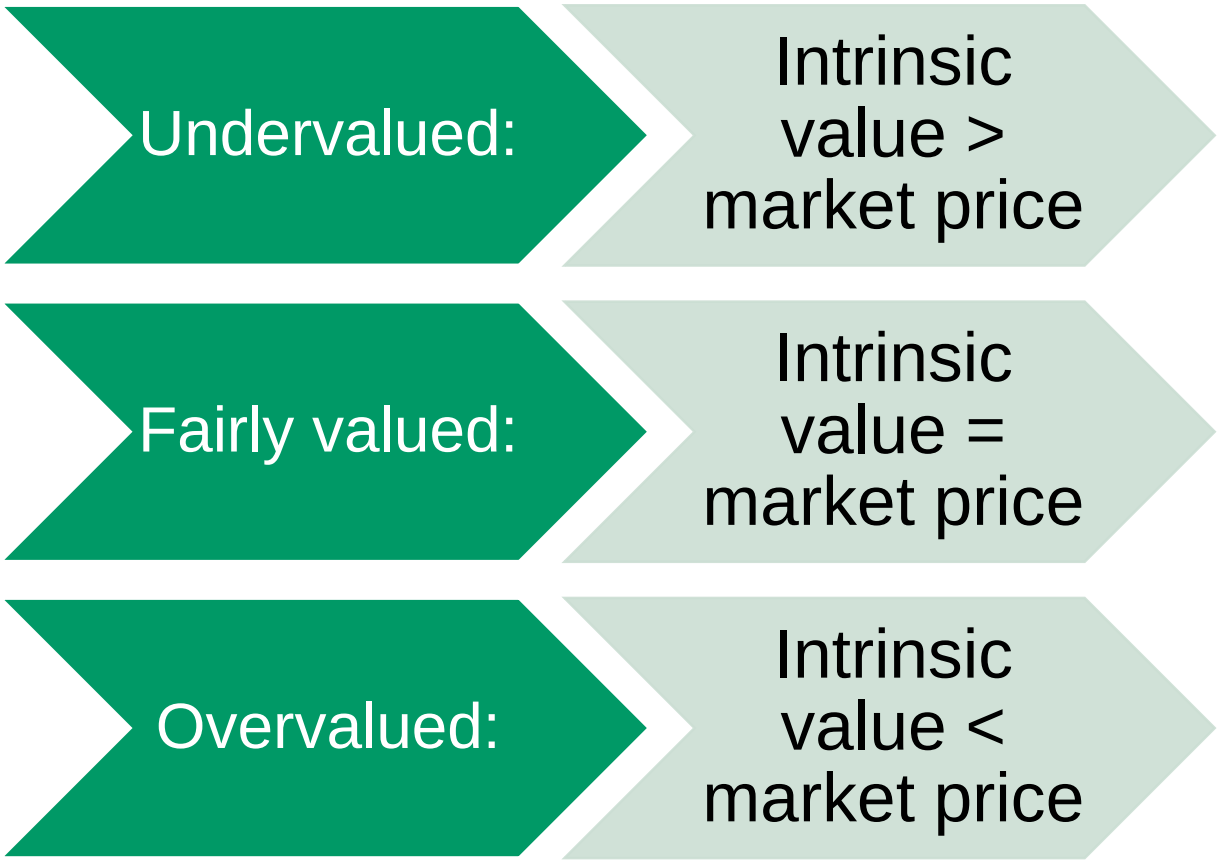
CHAPTER 10
EQUITY VALUATION: CONCEPTS AND BASIC TOOLS

Presenter
Venue
Date

CFA Institute

ESTIMATED VALUE AND MARKET PRICE



DEALING WITH UNCERTAINTY

Confidence in intrinsic value estimate

Uncertainties related to model appropriateness and the correct value of inputs

MAJOR CATEGORIES OF EQUITY VALUATION MODELS

Present value models

- Dividend discount models
- Free cash flow models

Multiplier models

- Share price multiples
- Enterprise value multiples

Asset-based valuation models

- Adjustments to book value

PRESENT VALUE MODELS

Value of an investment = present value of expected future benefits

Future benefits = dividends

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)^t}$$

Future benefits = free cash flow

$$V_0 = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+r)^t}$$

PREFERRED STOCK VALUATION (NON-CALLABLE, NON-CONVERTIBLE SHARES)

Perpetual

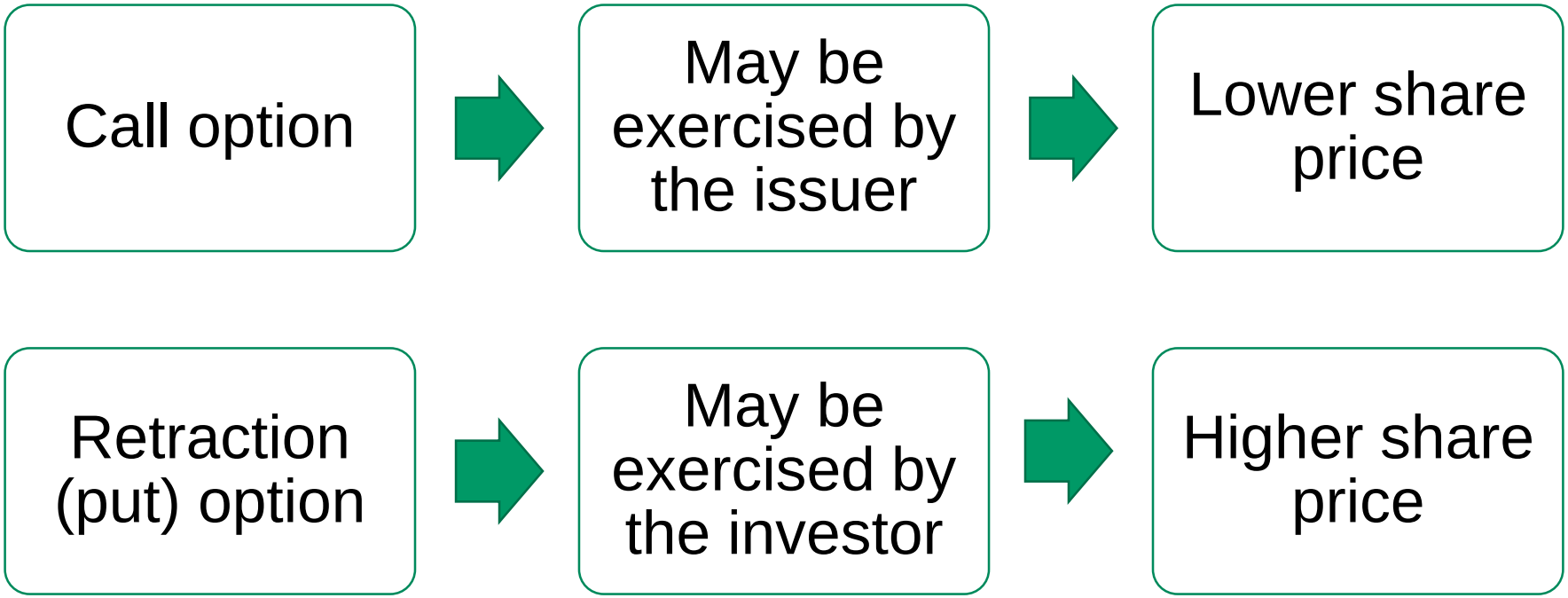
$$V_0 = \frac{D_0}{r} = \frac{\$5.50}{0.06} \approx \$91.67$$

Maturity at time period n

$$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1+r)^t} + \frac{F}{(1+r)^n}$$

$$V_0 = \sum_{t=1}^{12} \frac{\text{GBP}2.00}{(1+0.041)^t} + \frac{\text{GBP}20.00}{(1+0.041)^{12}} \approx \text{GBP}31.01$$

THE EFFECT OF OPTIONS ON THE PRICE OF A PREFERRED SHARE



THE GORDON GROWTH MODEL

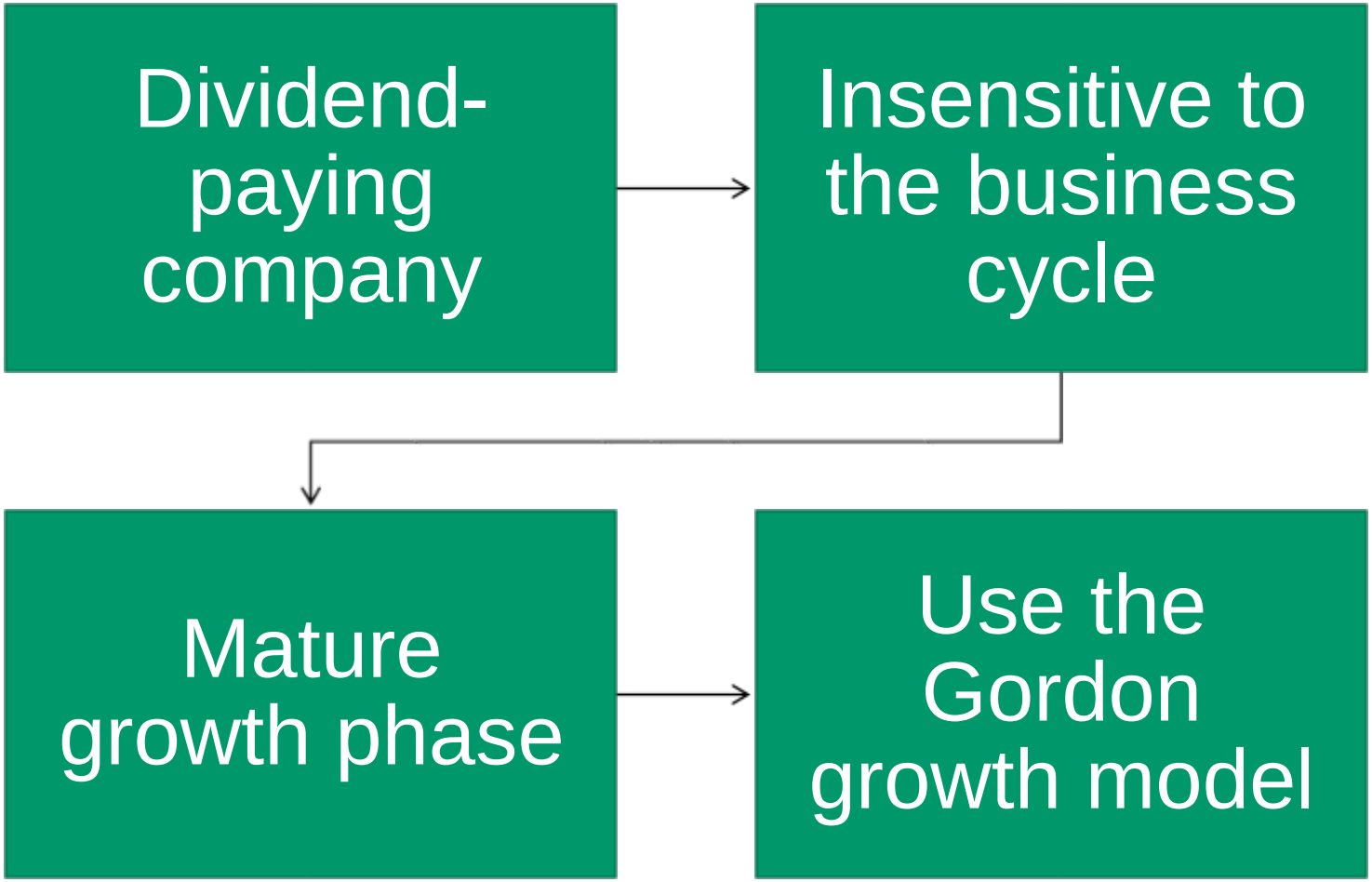
Assumptions:

- Dividends are the correct metric to use for valuation purposes.
- The dividend growth rate is forever: It is perpetual and never changes.
- The required rate of return is also constant over time.
- The dividend growth rate is strictly less than the required rate of return.

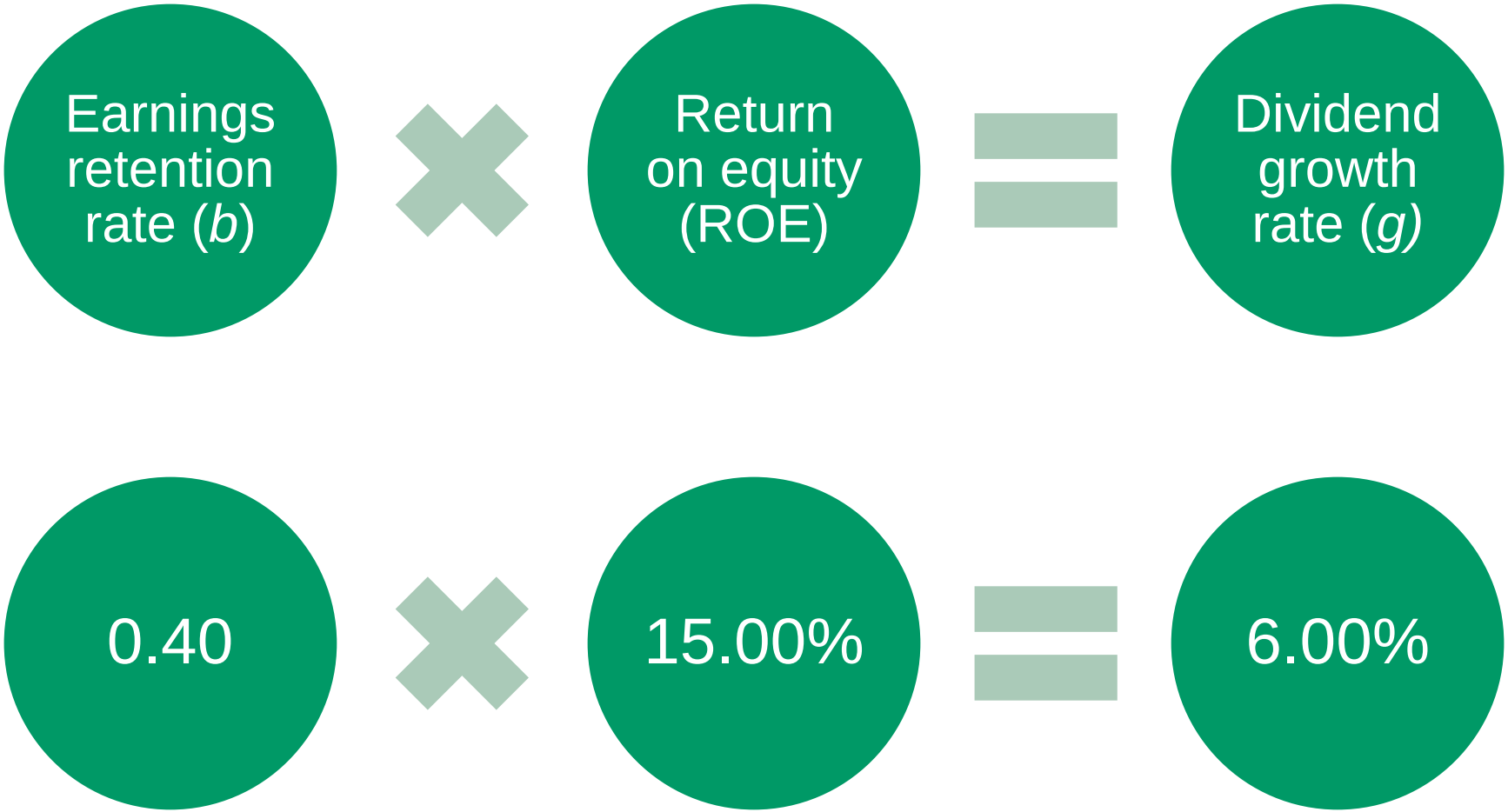
$$V_0 = \sum_{t=1}^{\infty} \frac{D_0(1+g)^t}{(1+r)^t} = \frac{D_0(1+g)}{r-g} = \frac{D_1}{r-g}$$

$$V_0 = \frac{\text{EUR}5.00(1+0.04)}{0.08-0.04} = \text{EUR}130$$

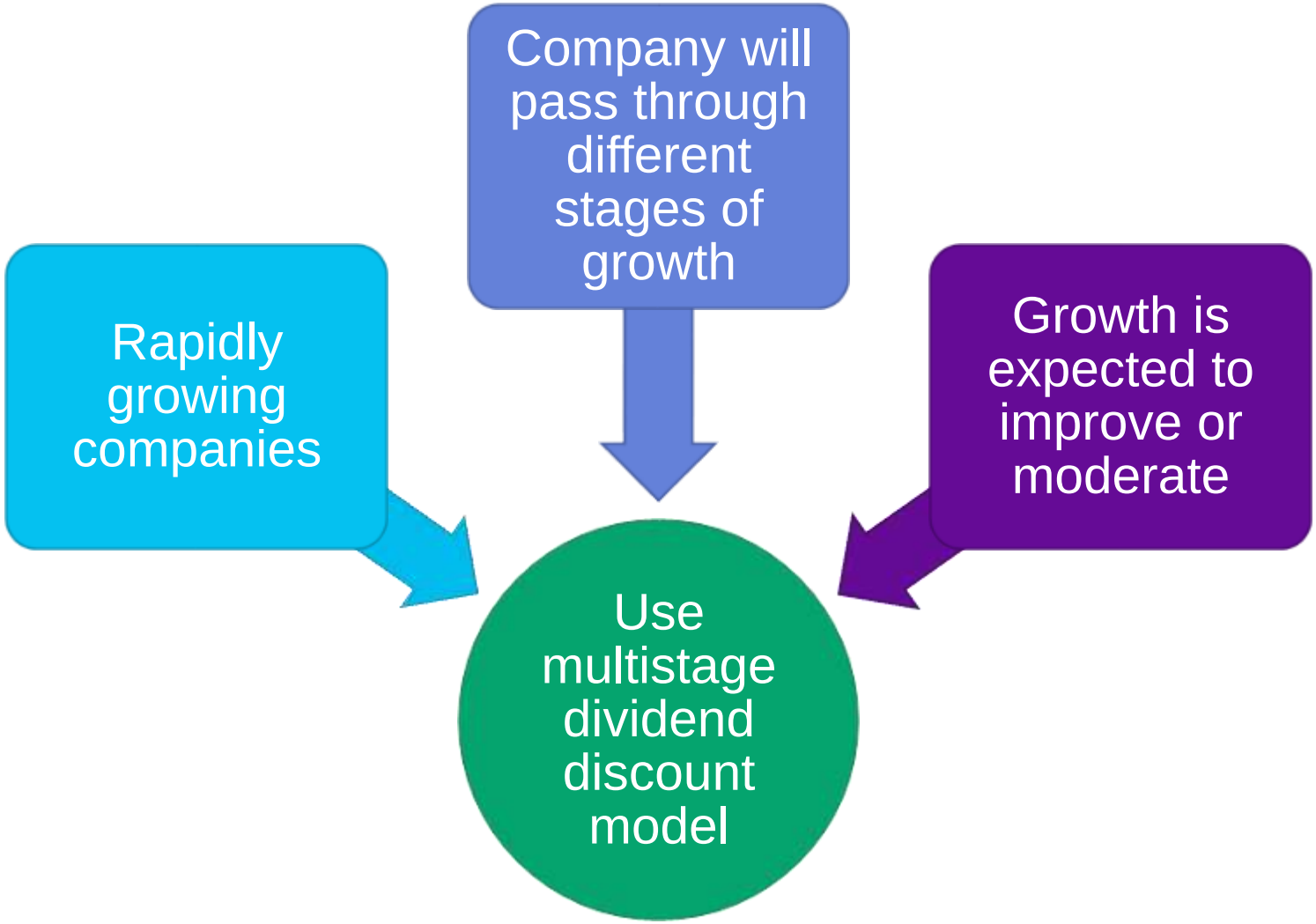
WHEN IS THE GORDON GROWTH MODEL MOST APPROPRIATE FOR VALUING EQUITY?



ESTIMATING A LONG-TERM GROWTH RATE



MULTISTAGE DIVIDEND DISCOUNT MODEL



THE TWO-STAGE DIVIDEND DISCOUNT MODEL

Dividends grow at rate g_S for n years and rate g_L thereafter:

$$V_0 = \sum_{t=1}^{n} \frac{D_0(1+g_S)^t}{(1+r)^t} + \frac{V_n}{(1+r)^n}$$

$$V_n = \frac{D_{n+1}}{r - g_L}$$

$$D_{n+1} = D_0(1+g_S)^n(1+g_L)$$

THE TWO-STAGE DIVIDEND DISCOUNT MODEL (CONTINUED FROM PREVIOUS SLIDE)

$$D_1 = \$5.00(1+0.10) = \$5.50$$

$$D_2 = \$5.00(1+0.10)^2 = \$6.05$$

$$D_3 = \$5.00(1+0.10)^3 = \$6.655$$

$$D_4 = \$5.00(1+0.10)^3(1+0.05) = \$6.98775$$

$$V_3 = \frac{\$6.98775}{0.15-0.05} = \$69.8775$$

$$V_0 = \frac{\$5.50}{1+0.15} + \frac{\$6.05}{(1+0.15)^2} + \frac{\$6.655}{(1+0.15)^3} + \frac{\$69.8775}{(1+0.15)^3}$$

$$V_0 \approx \$59.68$$

PRICE MULTIPLES

Group or sector of stocks

Use price multiples as a screen

Identify overvalued and undervalued stocks

POPULAR PRICE MULTIPLES

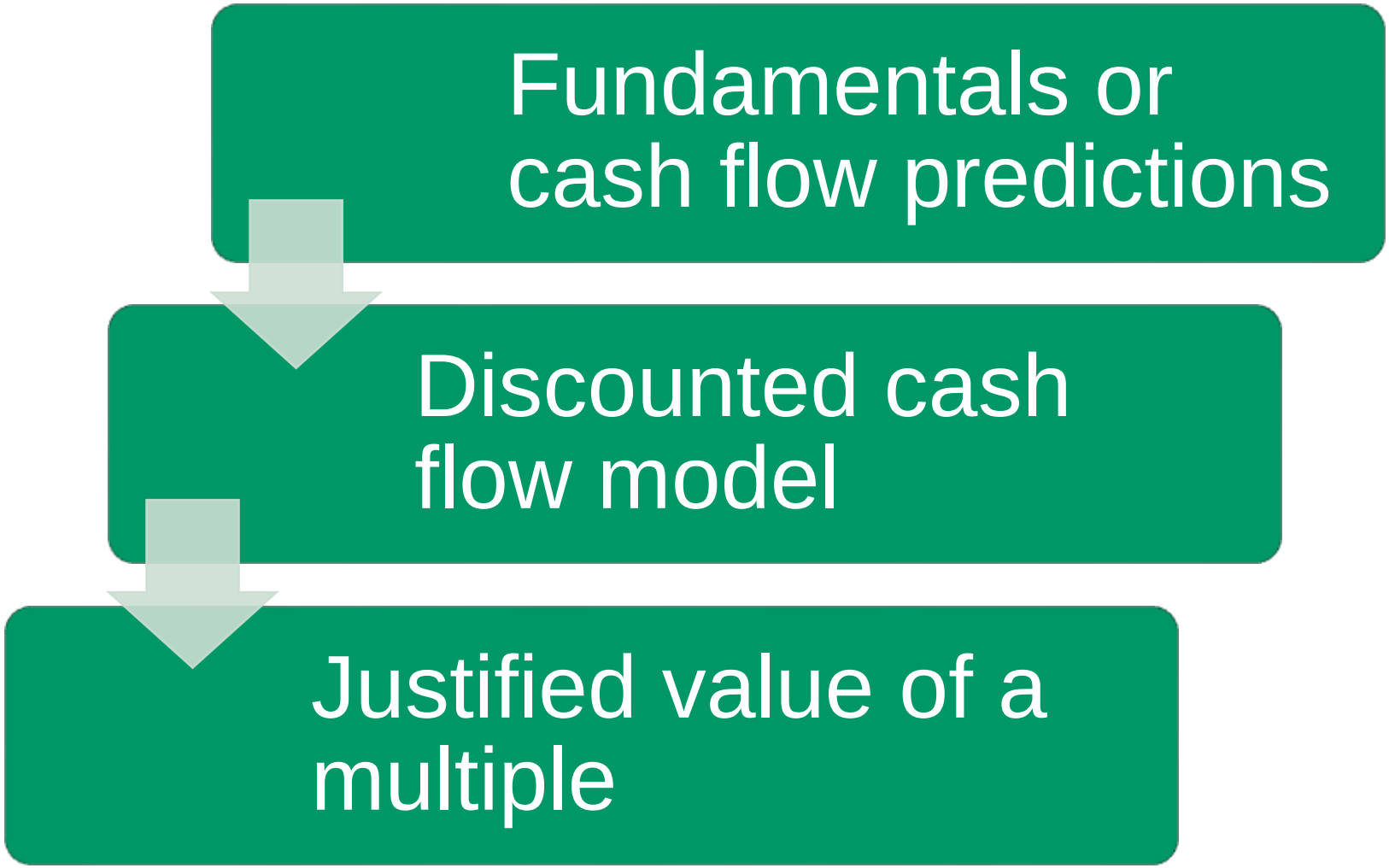
Price-to-earnings ratio (P/E)	• Stock price ÷ earnings per share
Price-to-book ratio (P/B)	• Stock price ÷ book value per share
Price-to-sales ratio (P/S)	• Stock price ÷ sales per share
Price-to-cash flow ratio (P/CF)	• Stock price ÷ cash flow per share

PRICE MULTIPLES FOR TELEFÓNICA AND DEUTSCHE TELEKOM

	Telefónica			Deutsche Telekom		
	2008	2007	2006	2008	2007	2006
(1) Total assets (€ billions)	99.9	105.9	109.0	123.1	120.7	130.2
Asset growth	−5.7%	−2.8%	--	2.0%	−7.3%	--
(2) Net revenues (€ billions)	57.9	56.4	52.9	61.7	62.5	61.3
Revenue growth	2.7%	6.6%	--	−1.3%	2.0%	--
(3) Net cash flow from operating activities (€ billions)	16.4	15.6	15.4	15.4	13.7	14.2
Cash flow growth	5.1%	1.3%	--	12.4%	−3.5%	--
(4) Book value of common shareholders' equity (€ billions)	19.6	22.9	20.0	43.1	45.2	49.7
Debt ratio: 1 − [(4) ÷ (1)]	80.4%	78.4%	81.7%	65.0%	62.6%	61.8%
(5) Net profit (€ billions)	7.8	9.1	6.6	1.5	0.6	3.2
Earnings growth	−14.3%	37.9%	--	150.0%	−81.3%	--
(6) Weighted average number of shares outstanding (millions)	4,646	4,759	4,779	4,340	4,339	4,353
(7) Price per share (€)	15.85	22.22	16.22	10.75	15.02	13.84
Price-to-revenue ratio (P/R): (7) ÷ [(2) ÷ (6)]	1.3	1.9	1.5	0.8	1.0	1.0
P/CF: (7) ÷ [(3) ÷ (6)]	4.5	6.8	5.0	3.0	4.8	4.2
P/B: (7) ÷ [(4) ÷ (6)]	3.8	4.6	3.9	1.1	1.4	1.2
P/E: (7) ÷ [(5) ÷ (6)]	9.4	11.6	11.7	31.1	108.6	18.8

Sources: Company websites: www.telefonica.es and www.deutschetelekom.com.

JUSTIFIED VALUE OF A MULTIPLE



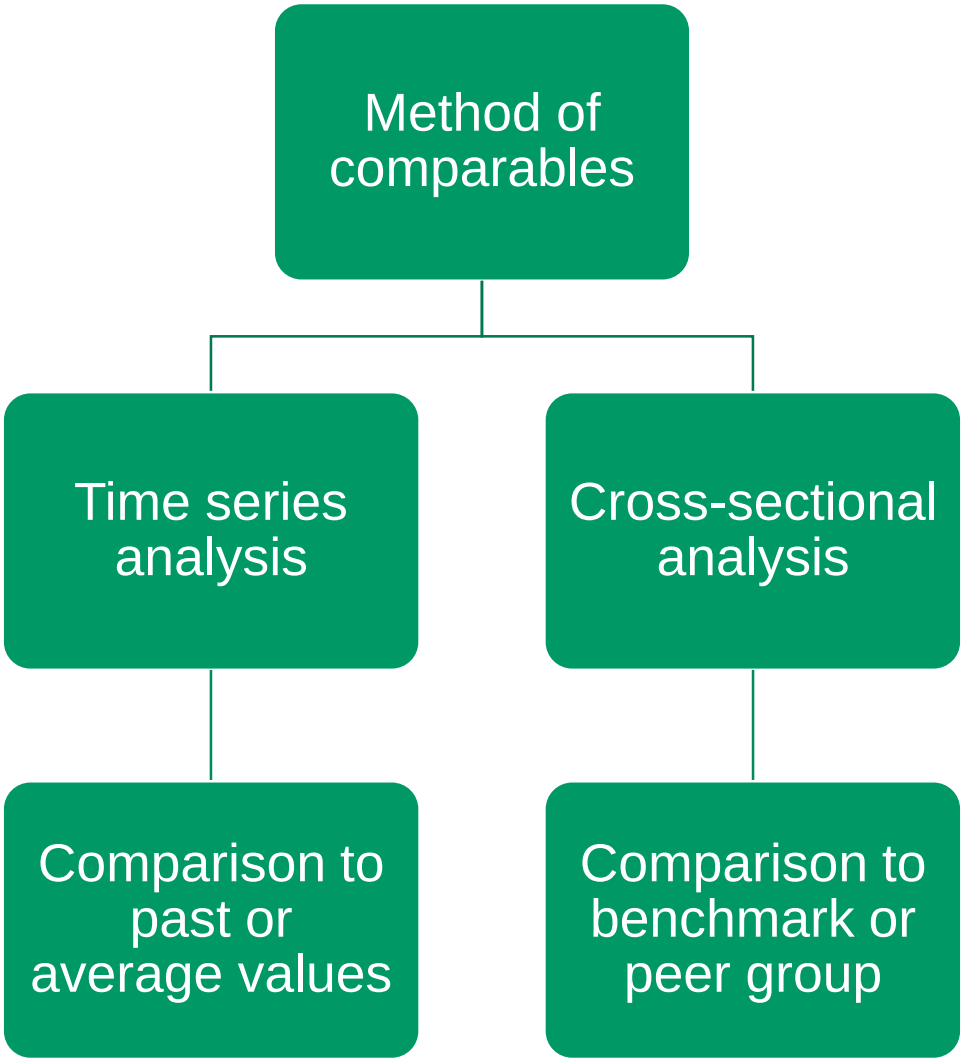
JUSTIFIED FORWARD P/E FOR NESTLÉ

Required Rate of Return = 12 percent

Constant Dividend Growth Rate	Dividend Payout Ratio				
	40.0%	42.5%	45.0%	47.5%	50.0%
7.0%	8.0	8.5	9.0	9.5	10.0
7.5%	8.9	9.4	10.0	10.6	11.1
8.0%	10.0	10.6	11.3	11.9	12.5
8.5%	11.4	12.1	12.9	13.6	14.3
9.0%	13.3	14.2	15.0	15.8	16.7
9.5%	16.0	17.0	18.0	19.0	20.0
10.0%	20.0	21.3	22.5	23.8	25.0
10.5%	26.7	28.3	30.0	31.7	33.3

$$P_0 = \frac{D_1}{r-g} \overset{\text{algebra}}{\Rightarrow} \frac{P_0}{E_1} = \frac{D_1/E_1}{r-g} = \frac{p}{r-g} = \frac{0.45}{0.12-0.085} \approx 12.9$$

THE METHOD OF COMPARABLES



PRICE-TO-SALES RATIO DATA FOR MAJOR AUTOMOBILE MANUFACTURERS (2009)

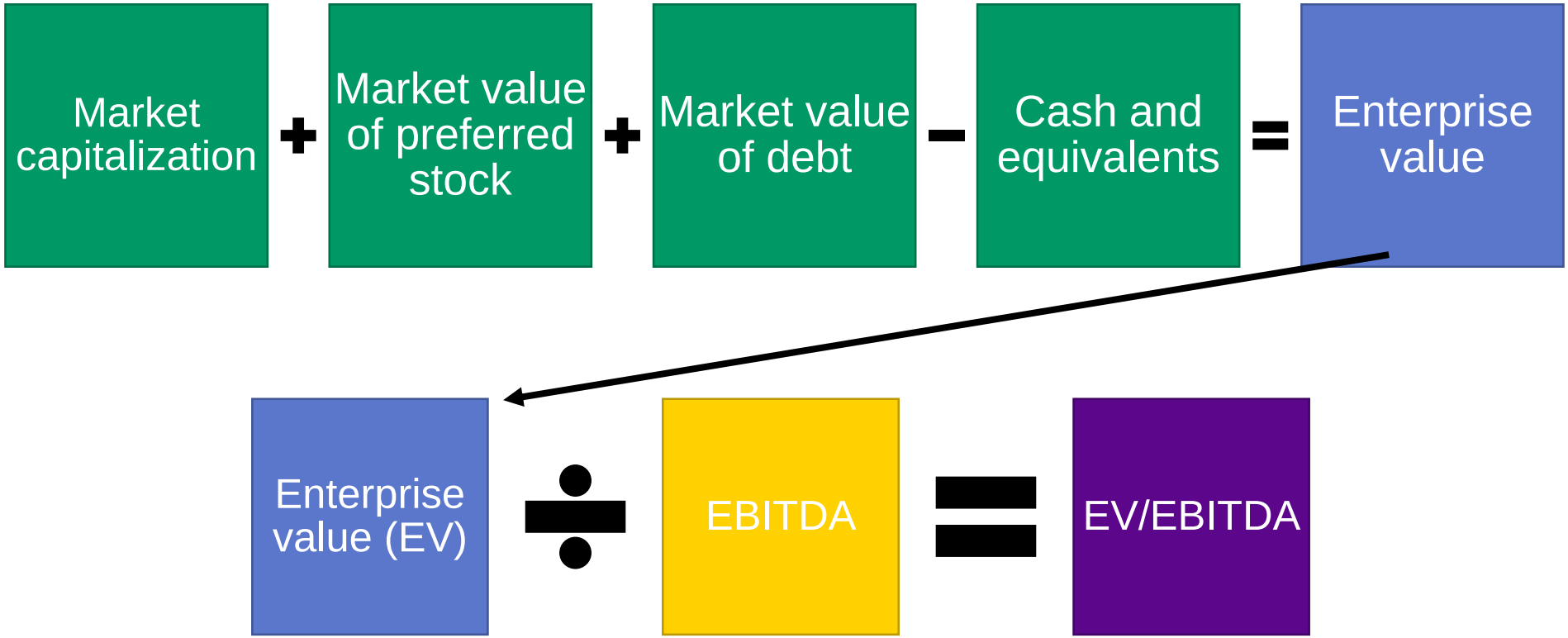
Company	P/S
General Motors	0.01
Ford Motor	0.14
Daimler	0.27
Nissan Motor	0.32
Honda Motor	0.49
Toyota Motor	0.66

P/E DATA FOR CANON

Year	Price (a)	EPS (b)	P/E (a) ÷ (b)
2004	¥5,546	¥387.8	14.3
2005	¥6,883	¥432.9	15.9
2006	¥6,703	¥342.0	19.6
2007	¥5,211	¥377.6	13.8
2008	¥2,782	¥246.2	11.3

Sources: EPS and P/E data are from Canon's website: www.canon.com. P/E is based on share price data from the Tokyo Stock Exchange.

ENTERPRISE VALUE MULTIPLES

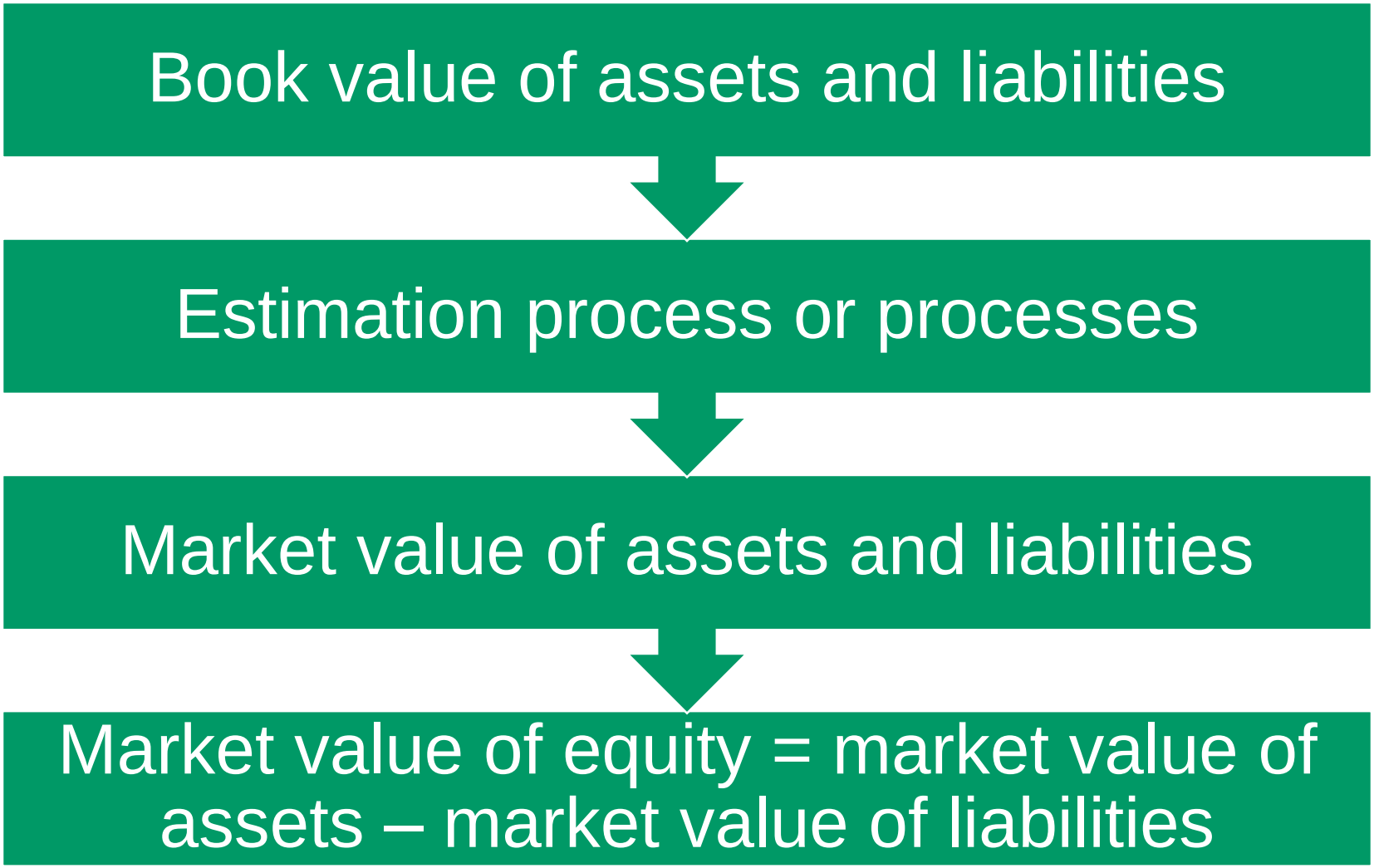


EV/OPERATING INCOME DATA FOR NINE MAJOR MINING COMPANIES

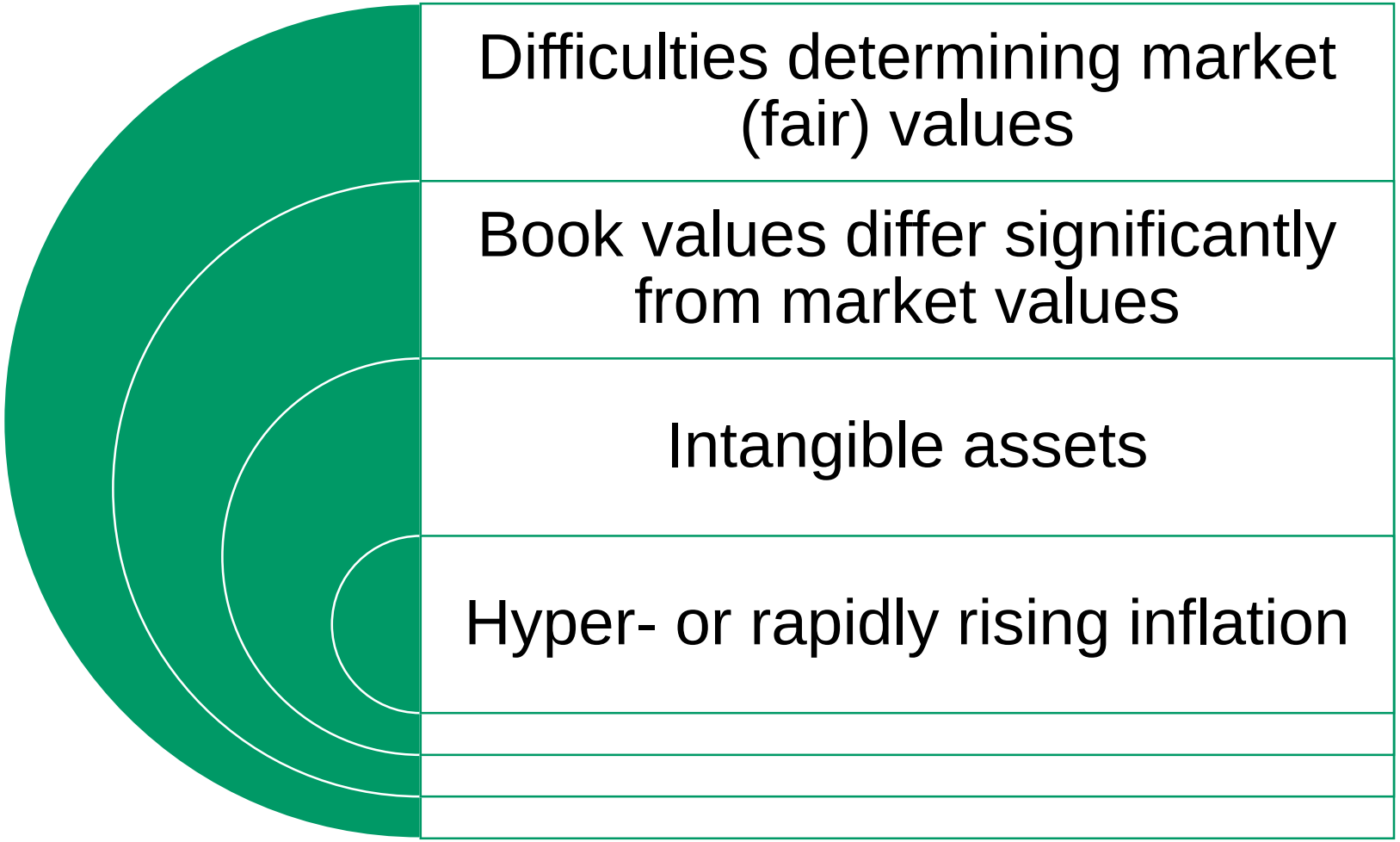
Company	Ticker Symbol	EV (C$ millions)	Operating Income (OI) (C$ millions)	EV/OI
BHP Billiton	BHP	197,112.00	9,794.00	20.1
Rio Tinto	RIO	65,049.60	7,905.00	8.2
Anglo American	AAL	48,927.30	6,208.00	7.9
Barrick Gold	ABX	35,288.00	1,779.00	19.8
Goldcorp	G	28,278.00	616.66	45.9
Newmont Mining	NEM	22,040.80	1,385.00	15.9
AngloGold Ashanti	AU	19,918.30	–362.00	–55.0
Alcoa	AA	17,570.40	4,166.00	4.2
Freeport-McMoRan Copper & Gold	FCX	11,168.40	2,868.75	3.9

Source: www.miningnerds.com

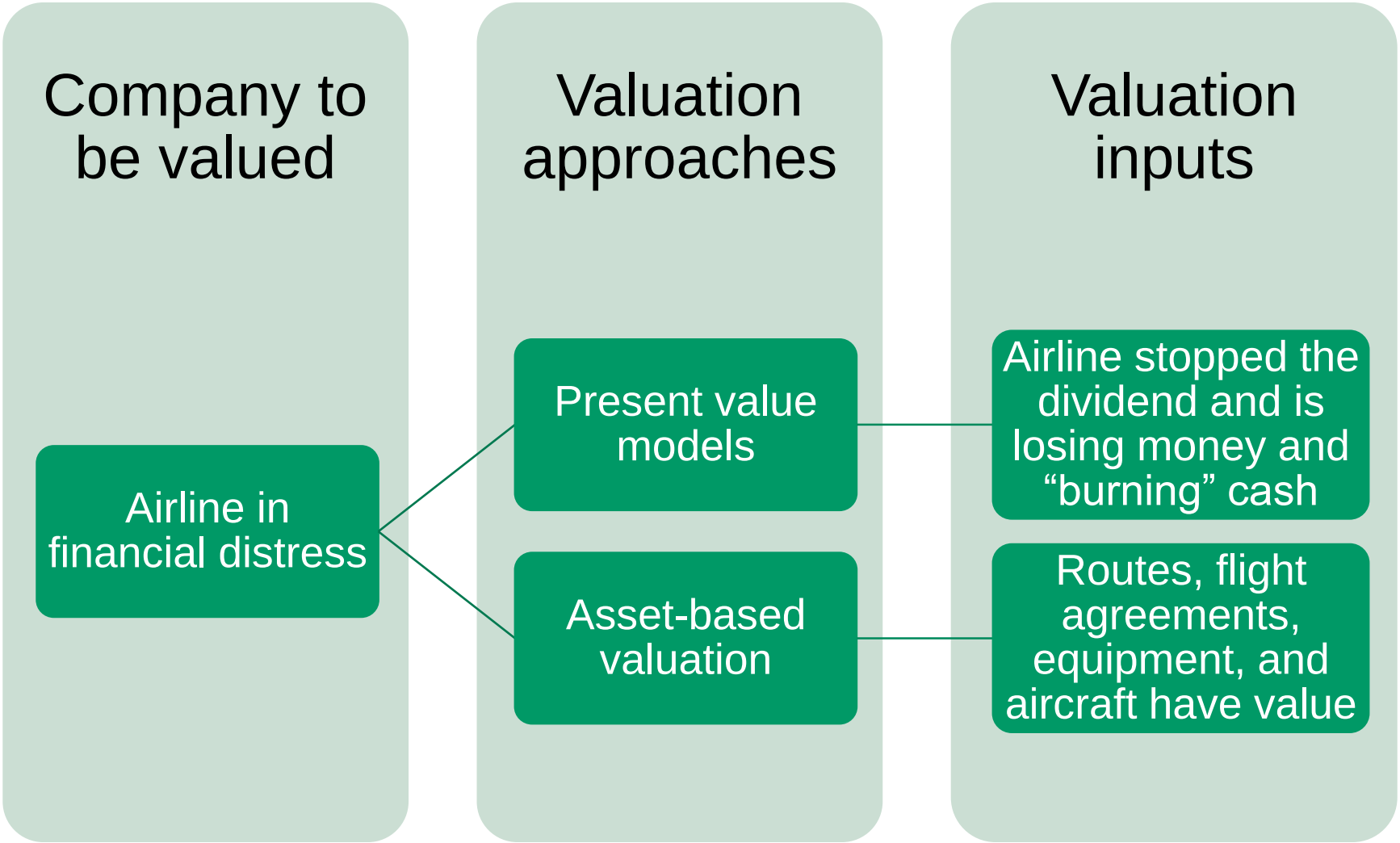
ASSET-BASED VALUATION



ASSET-BASED VALUATIONS: POTENTIAL PROBLEMS



ASSET-BASED VALUATION VERSUS DISCOUNTED PRESENT VALUE APPROACHES



ADVANTAGES AND DISADVANTAGES

Present value models	• Theoretically appealing and provide a direct computation of intrinsic value • Input uncertainty can lead to poor estimates of value
Multiplier models	• Ratios are easy to compute and analysis is easily understood • Problems with selecting a peer group or “comps”
Asset-based valuation	• Consistent with the notion that a business is worth the sum of its parts • Difficulties determining market value and the value of intangible assets

SUMMARY

- Overvalued, fairly valued, or undervalued securities
- Major categories of equity valuation models
- Present value models: dividend discount models and free cash flow models
- Multiplier models: price ratios and enterprise value ratios
- Asset-based valuation
- Advantages and disadvantages of equity valuation models