



Return on Capital



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Return on Equity

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Return on Capital Metrics



Assess the **level of earnings** generated by
a defined **amount of capital**

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Shareholders

Return on equity

How much profit is the company generating for
each \$1 of equity invested in the company?

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$

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$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$

1



To identify the **book value of equity** at the **start of the year**

Return on **opening equity**

2



To calculate the average of **opening** and **closing equity**

Return on **average equity**

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Profit only for shareholders

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$

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$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}}$$

Net income is after **interest expense**



A company has much **higher** or **lower leverage** than peer companies

Distorts return on equity

Return on Invested Capital



Return on invested capital is an **important metric** when assessing the **operations of a company**

How much **profit** is the company generating for each **\$1 of total capital invested** in the company?

$$\begin{array}{c}
 \begin{array}{ccc}
 \text{Earnings before interest and tax} & \xrightarrow{\text{EBIT X (1 - ETR)}} & \text{Effective tax rate} \\
 & \text{= Net operating profit after tax} & \\
 & \downarrow \text{NOPAT} & \\
 \text{Return on Invested Capital} = & \frac{\text{NOPAT}}{\text{Invested Capital}} & \\
 & \uparrow & \\
 \text{Debt - cash} & \xrightarrow{\text{Book Value of Equity and Net Debt}} &
 \end{array}
 \end{array}$$

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$$\text{Return on Invested Capital} = \frac{\text{NOPAT}}{\text{Invested Capital}}$$

1



Use **book values** at the start of the year

Return on **opening capital**

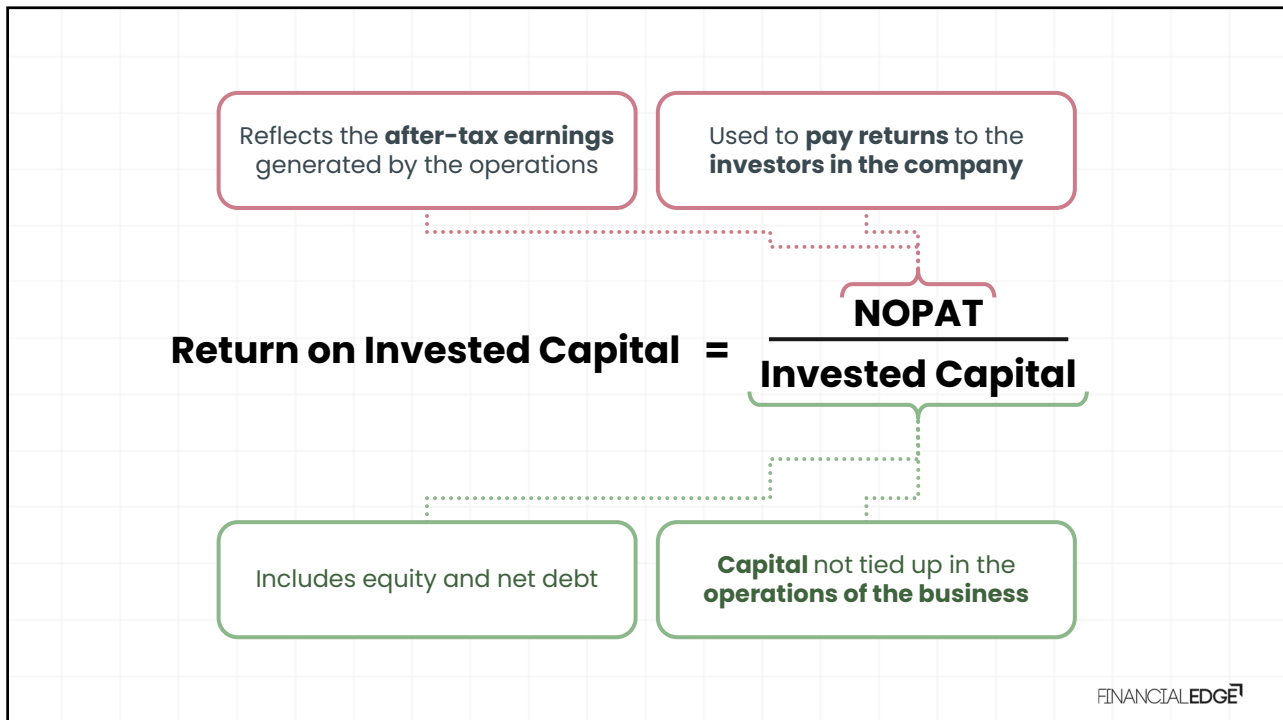
2



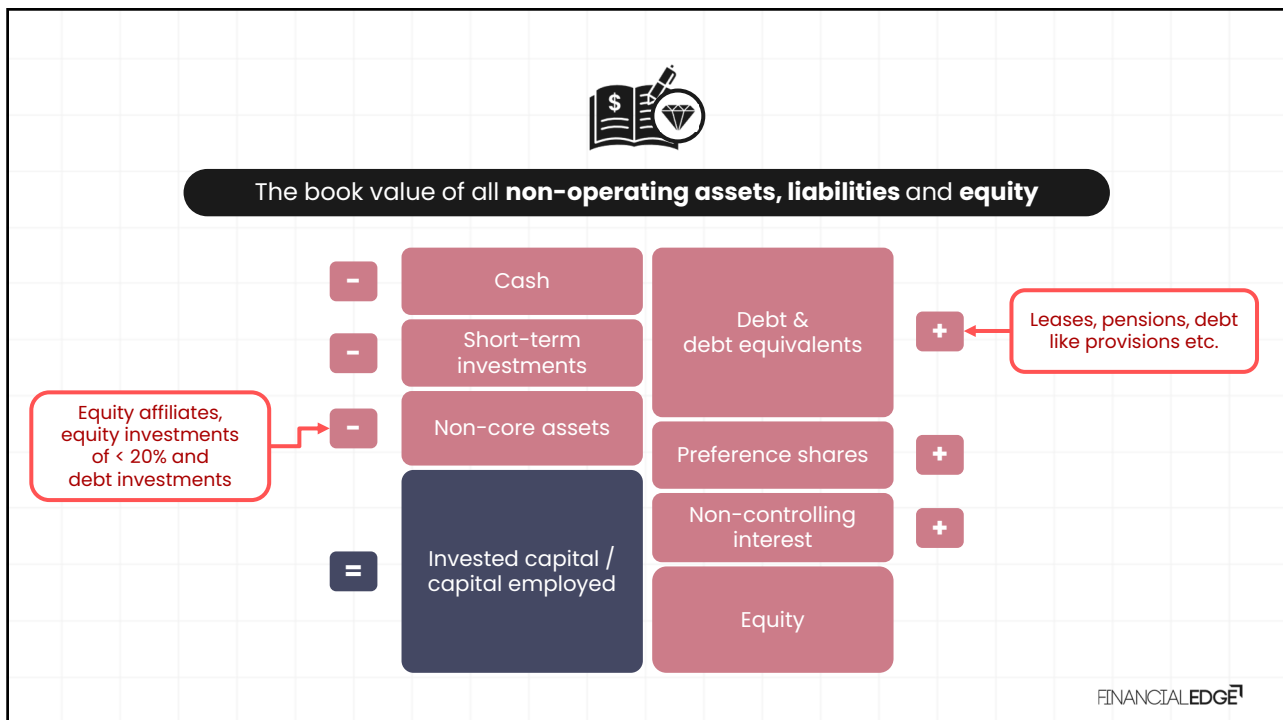
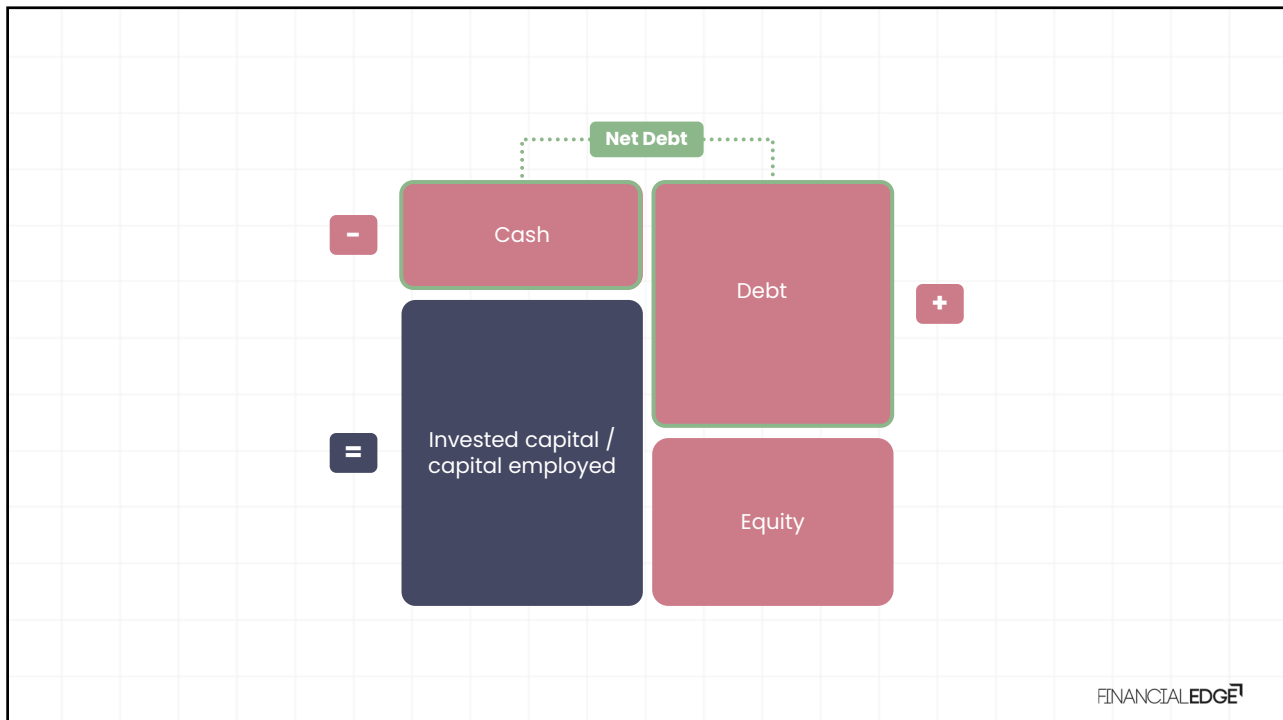
The average amount of **invested capital** for the year

Return on **average invested capital**

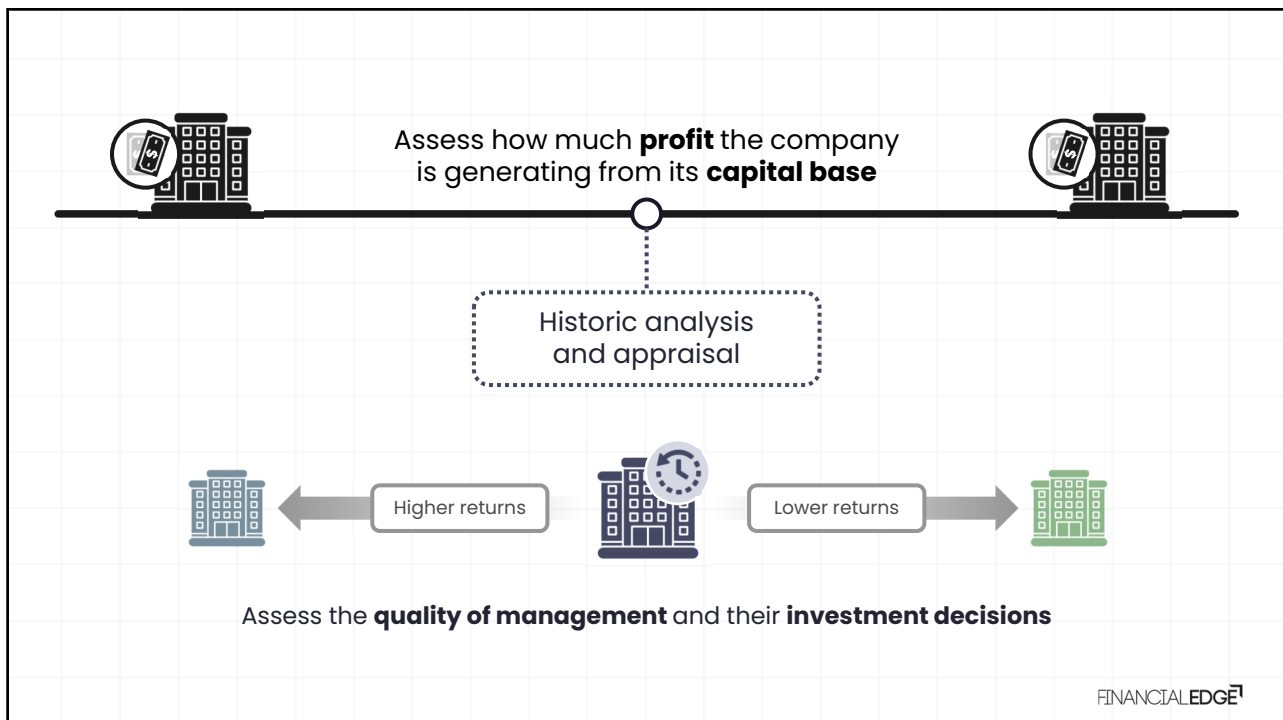
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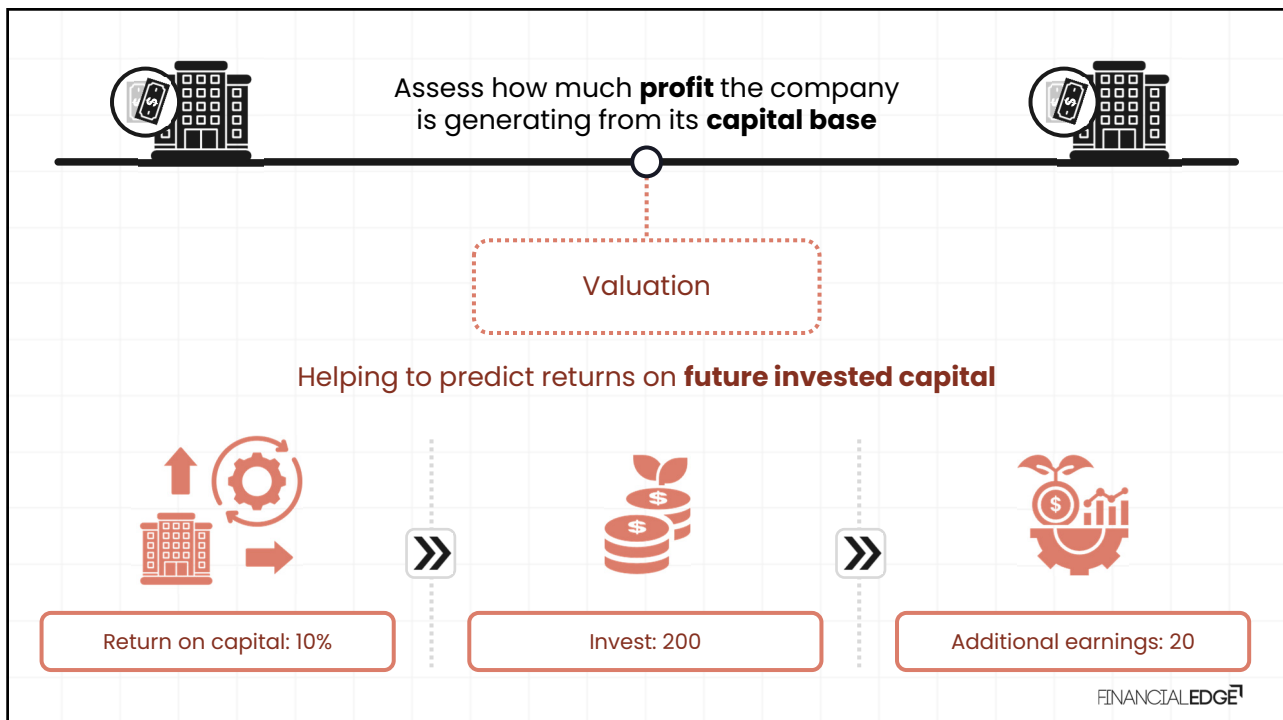
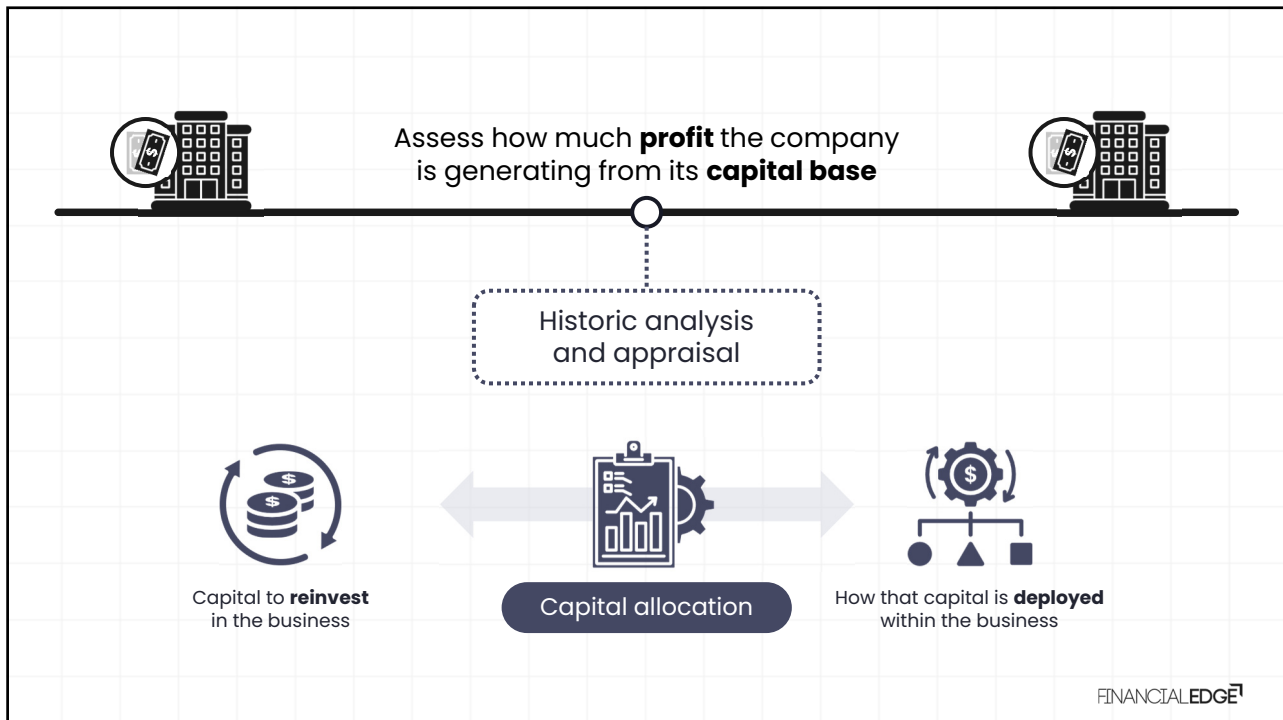


Invested Capital and Capital Employed



Why Do Returns Matter?

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Dupont Decomposition



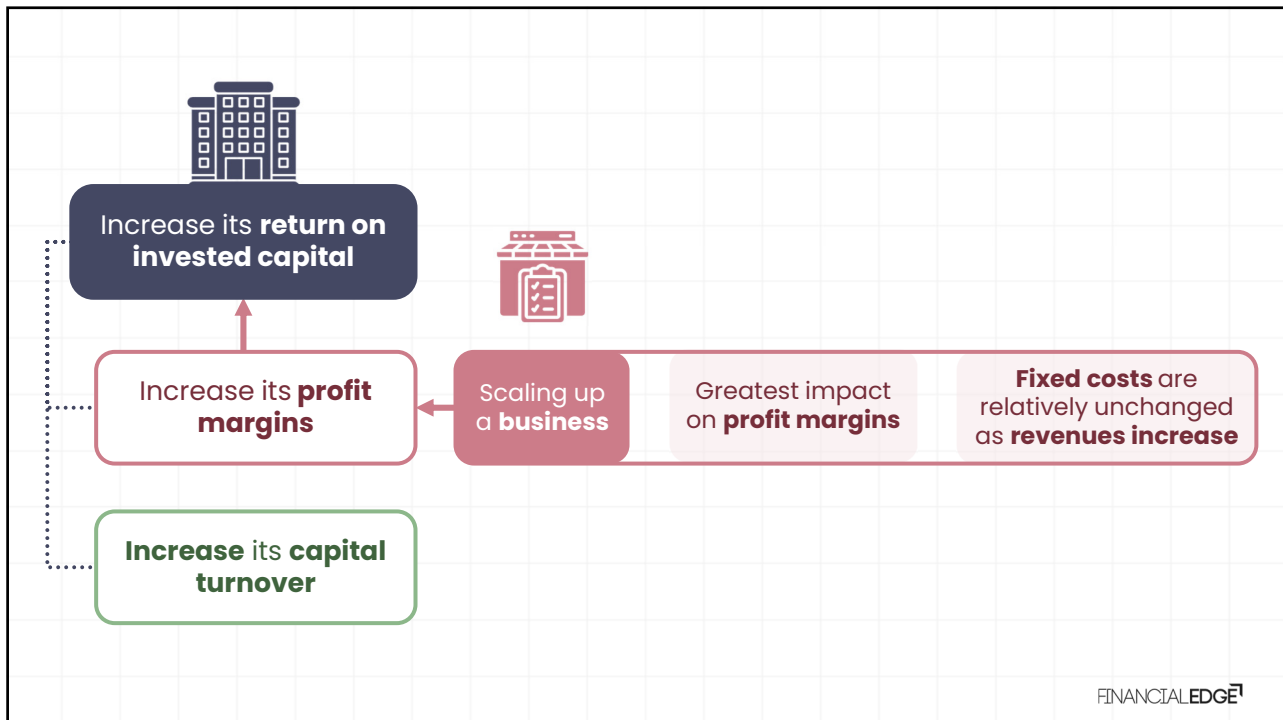
Dupont analysis can be used to **understand what drives returns**

$$\frac{\text{NOPAT}}{\text{Invested Capital}} = \frac{\text{NOPAT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Invested Capital}}$$

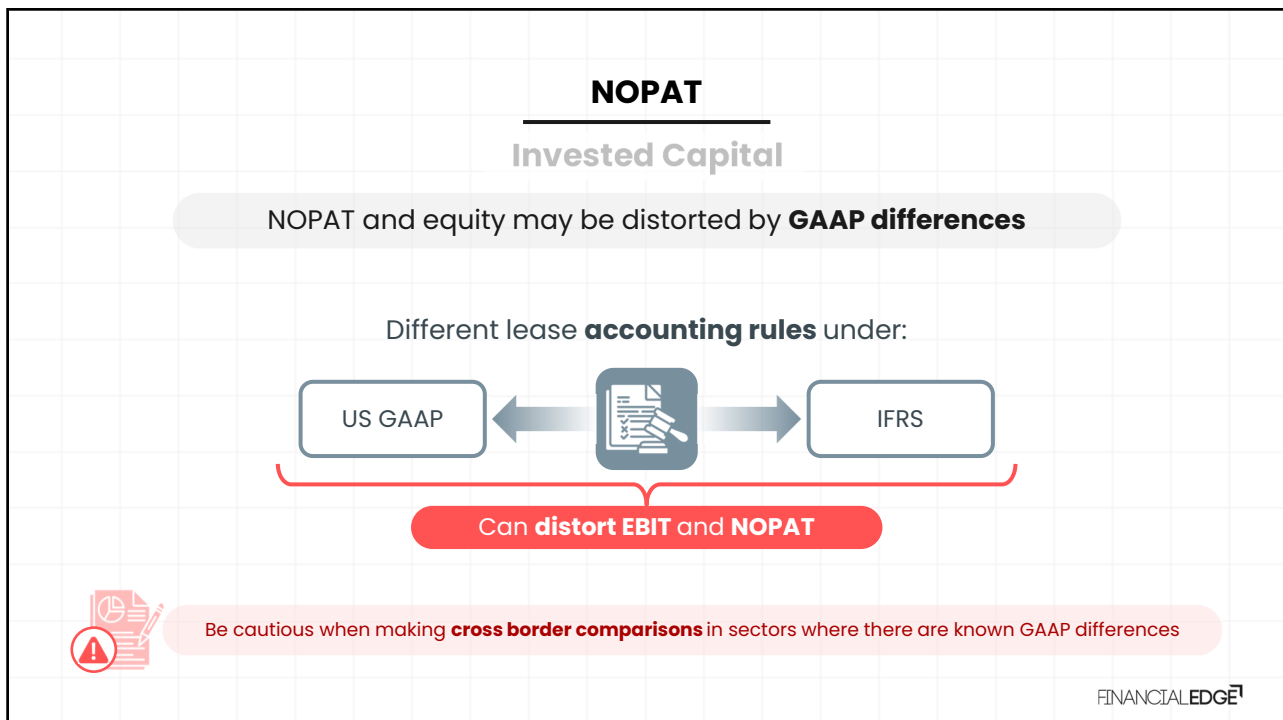
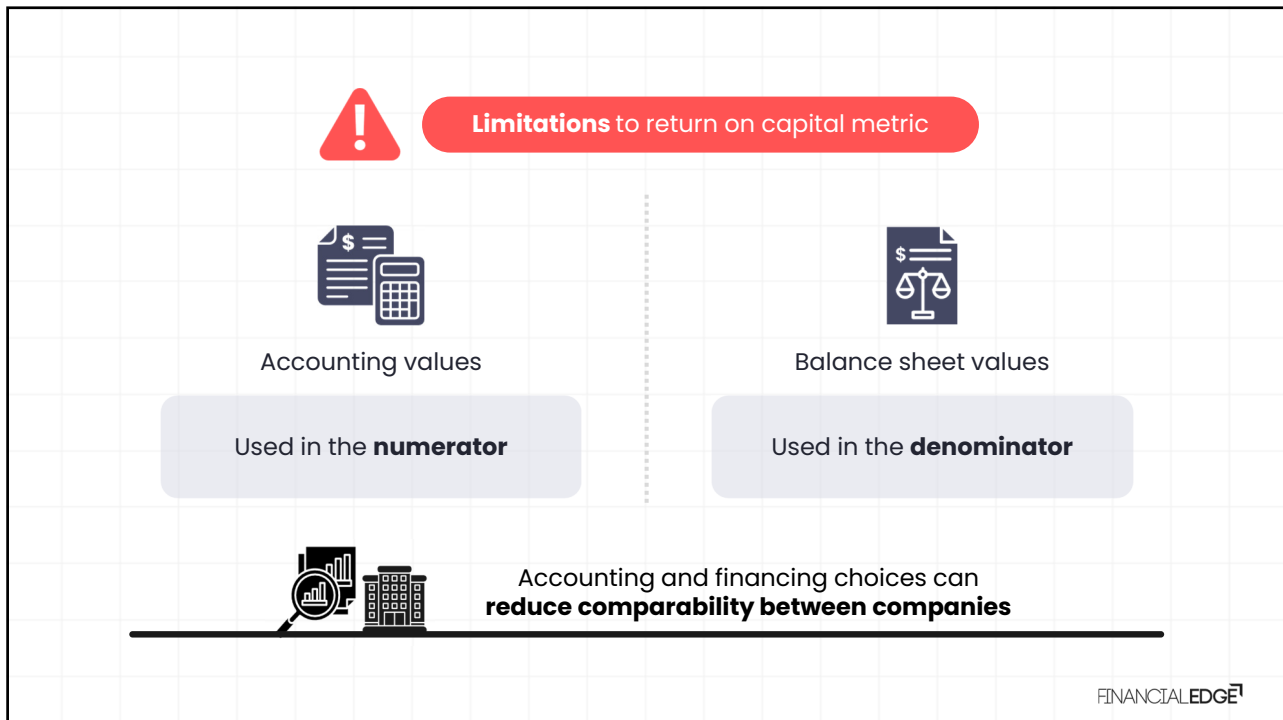
Net operating profit after tax

Profitability

Efficiency



Return on Capital Limitations



NOPAT

Invested Capital

If companies **choose** to use certain forms of **off balance sheet finance**



Factoring or receivables financing



Be cautious when **comparing companies** if we know that off balance sheet finance is being used

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Return on capital relies on **book values NOT market values**

1

2

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Return on capital relies on **book values NOT market values**

1

2

Invested capital does not include **internally generated intangible assets**



Brands



Research & development



Customer relationships

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Return on capital relies on **book values NOT market values**

1

2

Where intangibles are a **material driver** in a **company's profits**



Pharmaceuticals

Tech



Return on invested capital (ROIC) is a **much less useful metric**

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Return on capital relies on **book values NOT market values**

1

2

Invested capital relies on **book values**



Heavily **depreciated** property, plant and equipment (PP&E)



Will **suppress** invested capital



Exaggerate return on invested capital

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Return on capital relies on **book values NOT market values**

1

2



Exaggerate return on invested capital



Telecoms



Infrastructure businesses

Prone to investment cycles

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Return on capital relies on **book values NOT market values**

1

2



Cabling and roads

Not constantly replaced



Factories and equipment

Constantly replaced

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Linking FCF and Return on Capital

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A company has **1,000 of invested capital** at the **start of 20X1**.
The financials for 20X1 show the following...

	20X1
NOPAT	200
Add back depreciation	100
Capex	(110)
Change in working capital	(50)
Free cash flow	140

ROIC =

$$\frac{\text{NOPAT}}{\text{Invested Capital}}$$

200 / 1000 = 20%

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A company has **1,000 of invested capital** at the **start of 20X1**.
The financials for 20X1 show the following...

	20X1
NOPAT	200
Add back depreciation	100
Capex	(110)
Change in working capital	(50)
Free cash flow	140



Net investment of 10 - property,
plant and equipment (PP&E)

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The financials for 20X1 show the following...

	20X1
NOPAT	200
Add back depreciation	100
Capex	(110)
Change in working capital	(50)
Free cash flow	140



Working capital increased by **50**

A company has **1,000 of invested capital** at the **start of 20X1**.
The financials for 20X1 show the following...

	20X1
NOPAT	200
Add back depreciation	100
Capex	(110)
Change in working capital	(50)
Free cash flow	140

Net investment
in PP&E =

10

Investment in
working capital =

50

Net investment in
operating assets =

60

A company has **1,000 of invested capital** at the **start of 20X1**.
The financials for 20X1 show the following...

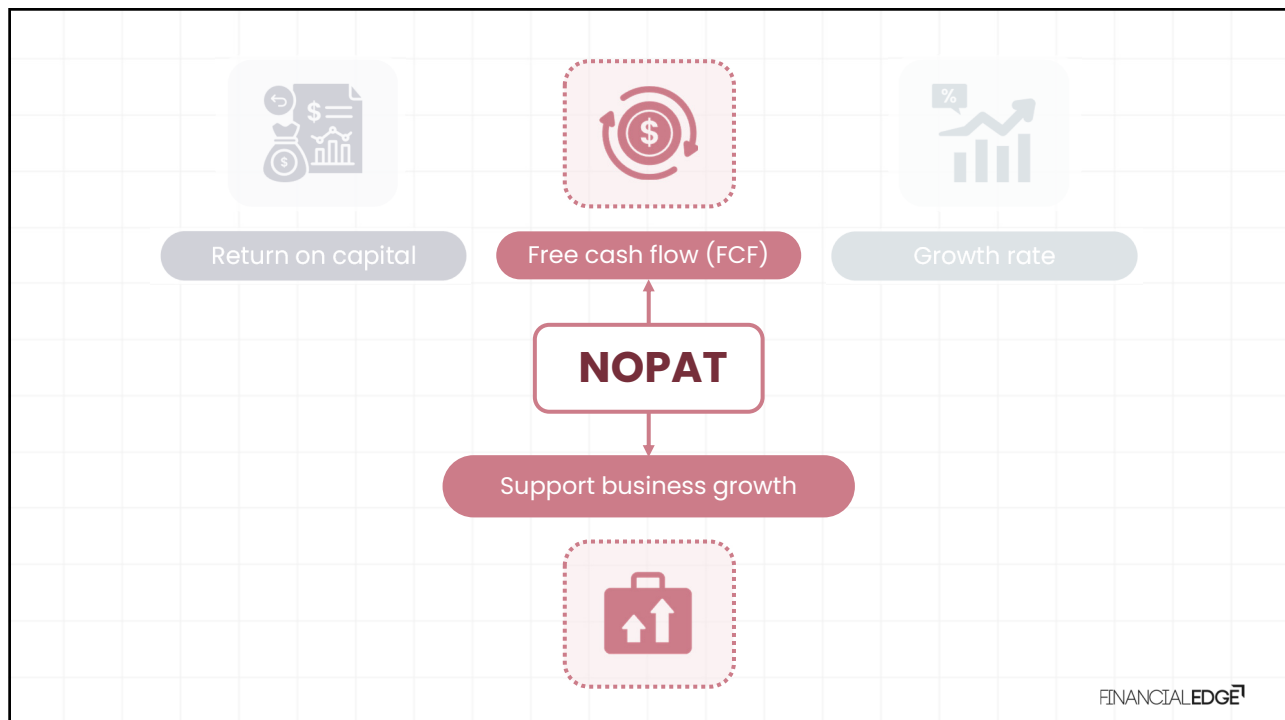
	20X1
NOPAT	200
Add back depreciation	100
Capex	(110)
Change in working capital	(50)
Free cash flow	140

Invested capital at the end of 20X1

$$\$1,000 + \$60$$

The firm's **growth rate**

$$\$60 / \$1,000 = 6\%$$

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Growth, Risk and Returns

$$\text{Enterprise value (EV)} = \frac{FCF_{n+1}}{\underbrace{WACC}_{\text{Cost of Capital}} - \underbrace{g}_{\text{Growth Rate}}}$$

$$FCF = \text{NOPAT} - \text{Net Reinvestment} = \text{NOPAT} - g * \text{Invested Capital}$$

Net reinvestment in the business

= Growth rate x opening invested capital



Capital base and earnings at **6%**



1,000 of invested capital



Must reinvest **6% x 1000**



Earnings will **grow at 6%**

$$EV = \frac{FCF_{n+1}}{WACC - g}$$

FCF = NOPAT – Net Reinvestment
= NOPAT – g * Invested Capital

$$EV = \frac{NOPAT_{n+1} - (g * \text{Invested Capital})}{WACC - g}$$

ROIC = NOPAT / Invested Capital

$$EV = \frac{NOPAT_{n+1} * (1 - \frac{g}{ROIC})}{WACC - g}$$

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$$EV = \frac{NOPAT_{n+1} * (1 - \frac{g}{ROIC})}{WACC - g}$$

If **ROIC** increases, the **value of the company** increases

WACC – **decreases** then the denominator contracts, so this will **increase the company's valuation**

Growth, risk and returns

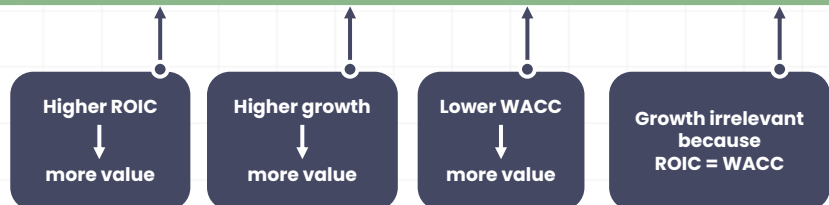
Often referred to as **value drivers**

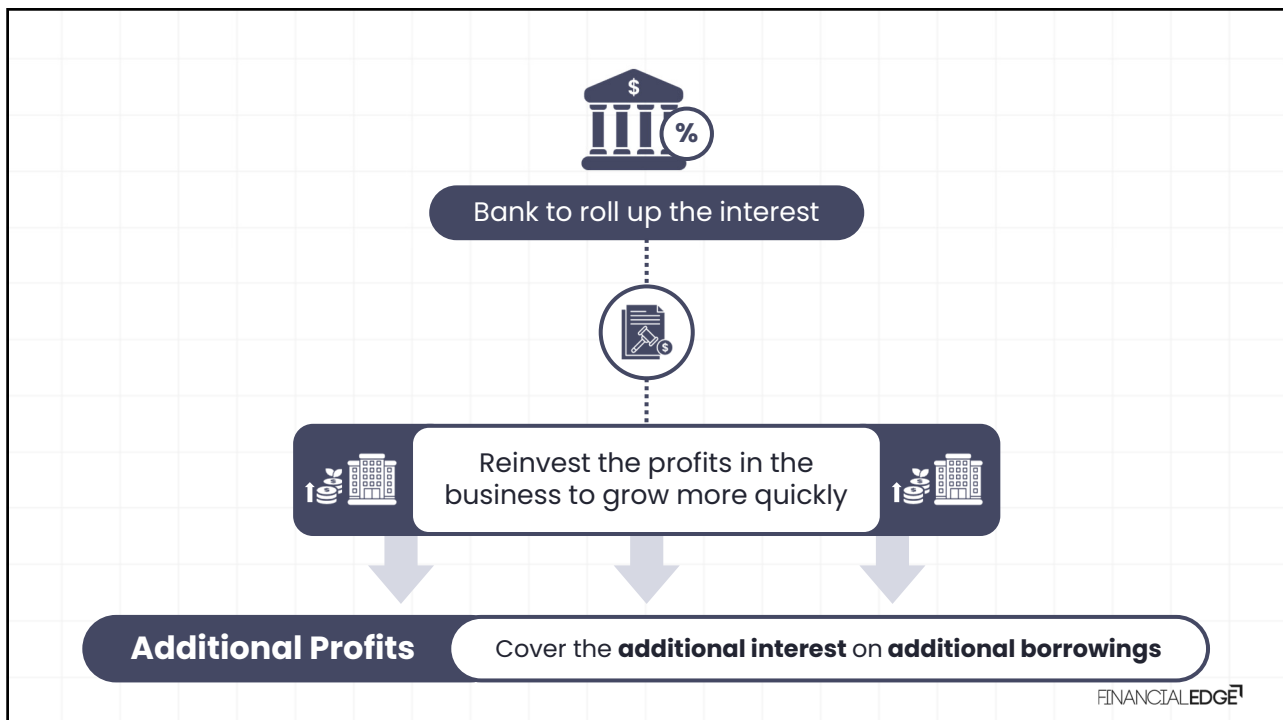
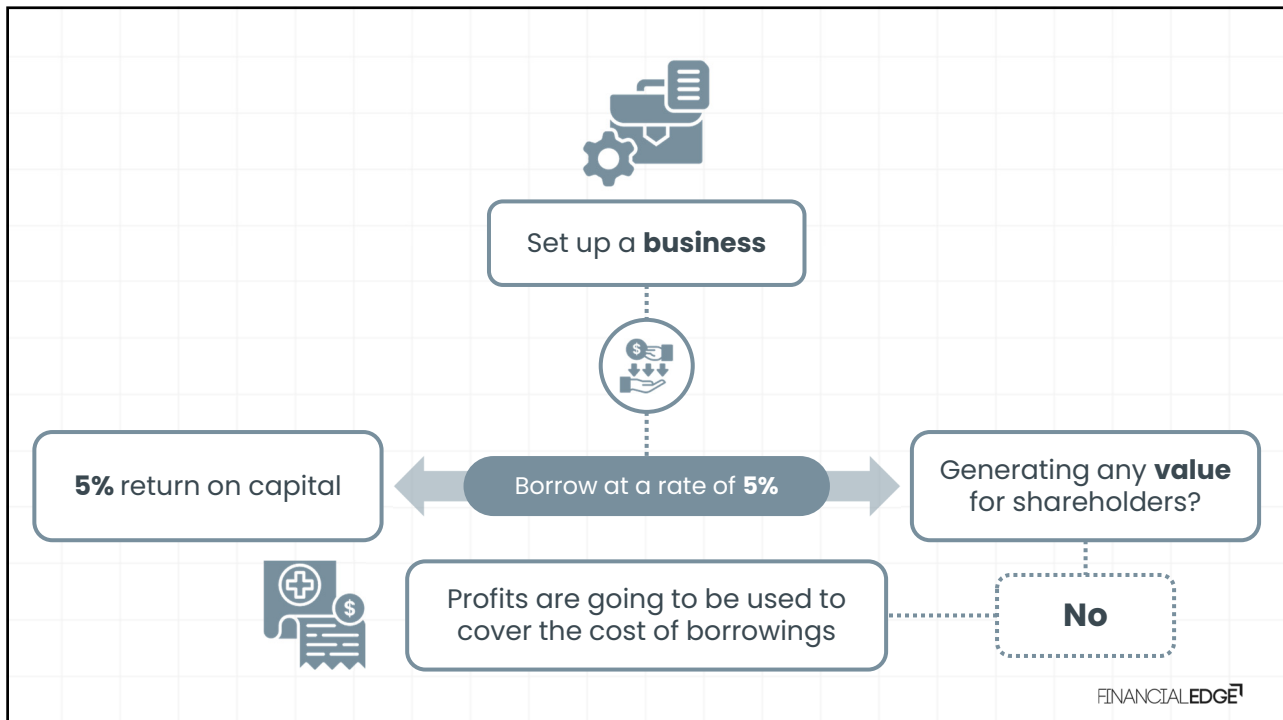
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Multiples Returns and Growth

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	Base	High ROIC	High g	Low WACC	Return = WACC
Invested capital	100.0	100.0	100.0	100.0	100.0
Return on capital	11.0%	15.0%	11.0%	10.0%	10.0%
WACC	10.0%	10.0%	10.0%	8.0%	10.0%
Growth	3.0%	3.0%	6.0%	6.0%	6.0%
EV	114.3	171.4	125.0	200.0	100.0
EBIT	11.0	15.0	11.0	10.0	10.0
Multiple	10.4 x	11.4 x	11.4 x	20.0 x	10.0 x

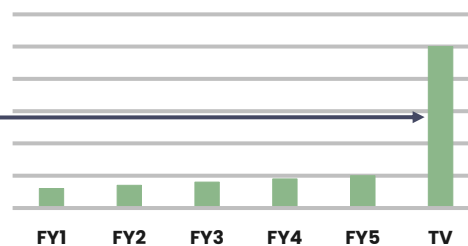
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Value Driver Formula for Terminal Value

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Terminal value calculated using the formula

$$\frac{FCF_n * (1 + g)}{(WACC - g)}$$


$$FCF = NOPAT - \text{Profits Reinvested} = NOPAT - g * \text{Invested Capital}$$

$$ROIC = NOPAT / \text{Invested Capital}$$

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We can express a steady state **DCF valuation**
in terms of **growth, risk and returns**



$$TV_n = \frac{NOPAT_n * \left(1 - \frac{g}{ROIC}\right) * (1+g)}{WACC - g}$$

Reinvestment Rate

Expected
growth (g)

5%

Return on invested
capital (ROIC)

10%

=

Reinvest each year
to support growth

50%

$$TV_n = \frac{NOPAT_n * \left(1 - \frac{g}{ROIC}\right) * (1+g)}{WACC - g}$$

50% of profits are free to be returned to **investors as free cash flow**

Expected
growth (g)

5%

Return on invested
capital (ROIC)

20%

=

Reinvest each year
to support growth

25%

$$TV_n = \frac{NOPAT_n * \left(1 - \frac{g}{ROIC}\right) * (1+g)}{WACC - g}$$

75% of profits are free to be returned to investors as free cash flow

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