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The Goldman Sachs Group, Inc.

Equity Valuation – Understanding what's important

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Introduction

- We are going to consider three of the most popular and effective valuation tools
  - Returns based analysis
  - Multiple Analysis
  - DCF

- For each of them we are going to look at:
  - How they work
  - Why some work better than others, and….
  - Why they are all simply different ways of looking at the same thing

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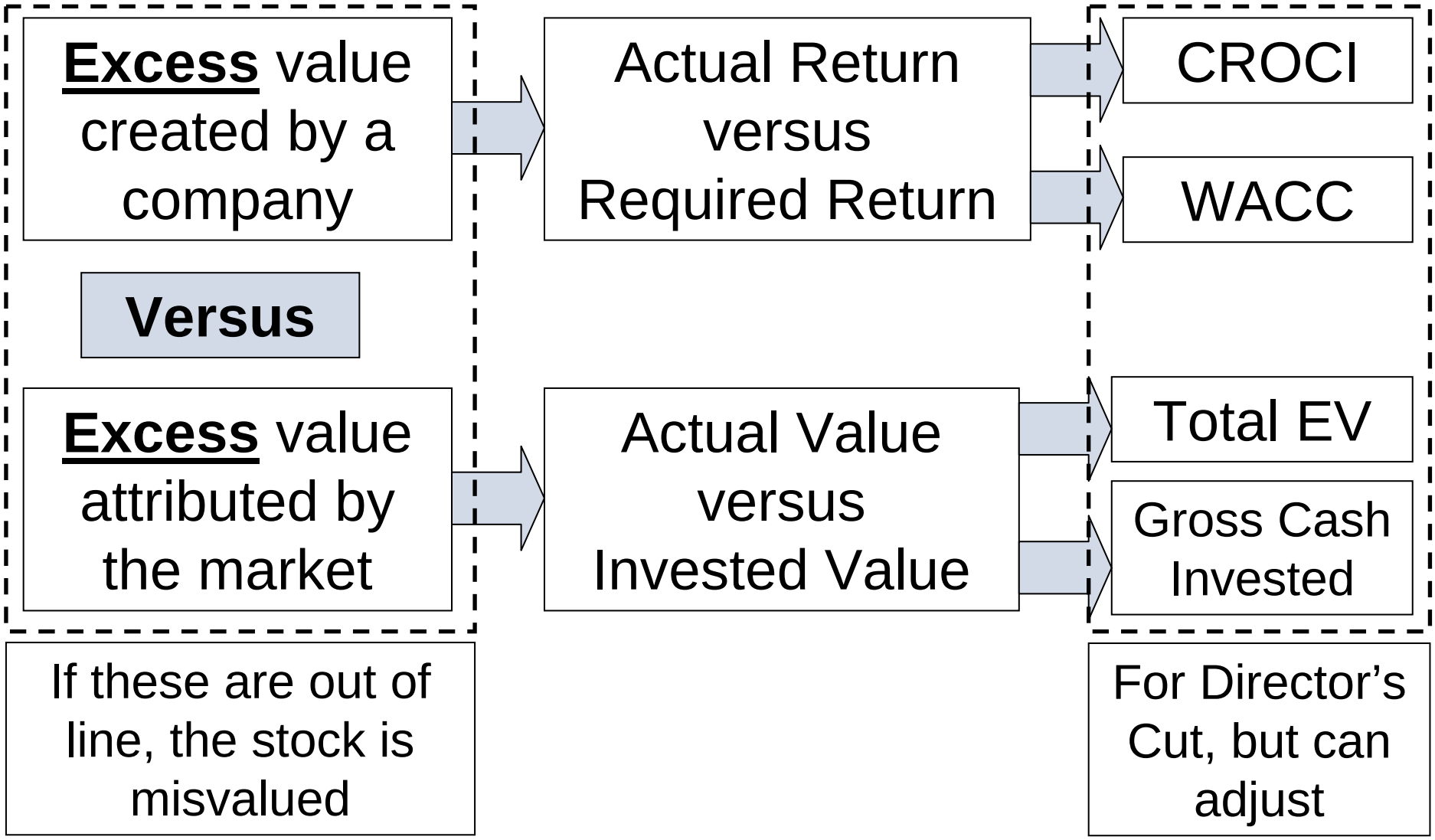
Returns Based Analysis

Key Idea

It's all about the value-added



Why Does it Work?

You invest $100m in some assets
Your required return is 10%

The actual return is 10%	The actual return is 20%	The actual return is 5%
The investment **should** be worth $100m	The investment **should** be worth $200m	The investment **should** be worth $50m
$\frac{EV}{GCI} = \frac{CROCI}{WACC}$	$\frac{EV}{GCI} = \frac{CROCI}{WACC}$	$\frac{EV}{GCI} = \frac{CROCI}{WACC}$
	Value Creating	Value Destroying

Calculating CROCI

Operating cash flow (ignoring Working Capital) plus after-tax interest and lease expense

Non-cash items and the company's financial structure have no impact, making comparisons more meaningful

Interest and Lease x (1 – Tax Rate)

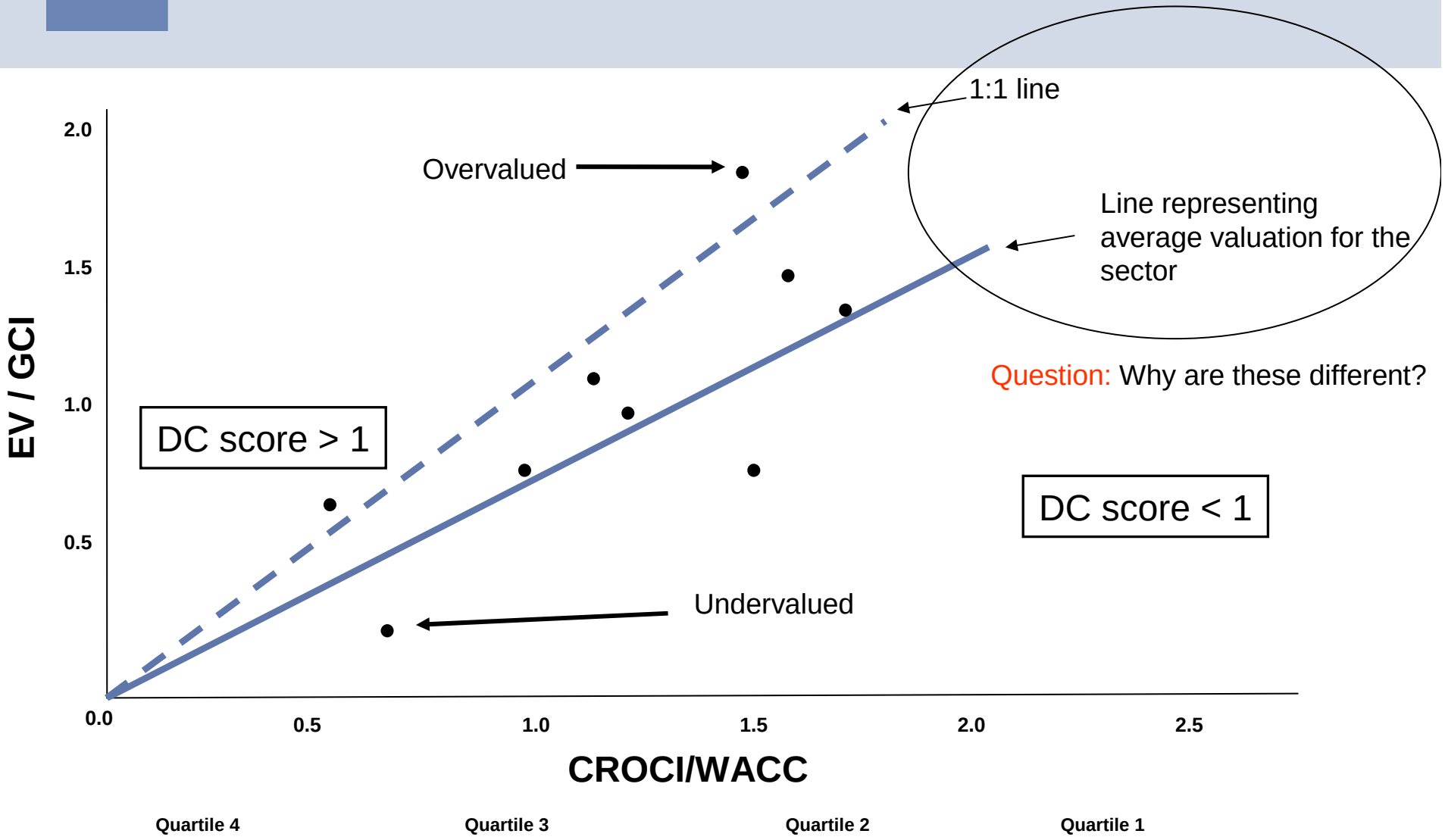
$$\text{CROCI} = \frac{\text{Debt-Adjusted Cash Flow}}{\text{Gross Cash Invested}}$$

Pre-depreciation and write off value of tangible and intangible assets

Gross Assets plus Operating working capital plus capitalised leases plus investments

Depreciation policies do not impact this figure

Companies are compared with the sector



Why are these different?

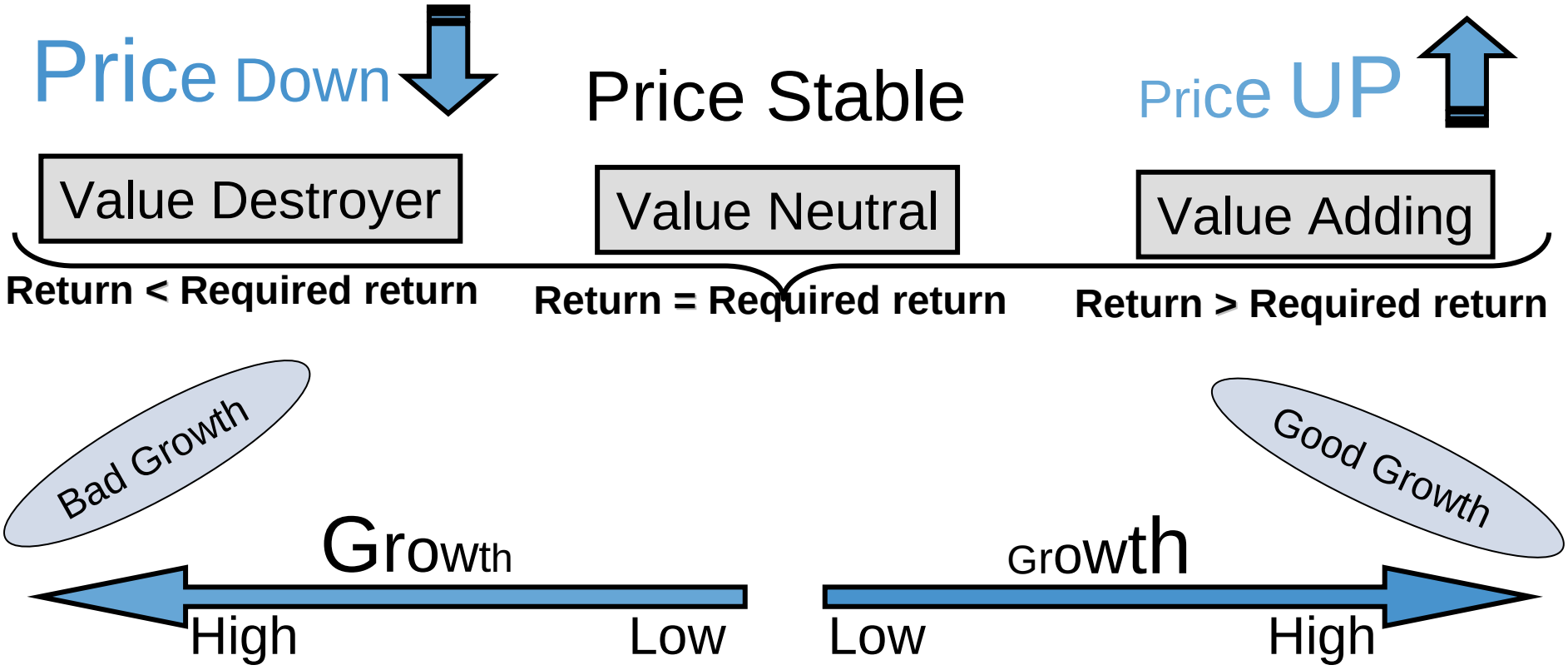
- Capex
- Valuable assets which are not revalued (eg. Intangibles)
- Growth…..

What about growth?

- Absolute growth is not the driver of value
- Why?
- Growth isn’t always good
- Returns, not growth, have historically been shown to drive valuations
- Returns are more stable and consistent than growth

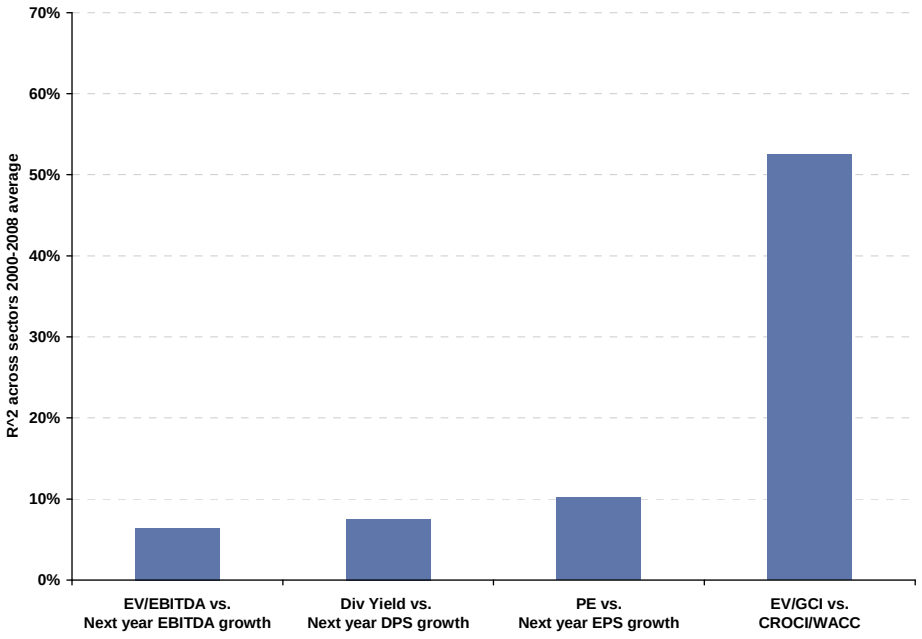
Growth isn't always good!

- If management are generating lower returns than required returns, then value will be destroyed
- If management are generating higher returns than required returns, then value will be added

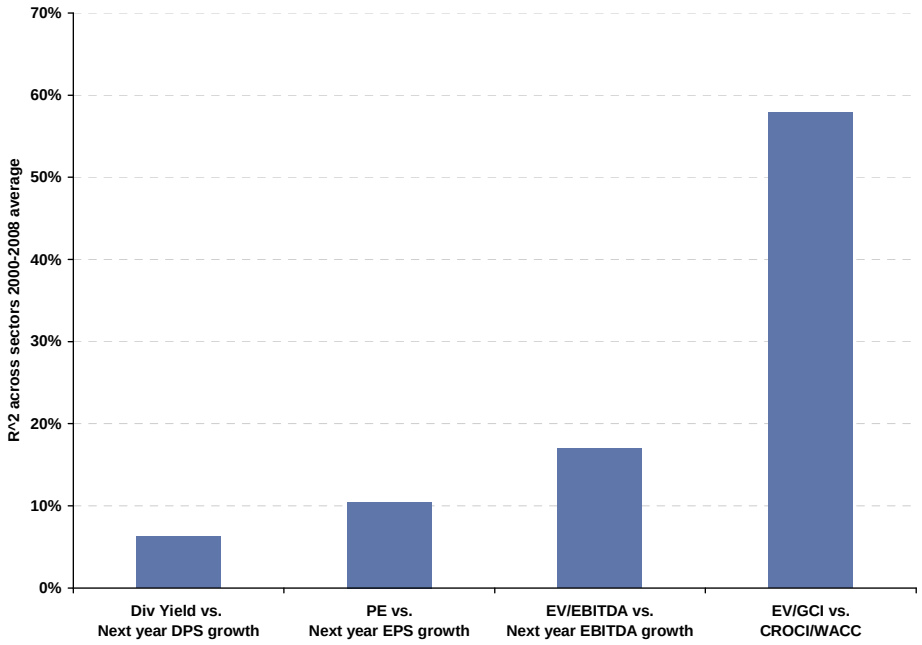


Cash return spreads, not growth, drive valuation and performance

Director's Cut shows the highest correlation with market valuation over time in AEJ…



…as well as in Japan

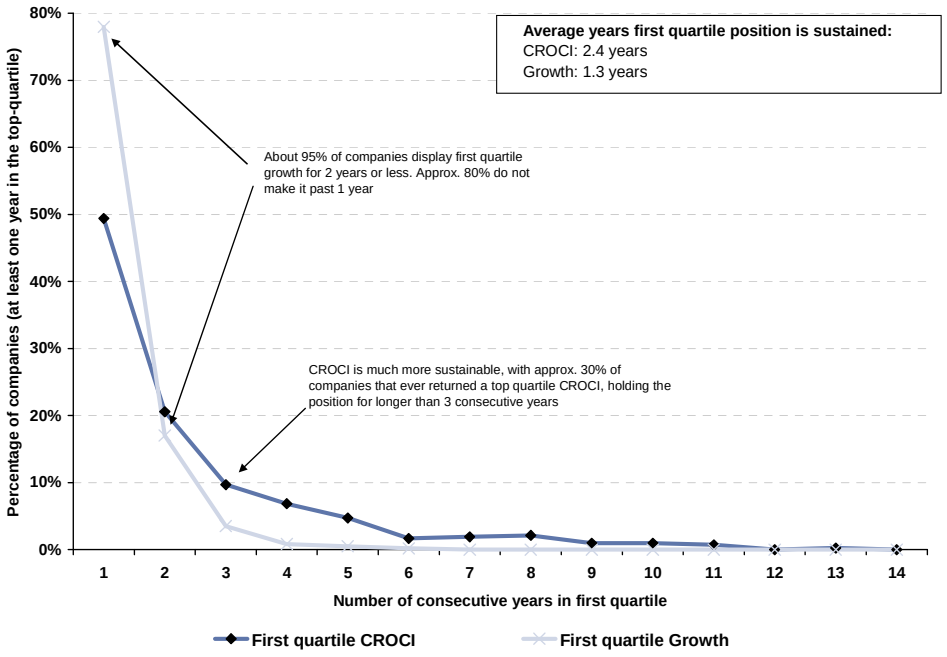


Source: Goldman Sachs Research estimates, Gao Hua Securities Research estimates.

The market values companies on <u>returns</u>: The correlation between capitalization of cash invested (EV vs. GCI) and economic return spread (CROCI vs. WACC) is significantly higher than between multiples and growth

Superior returns are more sustainable than superior growth

Top-quartile returns more sustainable than growth in AEJ…



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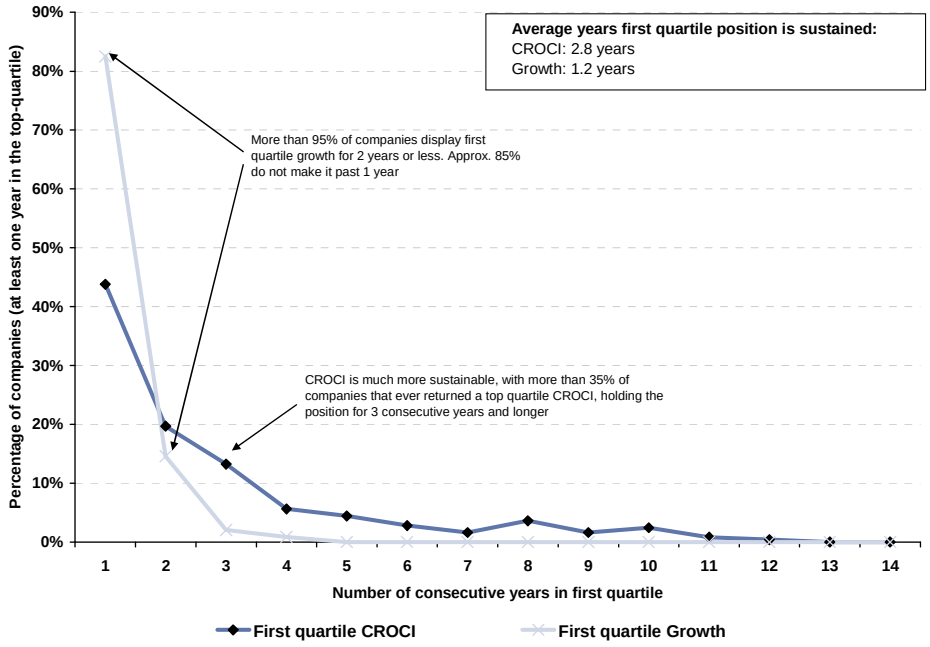


Source: Company data, Goldman Sachs Research estimates, Gao Hua Securities Research estimates.

And understanding the sustainability of returns is critical for valuation……

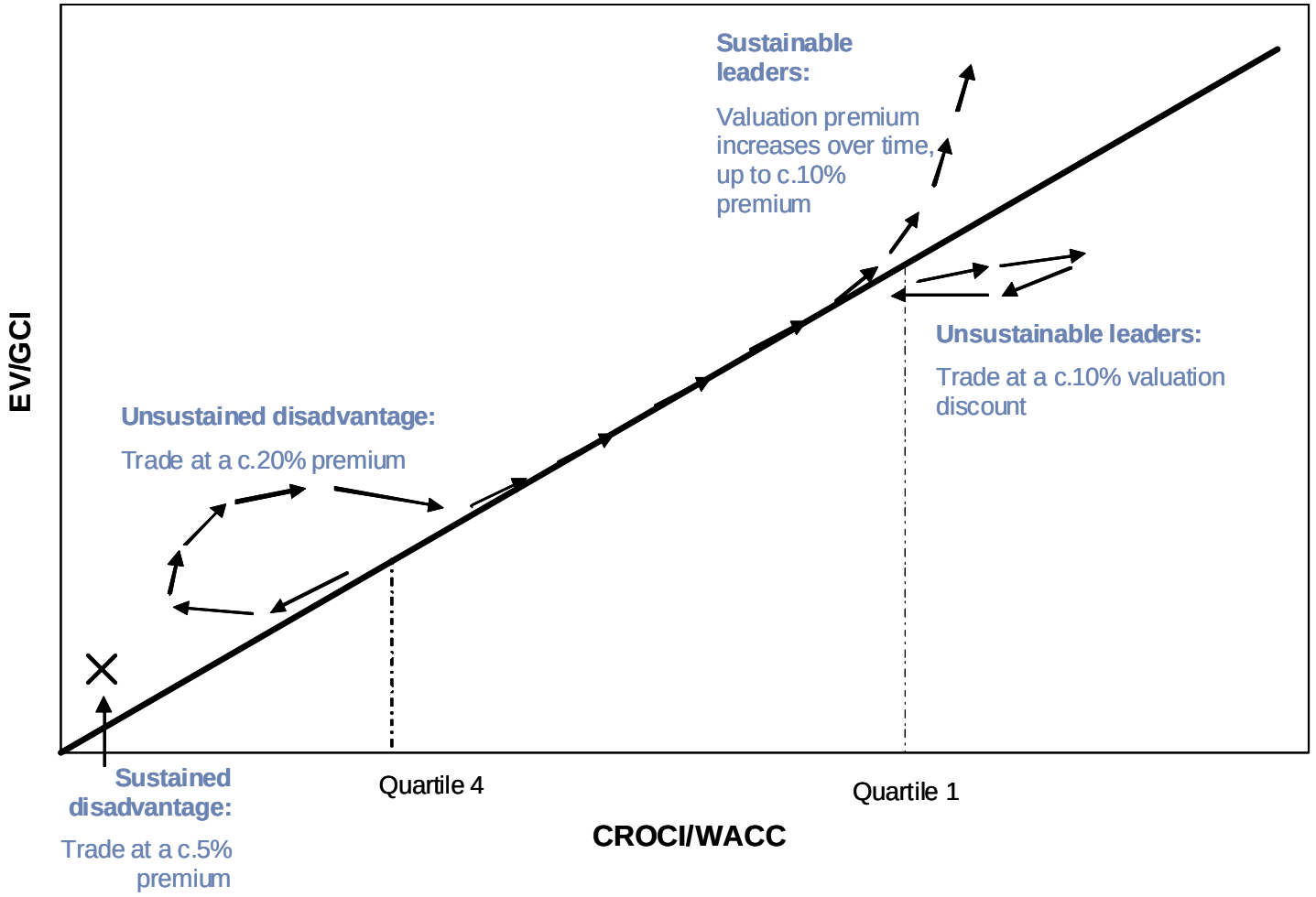
Taking the methodology one step further – understanding the behaviour of Q1 and Q4 CROCI companies

- Companies who have Q1 CROCI and who can sustain this level of CROCI will be ascribed a premium by the market (they may appear to be overvalued but they are not). The size of the premium depends on how long they will stay as a Q1 CROCI stock

- Companies who move into Q1 CROCI but for who the market does not believe this to be sustainable will not re-rate (they may appear to be undervalued but they are not)

- Companies which are Q4 have a floor valuation and so trade at a premium to the line. The size of the premium depends on whether they are a sustained loser or not

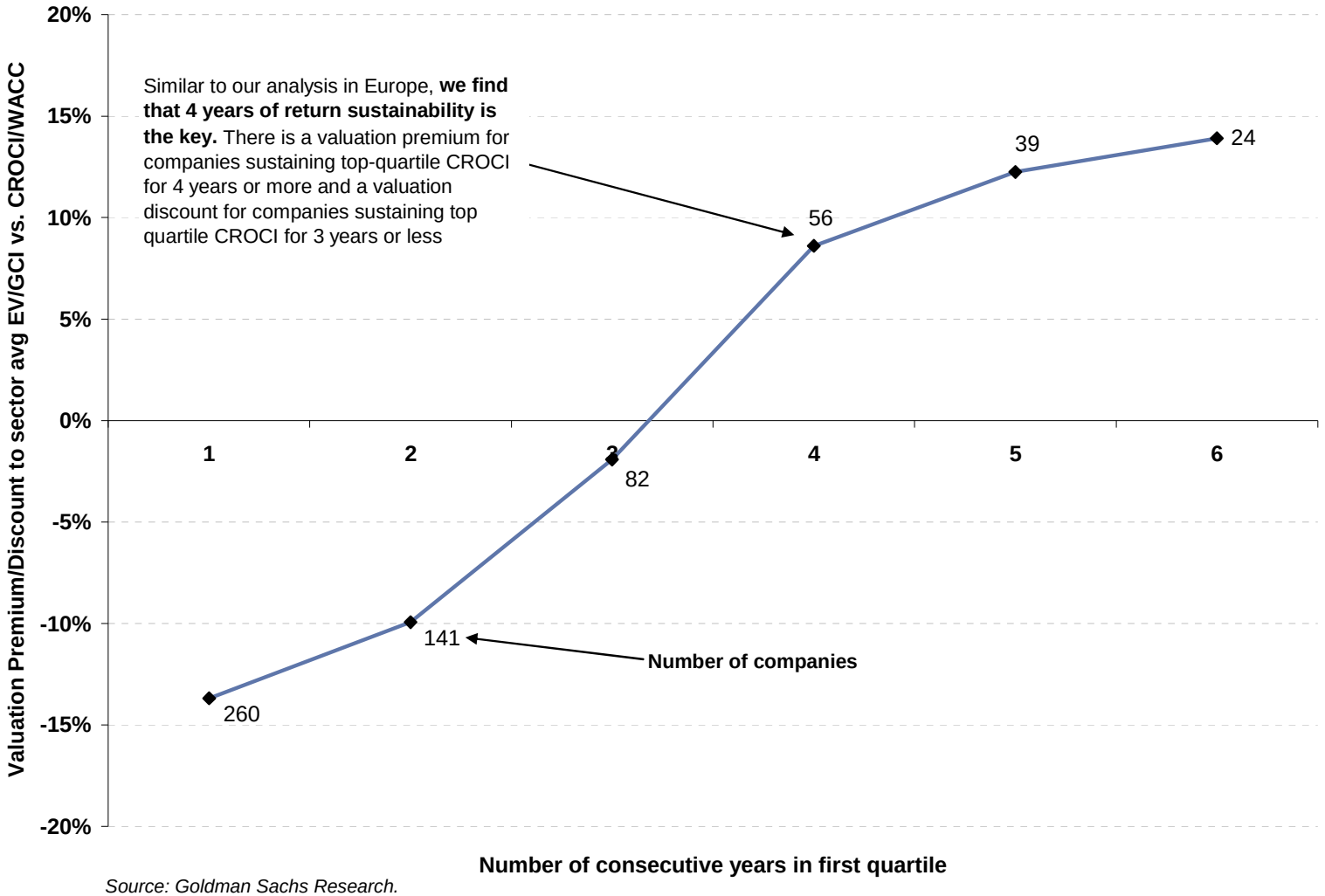
The adjusted Director's Cut methodology – looking at the duration of value addition/destruction



Source: Goldman Sachs Research estimates

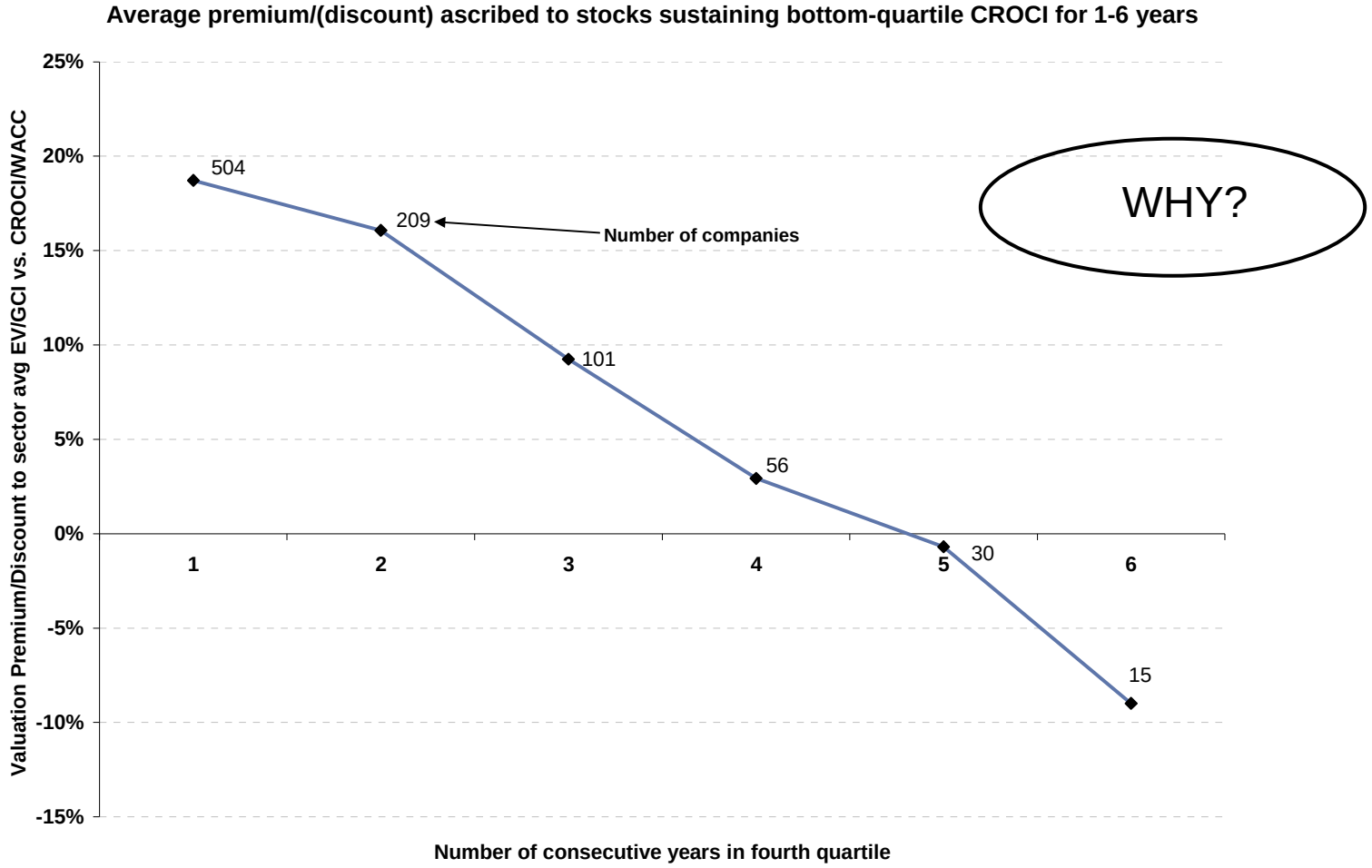
Industry Leaders: Sustained advantage greater than four years is reflected in the valuation premium

Average premium/(discount) ascribed to stocks sustaining top-quartile CROCI for 1-6 years



Source: Goldman Sachs Research.

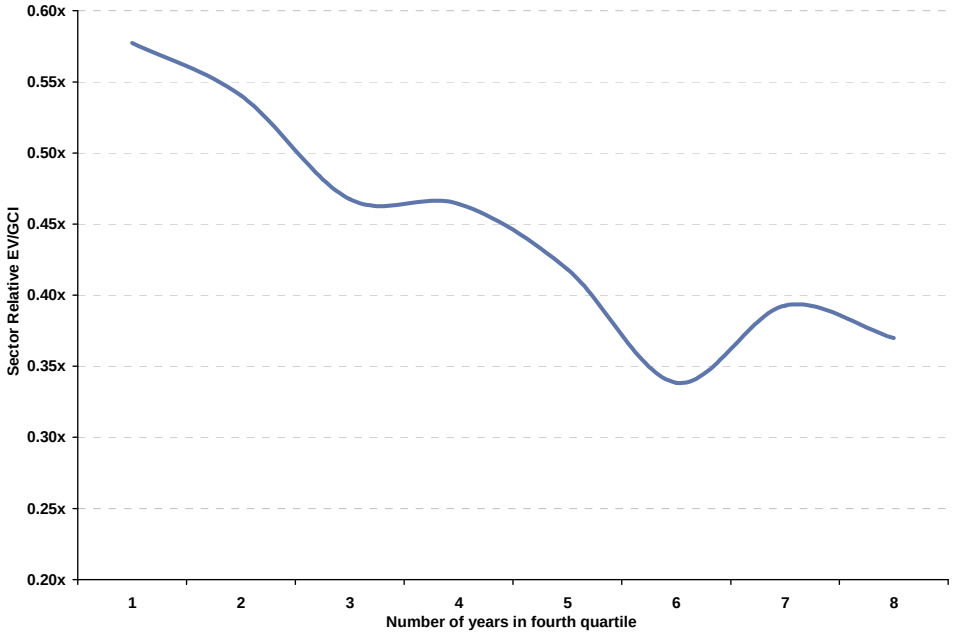
Industry Laggards: Sustained disadvantage leads to a lower valuation premium, which disappears after 4 years



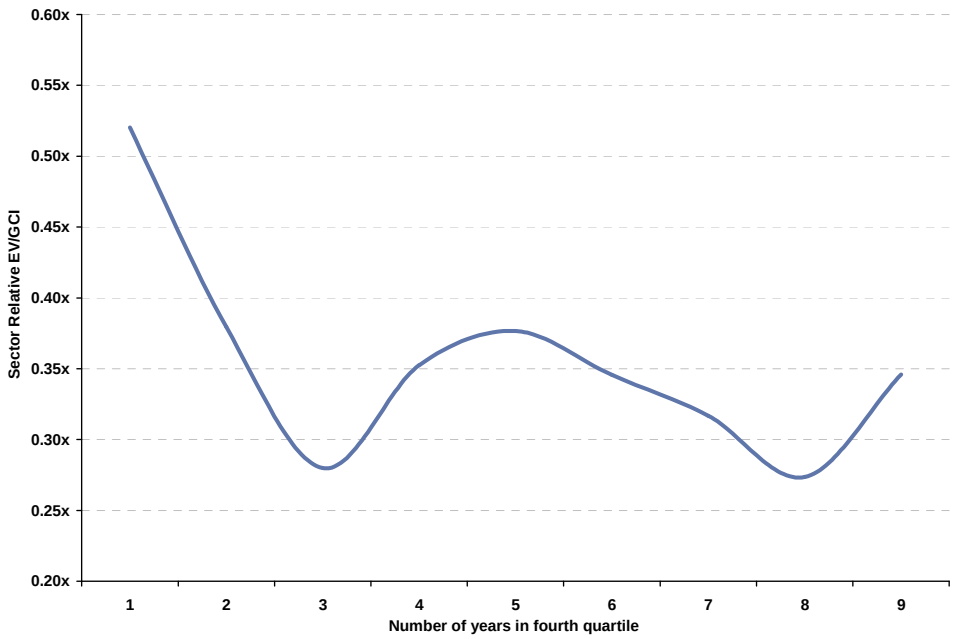
Source: Goldman Sachs Research.

Sustained laggards tend to revert to an asset-based valuation

Continuous fourth-quartile CROCI companies find a floor at about 0.34X sector relative EV/GCI in AEJ…



…and 0.27X in Japan



Source: Goldman Sachs Research.

While CROCI may trend towards zero (or negative), enterprise values are unlikely to converge towards zero due to potential for sale or break-up, hence sustained laggards find a floor

Sustainable returns.....GS SUSTAIN

GS SUSTAIN identifies companies which stand out for their superior performance in each of the drivers of corporate performance:

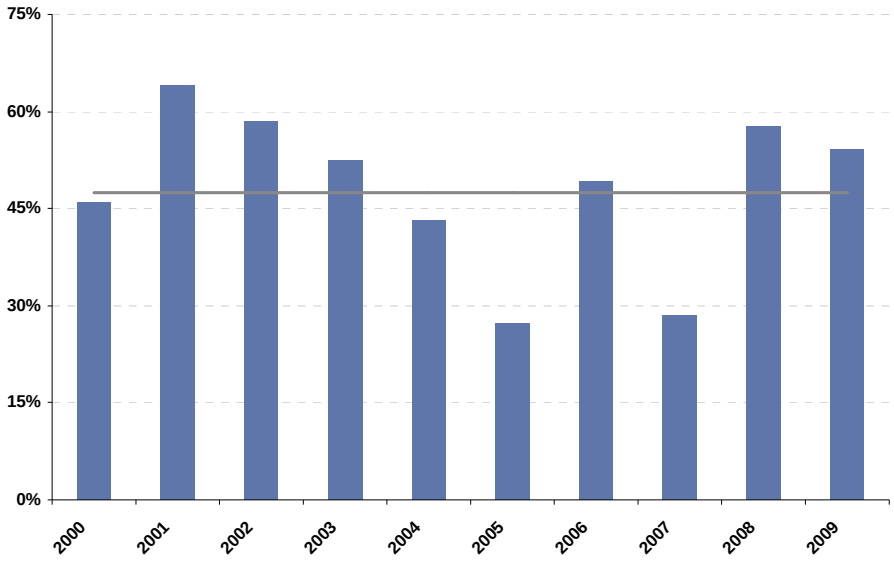
- Return on capital ⟵ Identified by looking at CROCI quartile
- Industry positioning ⟵ Identified in collaboration with teams
- Management quality with respect to ESG issues ⟵ Using our ESG framework

GS SUSTAIN focus list performance YTD

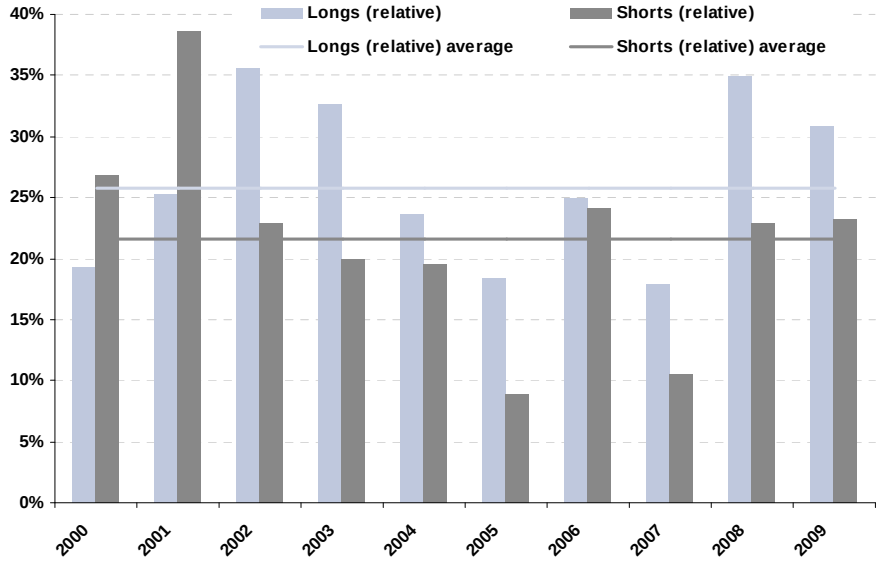
Source: Bloomberg, MSCI, Goldman Sachs Research.

Backtesting shows consistent alpha generated

The Director's Cut basic methodology generated 47% long/short performance in Asia on average (2000-2008)



Positive alpha generated each year on both the long and the short legs



Source: Goldman Sachs Research. 2009 corresponds to annualized ytd performance.

Significant alpha generated by selecting top and bottom 20% of stocks - Portfolio rebalanced every month

Both in AEJ and Japan, the backtest shows strong alpha (46% and 34% p.a. in AEJ and Japan respectively)

Issues with the methodology

- Methodology is based on a company's cash flow over the next 12 months
  - Stocks with strong cash flow returns over medium term may screen as expensive
  - Stocks with deteriorating cash flow returns over medium term may screen as cheap
- TRG team in Asia have increased the time horizon to 2 years and 3 years
  - Increasing the time horizon to 2 years translates into small alpha gain for AEJ, and alpha reduction for Japan (and assumes perfect foresight)
  - Increasing the time horizon to 3 years generates consistently lower alpha
- Different time horizons work in different periods
  - Generally, methodology based on one year forward is better, except when markets peak when a 3 year forward works best
- We use the same WACC across sectors. Why?....

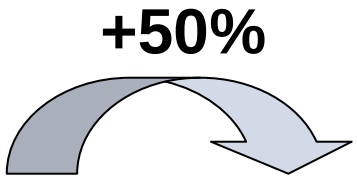
Methodology is only ever as good as your numbers

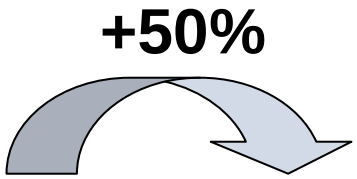
- Spending time forecasting numbers is critical

- In the recent downturn, analysts forecasted revenue well, but missed working capital and operating leverage, meaning that actual returns (especially on a cash basis) were overstated

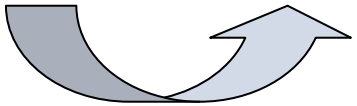
- Understanding industry concentration also critical – work by SUSTAIN team shows that more consolidated sectors yield higher average cash returns and industry stability supports higher average returns

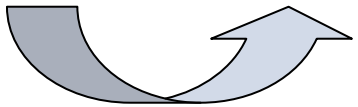
Operating Leverage





	Co. A		Co. B	
Unit sales:	**10,000**	**15,000**	**10,000**	**15,000**
	$000	**$**	**$**	**$**
Turnover	100	150	100	150
Variable costs	(60)	(90)	(20)	(30)
Contribution	40	60	80	120
Fixed costs	(20)	(20)	(60)	(60)
Profit	20	40	20	60





Reverse in a downturn!

+100%

+200%

How to forecast Working Capital

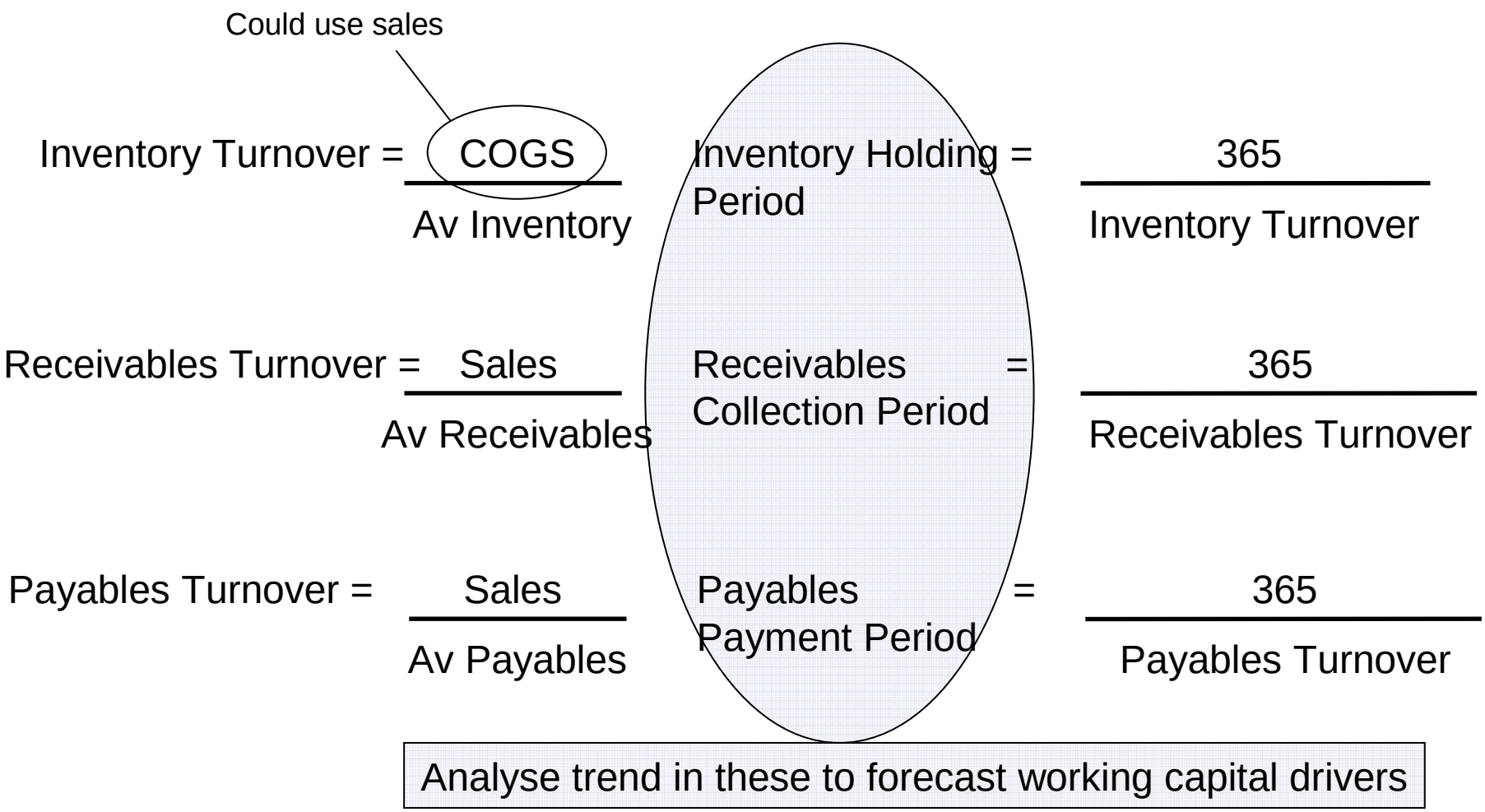
- The most simple way to calculate WC is as a % sales

Sales	1,000	1,100	1,210	1,300	1,200
Sales growth		10.0%	10.0%	7.4%	-7.7%
WC % Sales	5%	5%	5%	5%	5%
WC	50	55	61	65	60
Change in WC		5	6	5	(5)
Change in WC as % Sales		0.45%	0.45%	0.35%	-0.42%

Note that working capital is forecast from sales and change in working capital is subsequently calculated.

- However, this assumes that if sales fall, the working capital requirement is positive. It also does not allow analysis of the various components of working capital and how they are moving…

Calculating Working Capital using the Cash Conversion Cycle

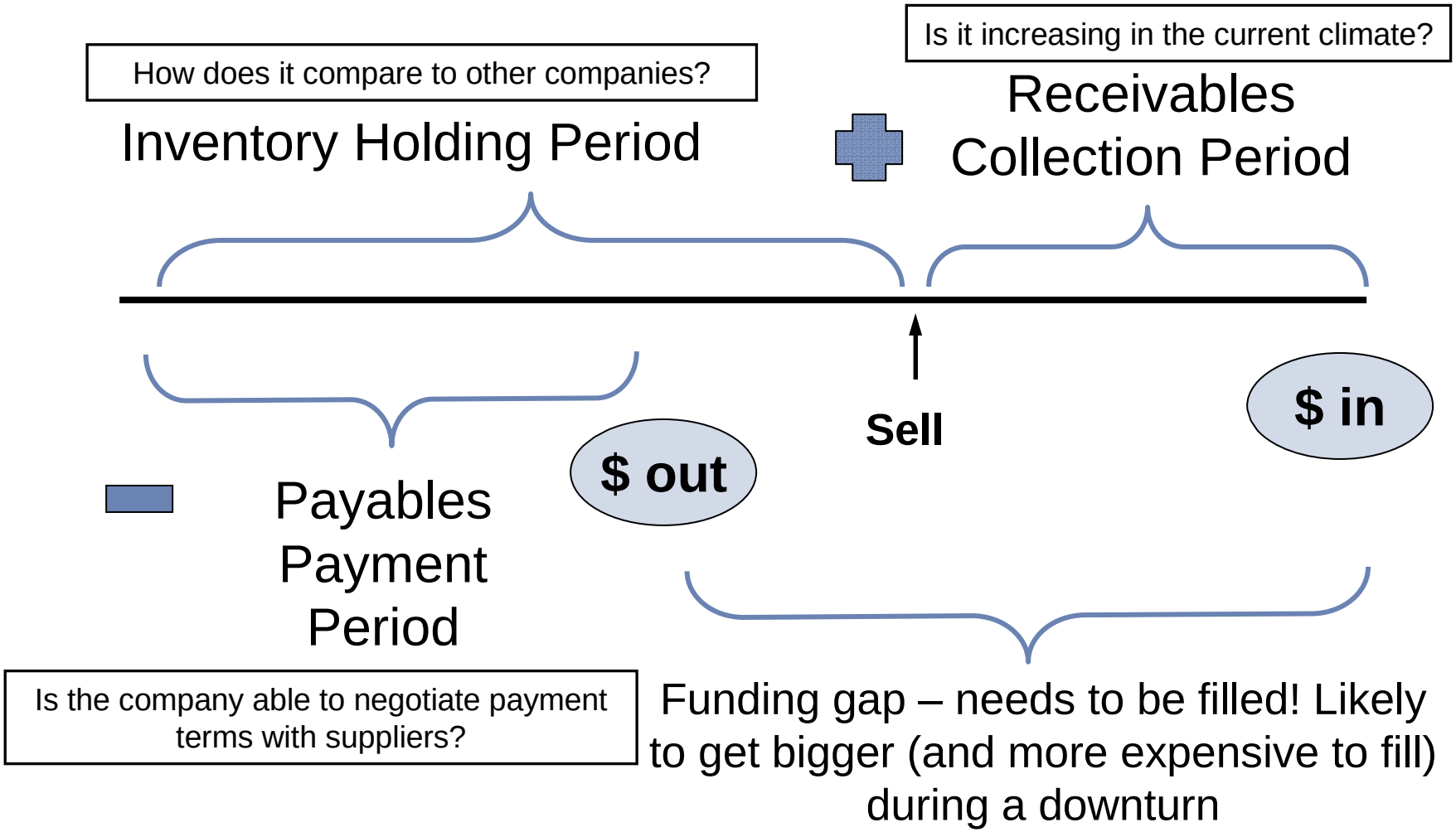


Calculating Working Capital using the Cash Conversion Cycle

Balance Sheet (GBP mn)	2005	2006	2007	2008E	2009E	2010E	2011E
Inventory turnover	23.7	24.1	20.2	20.2	20.2	20.1	20.1
Inventory days	15.4	15.2	18.1	18.1	18.1	18.1	18.1
Receivables turnover	44.0	43.1	39.5	39.5	39.5	39.5	39.5
Receivable days	8.3	8.5	9.2	9.2	9.2	9.2	9.2
Payable turnover	12.0	13.6	12.9	12.9	12.9	12.9	12.9
Payable days	30.4	26.9	28.4	28.4	28.4	28.4	28.4

- Look at the trends in each of the components to drive the calculation of the balance sheet item
- Easier to understand and analyse than simple percentage numbers
- Allows working capital to be analysed and any anomalies to be spotted
- Can also look at trends in the cash conversion cycle….

Cash Conversion Cycle



Deconstructing CROCI

$$\text{CROCI} = \frac{\text{DACF}}{\text{GCI}} = \underbrace{\frac{\text{Revenue}}{\text{GCI}}}_{\text{Asset turnover}} \times \underbrace{\frac{\text{EBITDA}}{\text{Revenue}}}_{\text{Operating margin}} \times \underbrace{\frac{\text{DACF}}{\text{EBITDA}}}_{\text{Cash conversion}}$$

↓

Higher the operating leverage greater the sensitivity of EBITDA to changes in revenue

Can use methodology to generate price target

- You are given the following information about a stock. Assuming that the sector EV/GCI vs CROCI/WACC is 1:1, what is the target price?

(GBP mn)	2009E
Sales	**8,728.7**
Operating costs (COGS & SG&A)	(8,000.5)
Other operating income/(expense)	340.6
EBITDA	**1,068.8**
EBITDA (analyst) (GBP)	1,068.8
Depreciation	(369.4)
Operating income (EBIT)	**699.4**
Net interest expense	(121.3)
Pre-tax profit	**578.1**
Pre-tax profit (analyst) (GBP)	578.1
Effective tax rate	28.0%
Provision for income taxes	(161.9)
Net income	**416.2**

(GBP mn)	2009E
Weighted shares outstanding (mn)	1,586.0
Net debt	2,532.2
Minority interests	7.3
Unfunded pensions and other provisions	769.4

Balance Sheet (GBP mn)	2009E
Cash & equivalents	27.0
Stocks	480.3
Accounts receivable	300.6
Other current assets	571.2
Current assets	**1,379.1**
Accounts payable	(933.5)
Other current liabilities	(435.2)
Current liabilities	**(1,368.7)**
Gross fixed assets	9,027.0
Accumulated depreciation	(3,582.4)
Net fixed assets	**5,444.6**
Gross intangible assets	305.5
Accumulated amortization	0.0
Net intangible assets	**305.5**
Total net depreciating assets	**5,750.1**

(increase)/decrease in working capital	(27.6)
Operating working capital	10.4

WACC	7.1%

Answer

- Operating Cash Flow = Net Income + Depreciation – increase in working capital
  = £416.2m + £369.4m - £27.6m = £758m

- DACF = Operating Cash Flow + Interest x (1 – Tax rate)
  = £758m + £121.3m x (1 – 28%) = £845.3m

- GCI = Gross fixed assets + Gross intangible assets + Operating working capital
  = £9,027.0m + £305.5m + £10.4m = £9,342.9m

- CROCI = DACF/GCI = 845.3/9,342.9 = 9.05%
- CROCI/WACC = 9.05%/7.1% = 1.2743

- Enterprise Value = 1.27 x GCI = 1.2743 x £9,342.9m = £11,906m

- Equity Value = Enterprise Value – Net Debt – Minority Interests – Unfunded Pensions
  = £11,906m - £2,532.2m - £7.3m - £769.4m = £8,597m

- Target price per share = £8,597m/1,586m = £5.42

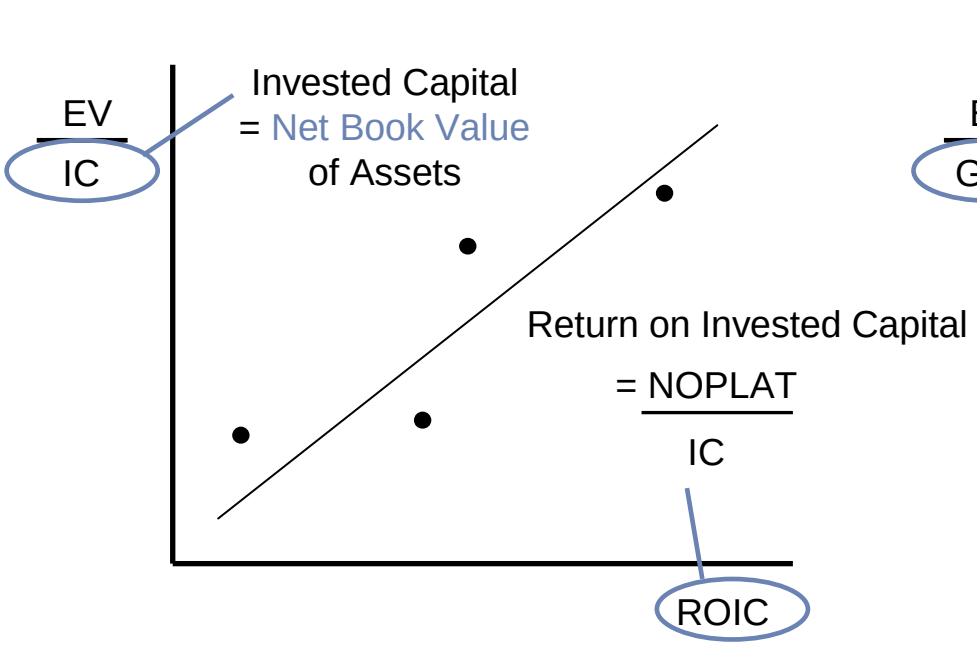
Adapting the methodology

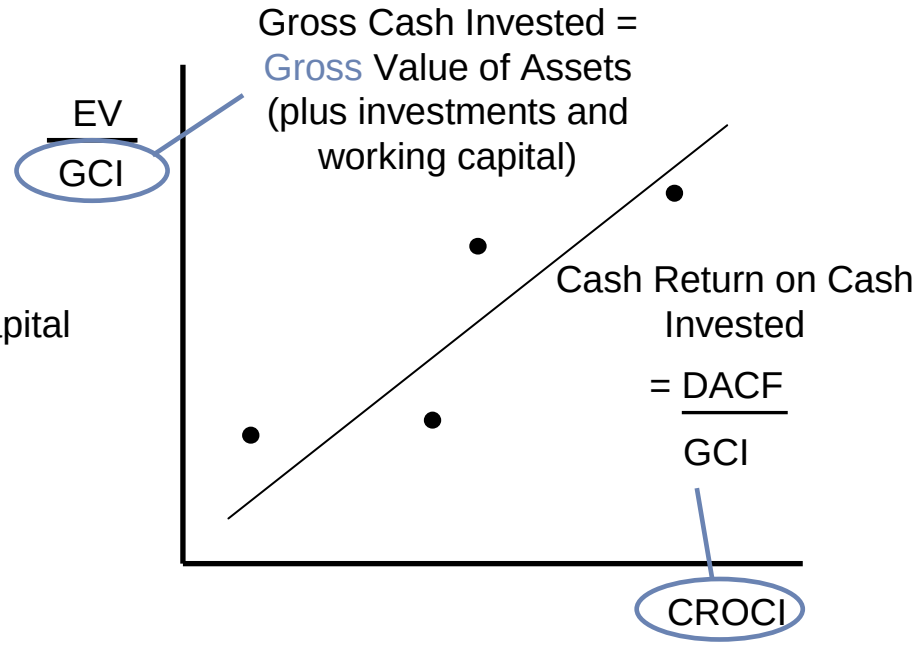
- We have focussed on the ‘Director’s Cut’ concept of CROCI. However, the concept of comparing excess value generated to excess value placed on the stocks by the market can be applied to different metrics

- Critical thing is to be consistent, and be aware of any issues….

Using ROIC instead of CROCI

- Both CROCI (Cash Return on Cash Invested) and ROIC (Return on Invested Capital) measure the return that a company is generating and so are useful valuation metrics
- Remember to be consistent…..





CROCI versus ROIC

- Key difference between CROCI and ROIC is in the asset valuation – ROIC uses accounting figures whereas CROCI is a cash based measure

EBIT x (1 – tax rate) ie. Post depreciation and provisions

$$ROIC = \frac{NOPLAT}{IC}$$

NBV of Assets ie. Post depreciation and provisions

Operating Cash Flow + Interest x (1 – tax rate) ie. Pre depreciation and provisions

$$CROCI = \frac{DACF}{GCI}$$

Gross Value of Assets ie. Pre depreciation and provisions

- Whilst the impact of depreciation normally cancels out, provisions can cause distortions in ROIC which do not affect the CROCI number….

CROCI versus ROIC – Example

- Assume that a company is being analysed over a three year period. EBIT and GCI is constant. The company has an EV of 12,000. There are no taxes or interest.

	Year 1	Year 2	Year 3
GCI	10,000	10,000	10,000
Depreciation	1,000	1,000	1,000
IC	9,000	8,000	7,000
EBIT	500	500	500
DACF	1,500	1,500	1,500
CROCI	15.0%	15.0%	15.0%
ROIC	5.6%	6.3%	7.1%
Introducing a provision…			
GCI	10,000	10,000	10,000
Depreciation	1,000	1,000	1,000
Provision	300		
IC	8,700	7,700	6,700
EBIT	200	500	500
DACF	1,500	1,500	1,500
CROCI	15.0%	15.0%	15.0%
ROIC	2.3%	6.5%	7.5%

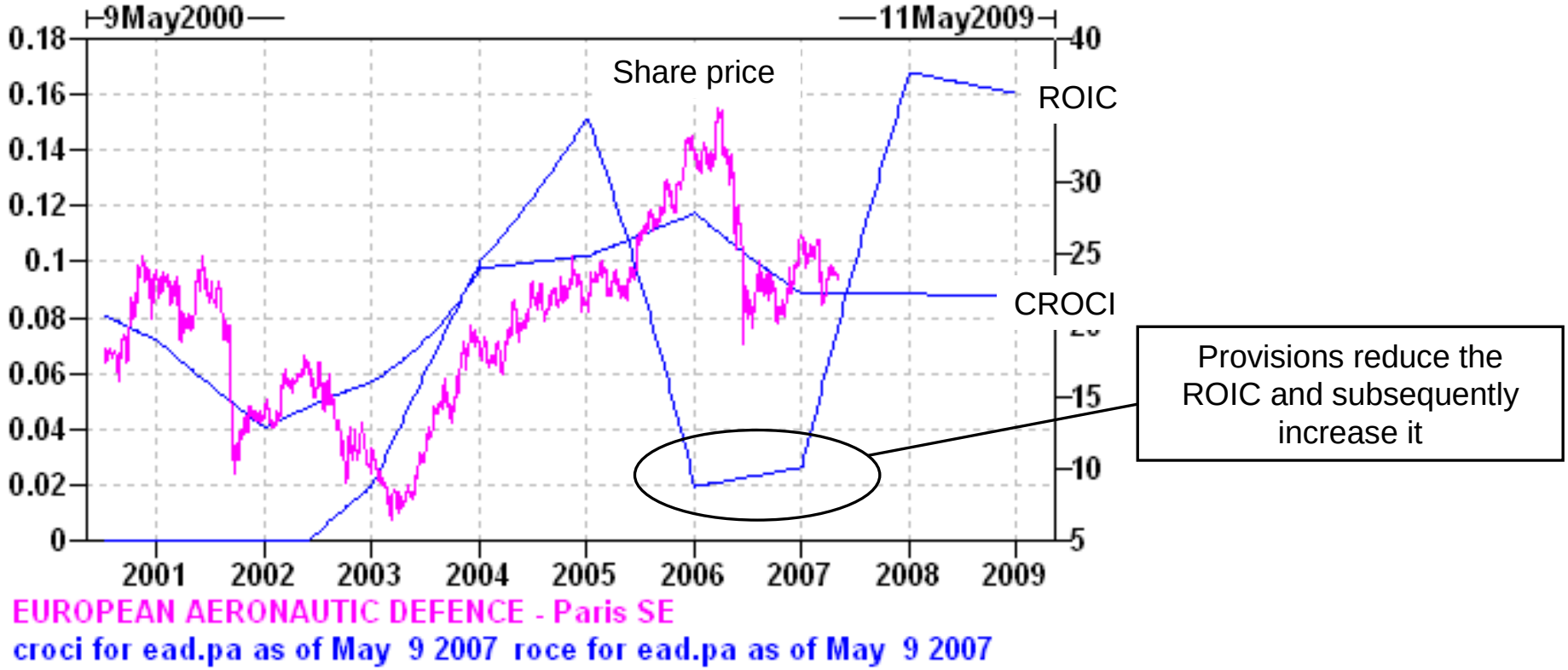
CROCI remains constant (as does GCI) and ROIC increases in line with IC

CROCI remains constant but ROIC is distorted by the provision in year 1. If the provision was reversed, this would create further distortion

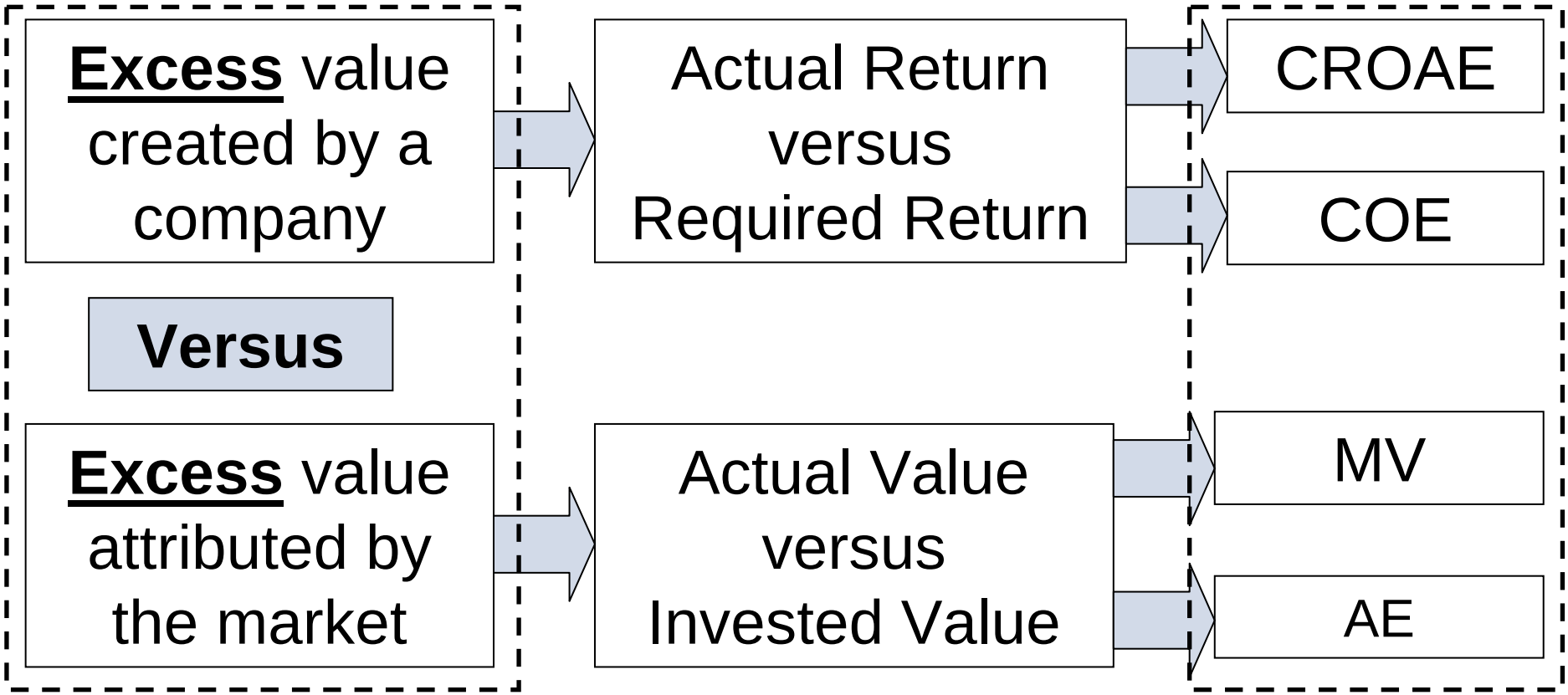
Therefore, analysing returns on a cash basis will give a better indication of future performance than looking at accounting returns…..

CROCI versus ROIC – Example

- For this company (EADS), provisions have distorted ROIC so that the share price/ROIC correlation is weak compared with the share price/CROCI correlation

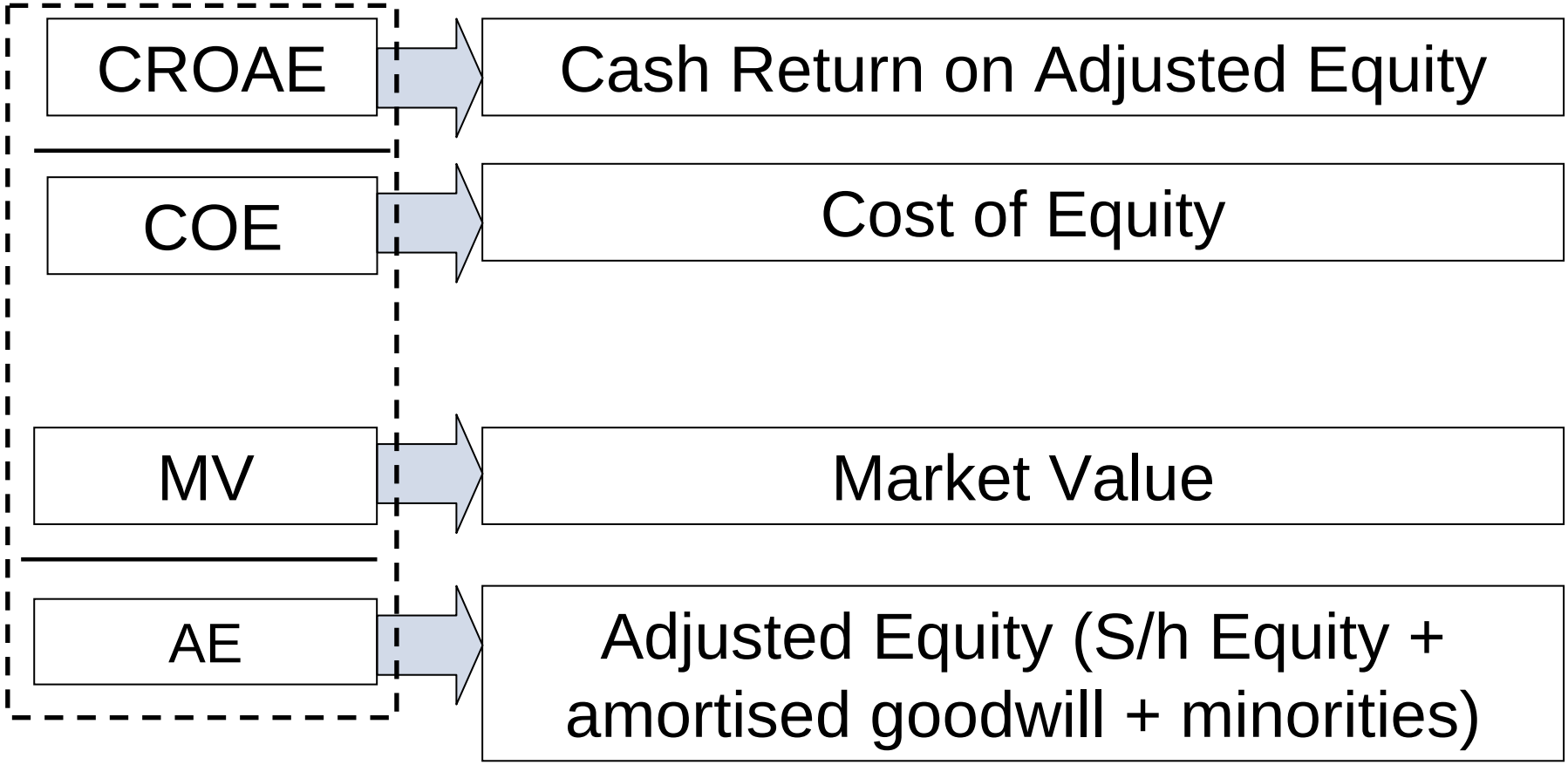


Valuing the Banks Sector

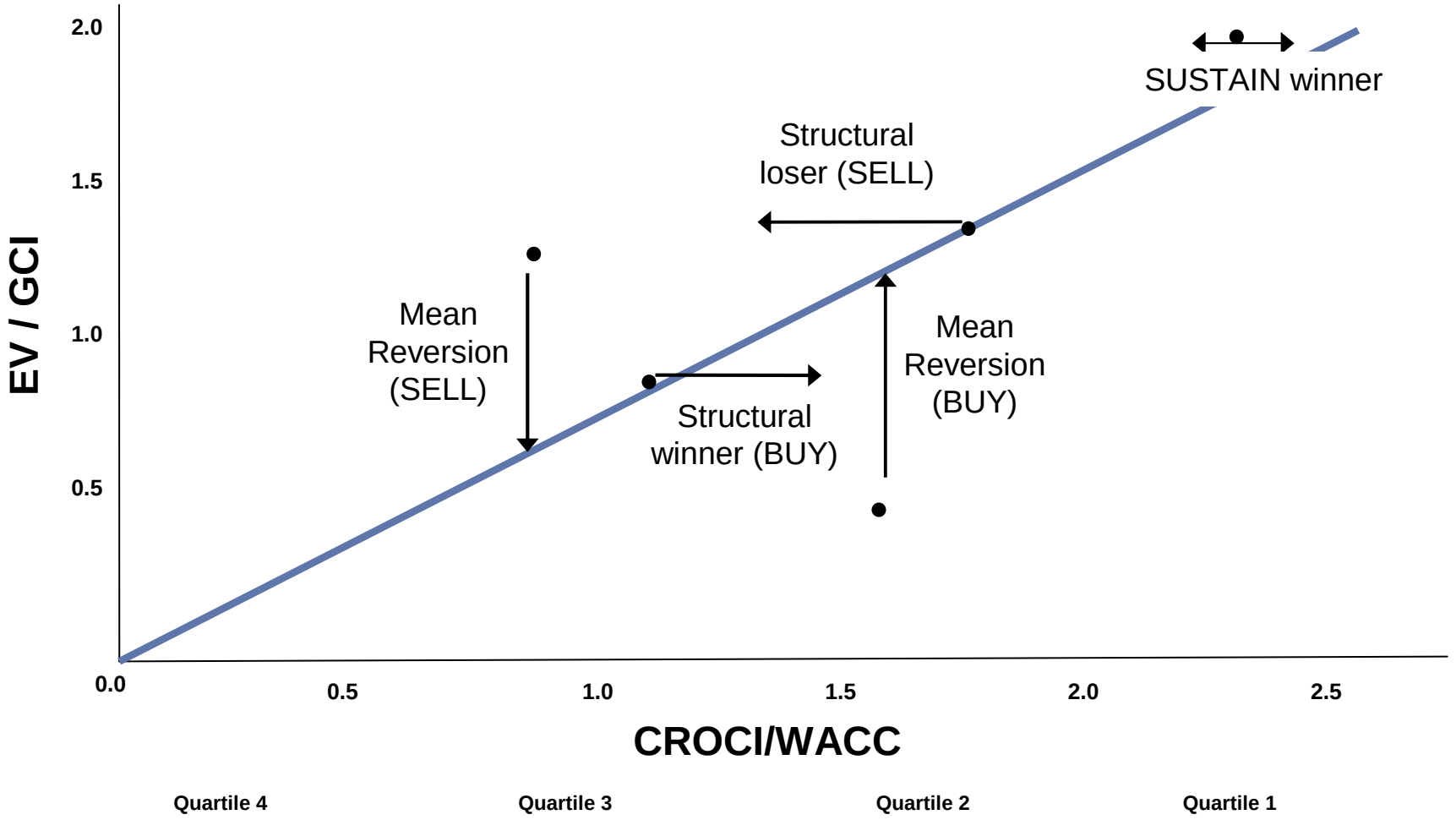


If these are out of line, the stock is misvalued

Valuing the Banks Sector

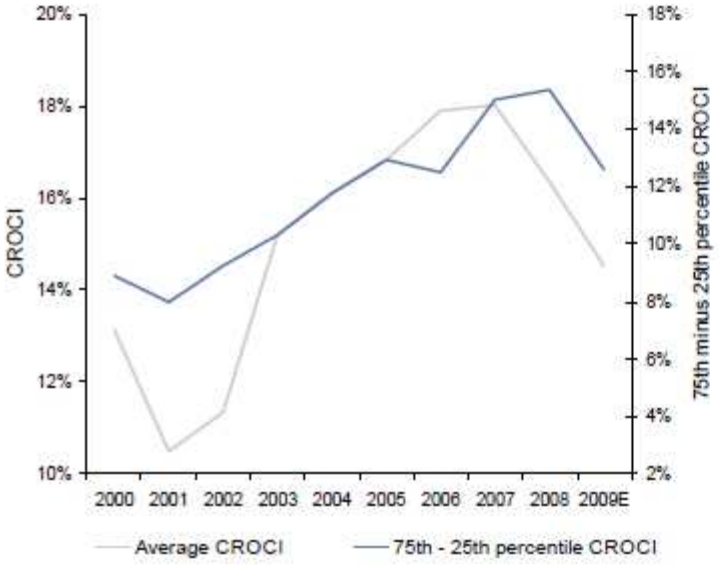


All our stock calls can be categorised using a returns framework



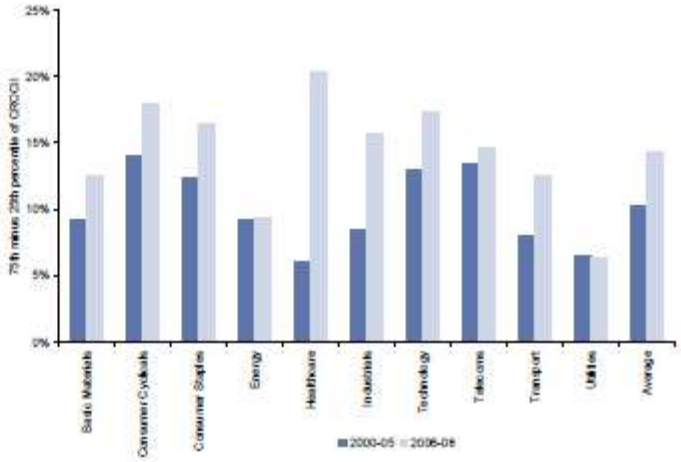
Final note.....gap between winners and losers is wide but valuations are not. Opportunities abound.....

Exhibit 27: We believe the gap between Asian leaders and laggards will continue to widen in the long term...
CROCI across our Asian coverage universe (2000-09E).



Source: Quantum database, Goldman Sachs Research estimates.

Exhibit 28: ... and across almost every sector
75th-25th percentile CROCI across sectors within our Asian coverage universe (2000-05 and 2006-08 averages).



Source: Quantum database, Goldman Sachs Research estimates.

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Multiple Analysis

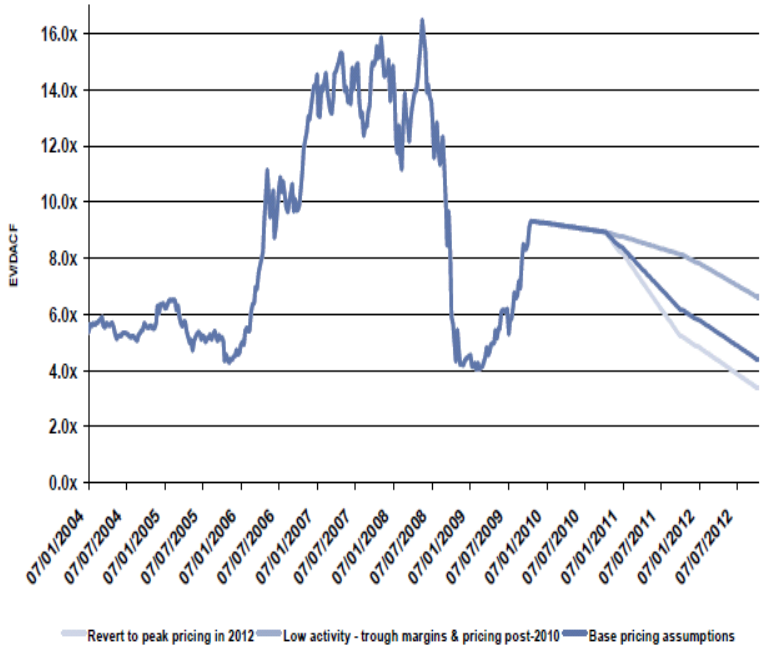
Using Multiples in Valuation

- Unfortunately, using multiples to derive price targets directly simply leads to price targets following market moves
- The best way to consider multiples is in the context of returns analysis, such as the Director's Cut framework or via target multiples
- However, simple multiples should always be used to sanity check price targets that have been derived from other analysis
  - What EV/DACF multiple is implied by the DCF?
- Multiples can also be used when carefully considered against history
- Fundamental multiple analysis can also be useful….

Using multiples as a sanity check

Exhibit 1: PGS would trade on 3.4x 2012E EV/DACF in our high-activity scenario

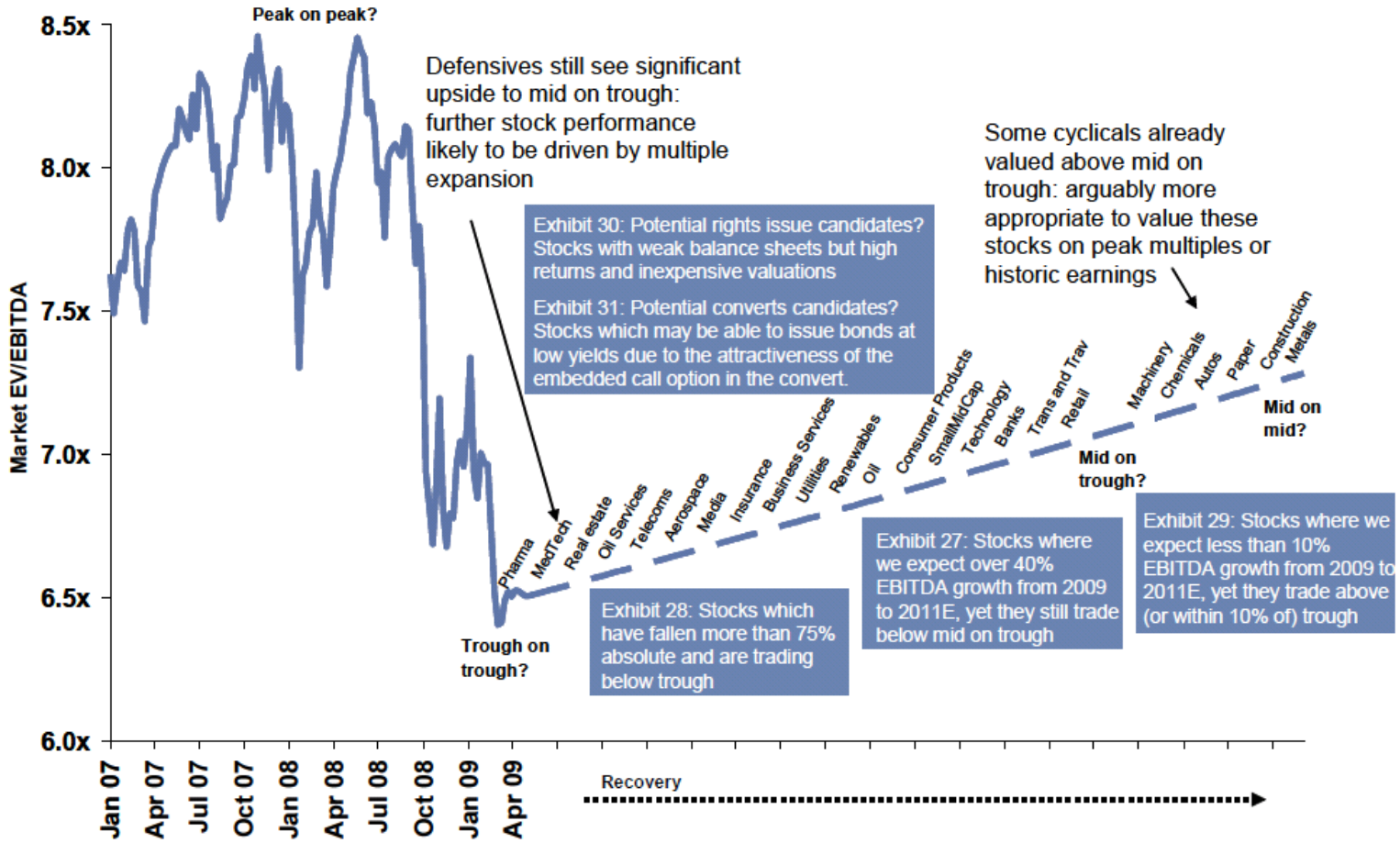
EV/DACF multiple in different scenarios



Source: Datastream, Goldman Sachs Research estimates.

Multiples change over time

Exhibit 1: The market appears to be moving towards a mid-on-trough valuation approach
Market EV/EBITDA from January 2007 to date, and the distribution of sectors on the basis of current multiples vs mid-on-trough



Source: Goldman Sachs Research estimates.

Target or Fundamental Multiples

- A target multiple is the maximum multiple that an investor could pay and receive the **required** return on the investment
- For example, if Co. A shares are currently trading at $140 and year end eps was $11.73, with a 6 month required return of 6%, an investor with perfect foresight could have paid 11.3x earnings and generated their required return
- 11.3x is the target or fundamental multiple, and there are obvious benefits to being able to identify this multiple

Fundamental P/E

If ROE = COE, then the equation collapses down to:

$$\frac{1}{ROE}$$

If the ROE is 10% and COE is 10% then P/E will be 10x regardless of g

If ROE < COE, then the P/E will be less than 1/ROE

If the ROE is 10%, COE is 12% and g is 5%, the P/E is 7.14x

If ROE > COE, then the P/E will be greater than 1/ROE

If the ROE is 12%, COE is 10% and g is 5%, the P/E is 11.67x

$$\frac{P}{E} = \frac{ROE - growth}{ROE \times (COE - growth)}$$

If COE increases (for example, the risk of the equity rises) then the P/E will fall

An increase in g will increase the P/E (if the company is adding value) or reduce the P/E (if the company is destroying value)

If the ROE rises, the P/E will rise

Fundamental P/E

Perpetual growth rate (less than k_e)

Growth = ROE x b

So b = $\frac{\text{growth}}{\text{ROE}}$

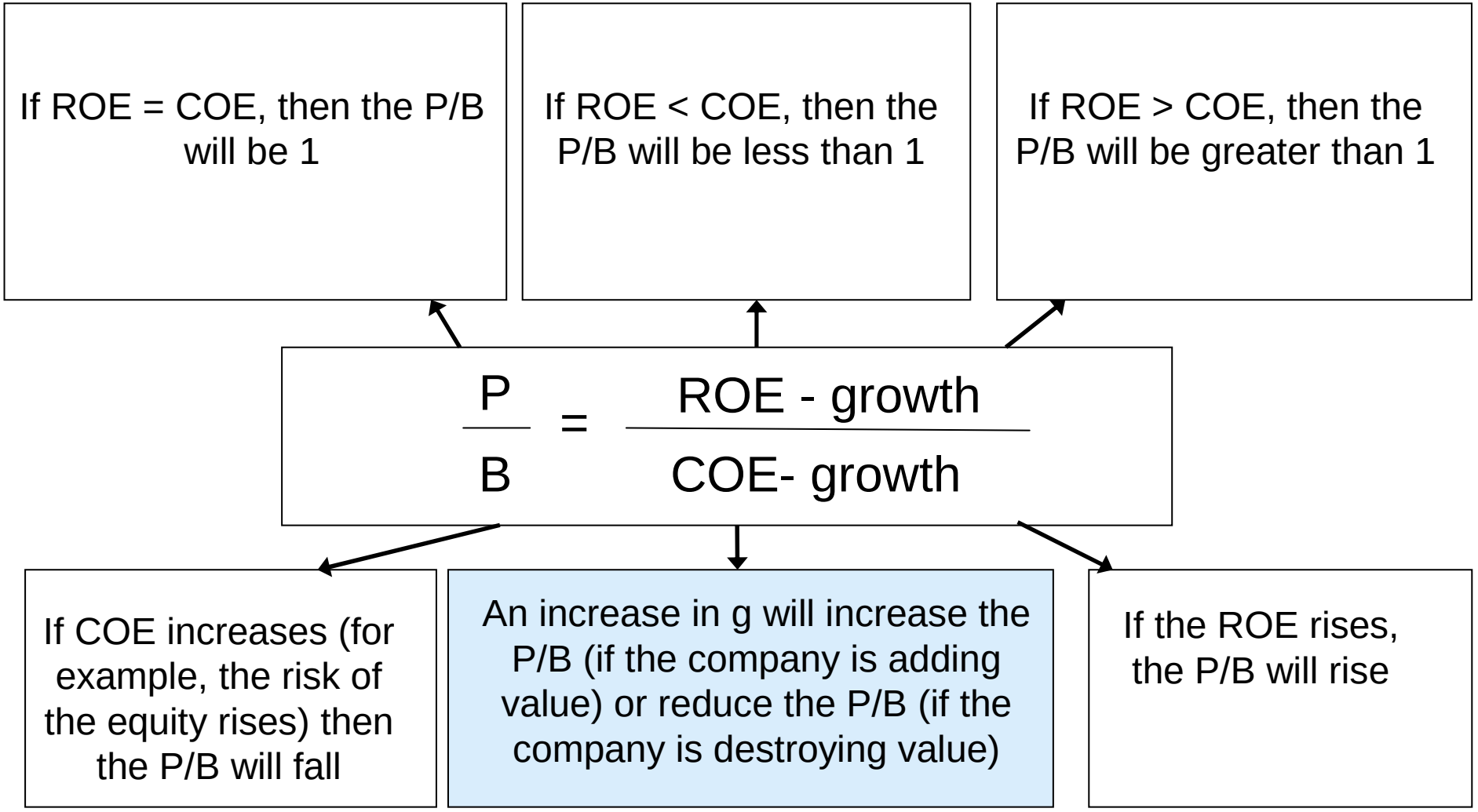
$$\text{Price} = \frac{\text{Dividend}}{k_e - g} = \frac{\text{Earnings x (1 – retention rate (b))}}{k_e - g}$$

Cost of equity

$$= \frac{\text{Earnings x (1 – growth/ROE)}}{k_e - g}$$

$$\frac{\text{Price}}{\text{Earnings}} = \frac{1 - \text{growth/ROE}}{k_e - g} = \boxed{\frac{\text{ROE} - g}{\text{ROE x } (k_e - g)}}$$

Fundamental P/B



Fundamental P/B

Dividend = earnings$_1$ x payout ratio (p/o)

= Book Value$_0$ x return on equity (r)

$$\text{Price} = \frac{\text{Dividend}_1}{k_e - g} = \frac{B \times r \times p/o}{k_e - g}$$

Payout ratio = 1-b

r x b = growth

$$\frac{\text{Price}}{\text{Book}} = \frac{r \times p/o}{k_e - g} = \frac{r \times (1 - b)}{k_e - g} = \frac{r - r \times b}{k_e - g}$$

$$= \frac{r - g}{k_e - g}$$

Which is the actual return on equity versus the required return on equity (cost of equity)!!

Other uses of P/E and P/B

What if growth is zero?....

$$\frac{ROE - g}{ROE \times (k_e - g)} = \frac{1}{k_e}$$

P/E differentiation based on:

- Growth
- Risk

$$\frac{ROE - g}{k_e - g} = \frac{ROE}{k_e}$$

P/BV differentiation based on:

- Value-added

The formulas then give us a minimum level for the P/E and P/BV

Linking Multiples and Value Drivers

Multiples can be plotted against value drivers such as growth and value added to try to identify anomolies in the market

Relative Valuation

- P/E to earnings growth (PEG ratio)
- EV/EBITDA to EBTIDA growth

- Ignores factors such as return on capital
- Assumes a linear relationship between P/E and growth

Multiple to Return on Capital/ Excess Return

- P/BV vs ROE
- EV/Invested Capital vs Return on Capital
- EV/Invested Capital vs Excess Return

Director's Cut!

Goldman Sachs

Discounted Cash Flow Analysis

Overview

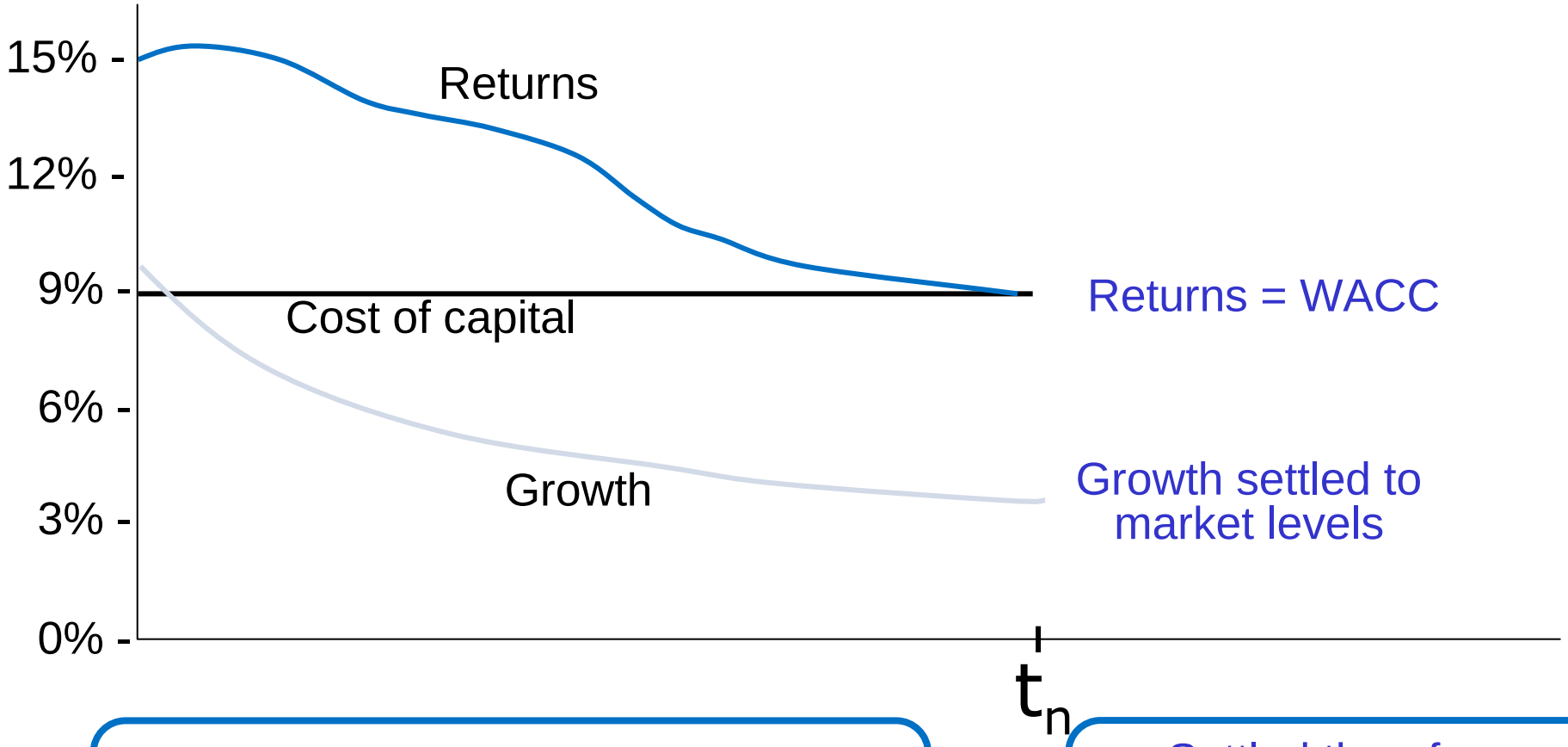
- DCF is one of the fundamental valuation techniques, but it needs to be carefully constructed
- In any DCF analysis, must define
  - Competitive advantage period (forecast period)
  - Free cash flow (to firm or to equity)
  - WACC
  - Terminal Value

Will go through each of these in turn and also consider sensitivity analysis

Selecting the forecast period

- Analysts often select the forecast period by reference to a certain time period such as ten years
- The forecast period should be the period where the company has a competitive advantage or disadvantage
  - Finite period for all companies
  - Economic forces mean that return will converge to required return and growth to macroeconomic growth
  - Requires judgement and knowledge of the industry, but the last year of the forecast period should be a return that you believe the company can sustain FOREVER

Selecting the forecast period

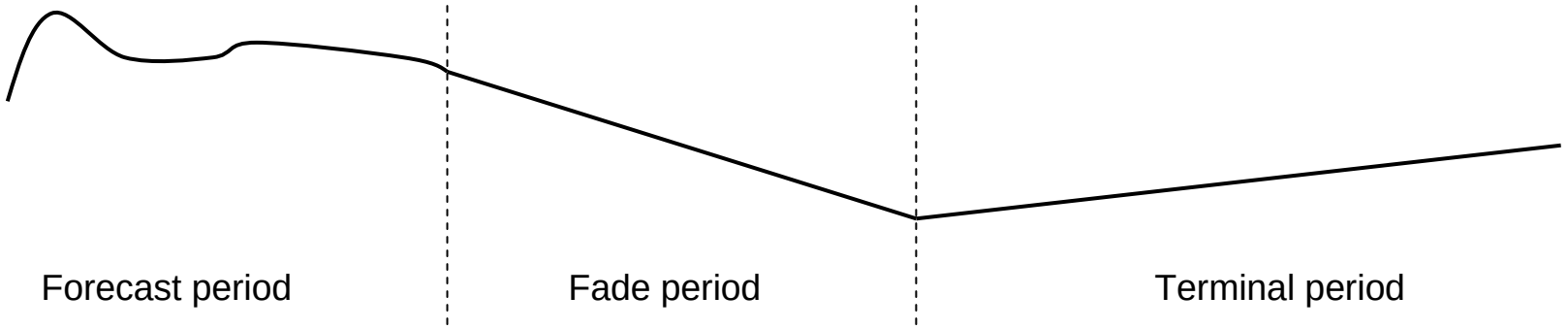


Dynamic therefore need to forecast explicitly

Settled therefore formulate terminal value

What if your forecast period is too long?

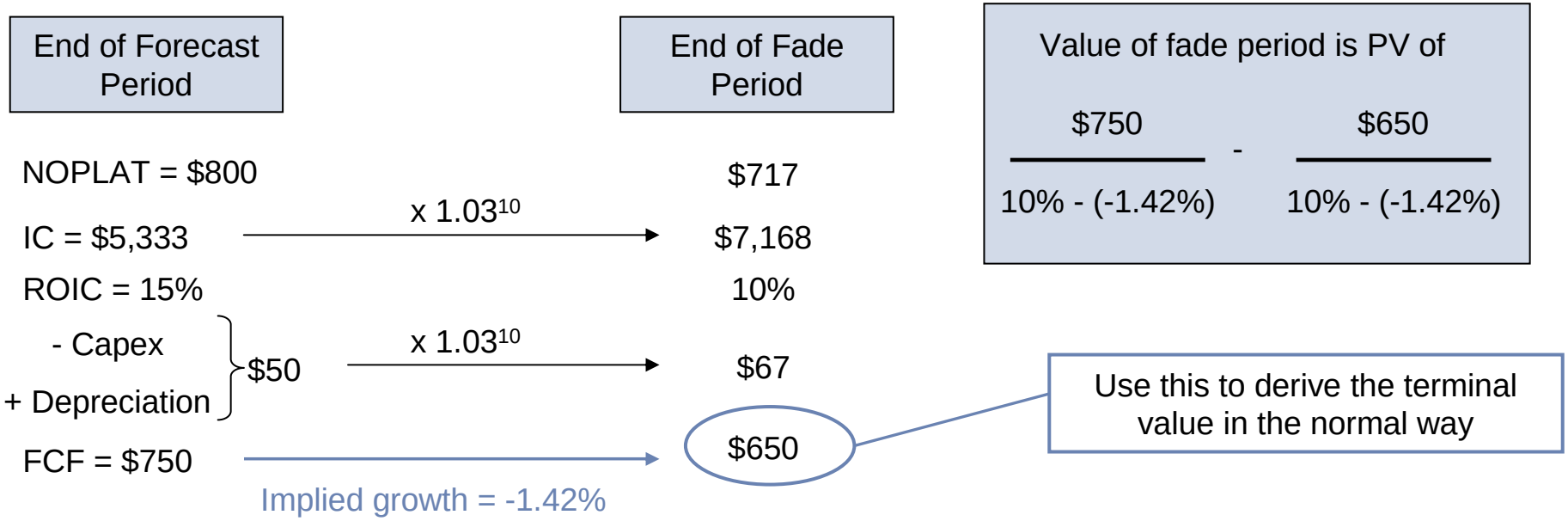
- If the competitive advantage period for your company is longer than you feel able to forecast, you must not simply stop the your forecasts and run a terminal value
- The terminal value MUST be driven from a sustainable cash flow
- One option is to forecast a simple linear trend from the end of the period to which you feel comfortable forecasting to a sustainable cash flow level, creating a three stage DCF model



Three stage DCF

There are many ways of approaching a fade period. One way is to look at the FCF at the end of the forecast period, work out what the ROIC should be at the end of the fade period and then back out the FCF.

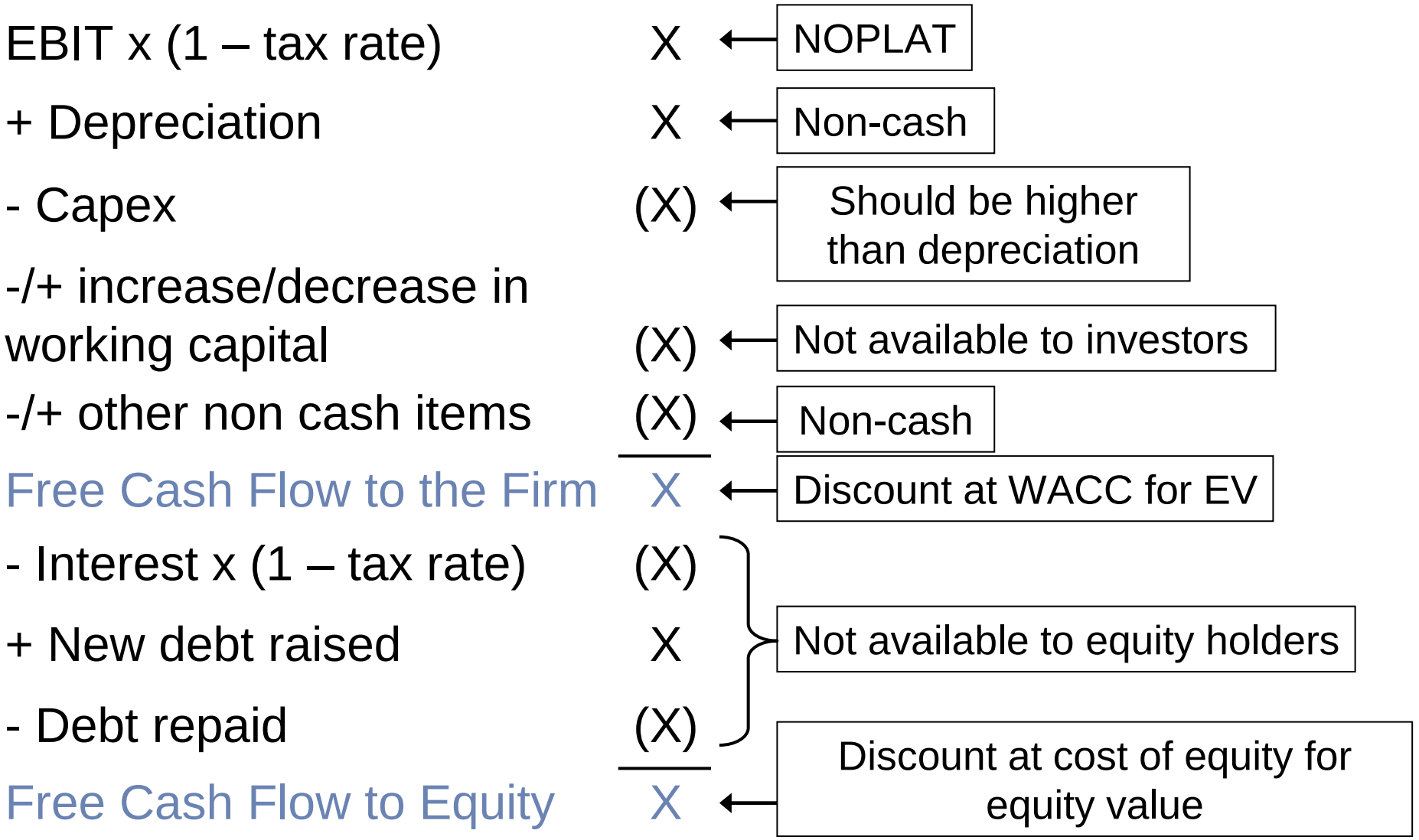
For example, assume that the following company has a WACC of 10% and the competitive advantage period is forecast to be another 10 years. Capex growth is expected to be 3%.



Free Cash Flow

- It is very important to get the cash flow calculation correct
- Key things to remember are
  - You need to calculate cash returns
  - Cash flow to the firm is pre-interest, but the tax shield on interest is taken into account in the WACC, not the cash flow
  - One-off cash returns or costs should be included, but ensure there are non in the final ‘terminal-value driving’ year
  - If a company is growing, capex will be higher than depreciation. This is especially important in the ‘terminal-value driving’ year

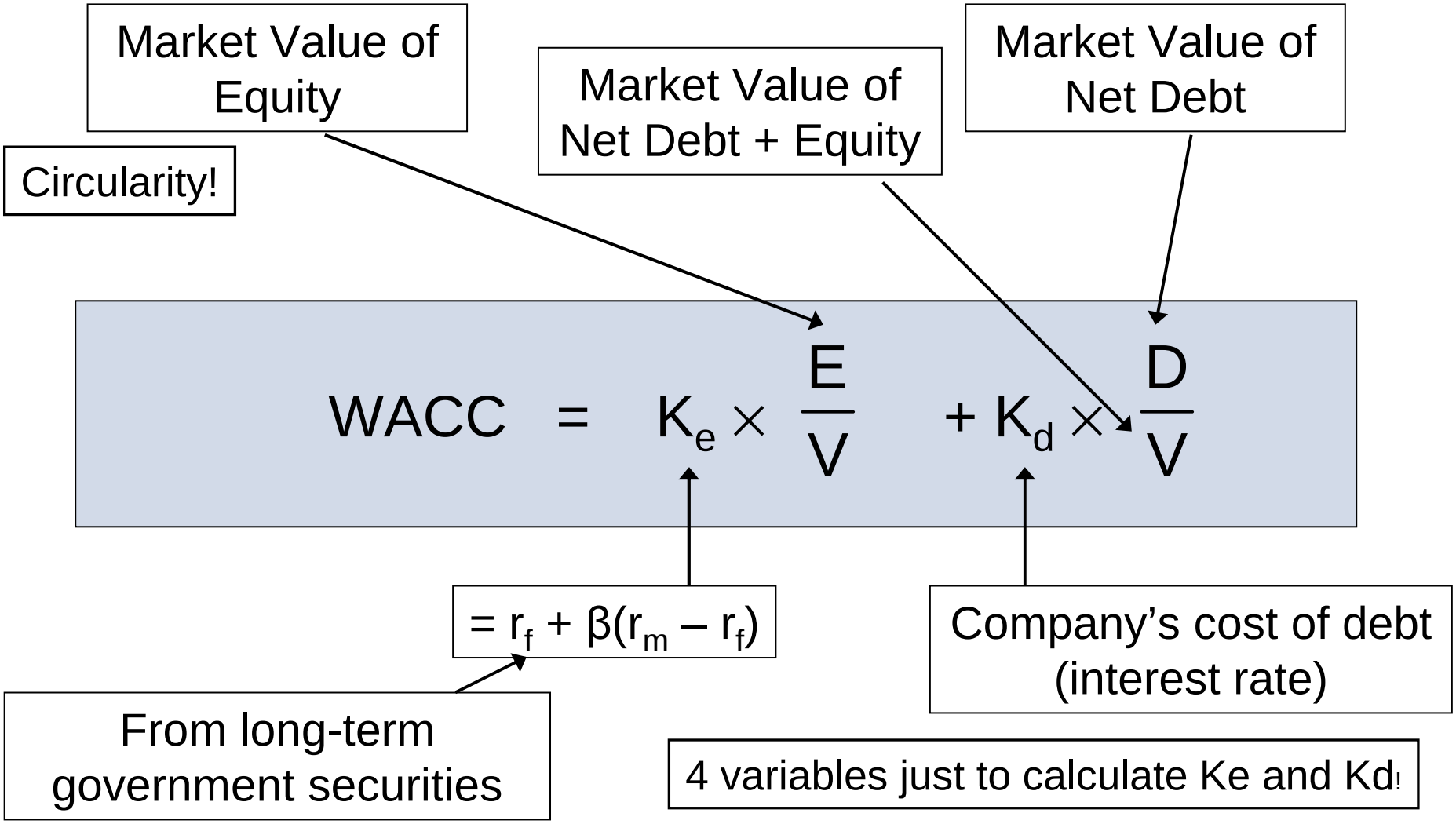
Calculation of Free Cash Flow



Forecasting Free Cash Flow

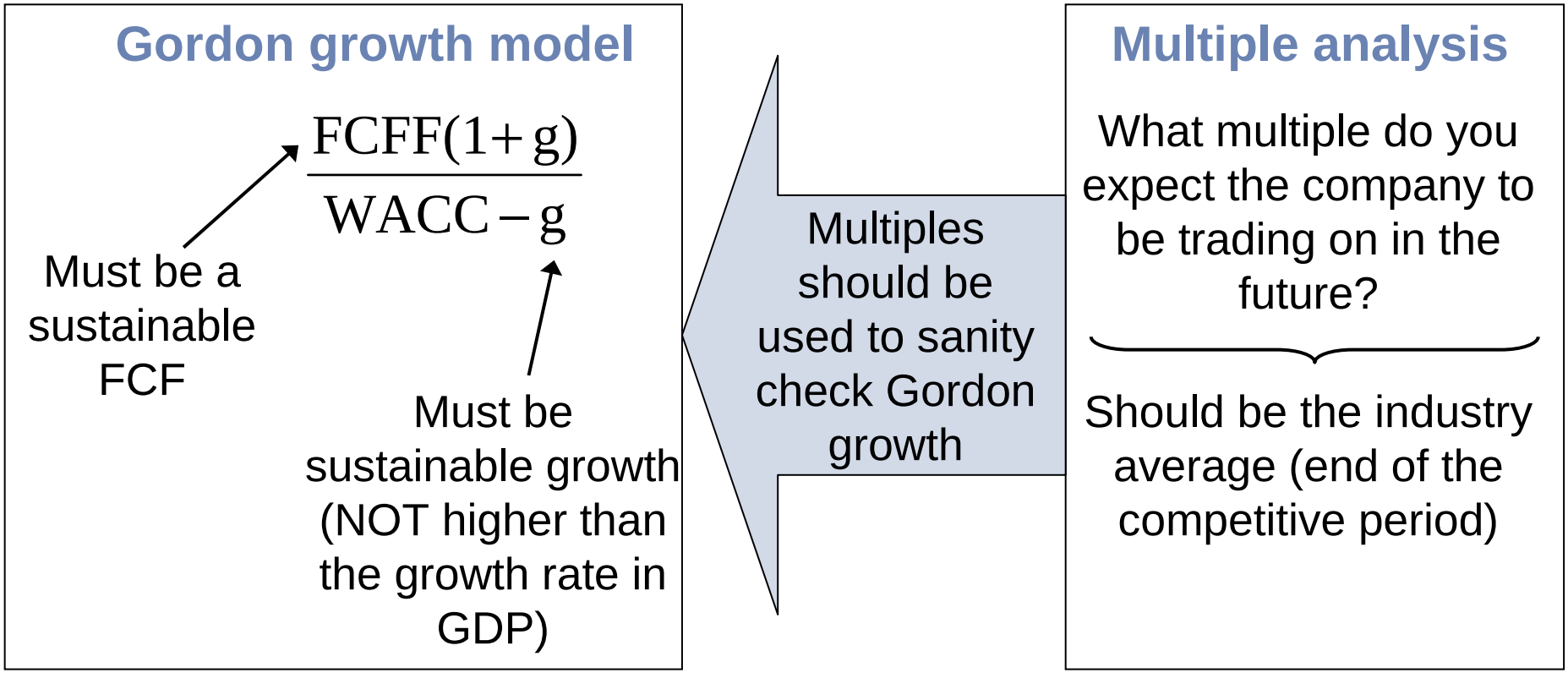
- Free cash flow forecasts should be created indirectly by forecasting the income statement and balance sheet
- Revenue is the key driver – most other items can be calculated from this by looking at past relationships
- Always calculate ratios such as gross profit, operating leverage and ROIC to sanity-check numbers
- Capex should be bigger than depreciation – if it isn't, there must be a good reason why and it must always be bigger in the terminal-value driver year (if growth is positive)

Weighted Average Cost of Capital (WACC)



Terminal Value

- A large proportion of a DCF is in the terminal value, and yet it is often given a disproportionately small amount of consideration
- There are two main ways of calculating the terminal value



Sensitivity Analysis

1) Sensitivity to accounting inputs

		Top line (2016E)				
	426.7	**2.0%**	**3.0%**	**4.0%**	**5.0%**	**6.0%**
Gross margin 2016E	**19.0%**	139.6	158.5	177.4	196.3	215.2
	20.0%	256.0	276.1	296.1	316.1	336.2
	21.0%	372.5	393.6	414.8	436.0	457.1
	22.0%	488.9	511.2	533.5	555.8	578.1
	23.0%	605.3	628.7	652.2	675.6	699.1

2) Sensitivity to WACC and terminal growth

		Perpetual growth			
	426.7	**-1%**	**0%**	**1%**	**2%**
WACC	**9.0%**	207	223	244	270
	8.0%	237	258	286	323
	7.0%	274	303	342	397
	6.0%	321	363	421	507

Not as straight forward as you might think……

Sensitivity Analysis

- If terminal growth increases then capex in the terminal-value driver year will be higher and FCF in that year will be lower
- For this reason, it is useful to use the Value Driver formula for the terminal value in sensitivity analysis

Converts NOPLAT to FCF allowing for the fact that higher g leads to higher capex and lower FCF

$$\text{Terminal Value} = \frac{\text{NOPLAT}_{t+1}\left(1 - \frac{g}{\text{ROIC}}\right)}{\text{WACC} - g}$$

- If ROIC = WACC in the terminal value driving year, there is no sensitivity to the terminal growth rate

DCF – the good and the bad

- Academically, DCF is the best way of valuing companies
- In reality, it is not due the number of variables (particularly in the WACC) and the mistakes made when calculating the terminal value
- DCF can be a good way of forcing people to think about company fundamentals, but better to think about the fundamentals and then use returns based valuation techniques if possible

Goldman Sachs

Bringing it all together

All methods are the same – so what do different results mean?

Back to Basics – it's all about the Value-Added

- Which methodologies do GS teams use?
  - DCF
  - Director's Cut
  - EVA
  - Multiples

The big question

Q: Why do different teams use different methods??

A: THEY DON'T!

All of the methodologies come down to the same underlying theme….

Value Added

DCF and value-added

- DCF is all about comparing actual return (free cash flow) with required return (WACC)
- For example, imagine that you are given $100m to start a company. The required return of investor's is 10%
  - If you deliver return of 13%, the value of the firm will be:

$$\frac{\$13\text{m}}{10\%} = \$130\text{m}$$

  - If you deliver return of 7%, the value of the firm will be:

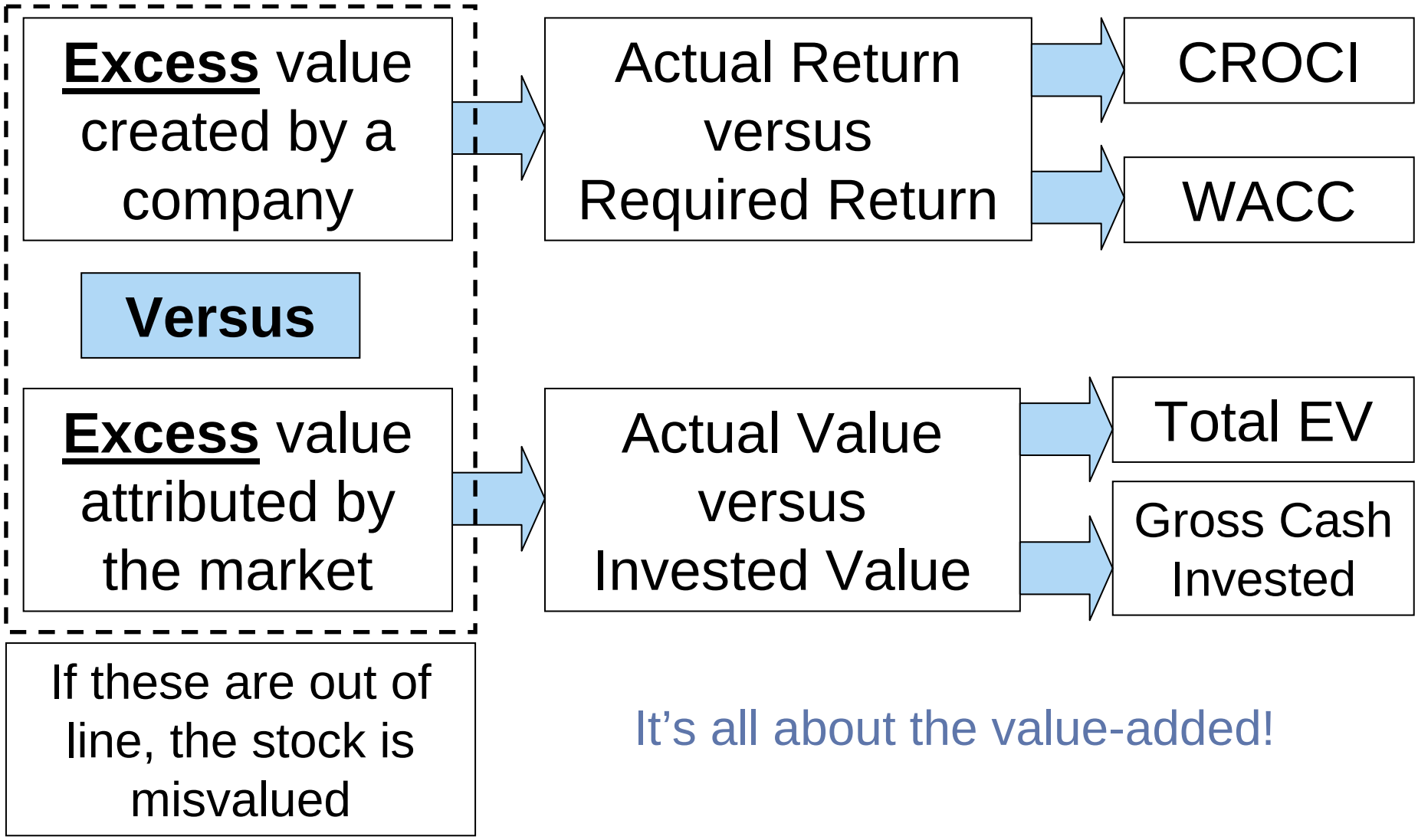
$$\frac{\$7\text{m}}{10\%} = \$70\text{m}$$

  - If you deliver return of 10%, the value of the firm will be:

$$\frac{\$10\text{m}}{10\%} = \$100\text{m}$$

It's all about the value-added!

Director's Cut and value-added



It's all about the value-added!

EV/GCI vs CROCI/WACC is equivalent to DCF

The basis of Director's Cut is that:

$$\frac{EV}{GCI} = \frac{CROCI}{WACC}$$

$$CROCI = \frac{DACF}{GCI}$$

So….

$$\frac{EV}{\cancel{GCI}} = \frac{DACF}{\cancel{GCI}} \times \frac{1}{WACC}$$

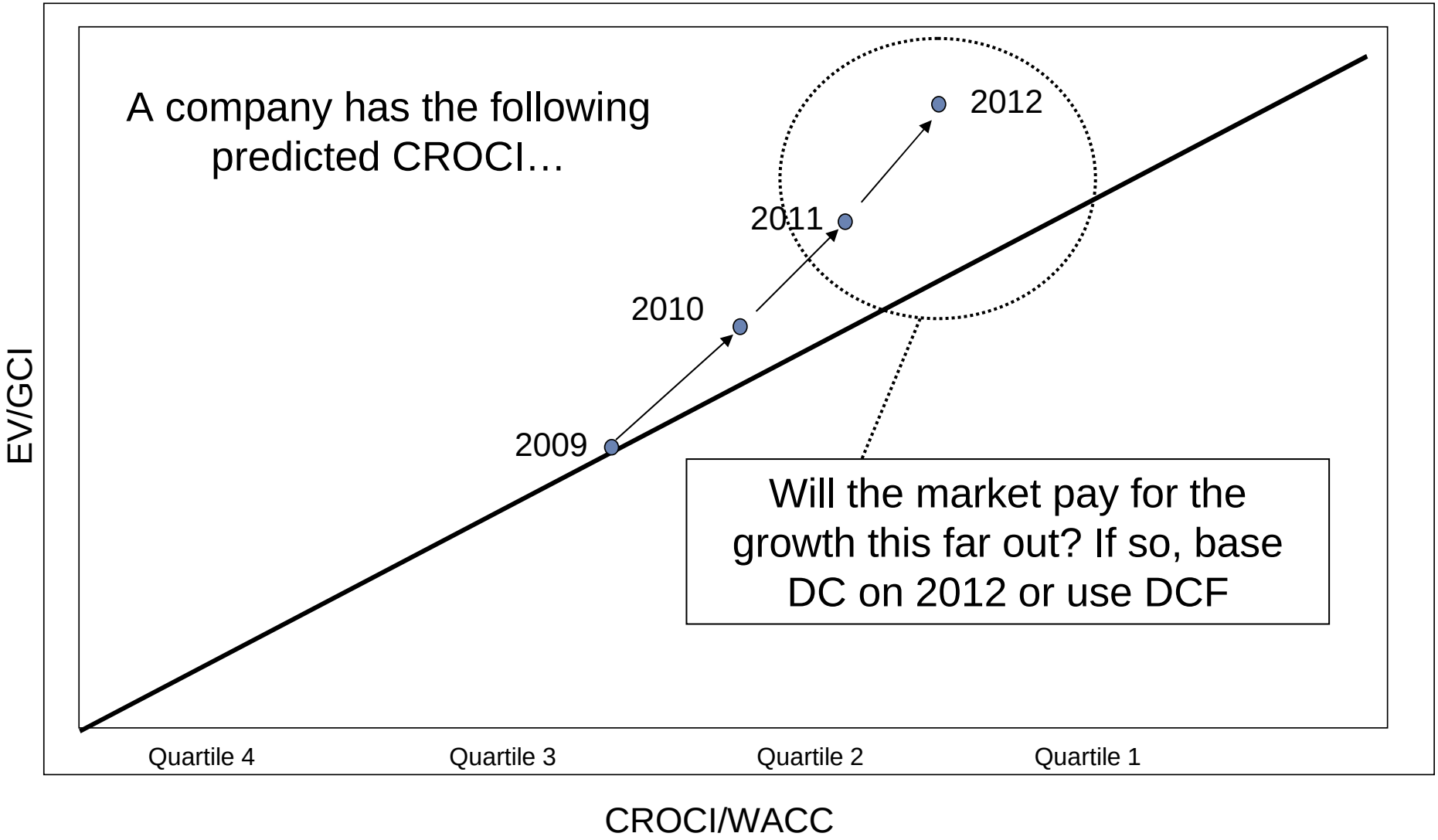
So….

$$EV = \frac{DACF}{WACC}$$

Which is a DCF assuming no growth

So how do we deal with the growth?....

EV/GCI vs CROCI/WACC and growth



EVA®, DCF and Director's Cut

Enterprise Value = GCI + PV (Future EVAs)

Assume NOPAT equals cash returns

$$EV = GCI + \frac{[NOPAT - (GCI \times WACC)]}{WACC}$$

$$EV = GCI + \frac{[DACF - (GCI \times WACC))]}{WACC}$$

$$EV = GCI + \frac{[(CROCI \times GCI) - (GCI \times WACC)]}{WACC}$$

$$EV = GCI + \frac{[GCI \times (CROCI - WACC)]}{WACC}$$

$$\frac{EV}{GCI} = 1 + \frac{(CROCI - WACC)}{WACC}$$

$$\frac{EV}{GCI} = 1 + \frac{CROCI}{WACC} - 1$$

$$\frac{EV}{GCI} = \frac{CROCI}{WACC}$$

Director's Cut!

Assume NOPAT equals cash returns

$$EV = GCI + \frac{[NOPAT - (GCI \times WACC)]}{WACC}$$

$$EV = GCI + \frac{[DACF - (GCI \times WACC)]}{WACC}$$

$$EV = GCI + \frac{DACF}{WACC} - \frac{(GCI \times WACC)}{WACC}$$

$$EV = GCI + \frac{DACF}{WACC} - GCI$$

$$EV = \frac{DACF}{WACC}$$

DCF!

P/E and value-added

If ROE = COE, then the equation collapses down to:

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If the ROE is 10% and COE is 10% then P/E will be 10x regardless of g

If ROE < COE, then the P/E will be less than 1/ROE

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An increase in g will increase the P/E (if the company is adding value) or reduce the P/E (if the company is destroying value)

If the ROE rises, the P/E will rise

It's all about the value-added!

P/B and value-added

If ROE = COE, then the P/B will be 1

If ROE < COE, then the P/B will be less than 1

If ROE > COE, then the P/B will be greater than 1

$$\frac{P}{B} = \frac{ROE - growth}{COE - growth}$$

If COE increases (for example, the risk of the equity rises) then the P/B will fall

An increase in g will increase the P/B (if the company is adding value) or reduce the P/B (if the company is destroying value)

If the ROE rises, the P/B will rise

It's all about the value-added!

When are different methods more appropriate

- Director's Cut works best with mature, homogenous sectors driven by company-specific returns; technology, retail, consumer staples and industrials but can be used or adapted for other sectors unless there is heterogeneity in the sector e.g. media and internet
- EVA is useful for sector with a large tangible asset base which generates cash-like operating profit such as real estate
- DCF can be used for most sectors with predictable cash flows, but it very easy to manipulate and do badly
- Multiple analysis is useful for sectors with no cash returns such as financials and should also be used as a cross check against other methodologies

What does it mean when you get different results

- Understanding why results are different can tell you a lot about a company
- If DCF says buy and Director's Cut says sell, says that the stock is not generating returns near term but is generating returns in the medium to long term
  - Look at Director's Cut a few years about
  - Be aware that the market does not tend to pay for returns which are more than 3 years away
- If a 2010E P/E multiple says sell and 2010E Director's Cut says buy, suggests company is not turning earnings into cash

Summary

- There are many different ways to look a stock valuation, but they are all doing the same thing – measuring value add
- Returns methodology, in particular cash returns, provides a simple and effective framework to value stocks
- The market pays a premium to companies that can sustain top quartile returns
- Any methodology is only as good as its numbers put into it