



# Modelling & Valuation

# Measuring Business Performance Using Financial Ratios

## Financial Ratios can be compared with

- Historical financial ratios (Trend Analysis)
- Budgeted financial ratios (Forecast Analysis)
- Industry-average ratios (Peer/Competitor Analysis)
- Cross-industry ratios
- Cross-country ratios



## Ways to look at financial ratios could be through either:

### Horizontal analysis

- Where we compare the year on year performance of a company
- We can review overall performance and establish any trends

### Vertical analysis

- Where we compare the performance of the firm against its peer group to gauge how well the firm is doing within its own industry

# Horizontal vs Vertical Analysis

## Ratio Analysis Trend Analysis

- **Vertical:**

- Select one item from the financial statement to be the base value, e.g. sales, net worth, etc.
- Calculate every value (including the base value) as a percentage of the base value (base value becomes 100) for that period
- Repeat the process for several periods to identify trends

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- **Horizontal:**

- Select one year as the reference or base year
- Calculate each value in subsequent years as a percentage of the corresponding value in the base year (base year value becomes 100)

# Horizontal vs Vertical Analysis

Feature	Vertical Analysis	Horizontal Analysis
Definition	Vertical analysis compares different components of a financial statement to the total value of that statement.	Horizontal analysis compares the same component of a financial statement across multiple periods.
Purpose	To determine the proportion of each item on a financial statement relative to the total amount.	To identify trends or changes in a company's financial performance over time.
Calculation	Each item on the financial statement is expressed as a percentage of the total value of that statement.	Each item on the financial statement is expressed as a percentage change from a base year or period.
Example	Comparing the cost of goods sold to the total revenue on an income statement.	Comparing the revenue from year to year on an income statement.
Focus	Focuses on the current financial statement, highlighting the relationship between the different components.	Focuses on the trend of a specific component over multiple periods, highlighting the change or growth.
Usefulness	Helps to identify any significant changes in the composition of the financial statement.	Helps to analyze the overall financial performance and growth of the company over time.

# Financial Ratio Analysis

- **Profitability**

How successful the business is in making return on investments

- **Liquidity/Accounting**

The quality and adequacy of current assets to meet current liabilities as they come due

- **Activity/Efficiency**

The efficiency with which the business uses its resources

- **Leverage/Financial risk ratio/ Solvency Ratio**

Business Ability to service its debt

- **Investor Ratio**

Investors' evaluation of business performance

# Profitability Ratio

Profitability ratios look at how well the company is performing:

**1. Revenue growth:**

$$\frac{\text{TY Revenues} - \text{LY Revenues}}{\text{LY Revenues}} \times 100\%$$

**2. Gross profit margin (GPM):**

$$\frac{\text{Gross Profit}}{\text{Sales}} \times 100\%$$

**3. Operating profit (EBIT) margin (OPM)**

$$\frac{\text{Operating Profit}}{\text{Sales}} \times 100\%$$

**4. Net profit (Net Income) margin (NPM)**

$$\frac{\text{Net Profit}}{\text{Sales}} \times 100\%$$



# Liquidity Ratio

**Liquidity ratios are designed to look at whether a firm can cover its liabilities in the short term, using its short term assets:**

## **1. Current ratio:**

$$\frac{\text{Current Assets}}{\text{Current Liabilities}} \times 100\%$$

Often the convention is to quote 2:1 i.e. the firm has 2x as many current assets as liabilities.

## **2. Liquid, Quick or Acid Test ratio:**

$$\frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \times 100\%$$

Efficiency ratios measure how efficiently the firm is managing its assets – both in the short and long term

1. Inventory days on hand (DOH) ratio
2. Payables DOH ratio
3. Receivables DOH ratio
4. Total asset turnover ratio
5. Fixed asset turnover ratio

# Efficiency Ratio/Activity Ratio

## The Days-on-Hand ratios tell you about:

- The length of time customers take to pay the company
- The length of time the company takes to pay its suppliers
- The length of time that inventory is held by the company before being sold

Receivable days	$\frac{\text{Accounts receivable}}{\text{Sales}} \times 365$
Payable days	$\frac{\text{Accounts payable}}{\text{Purchases}^*} \times 365$
Inventory days	$\frac{\text{Inventory}}{\text{Cost of goods sold}} \times 365$

\* Or use Cost of Goods Sold

# Efficiency Ratio/Activity Ratio

## 1. Asset Turnover ratio:

$$\frac{\text{Sales}}{\text{Total Assets}} \times 100\%$$

## 2. Fixed Asset Turnover ratio:

$$\frac{\text{Sales}}{\text{Fixed Assets}} \times 100\%$$

## Solvency ratios measure the firm's financial leverage and ability to meet its long-term obligations

- The two basic types of ratio are 'leverage' and 'coverage':
  - Leverage ratios tell you about the amount of debt in the company
  - Coverage ratios tell you about the ability of the company to meet its interest obligations
- There are many variations of how these ratios are calculated:
  1. Gearing and Leverage
  2. Interest coverage ratio

# Solvency Ratios

## 1. Gearing

$$\frac{\text{Debt}}{\text{Equity}} \times 100\%$$

All on-balance sheet short & long term debt e.g. o/d, CPLTD, Loans, Bonds, Commercial Paper

## 2. Leverage

$$\frac{\text{Total Liabilities}}{\text{Equity}} \times 100\%$$

Equity or Shareholders' Funds comprise of Share Capital, Share Premium, Retained Earnings & Reserves

Total Liabilities include all short and long term liabilities, so debt as above, plus payables, o/s tax & dividends, accrued expenses

## Interest coverage ratio

$$\frac{\text{EBIT}}{\text{Interest Paid}} \times 100\%$$

- The ratio tells us how many times the firm can cover its interest costs from profits
- Note use of pre-interest profits i.e. EBIT
- Many analysts now supplement this ratio with a cash flow metric, as the numerator as ultimately interest costs are paid in **cash**

- Investor ratios are largely concerned with the equity investor
- As analysts we use these ratios selectively, tending to focus on:
  1. EPS
  2. Dividend Payout rate
  3. ROE



# Return on Equity Breakdown

**Return on equity (ROE)** measures the returns to shareholders only.

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total Shareholders' Equity}}$$

- ROE can also be analysed through the **DuPont method**:

$$\text{ROE} = \frac{\text{Net income}}{\text{Total equity}} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Equity}}$$

↑                      ↑                      ↑  
Profitability      Efficiency      Leverage

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$$\frac{\text{Net Income}}{\text{Pretax Income}} \times \frac{\text{Pretax Income}}{\text{Op Income}} \times \frac{\text{Op Income}}{\text{Sales}}$$

# Financial Ratios: Limitations

- No single ratio has all the answers
- They are not that useful when viewed in isolation
- Differ for different industries
- Hard to determine a perfect peer group
- Inflationary effects / seasonality impact
- Firms can 'window dress' / gear up for end year date
- Impact of different accounting methods
- Mixed Industries are hard to read
- We need to be mindful of ratio overload

# Management's Reports & Views

# Management's Point of View

## Analyzing financial statements:

Management plays a crucial role in analyzing and interpreting financial statements to assess the company's financial performance, identify areas of improvement, and make informed business decisions.

## Accuracy and Transparency:

From the management's point of view, financial statements must be accurate and transparent to ensure that the company's financial position is correctly presented to stakeholders. This includes ensuring compliance with accounting standards and regulations.

## Focus on key performance indicators (KPIs)

Management typically focuses on specific KPIs such as revenue growth, profit margins, and cash flow to measure the company's financial performance and make strategic decisions. These KPIs may vary depending on the industry, company size, and other factors.

## Communication with stakeholders

Management is responsible for communicating financial information to stakeholders such as investors, creditors, and regulatory authorities. This includes preparing financial reports, holding investor meetings, and responding to inquiries from stakeholders.

## Continuous improvement

Management continually reviews and evaluates financial reports to identify areas for improvement and ensure that the company's financial position remains strong. This includes implementing internal controls, optimizing financial processes, and making strategic investments to support growth.

# Owner's Point of View

## Understanding profitability

Owners typically want to see the bottom line of the financial statements, including net income and profit margins. They want to understand how much money the business is making & how profitable it is.

## Evaluating cash flow

In addition to profitability, owners want to know how much cash is coming in and going out of the business. This information is important for making strategic decisions such as investing in new equipment or expanding the business.

## Assessing risk

Owners need to understand the risks that the business is facing, including both internal and external factors. This includes evaluating the financial health of the business and assessing any potential legal or regulatory risks.

## Identifying growth opportunities

Owners want to know how the business is performing in comparison to its competitors and what growth opportunities are available. They may also be interested in understanding the potential for expansion into new markets or product lines.

## Making informed decisions

Ultimately, owners want management reports and financial statements that provide them with the information they need to make informed decisions about the future of the business. This includes understanding financial performance, risks, and growth opportunities, as well as having access to clear, concise reports that are easy to understand.

# Lender's Point of View

## Creditworthiness assessment

Lenders analyze financial statements to evaluate the borrower's ability to repay the loan. They focus on factors such as liquidity, solvency, profitability, and cash flow.

## Risk assessment

Lenders assess the risk involved in lending to a particular borrower. They consider the industry, market trends, and economic conditions to determine the probability of default and the overall risk associated with the loan.

## Collateral evaluation

Lenders look at the collateral that the borrower has offered to secure the loan. They evaluate the value of the collateral, the marketability, and the ease of liquidation in case of default.

## Debt capacity analysis

Lenders analyze the borrower's debt capacity to ensure that the borrower can service the debt. They consider the borrower's debt-to-equity ratio, debt-to-income ratio, and other financial ratios to determine the borrower's debt capacity.

## Financial covenants

Lenders impose financial covenants on borrowers to ensure that the borrower maintains certain financial ratios and meets certain financial obligations. They monitor the borrower's financial performance and may take corrective actions if the borrower fails to meet the financial covenants.

Economic Value Added (EVA) is a measure of a company's financial performance that takes into account its cost of capital.

**EVA = Net Operating Profit after Tax - Cost of Capital**

- EVA helps management assess whether the company is creating value for its shareholders, as it takes into account the cost of capital that the shareholders have invested in the company.
- Net Present Value (NPV) is a method used to evaluate the profitability of an investment. It compares the present value of cash inflows generated by the investment to the present value of cash outflows required by the investment.
- NPV helps management assess whether an investment is worth pursuing, as it takes into account the time value of money and the opportunity cost of investing in a particular project.
- Both EVA and NPV are useful tools for management to evaluate the financial performance of a company and make informed decisions about future investments and strategic planning.



# Effective Models: Foundations

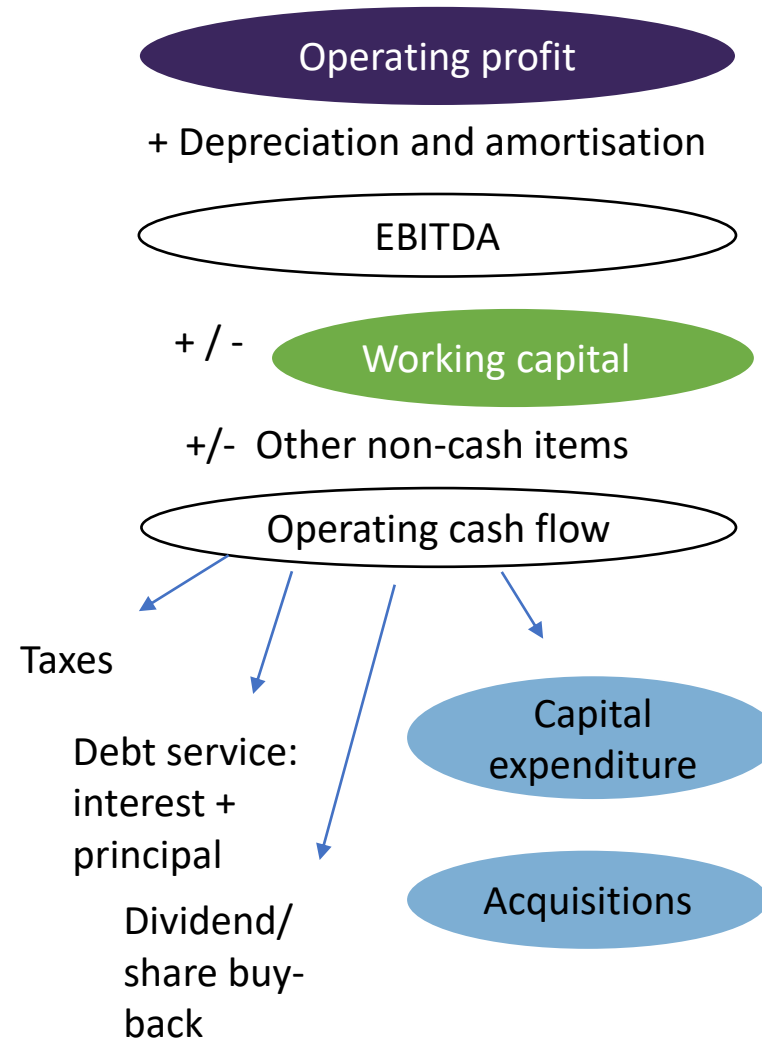
Analysis Framework

What are the main drivers?

Build a suitable model

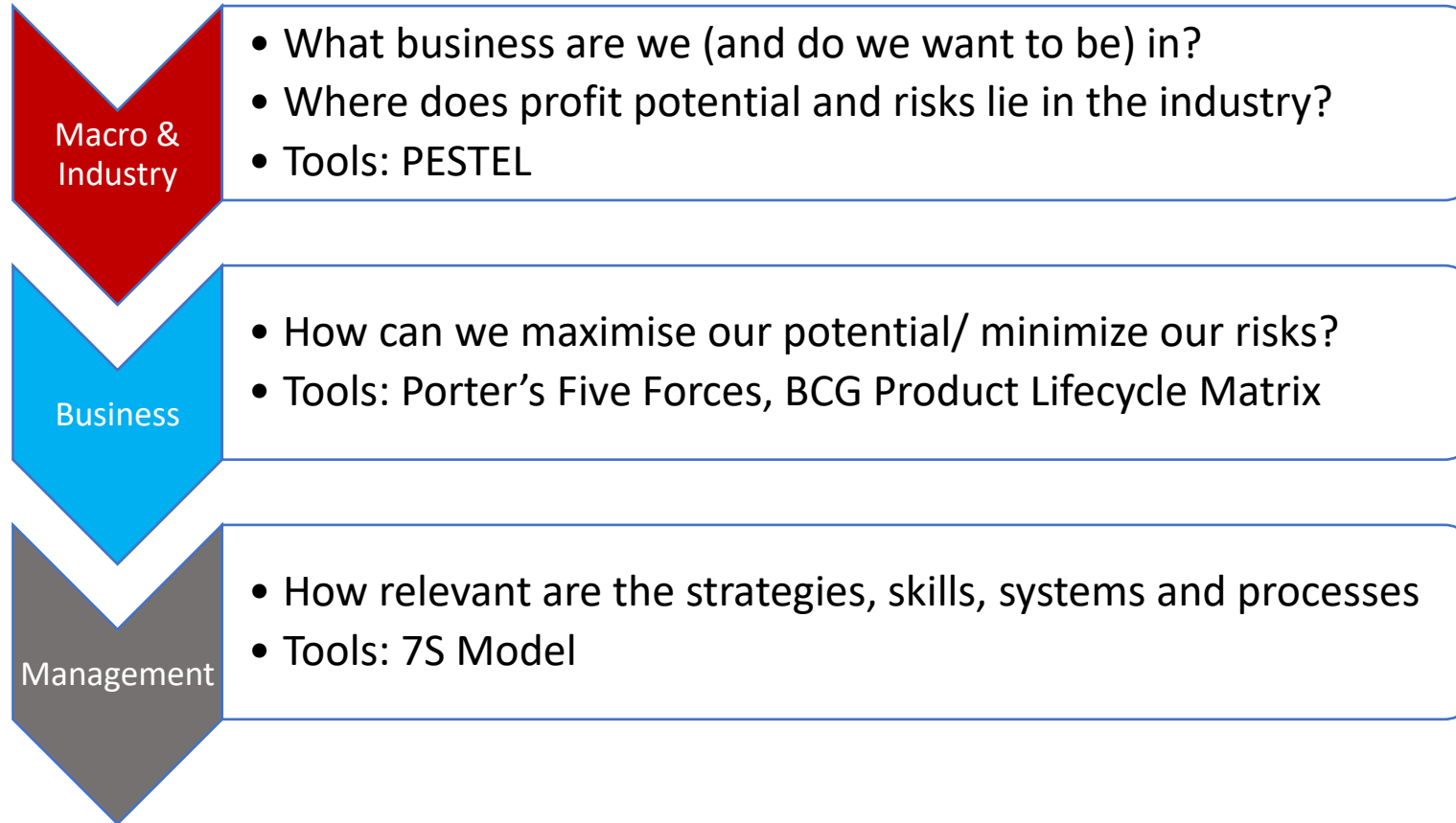
Develop assumptions

# Linking Profits to Cash Flow



# Analytical Framework

# Qualitative Analysis



# Sources of Qualitative Information

You are an analyst seeking to study the qualitative drivers for a sector/ an industry. What are the possible sources through which you could gather relevant information?

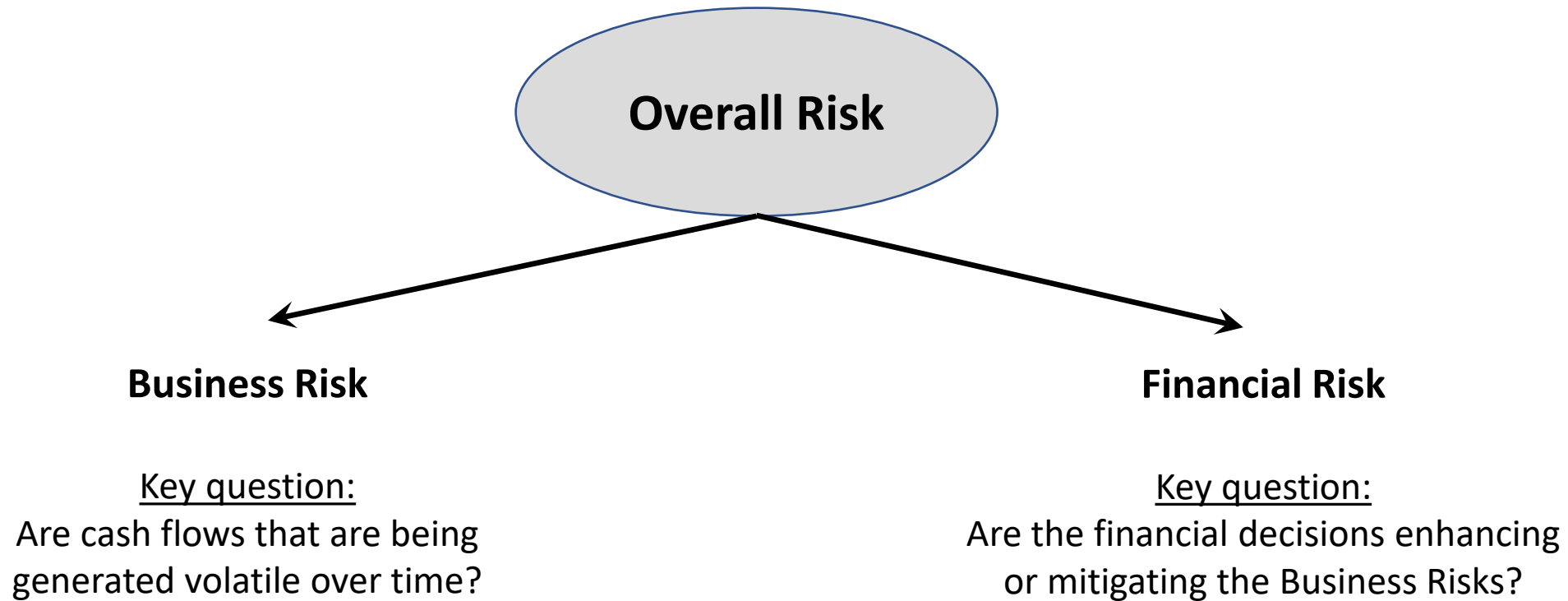
1. ....
2. ....
3. ....
4. ....
5. ....

The Annual Report is the primary public document used to disclose the company's business and financial performance?

## Question:

What are the various topics that you would expect to see in a Company's Annual Report?

# What does this tell us?



Capital Structure

Financial Control

Financial Reporting



## Key Consideration: The level and appropriateness of Debt

### Question: How much debt can be serviced given the projected cash?

- Having forecasted the financials for ABC Ltd, you assess that they are likely to generate an annual adjusted cash flow of AED 18.7 mln (operating cash flow less other business expenses related to taxes, dividends and capex) over the next 5 years.
- Based on these projections, you would like to assess the maximum debt that the company should be taking on assuming:
  - *Scenario 1: There are no covenants from the banking group*
  - *Scenario 2: The banking group insists on a minimum coverage ratio of 1.2x*
- The company's cost of debt is assumed to be unchanged at 6%, and its tax rate at 30%

# Debt Capacity: Inputs

## Cash flow available to service debt (existing and new debt)

EBITDA

+/- Change in net working capital (NTA/NWI)

- Taxation

- Capital expenditure

- Dividends

+/- Other principal sources and uses

**Cash available to service debt**

**Discount rate:** After tax cost of borrowing reflecting new capital structure

Discount rate = Interest rate (1 - Tax rate)

**Number of years:** Average tenor of existing and new debt

# Where can it go wrong?



## Country

- Chronic and growing public sector deficits
- Weakening external debt-servicing capacity
- Signs of asset price bubbles

## Economy

- Falling GDP growth
- Unemployment rates increasing
- Rising inflation or deflation
- Depreciation in exchange rates

## Industry

- Consistently poor capacity utilization in identified industry
- Poor industrial growth rate in identified industry
- Adverse industry regulations

# Where can it go wrong?



## Operations

- Steady decline or rapid increase in sales
- Significant changes in NWC
- Frequent cash shortages

## Management

- Poor sponsor reputation
- Lack of management vision
- Frequent changes in ownership and key positions

## Financial

- Declining gross profit margin
- Rising levels of bad debt losses
- Rising levels of total assets, relative to sales/profits

## Investing

- Seemingly speculative inventory purchases
- Major procurement without proper rationale/financing
- Working capital needs funded by asset sales

## Perception

- Less positive media exposure
- Equity market collapse
- Recall of sold products
- A decrease in awareness of the client's brand and/or logo

# Where can it go wrong?



## Financial Risks

- Inappropriate levels and cost of Debt
- Debt Repayment profile
- Balance Sheet Mismatch Risks
- Market (e.g, FX, Interest Rate) Risks
- Capital Market Access Risks

**Higher Risk of Financial Distress**

=

**Higher Probability of Default on Debt**

=

**Loss Absorption by Equity Investors**

# Estimating Debt Default Risk

**There are a variety of methodologies that help us evaluate default risk:**

- Rating agency ratings – Moody's, S&P, etc
- Quantitative calculators – e.g. Moody's analytics (KMV), Altman Z-Scores
- Asset swap, credit and credit default spreads (CDS)
- Fundamental Credit Analysis

# Altman Z-Score

- Scoring model to 'predict' probability of default (or bankruptcy)
- Scoring range of 1 to 4
- A low (Z) score (< 1.8) suggests a higher likelihood of default
- A high (Z) score (> 3) suggests credit safety
- Formulaic approach using a combination of:
  - Financial ratios
  - A weight assigned to each financial ratio

$$\text{Z-Score} = 1.2(\text{R1}) + 1.4(\text{R2}) + 3.3(\text{R3}) + 0.6(\text{R4}) + 1(\text{R5})$$

R1 = Working Capital/Total Assets

R2 = Retained Earnings/Total Assets

R3 = EBIT/Total Assets

R4 = MV of Equity/Total Liabilities

R5 = Total Sales/Total Assets

# Financial Risks: Creative Accounting

## Company

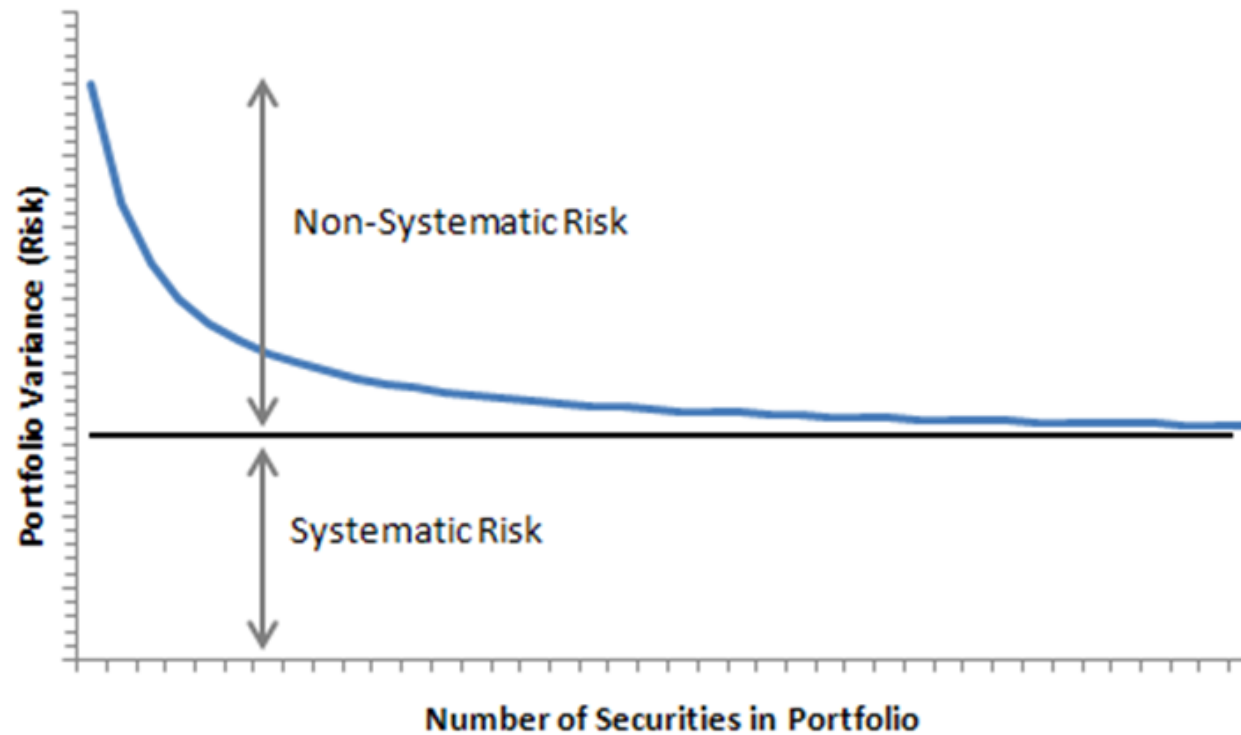
- A company with its accountant will have some discretion in how it reports revenues, costs, assets, etc.
- Management often seeks to show performance and financial condition in an optimistic, promising way

- What discretion or loopholes are available to management?
- Are there signs the company may be reporting results illegally?
- Are there signs management is misrepresenting financial condition
- Should analysts adjust reported information to account for true financial condition?



# The Investor Perspective

Question: What can investors do to manage the (business and financial) risks in their investee companies?



# Growth and Value Drivers

# Building Assumptions: Key Drivers

Historical Financials and Analysis

Forecasted Financials and Analysis



*Historical Drivers*

*Forecasted Drivers*

## **Incorporate:**

1. Macro-economic forecasts
2. Key Industry Drivers
3. Company specific position
4. Management Strategy

*Validate with industry benchmarks and other related financial variables*

# Selected Drivers

## Sales Revenues

- Division and geographic break-up, price vs volume, industry specific metrics (sales/sq feet)
- Consider industry factors, input prices, constraints, order books, etc

## Operating Profit

- Division and geographic break-up, opex/ sales and leverage, input price trends
- Consider industry factors, cost and pricing strategy, competition, business mix, etc

## Net Working Capital

- NWC/Sales, Days Ratios
- Consider historical efficiency, sales drivers, changes in industry environment, etc

## Capex and Depreciation

- Capex/Sales, Sales Turnover Ratios, Maintenance costs, Equipment costs, Useful life
- Consider historical trends, management strategy, capacity utilization, industry dynamics, etc

## Other Liabilities (Tax and Dividends)

- Tax Rates, Tax Credits/ Carry forwards/ Incentives, Dividend history and trends
- Shareholder configuration, Sector norms, payout rates, capital structure

## Long Term Debt

- Repayment profile of debt and lease commitments, CPLTD
- Consider prepayment requirements, capex and/or divestment plans

# Cleaning Data: Normalizing Earnings

Historical Data

Forecasted Numbers



## Key Question:

- Have we cleaned the data to remove items that may not be 'representative'?
- Do we have a clear estimate of the 'recurring' earnings of the business?

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**Recurring net income** is bottom line net profit adjusted for the post-tax impact of non-recurring items only

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This is then used to calculate normalised earnings per share measures which are used in valuation

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As for EBIT and EBITDA, there is subjectivity in deciding which items are non-recurring

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All non-recurring items adjusted in EBIT and EBITDA are also non-recurring for net income

# Example: Non-Recurring Income

Net income	X
Add back: post-tax non-recurring expenses	X
Deduct: post-tax non-recurring income	<u>(X)</u>
<b>Recurring net income</b>	<b>X</b>

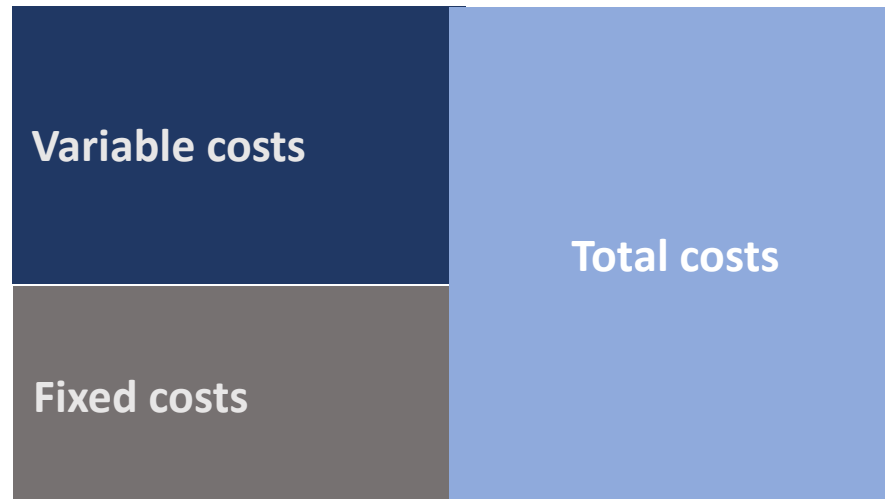
- Companies sometimes disclose the tax impact of non-recurring items
- If the tax impact has not been disclosed then use the companies **marginal tax rate** to estimate the tax effect of non-recurring items, if taxable

$$\text{Post-tax non-recurring item} = \text{Pre-tax non recurring item} * (1-MTR)$$

# Related Concept: Operating Leverage

## Examining fixed vs. variable costs (FC/TC, VC/TC)

- Understand the advantages of low fixed costs when sales decline
- Understand the advantages of low variable costs when sales increase





# Break-even analysis

- **Break-even sales**

- The level of sales required for a business to cover its fixed costs and make neither a profit nor a loss:

$$\frac{\text{Fixed costs}}{\text{Gross margin (decimal)}}$$

- To estimate fixed costs, assume these are:

$$\text{Gross profit} - \text{Profit before tax}$$

- **Margin of safety**

- The gap between current sales and break-even sales
- Expressed absolutely or as a percentage

$$\frac{\text{Sales} - \text{Breakeven}}{\text{Sales}}$$

- Is the company able to pass cost increases to customers (variable costs)?
- Does the company have leverage in reducing costs when sales decline?
- Is lack of demand reducing pricing and margins?

# Modelling Considerations

# Model Considerations

## Objective of the Model

- Valuation? Debt Repayment? Project Evaluation?

## Inputs and Outputs

- Primary and Secondary (Derived) Inputs
- Required Output Data and Visuals

## User-friendliness

- How easy is it to find information?
- How easy is it to understand the “logic”?
- How flexible is your model? A model is not an answer key, it is a tool. It should allow for changes in scenarios

# Model Components

- A set of financial statements – I/S, B/S, and CFS – including relevant details
  - Historical data
  - Forecast period
- To build the values for the forecast period, we need a set of Assumptions – one assumption for each line in the financial statements
- Ratios, summary tables, for analysis
- Cover worksheet

# Data Legends

- Models consists of historical data and your forecasts
- It is standard to distinguish between them visually to make it easy for a user to identify
- Example legend:

text / ### in black are calculation or forecast

text / ### in blue are historical or hard-coded

use “A” or “Actual” for past dates

use “P”, “F” or “Projected” or “Forecasted” for future dates

text / ### in a yellow box are assumptions

# Model Tips

Try to use only the visible field of a worksheet

Try to group logical inputs and outputs together

Try to keep your formulas simple to understand

Expenses can be shown as negative or positive – just be consistent

Cash flows should always be shown as positive if cash-generative and negative if cash-usage

# Worksheet Structure

## Everything on one worksheet

- Benefit is do not need to move from worksheet to worksheet
- Suitable for simple models
- Ensure the model is built in logical progression, running from top to bottom or from left to right
- If it's a larger model, may want to use "group" to collapse and expand sections (make sure your user knows how to use this functionality)

## One function one worksheet

- Benefit of keeping the model structure clear even if does requiring moving from 1 worksheet to another
- Keeps workings within field of vision on each worksheet
- Suitable for normal to large models
- Ensure the worksheets are appropriately named so your user knows where to find information
- Ensure your cover page provides a table of contents

# Building a Simple Model

**Building a model is iterative but in general the steps are as follows:**

- **Step 1:** build the I/S first (this is because certain I/S items feed into the B/S)  
Some I/S items may be dependent on B/S, link to the B/S item's cell address(es) anyway, it will update as the B/S is built
- **Step 2:** build the B/S footnote calculations before building the B/S – do not build cash!
- **Step 3:** build the CFS next – the ending balance feeds into the “cash” item on the BS
- **Step 4:** do you balance?
- **Step 5:** complete ratios & summary – remember this is the output and for now sanity checks your model

**This is a starting point. A fuller set of model building guidelines shall follow**



# Tips: When you do not balance

- Delete all values but year 1 before checking
- “Ctrl + ~” shows worksheet as formulas
  - Step 1: check that you deducted expenses if you showed them as positive values
  - Step 2: make sure you do not total something twice
  - Step 3: make sure you calculated changes in assets, liabilities & equities correctly (& capex is cash-negative)
- In general:
  - Make sure you picked up the correct assumption
    - Use “ctrl + [” to find first input - note this only works if first input is from assumptions
  - Check that forecast values are consistent with historic values
    - No dramatic switching from gain to loss, from positive to negative value, or vice versa
    - No dramatic rates of change that cannot be explained
  - It is possible to have more than 1 error

# More on Errors!

- Is it possible to balance but still have mistakes in your model? Yes!
- Harder to find such errors
- Tips:
  - Check for extreme changes, check margins & ratios
  - Change assumptions and see if your model still balances and makes sense!

# Solving the Issue

## Modelling solution:

### Add a revolving line of credit in the model

- In your model, you need to have the flexibility that when there is cash, it is recorded in cash, but when there is no or negative cash, there is a more sensible record
- Insert a “CP-RCF” item in current liabilities
  - If ending cash is positive, the value goes to cash (assets); if cash is negative, the value goes to CP-RCF (liabilities)

## Forecasting solution:

### Need a realistic debt issuance/repayment schedule in your forecast

- Commercial paper (CP) and or its back-stop, a revolving line of credit (RCF), are typically used by companies to daily cash flow short fall, in particular do to seasonal variations, OWC management, and unexpected needs in cash
- Companies should also have a strategy for medium- and long- term funding – and your model should reflect that

# Circular References

- The following is a simpler example of a circular reference error

- Here is a simple finance example

	A	B
1	=B2	
2		=A1

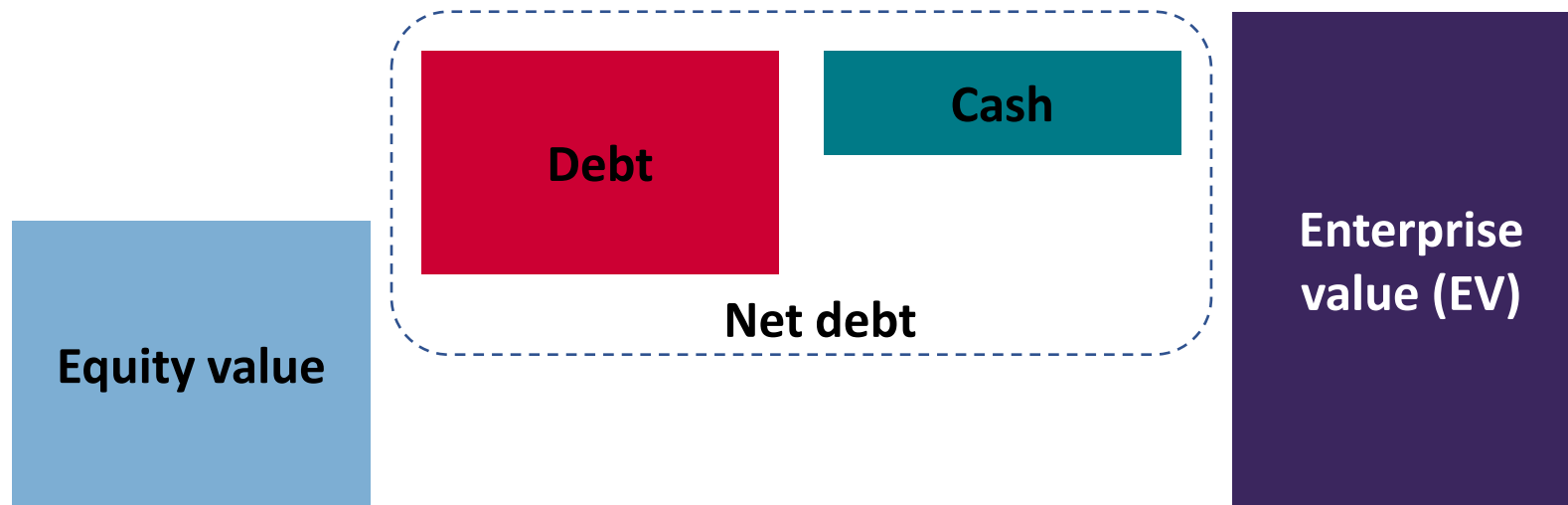
- What is a circular reference?
- Why did changing the interest expense in FS 201.xls cause a circular reference?

	A	B
1	Principal	= 100 + B2
2	interest	= B1 * 10%

# Forecasting & Valuation

# What are we valuing?

- Usually, we value a firm. A firm is a group of assets (and associated liabilities) used to generate profit for its owners:
  - Equal to the value of the financing to support operations (at its simplest, debt, cash and/or equity)
- Valuation can be done at equity or enterprise level:
  - Equity value reflects only the claims due to equity holders
  - Enterprise value reflects the value of claims by all stakeholders



# Valuation Methodologies

## Relative valuation



References what other people think about the value of the asset we are looking at

- Using multiples
- Comparable company analysis (using public companies)
- Comparable transaction analysis (M&A based comps)

## Absolute valuation



Based on assumptions of future performance of the company

- DCF – PV of future operating cash flows available to stakeholders
- Implied private equity valuation – range based on target returns given a certain capital structure and exit timeframe

## Equity Valuation

Equity value = PV of cash available for distribution to equity holders

- Free Cash Flow To Equity (FCFE)
- Discounted at required return of equity

Only used to value financial institutions (no ability to distinguish operational and financial assets)

## Enterprise Value

Enterprise value = PV of cash flows from operations available for distribution to all capital providers

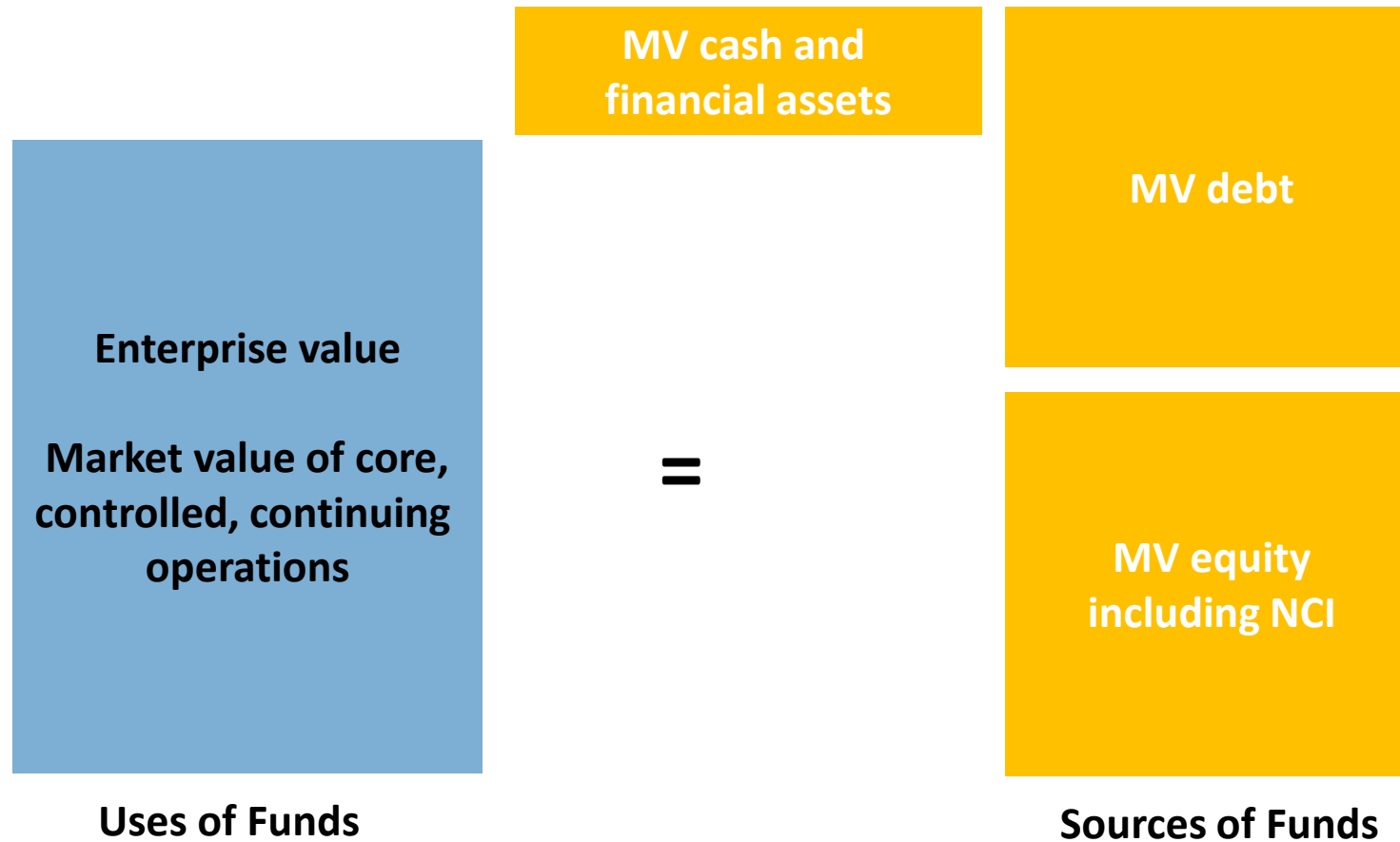
- Free Cash Flow To Firm (FCFF)
- Discounted at weighted average required return of all capital providers (WACC)

Will need to bridge from Enterprise/Firm Value to Equity value

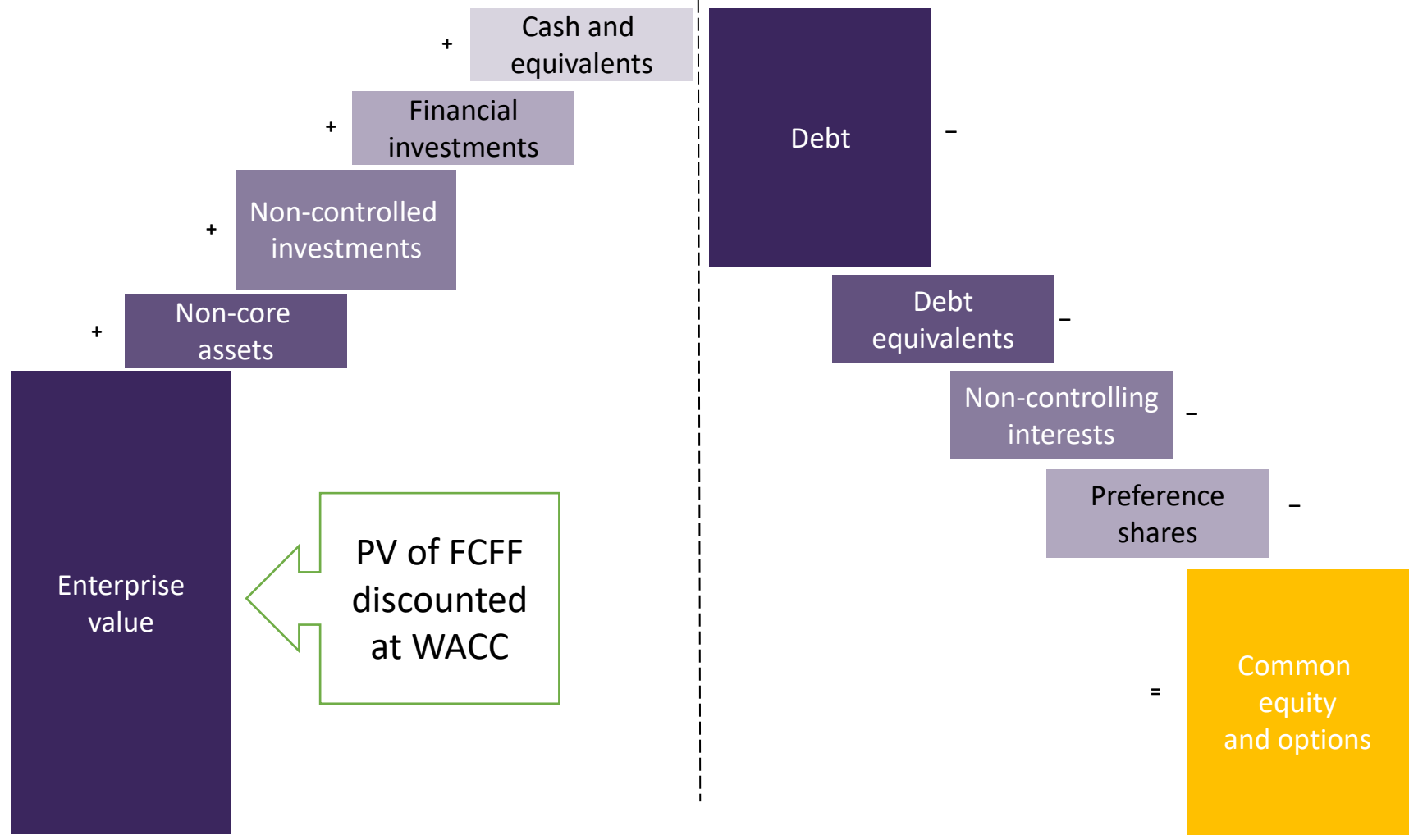


# Enterprise Value (EV): The Intuition

$$\text{Enterprise value} = \text{MV equity} + \text{MV debt} - \text{MV financial assets}$$



# Enterprise to Equity Value: Derivation



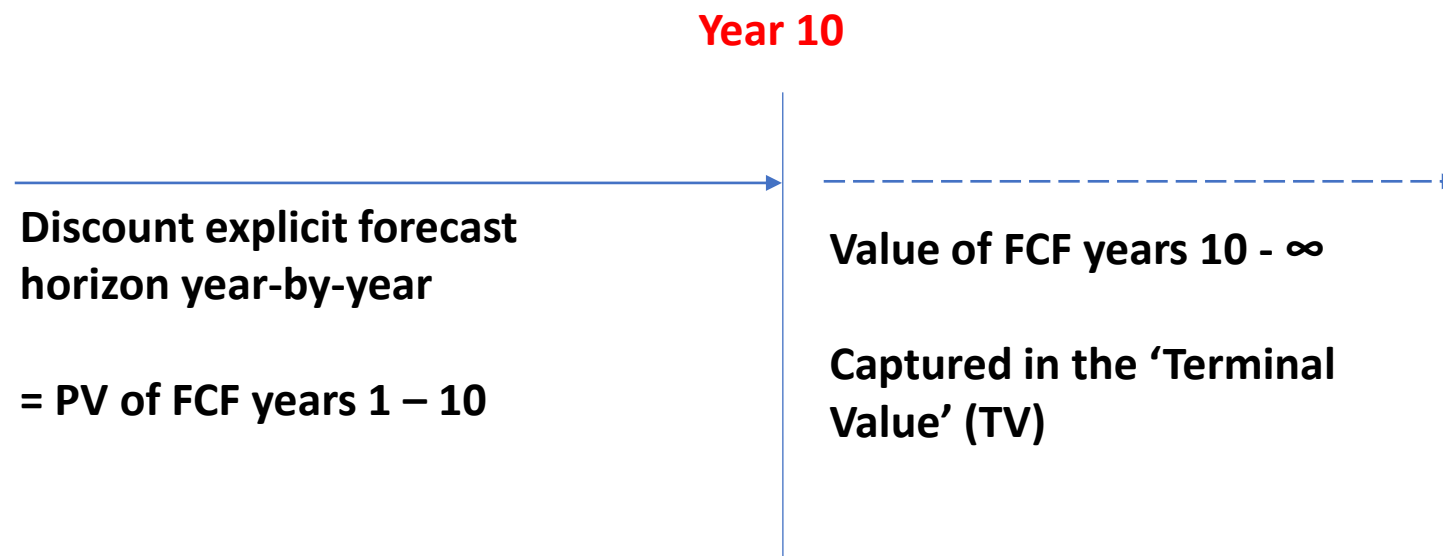
# Deriving FCFF/ Unlevered FCF

EBIT	43,200
Effective tax rate	23.0%
NOPAT [ EBIT x (1-t) ]	33,264
Capex (net of disposal proceeds)	(3,900)
Depreciation	1,640
Amortization	345
(Inc.) / dec. in net working capital	(750)
(Inc.) / dec. in other operating assets	(278)
Inc. / (dec.) in other operating liabilities	102
<hr/>	
<b>Unlevered FCF</b>	<b>30,423</b>

- **Do not** adjust FCF for non-cash **stock-based compensation**
- Forecast of **operating items only** is required:
  - Excludes any income from financial assets
  - Excludes claims of financing capital providers

# FCF Forecast

- Good DCF will be based on valid, justifiable forecasting assumptions
- Forecast horizon may be 5 to 10 years
- Need to forecast until reach sustainable mid-cycle position, viz, 'Steady state'



## Growing perpetuity

- Assumes constant long-term growth rate (LTG) in FCF in perpetuity.
- Ensure integrity of final forecast FCF.
- Should reflect steady state

$$TV_N = \frac{\text{Steady state } FCF_N \times (1 + LTG)}{(WACC - LTG)}$$

- Requires discounting back from final year (N)
- May ignore link between reinvestment and growth

## EV multiple

- Use a multiple of final forecast EBIT(DA).
- Ensure integrity of final year forecast.
- The multiple must reflect steady state growth and margins
- Use a mature multiple

$$TV_N = \text{Steady state } EBIT(DA)_N \times \text{Multiple}$$

- Requires discounting back from final year (N)

# Discount Rate

**Discount rate = Hurdle rate**

**Value is only created if the FCF at least covers the cost of funding.**

- **FCFF are discounted by WACC:**

- WACC must be calculated using a capital structure which is appropriate to the length of your forecast period:
  - The 'long-term'/'target'/'targeted'/'optimal' capital structure. This may be different from the company's actual capital structure
  - Beta must also be calculated according to the target capital structure (expressed as D/E)
- Use up-to-date market values

- **Note: FCFE are discounted by 'Cost of Equity'**

# What is WACC?

$$\text{WACC} = \frac{(K_d \times D) + (K_e \times E)}{(D + E)}$$

WACC = Weighted average cost of capital (aka cost of capital). Weighted individual cost of each capital structure component

- Influenced by perceptions of risk and opportunity cost
- Driven by market expectations

$K_d$  = Cost of debt after tax =  $R_d \times (1 - t)$

$D$  = Market value of target debt amount

$K_e$  = Cost of equity

$E$  = Market value of target equity amount