

# CORPORATE FINANCE FOR LONG-TERM VALUE

Chapter 9: Valuing public equity

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# The BIG Picture

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- Company valuation is at the core of corporate finance
- Listed companies are traded (and valued) in financial markets

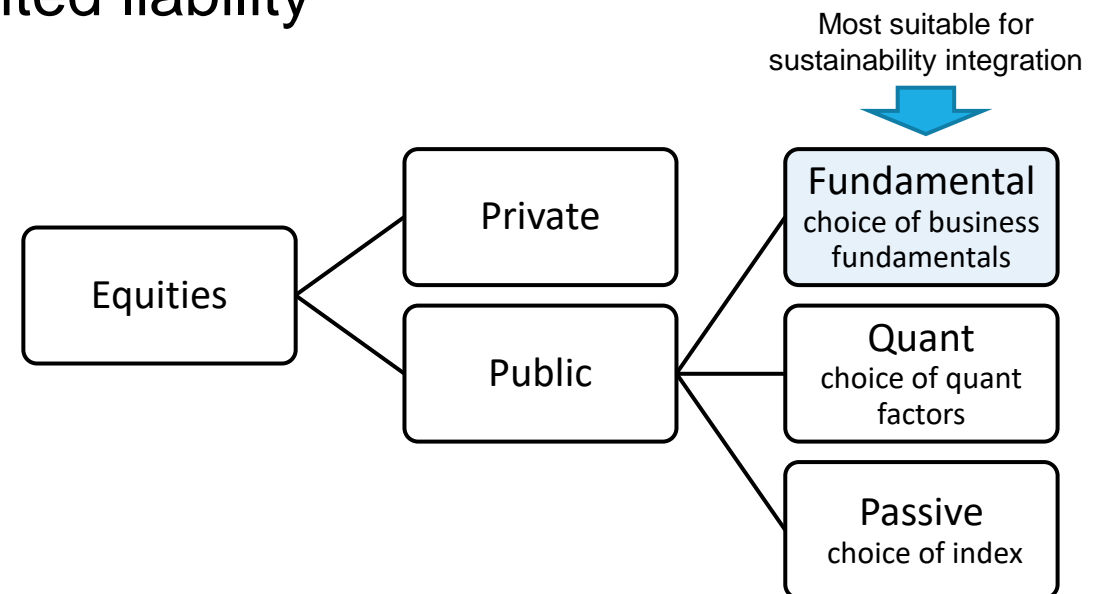
## Different methods

- While relative valuation methods rely on market metrics and efficient markets, absolute valuation brings a deeper (fundamental) understanding of companies
- Key is to assess a company's value drivers
- Fundamental methods are most suited for integrating S & E factors into equity valuation

# The public equity (or stock) market

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- Global stock markets reached a market capitalisation of \$106 trillion in 2021, which is about 125% of global GDP
- The joint stock company allows for the spreading of risk across many shareholders with residual claims and limited liability
- Classification of investment types:
  - **Active investing:** based on fundamental or quantitative analysis of the company
  - **Passive investing:** through indices or ETFs (Exchange Traded Funds)



# Allocation role

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- Trading in stock markets facilitates price discovery

## Puzzle of passive vs active investing

- Passive investing limits cost of analysis and trading (active investing adds 70bps), but also limits scope for societal allocation role of finance
- You need a minimum amount of active traders to get news into stock market prices (the so-called process of price discovery)
- What is appropriate balance between passive and active investing?

# Stock markets

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- Primary stock markets
  - New issues of stock are issued to investors
  - A firm's *initial public offering (IPO)* is their first listing on a stock exchange
  
- Secondary stock markets
  - Previously traded equities are traded again
  - If a firm sells new stock on an exchange, this is called a *seasoned equity offering (SEO)* or *secondary public offering (SPO)*

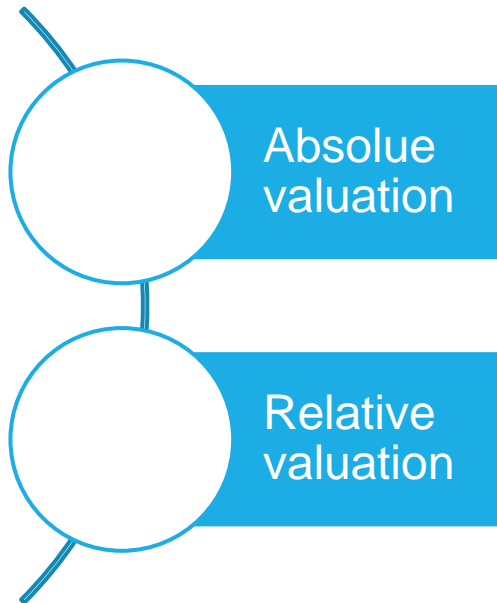
# Initial Public Offerings (IPOs)

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- Motives for IPOs:
  - To obtain funds to finance investments
  - Increased financial autonomy due to becoming less dependent on a single financial provider
  - Diversifies investment risk of owners
  - Increased recognition of company name
  - Better information and transparency due to disclosure requirements
  - Stock acts as disciplining mechanism for managers
- Disadvantages of IPOs:
  - Expensive procedure due to underwriters' commission, legal fees, etc.
  - Creates a larger gap between external investors and managers, which could lead to more agency problems
  - Increased exposure to scrutiny of shareholders focused on short-term gain

# Equity valuation

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$$V_0 = \frac{FCF_1}{(1 + WACC)} + \frac{FCF_2}{(1 + WACC)^2} + \dots + \frac{FCF_N + V_N}{(1 + WACC)^N}$$

$$P = EPS * \frac{P}{E}$$

## Abbreviations

$V$	Value
$FCF$	Free cash flow
$WACC$	Weighted average cost of capital
$P$	Stock price
$EPS$	Earnings per share
$E$	Earnings



# Equity valuation

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- Absolute valuation methods
  - Based on the company's cash flows, which are forecasted and then discounted at company's discount rate
  - Three main value drivers
    - **Sales**, which are composed into volumes and price
    - **Margins**, which are analysed by type of costs and before or after depreciation, taxes and interest paid (EBIT)
    - **Capital**, which is split into the cost of capital (discount rate) and the uses of capital (capex, working capital)
  
- Question – what is more important for valuation – cash flows or discount rate?
  - Academics – discount rate (capital)
  - Practitioners – cash flows (sales and margins)

# Enterprise value

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- The enterprise value is the market value of the company's underlying business before financing by equity and debt, and separate from any cash

$$V_0 = Equity_0 + Debt_0 - Cash_0$$

- It provides a comprehensive overview of the company's business activities, which helps to focus on a company's long-term value
- It highlights which activities contribute and negatively impact a company's future value, which can aid the company in its strategy setting

# Dividend-discount model

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- The dividend discount-model looks at cash flows to equity investors
  - First, the cash flow of the dividend received
  - Second, the cash flow from the sale of the stock at a future date
- Equation for stock price:  $P_0 = \frac{Div_1 + P_1}{1 + r_E}$ , where:
  - $Div_1$  is the net present value of dividends received during the year
  - $P_1$  is the stock price at the end of the year
  - $r_E$  is the cost of equity, which is the expected return of other investments in the market with similar risks
- Rewriting the formula:  $r_E = \frac{Div_1 + P_1}{P_0} - 1 = \frac{Div_1}{P_0} + \frac{P_1 - P_0}{P_0}$ 
  - Dividend yield
  - Capital gain

# Multi-year dividend-discount model

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- The stock price is equal to the present value of the expected dividends
- Assuming a constant dividend growth  $g$ , we get the following:

$$P_0 = \frac{Div_1}{(1+r_E)} + \frac{Div_1 \cdot (1+g)}{(1+r_E)^2} + \frac{Div_1 \cdot (1+g)^2}{(1+r_E)^3} + \dots = \sum_{n=1}^{\infty} \frac{Div_1 \cdot (1+g)^{n-1}}{(1+r_E)^n}$$

- If an investor receives growing dividends into perpetuity, the equation becomes:

$$P_0 = \frac{Div_1}{r_E - g} \leftarrow \text{Constant dividend growth model}$$

# Dividend payout ratio

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- The actual dividend depends on the payout ratio:

$$Div_t = \frac{\text{Earnings}_t}{\text{Shares outstanding}_t} \times \text{dividend payout ratio}_t = EPS_t \times \text{dividend payout ratio}_t$$

$EPS_t$  = earnings per share

- An updated dividend-growth model includes share repurchases

$$P_0 = \frac{PV(\text{total dividends and share repurchases})}{\text{Shares outstanding}_0}$$

- Share repurchases are exempt of dividend tax, and are thus an efficient way of rewarding shareholders
- The equity value is the present value of total dividends and share repurchases

$$Equity_0 = PV(\text{total dividends and share repurchases})$$

# The discounted cash flow (DCF) model

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- The DCF model values a company's assets based on their discounted future cash flows
- The starting point is the earnings before interest and taxes *EBIT*
- The company must pay corporate tax  $\tau$  on these earnings
- Deduct net investment (*CAPEX* – depreciation) and increases in net working capital *NWC*
- The free cash flow *FCF* of the company is:

$$FCF = EBIT \times (1 - \text{tax rate}) - CAPEX + \text{depreciation} - \text{increases in } NWC$$

# Free cash flows (FCF)

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- Free cash flows are to be distributed to financiers after all positive *NPV* investments have been done
- Use FCF instead of earnings, since earnings can be easily manipulated (i.e. through accruals and depreciation)
- Accruals are differences between net earnings and operational cash flow, where cash has not changed hands
- A company can increase depreciation to reduce (taxable) profits or decrease depreciation to show higher book profits to investors

# Weighted average cost of capital


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- The free cash flows can be discounted to obtain the enterprise / company value  $V_0$  at  $t = 0$ :

$$V_0 = \frac{FCF_1}{(1 + WACC)} + \frac{FCF_2}{(1 + WACC)^2} + \dots + \frac{FCF_N + TV_N}{(1 + WACC)^N}$$

- $WACC$  is the weighted average cost of capital, which is the rate of return demanded by the company's financiers (of both equity and debt)
- In the case of constant growth  $g$ :

$$V_0 = \frac{FCF_1}{WACC - g}$$

  
Same formula used to  
determine the terminal value

$$TV_N = \frac{FCF_{N+1}}{WACC - g}$$



# Assumptions in the DCF model

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- A *DCF* valuation crucially relies on assumptions to be made on future *FCF* and on the cost of capital *WACC*
  - Behavioural problem: analysts often extrapolate historical numbers into infinity
- Having determined a company's enterprise value  $V_0$ , the stock price  $P_0$  can be determined as follows:

$$P_0 = \frac{V_0 - Debt_0 + Cash_0}{\text{Shares outstanding}_0} = \frac{Equity_0}{\text{Shares outstanding}_0}$$

# DCF example

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*NOPLAT* = net operating profit less adjusted taxes



	WACC		TV growth														
	8%	8%	2%	2%	FY2019	FY 2020	FY 2021	FY 2022	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e
Sales growth	6%	11%	6%	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	2%
EBIT margin	11%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Tax rate	20%	21%	30%	29%	28%	28%	28%	28%	28%	28%	28%	28%	28%	28%	28%	28%	28%
Depreciation/sales	6%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
CAPEX/sales	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
NWC/sales	9%	9%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Sales	6233	6910	7348	7856	8327	8827	9357	9918	10513	11144	11813	12521	12772				
EBIT	691	807	906	937	993	1053	1116	1183	1254	1329	1409	1493	1523				
Taxes on EBIT	138	172	276	269	278	295	312	331	351	372	394	418	427				
<b>NOPLAT</b>	<b>553</b>	<b>635</b>	<b>630</b>	<b>668</b>	<b>715</b>	<b>758</b>	<b>804</b>	<b>852</b>	<b>903</b>	<b>957</b>	<b>1014</b>	<b>1075</b>	<b>1097</b>				
Depreciation	361	377	352	405	416	441	468	496	526	557	591	626	639				
Gross CF	914	1012	982	1073	1131	1199	1271	1348	1428	1514	1605	1701	1735				
CAPEX	399	430	458	472	500	530	561	595	631	669	709	751	639				
increase in NWC	37	33	32	28	40	42	44	47	50	53	56	59	21				
Gross investment	436	463	490	500	539	572	606	642	681	722	765	811	660				
<b>FCF</b>	<b>478</b>	<b>549</b>	<b>492</b>	<b>573</b>	<b>592</b>	<b>628</b>	<b>666</b>	<b>705</b>	<b>748</b>	<b>793</b>	<b>840</b>	<b>891</b>	<b>1076</b>				
<b>Terminal Value (TV)</b>																	
period, in years																	
Discount Factor																	
Present Value																	
Sum of Present Values: Enterprise Value (V)																	
Net debt																	
Equity value																	
Number of shares outstanding																	
Stock price																	
Current stock price																	
Implied upside																	
Net Working Capital (NWC)	566	599	631	659	699	740	785	832	882	935	991	1050	1071				
Invested Capital	3982	4068	4206	4301	4424	4554	4692	4838	4993	5158	5332	5517	5538				
<b>ROIC</b>	<b>14%</b>	<b>16%</b>	<b>15%</b>	<b>16%</b>	<b>17%</b>	<b>17%</b>	<b>18%</b>	<b>18%</b>	<b>19%</b>	<b>19%</b>	<b>20%</b>	<b>20%</b>	<b>20%</b>				

$$ROIC = \frac{NOPLAT}{CAPEX - depreciation + NWC}$$

↑  
 ROIC = return on invested capital



# DCF equity valuation – changed EBIT (previously 12%)

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	WACC		8%		TV growth		2%						
	FY2014	FY 2015	FY 2016	FY 2017	2018e	2019e	2020e	2021e	2022e	2023e	2024e	2025e	2026e
Sales growth	6%	11%	6%	7%	6%	6%	6%	6%	6%	6%	6%	6%	2%
EBIT margin	11%	12%	12%	12%	12%	13%	14%	15%	16%	16%	16%	16%	16%
Tax rate	20%	21%	30%	29%	28%	28%	28%	28%	28%	28%	28%	28%	28%
Depreciation/sales	6%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
CAPEX/sales	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	5%
NWC/sales	9%	9%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
<b>Sales</b>	6233	6910	7348	7856	8327	8827	9357	9918	10513	11144	11813	12521	12772
<b>EBIT</b>	691	807	906	937	993	1148	1310	1488	1682	1783	1890	2003	2043
<b>Taxes on EBIT</b>	138	172	276	269	278	321	357	417	471	499	529	561	572
<b>NOPLAT</b>	553	635	630	668	715	826	943	1071	1211	1284	1361	1442	1471
<b>Depreciation</b>	361	377	352	405	416	441	468	496	526	557	591	626	639
<b>Gross CF</b>	914	1012	982	1073	1131	1268	1411	1567	1737	1841	1951	2069	2110
<b>CAPEX</b>	399	430	458	472	500	530	561	595	631	669	709	751	639
<b>increase in NWC</b>	37	33	32	28	40	42	44	47	50	53	56	59	21
<b>Gross investment</b>	436	463	490	500	539	572	606	642	681	722	765	811	660
<b>FCF</b>	270	751	1022	1473	592	696	805	925	1056	1119	1187	1258	1450
	<b>Terminal Value (TV)</b>												24172
				<b>period, in years</b>	1	2	3	4	5	6	7	8	8
				<b>Discount Factor</b>	0.926	0.858	0.794	0.735	0.681	0.630	0.583	0.540	0.540
				<b>Present Value</b>	549	697	639	680	719	705	692	679	13056
				<b>Sum of Present Values: Enterprise Value (EV)</b>	18317								CV/EV 71%
				<b>Net debt</b>	1328								
				<b>Equity value</b>	16989								
				<b>Number of shares outstanding</b>	213								
				<b>Stock price</b>	79.8								
				<b>Current stock price</b>	60.2								
				<b>Implied upside</b>	32%								
<b>Net Working Capital (NWC)</b>	566	599	631	659	699	740	785	832	882	935	991	1050	1071
<b>Invested Capital</b>	3982	4068	4206	4301	4424	4554	4692	4838	4993	5158	5332	5517	5538
<b>ROIC</b>	14%	16%	15%	16%	17%	19%	21%	23%	25%	26%	26%	27%	27%

# Sensitivity analysis

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- A sensitivity analysis shows that ‘under reasonable assumptions’ the stock price can fluctuate between a range
  - Using DCF, Adidas’ stock price is €301.20 (based on 9% growth + 13% EBIT)
  - In the table below, assuming a ranging sales growth between 7% and 11% and EBIT margin between 11% and 15%, Adidas’ stock price can ‘reasonably’ fluctuate between €227.60 and €385.50

		Sales growth				
		7%	8%	9%	10%	11%
	11%	227.6	238.9	250.7	262.8	275.4
	12%	250.7	263.1	275.9	289.2	302.9
EBIT	13%	273.9	278.3	301.2	315.5	330.4
margin	14%	297.1	311.5	326.4	341.9	357.9
	15%	320.2	335.7	351.7	368.3	385.5

# Comparing absolute valuation methods

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Present value of ...	Determines the ...	Value
Dividend payments per share	Stock price	$P_0$
Total payouts (total dividends and share repurchases)	Equity value	$Equity_0$
Free cash flow (cash available to equity and debt holders)	Enterprise value	$V_0$

# Equity value multiples

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- In relative (or multiples) valuation, a stock value  $P_0$  is derived from the given value of another comparable stock

$$P_0 = EPS_0 * \frac{P}{E}$$

↑  
Company's EPS

← Peer group's  
P/E ratio

- A disadvantage of using the P/E ratio is that a company's current earnings can be distorted → use forward P/E ratio instead, which are the expected earnings over the next year
- Other method is the market price to book value ratio P/B, although this ratio fluctuates considerably making it imprecise and less reliable compared to P/E

# Enterprise value multiples

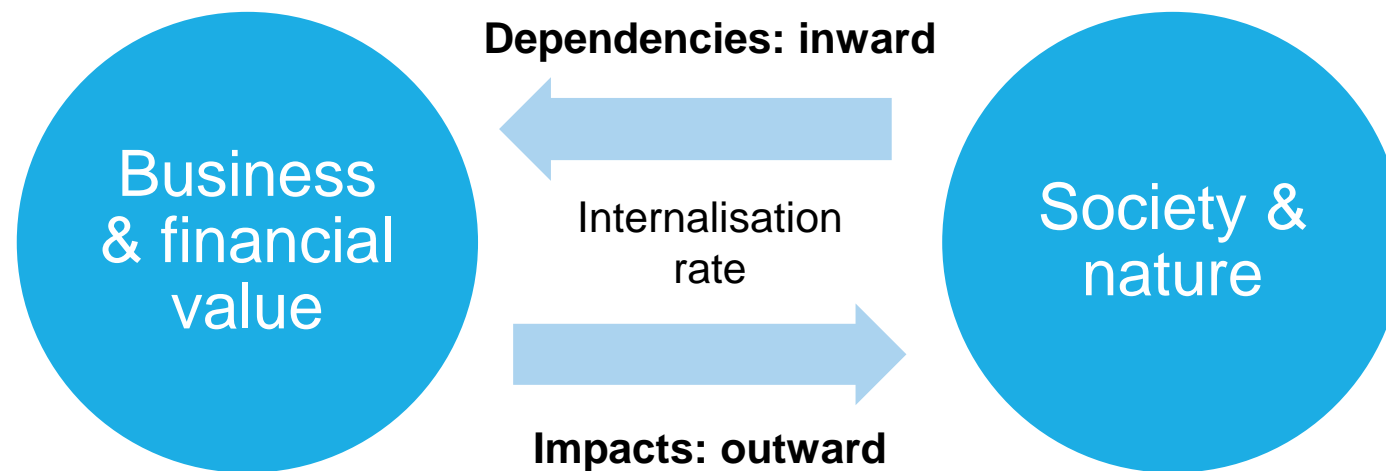
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- To compare companies with different leverage, multiples can be based on a company's enterprise value  $V$ , as this is the value before financing
- Indicator of earnings before payment to financiers: EBIT (Earnings Before Interest and Taxes)
- Indicator of earnings before payment to financiers and investments: EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization)
- Enterprise value  $V_0$  multiples formula:  $V_0 = EBITDA_0 * \frac{V}{EBITDA}$ 
  - ↑ Company's EBITDA
  - ← Peer group's enterprise value / EBITDA

# Integrating sustainability into value drivers

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- Adjusting value drivers on material sustainability issues allows for integration of sustainability into enterprise valuation
- The value-driver adjustment provides the inward perspective on sustainability and is financially driven





# Value driver adjustment (VDA) approach

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- Schramade's (2016) Value Driver Adjustment (VDA) approach splits enterprise valuation into value drivers:
  - **Sales**, composed into volumes and price
  - **Margins**, analysed by type of costs and before or after depreciation, taxes, and interest paid
  - **Capital**, split into the cost of capital (discount rate) and the uses of capital (capex, working capital)
- VDA approach highlights the company's sources of competitive advantage

# Value driver adjustment (VDA) approach

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- Three-step approach:
  1. Identify and focus on the most material issues
    - Perform materiality analysis of the industry
    - Plotting likelihood of impact of each issue against its likely size
  2. Analyse the impact of these material factors on the individual company
    - Assess company performance on material sustainability issues, both on absolute basis and relative to peers
  3. Quantify competitive advantages to adjust for value driver assumptions
    - Make deliberate adjustments to value drivers based on company's competitive (dis)advantages on material sustainability issues

# Example VDA approach for medical company

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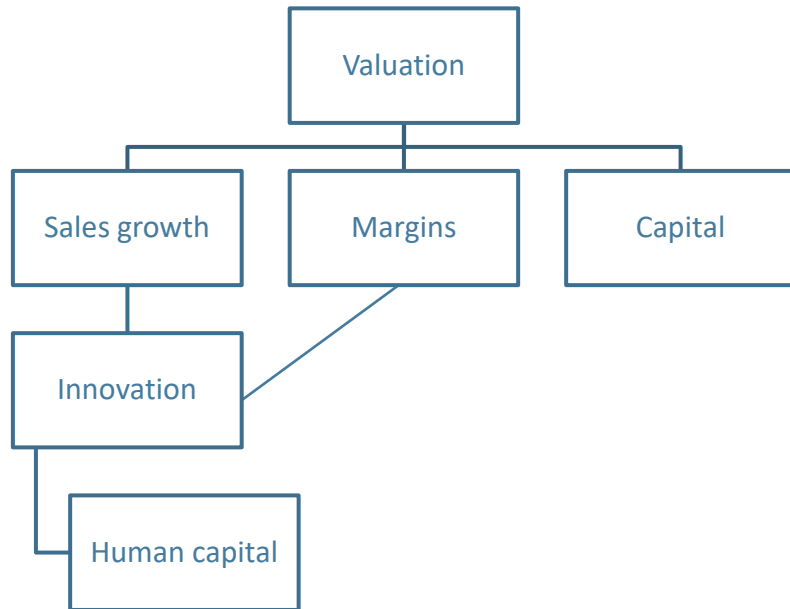
- Medical company assessed by analyst
  - ▣ Material issues: for industry - innovation, human capital, energy, circular economy
  - ▣ Performance: medtech's strengths - innovation, human capital & capital management
  - ▣ Value driver adjustments: sales +100bps; margins +200bps; capital 0bps (see table)
  - ▣ Net result: increase in target stock price from €39.3 to €48.1 (see table)

Value driver	Sales growth	Margins	Cost of capital	Target price
<b>Benchmark (performance excluding sustainability advantage)</b>	4%	13%	8%	€39.3
<b>Impact from sustainability factors</b>	Innovation: +100bps	Innovation and circularity/energy savings: +200bps	No impact: 0bps	€8.8 (22% higher value)
<b>Total</b>	5%	15%	8%	€48.1

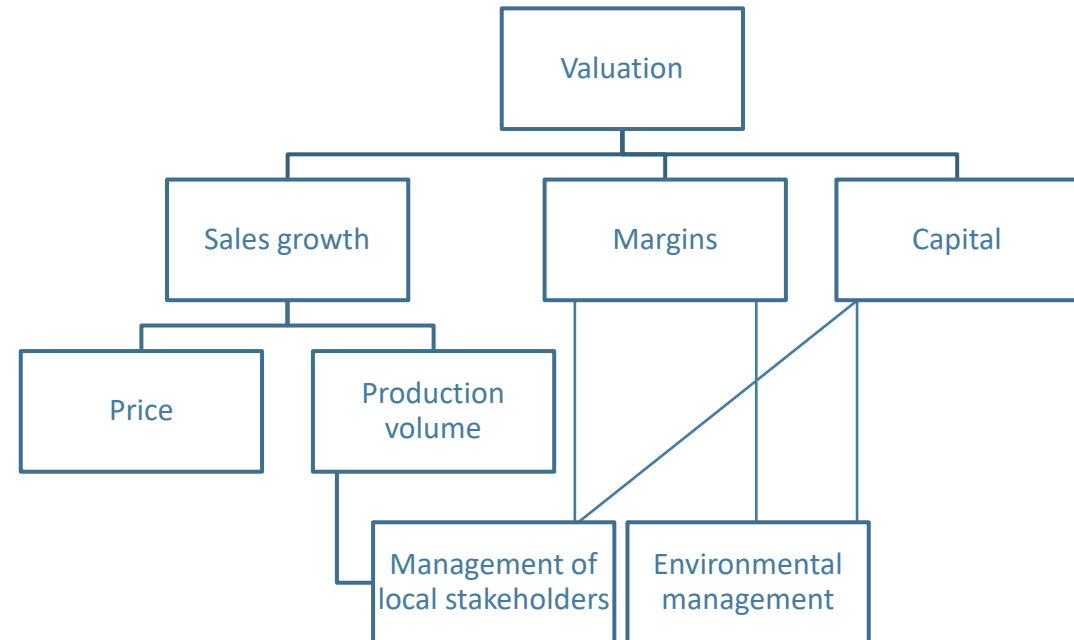
# Examples of value drivers

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## Novozymes



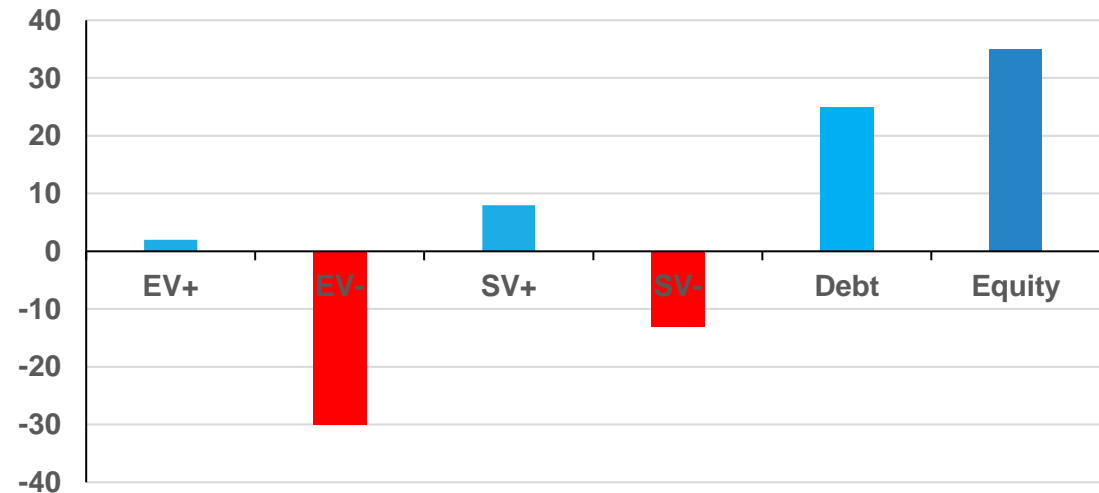
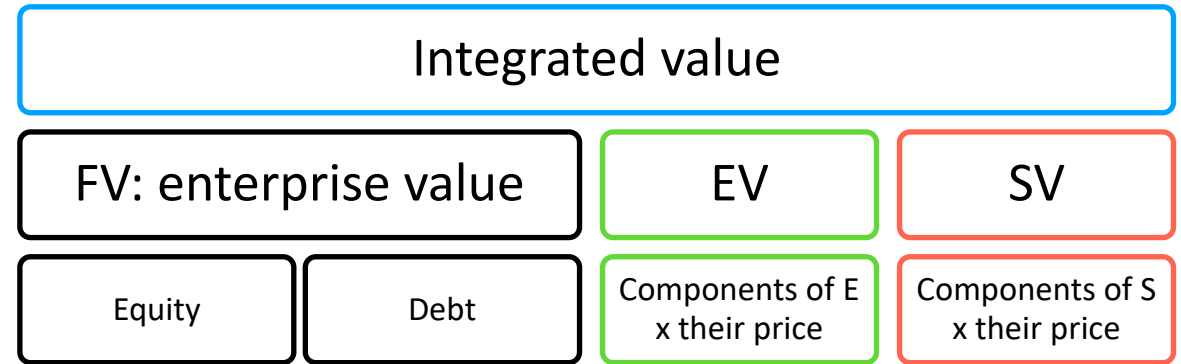
## Mining company



# Integrated value calculation

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- Graph shows IV and its components: FV, EV, SV
- Negative values of S and E raise risk of both debt and equity
- S and E factors can be internalised and spill over into financial value



# Case-studies integrated value calculation

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## Case-studies integrated value

- Ch6-7 – project valuation
- Ch11 – company valuation Inditex
  - ▣ Make DCF for enterprise value FV
  - ▣ Make DCF for SV + EV
  - ▣ Integrate numbers
- Ch18 – attempted take-over of Unilever by Kraft Heinz

Inditex IV calculation	Value (Euro billions)
<b>FV (enterprise value)</b>	79
<b>Positive SV</b>	283
<b>Negative SV</b>	-137
<b>Negative EV</b>	-183
<b>IV (integrated value)</b>	42

# Conclusions

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- To obtain a company's value, equity valuations either:
  - ▣ Look at a company's 'fundamentals' using *absolute valuation models* (e.g. DCF)
  - ▣ Compare a company to a similar company using *relative valuation models* (e.g. P/E ratio)
  
- As residual claimholders, equity investors have strong incentives to help companies achieve the conditions for integrated value creation
  
- Fundamental valuation methods - through a deeper understanding of a company's value drivers – are most suited to sustainability integration