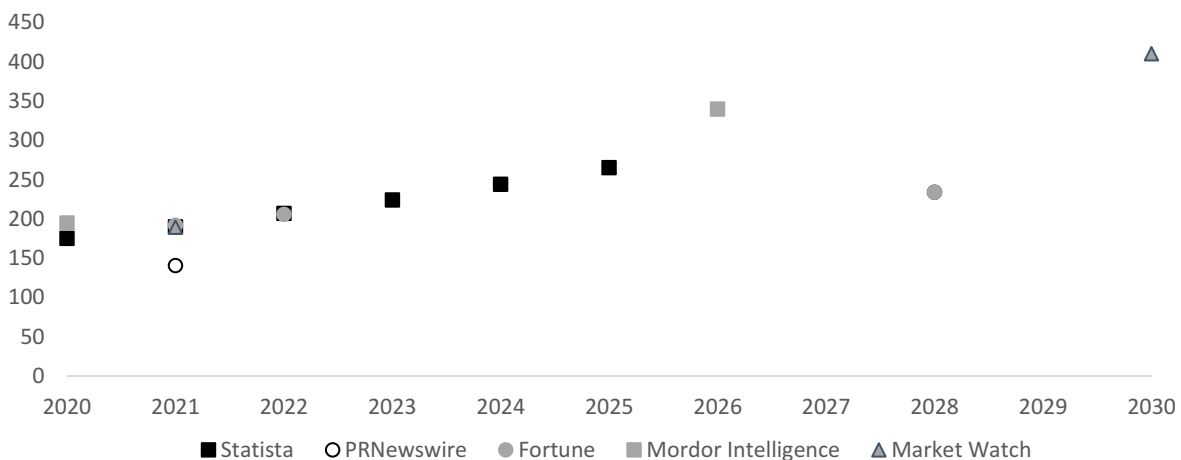
evidence for value creating deals to be conducted to realize synergies, while especially egoistic interests of managers, but also misvaluations, are responsible for value destruction. An average overall abnormal return of 7.6% of the combined firm compared to the sum of buyer and target is found.

### 3 Industry Overview

#### 3.1 Industrial Automation Industry

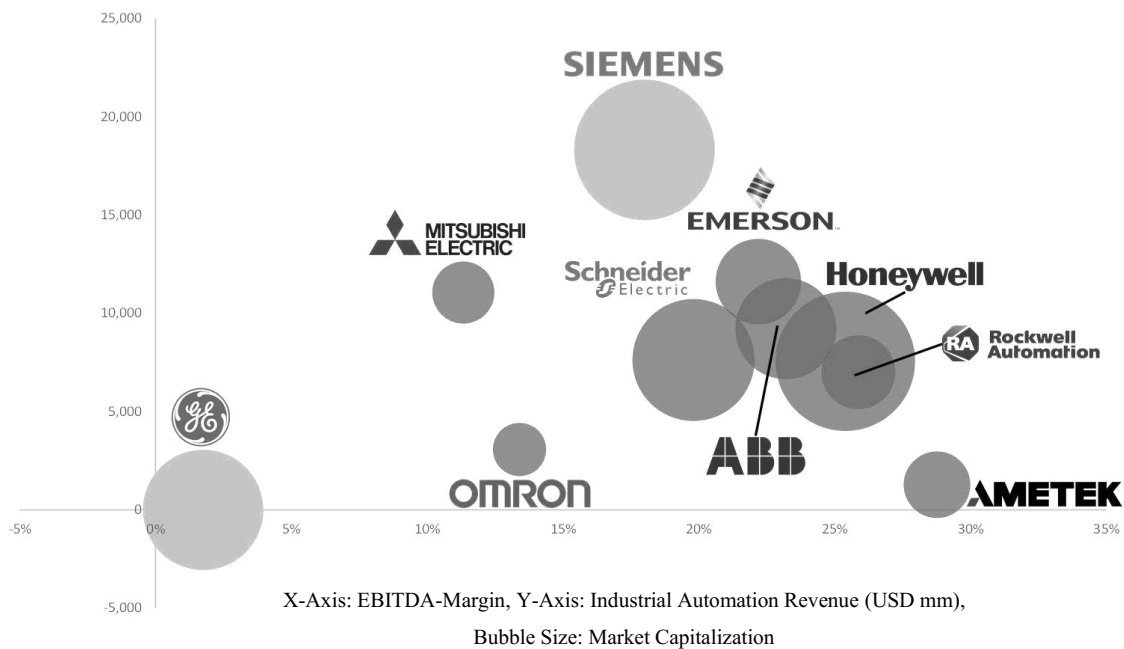
The term Industrial Automation originated as early as the 1940s and can be defined as “the process of following a predetermined sequence of operations with little or no human labor, using specialized (...) devices that perform and control manufacturing processes” (Arora et al. 2017). Ultimately, the technology shall be “capable of observing the manufacturing process, making decisions concerning the [necessary] changes (...), and controlling all aspects of it” (Arora et al. 2017). This comprises hardware, such as sensors, programmable logic controllers (PLC), human machine interfaces (HMI), servo-technology, lasers, safety light curtains and robots, as well as software (Fortune Business Insight Industrial 2022).

The market has an average estimated size of USD 224 bn in 2023 as shown in 3-1. It is projected to grow at an average annual rate of 7.6%. Considering the overall aligning trend of all estimations, the market will likely double in size over the next decade reaching over USD 400 bn, representing an enormous boost in the significance of this industry field. The European market made up a portion of 35% equaling a size of c. USD 62 bn (Fortune Business Insight Industrial 2022).



3-1 Industrial Automation Market Size Estimates (USD bn)

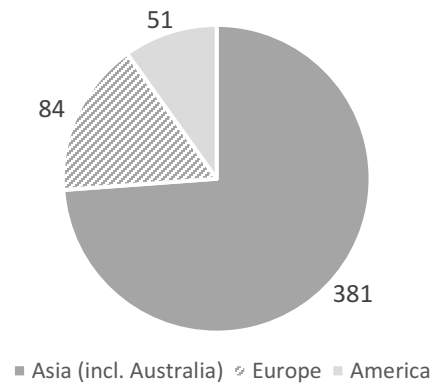
There are roughly ten dominant players in the market, which are clustered in figure 3-2. Overall, the cluster is relatively dense in this yet developing market, with the highlighted exceptions of Siemens and General Electric, for which the relevant revenue share was either insufficiently identifiable, explaining their deviation. The dominant players account for 43% of total market size (mean of all 2021 estimates, including Siemens, excluding General Electric). Consequently, the industry is neither highly fragmented nor consolidated, defined as dominated by a maximum of five corporates by Mordor Intelligence (2021). Interestingly, the companies are not far apart in their relevant revenue with all of them being well below USD 20 bn annually. This, in combination with the projected market growth, means there will likely be a race for the additional potential revenues in order to gain market shares.



3-2 Dominant Players in Industrial Automation Market

The operational stock of industrial robots worldwide as one major technology have been growing exponentially from 1.8 mm robots in 2016 to over 3.4 mm in 2021, equaling a five-year CAGR of 14%. The majority of new installations, as depicted in figure 3-3, are made in Asia with 74%, while Europe and America are lagging behind. The United States as the world's largest economy is particularly slow to adapt, placing only 7<sup>th</sup> in the list of countries with the highest robot density in the manufacturing industry (World Robotics 2022). In contrast, Western and Northern Europe already have the highest robot density worldwide, putting the fewer new installations into

perspective. Especially due to the immense production power, North America will be an important growth market for automation products (Fortune Business Insight Industrial 2022).

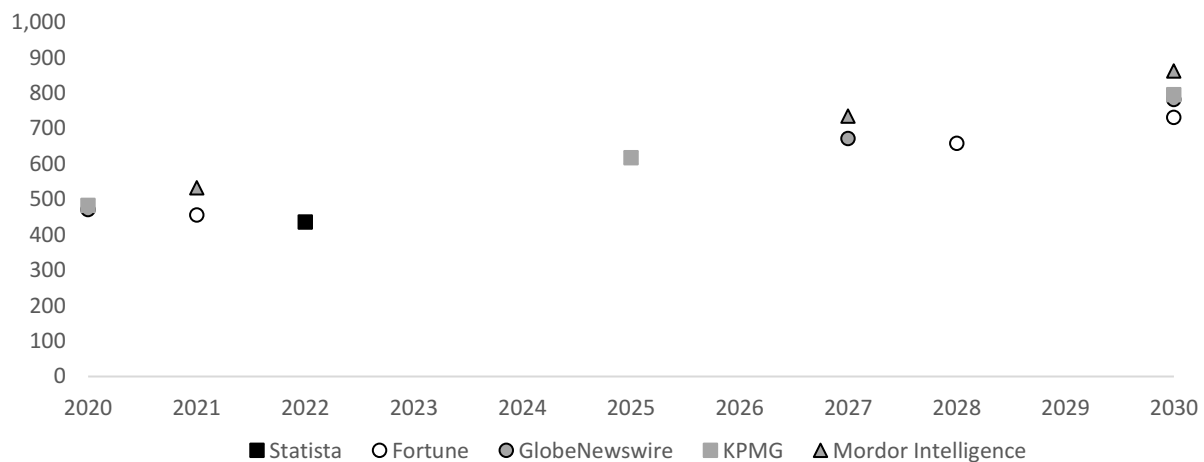


3-3 Annual Installations of Industrial Robots in 2021 (in k units)

### 3.2 Medical Device Industry

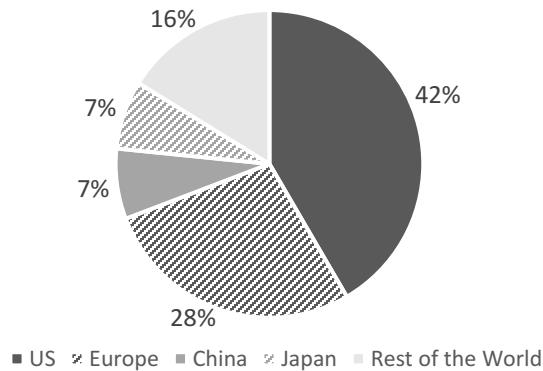
The market consists of advanced medical devices and equipment for preventing, diagnosing, monitoring and curing of diseases (European Commission 2023). It does not include any purely digital health solutions (MedTech Europe 2022).

The global medical device market was estimated at a size of USD 436 bn in 2022 as depicted in 3-4. The average annual growth rate is projected to be 5.3%. At this rate the average estimated market value until 2030 around USD 800 bn equaling a 67% increase over ten years.



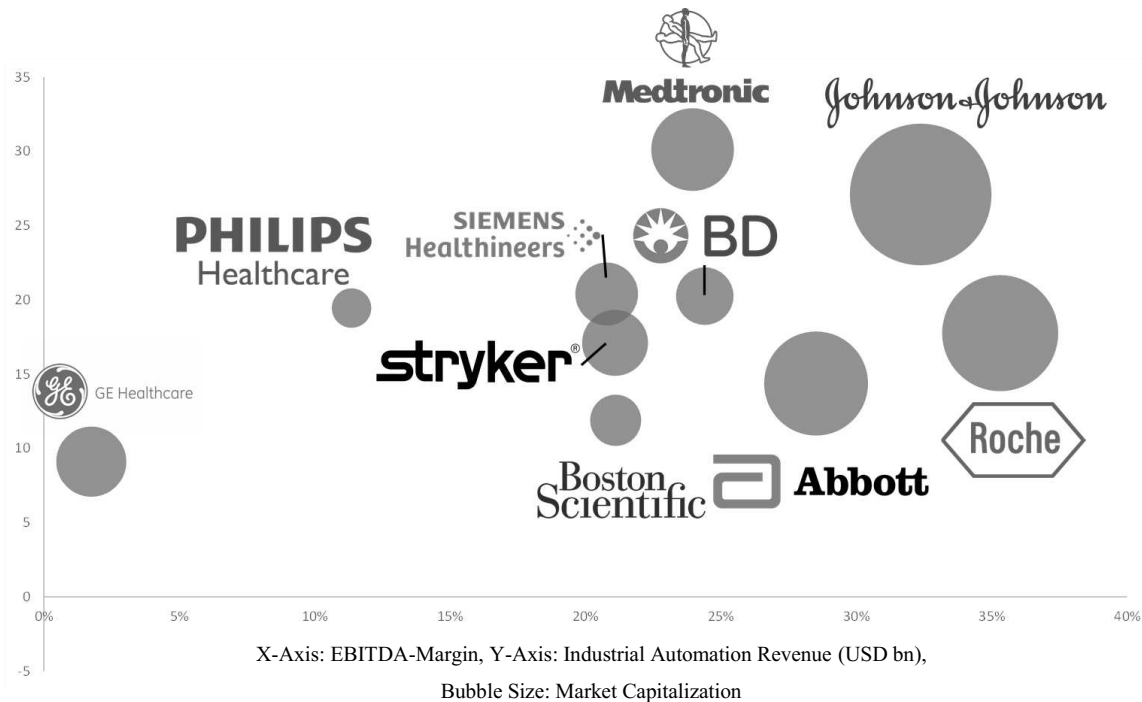
3-4 Medical Device Market Size Estimate

The global medical device market is led by the US with a market share of 42% followed by Europe as the second largest market with a share of 28%. This is, Europe is more complex to penetrate as a whole due to different regulations, e.g., in the EU, UK or Switzerland.



*3-5 Medical Device Market Shares by Region*

The market is overall moderately fragmented as there are about ten major players globally with all of them being quite homogenous in their market capitalization. The major players make up an estimated revenue share of 38% of the whole market. Likewise, no single players clearly dominate the rest regarding the relevant revenue share. All of them realize revenues between USD 9 bn to 30 bn. Only, the EBITDA-margin of the overall business differ substantially. This, however, may likely stem from the diverging profitability of other business segments. The tendency of companies anchored more strongly in the pharma industry, such as Roche, Johnson & Johnson and Abbott show a higher overall profitability than those with a greater component in engineering.



*3-6 Dominant Players in the Medical Device Industry*

From a financial perspective, an increased race for efficiency can be expected. European governments have experienced higher expenses consuming the healthcare budgets and are therefore set to work on efficiency gains to reach better healthcare quality for their countries. This is highly relevant for the medical device market wherever upgraded technology has the potential to cut costs overall without decreasing treatment quality (CBI 2017). The same is true for the US which ranks in the bottom quintile of healthcare spending efficiency in high-income nations. For perspective, a spending of USD 100 by Germany results in over eight times the increase in life expectancy compared to the US (UCLA 2013).

In sum, the status quo of the industry together with underlying long-term trends is expected to lead to an ongoing consolidation process with a high utilization of M&A as an instrument (CBI 2017, Kapadia et al. 2018).

## 4 Company Overview

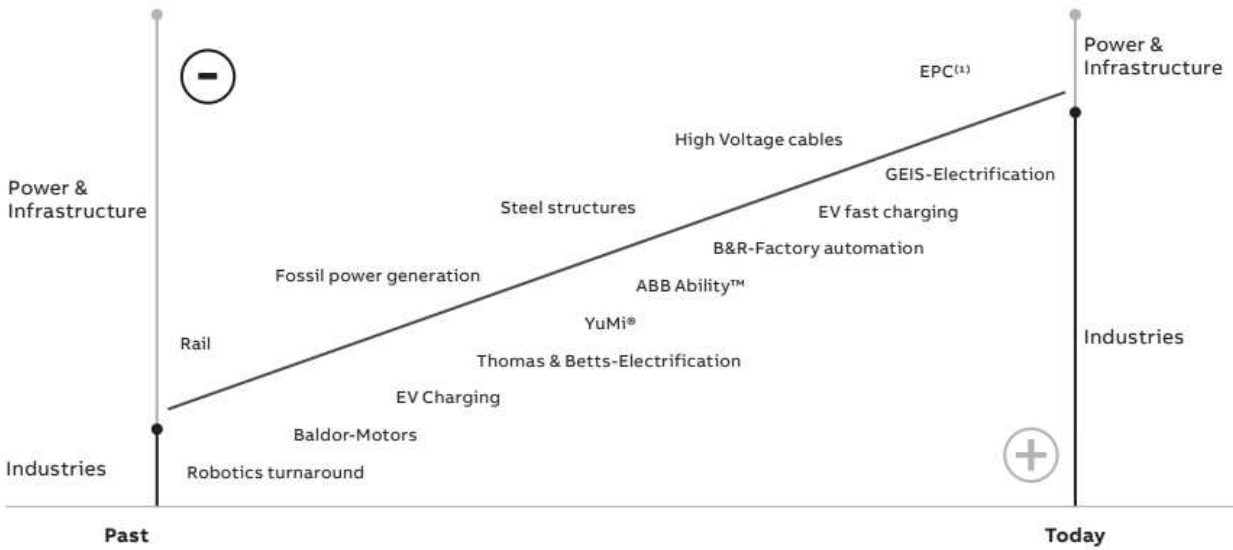
### 4.1 ABB

ABB Ltd is a Swiss-based technology company that offers electrification, robotics, automation and motion solutions in combination with software to address global energy challenges and transform

industries. Operations are spread over 440 sites in over 100 countries with 105,000 employees. The firm ABB came to existence through the merger of the businesses of Swiss BBC and Swedish ASEA in 1988. Both firms continued to exist as dual-listed companies until the definitive merger of the parent companies in 1999, creating today's ABB Ltd. The firm is listed on the SIX Swiss Exchange, on the OMX Stockholm and via American Depository Shares on the New York Stock Exchange.

ABB introduced the "Next Level" strategy program in 2014 setting the aim to be the leading or second leading firm with each of its divisions, which was largely achieved to management's own assessment. A simplification of the organizational structure was announced in 2018. A new sequence to this process of transformation was added by introducing the new operating model ABB Way in 2020, focused on operating efficiency. It further progresses the decentralization in the organization, handing responsibility and target metrics to the divisions while the business segments above are responsible for coordinating shared resources such as R&D and the ABB Ability platform. By year's end 2021 60% of ABB's 20 divisions were in a state of growth, seeking further organic or inorganic opportunities. Electrification and automation are the focus areas for future business extension. Additionally, three divisions were decided to be exited to streamline the business: Turbocharging, Power Conversion and Mechanical Power Transmission, all due to a lack of fit into the digital-industries-focused portfolio.

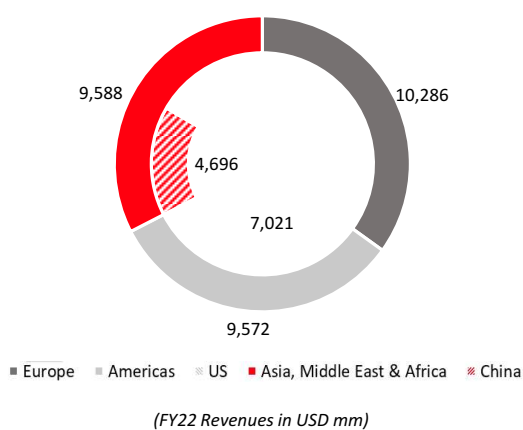
As depicted in figure 4-1, there has been a gradual shift of the business core away from power and infrastructure markets towards industrial customers. Notable divestments included the sale of 80% of the Power Grids business to Hitachi for proceeds of USD 7.8 bn in July 2020 and the Mechanical Power Transmission division for USD 2.9 bn in cash in 2021. The turbocharging business was spun-off in October 2022 as Accelleron, followed by the sale of the remaining 20% stake in Hitachi Energy (formerly Power Grids business) for USD 1.7 bn. The sale of ABB's Power Conversion unit for USD 505 mm was announced in January 2023, while the E-mobility business carve out via public listing is expected in the course of 2023, which would then conclude ABB's transformational divestiture plan.



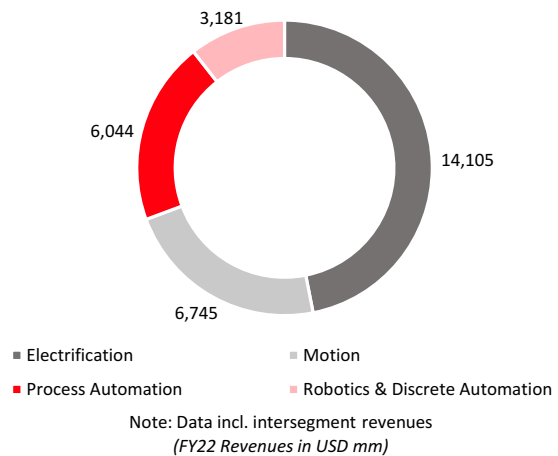
4-1 ABB's Shift in Business Strategy

Notable investments by ABB include the machine and factory automation company Bernecker + Rainer Industrie-Elektronik GmbH which was acquired in July 2017. In September 2017 the Electrification business, especially in North America, was strengthened by the acquisition of General Electric's Global Electrification Business. The Spanish ASTI Mobile Robotics Group was acquired in 2021 to become ABB's autonomous mobile robots headquarter.

Within FY2022 revenues depicted in 4-2 and 4-3, the Electrification business is the largest segment with a share of 47%. It is estimated to profit from the increasing demand for electricity, growing at twice the pace of other energy sources. The segment is further divided into Distribution Solutions, Smart Power, Smart Buildings, Installation Products, Power Conversion and E-mobility.



4-2 ABB Revenue by Region



4-3 ABB Revenue by Division

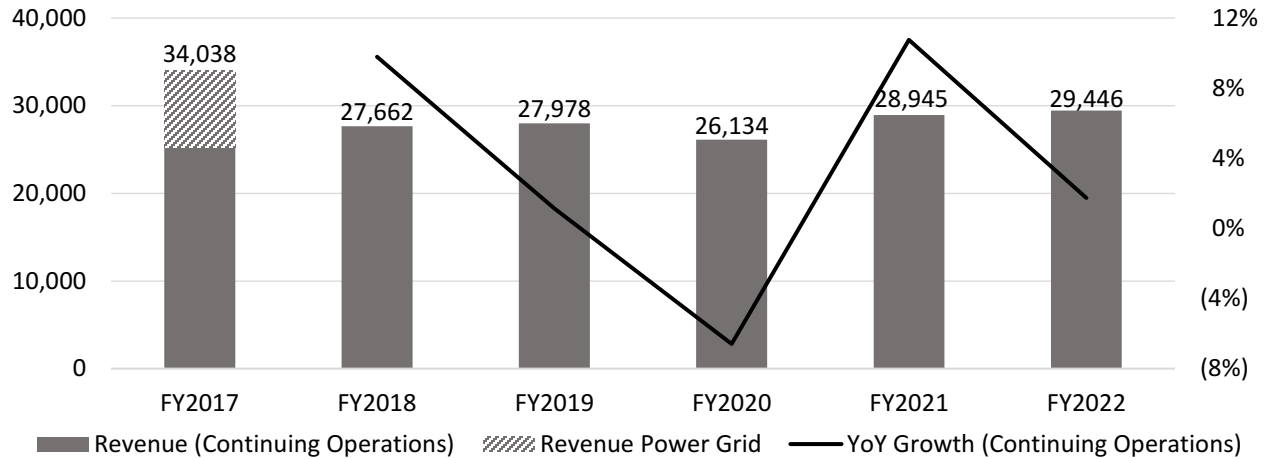
The Motion segment has a revenue share of 23%. It offers a range of electric motors, generators and variable-speed drives for frequency control of electric motors. It is comprised of the divisions Drive Products, System Drives, Service, Traction, IEC LV (low voltage) Motors, Large Motors and Generators and NEMA (standardized size) Motors. A wide range of sales markets are served with industrial and metal/mining companies making up the most relevant ones.

Process Automation is ABB's third largest business area providing PLCs, control systems, measurement and analysis technology with a contribution of 21% to the firm's total revenue. It is split into the divisions Energy Industries, Process Industries, Marine & Ports, Measurement & Analytics and the to be exited Turbocharging. There are two leading sales markets with a 22% share of revenue generation, the Mining, Metals, Pulp & Paper and the Marine & Ports, while other markets range significantly below 20%.

Lastly, Robotics & Discrete Automation, responsible for an 11% revenue share offering a combination of hard- and software solutions to cut human interference and increase efficiency. Current main markets are Automotive, Machine Automation itself and General Industry with traditional industrial applications.

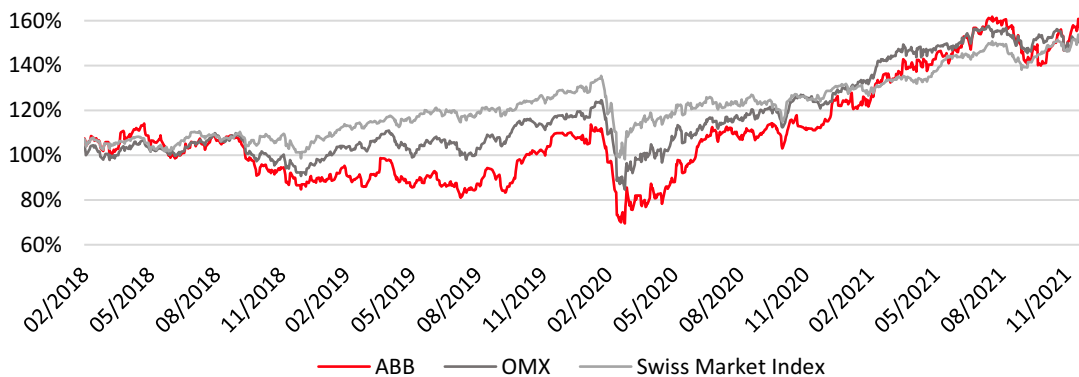
Geographically, there is a balanced mix of revenue generating regions with Europe accounting for 35%, AMEA for 33% and the Americas for 33% of revenues. As visible in figure 4-2, the US and China each generated the majority of revenues in their respective region making them important single markets.

Over the last five fiscal years ABB grew its revenues from continuing operations by 17% from FY2021 to FY2022 and at a CAGR of 3.2% since FY2017. A six-year financial history was chosen to have sufficient data for five years of growth figures for subsequent chapters. Even though there has been stable growth, Covid-19 impacted FY2020, ABB overall performs below the estimated market growth of the industrial automation market indicating potential for improvement. A further analysis of ABB's key financials is provided in 9-3.



4-4 ABB Historic Revenue Development (USD mm)

On 28 February 2023 ABB's market capitalization was USD 65.57 bn. The largest investor, Investor AB, holds 13.5% of ABB's voting rights followed by BlackRock with 5.0% and Cevian Capital with 3.3%. This presents ABB's shareholder base as fairly diversified. The ABB stock as shown in 4-5 strongly correlates with both the Swedish market index OMX Stockholm 30 and the Swiss Market Index. One possible reason for this to occur is the low number of constituents in both indices, another would be a strong dependency of ABB on overall market conditions. In terms of performance the stock had a period of underperformance starting Q4 2018, but was beating the two benchmarks starting Q3 2021. This development could be associated with the introduction of the business transformation and associated uncertainties which seem to disappear with the progressing implementation.



4-5 ABB Stock Price Development

## 4.2 Novanta

Novanta Inc. is a US-based producer of photonics, vision and precision motion technologies, which are mainly aimed at advanced industrial and medical OEM-customers. The firm was originally founded in 1968 in Massachusetts as General Scanning, Inc. After its foundation the firm was substance to comprehensive M&A activity, notably first merging in 1999 with Lumonics Inc. to form GSI Lumonics Inc. There were multiple additions and divestitures in the years after leading to a rebranding as GSI Group Inc. in 2005 to resemble the strategic shift from a firm focused on the semiconductor industry to today's offering. Since 2016, Novanta exists under its current brand.

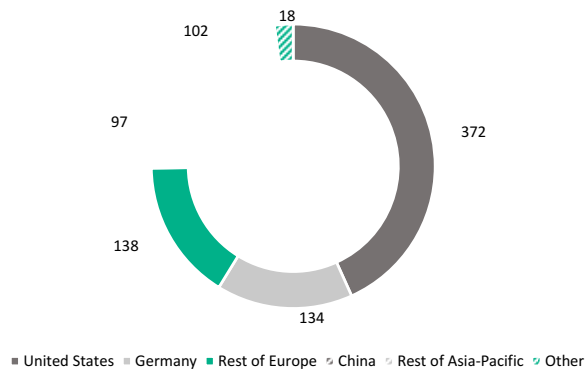
Novanta acquired ATI Industrial Automation at the end of August 2021 for a total of ca. USD 224 mm. The Schneider Electric Motion USA business, for a consideration of ca. USD 119 mm, was purchased in a simultaneous process. Both deals are aimed to strengthening Novanta's position in industrial automation to a great extent. Its acquisition strategy showed a shift from medical technology to laser technology and lastly to industrial automation firms.

The business is divided into three divisions, the Photonics, the Vision and the Precision Motion business, all of which with similar revenue contributions. The Photonics unit accounts for 32% of revenues and contributed a 34% share to the total gross profit alongside achieving a 47% gross profit margin, making it the second most cost-efficient division.

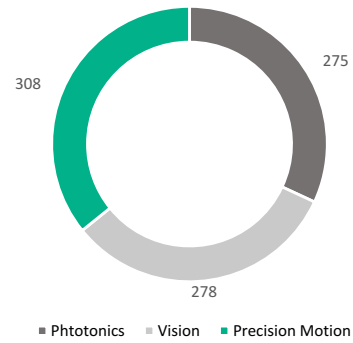
The Vision business is responsible for 32% of revenues, nevertheless it only accounts for ca. 28% of the total gross profits as well as the lowest gross profit margin at 40%.

Around 36% of revenues can be associated with the Precision Motion division, which yields the highest gross profit share of 38% and gross profit margin 47% respectively. This makes Precision Motion the leading division in cost-efficiency and absolute profitability.

The geographic footprint of sales at Novanta is majorly characterized by the US and Europe with 43% and 32% of FY2022 sales from each region respectively. The sales in Europe are dominated by Germany accounting for 16% of sales as a single market. A share of 22% was achieved in Asia, with China as the biggest market, making up 11% of the sales.

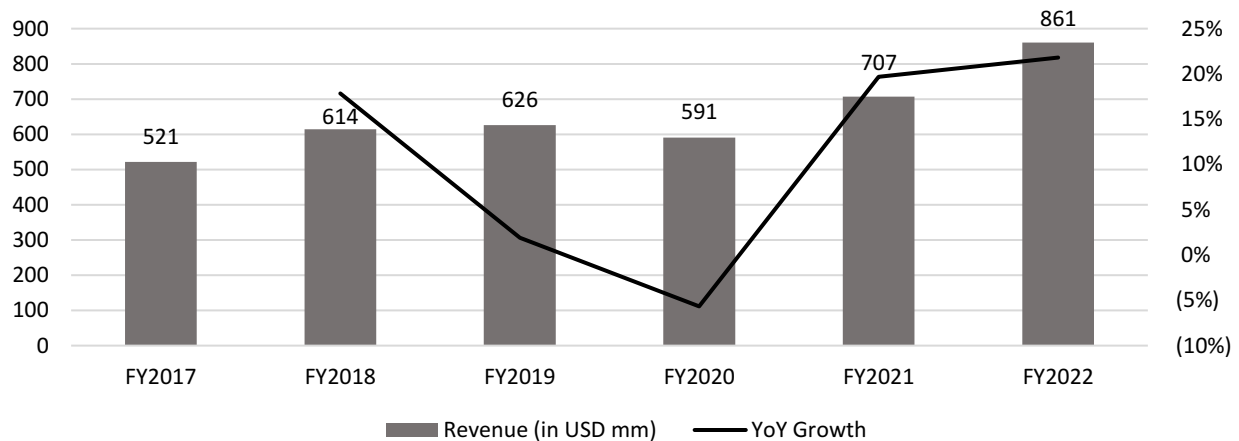


4-6 Novanta Revenues by Region



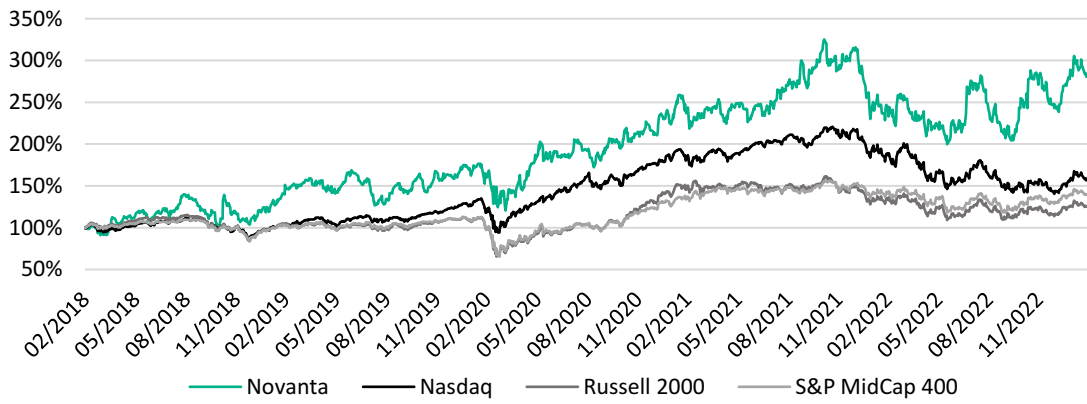
4-7 Novanta Revenues by Division

Overall, Novanta managed to grow its revenues by 65% between FY2017 and FY2022 resulting in a 11% CAGR. Revenues have been quite stable with all periods presenting growth except for Covid-outbreak-year FY2020 which shows decline of 6%. The year-on-year growth rate, however, was already decreasing over three consecutive periods priorly from a very high level of 36% in FY2017 down to 2% in FY2019. The immense growth in FY2017 is largely associated with inorganic growth, which added over USD 100 mm in annual revenue. A further analysis of ABB's key financials is provided in 9-4.



4-8 Novanta Historic Revenue Development (USD mm)

At 28 February 2023 Novanta's market capitalization was USD 5.6 bn. Novanta's stock has been outperforming its relevant indices constantly and substantially, creating a total price return of 284% over the last five years. At year's end 2021 the Novanta stock's cumulated return had outperformed the NASDAQ Composite by a difference of 126%, the Russell 2000 by 158% and the S&P MidCap 400 by 144% in return.



4-9 Novanta Stock Price Development

## 5 ABB Valuation

### 5.1 Financial Statements Projection

The forecasting is done on a total revenues level due to the unknown split of segment revenues between products as well as services and other. Also, segments are interwoven and address the same industries. The described forecast builds the base case for the revenue and expense drivers, complemented by an upside and a downside scenario presented in 9-5.

The revenues from both products as well as services and other are forecasted to grow at 100% in FY23E and 50% of the average of the historic rates since FY18A afterwards, excluding the unrepresentative Covid-19 outbreak year FY20A. The discount is employed due to the change in corporate strategy, with its main goal shifting from revenue growth to a focus on margin improvement. FY23E is expected by ABB to experience a catch-up effect from prior year's uncertainty due to the war in Ukraine and is therefore exempt from the discount. The resulting 4.4% growth is slightly below ABB's FY23E target of 5%.

The margin from product sales shows a steady improvement over historic periods. Accordingly, this trend was continued by applying a yearly step-up of 50 bp to prior period's margin from FY23E onwards. For services and other, the margin was steady in the past. The first projection was made by taking the average of the last six historic years excluding FY20A as the only outlier, and applying the same 50 bp step-up every year in addition. Despite lack of improvement in the past, this is deemed as appropriate due to said strategic change.

To continue past efforts made in optimizing the relative SG&A expenditure to revenue the FY22A ratio is used for the forecast, while adjusting SG&A for certain one-off items such as restructuring and past divestments beforehand. The R&D spending relative to revenue, however, is projected in straight line based on the historic average since FY17A. This is decided due to the stability of the relative R&D expenses and because there is no indication for cost saving or an increase in efforts by the management.

The sale of the power conversion unit in 2023 for USD 505 mm in cash was included in the model in a simplified way due to limited data availability. Based on a company statement USD 55 mm were recognized under other income as gain on the business sale, while USD 450 mm are assumed to be the book value of the division. This value is proportionally negatively included in the

forecasted inventories, PP&E and goodwill. The difference between the gain from sale and the purchase price was recognized under cash flow from investing.

The interest expense forecast builds on ABB's current cost of financing. The weighted average short-term debt interest rate in FY22A was 1.9% and the weighted average YTM of all outstanding bonds was 3.3% which is used as the long-term debt interest rate. To reflect the change in the interest environment caused by interest hikes since Q1 2022, both interest rates were increased by 100 bp in total over time. Debt facilities are only refinanced upon maturity therefore the full impact of increased financing costs is delayed. 25 bp were added in FY23E and FY24E respectively when approximately half of the volume matures. The remaining 50 bp were spread as 10 bp increases over five years from FY25E to FY29E. For consistency the same was done for interest income on cash, marketable securities and short-term investments.

The weighted-average effective global tax rate of ABB was largely stable in the past with a median of 23%. However, as ABB gives a specific guidance of an expected 25% global tax rate for FY23E, this rate is employed in the base scenario for all projection periods.

The second private placement for ABB's E-mobility business in February 2023 of 12% is used to value the whole unit at USD 2.8 bn. Further, the IPO of the E-mobility business is assumed to comprise a 20% stake, because ABB's stake reduced to 80% after the two private placements and management declared to retain a majority stake. This results in total proceeds for the unit of USD 892 mm in FY23E. 40% of the net assets were recorded as noncontrolling interest on the balance sheet. Also 40% of the attributed net income share of the E-mobility based on its revenue contribution to the whole group is recorded as net income attributable to noncontrolling interest in the income statement.

D&A and capital expenditure are forecasted via a separate PP&E schedule (see 9-11). The highly stable historic average capex in % of revenue of 2.6% was used to project capex. In FY23E mentioned impact of the power conversion sale was included. Depreciation for FY23E was forecasted based on FY22A's investment ratio, capex-to-depreciation, of 130%. From there on, a yearly step-down in that ratio of 3% was applied to comply with an assumed long-term capex-to-depreciation ratio of 100%. This avoids unlikely scenarios of either eternally growing PP&E or wearing it down to zero in the long term.

Working capital items and deferred taxes are expected to grow in line with revenue as they have in the past. Notably cash flows from investing includes the proceeds from the sale of the power conversion and parts of the E-mobility business.

Dividends for FY23E were included as proposed by ABB's management, since such propositions were historically clearly approved. Further, the dividend payout ratio is used for all following periods to forecast dividends reliant on each period's net income. The applied dividend payout ratio of 66% is also at the historic average for periods FY18A to FY22A. In FY22A and FY21A ABB cancelled treasury shares priorly repurchased for USD 3 bn in both years. This was part of a now completed program and there is no indication for further cancellations

ABB maintains an employee share program as part of the regular compensation (see 9-6). The value of repurchases for the delivery of those shares varied since FY17A, accordingly a mean repurchasing amount was employed going forward. The cash received by ABB in return is based on the mean ratio of cash received for stock deliveries to value of shares actually delivered to reflect the discounts offered to employees. The value of shares repurchased for the program and shares delivered are assumed to equal one another each period. Lastly, expected amortization was based on the historic mean amortization in percent of revenue.

The net change in cash is converted into 83% cash and equivalents and into 17% marketable securities and short-term investments. This corresponds to the relative size of the two liquidity components averaged over FY17A to FY22A excluding outlier year FY20A. The minimum cash balance is assumed to be 50% of FY22A.

While there was considerable cash spending on acquisitions in some historic periods, goodwill changes did neither correlate to those nor to net cash spent on acquisitions. Further, as the item was rather stable without a clear trend over historic periods, goodwill was projected in straight line from FY22A except for the pro rata deduction due to the power conversion business sale in FY23E.

The ABB debt schedule is comprised of two parts, STD facilities with maturities below 90 days to finance possible immediate liquidity needs over a short horizon and the LTD in form of bonds. The STD is drawn whenever the cash flow excluding STD financing is negative and would moreover tip ABB's total liquidity below an assumed minimum cash requirement, defined as the minimum value observed since FY17A. If the same cash flow is positive and causes liquidity to be at least

equal to the minimum cash requirement, any excess cash is used to repay possible STD amounts outstanding. LTD is assumed to remain constant in sum as there is no indication by management for a significant change in capital structure. The exact repayments anticipated by ABB are available and incorporated until FY27E. Beyond this date a yearly repayment based on the average repayments in FY23E until FY27E is included. A projection using bond maturities outstanding at the valuation date is not done, since bonds refinanced before FY28E may have varying maturities and will add to the maturing values defined at the valuation date each year.

## 5.2 Discounted Cash Flow Valuation

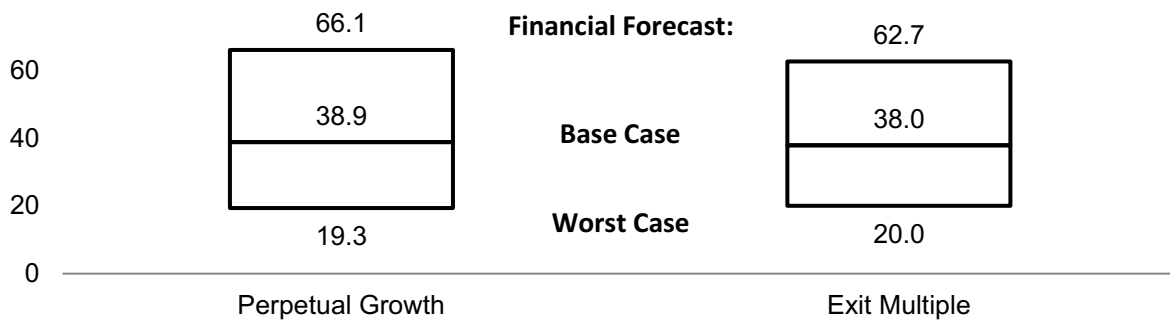
All necessary cash flow information was forecasted with the financial statements. The cost of equity is comprised of a 1.5% risk-free rate for which the mean of the 10-, 20- and 30-year US government bond yields are used. The US is chosen for currency consistency and its perceived risk-freeness. The beta factor is calculated with the daily returns of the S&P 500 index. The S&P 500 is the US market portfolio proxy suggested by Damodaran (2002) and Pearl and Rosenbaum (2013). No Swiss index was chosen because the weight of ABB in those small indices is quite high, meaning ABB substantially dictates the index movements which is distorting. The country risk premium for a Swiss company is zero. MRP estimates ranged from 5.6 (Statista) to 6.9% (Ibbotson and Harrington 2021), however 5.8% from KPMG was chosen in the base case, since it is the only estimate not only reliant on US market data to decrease a potential survivorship bias. The resulting cost of equity is 6.9%

The cost of debt is calculated as the weighted average target interest rate of all outstanding debt equaling 4.4%. This yields an after-tax cost of debt of 3.3%. After adding the dilutive impact of all outstanding stock options, using the treasury stock method, the weight of equity is 93% in the target capital structure, compared to a 7% weight of net debt. The net debt is used for consistency.

The WACC achieved is 6.6% and used in the base case. Additionally, WACC estimates are constructed via a median of the core peer group as well as a SOTP peer group ER discount rates. The ER peer group approach is further described in 5.3. Both peer groups yield WACC estimates of 7.7% meaning ER WACC's for similar companies.

Beyond the explicit forecasting period ending with FY32E, a terminal value with the perpetual growth approach and for comparison with an Exit multiple approach are calculated. The perpetual

growth method uses a 2.4% PGR in the base case from the SOTP peer group ER estimates over the 2.0% long-term inflation target defined by institutions such as Fed and ECB and the core peer group estimate of 2.5%. For the Exit multiple method again the SOTP peer ER multiple of 14.4x was selected, with ABB’s trading multiple at valuation date lying at 13.3x and the core peer ER multiple at 15.5x. The SOTP peer group yields the advantage of higher diversification of valuation data points. 9-21 present sensitivity tables for both terminal value approaches with the financial forecast’s the base case.



5-1 ABB DCF Valuation Football Field (USD)

5-1 visualizes the valuation ranges of the three cases based on the perpetual growth as well as the exit multiple approach. Further input changes for WACC, tax rate, PGR and exit multiple are depicted in 9-22. All resulting implicit share prices from the different input variants are shown in a combined football field in 9-23. The overall median valuation price per share is USD 38.0.

### 5.3 Trading Comparables Valuation

The trading comparables analysis is split into a valuation using a group of overall trading peers to ABB and a SOTP valuation with trading peers for each segment. The latter has overall a larger deviation in peer size. The SOTP conducted with regular trading comparables and complemented by a multiple valuation based on an ER consensus for comparison. Both sets of comparable firms were chosen by criteria such as similar size in terms of market capitalization, revenue, EBITDA levels, profitability and fit of comparable firms’ business segments. For the overall peers, a broad similarity of the products and services offering as well as industries addressed is necessary. Due to the vast product spectrum of ABB that is only matched by few firms already a close offering comparability in two out of four segments shall suffice this condition. This is since only very few firms will match the whole offering of a historically grown concern of this size. Any comparable companies with only one fitting segment are additionally included in the SOTP peer group. Further

the size requirements were lifted in order to achieve an appropriate number of comparables for each segment. Considering the high geographic diversification of the revenue generation, stemming in similar parts from Europe, the Americas and Asia, no geographic restriction was applied.

The overall core peer group of eleven firms is very close to ABB in terms of market capitalization, EV, revenues, EBITDA and net income. A deviation lies in the margin, where ABB lacks behind the median and mean by 5 pp. This is explained by ABB's struggle to optimize profitability in the recent past and was also addressed as an issue by its management.

<i>values in USD mm</i>	Last Twelve Months (LTM)						
	Market capitalization (mm)	Enterprise value (EV)	Revenues	EBITDA	EBITDA-Margin	EBIT	Net Income
<b>ABB</b>	<b>65,571</b>	<b>69,887</b>	<b>29,466</b>	<b>4,246</b>	<b>14%</b>	<b>3,432</b>	<b>2,637</b>
Top-Quartile	104,209	115,991	35,569	7,137	21%	5,794	3,528
Bottom-Quartile	28,365	22,933	7,033	1,729	15%	1,451	956
<b>Median</b>	<b>47,260</b>	<b>60,927</b>	<b>20,752</b>	<b>3,953</b>	<b>19%</b>	<b>3,031</b>	<b>2,462</b>
<b>Mean</b>	<b>62,081</b>	<b>67,099</b>	<b>29,102</b>	<b>4,900</b>	<b>19%</b>	<b>3,595</b>	<b>2,332</b>

*5-2 Core Peer Group Benchmarking*

The SOTP peer group consists of 36 companies compared to which ABB is, as expected, belongs to the top-quartile by all measures except EBTDA-margin. While the bottom-quartile lies significantly below ABB, the mean retains similarity while lying substantially below ABB. The peer group is deemed appropriate in size since the mean and median profitability measures are reasonably close to ABB, with a margin range of 11-15% covering ABB's operating profitability of 14%. Meanwhile market capitalization and EV are still well above USD 10 bn.

<i>values in USD mm</i>	Last Twelve Months (LTM)						
	Market capitalization (mm)	Enterprise value (EV)	Revenues	EBITDA	EBITDA-Margin	EBIT	Net Income
<b>ABB</b>	<b>65,571</b>	<b>69,887</b>	<b>29,466</b>	<b>4,246</b>	<b>14%</b>	<b>3,432</b>	<b>2,637</b>
Top-Quartile	33,973	35,568	25,386	3,364	21%	2,006	1,540
Bottom-Quartile	6,129	6,189	3,821	590	10%	446	259
<b>Median</b>	<b>14,633</b>	<b>14,827</b>	<b>5,931</b>	<b>1,395</b>	<b>15%</b>	<b>914</b>	<b>818</b>
<b>Mean</b>	<b>33,852</b>	<b>37,002</b>	<b>16,849</b>	<b>2,724</b>	<b>11%</b>	<b>1,968</b>	<b>1,404</b>

*Number of Comparables Available*

36

*5-3 SOTP Peer Group Benchmarking*

After examining and approving the peer groups, the trading multiples are calculated. Backwards-looking LTM multiples are supplemented by NTM forward-looking values. To calculate the NTM multiples, Refinitiv Eikon revenue and profit estimates are used. The ER consensus only utilizes NTM data due to availability of valuation multiples. These are constructed by calculating the median of the most current valuation multiples from available broker reports for each peer. Notably, this includes an EV/EBITA multiple, which was not feasible to calculate for the other multiple classes due to a lack of distinction in the peers' D&A reporting.

For the core peers a valuation premium over ABB is found. The ER consensus multiples present a more heterogenous picture with EBITA, EBIT and PE multiples set below ABB's. Also, the NTM ER consensus multiples are consistently below the calculated NTM peer multiples.

Multiple Basis	Last Twelve Months			
	Revenue	EBITDA	EBIT	EPS
ABB	2.4x	16.5x	20.4x	24.9x
<b>Median</b>	<b>3.1x</b>	<b>18.1x</b>	<b>21.5x</b>	<b>28.3x</b>
Premium over ABB	29%	10%	5%	14%
<b>Mean</b>	<b>3.0x</b>	<b>15.0x</b>	<b>19.3x</b>	<b>33.0x</b>
<b>Top-Quartile</b>	<b>3.8x</b>	<b>19.0x</b>	<b>24.5x</b>	<b>32.6x</b>
<b>Bottom-Quartile</b>	<b>1.7x</b>	<b>12.1x</b>	<b>15.6x</b>	<b>24.0x</b>

Multiple Basis	Next Twelve Months				Next Twelve Months - ER Consensus				
	Revenue	EBITDA	EBIT	EPS	Revenue	EBITDA	EBITA	EBIT	EPS
ABB	2.3x	13.3x	16.5x	22.1x	2.3x	13.3x	16.6x	16.5x	22.1x
<b>Median</b>	<b>3.4x</b>	<b>15.7x</b>	<b>19.8x</b>	<b>22.2x</b>	<b>2.6x</b>	<b>15.5x</b>	<b>13.9x</b>	<b>14.7x</b>	<b>20.0x</b>
Premium over ABB	50%	18%	20%	1%	14%	17%	(16%)	(11%)	(10%)
<b>Mean</b>	<b>3.0x</b>	<b>14.5x</b>	<b>18.1x</b>	<b>24.1x</b>	<b>2.6x</b>	<b>14.3x</b>	<b>13.9x</b>	<b>15.1x</b>	<b>19.9x</b>
<b>Top-Quartile</b>	<b>3.9x</b>	<b>17.4x</b>	<b>21.9x</b>	<b>26.3x</b>	<b>2.6x</b>	<b>16.8x</b>	<b>14.3x</b>	<b>16.5x</b>	<b>21.9x</b>
<b>Bottom-Quartile</b>	<b>1.7x</b>	<b>13.8x</b>	<b>16.7x</b>	<b>20.8x</b>	<b>2.6x</b>	<b>11.8x</b>	<b>13.4x</b>	<b>13.3x</b>	<b>17.1x</b>

Number of Comparables Available

1 10 2 4 11

#### 5-4 Core Peer Group Trading Multiples

The SOTP multiples fluctuate in all three multiple classes around the multiples of ABB. Premiums only go as high as 12% (LTM EV/Revenue) compared to a maximum of 50% in the core peer multiples (NTM EV/Revenue). The number of comparables available for the ER consensus is substantially higher in the SOTP peer group. Nevertheless, the ER consensus EV/Revenue multiple is excluded from the valuation due insufficient data inputs as before in the core peer valuation.

Multiple Basis	Last Twelve Months			
	Revenue	EBITDA	EBIT	EPS
ABB	2.5x	17.4x	21.7x	25.3x
<b>Median</b>	<b>2.6x</b>	<b>13.9x</b>	<b>19.6x</b>	<b>24.6x</b>
Premium over ABB	7%	(20%)	(10%)	(3%)
<b>Mean</b>	<b>2.8x</b>	<b>13.9x</b>	<b>18.6x</b>	<b>25.6x</b>
<b>Top-Quartile</b>	<b>4.0x</b>	<b>18.1x</b>	<b>23.2x</b>	<b>31.6x</b>
<b>Bottom-Quartile</b>	<b>1.5x</b>	<b>10.5x</b>	<b>14.8x</b>	<b>13.1x</b>

Multiple Basis	Next Twelve Months				Next Twelve Months - ER Consensus				
	Revenue	EBITDA	EBIT	PE	Revenues	EBITDA	EV / EBITA	EV / EBIT	PE
ABB	2.3x	13.3x	16.5x	22.1x	2.3x	13.3x	16.6x	16.5x	22.1x
<b>Median</b>	<b>2.1x</b>	<b>14.0x</b>	<b>17.7x</b>	<b>22.2x</b>	<b>2.3x</b>	<b>14.4x</b>	<b>13.6x</b>	<b>14.5x</b>	<b>19.9x</b>
Premium over ABB	(6%)	6%	7%	1%	3%	8%	(18%)	(12%)	(10%)
<b>Mean</b>	<b>2.6x</b>	<b>13.0x</b>	<b>16.6x</b>	<b>22.0x</b>	<b>2.3x</b>	<b>13.5x</b>	<b>14.8x</b>	<b>14.7x</b>	<b>19.9x</b>
<b>Top-Quartile</b>	<b>3.9x</b>	<b>16.5x</b>	<b>20.9x</b>	<b>24.9x</b>	<b>2.3x</b>	<b>15.8x</b>	<b>15.5x</b>	<b>15.5x</b>	<b>22.1x</b>
<b>Bottom-Quartile</b>	<b>1.4x</b>	<b>10.1x</b>	<b>13.8x</b>	<b>16.5x</b>	<b>2.3x</b>	<b>10.5x</b>	<b>13.4x</b>	<b>13.8x</b>	<b>17.5x</b>

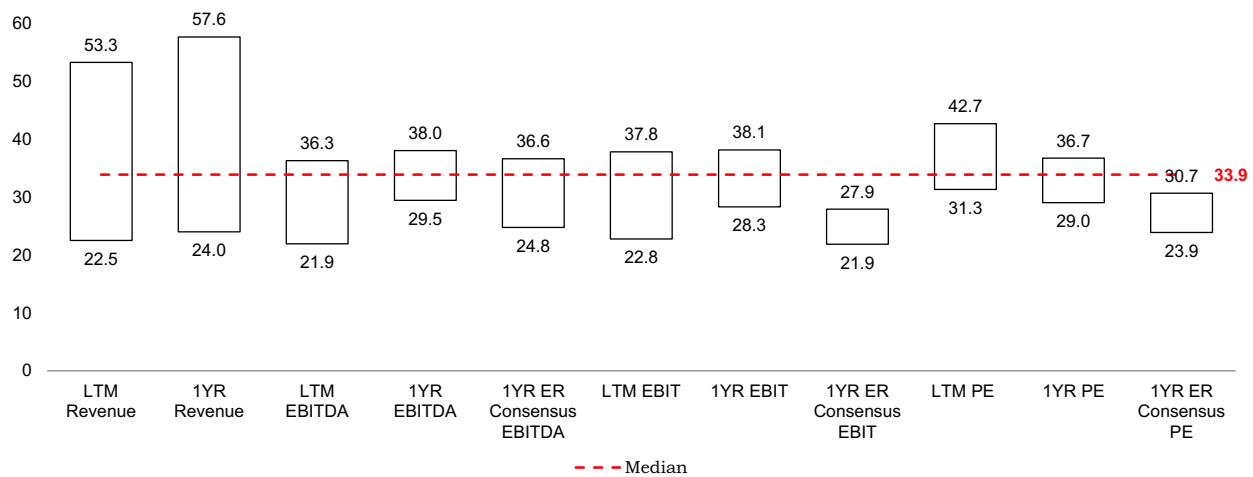
Number of Comparables Available

2 19 5 7 26

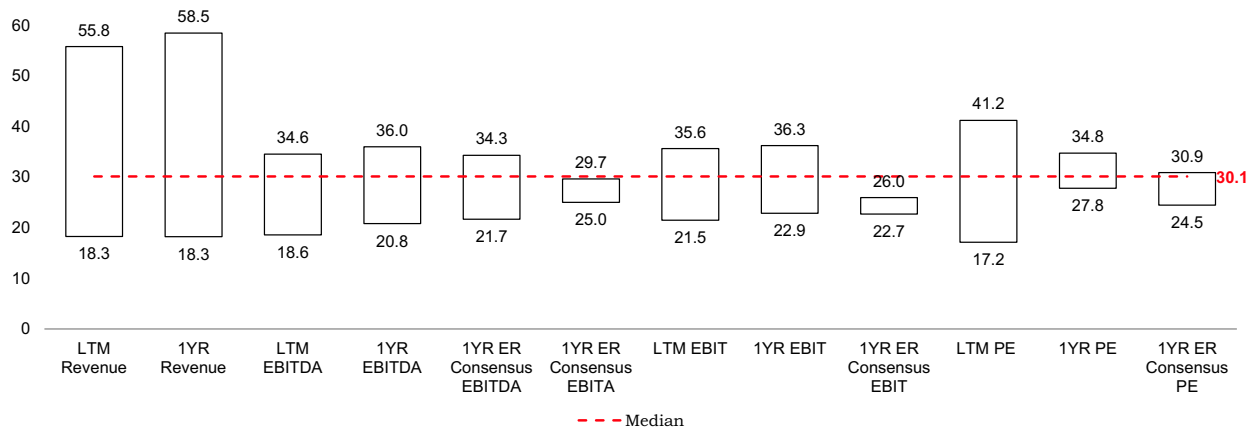
#### 5-5 SOTP Peer Group Trading Multiples

The multiples are then applied to either ABB's last fiscal year's actuals in case of the LTM multiple valuation or to the forecasted FY23 revenue and profit estimates. NTM EV/Revenue and NTM ER consensus EV/EBITA are excluded due to a lack of available comparables within the core peer group.

To find the implicit value range of ABB, the median, top- and bottom-quartile multiples are applied to the respective LTM and forecasted NTM revenue and profitability measures. The valuation ranges implied by the trading multiple approach for core peers and SOTP are presented in 5-6 and 5-7 on a per share basis. The revenue multiples result in the widest valuation range, likely because deviations of a few turns have a greater absolute effect on the EV due to ABB's high revenue compared to smaller growth firms. In direct comparison the core peers give a slightly higher valuation with a median of USD 34 compared to USD 30.



5-6 Core Peers Trading Comparables Football Field (USD per Share)



5-7 SOTP Trading Comparables Football Field (USD per Share)

## 5.4 Precedent Transactions Valuation

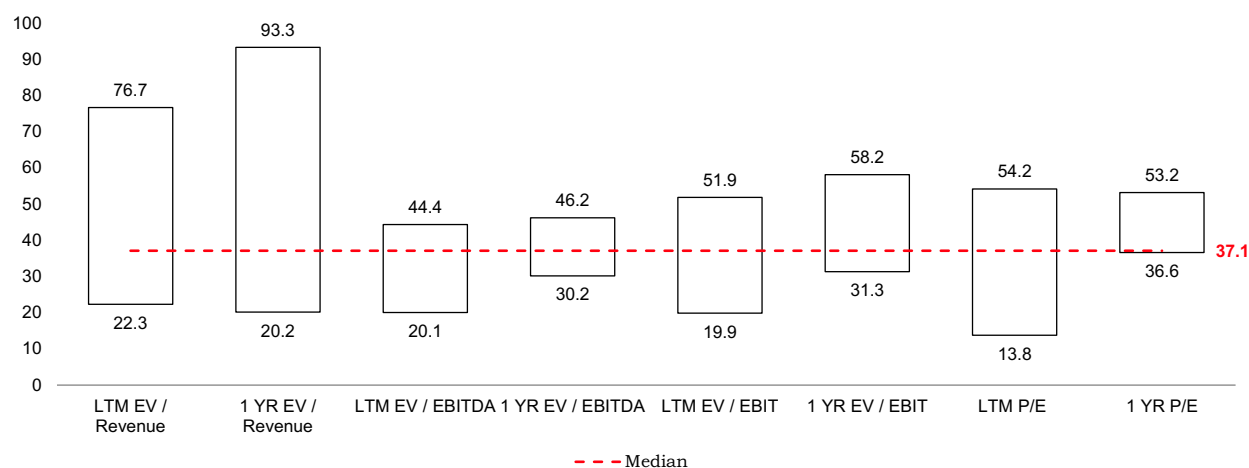
The first step in the precedent transactions analysis should be to set the search parameters for relevant past deals that have occurred with targeted companies which are again comparable to ABB. Mergermarket was selected as database due to the broad availability of filtering tools and deal data. Naturally, the target companies are expected to deviate from the priorly established peer group as it consisted largely of companies with tens of billions of USD in equity value. However, transactions of such size are rare, which demands for a deal value threshold substantially below ABB's market capitalization. A minimum value of USD 1 bn was therefore chosen. Again, no geographic restrictions were imposed. The operational relevancy of a target's is secured by defining a set of subsectors in which ABB is active. Using subsectors over sectors allows for a higher precision. Target companies are required to operate in at least one of the following subsectors available in Mergermarket: "Industrial measurement and sensing equipment", "Numeric and computerized control of machine tools", "Process control equipment", "Robotics" (sector: "Industrial automation") as well as "Batteries and Power supplies" and "Electrical components" ("Industrial: Electronics"). Only deals with reported target EVs are considered. The timeframe was set to the past 10 years aiming to create a sufficiently large dataset without ignoring changes in M&A, e.g. compared to using 20 years including pre-financial crisis deals with different market with differing market dynamics.

The resulting dataset consists of 64 deals which were refined to 26 relevant deals after a one-by-one examination of all targets' products and services offering. The Process Automation segment is addressed by the largest number of 13 target companies, followed by Electrification with eight, Robotics & Discrete Automation with five and lastly Motion which was only addressed by one target firm. The lack of precedents for latter segments prevents a sum-of-the-parts approach from being representative. The largest deal captured was the merger of electrification company Johnson Controls valued at an EV of USD 16.2 bn and video surveillance provider Tyco International. There was only one additional deal with a target valued at above USD 10 bn in the dataset and no further deals of such size occurred when extending the timeframe back until year 1993. Consequently, target revenues lack behind ABB with a median of only USD 1.2 bn. Therefore, comparability of the dataset's size to ABB is a weakness of this valuation. The median operational profitability in contrast is equal to ABB measured by the EBITDA-margin of 14%.

Multiple Basis	Last Twelve Months				Next Twelve Months			
	Revenue	EBITDA	EBIT	EPS	Revenue	EBITDA	EBIT	EPS
<b>ABB</b>	<b>2.4x</b>	<b>16.5x</b>	<b>20.4x</b>	<b>24.9x</b>	<b>2.3x</b>	<b>13.3x</b>	<b>16.5x</b>	<b>22.1x</b>
<b>Median</b>	<b>3.3x</b>	<b>18.1x</b>	<b>23.1x</b>	<b>25.2x</b>	<b>2.6x</b>	<b>16.9x</b>	<b>25.5x</b>	<b>34.7x</b>
<i>Premium over ABB</i>	<i>37%</i>	<i>10%</i>	<i>13%</i>	<i>2%</i>	<i>14%</i>	<i>27%</i>	<i>54%</i>	<i>57%</i>
<b>Mean</b>	<b>5.2x</b>	<b>17.9x</b>	<b>23.2x</b>	<b>26.1x</b>	<b>4.8x</b>	<b>18.6x</b>	<b>27.2x</b>	<b>33.4x</b>
<b>Top-Quartile</b>	5.4x	22.8x	32.9x	41.4x	6.2x	20.8x	32.4x	38.1x
<b>Bottom-Quartile</b>	1.7x	11.2x	13.8x	10.5x	1.5x	14.1x	18.3x	26.2x

5-8 ABB Precedent Transaction Multiples

The NTM, as well as LTM data were calculated. Notably, the implicit control premium included in the precedent transaction multiples compared to ABB’s trading multiples is larger when looking at the median NTM profit multiples. The implied share prices for ABB’s revenue and profit data are shown as ranges in 5-9. The revenue multiples show the highest absolute valuation and price range as in the trading multiples valuation. The median implicit share price lies at USD 37.



5-9 ABB Precedent Transactions Football Field (USD per Share)

## 5.5 Valuation Summary

The average across the valuation methods is presented in 5-10, together with the bridge to equity and the breakdown to the implicit price per share, which is 14% above the market price at 28 February 2023.

<b>Standalone Valuation</b>	<b>ABB</b>
Enterprise value	80,102
Net equity bridge	(6,757)
Equity value	73,345
<i>Market Capitalization</i>	<i>65,571</i>
Shares outstanding	1,984
<b>Equity value per share</b>	<b>36.96</b>
Share price	32.37

In USD, except shares outstanding.

In mm, except share price.

*5-10 ABB Standalone Valuation*

## 6 Novanta Valuation

### 6.1 Financial Statements Projection

The revenue of Novanta is generally forecasted, in the base case, using the average historic growth rate excluding FY20A. Due to a general economic slowdown management expect a short-term negative impact on sales. This is reflected by slowing the growth rate to 40% of the historic average rate in FY23E and to 70% of the same in FY24E.

The gross margin is expected to be further improved by 2% in FY23E above FY22A, continuing the efficiency efforts of the last two historic periods. Spending for SG&A is likewise forecasted to be improved downwards by 2%. Both are kept steady in following periods. In contrast the relative R&D expenses had risen in the past, partly due to acquisitions, but slightly decreased again since FY20A. As no, possibly R&D intensive, acquisitions are planned, efficiency measures are forecasted to reduce R&D expenses by 50bp in FY23E and FY24E from the historic average and to stay steady afterwards.

Novanta faces a weighted average interest rate of 5.1% on its debt at year's end FY22A. No fixed rate instruments are outstanding, therefore past prime rate changes are already fully reflected. Beyond that, 25bp increases of the average weighted interest rate are employed in FY23E and FY24E respectively.

Globally, the effective tax rate Novanta faces was 13.2% on average since FY17A. This effective rate is employed as tax rate in the base case forecast. The statutory rate in Canada, country of its legal headquarter, is 29% and would be the maximum tax rate applicable.

The PP&E forecast utilizes the PP&E growth rate of historic years excluding extraordinarily low spending year FY20A of 13.4% and projects PP&E to grow in straight line at this rate. Capex and depreciation are kept at their historical average ratio of capex equaling 93.9% of depreciation each year. Overall, PP&E is growing as asset acquisitions are a consistent part of Novanta's strategy and are continued into the forecast.

Working capital items are forecasted to grow at the same rate as revenues. Novanta's debt is projected to be refinanced upon maturity in case of its term-loans, while RCF levels are kept stable as no further outside capital is needed to fund its cash positive operations. The minimum cash balance is zero, leaving only excess cash, due to the flexibility of the RCF. Further, management does not plan to pay dividends or cancel shares.

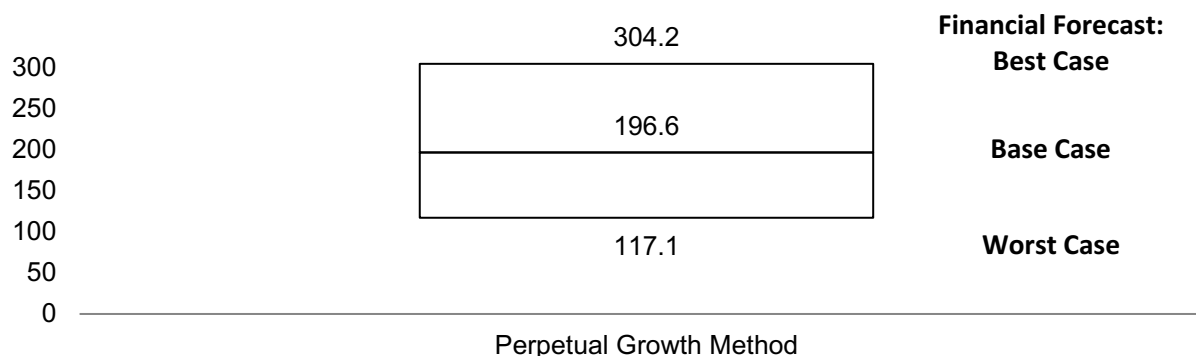
Operating cash flows include share-based compensation add-backs, forecasted to grow at the weighted average growth rate of cost of sales, SG&A and R&D expenses. In the investing cash flows, acquisitions are forecasted to continue at the historic average, excluding FY17A and FY21A due to extraordinary M&A activity. Stock purchases are forecasted in straight line from the historic average in the financing activity.

## 6.2 Discounted Cash Flow Valuation

The first risk-free rate consists of a blend of the 10, 20 and 30 years US treasury yield. Regarding the MRP, the same premiums as in 5.2 are applied, with 5.8% in the base case. The country risk premium for a US company is zero. For the beta calculation, the S&P 500 daily returns of ten years was used, yielding a factor of 1.1. This results in a base case cost of equity of 8.0%. Cost of debt is assumed to be the weighted average target interest rate of Novanta's debt of 5.6%. A 4.8% after tax cost of debt is achieved in the base case using the same 15% tax rate as in 6.1. The cost of equity is weighted with 94.4% compared to 5.6% for the cost of debt in the target capital structure, totaling in a WACC of 7.8%.

Differing from 5.2 the terminal value is solely calculated via perpetual growth method. Applying an exit multiple does not appear to yield an informative result as comparability of peers seems to be low. A PGR of 3.1%, the US GDP growth rate, is chosen in the base case over the long-term target inflation rate to reflect the growth potential of the market and within. 6-1 shows the valuation range for all three financial forecast cases with USD 196 in the base case. All varying inputs for

the DCF are presented jointly in 9-41 with the corresponding valuation ranges in 9-42 and their median implied share price of USD 181.



6-1 Novanata DCF Valuation Football Field (USD per Share)

### 6.3 Trading Comparables Valuation

Due to the more homogenous offering of Novanta, compared to the rather independent divisions of ABB, solely an overall peer group was created. Again, the firms with an overall closely comparable offering and similar size as well as profitability measures globally are selected.

This process yields a group of 14 comparable traded companies. Even though several there are many firms with a comparable offering which do not suffice the size requirement for being too small, only one firm, Keyence, was discarded for being too large. Novanta ranks slightly above mean/median market capitalization and EV compared to its peers. When LTM revenue and profit measures are compared, Novanta actually is allocated below the mean/median of the peer group.

values in USD mm	Market capitalization (mm)	Enterprise value (EV)	Last Twelve Months (LTM)				
			Revenues	EBITDA	EBITDA-Margin	EBIT	Net Income
<b>Novanta</b>	<b>5,608</b>	<b>5,943</b>	<b>861</b>	<b>156</b>	<b>18%</b>	<b>103</b>	<b>74</b>
Top-Quartile	6,302	7,013	2,240	446	30%	288	261
Bottom-Quartile	2,414	2,962	1,103	286	15%	116	83
<b>Median</b>	<b>4,456</b>	<b>4,424</b>	<b>1,630</b>	<b>302</b>	<b>20%</b>	<b>254</b>	<b>230</b>
<b>Mean</b>	<b>5,005</b>	<b>5,384</b>	<b>1,753</b>	<b>395</b>	<b>24%</b>	<b>279</b>	<b>218</b>

6-2 Novanta Peer Group Benchmarking

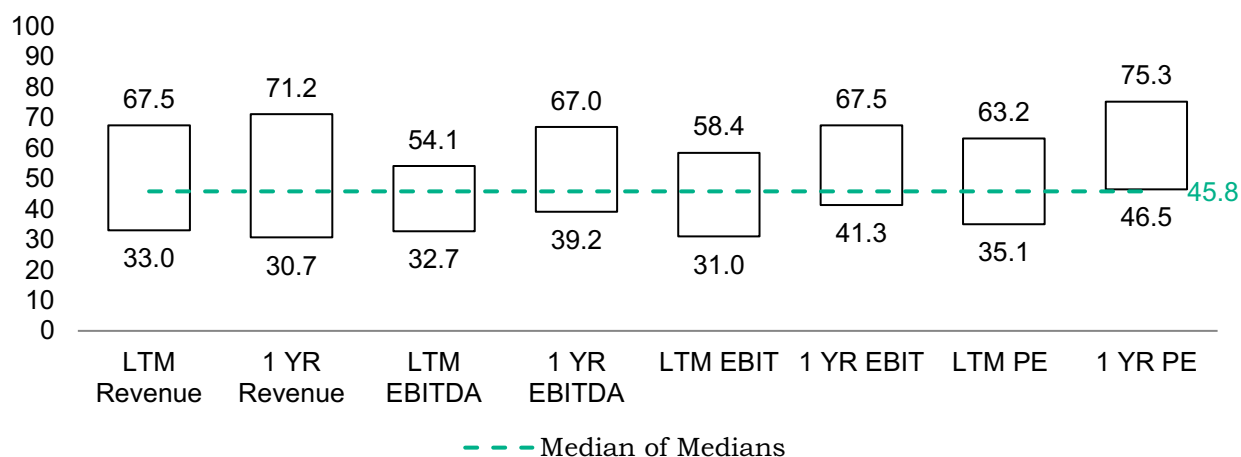
Following, the multiples for all peer group companies are calculated on a LTM and NTM basis, again using Refinitiv Eikon revenue and profit estimates. 6-3 shows a summary of the peer group multiples in comparison to Novanta. Compared to each of Novanta's multiples the peer group

median multiples present an enormous 57 to 73% discount. Even when looking at the top-quartile values for each multiple, Novanta is still valued substantially higher in relative terms of revenue and profits generated.

Multiple Basis	Last Twelve Months				Next Twelve Months			
	Revenue	EBITDA	EBIT	PE	Revenue	EBITDA	EBIT	PE
Novanta	6.9x	45.9x	57.6x	75.7x	6.6x	29.3x	36.7x	50.1x
<b>Median</b>	<b>2.3x</b>	<b>12.5x</b>	<b>16.5x</b>	<b>21.3x</b>	<b>2.2x</b>	<b>12.3x</b>	<b>15.7x</b>	<b>19.5x</b>
<i>Discount from Novanta</i>	<i>(67%)</i>	<i>(73%)</i>	<i>(71%)</i>	<i>(72%)</i>	<i>(67%)</i>	<i>(58%)</i>	<i>(57%)</i>	<i>(61%)</i>
<b>Mean</b>	<b>2.9x</b>	<b>13.2x</b>	<b>19.8x</b>	<b>29.8x</b>	<b>2.8x</b>	<b>13.2x</b>	<b>16.9x</b>	<b>21.4x</b>
<b>Top-Quartile</b>	3.2x	14.6x	23.6x	30.7x	3.2x	13.8x	18.5x	24.9x
<b>Bottom-Quartile</b>	1.8x	9.7x	14.1x	17.0x	1.6x	8.8x	12.2x	15.4x

### 6-3 Novanta Peer Group Trading Multiples

In the next step the top- and bottom-multiples are applied to Novanta’s LTM actual and NTM forecasted revenue and profit figures to span the valuation range for each multiple as well as the median implicit price. As expectable, the resulting valuation range lies massively below Novanata’s share price at the valuation date of USD 157. Two reasons may be the cause: Either Novanta is vastly overvalued by its current investors or Novanta is unique, in possession of an advantage over the comparable companies it competes with.



6-4 Trading Comparables Football Field (USD per Share)

## 6.4 Precedent Transactions Valuation

The sectors target companies are required to operate in are at least one of the following: “Industrial measurement and sensing equipment”, “Machine vision systems”, “Numeric and computerized control of machine tools”, “Process control equipment” (sector: “Industrial automation”),

“Analytical and scientific instrumentation” and “Electrical components” (sector: “Industrial: Electronics”). The timeframe is again set to the last ten years. Further, companies shall have an EV of at least USD 500mm, to ensure similarity in size.

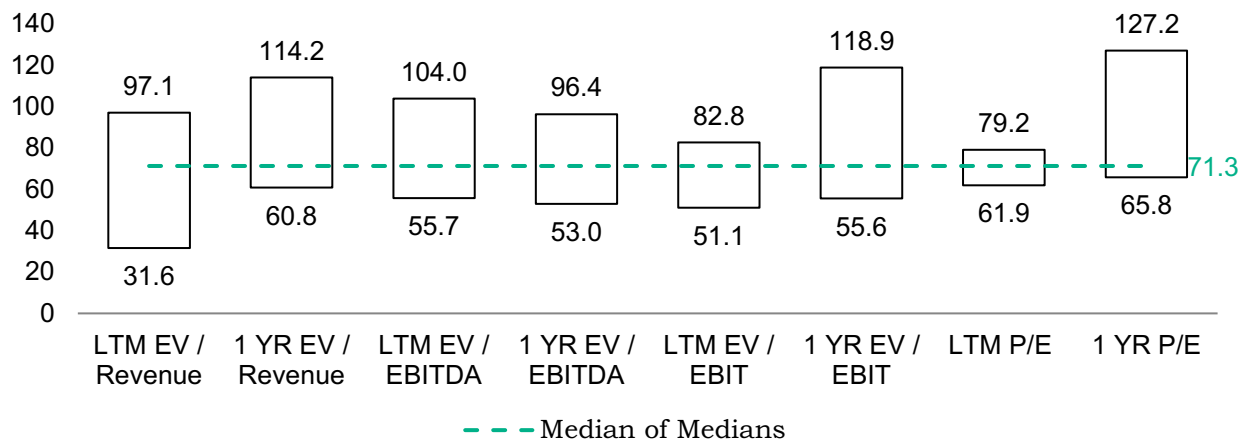
Through these filters, a total number of 110 potential precedent transactions was obtained. However, after a one-by-one examination of the target companies’ offering only 11 companies with comparable offerings in photonics, precision motion and vision for OEM customers. No transaction is discarded for being too large as all of them are below USD 5 bn in EV.

The precedent transactions multiple overview in 6-5 shows yet again Novanta’s multiples to be far above the precedent transactions group’s top-quartile. As expected, the gap is smaller compared to the trading comparables with a discount range of 36 to 59% compared to Novanta’s trading multiples due to the control premium included in the precedent transactions.

Multiple Basis	Next Twelve Months				Last Twelve Months			
	Revenue	EBITDA	EBIT	PE	Revenue	EBITDA	EBIT	PE
<b>Novanta</b>	<b>6.6x</b>	<b>29.3x</b>	<b>36.7x</b>	<b>50.1x</b>	<b>6.9x</b>	<b>45.9x</b>	<b>57.6x</b>	<b>75.7x</b>
<b>Median</b>	<b>3.0x</b>	<b>12.1x</b>	<b>23.4x</b>	<b>31.1x</b>	<b>3.5x</b>	<b>20.2x</b>	<b>27.0x</b>	<b>32.7x</b>
<i>Discount from Novanta</i>	<i>(54%)</i>	<i>(59%)</i>	<i>(36%)</i>	<i>(38%)</i>	<i>(49%)</i>	<i>(56%)</i>	<i>(53%)</i>	<i>(57%)</i>
<b>Average</b>	<b>3.8x</b>	<b>15.4x</b>	<b>23.2x</b>	<b>32.8x</b>	<b>3.5x</b>	<b>20.8x</b>	<b>26.2x</b>	<b>34.7x</b>
<b>Top-Quartile</b>	4.9x	19.1x	30.9x	42.1x	4.4x	26.1x	32.1x	38.4x
<b>Bottom-Quartile</b>	2.8x	11.3x	15.7x	21.8x	1.7x	15.0x	21.1x	30.1x

6-5 Novanta Precedent Transactions Multiples

These multiples are applied to Novanta’s LTM and NTM revenue and profit measures to receive the valuation range in 6-6. With a median implicit share price of USD 101 across all calculated top-quartile prices and a median of all multiples’ median implicit prices of USD 71, the question of actual comparability of the target companies and Novanta has to be raised.



6-6 Novanta Precedent Transactions Football Field (USD per Share)

## 6.5 Valuation Summary

Contrary to the valuation of ABB, solely the valuation result via DCF with perpetual growth method was deemed meaningful. As there are no truly comparable companies to Novanta, the relative approach should not be used.

Standalone Valuation	Novanta
Enterprise value	7,395
Net equity bridge	(335)
Equity value	7,059
<i>Market Capitalization</i>	<i>5,608</i>
Shares outstanding	36
<b>Equity value per share</b>	<b>196.59</b>
Share price	156.91

In USD, except shares outstanding.

In mm, except share price.

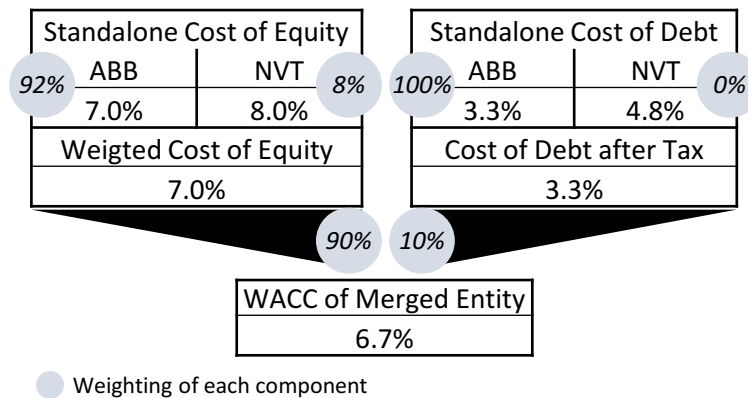
6-7 Valuation Summary for Novanta

The equity bridge consists of gross debt and cash-like items. The results show an equity value slightly below the market capitalization. An equity value per share of 25% above the actual share price at the valuation date is implied as appropriate.

## 7 Merged Entity

### 7.1 General Deal Assumptions

The cost of equity of both separate firms is weighted by their market capitalization following Damodaran (2005). The cost of debt in contrast is assumed from ABB, since the acquiror by itself presents further debt capacity, strong cash flows for debt repayment and Novanta’s additional debt of USD 435 mm is comparably low. The resulting WACC is depicted in 7-1:



7-1 WACC of Merged Entity

### 7.2 Valuing Synergies

There are two supercategories for synergies: financial and operating synergies (Damodaran 2005). A three-step approach is proposed by Damodaran (2005) to value operating synergies. For the purpose of singling out the value of synergies only the DCF method is used, because a relative valuation would not fully reflect all future cash flow effects. The aim is to isolate the effect of the synergies on the firm value, comparing the merged entity DCF value to the sum of the standalone DCF values to quantify the effect of each, in line with Chapman (2023) and Damodaran (2005). Due to their uncertainty, financial synergies are not assumed for this transaction. Further, only the perpetual growth approach is deemed suitable as the set of similar companies of the acquiror may change after the transaction.

The first valuation step will be:

1. “...value the firms involved in the merger independently”

This step was performed in previous chapters. Afterwards the second step is performed:

2. *“estimate the value of the combined firm, with no synergy, by adding the values obtained for each firm”*

Summarized in 7-2, this value for the combined firm is the simple sum of the standalone DCF valuations using the perpetual growth method.

<b>DCF Enterprise Value</b>	<b>ABB</b>	<b>Novanta</b>
Standalone	82,722	7,395
<b>EV Merged Entity excl. Synergies</b>	90,116	

*7-2 Merged Entity Simple Sum Valuation (USD mm)*

The last step then isolates the value of the operating synergies and is executed in chapter 7.3:

3. *“revalue the combined firm with synergy. The difference between the value of the combined firm with synergy and [...] without synergy provides a value for synergy”*

### 7.3 Valuation of Operating Synergies

The revenues of the combined entity are assumed to grow by an additional 4.8% of the target’s revenues upon merger, based on the median announced synergy in M&A deals (Kaserer et al. 2013). This rate is confirmed by Deloitte’s (2022) study which found the most frequently achieved range of revenue synergies to be 1-5%. The resulting revenue growth is only fully expected to be achieved during the second year after the merger. Only half of it is included in the first year equaling USD 21 mm, to reflect that new revenue opportunities, such as enhanced products or possibilities for cross-selling are exploited gradually. This is as product adjustments or introductions need development time while capturing cross-selling opportunities requires education of customers.

Cost synergies are assumed to be 50% of Novanta’s SG&A cost. COGS are not expected to be influenced by the acquisition, as well as R&D costs which should not be reduced as they are the key driver of the revenue growth. Much of Novanta’s organizational functions in contrast should face redundancy after integration into ABB. The cost synergies are expected to materialize swiftly within the first year and make up 0.3% of the combined entity’s costs. This compares to the bottom 27% group of announced deal cost synergies in Deloitte’s (2022) study. The value of the combined entity is elevated by USD 3.4 bn through synergies.

EV Merged Entity incl. Operating Synergies	93,548
EV Merged Entity excl. Synergies	(90,116)
Value of Operating Synergies	3,432

7-3 Merged Entity Value of Operating Synergies (USD mm)

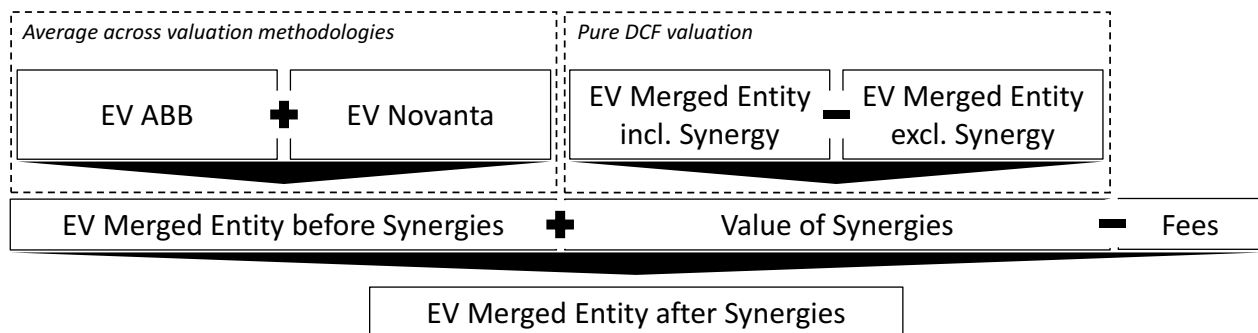
## 7.4 Valuation of the Merged Entity Including Synergies

The multiple steps of valuation can now be combined to determine the value of the merged entity using prior results. To value the firm as a whole the average EV of both firms across the valuation methodologies shall be summed in a first step:

Enterprise Value	ABB	Novanta
DCF	81,856	7,395
Trading Comparables	74,011	n.m.
Precedent Transactions	84,438	n.m.
<b>Average</b>	<b>80,102</b>	<b>7,395</b>
<b>Sum excl. Synergies</b>	<b>87,496</b>	

7-4 Simple Sum Merged Entity Value

The value of synergies is added and fees related to the transaction deducted to reach the overall EV of the entity after all merger effects. The fees consist of a flat 1.5% transaction fee of the purchase price along with integration costs of 5% of Novanta’s revenues divided over three years. These costs, such as consulting fees, are mainly required to realize estimated synergies and negatively impact the combined entity’s cash flows (Kaske and Salsberg 2023).



7-5 Overview of Merged Entity Valuation Steps

Finally, the bridge to equity can be built, consisting of both separate firm’s debt, the additional debt for the transaction and noncontrolling interest. After the acquisition, the shares of Novanta’s equity are deleted, leaving the merged entity with ABB’s number of shares outstanding prior to the deal.

Dividing the value of equity by the number of shares provides the implied value per share of USD 38.50 for ABB post-merger, 19% above its share price of USD 32.37 at valuation date. This process is summarized in 7-6:

<b>Merged Entity Valuation</b>	
<b>Sum excl. Synergies</b>	<b>87,496</b>
Operating Synergies	3,432
Fees	(334)
Equity Bridge	(14,206)
<b>Equity value</b>	<b>76,388</b>
Shares outstanding	1,984
<b>Equity value per share</b>	<b>38.50</b>

*7-6 Combined Entity Implied Value per Share*

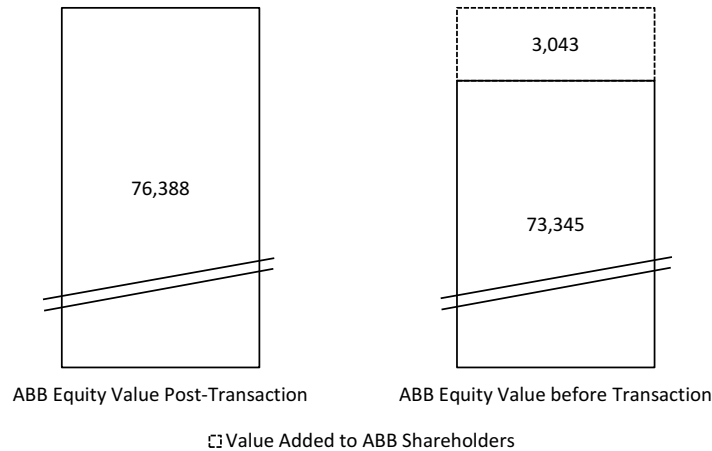
## 7.5 Deal Structure

The deal is assumed to be realized as a transaction paid in cash instead of ABB shares considering they are deemed as undervalued. Lastly, the deal shall be structured as purchase of stock for USD 220.21 per share, to avoid a potential double taxation via corporate and capital gains tax for the seller's shareholders in an asset deal in order to increase the likelihood of their approval to the deal (DePamphilis 2018).

ABB is expected to be able to raise additional debt at its current average interest rate. Based on the average purchase price premium paid in 2022, the purchase price is assumed to surpass the pre-transaction market capitalization by 41% (Loeb 2022). This translates into a proposed purchase price of USD 7.9 bn or USD 220.21 on a per share basis. The minimum cash balance for the combined entity is assumed to be 50% of the sum of the merging firms' cash balances to maintain a minimum level of liquidity. This frees USD 2.2 bn to be used for the purchase price payment, while the remaining USD 5.7 bn are paid through additional debt. The instrument shall be a Baa rated bond with Moody's Seasoned Baa Corporate Bond Yield of 5.8% as interest rate (YCharts 2023). The synthetic rating was achieved based on Moody's rating for a 7.3x interest coverage ratio post-financing (Bodie et al. 2018).

## 8 Conclusion

The potential value added by the transaction is presented in 8-1. The value for ABB's shareholders is determined by the difference between the value of the firm's equity pre- and post-acquisition. A total of USD 3.0 bn is added to their economic position, which is the difference between the post-acquisition equity value in 7-6 and the standalone ABB equity valuation in 5-10. The corresponding equity bridge is shown in 9-61. Novanta's equity value beyond market capitalization as well as expected synergies provide additional value to ABB's shareholders. The value, however, is shared as some of it is transferred, via the purchase price premium paid, to Novanta's shareholders, while the remainder improves the equity value of ABB's shareholders. This, importantly, gives incentive for the deal to both sides.



8-1 ABB Equity Value Post-Transaction (USD mm)

The aim of this paper is to evaluate whether or not an acquisition of Novanta by ABB would be advantageous. It was examined by using financial forecasting alongside relative and intrinsic valuation techniques applied to the standalone companies and the hypothetical joint entity. This proposed transaction provides strategic opportunity to create synergetic value at an acquisition price of USD 220.21 per share.

In reality this price may vastly differ and ultimately decide if the transaction is adding value for the acquiror. ABB is in a rare position of widespread transformation for a multibillion Dollar company, while Novanta offers additional competency in high technology niche components for the vertical integration in ABB's industrial automation portfolio together with an entrance opportunity into the

medical device industry. This proposed transaction appears attractive from a financial and strategic point of view. An actual transaction, nevertheless, would need to tailor in the positions of ABB's as well as Novanta's shareholders, ABB's current debt investors, the likelihood of regulatory approval and the reaction from both firms' customers, suppliers and competitors in order to make an informed decision on whether or not the acquisition of Novanta by ABB should be pursued.

## 9 Appendix

### Appendix Section 1: Industry Analysis

#### Industrial Automation Industry – Porter’s Five Forces

##### **Buyer Power**

In general, similar offering for standard robotics and automation applications. Switching costs are high in case whole systems need to communicate with each other and compatibility is needed.

Switching costs may be significant. Any new systems by a new manufacturer would need to be integrated into existing infrastructures and employees would need to be trained on them as well. Margins of manufacturing type buyer firms are on average tight causing vulnerability to switching costs and mitigating their bargaining power.

The threat of a backward integration is unlikely, customers are in producing industries where only from time to time the manufacturing process will need technical upgrades making in-house solutions inefficient. In sum, the **buyer power is low**.

##### **Supplier Power**

Metals, plastics, electrical equipment and performance materials are usually readily available with little switching costs, even though prices have been volatile since the start of the global pandemic in 2020. Semiconductors were also largely affected, with the difference of them being supplied by substantially lower number of entities with much higher negotiation power, due to a swift consolidation of the industry, which is only contradicted by upcoming, state induced rise of Chinese suppliers. Forward integration may be an option for large pre-part suppliers, however, this would be highly capital intensive and risky. Overall, this makes the **suppliers’ negotiation power low**.

##### **Threat of New Entrants**

Existing players largely build on existing know-how from a number of different fields such as (electrical) engineering, computer science and photonics, which entering firms have to acquire beforehand in order to innovate. Even with the prerequisite know-how massive R&D often along with M&A investments are necessary.

Sheer complexity is another issue as large deals can only be served by larger firms with matching capacities. Additionally, there exists a broad body of regulation, certification, patent and licensing requirements which needs to be complied with making the market entry a lengthy process.

Lastly, reliability of products is not easily verifiable because functionality needs to be proven over a long period of time, therefore reputation of the firms is very important, hindering the entry for new firms. In total this results in a **low threat of new entrants**.

### **Availability of Substitutes**

No real substitutes, only the option not to automate and have steps or at least the interconnection of deals be done by manual workers. Only different solutions of automation, but not replacing industrial automation products altogether as long as the respective manufacturing process exists. Accordingly, the **availability of substitutes is low**.

### **Industry Competition**

Competitive advantage can come from product functionality, integratedness of products into systems as well as surrounding services. Multiple large and smaller players are trying to cover all new areas that are developing with high investments into R&D and inorganic growth alike. There is also no indication for the need for innovativeness to plateau in the foreseeable future. The differentiation of products offered is generally high. Therefore, the **industry competition is assessed to be high**.

## *9-1 Industrial Automation Industry - Porter's Five Forces*

### **Medical Device Industry – Porter's Five Forces**

#### **Buyer Power**

The purchasers in the medical device market can be separated into an intramural market consisting of hospitals, nursing homes or psychiatric institutions as buyers. Outside of large medical facilities, the extramural market is comprised of general practitioners, specialist doctor practices and the homecare market where the patient is likewise the purchaser. Private and public hospitals represent the largest buyer group, followed by general practitioners and practices of specialist doctors (CBI).

There is a high medium to high differentiation of products in the industry decreasing the buyer bargaining power. Switching costs vary substantially depending on the products depending of the complexity and interconnectedness of parts of or multiple products. Price sensitivity is higher for simple, cheaper devices and will be lower for complex, costly systems as they are expected to pay off over a longer period of time with significant yields. A large initial investment, however, is expected. The power of buyers overall can be characterized as **medium**.

### **Supplier Power**

Suppliers to medical device manufacturers are deliver raw materials and pre-products. Switching of suppliers may be hampered by manufacturing requirements for suppliers from the relevant regulatory authorities such as the FDA in the US or the EMA in the EU. Regardless, access to a large global pool of suppliers for most pre-products is keeping the bargaining power low for suppliers, even though they might have greater power for some particularly complex pre-products. **The overall supplier power is low.**

### **Threat of New Entrants**

As the main product is not actually the physical device but the intellectual property for the increasingly complex devices and considering the ongoing technological evolution in the industry, entry barriers appear progressively smaller. Highly specialized research teams can find solutions and create prototype level niche-products without massive capital investments beforehand. Once the competitive edge becomes apparent funding is a lesser issue with medical technology venture capital investments growing to record levels (Cairns 2021). Additionally, with technological advances creating new product opportunities, the competition will initially be lower in the niches which eases the entry for new firms and resulting in a **high threat of new entrants** overall.

### **Availability of Substitutes**

The number of substitutes available largely depends on the technological advantage over the competition by any product. With increasing complexity substitutability decreases regardless whether a firm offers whole devices or parts. Due to the diversity of medical applications and products involved in most cases buyers will face very few options to choose from. **The overall availability of substitutes is low.**

### **Industry Competition**

To give a general idea, there are over 34,000 medical technology companies in Europe alone, with 95% of them being small and medium sized companies (SMEs) (The European Medical Technology Industry in Figures 2022). Considering that, as stated priorly, the key players in the industry account for less than 40% of the revenue, it results in a high competition between all firms. There may be substantial switching costs for buyers as they profit from established relationships with the companies, often times through discounts on subsequent purchases. On the other hand, there are many products with low differentiation, where firms compete directly against each other. Overall, this results in a **medium to high** competition.

*9-2 Medical Device Industry - Porter's Five Forces*

## Appendix Section 2: Company Analysis

### ABB – Key Financials Analysis

For comparability, the key financials are provided excluding the power grid business. The revenues have been growing for four out of five years, excluding FY2020, when the EBITDA-margin still declined by only 2.5%. FY2021 resembles an outlying catch-up-year with a margin of above 20%, but normalizing in FY2022. Overall, the net NWC varied moderately, leaving the working capital at a steady level. Similarly, the capex was locked in at 2.6 to 3.0% of sales indicating a clear policy. The ability to generate cash is measured by the pro forma NOCF to reflect the unavailability of most maintenance. This cash flow drops even before the first Covid-19 impacted year with its low points in FY2020 and the Ukraine crisis affected FY2022. Even more interesting is the ratio of NOCF to EBITDA, the cash flow after capex, representing the degree to which the EBITDA, in form of actual additional cash, can be utilized at the firm's will. Here, a gradual decline from 126% in FY2017 to 34% in FY2022 is acknowledgeable, indicating a decreasing ability to convert the EBITDA into cash. Dividends to shareholders as well as cash levels are overall stable. The financial debt similarly stable with a low leverage, which was reduced since FY2019 through USD 1.3bn of debt eliminations. The ratio of equity over total assets over the historic periods was healthy and ranged between 29 and 39%.

		FY17A	FY18A	FY19A	FY20A	FY21A	FY22A
<b>Income Statement</b>	Revenue	25,196	27,662	27,978	26,134	28,945	29,446
	<i>Growth in %</i>	6.5%	9.8%	1.1%	-6.6%	10.8%	1.7%
	EBITDA	3,066	3,142	2,899	2,508	6,611	4,151
	<i>Margin in %</i>	12.2%	11.4%	10.4%	9.6%	22.8%	14.1%
	EBIT	2,230	2,226	1,938	1,593	5,718	3,337
	<i>Margin in %</i>	8.9%	8.0%	6.9%	6.1%	19.8%	11.3%
	Net Income	2,213	2,173	1,439	5,146	4,546	2,475
	<i>in % of Sales</i>	8.8%	7.9%	5.1%	19.7%	15.7%	8.4%
<b>Cash Flow</b>	Δ in NWC	n.a.	(1,830)	(35)	239	(189)	1,138
	Capex	752	772	762	694	820	762
	<i>in % of Sales</i>	3.0%	2.8%	2.7%	2.7%	2.8%	2.6%
	NOCF	3,864	2,958	2,550	1,735	3,715	1,412
	<i>NOCF/EBITDA</i>	126.0%	94.1%	88.0%	69.2%	56.2%	34.0%
	Dividends	1,635	1,717	1,675	1,736	1,726	1,698
<b>Balance Sheet</b>	Cash & Equivalents	5,628	4,157	4,074	5,386	5,329	4,881
	Financial Debt	7,447	8,618	9,059	6,121	5,561	7,678
	Net Debt	1,819	4,461	4,985	735	232	2,797
	<i>Financial Leverage</i>	0.6x	1.4x	1.7x	0.3x	0.0x	0.7x
	<i>Equity/Total Assets</i>	34.3%	31.4%	29.3%	38.2%	38.7%	32.6%

*NOCF = Cash Flow from Operations - Capex + Interest Expense + Taxes*

### 9-3 ABB – Key Financials Analysis

## Novanta – Key Financials Analysis

Novanta's key financials show revenues growing at a double-digit rate in three out of five periods. The EBITDA-margins were quite stable in a range of 15 to 18%. The EBIT-margin had an underperforming phase below 10% from FY 2019 to FY2021, but improved again in FY2022 to 12%. Net income followed the same pattern reaching its six-period high in FY2022 of USD 74 mm.

In terms of working capital, NWC investments correlate somewhat with revenue growth, meaning revenue increases do not necessarily have proportionate NWC investments as a prerequisite. Capital expenditures grew in absolute and relative terms (in % of revenue) indicating either a state of growth, where management still sees positive net present value investments available or the need to mitigate growing depreciations of the asset base over time. The NOCF to EBITDA ratio appears

volatile ranging from just below 64 to 149%. This deviation mainly originates from increases or reductions in working capital, where in Covid-19 breakout period FY20 cash was generated from accounts receivable and inventories for the first and only time over six periods, instead of being invested. Novanta has neither paid nor anticipates to pay any dividends, however repurchases shares in varying amounts with FY2021 marking the only exception without any capital distributions.

		FY17A	FY18A	FY19A	FY20A	FY21A	FY22A
<b>Income Statement</b>	Revenue	521	614	626	591	707	861
	<i>Growth in %</i>	35.5%	17.8%	1.9%	(5.7%)	19.7%	21.8%
	EBITDA	88	108	94	94	107	156
	<i>Margin in %</i>	16.9%	17.6%	14.9%	15.9%	15.2%	18.1%
	EBIT	58	71	55	56	64	103
	<i>Margin in %</i>	11.0%	11.6%	8.8%	9.5%	9.1%	12.0%
	Net Income	62	51	41	45	50	74
	<i>in % of Sales</i>	12.0%	8.3%	6.5%	7.5%	7.1%	8.6%
<b>Cash Flow</b>	Δ in NWC	n.a.	1	24	(37)	52	57
	Capex	9	15	11	11	29	20
	<i>in % of Sales</i>	1.7%	2.4%	1.7%	1.8%	4.1%	2.3%
	NOCF	75	95	66	140	79	100
	<i>NOCF/EBITDA</i>	85.2%	87.9%	70.5%	148.8%	73.6%	63.9%
	Cash Distributions	0	6	10	6	-	10
<b>Balance Sheet</b>	Cash	100	82	79	125	117	100
	Financial Debt	235	230	231	231	231	230
	Net Debt	135	148	152	106	113	130
	<i>Financial Leverage</i>	1.5x	1.4x	1.6x	1.1x	1.1x	0.8x
	<i>Equity/Total Assets</i>	42.9%	51.2%	48.0%	55.1%	42.5%	46.5%

NOCF = Cash Flow from Operations - Capex + Interest Expense + Taxes

#### 9-4 Novanta – Key Financials Analysis

## Appendix Section 3: Valuation

SCENARIO ANALYSIS	Delta	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Sales of products growth</b>											
Best case	2.5%	8.8%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%
Base case	n.m.	6.3%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%
Weak case	(2.5%)	3.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
<b>Sales of services and other growth</b>											
Best case	2.5%	6.3%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%
Base case	n.m.	3.8%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
Weak case	(2.5%)	1.3%	(0.6%)	(0.6%)	(0.6%)	(0.6%)	(0.6%)	(0.6%)	(0.6%)	(0.6%)	(0.6%)
<b>Gross profit margin of products</b>											
Best case	2.0%	32.5%	33.0%	33.5%	34.0%	34.5%	35.0%	35.5%	36.0%	36.5%	37.0%
Base case	n.m.	30.5%	31.0%	31.5%	32.0%	32.5%	33.0%	33.5%	34.0%	34.5%	35.0%
Weak case	(2.0%)	28.5%	29.0%	29.5%	30.0%	30.5%	31.0%	31.5%	32.0%	32.5%	33.0%
<b>Gross profit margin of services and other</b>											
Best case	1.0%	42.7%	43.2%	43.7%	44.2%	44.7%	45.2%	45.7%	46.2%	46.7%	47.2%
Base case	n.m.	40.7%	41.2%	41.7%	42.2%	42.7%	43.2%	43.7%	44.2%	44.7%	45.2%
Weak case	(1.0%)	38.7%	39.2%	39.7%	40.2%	40.7%	41.2%	41.7%	42.2%	42.7%	43.2%
<b>SG&amp;A % of sales</b>											
Best case	(2.0%)	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%
Base case	n.m.	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%	16.3%
Weak case	2.0%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%
<b>R&amp;D % of sales</b>											
Best case	(1.0%)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Base case	n.m.	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Weak case	1.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

9-5 ABB Financial Forecast Drivers in Different Cases

<i>in USD mm</i>	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	
Repurchases for Employee Share Program	259	249	-	331	997	563	
Share delivery for Employee Share Program	220	79	36	448	1022	563	
Cash received for delivery of shares	163	42	10	412	812	394	Mean
<i>in % of share delivery</i>	74%	53%	28%	92%	79%	70%	66%

9-6 ABB Employee Share Program

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Sales of products	20,438	22,366	22,554	21,214	23,745	24,471	26,016	26,838	27,686	28,560	29,462	30,392	31,352	32,342	33,363	34,416
Sales of services and other	4,758	5,296	5,424	4,920	5,200	4,975	5,163	5,260	5,359	5,460	5,563	5,668	5,775	5,884	5,995	6,108
<b>Total revenues</b>	<b>25,196</b>	<b>27,662</b>	<b>27,978</b>	<b>26,134</b>	<b>28,945</b>	<b>29,446</b>	<b>31,179</b>	<b>32,098</b>	<b>33,045</b>	<b>34,020</b>	<b>35,025</b>	<b>36,060</b>	<b>37,127</b>	<b>38,226</b>	<b>39,358</b>	<b>40,525</b>
Cost of sales of products	(14,485)	(15,961)	(15,811)	(15,229)	(16,364)	(16,804)	(18,077)	(18,514)	(18,960)	(19,416)	(19,882)	(20,510)	(21,158)	(21,826)	(22,515)	(23,226)
Cost of services and other	(2,865)	(3,157)	(3,261)	(3,027)	(3,114)	(2,932)	(3,059)	(3,090)	(3,122)	(3,154)	(3,185)	(3,245)	(3,306)	(3,369)	(3,432)	(3,497)
<b>Total cost of sales</b>	<b>(17,350)</b>	<b>(19,118)</b>	<b>(19,072)</b>	<b>(18,256)</b>	<b>(19,478)</b>	<b>(19,736)</b>	<b>(21,137)</b>	<b>(21,605)</b>	<b>(22,082)</b>	<b>(22,570)</b>	<b>(23,067)</b>	<b>(23,755)</b>	<b>(24,464)</b>	<b>(25,194)</b>	<b>(25,947)</b>	<b>(26,723)</b>
<b>Gross profit</b>	<b>7,846</b>	<b>8,544</b>	<b>8,906</b>	<b>7,878</b>	<b>9,467</b>	<b>9,710</b>	<b>10,043</b>	<b>10,494</b>	<b>10,962</b>	<b>11,450</b>	<b>11,958</b>	<b>12,305</b>	<b>12,663</b>	<b>13,031</b>	<b>13,411</b>	<b>13,802</b>
SG&A	(4,765)	(5,295)	(5,447)	(4,895)	(5,162)	(5,132)	(5,081)	(5,231)	(5,386)	(5,544)	(5,708)	(5,877)	(6,051)	(6,230)	(6,414)	(6,605)
Non-order related research and development expenses	(1,013)	(1,147)	(1,198)	(1,127)	(1,219)	(1,166)	(1,247)	(1,284)	(1,322)	(1,361)	(1,401)	(1,442)	(1,485)	(1,529)	(1,574)	(1,621)
Impairment of goodwill	-	-	-	(311)	-	-	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	162	124	(323)	48	2,632	(75)	55	-	-	-	-	-	-	-	-	-
<b>Income from operations</b>	<b>2,230</b>	<b>2,226</b>	<b>1,938</b>	<b>1,593</b>	<b>5,718</b>	<b>3,337</b>	<b>3,769</b>	<b>3,978</b>	<b>4,255</b>	<b>4,545</b>	<b>4,848</b>	<b>4,986</b>	<b>5,127</b>	<b>5,272</b>	<b>5,422</b>	<b>5,576</b>
Interest and dividend income	73	72	67	51	51	72	80	80	80	80	80	80	80	80	80	80
Interest and other finance expense	(234)	(262)	(215)	(240)	(148)	(130)	(242)	(248)	(254)	(255)	(261)	(267)	(273)	(273)	(273)	(273)
Losses from extinguishment of debt	-	-	-	(162)	-	-	-	-	-	-	-	-	-	-	-	-
Non-operational pension (cost) credit	33	83	72	(401)	166	115	94	94	94	94	94	94	94	94	94	94
<b>Income from continuing operations before taxes</b>	<b>2,102</b>	<b>2,119</b>	<b>1,862</b>	<b>841</b>	<b>5,787</b>	<b>3,394</b>	<b>3,700</b>	<b>3,904</b>	<b>4,175</b>	<b>4,464</b>	<b>4,761</b>	<b>4,892</b>	<b>5,027</b>	<b>5,172</b>	<b>5,322</b>	<b>5,476</b>
Income tax expense	(583)	(544)	(772)	(496)	(1,057)	(757)	(925)	(976)	(1,044)	(1,116)	(1,190)	(1,223)	(1,257)	(1,293)	(1,331)	(1,369)
<b>Income from continuing operations, net of tax</b>	<b>1,519</b>	<b>1,575</b>	<b>1,090</b>	<b>345</b>	<b>4,730</b>	<b>2,637</b>	<b>2,775</b>	<b>2,928</b>	<b>3,131</b>	<b>3,348</b>	<b>3,571</b>	<b>3,669</b>	<b>3,770</b>	<b>3,879</b>	<b>3,992</b>	<b>4,107</b>
Income (loss) from discontinued operations, net of tax	846	723	438	4,860	(80)	(43)	-	-	-	-	-	-	-	-	-	-
<b>Net income</b>	<b>2,365</b>	<b>2,298</b>	<b>1,528</b>	<b>5,205</b>	<b>4,650</b>	<b>2,594</b>	<b>2,775</b>	<b>2,928</b>	<b>3,131</b>	<b>3,348</b>	<b>3,571</b>	<b>3,669</b>	<b>3,770</b>	<b>3,879</b>	<b>3,992</b>	<b>4,107</b>
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(152)	(125)	(89)	(59)	(104)	(119)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)
<b>Net income attributable to ABB</b>	<b>2,213</b>	<b>2,173</b>	<b>1,439</b>	<b>5,146</b>	<b>4,546</b>	<b>2,475</b>	<b>2,646</b>	<b>2,799</b>	<b>3,002</b>	<b>3,219</b>	<b>3,442</b>	<b>3,540</b>	<b>3,642</b>	<b>3,751</b>	<b>3,863</b>	<b>3,978</b>

9-7 ABB Income Statement

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Assets</b>																
<b>Current assets</b>																
Cash and cash equivalents	4,526	3,445	3,508	3,278	4,159	4,156	4,538	5,093	5,713	6,401	7,141	7,898	8,690	9,517	10,384	11,292
Restricted cash	-	-	36	323	30	18	-	-	-	-	-	-	-	-	-	-
Marketable securities and short-term investments	1,102	712	566	2,108	1,170	725	806	923	1,055	1,201	1,357	1,518	1,686	1,861	2,044	2,237
Accounts receivable	10,416	6,386	6,434	6,820	6,551	6,858	7,262	7,476	7,696	7,923	8,157	8,398	8,647	8,903	9,167	9,438
Contract assets	-	1,082	1,025	985	990	954	1,010	1,040	1,071	1,102	1,135	1,168	1,203	1,238	1,275	1,313
Inventories	5,059	4,284	4,184	4,469	4,880	6,028	6,323	6,463	6,606	6,752	6,901	7,106	7,319	7,537	7,762	7,994
Prepaid expenses	189	176	191	201	206	230	246	252	257	263	269	277	285	294	302	311
Other current assets	647	616	674	760	573	505	535	550	567	583	601	618	637	656	675	695
Current assets held for sale and in discontinued operation:	-	5,164	9,840	282	136	96	-	-	-	-	-	-	-	-	-	-
<b>Total current assets</b>	<b>21,939</b>	<b>21,865</b>	<b>26,458</b>	<b>19,226</b>	<b>18,695</b>	<b>19,570</b>	<b>20,720</b>	<b>21,797</b>	<b>22,964</b>	<b>24,226</b>	<b>25,561</b>	<b>26,984</b>	<b>28,466</b>	<b>30,005</b>	<b>31,609</b>	<b>33,280</b>
<b>Non-current assets</b>																
Restricted cash, non-current	-	-	-	300	300	-	-	-	-	-	-	-	-	-	-	-
Property, plant and equipment	5,363	4,133	3,972	4,174	4,045	3,911	4,010	4,186	4,351	4,503	4,641	4,763	4,867	4,950	5,009	5,042
Operating lease right-of-use assets	-	-	994	969	895	841	890	917	944	972	1,000	1,030	1,060	1,092	1,124	1,157
Goodwill	11,199	10,764	10,825	10,850	10,482	10,511	10,280	10,280	10,280	10,280	10,280	10,280	10,280	10,280	10,280	10,280
Other intangible assets	2,622	2,607	2,252	2,078	1,561	1,406	1,724	1,998	2,271	2,548	2,852	2,991	3,138	3,301	3,476	3,666
Prepaid pension and other employee benefits	144	83	133	360	892	916	733	550	366	183	-	-	-	-	-	-
Investments in equity-accounted companies	158	87	33	1,784	1,670	130	130	130	130	130	130	130	130	130	130	130
Deferred tax assets	1,250	1,006	910	843	1,177	1,396	1,478	1,522	1,567	1,613	1,660	1,710	1,760	1,812	1,866	1,921
Other assets	587	469	531	504	543	467	517	517	517	517	517	517	517	517	517	517
Non-current assets held for sale and in discontinued operation:	-	3,427	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total non-current assets</b>	<b>21,323</b>	<b>22,576</b>	<b>19,650</b>	<b>21,862</b>	<b>21,565</b>	<b>19,578</b>	<b>19,762</b>	<b>20,098</b>	<b>20,425</b>	<b>20,745</b>	<b>21,081</b>	<b>21,420</b>	<b>21,752</b>	<b>22,081</b>	<b>22,401</b>	<b>22,713</b>
<b>Total assets</b>	<b>43,262</b>	<b>44,441</b>	<b>46,108</b>	<b>41,088</b>	<b>40,260</b>	<b>39,148</b>	<b>40,482</b>	<b>41,895</b>	<b>43,390</b>	<b>44,971</b>	<b>46,641</b>	<b>48,404</b>	<b>50,218</b>	<b>52,086</b>	<b>54,011</b>	<b>55,993</b>

9-8 ABB Assets

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Liabilities and Stockholders Equity</b>																
<b>Current liabilities</b>																
Accounts payable, trade	5,419	4,424	4,353	4,571	4,921	4,904	5,252	5,368	5,487	5,608	5,732	5,903	6,079	6,260	6,447	6,640
Contract liabilities	2,618	1,707	1,719	1,903	1,894	2,216	2,346	2,416	2,487	2,560	2,636	2,714	2,794	2,877	2,962	3,050
Short-term debt and current maturities of long-term debt	738	2,031	2,287	1,293	1,384	2,535	2,387	638	-	461	820	820	820	820	820	-
Current operating leases	-	-	305	270	230	220	233	240	247	254	262	269	277	286	294	303
Provisions for warranties	1,231	948	816	1,035	1,005	1,028	1,089	1,121	1,154	1,188	1,223	1,259	1,296	1,335	1,374	1,415
Other provisions	1,882	1,372	1,375	1,519	1,386	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171
Other current liabilities	4,385	3,780	3,761	4,181	4,367	4,323	4,577	4,712	4,851	4,995	5,142	5,294	5,451	5,612	5,778	5,949
Current liabilities held for sale and in discontinued operations	-	4,185	5,650	644	381	132	-	-	-	-	-	-	-	-	-	-
<b>Total current liabilities</b>	<b>16,273</b>	<b>18,447</b>	<b>20,266</b>	<b>15,416</b>	<b>15,568</b>	<b>16,529</b>	<b>17,055</b>	<b>15,665</b>	<b>15,397</b>	<b>16,237</b>	<b>16,985</b>	<b>17,430</b>	<b>17,888</b>	<b>18,360</b>	<b>18,846</b>	<b>18,528</b>
<b>Non-current liabilities</b>																
Long-term debt	6,709	6,587	6,772	4,828	4,177	5,143	3,843	5,592	6,230	5,769	5,410	5,410	5,410	5,410	5,410	6,230
Non-current operating leases	-	-	717	731	689	651	689	710	731	752	774	797	821	845	870	896
Pension and other employee benefits	1,882	1,828	1,793	1,231	1,025	719	719	719	719	719	719	719	719	719	719	719
Deferred tax liabilities	1,099	927	911	661	685	729	772	795	818	842	867	893	919	946	974	1,003
Other non-current liabilities	1,950	1,689	1,669	2,025	2,116	2,085	2,208	2,273	2,340	2,409	2,480	2,553	2,629	2,707	2,787	2,869
Non-current liabilities held for sale and in discontinued operations	-	429	-	197	43	20	-	-	-	-	-	-	-	-	-	-
<b>Total non-current liabilities</b>	<b>11,640</b>	<b>11,460</b>	<b>11,862</b>	<b>9,673</b>	<b>8,735</b>	<b>9,347</b>	<b>8,231</b>	<b>10,088</b>	<b>10,837</b>	<b>10,491</b>	<b>10,251</b>	<b>10,373</b>	<b>10,498</b>	<b>10,627</b>	<b>10,761</b>	<b>11,718</b>
<b>Total liabilities</b>	<b>27,913</b>	<b>29,907</b>	<b>32,128</b>	<b>25,089</b>	<b>24,303</b>	<b>25,876</b>	<b>25,286</b>	<b>25,754</b>	<b>26,234</b>	<b>26,728</b>	<b>27,236</b>	<b>27,802</b>	<b>28,386</b>	<b>28,987</b>	<b>29,607</b>	<b>30,245</b>

9-9 ABB Liabilities & Equity

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Cash flows from operating activities</b>																
Consolidated net income	2,365	2,298	1,528	5,205	4,650	2,594	2,775	2,928	3,131	3,348	3,571	3,669	3,770	3,879	3,992	4,107
Loss (income) from discontinued operations, net of tax	(846)	(723)	(438)	(4,860)	80	43	-	-	-	-	-	-	-	-	-	-
Adjustments to reconcile consolidated net income to net cash provided by operating activities:																
Depreciation and amortization	836	916	961	915	893	814	971	1,014	1,060	1,109	1,160	1,215	1,273	1,334	1,400	1,469
Impairment of goodwill	-	-	-	311	-	-	-	-	-	-	-	-	-	-	-	-
Changes in fair values of investments	-	-	-	(99)	(123)	(33)	-	-	-	-	-	-	-	-	-	-
Pension and other employee benefits	-	-	-	50	(216)	(125)	(132)	(136)	(140)	(144)	(149)	(153)	(158)	(162)	(167)	(172)
Deferred taxes	(199)	(142)	(83)	(280)	(289)	(344)	(364)	(375)	(386)	(397)	(409)	(421)	(434)	(447)	(460)	(473)
Losses from extinguishment of debt	-	-	-	162	-	-	-	-	-	-	-	-	-	-	-	-
Loss from equity-accounted companies	-	-	-	66	100	102	-	-	-	-	-	-	-	-	-	-
Net loss (gain) from derivatives and foreign exchange	29	93	1	(2)	49	(23)	-	-	-	-	-	-	-	-	-	-
Net gain from sale of property, plant and equipment	(37)	(57)	(51)	(37)	(38)	(84)	(51)	(53)	(52)	(52)	(55)	(58)	(54)	(54)	(54)	(55)
Net loss (gain) from sale of businesses	(252)	(57)	(55)	2	(2,193)	7	(55)	-	-	-	-	-	-	-	-	-
Fair value adjustment on assets and liabilities held for sale	-	-	421	-	-	-	-	-	-	-	-	-	-	-	-	-
Share-based payment arrangements	49	50	46	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	4	(76)	(59)	90	117	66	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities: net cash provided by operating activities:																
Accounts receivable	(178)	(144)	(202)	(100)	(142)	(831)	(404)	(214)	(220)	(227)	(234)	(241)	(248)	(256)	(264)	(272)
Contract assets and liabilities	6	(18)	128	186	29	416	74	39	41	42	43	44	46	47	49	50
Inventory	(66)	(336)	(182)	196	(771)	(1,599)	(295)	(140)	(143)	(146)	(149)	(206)	(212)	(219)	(225)	(232)
Accounts payable	474	454	130	(13)	659	395	348	116	119	121	124	171	176	182	187	193
Accrued liabilities	99	252	(76)	(92)	454	136	136	144	149	153	158	162	167	172	177	182
Provisions	(4)	87	(36)	243	(48)	(70)	-	-	-	-	-	-	-	-	-	-
Income taxes payable and receivable	202	(102)	(3)	(76)	117	(94)	-	-	-	-	-	-	-	-	-	-
Other assets and liabilities, net	106	(143)	(131)	8	10	(36)	(31)	(54)	(39)	(24)	(29)	(35)	(35)	(36)	(33)	(32)
Cash provided by operating activities — continuing operat	2,588	2,352	1,899	1,875	3,338	1,334	2,972	3,270	3,518	3,782	4,030	4,147	4,291	4,441	4,601	4,766
Cash provided by operating activities — discontinued oper	1,211	572	426	(182)	(8)	(47)	-	-	-	-	-	-	-	-	-	-
Cash provided by operating activities	3,799	2,924	2,325	1,693	3,330	1,287	2,972	3,270	3,518	3,782	4,030	4,147	4,291	4,441	4,601	4,766
<b>Cash flows from investing activities</b>																
Purchases of investments	(666)	(322)	(748)	(5,933)	(1,528)	(321)	(81)	(118)	(131)	(146)	(157)	(160)	(168)	(175)	(184)	(192)
Purchases of property, plant and equipment and intangible	(752)	(772)	(762)	(694)	(820)	(762)	(797)	(820)	(844)	(869)	(895)	(921)	(949)	(977)	(1,006)	(1,035)
Acquisition of businesses (net of cash acquired) and increa	(2,011)	(2,664)	(22)	(121)	(241)	(288)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)
Proceeds from sales of investments	1,443	567	749	4,341	2,272	697	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146
Proceeds from maturity of investments	100	160	80	11	81	73	84	84	84	84	84	84	84	84	84	84
Proceeds from sales of property, plant and equipment	61	72	82	114	93	127	92	92	92	92	92	92	92	92	92	92
Proceeds from sales of businesses (net of transaction costs)	607	113	69	(136)	2,958	1,541	1,397	-	-	-	-	-	-	-	-	-
Net cash from settlement of foreign currency derivatives	63	(30)	(76)	138	(121)	(166)	-	-	-	-	-	-	-	-	-	-
Changes in loans receivable, net	-	-	-	(3)	(19)	320	-	-	-	-	-	-	-	-	-	-
Other investing activities	37	(32)	(23)	11	(4)	(14)	(4)	(11)	(8)	(5)	(8)	(9)	(8)	(8)	(8)	(8)
Cash provided by (used in) investing activities — continuing	(1,118)	(2,908)	(651)	(2,272)	2,671	1,207	945	(519)	(553)	(590)	(630)	(660)	(694)	(730)	(767)	(806)
Cash provided by (used in) investing activities — discontinu	(332)	(177)	(164)	9,032	(364)	(226)	-	-	-	-	-	-	-	-	-	-
Cash provided by investing activities	(1,450)	(3,085)	(815)	6,760	2,307	981	945	(519)	(553)	(590)	(630)	(660)	(694)	(730)	(767)	(806)
<b>Cash flows from financing activities</b>																
Net changes in debt with maturities of 90 days or less	204	221	164	(587)	(83)	1,366	(1,477)	-	-	-	-	-	-	-	-	-
Increase in debt	920	1,914	2,406	343	1,400	3,849	1,058	2,387	193	-	461	820	820	820	820	820
Repayment of debt	(1,000)	(830)	(2,156)	(3,459)	(1,538)	(2,703)	(1,058)	(2,387)	(193)	-	(461)	(820)	(820)	(820)	(820)	(820)
Delivery of shares	163	42	10	412	826	394	264	264	264	264	264	264	264	264	264	264
Purchase of treasury stock	(251)	(250)	-	(3,048)	(3,708)	(3,553)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)
Dividends paid	(1,635)	(1,717)	(1,675)	(1,736)	(1,726)	(1,698)	(1,752)	(1,854)	(1,988)	(2,132)	(2,279)	(2,344)	(2,411)	(2,484)	(2,558)	(2,634)
Cash associated with the spin-off of the Turbocharging Div	-	-	-	-	-	(172)	-	-	-	-	-	-	-	-	-	-
Dividends paid to noncontrolling shareholders	(83)	(86)	(90)	(82)	(98)	(99)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)
Proceeds from issuance of subsidiary shares	-	-	-	-	-	216	-	-	-	-	-	-	-	-	-	-
Other financing activities	(6)	(35)	13	(49)	(41)	6	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities — continuing operations	(1,688)	(741)	(1,328)	(8,206)	(4,968)	(2,394)	(3,455)	(2,079)	(2,213)	(2,357)	(2,504)	(2,569)	(2,636)	(2,709)	(2,783)	(2,860)
Cash provided by financing activities — discontinued operat	(47)	(48)	(55)	31	-	-	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities	(1,735)	(789)	(1,383)	(8,175)	(4,968)	(2,394)	(3,455)	(2,079)	(2,213)	(2,357)	(2,504)	(2,569)	(2,636)	(2,709)	(2,783)	(2,860)
Effects of exchange rate changes on cash and equivalents	268	(131)	(28)	79	(81)	(189)	-	-	-	-	-	-	-	-	-	-
Net change in cash and equivalents and restricted cash	882	(1,081)	99	357	588	(315)	463	672	751	834	896	917	960	1,002	1,051	1,101

9-10 ABB Cash Flow Statement

<b>Property, Plant &amp; Equipment</b>																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Beginning of period		5,363	4,133	3,972	4,174	4,045	3,911	4,010	4,186	4,351	4,503	4,641	4,763	4,867	4,950	5,009
Plus: Capital expenditures (Purchases of PP&E)	677	703	718	644	787	693	797	820	844	869	895	921	949	977	1,006	1,035
as % of revenue	2.7%	2.5%	2.6%	2.5%	2.7%	2.4%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Less: Write downs (-ups), divestments or (acquisitions)		1,355	263	-144	341	295	86	-	-	-	-	-	-	-	-	-
Less: Depreciation	549	578	616	586	575	532	612	644	679	717	757	799	845	894	946	1,003
<b>End of period</b>	<b>5,363</b>	<b>4,133</b>	<b>3,972</b>	<b>4,174</b>	<b>4,045</b>	<b>3,911</b>	<b>4,010</b>	<b>4,186</b>	<b>4,351</b>	<b>4,503</b>	<b>4,641</b>	<b>4,763</b>	<b>4,867</b>	<b>4,950</b>	<b>5,009</b>	<b>5,042</b>
Capex in % of depreciation	123%	122%	117%	110%	137%	130%	130%	127%	124%	121%	118%	115%	112%	109%	106%	103%
<b>IMPUTING TOTAL DEPRECIATION &amp; AMORTIZATION</b>																
Amortization	287	338	345	329	318	282	359	370	381	392	403	415	428	440	453	467
as % of revenue	1.1%	1.2%	1.2%	1.3%	1.1%	1.0%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
<b>Depreciation &amp; Amortization - Total</b>	<b>836</b>	<b>916</b>	<b>961</b>	<b>915</b>	<b>893</b>	<b>814</b>	<b>971</b>	<b>1,014</b>	<b>1,060</b>	<b>1,109</b>	<b>1,160</b>	<b>1,215</b>	<b>1,273</b>	<b>1,334</b>	<b>1,400</b>	<b>1,469</b>
Total capex (Purchases of PP&E and intangibles)	752	772	762	694	820	762	852	890	931	973	1,018	1,066	1,117	1,171	1,229	1,290
Total capex in % of D&A	90%	84%	79%	76%	92%	94%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%

*9-11 ABB Property, Plant & Equipment Schedule*

<b>Debt Schedule</b>																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Cash, marketable securities and short-term investments	5,628	4,157	4,074	5,386	5,329	4,881	5,344	6,016	6,768	7,602	8,498	9,415	10,376	11,377	12,428	13,528
<b>Commercial paper and revolver needs analysis (STD)</b>																
Cash at beginning of period							4,881	5,344	6,016	6,768	7,602	8,498	9,415	10,376	11,377	12,428
Less: Minimum cash balance							4,074	4,074	4,074	4,074	4,074	4,074	4,074	4,074	4,074	4,074
Plus: Free cash flows generated during period (excl. STD)							1,940	(1,715)	558	834	435	97	140	182	231	281
<b>Cash available (needed) to pay down (draw from) STD</b>							<b>2,747</b>	<b>(445)</b>	<b>2,501</b>	<b>3,528</b>	<b>3,963</b>	<b>4,521</b>	<b>5,482</b>	<b>6,484</b>	<b>7,534</b>	<b>8,635</b>
<b>Commercial paper and revolver (STD)</b>																
Beginning of period							1,448	-	445	-	-	-	-	-	-	-
Draw / (paydown)							(1,448)	445	(445)	-	-	-	-	-	-	-
Discretionary borrowing / (paydown)																
<b>End of period</b>						<b>1,448</b>	<b>0</b>	<b>445</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Long-term debt (LTD)</b>																
Beginning of period							6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230
Scheduled repayments							(1,058)	(2,387)	(193)	-	(461)	(820)	(820)	(820)	(820)	(820)
Debt Refinancing							1,058	2,387	193	-	461	820	820	820	820	820
Additional long-term debt (for refinancing)							-	-	-	-	-	-	-	-	-	-
<b>End of period</b>						<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>	<b>6,230</b>

*9-12 ABB Debt Schedule*

<b>Interest Expense &amp; Interest Income</b>																
	<b>FY17A</b>	<b>FY18A</b>	<b>FY19A</b>	<b>FY20A</b>	<b>FY21A</b>	<b>FY22A</b>	<b>FY23E</b>	<b>FY24E</b>	<b>FY25E</b>	<b>FY26E</b>	<b>FY27E</b>	<b>FY28E</b>	<b>FY29E</b>	<b>FY30E</b>	<b>FY31E</b>	<b>FY32E</b>
Total interest expense (from I/S)	(234)	(262)	(215)	(240)	(148)	(130)	(242)	(248)	(254)	(255)	(261)	(267)	(273)	(273)	(273)	(273)
<b>Short-term debt / Revolver</b>																
Weighted average interest rate						1.90%	2.15%	2.40%	2.50%	2.60%	2.70%	2.80%	2.90%	2.90%	2.90%	2.90%
End of period balance						1,448	0	445	0	0	0	0	0	0	0	0
Interest expense						(28)	(16)	(5)	(6)	0	0	0	0	0	0	0
<b>Long-term debt</b>																
End of period balance (from B/S)						6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230	6,230
Weighted average interest rate						3.4%	3.6%	3.9%	4.0%	4.1%	4.2%	4.3%	4.4%	4.4%	4.4%	4.4%
Interest expense						(211)	(227)	(242)	(248)	(255)	(261)	(267)	(273)	(273)	(273)	(273)
<b>Interest rate on cash</b>																
Implied interest rate on cash, marketable securities and short-term	1.47%	1.63%	1.08%	0.95%	1.41%	1.56%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%
Interest income	72	67	51	51	72	80	103	116	130	146	162	179	197	215	235	235

*9-13 Interest Expenses & Interest Income*

<b>Retained Earnings</b>																
	<b>FY17A</b>	<b>FY18A</b>	<b>FY19A</b>	<b>FY20A</b>	<b>FY21A</b>	<b>FY22A</b>	<b>FY23E</b>	<b>FY24E</b>	<b>FY25E</b>	<b>FY26E</b>	<b>FY27E</b>	<b>FY28E</b>	<b>FY29E</b>	<b>FY30E</b>	<b>FY31E</b>	<b>FY32E</b>
Beginning of period	19,594	19,839	19,640	22,946	22,477	20,082	20,082	20,976	21,922	22,936	24,023	25,186	26,382	27,612	28,879	30,184
Plus: Net income	2,173	1,439	5,146	4,546	2,475	2,646	2,646	2,799	3,002	3,219	3,442	3,540	3,642	3,751	3,863	3,978
Less: Dividends	1,717	1,675	1,736	1,726	1,698	1,752	1,752	1,854	1,988	2,132	2,279	2,344	2,411	2,484	2,558	2,634
<i>Dividend payout ratio</i>	79%	116%	34%	38%	69%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%	66%
Less: Cancellation of shares	-	-	-	3,130	2,864	-	-	-	-	-	-	-	-	-	-	-
Other			(104)	(159)	(308)											
<b>End of period</b>	<b>19,594</b>	<b>19,839</b>	<b>19,640</b>	<b>22,946</b>	<b>22,477</b>	<b>20,082</b>	<b>20,976</b>	<b>21,922</b>	<b>22,936</b>	<b>24,023</b>	<b>25,186</b>	<b>26,382</b>	<b>27,612</b>	<b>28,879</b>	<b>30,184</b>	<b>31,528</b>
Share count	2,168	2,168	2,168	2,168	2,053	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965

*9-14 ABB Retained Earning*

Free Cash Flows to the Firm												
	LTM	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Revenue	29,730	29,446	31,179	32,098	33,045	34,020	35,025	36,060	37,127	38,226	39,358	40,525
% growth			5.9%	2.9%	2.9%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
EBITDA	4,247	4,151	4,740	4,992	5,315	5,654	6,009	6,200	6,400	6,606	6,822	7,046
% margin			15.2%	15.6%	16.1%	16.6%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%
EBITA	3,702	3,619	4,128	4,348	4,636	4,937	5,252	5,401	5,554	5,713	5,875	6,043
% margin			12.3%	13.2%	13.5%	14.0%	14.5%	15.0%	15.0%	14.9%	14.9%	14.9%
EBIT	3,408	3,337	3,769	3,978	4,255	4,545	4,848	4,986	5,127	5,272	5,422	5,576
% margin			11.3%	12.1%	12.4%	12.9%	13.4%	13.8%	13.8%	13.8%	13.8%	13.8%
Tax on EBIT		834	942	995	1,064	1,136	1,212	1,246	1,282	1,318	1,356	1,394
Tax rate			25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
<b>NOPAT</b>		<b>2,503</b>	<b>2,827</b>	<b>2,984</b>	<b>3,191</b>	<b>3,409</b>	<b>3,636</b>	<b>3,739</b>	<b>3,845</b>	<b>3,954</b>	<b>4,067</b>	<b>4,182</b>
Depreciation & amortization			971	1,014	1,060	1,109	1,160	1,215	1,273	1,334	1,400	1,469
Changes in net working capital			(31)	(46)	(47)	(48)	(49)	(62)	(63)	(65)	(67)	(69)
Capital expenditures			(852)	(890)	(931)	(973)	(1,018)	(1,066)	(1,117)	(1,171)	(1,229)	(1,290)
as % of revenue			(2.7%)	(2.8%)	(2.8%)	(2.9%)	(2.9%)	(3.0%)	(3.0%)	(3.1%)	(3.1%)	(3.2%)
<b>Free Cash Flows to the Firm (FCFF)</b>			<b>2,915</b>	<b>3,062</b>	<b>3,274</b>	<b>3,496</b>	<b>3,729</b>	<b>3,826</b>	<b>3,937</b>	<b>4,052</b>	<b>4,170</b>	<b>4,292</b>
Net working capital (WC Assets - WC liabilities)		677	708	753	800	848	897	959	1,022	1,087	1,155	1,224
as % of revenue			2.3%	2.3%	2.3%	2.4%	2.5%	2.6%	2.7%	2.8%	2.9%	3.0%

9-15 ABB Free Cash Flows to the Firm

Cost of Capital	Weights	WACC
Cost of debt	4.4%	
Tax rate	23.3%	
<b>Cost of debt (after tax)</b>	<b>3.4%</b>	<b>9.3%</b>
Risk free rate	1.5%	<b>6.6%</b>
Beta	0.93	
Market risk premium	5.8%	
<b>Cost of equity</b>	<b>6.9%</b>	<b>90.7%</b>

9-16 ABB WACC Calculation

Present value of FCFF on 28 February 2023 (WACC 6.6%)											
	Valuation date	Stub Year	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Date for discounting cash flows	02/28/2023	08/31/2023	08/31/2024	08/31/2025	08/31/2026	08/31/2027	08/31/2028	08/31/2029	08/31/2030	08/31/2031	08/31/2032
Free Cash Flow to the Firm (FCFF)		2,437	3,062	3,274	3,496	3,729	3,826	3,937	4,052	4,170	4,292
stub year FCFF adjustment		83.6% of FY23E									
<b>Present value of FCFF</b>		<b>2,359</b>	<b>2,780</b>	<b>2,787</b>	<b>2,792</b>	<b>2,792</b>	<b>2,686</b>	<b>2,593</b>	<b>2,502</b>	<b>2,415</b>	<b>2,331</b>

9-17 ABB Present Value of Free Cash Flows to the Firm

<b>Total Enterprise Value (TEV) - Perpetual Growth Method</b>		<b>Total Enterprise Value (TEV) - Exit Multiple Method</b>	
Perpetual growth rate	2.4%	Terminal year EBITDA	7,046
2032 FCFF x (1+PGR)	4,396	EBITDA multiple	14.4x
Terminal value in 2032	104,381	Terminal value in 2032	101,113
Present value of terminal value	56,685	Present value of terminal value	54,910
Present value of explicitly forecasted cash flows	26,037	Present value of explicitly forecasted cash flc	26,037
<b>Total enterprise value (TEV)</b>	<b>82,722</b>	<b>Total enterprise value (TEV)</b>	<b>80,991</b>

*in USD mm except growth rate and exit multiple*

9-18 ABB DCF Enterprise Values

<b>Equity Value</b>	<b>PGR Exit Multiple</b>	
	<b>82,722</b>	<b>80,991</b>
<b>Enterprise Value</b>	<b>82,722</b>	<b>80,991</b>
<b>Gross debt and equivalents</b>		
Debt	7,678	7,678
Convertible debt	-	-
Preferred stock	-	-
Noncontrolling (minority) interests	495	495
<b>Nonoperating assets</b>	-	-
Cash	2,441	2,441
Equity investments	130	130
<b>Net debt</b>	<b>5,603</b>	<b>5,603</b>
<b>Equity value</b>	<b>77,119</b>	<b>75,389</b>
Shares outstanding	1,985	1,985
<b>Equity value per share</b>	<b>38.86</b>	<b>37.99</b>

*in USD mm except equity value per share*

9-19 ABB DCF Equity Value per Share

<b>Dilutive Effect of Stock Options via Treasury Stock Method (TSM)</b>				
	Outstanding Options	Exercise price	USD-Converted Exercise Price	In the Money Options
Tranche 1	1.0	CHF 21.23	USD 22.54	1.000
Tranche 2	12.0	CHF 22.05	USD 23.41	12.000
Tranche 3	7.0	CHF 17.63	USD 18.72	7.000
Tranche 4	2.0	CHF 0.00	USD 0.00	2.000
Tranche 5	8.0	CHF 0.00	USD 0.00	8.000
Tranche 6	1.0	CHF 0.00	USD 0.00	1.000
Tranche 7	3.3	CHF 20.58	USD 21.85	3.300
<b>Total</b>	<b>34.3</b>			<b>34.300</b>
Total proceeds (USD)				477.154
Total shares repurchased via TSM				(14.741)
<b>Net dilutive impact of stock options</b>				<b>19.559</b>

*in mm except share price*

9-20 ABB Dilution of Shares Outstanding through Stock Options

**Perpetual Growth Method Sensitivity Analysis - Equity value per share**

		PGR:				
		1.4%	1.9%	<b>2.4%</b>	2.9%	3.4%
WACC:	8.6%	23.0	24.1	25.4	26.9	28.7
	7.6%	27.3	28.9	30.8	33.2	36.1
	<b>6.6%</b>	33.2	35.7	<b>38.9</b>	42.9	48.1
	5.6%	41.9	46.2	51.9	59.7	71.0
	4.6%	56.0	64.5	76.7	96.2	131.7

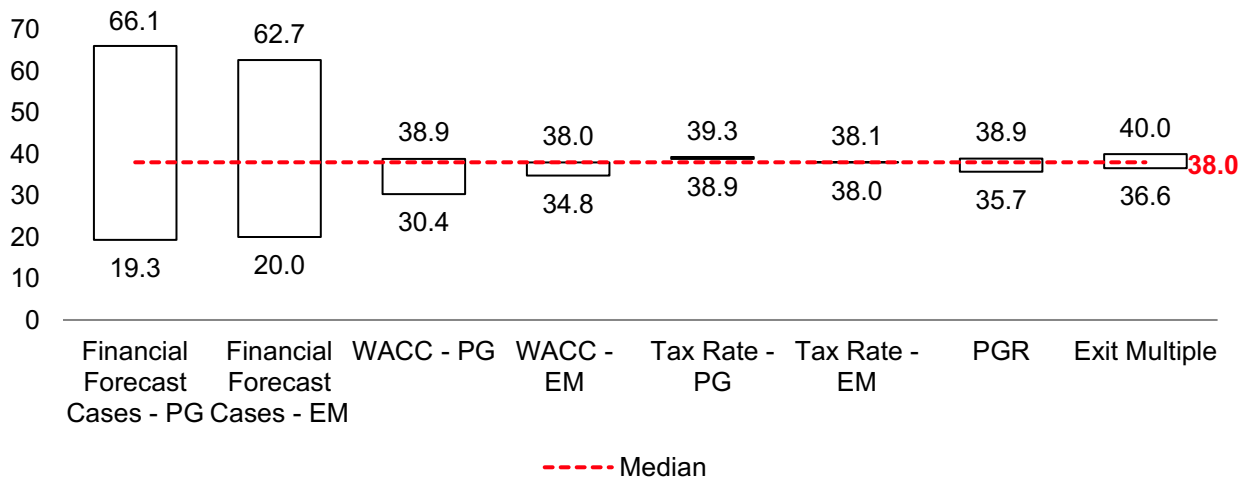
**Exit Multiple Method Sensitivity Analysis - Equity value per share**

		Exit EBITDA Multiple:				
		12.4x	13.4x	<b>14.4x</b>	15.4x	16.4x
WACC:	8.6%	29.1	30.7	32.4	34.0	35.6
	7.6%	31.5	33.3	35.0	36.8	38.6
	<b>6.6%</b>	34.1	36.0	<b>38.0</b>	39.9	41.8
	5.6%	37.0	39.1	41.2	43.3	45.4
	4.6%	40.1	42.4	44.7	47.0	49.3

9-21 ABB DCF Sensitivity Analysis (Price per Share in USD)

Methodology	Worst	Base	Best
WACC	7.7%	6.6%	-
	Direct & SOTP Peer Group WACC	Own Calculations	-
Tax Rate	-	25.0%	23.3%
	-	ABB FY23E Guidance	ABB Historical Average
PGR	2.0%	2.4%	2.5%
	Long Term Targeted Inflation Rate	ER SOTP Peer Group	ER Direct Peer Group
Exit Multiple	13.7x	14.4x	15.5x
	Year 1 ABB EV/EBITDA Multiple	ER SOTP Peer Group	ER Direct Peer Group

9-22 ABB Various Valuation Inputs



9-23 ABB Resulting Valuation Ranges Football Field (USD per share)

Name	Market capitalization (mm)	Enterprise value (EV)	Last Twelve Months (LTM)				Year 1 Forecast - Calendar Year				Net debt
			Revenues	EBITDA	EBIT	Net Income	Revenues	EBITDA	EBIT	Net Income	
ABB	65,570.8	72,327.9	29,446.0	4,151.0	3,337.0	2,594.0	31,179.1	4,739.7	3,769.0	2,775.2	6,757.1
AMETEK	32,572.1	34,611.7	6,150.5	1,829.7	1,510.2	1,159.5	6,499.0	1,950.0	1,619.0	1,351.0	2,039.6
Eaton	69,622.1	77,760.1	20,752.0	3,953.0	3,031.0	2,462.0	22,283.0	4,635.0	4,075.0	3,274.0	8,138.0
Emerson	47,260.5	60,927.5	19,846.0	5,003.0	3,964.0	2,803.0	15,189.6	3,877.9	3,070.4	2,374.3	13,667.0
General Electric	92,273.4	108,583.4	76,555.0	11,782.0	8,239.0	869.0	61,529.0	7,052.0	4,756.0	2,186.0	16,310.0
Honeywell	127,935.4	138,017.4	35,466.0	7,631.0	6,427.0	4,966.0	36,738.0	9,142.0	8,045.0	6,075.0	10,082.0
Mitsubishi Electric	3,291.7	690.9	4,860.7	438.6	225.3	608.8	5,019.4	506.3	297.2	229.3	(2,600.8)
Omron	1,508.1	1,461.0	842.3	118.5	92.7	68.0	847.0	117.7	89.9	64.0	(47.0)
Rockwell Automation	33,852.8	38,436.6	7,884.1	1,628.8	1,391.0	1,043.1	8,766.9	1,937.2	1,718.5	1,314.0	4,583.8
Schneider Electric	116,143.9	123,398.9	34,176.0	6,642.0	5,160.0	3,477.0	36,059.0	7,279.0	6,028.0	4,426.0	7,255.0
Siemens	117,519.9	129,305.9	73,550.0	10,745.0	7,042.0	3,578.0	76,865.0	12,960.0	9,936.0	6,783.0	11,786.0
Yaskawa Electric	1,429.5	1,533.5	529.2	80.6	61.1	44.8	553.2	84.4	63.5	47.3	104.0

9-24 ABB Trading Comparables Company Overview

Name	Last Twelve Months (LTM)				Year 1 Forecast - Calendar Year			
	EV / Revenues	EV / EBITDA	EV / EBIT	P/E	EV / Revenues	EV / EBITDA	EV / EBIT	P/E
ABB	2.5	17.4	21.7	25.3	2.4	13.7	17.1	22.1
AMETEK	5.6x	18.9x	22.9x	28.1x	5.3x	17.7x	21.4x	24.1x
Eaton	3.7x	19.7x	25.7x	28.3x	3.5x	16.8x	19.1x	21.3x
Emerson	3.1x	12.2x	15.4x	16.9x	4.0x	15.7x	19.8x	20.5x
General Electric	1.4x	9.2x	13.2x	106.2x	1.8x	15.4x	22.8x	42.2x
Honeywell	3.9x	18.1x	21.5x	25.8x	3.8x	15.1x	17.2x	21.1x
Mitsubishi Electric	0.1x	1.6x	3.1x	5.4x	0.1x	1.4x	2.3x	15.6x
Omron	1.7x	12.3x	15.8x	22.2x	1.7x	12.4x	16.3x	22.2x
Rockwell Automation	4.9x	23.6x	27.6x	32.5x	4.4x	19.8x	22.4x	26.3x
Schneider Electric	3.6x	18.6x	23.9x	33.4x	3.4x	17.0x	20.5x	26.2x
Siemens	1.8x	12.0x	18.4x	32.8x	1.7x	10.0x	13.0x	17.3x
Yaskawa Electric	2.9x	19.0x	25.1x	31.9x	2.8x	18.2x	24.1x	28.5x

Top Quartile	3.8x	19.0x	24.5x	32.6x	3.9x	17.4x	21.9x	26.3x
Bottom Quartile	1.7x	12.1x	15.6x	24.0x	1.7x	13.8x	16.7x	20.8x
<b>Median</b>	<b>3.1x</b>	<b>18.1x</b>	<b>21.5x</b>	<b>28.3x</b>	<b>3.4x</b>	<b>15.7x</b>	<b>19.8x</b>	<b>22.2x</b>
<b>Mean</b>	<b>3.0x</b>	<b>15.0x</b>	<b>19.3x</b>	<b>33.0x</b>	<b>3.0x</b>	<b>14.5x</b>	<b>18.1x</b>	<b>24.1x</b>

9-25 ABB Trading Comparables Multiple Overview

Companies	Date Completed	EV	Implied Equity Value	Revenue	EBITDA Margin	One Year Ahead				Last Twelve Months								
						Revenue	EBITDA	EBIT	PE	LTM Revenue	LTM EBITDA	LTM EBIT	LTM Net Income	Revenue	EBITDA	EBIT	PE	
E+ Engineering	11/1/2021	2,000																
Allego	3/16/2022	1,486		161	(60%)	9.2x	nm			91	8			16.3x	nm			
Neles	3/31/2022	2,252	2,176							679	181	98	324	3.3x	12.4x	23.1x	6.7x	
Raven Industries	11/30/2021	2,144	2,144	348	11%	6.2x	nm	nm	nm	404	42	29	25	5.3x	nm	nm	nm	
Expro	10/1/2021	2,118								390	(4)	(74)	(156)	5.4x	nm	nm	nm	
Flender	3/10/2021	2,371		2,583		0.9x												
Velodyne Lidar	9/29/2020	1,566	1,766							95				16.4x				
ISRA Vision	6/12/2020	1,198	1,197	168	33%	7.1x	21.4x	32.2x	48.5x	129	37	15	7	9.3x	32.2x	nm	nm	
Eaton (Hydraulics business)	8/2/2021	3,300		2,200		1.5x												
AutoStore	7/31/2019	1,812	1,832	136	34%	13.7x	39.7x	41.2x	34.7x									
Larsen & Toubro (Electrical & Automation business)	4/18/2019	2,100		79		27.8x												
nVent Electric	4/17/2018	4,964	4,817	2,100		2.4x				2,135	359	359	457	2.3x	13.8x	13.8x	10.5x	
General Electric Industrial Solutions	6/30/2018	2,600		2,700	8%	1.0x	12.0x											
ista International	10/18/2017	7,293	4,341	896	44%	7.3x	16.8x	33.7x										
ASCO Power Technologies	10/31/2017	1,250		468		2.7x		11.6x										
Vanderlande Industries	5/20/2017	1,268	1,296	1,174	7%	1.1x	14.6x	18.4x	24.7x									
Intelligrated	8/29/2016	1,500		760		2.0x												
Dematic	11/1/2016	3,250	2,100	1,800		1.8x		19.6x										
KUKA	12/29/2016	4,957	5,159	3,240	9%	1.5x	17.0x	32.4x	48.9x	3,120	223	140	92	1.6x	22.3x	35.4x	nm	
Johnson Controls	9/6/2016	16,166	14,421	5,965	21%	2.7x	13.2x	18.3x	26.4x	9,661	2,991	1,775	(615)	1.7x	5.4x	9.1x	nm	
Cameron International	4/4/2016	13,763	12,650	10,381	14%	1.3x	9.6x	12.7x	17.3x	8,782	1,564	1,222	501	1.6x	8.8x	11.3x	25.2x	
Elster Group	12/29/2015	5,126		1,635	22%	3.1x	14.3x	16.0x										
Vacon	11/21/2014	1,350	1,342	555	13%	2.6x	19.3x	25.5x	35.8x	421	60	45	32	3.2x	22.5x	29.9x	41.4x	
Measurement Specialties	10/9/2014	1,449	1,373	413	17%	3.5x	20.6x	29.0x	38.1x	426	63	44	30	3.4x	23.0x	32.9x	46.5x	
Invensys	1/17/2014	4,091	4,972	2,729	6%	1.5x	25.0x	62.7x	26.2x	2,139	149	213	48	1.9x	27.4x	19.2x	nm	
Valmet	1/2/2014	1,398	1,400			2.7x				2,764	129	41	(67)	0.5x	10.8x	33.9x	nm	
<b>Median</b>		2,131	2,122	1,174	14%	2.6x	16.9x	25.5x	34.7x	553	129	71	31	3.3x	18.1x	23.1x	25.2x	
<b>Average</b>						4.8x	18.6x	27.2x	33.4x	2,231	446	326	57	5.2x	17.9x	23.2x	26.1x	
<b>Top Quartile</b>		3,893	4,856	2,583	22%	6.2x	20.8x	32.4x	38.1x	2,608	223	249	150	5.4x	22.8x	32.9x	41.4x	
<b>Bottom Quartile</b>		1,489	1,393	413	8%	1.5x	14.1x	18.3x	26.2x	394	42	38	(11)	1.7x	11.2x	13.8x	10.5x	

Note: Multiples above 50 as well as negative values are excluded

Sources: Mergermarket, Refinitiv Eikon

### 9-26 ABB Precedent Transactions Overview

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Total revenues	521	614	626	591	707	861	914	1,012	1,166	1,345	1,551	1,788	2,062	2,378	2,742	3,162
Total cost of revenues	(301)	(353)	(364)	(346)	(406)	(482)	(497)	(550)	(634)	(731)	(843)	(972)	(1,121)	(1,293)	(1,490)	(1,719)
<b>Gross profit</b>	<b>221</b>	<b>262</b>	<b>262</b>	<b>245</b>	<b>300</b>	<b>378</b>	<b>417</b>	<b>462</b>	<b>532</b>	<b>614</b>	<b>708</b>	<b>816</b>	<b>941</b>	<b>1,085</b>	<b>1,251</b>	<b>1,443</b>
SG&A	(102)	(116)	(118)	(110)	(129)	(159)	(153)	(170)	(196)	(226)	(260)	(300)	(346)	(399)	(460)	(530)
Research and development and engineering expenses	(42)	(51)	(56)	(61)	(73)	(86)	(88)	(93)	(107)	(124)	(142)	(164)	(189)	(218)	(252)	(290)
Amortization of purchased intangibles	(12)	(16)	(16)	(14)	(17)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)	(26)
Restructuring, acquisition and related costs	(8)	(8)	(17)	(4)	(18)	(4)	-	-	-	-	-	-	-	-	-	-
<b>Income from operations</b>	<b>58</b>	<b>71</b>	<b>55</b>	<b>56</b>	<b>64</b>	<b>103</b>	<b>149</b>	<b>173</b>	<b>203</b>	<b>238</b>	<b>279</b>	<b>326</b>	<b>380</b>	<b>442</b>	<b>513</b>	<b>596</b>
Interest income (expense), net	(7)	(10)	(8)	(7)	(7)	(16)	(21)	(21)	(19)	(17)	(14)	(11)	(6)	(1)	5	13
FX gains (losses), net	(0)	0	(1)	(1)	(0)	0	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	26	(0)	(0)	0	(0)	(0)	-	-	-	-	-	-	-	-	-	-
<b>Income from continuing operations before taxes</b>	<b>76</b>	<b>61</b>	<b>46</b>	<b>48</b>	<b>56</b>	<b>87</b>	<b>128</b>	<b>152</b>	<b>184</b>	<b>222</b>	<b>265</b>	<b>315</b>	<b>373</b>	<b>441</b>	<b>519</b>	<b>609</b>
Income tax expense	(14)	(10)	(5)	(4)	(6)	(13)	(19)	(23)	(28)	(33)	(40)	(47)	(56)	(66)	(78)	(91)
<b>Income from continuing operations, net of tax</b>	<b>62</b>	<b>51</b>	<b>41</b>	<b>45</b>	<b>50</b>	<b>74</b>	<b>108</b>	<b>129</b>	<b>157</b>	<b>188</b>	<b>225</b>	<b>268</b>	<b>317</b>	<b>375</b>	<b>441</b>	<b>518</b>
Income (loss) from discontinued operations, net of tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Net income</b>	<b>62</b>	<b>51</b>	<b>41</b>	<b>45</b>	<b>50</b>	<b>74</b>	<b>108</b>	<b>129</b>	<b>157</b>	<b>188</b>	<b>225</b>	<b>268</b>	<b>317</b>	<b>375</b>	<b>441</b>	<b>518</b>
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(2)	(2)	-	-	-	-	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
<b>Net income attributable to ABB</b>	<b>60</b>	<b>49</b>	<b>41</b>	<b>45</b>	<b>50</b>	<b>74</b>	<b>108</b>	<b>129</b>	<b>156</b>	<b>188</b>	<b>224</b>	<b>267</b>	<b>317</b>	<b>374</b>	<b>440</b>	<b>517</b>

### 9-27 Novanta Income Statement

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Assets</b>																
<b>Current assets</b>																
Cash and cash equivalents	100	82	79	125	117	100	174	258	360	493	663	876	1,139	1,460	1,848	2,313
Accounts receivable	81	84	91	75	116	138	146	162	187	215	248	286	330	380	439	506
Prepaid income taxes and income taxes receivable	4	2	6	3	2	2	2	2	2	2	3	3	4	4	5	6
Inventories	91	105	117	93	126	168	173	191	221	255	294	339	390	450	519	598
Prepaid expenses and other current assets	11	9	12	8	13	13	14	16	18	21	24	27	32	36	42	49
<b>Total current assets</b>	<b>288</b>	<b>282</b>	<b>305</b>	<b>304</b>	<b>374</b>	<b>421</b>	<b>508</b>	<b>628</b>	<b>787</b>	<b>986</b>	<b>1,231</b>	<b>1,531</b>	<b>1,895</b>	<b>2,331</b>	<b>2,852</b>	<b>3,471</b>
<b>Non-current assets</b>																
Property, plant and equipment	62	65	78	79	87	103	117	133	151	171	194	220	249	283	321	364
Operating lease right-of-use assets	n.a.	n.a.	35	34	48	43	46	51	59	68	78	90	104	120	138	159
Goodwill	211	218	275	286	480	479	479	479	479	479	479	479	479	479	479	479
Other Intangible assets	155	143	166	149	221	176	189	199	206	205	198	180	151	109	54	(18)
Deferred tax assets	7	9	9	10	12	15	16	18	20	24	27	31	36	42	48	55
Other assets	4	2	3	3	6	4	4	4	4	4	4	4	4	4	4	4
<b>Total non-current assets</b>	<b>439</b>	<b>438</b>	<b>565</b>	<b>561</b>	<b>854</b>	<b>821</b>	<b>851</b>	<b>883</b>	<b>918</b>	<b>950</b>	<b>979</b>	<b>1,003</b>	<b>1,022</b>	<b>1,036</b>	<b>1,043</b>	<b>1,042</b>
<b>Total assets</b>	<b>727</b>	<b>720</b>	<b>870</b>	<b>865</b>	<b>1,228</b>	<b>1,241</b>	<b>1,359</b>	<b>1,512</b>	<b>1,705</b>	<b>1,936</b>	<b>2,210</b>	<b>2,534</b>	<b>2,917</b>	<b>3,367</b>	<b>3,895</b>	<b>4,514</b>

9-28 Novanta Assets

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Liabilities and Stockholders Equity</b>																
<b>Current liabilities</b>																
Accounts payable, trade	40	51	53	43	69	75	77	86	99	114	131	152	175	202	232	268
Current maturities of long-term debt	9	5	5	6	5	5	5	5	5	63	16	16	16	16	16	16
Current operating leases	n.a.	n.a.	5	6	7	8	8	9	11	12	14	16	19	22	25	29
Income taxes payable	6	3	2	6	5	14	14	14	14	14	14	14	14	14	14	14
Accrued expense and other current liabilities	43	46	70	54	98	63	67	74	85	98	114	131	151	174	201	232
<b>Total current liabilities</b>	<b>98</b>	<b>104</b>	<b>135</b>	<b>114</b>	<b>184</b>	<b>165</b>	<b>171</b>	<b>187</b>	<b>213</b>	<b>301</b>	<b>289</b>	<b>329</b>	<b>375</b>	<b>427</b>	<b>488</b>	<b>558</b>
<b>Non-current liabilities</b>																
Long-term debt	226	203	215	195	429	431	431	431	431	373	419	419	419	419	419	419
Non-current operating leases	-	-	34	33	46	41	43	48	55	64	74	85	98	113	130	150
Income taxes payable	4	4	5	5	4	4	4	4	4	4	4	4	4	4	4	4
Deferred tax liabilities	26	23	27	24	34	17	18	20	23	27	31	36	41	47	55	63
Other non-current liabilities	15	17	37	17	10	6	6	7	8	10	11	13	15	17	19	22
<b>Total non-current liabilities</b>	<b>270</b>	<b>247</b>	<b>318</b>	<b>274</b>	<b>523</b>	<b>499</b>	<b>503</b>	<b>510</b>	<b>522</b>	<b>477</b>	<b>539</b>	<b>557</b>	<b>577</b>	<b>600</b>	<b>628</b>	<b>659</b>
<b>Total liabilities</b>	<b>368</b>	<b>351</b>	<b>453</b>	<b>388</b>	<b>707</b>	<b>664</b>	<b>674</b>	<b>698</b>	<b>735</b>	<b>778</b>	<b>828</b>	<b>885</b>	<b>951</b>	<b>1,028</b>	<b>1,116</b>	<b>1,217</b>
<b>Stockholders Equity</b>																
Common shares	424	424	424	424	424	424	424	424	424	424	424	424	424	424	424	424
Additional paid-in capital	33	46	50	59	54	55	55	55	55	55	55	55	55	55	55	55
Retained earnings (Accumulated deficit)	(128)	(79)	(38)	6	57	131	238	367	523	711	935	1,202	1,519	1,893	2,333	2,851
Accumulated other comprehensive loss	(18)	(23)	(18)	(12)	(13)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)
<b>Total stockholders equity</b>	<b>312</b>	<b>368</b>	<b>417</b>	<b>477</b>	<b>521</b>	<b>578</b>	<b>685</b>	<b>814</b>	<b>970</b>	<b>1,158</b>	<b>1,382</b>	<b>1,649</b>	<b>1,966</b>	<b>2,340</b>	<b>2,780</b>	<b>3,298</b>
Rredeemable noncontrolling interest	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total liabilities and stockholders' equity</b>	<b>727</b>	<b>720</b>	<b>870</b>	<b>865</b>	<b>1,228</b>	<b>1,241</b>	<b>1,359</b>	<b>1,512</b>	<b>1,705</b>	<b>1,936</b>	<b>2,210</b>	<b>2,535</b>	<b>2,917</b>	<b>3,368</b>	<b>3,896</b>	<b>4,514</b>

9-29 Novanta Liabilities & Equity

	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Cash flows from operating activities</b>																
Consolidated net income	62	51	41	45	50	74	108	129	157	188	225	268	317	375	441	518
Adjustments to reconcile consolidated net income to net cash provided by operating activities:																
Depreciation and amortization	31	37	38	38	43	53	50	55	64	74	85	98	113	130	150	173
Provision for inventory excess and obsolescence	1	2	3	4	4	3	3	3	3	3	3	3	3	3	3	3
Deferred taxes	(3)	(6)	(4)	(4)	(4)	(19)	(20)	(22)	(25)	(29)	(34)	(39)	(45)	(52)	(59)	(69)
Write-off of unamortized deferred financing costs				-	-	1	1	1	1	1	1	1	1	1	1	1
Non-cash interest expense	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-
Inventory acquisition fair value adjustments	5	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-
Net gain (loss) from sale of property, plant and equipment	0	0	1	0	0	(0)	0	0	0	0	0	0	0	0	0	0
Loss (gain) from acquisition of businesses	(26)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Earnings from equity-method investment	(0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contingent consideration adjustments	0	-	0	(7)	(0)	(1)	-	-	-	-	-	-	-	-	-	-
Share-based compensation	5	8	9	23	26	23	26	29	33	38	44	50	58	66	76	88
Other	0	(0)	0	0	0	0	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities: net cash provided by operating activities:																
Accounts receivable	(2)	(1)	(4)	18	(25)	(23)	(8)	(16)	(25)	(29)	(33)	(38)	(44)	(50)	(58)	(67)
Prepaid expenses and other current assets	(2)	1	(2)	4	(3)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)
Inventory	(14)	(16)	(7)	22	(19)	(49)	(5)	(19)	(29)	(34)	(39)	(45)	(52)	(60)	(69)	(79)
Accounts payable, accrued expenses and other current liab	10	15	(15)	(14)	25	30	2	8	13	15	17	20	23	27	31	36
Income taxes payable and receivable	(3)	(1)	(5)	6	(0)	0	-	-	-	-	-	-	-	-	-	-
Other non-current assets and liabilities, net	(3)	(1)	5	3	(4)	(3)	(0)	0	0	(1)	(1)	(1)	(0)	(0)	(1)	(1)
Cash provided by operating activities — continuing operat	63	90	63	140	95	91	156	169	191	226	268	317	374	439	514	601
Cash provided by operating activities — discontinued operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operating activities	63	90	63	140	95	91	156	169	191	226	268	317	374	439	514	601
<b>Cash flows from investing activities</b>																
Purchases of investments																
Purchases of property, plant and equipment and intangible	(9)	(15)	(11)	(11)	(29)	(20)	(22)	(24)	(28)	(32)	(37)	(42)	(49)	(56)	(65)	(75)
Acquisition of businesses (net of cash acquired) and increa	(168)	(30)	(53)	(31)	(285)	(22)	(34)	(34)	(34)	(34)	(34)	(34)	(34)	(34)	(34)	(34)
Acquisition of assets	-	(2)	-	-	-	-	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Payment of contingent consideration related to acquisition of technology assets	-	-	-	(3)	(2)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Proceeds from sales of property, plant and equipment	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0
Cash provided by (used in) investing activities — continuin	(177)	(46)	(64)	(44)	(315)	(43)	(57)	(59)	(63)	(67)	(72)	(77)	(84)	(91)	(100)	(110)
Cash provided by (used in) investing activities — discontin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash provided by investing activities	(177)	(46)	(64)	(44)	(315)	(43)	(57)	(59)	(63)	(67)	(72)	(77)	(84)	(91)	(100)	(110)
<b>Cash flows from financing activities</b>																
Increase in debt	177	55	67	-	280	70	5	5	5	5	63	16	16	16	16	16
Repayment of debt	(27)	(75)	(51)	(35)	(32)	(59)	(5)	(5)	(5)	(5)	(63)	(16)	(16)	(16)	(16)	(16)
Payments of debt issuance costs	(1)	-	(3)	(2)	(1)	(2)	-	-	-	-	-	-	-	-	-	-
Purchase of common shares	(0)	(6)	(10)	(6)	-	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Dividends paid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payments of withholding taxes from share-based awards	(2)	(4)	(7)	(9)	(31)	(12)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)	(7)
Payments of contingent considerations	(3)	-	-	(1)	(2)	(46)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
Acquisition of noncontrolling interest	-	(31)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other financing activities	(1)	(1)	(0)	(1)	(1)	(1)	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities — continuing operations	143	(60)	(4)	(53)	213	(60)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
Cash provided by financing activities — discontinued operations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities	143	(60)	(4)	(53)	213	(60)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
Effects of exchange rate changes on cash and equivalents :	3	(2)	1	3	(0)	(5)	-	-	-	-	-	-	-	-	-	-
Net change in cash and equivalents and restricted cash	32	(18)	(3)	46	(8)	(17)	75	85	103	134	171	214	265	322	389	466

9-30 Novanta Cash Flow Statement

<b>Property, Plant &amp; Equipment</b>																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Beginning of period		62	65	78	79	87	103	117	133	151	171	194	220	249	283	321
Plus: Capital expenditures (Purchases of PP&E)	9	16	11	11	29	20	22	24	28	32	37	42	49	56	65	75
as % of revenue	1.7%	2.6%	1.7%	1.8%	4.1%	2.3%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
Less: Write downs (-ups), divestments or (acquisitions)		1	(13)	(18)	(10)	(36)	(15)	(17)	(20)	(22)	(25)	(29)	(33)	(37)	(42)	(48)
Less: Depreciation	10	11	12	27	30	40	23	26	29	34	39	45	52	60	69	80
<b>End of period</b>	<b>62</b>	<b>65</b>	<b>78</b>	<b>79</b>	<b>87</b>	<b>103</b>	<b>117</b>	<b>133</b>	<b>151</b>	<b>171</b>	<b>194</b>	<b>220</b>	<b>249</b>	<b>283</b>	<b>321</b>	<b>364</b>
		6.1%	18.5%	1.4%	11.1%	18.0%	13.4%	13.4%	13.4%	13.4%	13.4%	13.4%	13.4%	13.4%	13.4%	13.4%
Capex in % of depreciation	92.4%	141.7%	90.8%	38.7%	95.4%	49.2%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%
Overall reinvestment rate (capex, acquisitions in % of depreciation)		141.7%	202.2%	104.1%	129.1%	139.5%	160.0%	161.5%	160.5%	159.5%	158.5%	157.6%	156.6%	155.7%	154.8%	153.9%
<b>IMPUTING TOTAL DEPRECIATION &amp; AMORTIZATION</b>																
Amortization	21	26	26	11	13	13	27	30	34	40	46	53	61	70	81	93
as % of revenue	4.0%	4.2%	4.2%	1.9%	1.9%	1.5%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Depreciation &amp; Amortization - Total</b>	<b>31</b>	<b>37</b>	<b>38</b>	<b>38</b>	<b>43</b>	<b>53</b>	<b>50</b>	<b>55</b>	<b>64</b>	<b>74</b>	<b>85</b>	<b>98</b>	<b>113</b>	<b>130</b>	<b>150</b>	<b>173</b>
Total capex (Purchases of PP&E and intangibles)	9	16	11	11	29	20	20	23	26	30	35	40	46	53	61	71
Total capex in % of D&A	29.6%	43.8%	28.1%	27.5%	66.2%	37.0%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%

*9-31 Novanta Property, Plant & Equipment Schedule*

<b>Debt Schedule</b>																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Cash, marketable securities and short-term investments	100	82	79	125	117	100	175	260	363	497	668	882	1,147	1,469	1,858	2,324
<b>Revolver</b>																
Cash at beginning of period							100	175	260	363	497	668	882	1,147	1,469	1,858
Less: Minimum cash balance							79	87	101	116	134	155	178	205	237	273
Plus: Free cash flows generated during period (excl. STD)							70	80	98	130	108	198	248	306	373	450
<b>Cash available (needed) to pay down (draw from) STD</b>							<b>91</b>	<b>168</b>	<b>257</b>	<b>376</b>	<b>472</b>	<b>712</b>	<b>952</b>	<b>1,247</b>	<b>1,605</b>	<b>2,035</b>
<b>Revolver</b>																
Beginning of period							358	358	358	358	358	358	358	358	358	358
Draw / (paydown)																
Discretionary borrowing / (paydown)																
<b>End of period</b>						<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>	<b>358</b>
<b>Other Debt</b>																
Beginning of period							77	77	77	77	77	77	77	77	77	77
Scheduled repayments							(5)	(5)	(5)	(5)	(63)	(16)	(16)	(16)	(16)	(16)
Debt Refinancing							5	5	5	5	63	16	16	16	16	16
Additional long-term debt (for refinancing)							-	-	-	-	-	-	-	-	-	-
<b>End of period</b>						<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>	<b>77</b>

*9-32 Novanta Debt Schedule*

Interest Expense & Interest Income																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Total interest expense (from I/S)	(7)	(10)	(8)	(7)	(7)	(16)	(21)	(21)	(19)	(17)	(14)	(10)	(6)	(1)	6	13
<b>Short-term debt / Revolver</b>																
Weighted average interest rate						5.1%	5.4%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%
End of period balance						358	358	358	358	358	358	358	358	358	358	358
<b>Interest expense</b>						<b>(18)</b>	<b>(19)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>	<b>(20)</b>
<b>Long-term debt</b>																
End of period balance (from B/S)						77	77	77	77	77	77	77	77	77	77	77
Weighted average interest rate						5.1%	5.4%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%
<b>Interest expense</b>						<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>	<b>(4)</b>
<b>Interest rate on cash</b>																
Implied interest rate on cash, marketable securities and short-term investments							1.56%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%	1.81%
Interest income							2	4	6	8	11	14	18	24	30	38

9-33 Novanta Interest Expense & Interest Income

Retained Earnings																
	FY17A	FY18A	FY19A	FY20A	FY21A	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Beginning of period		(128)	(79)	(38)	6	57	131	238	367	523	711	935	1,202	1,519	1,893	2,333
Plus: Net income		49	41	45	50	74	108	129	156	188	224	267	317	374	440	517
Less: Dividends		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dividend payout ratio		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Less: Cancellation of shares		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other				(0)	(0)	0										
<b>End of period</b>		<b>(128)</b>	<b>(79)</b>	<b>(38)</b>	<b>6</b>	<b>57</b>	<b>131</b>	<b>238</b>	<b>367</b>	<b>523</b>	<b>711</b>	<b>935</b>	<b>1,202</b>	<b>1,519</b>	<b>1,893</b>	<b>2,333</b>
Share count (in mm)	2,168	2,168	2,168	2,168	2,053	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965

9-34 Novanta Retained Earnings

Free Cash Flows to the Firm													
	LTM	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E	
Revenue	870	861	914	1,012	1,166	1,345	1,551	1,788	2,062	2,378	2,742	3,162	
% growth			6.1%	10.7%	15.3%	15.3%	15.3%	15.3%	15.3%	15.3%	15.3%	15.3%	
EBITDA	163	156	199	228	267	312	364	424	492	572	664	769	
% margin	18.8%	18.1%	21.8%	22.6%	22.9%	23.2%	23.5%	23.5%	23.5%	23.5%	23.5%	23.5%	
EBITA	126	116	176	203	238	278	325	378	440	512	594	689	
% margin		13.5%	19.2%	20.0%	20.4%	20.7%	20.9%	21.2%	21.4%	21.5%	21.7%	21.8%	
EBIT	111	103	149	173	203	238	279	326	380	442	513	596	
% margin		12.0%	16.3%	17.1%	17.4%	17.7%	18.0%	18.0%	18.0%	18.0%	18.0%	18.0%	
Tax on EBIT		15	22	26	30	36	42	49	57	66	77	89	
Tax rate		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	
<b>NOPAT</b>		<b>88</b>	<b>127</b>	<b>147</b>	<b>173</b>	<b>203</b>	<b>237</b>	<b>277</b>	<b>323</b>	<b>375</b>	<b>436</b>	<b>507</b>	
Depreciation & amortization			50	55	64	74	85	98	113	130	150	173	
Changes in net working capital			(8)	(20)	(31)	(36)	(41)	(47)	(55)	(63)	(73)	(84)	
Capital expenditures			(22)	(24)	(28)	(32)	(37)	(42)	(49)	(56)	(65)	(75)	
as % of revenue			(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	(2.4%)	
<b>Free Cash Flows to the Firm (FCFF)</b>			<b>147</b>	<b>159</b>	<b>178</b>	<b>209</b>	<b>244</b>	<b>285</b>	<b>332</b>	<b>386</b>	<b>449</b>	<b>521</b>	
Net working capital (WC Assets - WC liabilities)		161	168	188	219	254	295	343	397	460	533	616	
as % of revenue		18.7%	18.4%	18.6%	18.8%	18.9%	19.0%	19.2%	19.3%	19.4%	19.4%	19.5%	

9-35 Novanta Free Cash Flows to the Firm

Cost of capital assumptions		Weights	WACC
Cost of debt	5.6%		
Tax rate	15.0%		
<b>Cost of debt (after tax)</b>	<b>4.8%</b>	<b>5.6%</b>	
			<b>7.8%</b>
Risk free rate	1.5%		
Beta	1.13		
Market risk premium	5.8%		
<b>Cost of equity</b>	<b>8.0%</b>	<b>94.4%</b>	

9-36 Novanta WACC Calculation

Present value of FCFF on 28 February 2023 (WACC 7.8%)											
	Valuation date	Stub Year	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Date for discounting cash flows	02/28/2023	08/31/2023	08/31/2024	08/31/2025	08/31/2026	08/31/2027	08/31/2028	08/31/2029	08/31/2030	08/31/2031	08/31/2032
Free Cash Flow to the Firm (FCFF)		123	159	178	209	244	285	332	386	449	521
stub year FCFF adjustment		83.6% of FY23E									
<b>Present value of FCFF</b>		<b>118</b>	<b>142</b>	<b>147</b>	<b>160</b>	<b>174</b>	<b>188</b>	<b>203</b>	<b>219</b>	<b>236</b>	<b>254</b>

9-37 Novanta Present Value of Free Cash Flows to the Firm

Total Enterprise Value (TEV) - Perpetual Growth Method	
Perpetual growth rate	3.1%
2032 FCFF x (1+PGR)	537
Terminal value in 1900	11,392
Present value of terminal value	5,553
Present value of explicitly forecasted cash flows	1,842
<b>Total enterprise value (TEV)</b>	<b>7,395</b>

in USD mm except growth rate and exit multiple

9-38 Novanta DCF Enterprise Value

Equity Value	
	PGR
<b>Enterprise Value</b>	<b>7,395</b>
<b>Gross debt and equivalents</b>	
Debt	435
Convertible debt	-
Preferred stock	-
Noncontrolling (minority) interests	-
<b>Nonoperating assets</b>	
Cash	100
Equity investments	-
Equity investments	-
<b>Net debt</b>	<b>335</b>
<b>Equity value</b>	<b>7,059</b>
Shares outstanding	36
<b>Equity value per share</b>	<b>196.59</b>

in USD mm except equity value per share

9-39 Novanta DCF Equity Value per Share

**Perpetual Growth Method Sensitivity Analysis - Equity value per share**

		PGR:				
		2.1%	2.6%	<b>3.1%</b>	3.6%	4.1%
WACC:	9.8%	115.5	121.4	128.1	135.9	145.1
	8.8%	137.9	146.3	156.2	168.0	182.4
	<b>7.8%</b>	168.3	181.1	<b>196.6</b>	215.8	240.1
	6.8%	212.1	232.8	259.2	293.7	340.9
	5.8%	280.0	317.4	368.5	442.8	560.2

9-40 Novanta DCF Sensitivity Analysis (Price per Share in USD)

Methodology	Worst	Base	Best
WACC	9.1%	7.8%	7.7%
	<i>Ibbotson &amp; Harrington MRP of 6.9%</i>	<i>KPMG MRP of 5.8%</i>	<i>Statista MRP of 5.6%</i>
Tax Rate	29.0%	15.0%	13.2%
	<i>Stated Statutory Rate</i>	<i>Novanta FY22A</i>	<i>Novanta Historical Average</i>
PGR	2.0%	3.1%	-
	Long Term Targeted Inflation Rate	US GDP Growth Rate	-

9-41 Novanta Various Valuation Input



9-42 Novanta Resulting Valuation Ranges Football Field (USD per share)

Name	Market capitalization (mm)	Enterprise value (EV)	Last Twelve Months (LTM)				Year 1 Forecast				Net debt
			Revenues	EBITDA	EBIT	Net Income	Revenues	EBITDA	EBIT	Net Income	
Novanta	5,608.1	5,943.5	860.9	156.2	103.0	74.0	913.6	198.9	148.9	108.5	335.4
OSI Systems	1,559.8	1,897.3	1,190.7	172.5	133.9	94.8	1,304.9	222.2	154.4	111.0	337.6
Han's Laser Technology	4,449.7	4,449.7	2,285.0	320.4	262.6	230.2	2,467.0	319.0	257.6	251.3	0.0
Carl Zeiss Meditec	12,036.3	12,075.9	2,103.2	487.7	410.7	329.0	2,321.6	537.8	469.6	335.2	39.6
Jenoptik	1,989.7	2,540.1	1,073.8	183.1	110.1	71.0	1,054.0	195.4	115.7	79.8	550.4
MKS Instruments	6,446.5	10,464.5	3,547.0	1,086.0	870.0	597.0	3,731.0	764.8	557.8	231.5	4,018.0
CTS Corp	1,371.5	1,298.3	586.9	289.0	103.0	79.3	615.4	138.2	106.4	81.8	(73.2)
IPG Photonics	5,869.6	4,708.0	1,430.0	526.6	294.2	255.5	1,433.0	389.5	295.2	235.7	(1,161.6)
Lumentum	3,686.0	4,397.6	1,830.0	314.9	93.8	28.6	1,954.4	521.4	433.4	409.3	711.6
Fabrinet	4,461.5	4,229.5	2,476.0	285.8	244.5	263.5	2,826.9	343.3	298.2	298.5	(232.0)
Cognex	8,181.7	7,781.5	1,006.0	288.3	268.7	228.9	930.4	233.0	201.7	187.3	(400.1)
Coherent	5,993.5	5,080.2	4,430.1	1,148.9	801.2	576.4	5,526.8	1,490.6	1,194.6	645.2	(913.3)
Barco	2,656.5	2,324.9	1,147.0	137.0	97.7	84.2	1,289.0	190.0	150.0	120.2	(331.6)
Renishaw	3,519.6	3,263.7	854.0	293.7	232.8	179.4	890.2	236.4	182.9	165.2	(255.9)
Allied Motion Technologies	685.8	655.2	503.0	67.0	41.5	30.0	556.7	77.5	55.4	38.6	(30.6)

9-43 Novanta Trading Comparables Company Overview

Name	Last Twelve Months (LTM)				Year 1 Forecast			
	EV / Revenues	EV / EBITDA	EV / EBIT	P/E	Revenues	EBITDA	EV / EBIT	P/E
Novanta	6.9	45.9	57.6	75.7	6.6	29.3	36.7	50.1
OSI Systems	1.6x	11.0x	14.2x	16.5x	1.5x	8.5x	12.3x	14.1x
Han's Laser Technology	1.9x	13.9x	16.9x	19.3x	1.8x	14.0x	17.3x	17.7x
Carl Zeiss Meditec	5.7x	24.8x	29.4x	36.6x	5.2x	22.5x	25.7x	35.9x
Jenoptik	2.4x	13.9x	23.1x	28.0x	2.4x	13.0x	22.0x	24.9x
MKS Instruments	3.0x	9.6x	12.0x	10.8x	2.8x	13.7x	18.8x	27.8x
CTS Corp	2.2x	4.5x	12.6x	17.3x	2.1x	9.4x	12.2x	16.8x
IPG Photonics	3.3x	8.9x	16.0x	23.0x	3.3x	12.1x	15.9x	24.9x
Lumentum	2.4x	14.0x	46.9x	128.9x	2.3x	8.4x	10.1x	9.0x
Fabrinet	1.7x	14.8x	17.3x	16.9x	1.5x	12.3x	14.2x	14.9x
Cognex	7.7x	27.0x	29.0x	35.7x	8.4x	33.4x	38.6x	43.7x
Coherent	1.1x	4.4x	6.3x	10.4x	0.9x	3.4x	4.3x	9.3x
Barco	2.0x	17.0x	23.8x	31.5x	1.8x	12.2x	15.5x	22.1x
Renishaw	3.8x	11.1x	14.0x	19.6x	3.7x	13.8x	17.8x	21.3x
Allied Motion Technologies	1.3x	9.8x	15.8x	22.9x	1.2x	8.5x	11.8x	17.8x
Top Quartile	3.2x	14.6x	23.6x	30.7x	3.2x	13.8x	18.5x	24.9x
Bottom Quartile	1.8x	9.7x	14.1x	17.0x	1.6x	8.8x	12.2x	15.4x
Median	2.3x	12.5x	16.5x	21.3x	2.2x	12.3x	15.7x	19.5x
Mean	2.9x	13.2x	19.8x	29.8x	2.8x	13.2x	16.9x	21.4x

9-44 Novanta Trading Comparables Multiple Overview

Companies	Date Completed	EV	Implied Equity Value	Revenue	EBITDA Margin	Next Twelve Months				LTM Revenue	LTM EBITDA	LTM EBIT	LTM Net Income	Last Twelve Months				
						Revenue	EBITDA	EBIT	PE					Revenue	EBITDA	EBIT	PE	
Schurter Holding AG (100% Stake)		554	554							324				1.7x				
SureWerx Inc. (100% Stake)	1/4/2023	640	640															
Oxford Instruments Plc (100% Stake)		2,316	2,393	440	22%	5.4x	25.1x	30.5x	39.9x	367	76	66	54	6.3x	30.6x	34.9x	44.1x	
Paramit Corporation	8/2/2021	1,000																
Mirion Technologies, Inc.				478	19%					718	165	(10)	68					
ISRA Vision Systems AG	6/12/2020	1,198	1,197	168	33%	7.1x	21.4x	32.2x	48.5x									
Exxelia Group		555		191	27%	2.9x	11.0x			125	23	18	17	4.4x	24.5x	31.2x		
e2v technologies plc	3/28/2017	804	782	338	22%	2.7x	12.1x	16.3x	20.4x	230	50	35	24	3.5x	15.9x	22.8x	32.7x	
Rofin-Sinar Technologies Inc.	11/7/2016	762	914	520	14%	1.5x	10.5x	13.6x	22.3x	491	63	48	33	1.6x	12.1x	16.0x	27.4x	
Custom Sensors & Technologies, Inc. (Sensing Portfolio)	12/1/2015	1,000		320	26%	3.1x	12.0x											
InnoVista Sensors	9/30/2014	900																
<b>Median</b>		852	848	338	22%	3.0x	12.1x	23.4x	31.1x	346	63	35	33	3.5x	20.2x	27.0x	32.7x	
<b>Average</b>						3.8x	15.4x	23.2x	32.8x	376	75	31	39	3.5x	20.8x	26.2x	34.7x	
<b>Top Quartile</b>		1,000	1,126	459	26%	4.9x	19.1x	30.9x	42.1x	460	76	48	54	4.4x	26.1x	32.1x	38.4x	
<b>Bottom Quartile</b>		670	675	255	20%	2.8x	11.3x	15.7x	21.8x	253	50	18	24	1.7x	15.0x	21.1x	30.1x	

Note: Multiples above 50 as well as negative values are excluded

Sources: Mergermarket, Refinitiv Eikon

### 9-45 Novanta Precedent Transactions Overview

ABB	Novanta		Merged Entity			
	FY22A	FY22A	Pro Forma Adjustments	FY22A		
<b>Assets</b>		<b>Assets</b>		<b>Assets</b>		
<b>Current assets</b>		<b>Current assets</b>		<b>Current assets</b>		
Cash and cash equivalents	4,156	Cash and cash equivalents	100	(2,180)	Cash and cash equivalents	2,077
Restricted cash	18				Restricted cash	18
Marketable securities and short-term investments	725				Marketable securities and short-term investments	725
Accounts receivable	6,858	Accounts receivable	138		Accounts receivable	6,996
Contract assets	954				Contract assets	954
		Prepaid income taxes and income taxes receivable	2		Prepaid income taxes and income taxes receivable	2
Inventories	6,028	Inventories	168		Inventories	6,196
Prepaid expenses	230				Prepaid expenses	230
Other current assets	505	Prepaid expenses and other current assets	13		Other current assets	518
Current assets held for sale and in discontinued operations	96				Current assets held for sale and in discontinued operations	96
<b>Total current assets</b>	<b>19,570</b>	<b>Total current assets</b>	<b>421</b>	<b>(2,180)</b>	<b>Total current assets</b>	<b>17,811</b>
<b>Non-current assets</b>		<b>Non-current assets</b>			<b>Non-current assets</b>	
Restricted cash, non-current	-				Restricted cash, non-current	-
Property, plant and equipment	3,911	Property, plant and equipment	103		Property, plant and equipment	4,014
Operating lease right-of-use assets	841	Operating lease right-of-use assets	43		Operating lease right-of-use assets	884
Goodwill	10,511	Goodwill	479	7,330	Goodwill	18,320
Other Intangible assets	1,406	Other Intangible assets	176		Other Intangible assets	1,582
Prepaid pension and other employee benefits	916				Prepaid pension and other employee benefits	916
Investments in equity-accounted companies	130				Investments in equity-accounted companies	130
Deferred tax assets	1,396	Deferred tax assets	15		Deferred tax assets	1,411
Other assets	467	Other assets	4		Other assets	471
Non-current assets held for sale and in discontinued operations	-				Non-current assets held for sale and in discontinued operations	-
<b>Total non-current assets</b>	<b>19,578</b>	<b>Total non-current assets</b>	<b>821</b>	<b>7,330</b>	<b>Total non-current assets</b>	<b>27,729</b>
<b>Total assets</b>	<b>39,148</b>	<b>Total assets</b>	<b>1,241</b>	<b>5,150</b>	<b>Total assets</b>	<b>45,539</b>

### 9-46 Consolidation of Assets and Pro Forma Adjustments

ABB	Novanta		Merged Entity	
	FY22A		FY22A	Pro Forma Adjustments
<b>Liabilities and Stockholders Equity</b>		<b>Liabilities and Stockholders Equity</b>		<b>Liabilities and Stockholders Equity</b>
<b>Current liabilities</b>		<b>Current liabilities</b>		<b>Current liabilities</b>
Accounts payable, trade	4,904	Accounts payable, trade	75	Accounts payable, trade
Contract liabilities	2,216			Contract liabilities
Short-term debt and current maturities of long-term debt	2,535	Current maturities of long-term debt	5	Short-term debt and current maturities of long-term debt
Current operating leases	220	Current operating leases	8	Current operating leases
Provisions for warranties	1,028			Provisions for warranties
Other provisions	1,171	Income taxes payable	13.66	Income taxes payable
Other current liabilities	4,323	Accrued expense and other current liabilities	63	Other provisions
Current liabilities held for sale and in discontinued operations	132			Other current liabilities
<b>Total current liabilities</b>	<b>16,529</b>	<b>Total current liabilities</b>	<b>165</b>	<b>Total current liabilities</b>
<b>Non-current liabilities</b>		<b>Non-current liabilities</b>		<b>Non-current liabilities</b>
Long-term debt	5,143	Long-term debt	431	Long-term debt
Non-current operating leases	651	Non-current operating leases	41	Non-current operating leases
Pension and other employee benefits	719			Pension and other employee benefits
Deferred tax liabilities	729	Deferred tax liabilities	17	Deferred tax liabilities
Other non-current liabilities	2,085	Income taxes payable	4	Income taxes payable
Non-current liabilities held for sale and in discontinued operations	20	Other non-current liabilities	6	Other non-current liabilities
<b>Total non-current liabilities</b>	<b>9,347</b>	<b>Total non-current liabilities</b>	<b>499</b>	<b>Total non-current liabilities</b>
<b>Total liabilities</b>	<b>25,876</b>	<b>Total liabilities</b>	<b>664</b>	<b>Total liabilities</b>
<b>Stockholders Equity</b>		<b>Stockholders Equity</b>		<b>Stockholders Equity</b>
Common shares (CHF 0.12 par value)	171	Common shares	424	Common shares (CHF 0.12 par value)
Additional paid-in capital	141	Additional paid-in capital	55	Additional paid-in capital
Retained earnings (Accumulated deficit)	20,082	Retained earnings (Accumulated deficit)	131	Retained earnings (Accumulated deficit)
Accumulated other comprehensive loss	(4,556)	Accumulated other comprehensive loss	(32)	Accumulated other comprehensive loss
Treasury stock (at cost)	(3,061)			Treasury stock (at cost)
<b>Total stockholders equity</b>	<b>12,777</b>	<b>Total stockholders equity</b>	<b>578</b>	<b>Total stockholders equity</b>
Noncontrolling interests	410			Noncontrolling interests
Redeemable noncontrolling interest	85			Redeemable noncontrolling interest
<b>Total liabilities and stockholders' equity</b>	<b>39,148</b>	<b>Total liabilities and stockholders' equity</b>	<b>1,241</b>	<b>Total liabilities and stockholders' equity</b>

9-47 Consolidation of Liabilities & Equity and Pro Forma Adjustments

ABB	Novanta		Merged Entity	
	FY22A		FY22A	FY22A
Sales of products	24,471	Sales	861	
Sales of services and other	4,975			Total Sales
<b>Total revenues</b>	<b>29,446</b>	<b>Total revenues</b>	<b>861</b>	<b>Total revenues</b>
Cost of sales of products	(16,804)			
Cost of services and other	(2,932)	Cost of revenue	(482)	Cost of revenue
<b>Total cost of sales</b>	<b>(19,736)</b>	<b>Total cost of revenues</b>	<b>(482)</b>	<b>Total cost of sales</b>
<b>Gross profit</b>	<b>9,710</b>	<b>Gross profit</b>	<b>378</b>	<b>Gross profit</b>
SG&A	(5,132)	SG&A	(159)	SG&A
Non-order related research and development expenses	(1,166)	Research and development and engineering expenses	(86)	Non-order related research and development expenses
Impairment of goodwill	-	Amortization of purchased intangibles	(26)	Impairment of goodwill
Other income (expense), net	(75)	Restructuring, acquisition and related costs	(4)	Other income (expense), net
<b>Income from operations</b>	<b>3,337</b>	<b>Income from operations</b>	<b>103</b>	<b>Income from operations</b>
Interest and dividend income	72	Interest income (expense), net	(16)	Interest income (expense) and dividends, net
Interest and other finance expense	(130)			
Losses from extinguishment of debt	-			Losses from extinguishment of debt
Non-operational pension (cost) credit	115	FX gains (losses), net	0	Non-operational pension (cost) credit
		Other income (expense), net	(0)	FX gains (losses), net
<b>Income from continuing operations before taxes</b>	<b>3,394</b>	<b>Income from continuing operations before taxes</b>	<b>87</b>	<b>Income from continuing operations before taxes</b>
Income tax expense	(757)	Income tax expense	(13)	Income tax expense
<b>Income from continuing operations, net of tax</b>	<b>2,637</b>	<b>Income from continuing operations, net of tax</b>	<b>74</b>	<b>Income from continuing operations, net of tax</b>
Income (loss) from discontinued operations, net of tax	(43)	Income (loss) from discontinued operations, net of tax	-	Income (loss) from discontinued operations, net of tax
<b>Net income</b>	<b>2,594</b>	<b>Net income</b>	<b>74</b>	<b>Net income</b>
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(119)	Net income attributable to noncontrolling interests and redeemable noncontrolling interests	-	Net income attributable to noncontrolling interests and redeemable noncontrolling interests
<b>Net income attributable to ABB</b>	<b>2,475</b>	<b>Net income attributable to ABB</b>	<b>74</b>	<b>Net income attributable to ABB</b>

9-48 Consolidation of Income Statement

ABB	Novanta		Merged Entity	
	FY22A		FY22A	FY22A
<b>Cash flows from operating activities</b>		<b>Cash flows from operating activities</b>		<b>Cash flows from operating activities</b>
Consolidated net income	2,594	Consolidated net income	74	2,668
Loss (income) from discontinued operations, net of tax	43	Loss (income) from discontinued operations, net of tax		43
Adjustments to reconcile consolidated net income to net cash provided by operating activities:		Adjustments to reconcile consolidated net income to net cash provided by operating activities:		
Depreciation and amortization	814	Depreciation and amortization	53	867
Impairment of goodwill	-	Impairment of goodwill	-	-
Changes in fair values of investments	(33)	Changes in fair values of investments	(33)	(33)
Pension and other employee benefits	(125)	Provision for inventory excess and obsolescence	3	3
Deferred taxes	(344)	Deferred taxes	(19)	(363)
		Write-off of unamortized deferred financing costs	1	1
		Non-cash interest expense	1	1
Losses from extinguishment of debt	-	Losses from extinguishment of debt	-	-
Loss from equity-accounted companies	102	Loss from equity-accounted companies	102	102
Net loss (gain) from derivatives and foreign exchange	(23)	Net loss (gain) from derivatives and foreign exchange	(23)	(23)
Net gain from sale of property, plant and equipment	(84)	Net gain from sale of property, plant and equipment	(84)	(84)
Net loss (gain) from sale of businesses	7	Net loss (gain) from sale of businesses	7	7
Fair value adjustment on assets and liabilities held for sale	-	Fair value adjustment on assets and liabilities held for sale	-	-
Share-based payment arrangements	-	Share-based payment arrangements	-	-
		Inventory acquisition fair value adjustments	0	0
		Net gain (loss) from sale of property, plant and equipment	(0)	(0)
		Loss (gain) from acquisition of businesses	-	-
		Earnings from equity-method investment	-	-
		Contingent consideration adjustments	(1)	(1)
		Share-based compensation	23	23
Other	66	Other	0	66
Changes in operating assets and liabilities: net cash provided by operating activities:		Changes in operating assets and liabilities: net cash provided by operating activities:		
Accounts receivable	(831)	Accounts receivable	(23)	(854)
Contract assets and liabilities	416	Contract assets and liabilities		416
Inventory	(1,599)	Prepaid expenses and other current assets	(1)	(1)
		Inventory	(49)	(1,648)
		Accounts payable, accrued expenses and other current liabilities	30	425
Accounts payable	395	Accrued liabilities	-	136
Accrued liabilities	136	Provisions	0	(70)
Provisions	(70)	Income taxes payable and receivable	0	(94)
Income taxes payable and receivable	(94)	Other non-current assets and liabilities, net	(3)	(39)
Other assets and liabilities, net	(36)			
Cash provided by operating activities — continuing operations	1,334	Cash provided by operating activities — continuing operations	91	1,425
Cash provided by operating activities — discontinued operations	(47)	Cash provided by operating activities — discontinued operations	-	(47)
Cash provided by operating activities	1,287	Cash provided by operating activities	91	1,378
<b>Cash flows from investing activities</b>		<b>Cash flows from investing activities</b>		<b>Cash flows from investing activities</b>
Purchases of investments	(321)	Purchases of investments	-	(321)
Purchases of property, plant and equipment and intangible assets	(762)	Purchases of property, plant and equipment and intangible assets	(20)	(782)
Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(288)	Acquisition of businesses (net of cash acquired) and increases in cost- and equity-accounted companies	(22)	(310)
Proceeds from sales of investments	697	Proceeds from sales of investments	0	697
Proceeds from maturity of investments	73	Proceeds from maturity of investments	0	73
Proceeds from sales of property, plant and equipment	127	Proceeds from sales of property, plant and equipment	0	127
Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	1,541	Proceeds from sales of businesses (net of transaction costs and cash disposed) and cost- and equity-accounted companies	0	1,541
Net cash from settlement of foreign currency derivatives	(166)	Net cash from settlement of foreign currency derivatives	0	(166)
Changes in loans receivable, net	320	Changes in loans receivable, net	0	320
		Acquisition of assets	-	-
		Payment of contingent consideration related to acquisition of technology assets	(1)	(1)
Other investing activities	(14)	Other investing activities	(1)	(14)
Cash provided by (used in) investing activities — continuing operations	1,207	Cash provided by (used in) investing activities — continuing operations	(43)	1,164
Cash provided by (used in) investing activities — discontinued operations	(226)	Cash provided by (used in) investing activities — discontinued operations	-	(226)
Cash provided by investing activities	981	Cash provided by investing activities	(43)	938
<b>Cash flows from financing activities</b>		<b>Cash flows from financing activities</b>		<b>Cash flows from financing activities</b>
Net changes in debt with maturities of 90 days or less	1,366	Net changes in debt with maturities of 90 days or less	70	1,366
Increase in debt	3,849	Increase in debt	(59)	3,919
Repayment of debt	(2,703)	Repayment of debt	(2)	(2,762)
		Payments of debt issuance costs	(2)	(2)
Delivery of shares	394	Delivery of shares	10	394
Purchase of treasury stock	(3,553)	Purchase of treasury stock	(10)	(3,563)
Dividends paid	(1,698)	Dividends paid	-	(1,698)
Cash associated with the spin-off of the Turbocharging Division	(172)	Cash associated with the spin-off of the Turbocharging Division	-	(172)
Dividends paid to noncontrolling shareholders	(99)	Dividends paid to noncontrolling shareholders	-	(99)
Proceeds from issuance of subsidiary shares	216	Proceeds from issuance of subsidiary shares	-	216
		Payments of withholding taxes from share-based awards	(12)	(12)
		Payments of contingent considerations	(46)	(46)
		Acquisition of noncontrolling interest	-	-
Other financing activities	6	Other financing activities	(1)	5
Cash used in financing activities — continuing operations	(2,394)	Cash used in financing activities — continuing operations	(60)	(2,454)
Cash provided by financing activities — discontinued operations	-	Cash provided by financing activities — discontinued operations	-	-
Cash used in financing activities	(2,394)	Cash used in financing activities	(60)	(2,454)
Effects of exchange rate changes on cash and equivalents and restricted cash	(189)	Effects of exchange rate changes on cash and equivalents and restricted cash	(5)	(194)
Net change in cash and equivalents and restricted cash	(315)	Net change in cash and equivalents and restricted cash	(17)	(332)

	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Total revenues	30,307	32,113	33,150	34,242	35,370	36,535	37,739	38,982	40,266	41,593	42,963
Total cost of sales	(20,218)	(21,637)	(22,174)	(22,738)	(23,315)	(23,906)	(24,693)	(25,507)	(26,347)	(27,215)	(28,112)
<b>Gross profit</b>	<b>10,088</b>	<b>10,477</b>	<b>10,976</b>	<b>11,504</b>	<b>12,055</b>	<b>12,629</b>	<b>13,045</b>	<b>13,475</b>	<b>13,919</b>	<b>14,378</b>	<b>14,851</b>
SG&A	(5,291)	(5,238)	(5,407)	(5,585)	(5,769)	(5,959)	(6,156)	(6,358)	(6,568)	(6,784)	(7,008)
Non-order related research and development expenses	(1,252)	(1,199)	(1,233)	(1,273)	(1,315)	(1,358)	(1,403)	(1,449)	(1,497)	(1,546)	(1,597)
Impairment of goodwill	(26)	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	(79)	55	-	-	-	-	-	-	-	-	-
<b>Income from operations</b>	<b>3,440</b>	<b>4,095</b>	<b>4,336</b>	<b>4,646</b>	<b>4,970</b>	<b>5,312</b>	<b>5,487</b>	<b>5,667</b>	<b>5,854</b>	<b>6,047</b>	<b>6,246</b>
Interest income (expense), net	(74)	(401)	(410)	(381)	(318)	(283)	(253)	(232)	(216)	(199)	(181)
Losses from extinguishment of debt	-	-	-	-	-	-	-	-	-	-	-
Non-operational pension (cost) credit	115	94	94	94	94	94	94	94	94	94	94
<b>Income from continuing operations before taxes</b>	<b>3,481</b>	<b>3,788</b>	<b>4,020</b>	<b>4,359</b>	<b>4,747</b>	<b>5,123</b>	<b>5,328</b>	<b>5,529</b>	<b>5,732</b>	<b>5,942</b>	<b>6,159</b>
Income tax expense	(757)	(947)	(1,005)	(1,090)	(1,187)	(1,281)	(1,332)	(1,382)	(1,433)	(1,486)	(1,540)
<b>Income from continuing operations, net of tax</b>	<b>2,724</b>	<b>2,841</b>	<b>3,015</b>	<b>3,269</b>	<b>3,560</b>	<b>3,842</b>	<b>3,996</b>	<b>4,147</b>	<b>4,299</b>	<b>4,457</b>	<b>4,619</b>
Income (loss) from discontinued operations, net of tax	(43)	-	-	-	-	-	-	-	-	-	-
<b>Net income</b>	<b>2,681</b>	<b>2,841</b>	<b>3,015</b>	<b>3,269</b>	<b>3,560</b>	<b>3,842</b>	<b>3,996</b>	<b>4,147</b>	<b>4,299</b>	<b>4,457</b>	<b>4,619</b>
Net income attributable to noncontrolling interests and redeemable noncontrolling interests	(119)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)	(129)
<b>Net income attributable to ABB</b>	<b>2,562</b>	<b>2,712</b>	<b>2,887</b>	<b>3,140</b>	<b>3,431</b>	<b>3,713</b>	<b>3,867</b>	<b>4,018</b>	<b>4,170</b>	<b>4,328</b>	<b>4,491</b>

9-49 Combined Entity Income Statement

	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Assets</b>											
<b>Current assets</b>											
Cash and cash equivalents	2,077	2,554	3,263	2,232	2,077	2,447	2,828	3,914	5,058	6,268	7,547
Restricted cash	18	-	-	-	-	-	-	-	-	-	-
Marketable securities and short-term investments	725	842	1,016	763	725	816	909	1,175	1,456	1,752	2,066
Accounts receivable	6,996	7,413	7,652	7,904	8,164	8,433	8,711	8,998	9,295	9,601	9,917
Contract assets	954	1,011	1,043	1,078	1,113	1,150	1,188	1,227	1,267	1,309	1,352
Prepaid income taxes and income taxes receivable	2	-	-	-	-	-	-	-	-	-	-
Inventories	6,196	6,531	6,693	6,863	7,038	7,216	7,454	7,699	7,953	8,215	8,485
Prepaid expenses	230	246	252	259	265	272	281	290	300	310	320
Other current assets	518	549	567	585	605	625	645	667	689	711	735
Current assets held for sale and in discontinued operation:	96	-	-	-	-	-	-	-	-	-	-
<b>Total current assets</b>	<b>17,811</b>	<b>19,146</b>	<b>20,486</b>	<b>19,684</b>	<b>19,987</b>	<b>20,958</b>	<b>22,016</b>	<b>23,971</b>	<b>26,017</b>	<b>28,166</b>	<b>30,422</b>
<b>Non-current assets</b>											
Restricted cash, non-current	-	-	-	-	-	-	-	-	-	-	-
Property, plant and equipment	4,014	4,177	4,393	4,597	4,786	4,958	5,110	5,240	5,343	5,418	5,460
Operating lease right-of-use assets	884	937	967	999	1,032	1,066	1,101	1,137	1,175	1,214	1,254
Goodwill	17,759	17,473	17,473	17,473	17,473	17,473	17,473	17,473	17,473	17,473	17,473
Other Intangible assets	1,582	1,770	1,861	4,220	3,327	2,856	2,803	1,912	1,830	1,749	1,673
Prepaid pension and other employee benefits	916	733	550	366	183	-	-	-	-	-	-
Investments in equity-accounted companies	130	130	130	130	130	130	130	130	130	130	130
Deferred tax assets	1,411	1,495	1,543	1,594	1,647	1,701	1,757	1,815	1,875	1,937	2,000
Other assets	471	518	518	518	518	518	518	518	518	518	518
Non-current assets held for sale and in discontinued opera	-	-	-	-	-	-	-	-	-	-	-
<b>Total non-current assets</b>	<b>27,168</b>	<b>27,232</b>	<b>27,435</b>	<b>29,898</b>	<b>29,095</b>	<b>28,702</b>	<b>28,892</b>	<b>28,225</b>	<b>28,344</b>	<b>28,438</b>	<b>28,507</b>
<b>Total assets</b>	<b>44,979</b>	<b>46,378</b>	<b>47,921</b>	<b>49,582</b>	<b>49,082</b>	<b>49,660</b>	<b>50,908</b>	<b>52,196</b>	<b>54,361</b>	<b>56,604</b>	<b>58,929</b>

9-50 Combined Entity Assets

	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Liabilities and Stockholders Equity</b>											
<b>Current liabilities</b>											
Accounts payable, trade	4,979	5,328	5,461	5,600	5,742	5,887	6,081	6,282	6,489	6,702	6,923
Contract liabilities	2,216	2,348	2,424	2,504	2,586	2,671	2,759	2,850	2,944	3,041	3,141
Short-term debt and current maturities of long-term debt	2,540	2,387	1,103	-	461	820	820	820	820	820	820
Current operating leases	228	241	249	257	266	275	284	293	303	313	323
Provisions for warranties	1,028	1,089	1,124	1,161	1,200	1,239	1,280	1,322	1,366	1,411	1,457
Income taxes payable	14	-	-	-	-	-	-	-	-	-	-
Other provisions	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171
Other current liabilities	4,386	4,647	4,798	4,956	5,119	5,287	5,462	5,642	5,827	6,019	6,218
Current liabilities held for sale and in discontinued operati	132	-	-	-	-	-	-	-	-	-	-
<b>Total current liabilities</b>	<b>16,694</b>	<b>17,213</b>	<b>16,330</b>	<b>15,649</b>	<b>16,545</b>	<b>17,351</b>	<b>17,857</b>	<b>18,379</b>	<b>18,919</b>	<b>19,477</b>	<b>20,053</b>
<b>Non-current liabilities</b>											
Long-term debt	10,741	9,446	10,730	9,553	7,773	6,648	5,846	5,846	5,846	5,846	5,846
Non-current operating leases	692	733	757	782	807	834	861	890	919	949	981
Pension and other employee benefits	719	719	719	719	719	719	719	719	719	719	719
Deferred tax liabilities	746	791	816	843	871	900	929	960	991	1,024	1,058
Income taxes payable	4	-	-	-	-	-	-	-	-	-	-
Other non-current liabilities	2,091	2,216	2,287	2,363	2,440	2,521	2,604	2,690	2,778	2,870	2,964
Non-current liabilities held for sale and in discontinued op	20	-	-	-	-	-	-	-	-	-	-
<b>Total non-current liabilities</b>	<b>15,013</b>	<b>13,904</b>	<b>15,309</b>	<b>14,259</b>	<b>12,611</b>	<b>11,621</b>	<b>10,959</b>	<b>11,104</b>	<b>11,253</b>	<b>11,408</b>	<b>11,567</b>
<b>Total liabilities</b>	<b>31,707</b>	<b>31,117</b>	<b>31,638</b>	<b>29,908</b>	<b>29,155</b>	<b>28,972</b>	<b>28,816</b>	<b>29,483</b>	<b>30,173</b>	<b>30,885</b>	<b>31,621</b>
<b>Stockholders Equity</b>											
Common shares	171	171	171	171	171	171	171	171	171	171	171
Additional paid-in capital	141	141	141	141	141	141	141	141	141	141	141
Retained earnings (Accumulated deficit)	20,082	21,042	22,063	23,174	24,388	25,702	27,071	28,493	29,968	31,500	33,089
Accumulated other comprehensive loss	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)	(4,556)
Treasury stock (at cost)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)	(3,061)
<b>Total stockholders equity</b>	<b>12,777</b>	<b>13,737</b>	<b>14,758</b>	<b>15,869</b>	<b>17,083</b>	<b>18,397</b>	<b>19,766</b>	<b>21,188</b>	<b>22,663</b>	<b>24,195</b>	<b>25,784</b>
Noncontrolling interests	410	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,525
Redeemable noncontrolling interest	85	-	-	-	-	-	-	-	-	-	-
<b>Total liabilities and stockholders' equity</b>	<b>44,979</b>	<b>46,378</b>	<b>47,921</b>	<b>47,302</b>	<b>47,763</b>	<b>48,894</b>	<b>50,107</b>	<b>52,196</b>	<b>54,361</b>	<b>56,604</b>	<b>58,929</b>

9-51 Combined Entity Liabilities & Equity

	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
<b>Cash flows from operating activities</b>											
Consolidated net income	2,594	2,841	3,015	3,269	3,560	3,842	3,996	4,147	4,299	4,457	4,619
Loss (income) from discontinued operations, net of tax	43	-	-	-	-	-	-	-	-	-	-
Adjustments to reconcile consolidated net income to net cash provided by operating activities:											
Depreciation and amortization	814	1,193	1,250	1,311	1,376	1,444	1,517	1,595	1,677	1,765	1,859
Impairment of goodwill	-	-	-	-	-	-	-	-	-	-	-
Changes in fair values of investments	(33)	-	-	-	-	-	-	-	-	-	-
Pension and other employee benefits	(125)	(132)	(137)	(141)	(146)	(151)	(156)	(161)	(166)	(172)	(177)
Deferred taxes	(344)	(365)	(376)	(389)	(401)	(415)	(428)	(442)	(457)	(472)	(488)
Losses from extinguishment of debt	-	-	-	-	-	-	-	-	-	-	-
Loss from equity-accounted companies	102	-	-	-	-	-	-	-	-	-	-
Net loss (gain) from derivatives and foreign exchange	(23)	-	-	-	-	-	-	-	-	-	-
Net gain from sale of property, plant and equipment	(84)	(51)	(53)	(52)	(52)	(55)	(58)	(54)	(54)	(54)	(55)
Net loss (gain) from sale of businesses	7	(55)	-	-	-	-	-	-	-	-	-
Fair value adjustment on assets and liabilities held for sale	-	-	-	-	-	-	-	-	-	-	-
Share-based payment arrangements	-	-	-	-	-	-	-	-	-	-	-
Other	66	-	-	-	-	-	-	-	-	-	-
Changes in operating assets and liabilities: net cash provided by operating activities:											
Accounts receivable	(831)	(417)	(239)	(252)	(260)	(269)	(278)	(287)	(296)	(306)	(316)
Contract assets and liabilities	416	75	43	45	47	49	50	52	53	55	57
Inventory	(1,599)	(335)	(162)	(170)	(174)	(178)	(238)	(246)	(254)	(262)	(271)
Accounts payable	395	349	132	139	142	145	194	200	207	214	221
Accrued liabilities	136	137	145	149	154	159	165	170	176	181	187
Provisions	(70)	-	-	-	-	-	-	-	-	-	-
Income taxes payable and receivable	(94)	-	-	-	-	-	-	-	-	-	-
Other assets and liabilities, net	(36)	(31)	(54)	(39)	(24)	(29)	(35)	(35)	(36)	(33)	(32)
Cash provided by operating activities — continuing operat	1,334	3,209	3,564	3,870	4,221	4,543	4,729	4,939	5,149	5,373	5,605
Cash provided by operating activities — discontinued oper	(47)	-	-	-	-	-	-	-	-	-	-
Cash provided by operating activities	1,287	3,209	3,564	3,870	4,221	4,543	4,729	4,939	5,149	5,373	5,605
<b>Cash flows from investing activities</b>											
Purchases of investments	(321)	-	-	-	-	-	-	-	-	-	-
Purchases of property, plant and equipment and intangible	(762)	(978)	(1,010)	(1,043)	(1,077)	(1,113)	(1,150)	(1,187)	(1,226)	(1,267)	(1,309)
Acquisition of businesses (net of cash acquired) and increa	(288)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)	(891)
Proceeds from sales of investments	697	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146
Proceeds from maturity of investments	73	84	84	84	84	84	84	84	84	84	84
Proceeds from sales of property, plant and equipment	127	92	92	92	92	92	92	92	92	92	92
Proceeds from sales of businesses (net of transaction costs)	1,541	1,397	-	-	-	-	-	-	-	-	-
Net cash from settlement of foreign currency derivatives	(166)	-	-	-	-	-	-	-	-	-	-
Changes in loans receivable, net	320	-	-	-	-	-	-	-	-	-	-
Other investing activities	(14)	(4)	(11)	(8)	(5)	(8)	(9)	(8)	(9)	(8)	(8)
Cash provided by (used in) investing activities — continuin	1,207	844	(591)	(621)	(653)	(691)	(728)	(765)	(805)	(845)	(887)
Cash provided by (used in) investing activities — discontini	(226)	-	-	-	-	-	-	-	-	-	-
Cash provided by investing activities	981	844	(591)	(621)	(653)	(691)	(728)	(765)	(805)	(845)	(887)
<b>Cash flows from financing activities</b>											
Net changes in debt with maturities of 90 days or less	1,366	(1,482)	-	-	-	-	-	-	-	-	-
Increase in debt	3,849	1,058	2,387	(2,086)	(1,319)	(306)	18	820	820	820	820
Repayment of debt	(2,703)	(1,058)	(2,387)	(193)	-	(461)	(820)	(820)	(820)	(820)	(820)
Delivery of shares	394	264	264	264	264	264	264	264	264	264	264
Purchase of treasury stock	(3,553)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)
Dividends paid	(1,698)	(1,752)	(1,865)	(2,029)	(2,217)	(2,399)	(2,499)	(2,596)	(2,695)	(2,797)	(2,902)
Cash associated with the spin-off of the Turbocharging Div	(172)	-	-	-	-	-	-	-	-	-	-
Dividends paid to noncontrolling shareholders	(99)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)	(90)
Proceeds from issuance of subsidiary shares	216	-	-	-	-	-	-	-	-	-	-
Other financing activities	6	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities — continuing operations	(2,394)	(3,459)	(2,090)	(4,534)	(3,761)	(3,391)	(3,526)	(2,822)	(2,920)	(3,022)	(3,127)
Cash provided by financing activities — discontinued oper	-	-	-	-	-	-	-	-	-	-	-
Cash used in financing activities	(2,394)	(3,459)	(2,090)	(4,534)	(3,761)	(3,391)	(3,526)	(2,822)	(2,920)	(3,022)	(3,127)
Effects of exchange rate changes on cash and equivalents	(189)	-	-	-	-	-	-	-	-	-	-
Net change in cash and equivalents and restricted cash	(315)	594	883	(1,284)	(193)	461	475	1,352	1,424	1,507	1,592

9-52 Combined Entity Cash Flow Statement

<b>Property, Plant &amp; Equipment</b>											
Period	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Beginning of period	4,045	4,014	4,177	4,393	4,597	4,786	4,958	5,110	5,240	5,343	5,418
Plus: Capital expenditures (Purchases of PP&E)	693	978	1,010	1,043	1,077	1,113	1,150	1,187	1,226	1,267	1,309
as % of revenue	2.3%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Less: Write downs (-ups), divestments or (acquisitions)	192	65	-	-	-	-	-	-	-	-	-
Less: Depreciation	532	751	793	839	888	941	997	1,058	1,123	1,192	1,267
<b>End of period</b>	<b>4,014</b>	<b>4,177</b>	<b>4,393</b>	<b>4,597</b>	<b>4,786</b>	<b>4,958</b>	<b>5,110</b>	<b>5,240</b>	<b>5,343</b>	<b>5,418</b>	<b>5,460</b>
Capex in % of depreciation	130%	130%	127%	124%	121%	118%	115%	112%	109%	106%	103%
<b>IMPUTING TOTAL DEPRECIATION &amp; AMORTIZATION</b>											
Amortization	282	442	457	472	487	503	520	537	555	573	592
as % of revenue	0.9%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
<b>Depreciation &amp; Amortization - Total</b>	<b>814</b>	<b>1,193</b>	<b>1,250</b>	<b>1,311</b>	<b>1,376</b>	<b>1,444</b>	<b>1,517</b>	<b>1,595</b>	<b>1,677</b>	<b>1,765</b>	<b>1,859</b>
Total capex (Purchases of PP&E and intangibles)	762	1,048	1,097	1,151	1,208	1,268	1,332	1,400	1,472	1,550	1,632
Total capex in % of D&A	94%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%

*9-53 Combined Entity Property, Plant & Equipment Schedule*

<b>Debt Schedule</b>											
Period	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Cash, marketable securities and short-term investments	2,802	3,396	4,279	2,995	2,802	3,263	3,737	5,090	6,514	8,021	9,613
<b>Commercial paper and revolver needs analysis (STD)</b>											
Cash at beginning of period		2,802	3,396	4,279	2,995	2,802	3,263	3,737	5,090	6,514	8,021
Less: Minimum cash balance		2,802	2,802	2,802	2,802	2,802	2,802	2,802	2,802	2,802	2,802
Plus: Free cash flows generated during period (excl. STD)		2,076	(1,504)	802	1,126	767	457	533	604	687	772
<b>Cash available (needed) to pay down (draw from) STD</b>		<b>2,076</b>	<b>(910)</b>	<b>2,279</b>	<b>1,319</b>	<b>767</b>	<b>918</b>	<b>1,468</b>	<b>2,893</b>	<b>4,399</b>	<b>5,991</b>
<b>Commercial paper and revolver (STD)</b>											
Beginning of period		1,448	-	910	-	-	-	-	-	-	-
Draw / (paydown)		(1,448)	910	(910)	-	-	-	-	-	-	-
Discretionary borrowing / (paydown)											
<b>End of period</b>	<b>1,448</b>	<b>-</b>	<b>910</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Long-term debt (LTD)</b>											
Beginning of period		11,833	11,833	11,833	9,553	8,234	7,467	6,665	6,665	6,665	6,665
Scheduled repayments		(1,058)	(2,387)	(193)	-	(461)	(820)	(820)	(820)	(820)	(820)
Debt Refinancing		1,058	2,387	193	-	461	820	820	820	820	820
Paydown of Acquisition Financing		-	-	(2,279)	(1,319)	(767)	(802)	-	-	-	-
<b>End of period</b>	<b>11,833</b>	<b>11,833</b>	<b>11,833</b>	<b>9,553</b>	<b>8,234</b>	<b>7,467</b>	<b>6,665</b>	<b>6,665</b>	<b>6,665</b>	<b>6,665</b>	<b>6,665</b>

*9-54 Combined Entity Debt Schedule*

<b>Interest Expense &amp; Interest Income</b>											
	FY22A	FY23E	FY24E	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	FY31E	FY32E
Total interest expense (from I/S)	(152)	(430)	(455)	(423)	(351)	(318)	(293)	(283)	(283)	(283)	(283)
<b>Short-term debt / Revolver</b>											
Weighted average interest rate	1.90%	2.15%	2.40%	2.50%	2.60%	2.70%	2.80%	2.90%	2.90%	2.90%	2.90%
End of period balance	1,448	-	910	-	-	-	-	-	-	-	-
<b>Interest expense</b>	<b>(28)</b>	<b>(16)</b>	<b>(11)</b>	<b>(11)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Long-term debt</b>											
End of period balance (from B/S)	11,833	11,833	11,833	9,553	8,234	7,467	6,665	6,665	6,665	6,665	6,665
Weighted average interest rate	3.3%	3.5%	3.8%	3.9%	4.0%	4.1%	4.2%	4.3%	4.3%	4.3%	4.3%
<b>Interest expense</b>	<b>(385)</b>	<b>(414)</b>	<b>(444)</b>	<b>(412)</b>	<b>(351)</b>	<b>(318)</b>	<b>(293)</b>	<b>(283)</b>	<b>(283)</b>	<b>(283)</b>	<b>(283)</b>
<b>Interest rate on cash</b>											
Implied interest rate on cash, marketable securities and s	(1.81%)	0.91%	1.16%	1.16%	1.16%	1.16%	1.16%	1.16%	1.16%	1.16%	1.16%
Interest income	(74)	28	45	42	34	35	41	51	68	85	103

*9-55 Combined Entity Interest Expense & Interest Income*

<b>Retained Earnings</b>											
	<b>FY22A</b>	<b>FY23E</b>	<b>FY24E</b>	<b>FY25E</b>	<b>FY26E</b>	<b>FY27E</b>	<b>FY28E</b>	<b>FY29E</b>	<b>FY30E</b>	<b>FY31E</b>	<b>FY32E</b>
Beginning of period	22,477	20,082	21,042	22,063	23,174	24,388	25,702	27,071	28,493	29,968	31,500
Plus: Net income	2,562	2,712	2,887	3,140	3,431	3,713	3,867	4,018	4,170	4,328	4,491
Less: Dividends	1,698	1,752	1,865	2,029	2,217	2,399	2,499	2,596	2,695	2,797	2,902
<i>Dividend payout ratio</i>	<i>66%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>	<i>65%</i>
Less: Cancellation of shares	2,864	-	-	-	-	-	-	-	-	-	-
Other	(395)	-	-	-	-	-	-	-	-	-	-
<b>End of period</b>	<b>20,082</b>	<b>21,042</b>	<b>22,063</b>	<b>23,174</b>	<b>24,388</b>	<b>25,702</b>	<b>27,071</b>	<b>28,493</b>	<b>29,968</b>	<b>31,500</b>	<b>33,089</b>
Share count	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965	1,965

*9-56 Combined Entity Retained Earnings*

<b>Free Cash Flows to the Firm</b>												
	<b>LTM</b>	<b>FY22A</b>	<b>FY23E</b>	<b>FY24E</b>	<b>FY25E</b>	<b>FY26E</b>	<b>FY27E</b>	<b>FY28E</b>	<b>FY29E</b>	<b>FY30E</b>	<b>FY31E</b>	<b>FY32E</b>
Revenue	30,603	30,307	32,113	33,158	34,267	35,429	36,650	37,934	39,288	40,717	42,231	43,837
% growth			6.0%	3.3%	3.3%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%
EBITDA	4,382	4,254	5,037	5,349	5,721	6,116	6,535	6,801	7,085	7,390	7,718	8,071
% margin		14.0%	15.7%	16.1%	16.7%	17.3%	17.8%	17.8%	17.8%	17.8%	17.8%	17.8%
EBITA	3,833	3,722	4,402	4,679	5,012	5,365	5,739	5,956	6,188	6,436	6,702	6,989
% margin		12.3%	13.7%	14.1%	14.6%	15.1%	15.7%	15.7%	15.8%	15.8%	15.9%	15.9%
EBIT	3,534	3,440	4,016	4,279	4,597	4,933	5,290	5,488	5,700	5,926	6,168	6,429
% margin		11.4%	12.5%	12.9%	13.4%	13.9%	14.4%	14.4%	14.4%	14.4%	14.4%	14.4%
Tax on EBIT		860	1,004	1,070	1,149	1,233	1,322	1,372	1,425	1,481	1,542	1,607
Tax rate		25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
<b>NOPAT</b>		<b>2,580</b>	<b>3,012</b>	<b>3,210</b>	<b>3,448</b>	<b>3,700</b>	<b>3,967</b>	<b>4,116</b>	<b>4,275</b>	<b>4,444</b>	<b>4,626</b>	<b>4,822</b>
Depreciation & amortization			1,021	1,069	1,124	1,182	1,245	1,313	1,386	1,464	1,550	1,643
Changes in net working capital			(38)	(65)	(78)	(84)	(90)	(109)	(118)	(128)	(140)	(153)
Capital expenditures			(873)	(913)	(957)	(1,003)	(1,053)	(1,106)	(1,163)	(1,225)	(1,290)	(1,361)
as % of revenue			(2.7%)	(2.8%)	(2.8%)	(2.8%)	(2.9%)	(2.9%)	(3.0%)	(3.0%)	(3.1%)	(3.1%)
<b>Free Cash Flows to the Firm (FCFF)</b>			<b>3,122</b>	<b>3,301</b>	<b>3,537</b>	<b>3,795</b>	<b>4,069</b>	<b>4,214</b>	<b>4,379</b>	<b>4,556</b>	<b>4,746</b>	<b>4,950</b>
Net working capital (WC Assets - WC liabilities)		838	876	941	1,019	1,102	1,193	1,301	1,419	1,548	1,687	1,840
as % of revenue		2.8%	2.7%	2.8%	3.0%	3.1%	3.3%	3.4%	3.6%	3.8%	4.0%	4.2%

*9-57 Combined Entity Free Cash Flows to the Firm*

<b>Present value of FCFF on 28 February 2023 (WACC 6.7%)</b>											
	<b>Valuation date</b>	<b>Stub Year</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>
Date for discounting cash flows	02/28/2023	08/31/2023	08/31/2024	08/31/2025	08/31/2026	08/31/2027	08/31/2028	08/31/2029	08/31/2030	08/31/2031	08/31/2032
Free Cash Flow to the Firm (FCFF)		2,610	3,301	3,537	3,795	4,069	4,214	4,379	4,556	4,746	4,950
<i>stub year FCFF adjustment</i>		<i>83.6% of FY23E</i>									
<b>Present value of FCFF</b>		<b>2,526</b>	<b>2,994</b>	<b>3,007</b>	<b>3,024</b>	<b>3,038</b>	<b>2,948</b>	<b>2,872</b>	<b>2,800</b>	<b>2,734</b>	<b>2,672</b>

*9-58 Combined Entity Present Value of Free Cash Flows to the Firm*

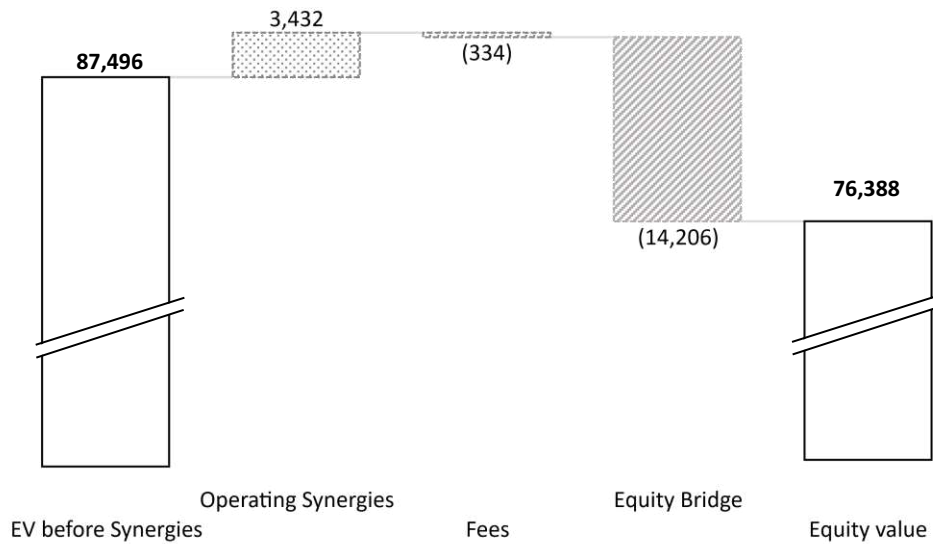
<b>Equity Value</b>	
	<b>PGR</b>
<b>Enterprise Value</b>	<b>93,548</b>
<b>Gross debt and equivalents</b>	
Debt	13,841
Convertible debt	-
Preferred stock	-
Noncontrolling (minority) interests	495
<b>Nonoperating assets</b>	-
Cash	-
Equity investments	130
Equity investments	-
<b>Net debt</b>	<b>14,206</b>
<b>Equity value</b>	<b>79,342</b>
Shares outstanding	1,984
<b>Equity value per share</b>	<b>39.99</b>

in USD mm except equity value per share

9-59 Merged Entity DCF Equity Value per Share

<b>Enterprise Value</b>		<b>ABB</b>	<b>Novanta</b>	
<b>DCF</b>	Perpetual Growth	82,722	7,395	
	Exit Multiple	80,991	n.m.	
<b>Average</b>		<b>81,856</b>	<b>7,395</b>	
<b>Trading Comparables</b>	<b>LTM</b>	EV/Revenues	90,400	1,971
		EV/EBITDA	75,077	1,951
		EV/EBIT	71,661	1,697
		P/E	77,672	1,908
	<b>NTM</b>	EV/Revenues	106,699	1,992
		EV/EBITDA	74,466	2,443
		EV/EBIT	74,791	2,341
		P/E	66,170	2,455
	<b>NTM ER Consensus</b>	EV/Revenues	81,066	n.m.
		EV/EBITDA	73,465	n.m.
		EV/EBITA	58,566	n.m.
		EV/EBIT	52,295	n.m.
P/E	59,811	n.m.		
<b>Average</b>		<b>74,011</b>	<b>2,095</b>	
<b>Precedent Transactions</b>	<b>LTM</b>	EV/Revenues	96,007	3,014
		EV/EBITDA	74,949	3,160
		EV/EBIT	76,955	2,779
		P/E	69,814	2,758
	<b>NTM</b>	EV/Revenues	80,795	2,771
		EV/EBITDA	80,099	2,400
		EV/EBIT	95,999	3,489
		P/E	100,889	3,709
	<b>Average</b>		<b>84,438</b>	<b>3,010</b>

9-60 Full Table of Valuation Results (USD mm)



9-61 Combined Entity Equity Bridge

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## Annual Reports

ABB Annual Report 2017	Novanta Annual Report 2017
ABB Annual Report 2018	Novanta Annual Report 2018
ABB Annual Report 2019	Novanta Annual Report 2019
ABB Annual Report 2020	Novanta Annual Report 2020
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