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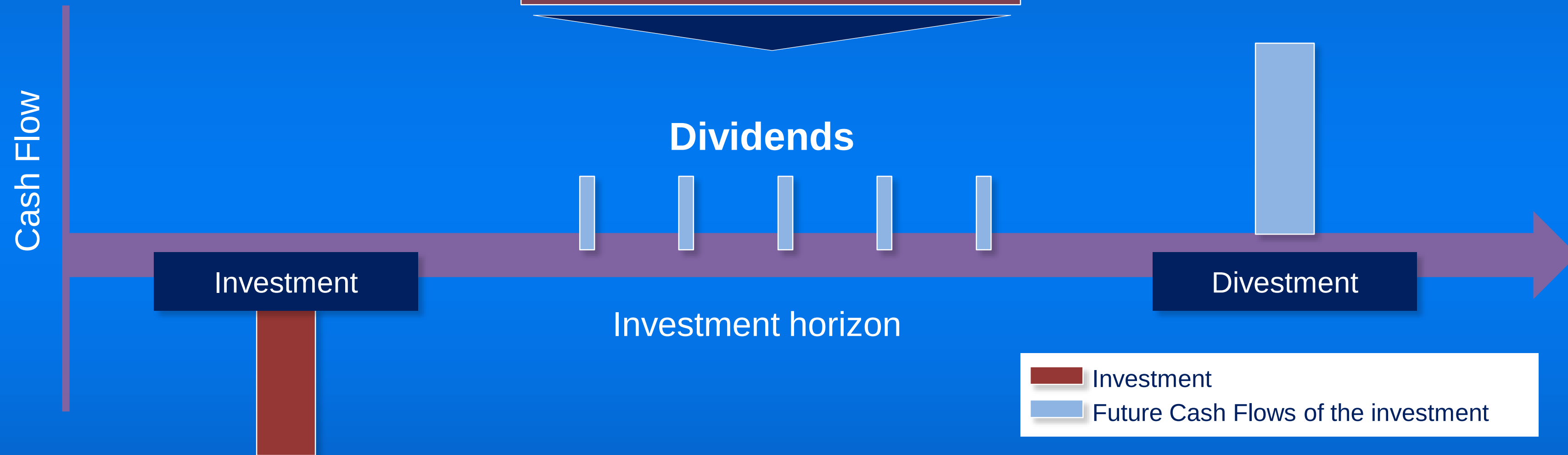
Company valuation

Why discounting future Cash Flows?

Let's consider that an investor wants to buy shares of a company

Primary goal? **Return on Investment**



The Investor buys the shares for a certain price based on his expectations for future Cash Flows deriving from the investment

Dividends are a function of future Cash Flows

Divestment price is a function of future Cash Flows

What drives company value?

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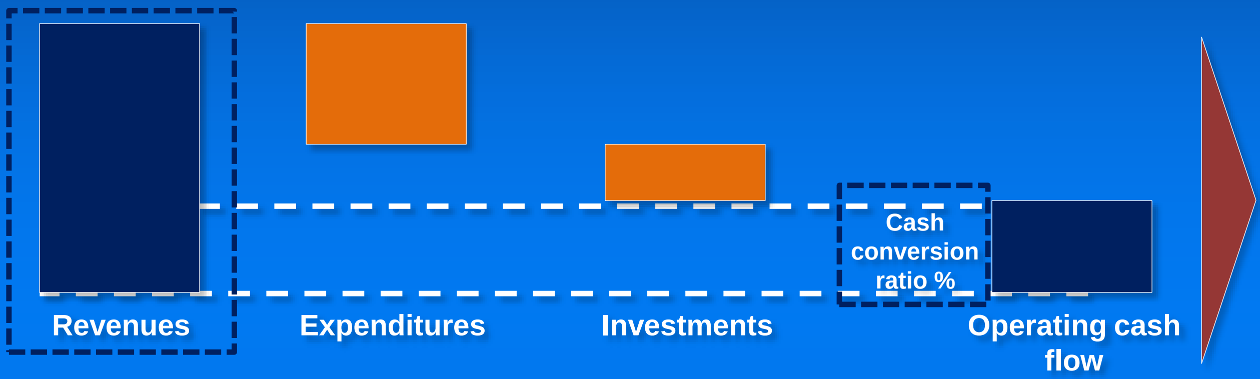
Given that a company's value is a function of its future cash flows we need to determine what drives future cash flows.

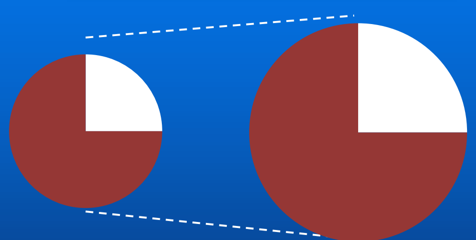


Two functions drive a firm's value in the future:

Growth

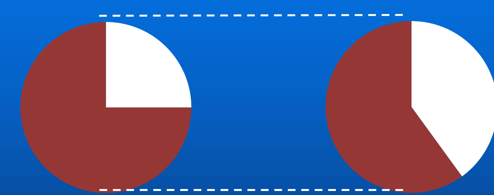
Profitability

1 **Why growth?**



- Bigger size
- Same conversion ratio

2 **Why profitability?**



- Same size
- Stronger conversion ratio

Higher future cash flows, higher valuation

Calculating Cash Flow: NOPAT

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1 **NOPAT (Net Operating Profit After Taxes) :**

$ in million	Year 1	Year 2	Year 3
Net Sales	17,022	18,341	18,549
Cost of goods sold	(9,483)	(9,822)	(9,857)
Gross Margin	**7,539**	**8,519**	**8,692**
Operating expenses	(3,492)	(4,394)	(4,123)
D&A	(487)	(511)	(693)
EBIT	**3,560**	**3,614**	**3,876**
Tax rate	35%	35%	35%
Operating taxes	(1,246)	(1,265)	(1,356)
NOPAT 1	**2,314**	**2,349**	**2,520**

NOPAT is a measure of operating profitability. It does not take into consideration financial structure. Interest expense is not included in the calculation above.

Calculating Cash Flow: Working Capital & Capex

2 Working Capital

$ in million	Year 1	Year 2	Year 3	DeltaY1-Y2	Calculate cash effect
Account receivables	3,621	4,174	3,492	-553	-(Receivables Y2-Receivables Y1)
Inventories	2,311	1,813	2,104	498	-(InventoriesY2-InventoriesY1)
Trade payables*	(3,383)	(4,207)	(3,212)	824	-(PayablesY2-PayablesY1)
Working Capital 2	**2,549**	**1,780**	**2,384**	**769**	

*Please note that Trade Payables are with a negative sign because they are a liability

3 Capital Expenditures

Capital expenditure is the cost which the company sustains in order to replace old PP&E or Acquire new PP&E.

A reasonable assumption is that a growing business will need additional PP&E investments.

4 Other assets and liabilities

Operating — Used for the generation of Operating Cash Flows; Could be modeled as a % of revenues

vs.

Non-operating — Not used for the generation of Operating Cash Flows; Their value (positive or negative) should be added/(subtracted) to Enterprise Value

Calculating Cash Flow

$ in million

NOPAT

Add-back D&A

▲ Working capital

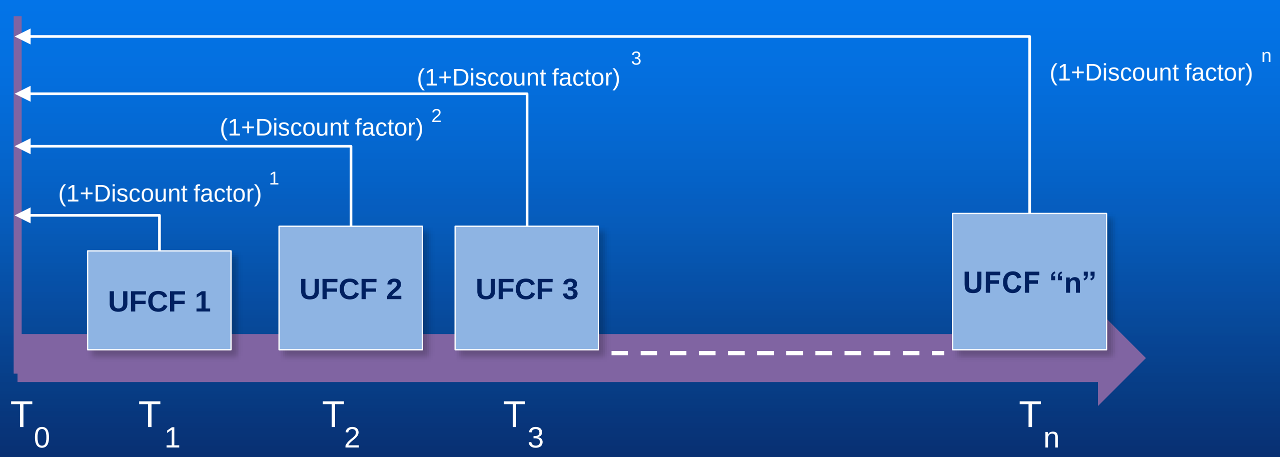
▲ Net other assets, liabilities

Capex

Unlevered Free Cash Flow

!Free Cash Flows are available to both debt and equity investors!

NOPAT	Net Operating Profit After Taxes is a measure of operating profitability
Add-back D&A	D&A is added back as it is not a Cash expense
Delta Working Capital	Growing a business requires investments in Receivables and Inventory and generates more Payables
Delta Net Other Operating assets	Similar to Working Capital. As a business grows it needs more other operating assets
Capex	Expenditure for PP&E used to replace old PP&E or acquire new PP&E in order to support the growth of the business



Finding a proper discount factor: WACC

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There are two types of financial investors in a firm

Debt investors

Equity investors

Free cash flow is available to both debt and equity investors

WACC
(Weighted average cost of capital)

Takes into consideration both debt and equity investors

WACC (*Weighted Average Cost of Capital*) represents the opportunity cost that investors sustain for investing their funds in the firm

$$WACC = \left(\frac{D}{D+E}\right) * k_d * (1-t) + \left(\frac{E}{D+E}\right) * k_e$$

D = Amount of debt financing

E = Amount of equity financing

k_d = Cost of debt

k_e = Cost of equity

t = Tax rate

Finding cost of equity and cost of debt

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	Methodology	Needed data	Practical implementation
Cost of debt	▪ **Market value of debt**	▪ **Bond current pricing**	Use the bond's Yield to Maturity
	▪ **Book value of debt**	▪ **Book value of Financial debt in BS** ▪ **Interest expense in P&L**	Divide Interest expense to the amount of Financial debt
Cost of equity	▪ **CAPM (Capital Asset Pricing Model)** $k_e = r_f + \beta * Market\ risk\ Premium$	▪ **Risk-free rate**	Use a 10 year government bond
		▪ **Market Risk Premium**	Studies show it is between 4.5% and 5.5%
		▪ **Company beta**	A measure of the stock's volatility in relation to the market. Available in financial platforms such as Bloomberg, Thomson Reuters etc.

Two stages of DCF

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	Stage 1		*Stage 2*
Present Value of Free Cash Flows =	Cash Flows in the Forecast period (5-10 years)	+	Continuing value (After forecast)

	Description	Needed data	Math formula
Forecast period (Stage 1)	The length of the explicit forecast period should allow the business to enter a steady state in its development	▪ Free Cash Flow Forecast (5 or 10 years ▪ WACC	$\frac{FCF_1}{(1+WACC)^1} + \frac{FCF_2}{(1+WACC)^2} + \frac{FCF_3}{(1+WACC)^3} + \frac{FCF_4}{(1+WACC)^4} + \frac{FCF_5}{(1+WACC)^5}$
Continuing Value (Stage 2)	Continuing Value is the period after the explicit forecast period. Often a large portion (>50%) of a company's valuation lies in its Continuing Value	▪ Free Cash Flow Forecast for 5th year ▪ WACC ▪ Perpetuity growth rate (g)	$\frac{\frac{FCF_5 * (1+g)}{(WACC-g)^1}}{(1+WACC)^5}$

From Enterprise Value to Equity Value

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	Present Value of Free Cash Flows	
+	Non-operating Assets	1
	Enterprise Value	
-	Financial debt	2
-	Debt-like items	3
	Equity Value	

1 Non-operating Assets: These are assets which are not used for the operating business of the company.

Non-operating real estate, personal cars, financial subsidiaries etc.

2 Financial debt: Interest-bearing financial debt

Debt to banks, Bond issues, Leases etc.

3 Debt-like items: Non-interest bearing liabilities which are not considered within Free Cash Flow

Provisions, Unfunded Pension liabilities, Liabilities from litigation, etc.