

FLAME Investment Lab With The Masters - 2015

Lecture on Valuation by

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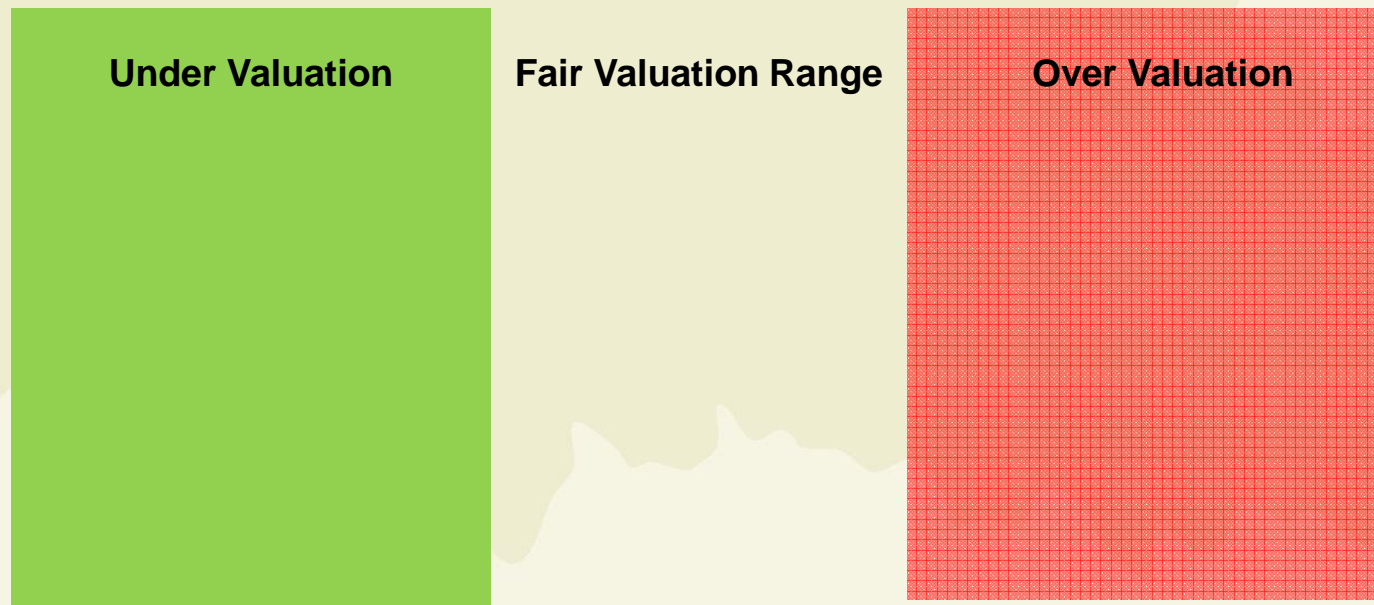
Valuation as a Profession

- Tragedy: The value gets set first and Valuation exercise happens to fit the number
- Is value real or in the eyes of the beholder?
 - Only reality is that there is no fixed valuation of an asset?
 - M&A, Diversified Portfolio Manager, Concentrated Investor, Foreign buyer.
- Is value driven by expected future cash flow? Or on hopes of bigger fool to pay higher price?
- Is valuation an art or a science?
- Is there bias in valuation?
 - All valuations are biased. The only questions are how much and in which direction. E.g. TCS
 - The direction and magnitude of the bias in your valuation is directly proportional to who pays you and how much you are paid.
- Does complexity mean precision
 - Understanding of a valuation model is inversely proportional to the number of inputs required for the model.
 - Simpler valuation models do much better than complex ones.



Investors need to know the range

- **Its almost impossible to find a fixed valuation**



- **Its not impossible to tell whether current price is a bargain**



Why so much discrimination?

11 Year History	'03 - '14 PAT CAGR	P/B	P/E	'03 - '14 Cash Profit CAGR
Asian Paints Ltd.	22%	12.98	50.44	21%
ACC Ltd.	22%	2.66	28.02	17%
Voltas Ltd.	21%	2.93	27.74	17%
Apollo Tyres Ltd.	21%	1.76	10.00	22%

Why so much discrepancy in valuation when earnings growth is the same?



Simple fundamentals of valuation

- How much do I want to pay NOW for expected future cash flow?
 - Your expected returns drive how much you want to pay NOW
 - E.g. 5 year g-sec: FV = 100, Coupon = 10%

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
Coupon (interest paid)	10%	10.00	10.00	10.00	10.00	10.00
Principal Paidback						100.00
Reinvest	0%	-	-	-	-	-
Payout		10.00	10.00	10.00	10.00	110.00
Expected Return	10%	0.91	0.83	0.75	0.68	0.62
		9.09	8.26	7.51	6.83	68.30
Present Value	100.00					

$$\text{Value} = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_4}{(1+r)^4} + \dots + \frac{CF_n}{(1+r)^n}$$



Simple fundamentals of valuation

- How much do I want to pay NOW for expected future cash flow?
 - Your expected returns drive how much you want to pay NOW
 - E.g. 5 year g-sec: FV = 100, Coupon = 0%

Years		1	2	3	4	5
Capital		100.00	110.00	121.00	133.10	146.41
Interest (coupon unpaid)	10%	10.00	11.00	12.10	13.31	14.64
Principal + Interest Paidback						146.41
Reinvest	100%	10.00	11.00	12.10	13.31	-
Payout		-	-	-	-	161.05
Expected Return	10%	0.91	0.83	0.75	0.68	0.62
		-	-	-	-	100.00
Present Value	100.00					



Simple fundamentals of valuation

- Value changes with change in expected yield/return or coupon

Years		1	2	3	4	5
Coupon	10%	10.00	10.00	10.00	10.00	110.00
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		8.70	7.56	6.58	5.72	54.69
Present Value	83.24					

Years		1	2	3	4	5
Coupon	10%	10.00	10.00	10.00	10.00	110.00
Expected Return	8%	0.93	0.86	0.79	0.74	0.68
		9.26	8.57	7.94	7.35	74.86
Present Value	107.99					

- You can always get your expected returns by paying a price over or under its face value



Simple fundamentals of valuation

- Let's replace g-sec example with a business
 - Business returns 10% on its capital
 - No leverage; Hence ROCE = ROE

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
PAT	10%	10.00	10.00	10.00	10.00	10.00
<i>Return on Capital (ROE)</i>		<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>
Reinvest	0%	-	-	-	-	-
Payout		10.00	10.00	10.00	10.00	10.00
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		8.70	7.56	6.58	5.72	4.97
Present Value	67					



Simple fundamentals of valuation

- When expectations and return match, value doesn't change with duration

Years		1	2	3	4	5
Capital		100.00	107.50	115.56	124.23	133.55
PAT	15%	15.00	16.13	17.33	18.63	20.03
<i>Return on Capital (ROE)</i>		<i>15%</i>	<i>15%</i>	<i>15%</i>	<i>15%</i>	<i>15%</i>
Reinvest	50%	7.50	8.06	8.67	9.32	10.02
Payout		7.50	8.06	8.67	9.32	10.02
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
Present Value	100	6.52	6.10	5.70	5.33	4.98



Money invested at returns $>$ expected return
generates value (i.e. $MV > BV$)

Money invested at returns $<$ expected returns
destroys value (i.e. $MV < BV$)

A person is shown in a meditative lotus position, centered in the lower half of the frame. The background consists of a light green gradient with dark green silhouettes of trees and foliage. The overall aesthetic is calm and contemplative.

Does earnings growth create value?

How To Create Growth

$$\begin{aligned}\text{Growth in Earnings} &= \text{ROE} \times \text{Reinvestment Rate} \\ &= \text{ROE} \times (1 - \text{Payout ratio})\end{aligned}$$



Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
PAT	10%	10.00	10.00	10.00	10.00	10.00
<i>Return on Capital (ROE)</i>		<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>
Reinvest	0%	-	-	-	-	-
Payout		10.00	10.00	10.00	10.00	10.00
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		8.70	7.56	6.58	5.72	4.97
Present Value	67					



- PAT CAGR = 0
- fwd PE x = 67/10 = 6.7
- ttm P/B x = 67/100 = 0.67

Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	105.00	110.25	115.76	121.55
PAT	10%	10.00	10.50	11.03	11.58	12.16
<i>Return on Capital (ROE)</i>		<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>	<i>10%</i>
Reinvest	50%	5.00	5.25	5.51	5.79	6.08
Payout		5.00	5.25	5.51	5.79	6.08
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
Present Value	50	4.35	3.97	3.62	3.31	3.02



- PAT CAGR = 5%
- fwd PE x = 50/10 = 5
- ttm P/B x = 50/100 = 0.5

-e.g. Bajaj Electricals. Can consumer business value > combined business?



Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
PAT	15%	15.00	15.00	15.00	15.00	15.00
<i>Return on Capital (ROE)</i>		<i>15%</i>	<i>15%</i>	<i>15%</i>	<i>15%</i>	<i>15%</i>
Reinvest	0%	-	-	-	-	-
Payout		15.00	15.00	15.00	15.00	15.00
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		13.04	11.34	9.86	8.58	7.46
Present Value	100					



- PAT CAGR = 0%
- fwd PE x = 100/15 = 6.7
- ttm P/B x = 100/100 = 1

Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	107.50	115.56	124.23	133.55
PAT	15%	15.00	16.13	17.33	18.63	20.03
<i>Return on Capital (ROE)</i>		15%	15%	15%	15%	15%
Reinvest Payout	50%	7.50	8.06	8.67	9.32	10.02
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
Present Value	100	6.52	6.10	5.70	5.33	4.98



- PAT CAGR = 7.5%
- fwd PE x = 100/15 = 6.7
- ttm P/B x = 100/100 = 1

Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
PAT	20%	20.00	20.00	20.00	20.00	20.00
<i>Return on Capital (ROE)</i>		<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>
Reinvest	0%	-	-	-	-	-
Payout		20.00	20.00	20.00	20.00	20.00
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		17.39	15.12	13.15	11.44	9.94
Present Value	133					



- PAT CAGR = 0%
- fwd PE x = $133/20 = 6.7$
- ttm P/B x = $133/100 = 1.33$

-Higher ROE doesn't change the PEx



Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	110.00	121.00	133.10	146.41
PAT	20%	20.00	22.00	24.20	26.62	29.28
<i>Return on Capital (ROE)</i>		<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>	<i>20%</i>
Reinvest	50%	10.00	11.00	12.10	13.31	14.64
Payout		10.00	11.00	12.10	13.31	14.64
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
		8.70	8.32	7.96	7.61	7.28
Present Value	200					



- PAT CAGR = 10%
- fwd PE x = 200/20 = 10
- ttm P/B x = 200/100 = 2

Simple fundamentals of valuation

Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT	20%	20.00	24.00	28.80	34.56	41.47
Return on Capital (ROE)		20%	20%	20%	20%	20%
Reinvest Payout	100%	20.00	24.00	28.80	34.56	41.47
Expected Return	15%	0.87	0.76	0.66	0.57	0.50
Present Value		Infinity				



- PAT CAGR = 20%
- fwd PE x = Infinity
- ttm P/B x = Infinity

-This is impossible in reality as the value would surpass that of our entire world



Growth can be increased by increasing investments

Growth will increase value ONLY IF the returns earned on the new investments exceed expected return

Simple fundamentals of valuation

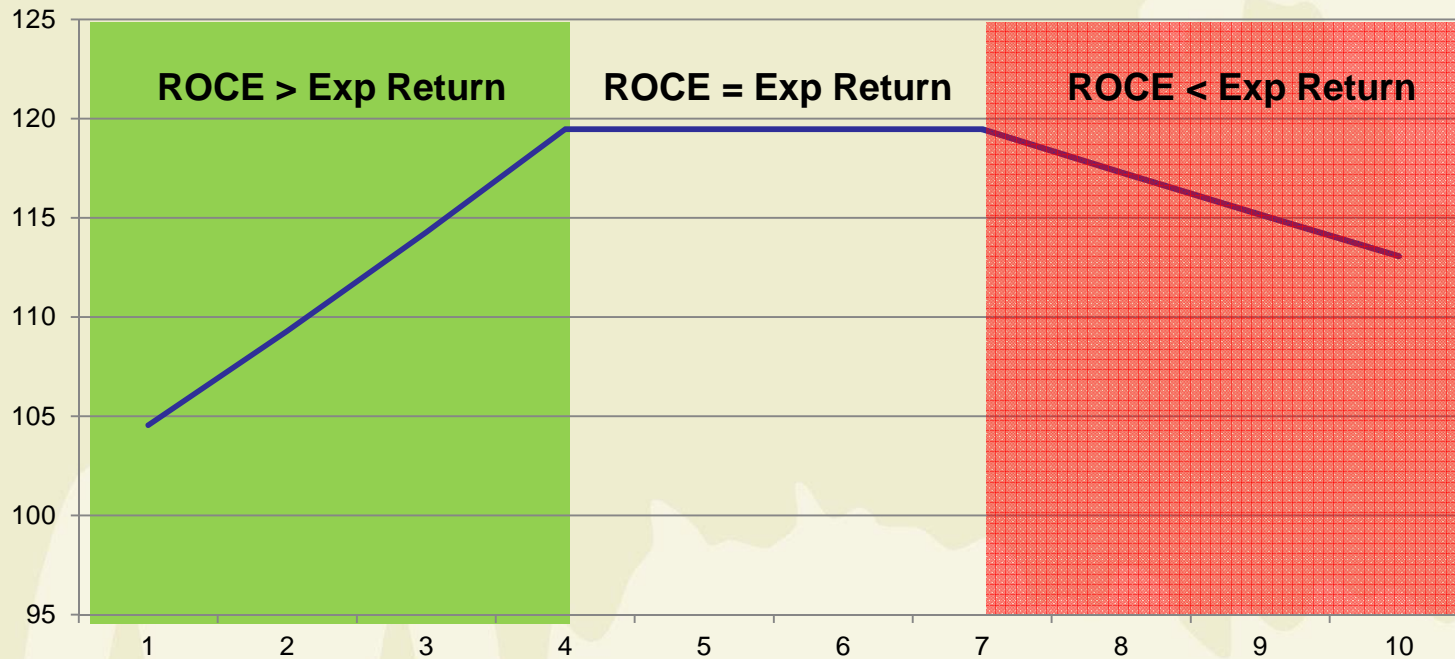
- Demonstration of what happens to value over time

Years	1	2	3	4	5	
Starting Capital	100.00	110.00	121.00	139.15	160.02	
ROCE	10%	10%	15%	15%	10%	
Incremental Cash Flow	10.00	11.00	18.15	20.87	16.00	
Ending Capital	110.00	121.00	139.15	160.02	176.02	
Expected Return	10%	0.91	0.83	0.75	0.68	0.62
Present Value	100.00	100.00	104.55	109.30	109.30	

- **Valuation of all businesses peak at some finite time. That's when you calculate the "Terminal Value"**

Simple fundamentals of valuation

- Graph of Present Value over Time



- **Valuation of all businesses peak at some finite time**





Sensitivity of Valuations (PE x and PB x)

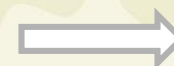
Same Growth but Different ROCE

20% growth for 25 years and 10% post that in both cases

Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		50.00	60.00	72.00	86.40	103.68
<i>Return on Capital (ROCE)</i>		50%	50%	50%	50%	50%
Reinvest		40%	40%	40%	40%	40%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		30.00	36.00	43.20	51.84	62.21
Extected Return	15%	0.87	0.76	0.66	0.57	0.50
		26.09	27.22	28.40	29.64	30.93
Present Value	3,456.99					
	fwdPE	69.1	ttmPB	34.57		



Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		25.00	30.00	36.00	43.20	51.84
<i>Return on Capital (ROCE)</i>		25%	25%	25%	25%	25%
Reinvest		80%	80%	80%	80%	80%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		5.00	6.00	7.20	8.64	10.37
Extected Return	15%	0.87	0.76	0.66	0.57	0.50
		4.35	4.54	4.73	4.94	5.15
Present Value	1,059.13					
	fwdPE	42.4	ttmPB	10.59		



Different Expected Return

20% growth for 10 years and 10% post that in both cases

Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		25.00	30.00	36.00	43.20	51.84
Return on Capital (ROCE)		25%	25%	25%	25%	25%
Reinvest		80%	80%	80%	80%	80%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		5.00	6.00	7.20	8.64	10.37
Extected Return	12%	0.89	0.80	0.71	0.64	0.57
		4.46	4.78	5.12	5.49	5.88
Present Value	1,538.75					
	fwdPE	61.5	ttnPB	15.39		



Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		25.00	30.00	36.00	43.20	51.84
Return on Capital (ROCE)		25%	25%	25%	25%	25%
Reinvest		80%	80%	80%	80%	80%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		5.00	6.00	7.20	8.64	10.37
Extected Return	18%	0.85	0.72	0.61	0.52	0.44
		4.24	4.31	4.38	4.46	4.53
Present Value	267.57					
	fwdPE	10.7	ttnPB	2.68		



Different Duration of Growth

20% growth for 5 years in 1st case and for 25 years in the 2nd case

Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		25.00	30.00	36.00	43.20	51.84
Return on Capital (ROCE)		25%	25%	25%	25%	25%
Reinvest		80%	80%	80%	80%	80%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		5.00	6.00	7.20	8.64	10.37
Extected Return	15%	0.87	0.76	0.66	0.57	0.50
		4.35	4.54	4.73	4.94	5.15
Present Value	416.36					
	fwdPE 16.7 ttmPB 4.16					



Years		1	2	3	4	5
Capital		100.00	120.00	144.00	172.80	207.36
PAT		25.00	30.00	36.00	43.20	51.84
Return on Capital (ROCE)		25%	25%	25%	25%	25%
Reinvest		80%	80%	80%	80%	80%
	growth 20%	20.00	24.00	28.80	34.56	41.47
Payout		5.00	6.00	7.20	8.64	10.37
Extected Return	15%	0.87	0.76	0.66	0.57	0.50
		4.35	4.54	4.73	4.94	5.15
Present Value	1,059.13					
	fwdPE 42.4 ttmPB 10.59					



Factors for Expected Return ("r")

Predictability and Consistency of earnings

- How predictable
- Probability of loss
- Probability of negative growth

Size (Mcap/Sales) of the company

- Regional or national
- Promoter driven or professional

Liquidity of the shares

- Impact cost for funds
- Illiquidity discount or scarcity premium (e.g. Gruh, Page)

Who are the investors

- What's their opportunity cost

Investment horizon

- Are the investors investing for a short term profit making trade or long term

- Investors with lowest expected return "r" drive valuations higher
- Company profile attracts the matching kind of investors.
- Would short term investors have same "r" as long term?

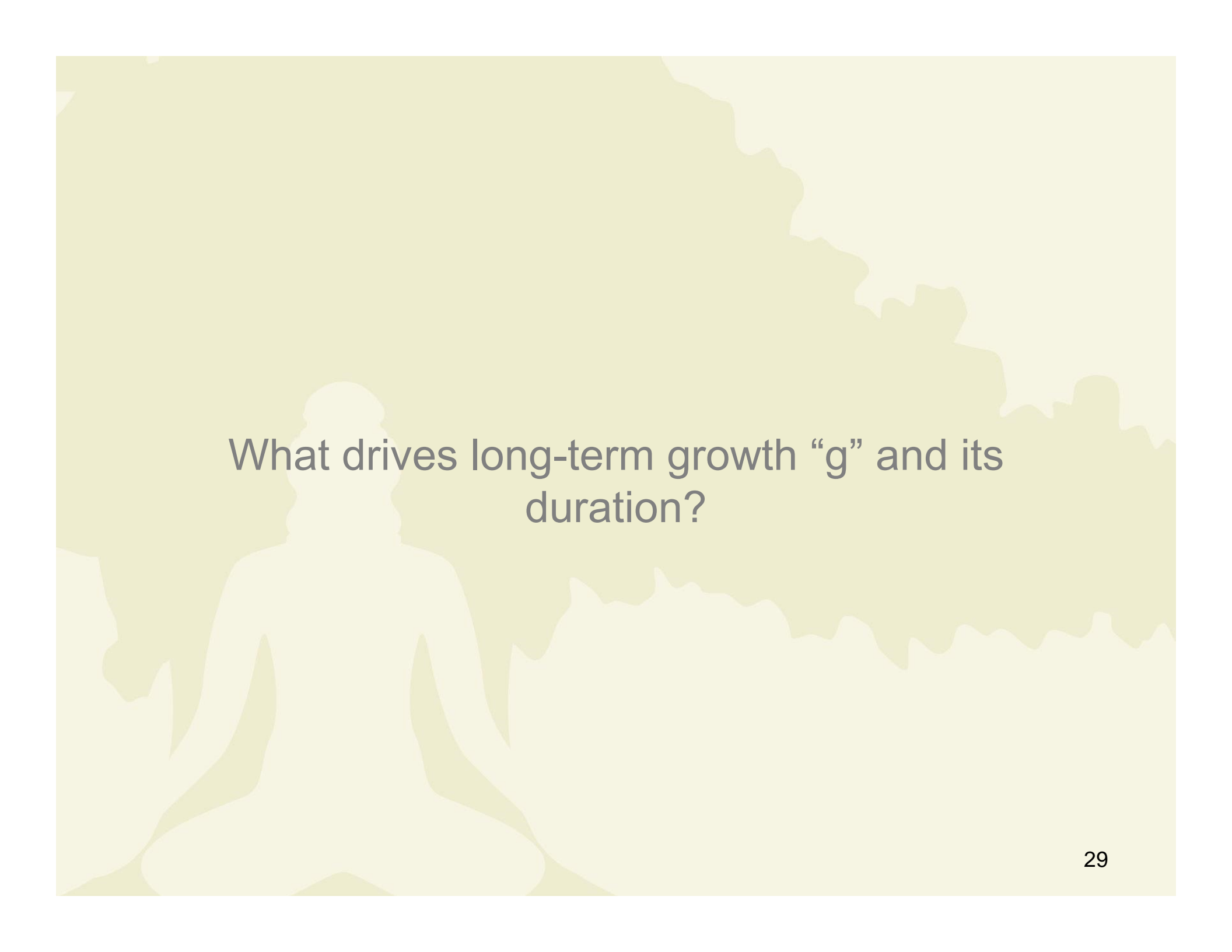


Expected growth and return pattern

	Year 1	Year 2	Year 3	Year 4	Year 5	CAGR
Nifty	25%	25%	25%	25%	-25%	12.9%
Company 1	40%	40%	40%	40%	-60%	9.0%
Company 2	25%	25%	25%	25%	-20%	14.3%

Which should have lowest expected return "r" by an investor?





What drives long-term growth “g” and its duration?

Factors for Sustainable Growth (“g”)

Industry Level	Inherent growth of the industry	<ul style="list-style-type: none"> • How does it relate to GDP growth of the country or some other driver
	Size of unorganized market/ PSUs	<ul style="list-style-type: none"> • Can organized players capture the unorganized market share and grow faster than the industry
	Untapped potential	<ul style="list-style-type: none"> • Are there new customers adapting to the products or services • Are there applications in new segments
	Consumable/Capex driven	<ul style="list-style-type: none"> • Is the company product a consumable or capex driven
Company Level	Entry Barriers	<ul style="list-style-type: none"> • Licenses, Brand, Land, Resources, Technology, Patent, Process, etc.
	Market share gain	<ul style="list-style-type: none"> • Is the company taking market share from competitors • Are there inefficient PSUs?



Examples as of Sept'14

11 Year History	03 - '14 PAT CAGR	PAT Growth range	Avg ROCE	ROCE Range	Average Payout %
Asian Paints Ltd.	22%	-2% to 111%; 1 negative year	49.22	40 - 75	44.14
ACC Ltd.	22%	-31% to 140%; 3 negative years	26.49	11 - 47	36.34
Voltas Ltd.	21%	-54% to 174%; 2 negative years	32.17	16 - 56	23.99
Apollo Tyres Ltd.	21%	-48% to 307%; 5 negative years	20.72	11 - 33	12.84

Who should get the highest and lowest valuation?



Examples as of Sept'14

11 Year History	03 - '14 PAT CAGR	PAT Growth range	Avg ROCE	ROCE Range	Average Payout %	P/B	P/E
Asian Paints Ltd.	22%	-2% to 111%; 1 negative year	49.22	40 - 75	44.14	12.98	50.44
ACC Ltd.	22%	-31% to 140%; 3 negative years	26.49	11 - 47	36.34	2.66	28.02
Voltas Ltd.	21%	-54% to 174%; 2 negative years	32.17	16 - 56	23.99	2.93	27.74
Apollo Tyres Ltd.	21%	-48% to 307%; 5 negative years	20.72	11 - 33	12.84	1.76	10.00



Sustainable PE multiple

Sustainable PE x of a stock

$$= \text{payout ratio} / (r - g)$$

where,

r = **market** expected return at stable growth

g = **market** expected constant growth rate

Let's do examples for the following companies:

1. HDFC Bank
2. Magalam Cement



Is reinvestment creating value?

	FY12	FY11	FY10	FY9	FY8
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Bajaj Electricals Ltd.

ROCE (EBIT/Cap Emp)	13.5%	17.5%	20.8%	20.5%	20.3%
Incr ROCE (Incr EBIT/Incr CE)	-10.5%	5.7%	18.6%	17.7%	41.3%
5 Yr Incr ROCE	12%				



Creating Growth vs. Creating Value

- Growth in Net Operating Income = ROCE x Reinvestment Rate
 - Reinvestment Rate = $(\text{Capex} - \text{Depr} + \Delta \text{WC}) / \text{EBIT} (1-t)$
 - Value created if ROCE > Cost of Capital (WACC)

- Growth in net Income = ROE x Equity Reinvestment Rate
 - Eq. Reinvestment rate = $(\text{Capex} - \text{Depr} + \Delta \text{WC} - \Delta \text{Debt}) / \text{Net Income}$
 - Value created if ROE > Cost of Equity

Bottomline: Simple fundamentals of valuation

- Value of perpetual (to infinity) growth above expected return results in INFINITE value
- Any company who is capable of doing that will itself become the entire economy and hence impossible
- Question is how long does the higher returning growth sustain
- After this, the return (from the business) falls below or at expected returns level
- That's the time to end forecast and calculate "**Terminal Value**"



DCF and Our Bond Examples

- Interest Paid: $EBIT (1-t)$
- Reinvestment: $(Capex - Depr) + \Delta WC$
- Payout: $FCFF$ (Free Cash Flow to Firm) = $EBIT (1-t) - Reinvestment$
- Expected Return: WACC: Weighted Avg Cost of Capital (Debt, Equity, etc..)
- Principal Paidback: Terminal Value
- Present Value: Enterprise Value (EV): Value of Debt, Common Equity and other stakeholder ownership

Years		1	2	3	4	5
Capital		100.00	100.00	100.00	100.00	100.00
Coupon (interest paid)	10%	10.00	10.00	10.00	10.00	10.00
Principal Paidback						100.00
Reinvestment	0%	-	-	-	-	-
Payout		10.00	10.00	10.00	10.00	110.00
Expected Return	10%	0.91	0.83	0.75	0.68	0.62
		9.09	8.26	7.51	6.83	68.30
Present Value	100.00					





Valuation Case Studies

Jubilant Foodworks – What’s wrong with this?

	FY12E	FY13E	FY14E	FY15E	FY16E	FY17E	FY18E	FY19E	FY20E
Sales growth (%)	50.9	46.5	42.8	36.1	31.5	21.3	19.9	18.8	18.1
SSS growth (%)	29.8	29.1	27.9	24.0	20.7	11.5	11.6	11.1	11.0
EBIDTA margin (%)	18.2	18.3	18.6	18.7	18.7	18.4	18.0	17.6	17.2
EBIT	1,490	2,283	3,415	4,774	6,357	7,613	8,984	10,468	12,014
Less: Depreciation	378	467	574	679	796	923	1,058	1,204	1,445
Add: Working capital	31	277	222	198	154	13	(63)	289	339
Less: Capex	(876)	(894)	(1,068)	(1,044)	(1,178)	(1,271)	(1,348)	(1,453)	(2,418)
Less: Taxes	492	753	1,127	1,576	2,098	2,512	2,965	3,454	3,965
Free cash flow (FCF)	531	1,380	2,016	3,032	4,032	4,766	5,666	7,053	7,416
Terminal Value									97,336
Discounted cash flow	531	1,221	1,579	2,101	2,473	2,587	2,722	2,998	2,790
DCF of Terminal value									36,614
Sum of DCF	55,085								
Add: Cash	770								
Less: Debt	-								
Equity value	55,854								
Equity shares o/s	65								
Value per share	854								



Jubilant Foodworks – What’s wrong with this?

	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
NOPLAT	170	420	720	998	1,530	2,288	3,198	4,259	5,101	6,019	7,014	8,049
Reinvestment	(361)	(260)	(398)	(467)	(150)	(272)	(167)	(228)	(335)	(353)	40	(634)
FCF	(191)	160	322	531	1,380	2,016	3,031	4,031	4,766	5,666	7,054	7,415
Reinvestment Rate	212%	62%	55%	47%	10%	12%	5%	5%	7%	6%	-1%	8%
NOPLAT Growth		147%	71%	39%	53%	50%	40%	33%	20%	18%	17%	15%
Implied ROCE		69%	115%	70%	114%	505%	335%	635%	369%	274%	282%	

Jubilant Foodworks – Constraints to Growth?

- Termination of master franchise agreement or higher franchise fee. Agreement until 2024 and renewable by 10 years. Royalty fees could increase from 3%. Can we assume this to be perpetual?
- Competition could get aggressive. Pizza Hut has announced opening up 270 new stores by 2015.
- Slowdown in store expansion rate. Estimate to reach 700 from 400 currently in the next 8 years. i.e. growth CAGR of 7.2%
- “Same store sales growth” could slow. Long-term trend should be < Nominal GDP
- Increasing density of stores could cannibalize sales? Can new stores be as profitable?
- Can margins be sustained with increasing raw material prices and increasing salaries?
- Historical ROCE does not incorporate normalized expenses
 - ESOPs calculated at intrinsic value
 - Lease expenses not capitalized. Typically this reduces the ROCE
 - Tax break expired



Jubilant Foodworks – Positives for Growth

- Dunkin' Donuts store growth rate higher than estimated. Current expectation of 80 stores in 5 years.
- Management able to sign more big master franchisee agreements.
- EBITDA margins expand above 19% currently (which management indicated are not sustainable) driving ROCE higher.
- Smaller towns respond well and higher growth rate sustain over longer duration.



Can do Reverse Calculation of PEx and PBx

	Year 0	Year 10
PEx	?			20x
Growth		20%	20%	20%
Expected Return	15%			
Earnings	X			$X * (1+g)^n$

**This is Tricky
Avoid Common Mistake.**

Access presentation (under "Newsletters & Presentation")
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