



CLOSURE IN VALUATION

The Big Enchilada

Getting Closure in Valuation

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- A publicly traded firm potentially has an infinite life. The value is therefore the present value of cash flows forever.

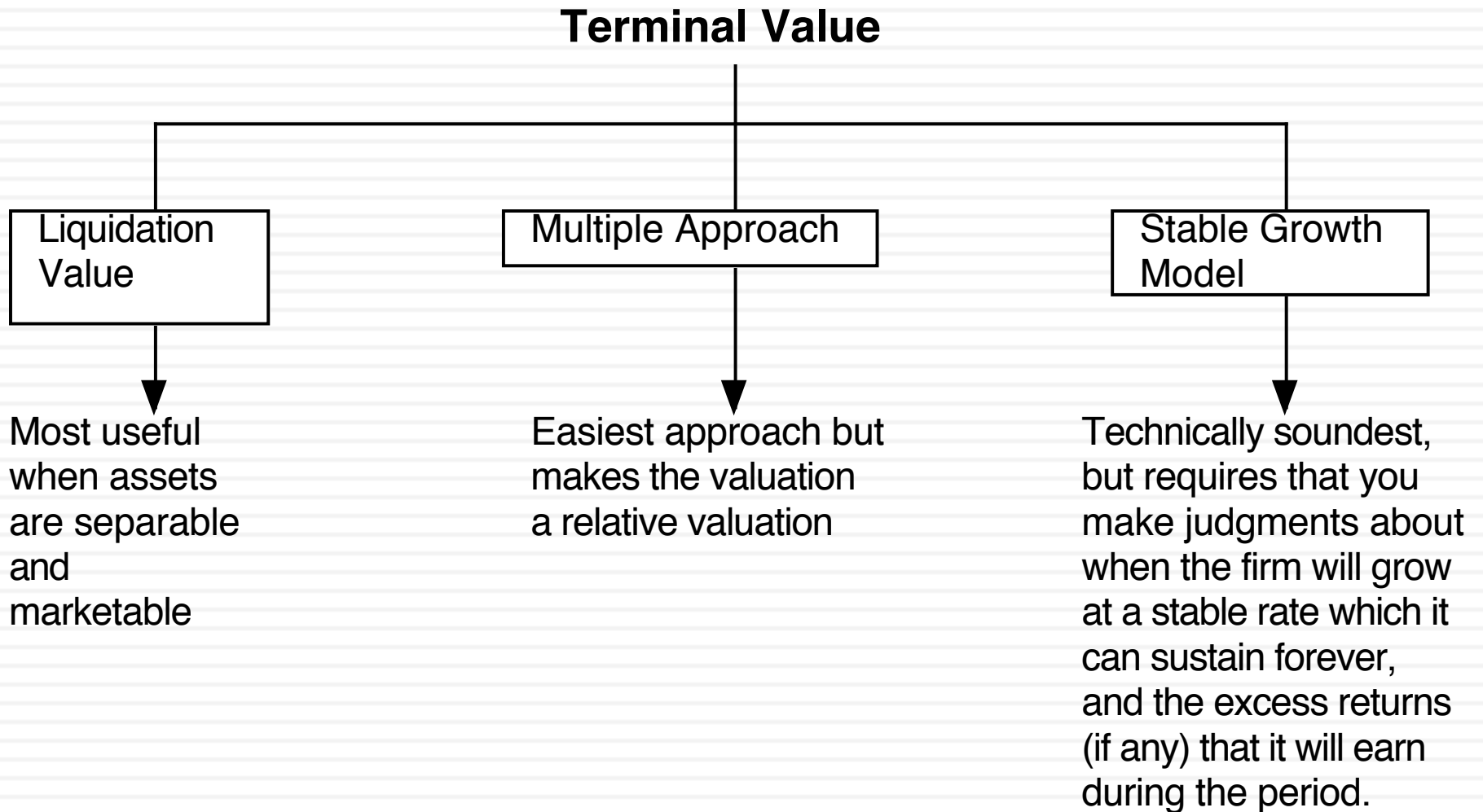
$$\text{Value} = \sum_{t=1}^{t=\infty} \frac{CF_t}{(1+r)^t}$$

- Since we cannot estimate cash flows forever, we estimate cash flows for a “growth period” and then estimate a terminal value, to capture the value at the end of the period:

$$\text{Value} = \sum_{t=1}^{t=N} \frac{CF_t}{(1+r)^t} + \frac{\text{Terminal Value}}{(1+r)^N}$$

Ways of Estimating Terminal Value

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1. Obey the growth cap

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- When a firm's cash flows grow at a “constant” rate forever, the present value of those cash flows can be written as:
Value = Expected Cash Flow Next Period / (r - g)
where,
 - r = Discount rate (Cost of Equity or Cost of Capital)
 - g = Expected growth rate
- The stable growth rate cannot exceed the growth rate of the economy but it can be set lower.
 - If you assume that the economy is composed of high growth and stable growth firms, the growth rate of the latter will probably be lower than the growth rate of the economy.
 - The stable growth rate can be negative. The terminal value will be lower and you are assuming that your firm will disappear over time.
 - If you use nominal cashflows and discount rates, the growth rate should be nominal in the currency in which the valuation is denominated.
- One simple proxy for the nominal growth rate of the economy is the riskfree rate.

Risk free Rates and Nominal GDP Growth

- **Risk free Rate** = Expected Inflation + Expected Real Interest Rate
- **Nominal GDP Growth** = Expected Inflation + Expected Real Growth
- The real interest rate is what borrowers agree to return to lenders in real goods/services.
- The real growth rate in the economy measures the expected growth in the production of goods and services.

The argument for Risk free rate = Nominal GDP growth

1. In the long term, the real growth rate cannot be lower than the real interest rate, since you have the growth in goods/services has to be enough to cover the promised rate.
2. In the long term, the real growth rate can be higher than the real interest rate, to compensate risk taking. However, as economies mature, the difference should get smaller and since there will be growth companies in the economy, it is prudent to assume that the extra growth comes from these companies.

<i>Period</i>	<i>10-Year T.Bond Rate</i>	<i>Inflation Rate</i>	<i>Real GDP Growth</i>	<i>Nominal GDP growth rate</i>	<i>Nominal GDP - T.Bond Rate</i>
1954-2015	5.93%	3.61%	3.06%	6.67%	0.74%
1954-1980	5.83%	4.49%	3.50%	7.98%	2.15%
1981-2008	6.88%	3.26%	3.04%	6.30%	-0.58%
2009-2015	2.57%	1.66%	1.47%	3.14%	0.57%

A Practical Reason for using the Risk free Rate Cap – Preserve Consistency

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- You are implicitly making assumptions about nominal growth in the economy, with your risk free rate. Thus, with a low risk free rate, you are assuming low nominal growth in the economy (with low inflation and low real growth) and with a high risk free rate, a high nominal growth rate in the economy.
- If you make an explicit assumption about nominal growth in cash flows that is at odds with your implicit growth assumption in the denominator, you are being inconsistent and bias your valuations:
 - If you assume high nominal growth in the economy, with a low risk free rate, you will over value businesses.
 - If you assume low nominal growth rate in the economy, with a high risk free rate, you will under value businesses.

2. Don't wait too long...

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- Assume that you are valuing a young, high growth firm with great potential, just after its initial public offering. How long would you set your high growth period?
 - a. < 5 years
 - b. 5 years
 - c. 10 years
 - d. >10 years
- While analysts routinely assume very long high growth periods (with substantial excess returns during the periods), the evidence suggests that they are much too optimistic. Most growth firms have difficulty sustaining their growth for long periods, especially while earning excess returns.

And tie to competitive advantages

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- Recapping a key lesson about growth, it is not growth per se that creates value but growth with excess returns. For growth firms to continue to generate value creating growth, they have to be able to keep the competition at bay.
- Proposition 1: The stronger and more sustainable the competitive advantages, the longer a growth company can sustain “value creating” growth.
- Proposition 2: Growth companies with strong and sustainable competitive advantages are rare.

3. Don't forget that growth has to be earned..

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- In the section on expected growth, we laid out the fundamental equation for growth:
Growth rate = Reinvestment Rate * Return on invested capital
+ Growth rate from improved efficiency
- In stable growth, you cannot count on efficiency delivering growth and you have to reinvest to deliver the growth rate that you have forecast.
- Consequently, your reinvestment rate in stable growth will be a function of your stable growth rate and what you believe the firm will earn as a return on capital in perpetuity:
 - ▣ Reinvestment Rate = Stable growth rate/ Stable period ROC = g/ ROC
- Your terminal value equation can then be rewritten as:

$$\text{Terminal Value in year } n = \frac{\text{EBIT}_{n+1} (1-t)(1-\frac{g}{\text{ROC}})}{(\text{Cost of Capital}-g)}$$

The Big Assumption

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		Return on capital in perpetuity				
		6%	8%	10%	12%	14%
Growth rate forever	0.0%	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
	0.5%	\$965	\$987	\$1,000	\$1,009	\$1,015
	1.0%	\$926	\$972	\$1,000	\$1,019	\$1,032
	1.5%	\$882	\$956	\$1,000	\$1,029	\$1,050
	2.0%	\$833	\$938	\$1,000	\$1,042	\$1,071
	2.5%	\$778	\$917	\$1,000	\$1,056	\$1,095
	3.0%	\$714	\$893	\$1,000	\$1,071	\$1,122

Terminal value for a firm with expected after-tax operating income of \$100 million in year $n+1$ and a cost of capital of 10%.

Excess Returns to Zero?

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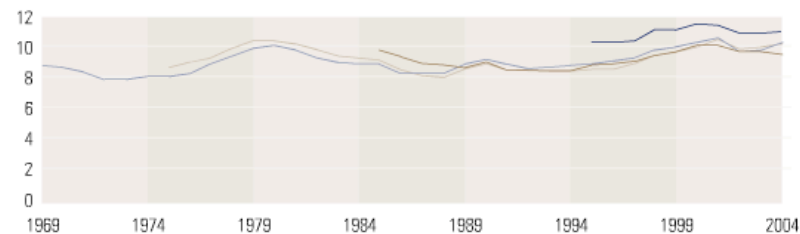
- There are some (McKinsey, for instance) who argue that the return on capital should always be equal to cost of capital in stable growth.
- But excess returns seem to persist for very long time periods.

A more sustainable measure

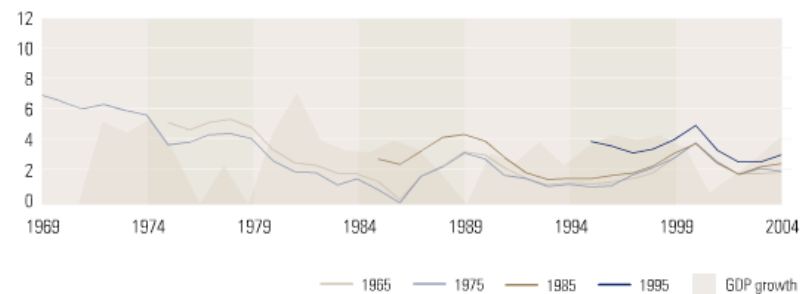
Median for top 500 publicly listed US companies by revenues in 1965, 1975, 1985, and 1995

Returns on invested capital (ROIC) is sustainable over time, but growth inevitably declines.

ROIC,¹ %



Real revenue growth,¹ %



¹ROIC shown is 7-year simple average, including goodwill; growth shown is 7-year compound annual growth rate for revenues adjusted for inflation.

And don't fall for sleight of hand...

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- A typical assumption in many DCF valuations, when it comes to stable growth, is that capital expenditures offset depreciation and there are no working capital needs. Stable growth firms, we are told, just have to make maintenance cap ex (replacing existing assets) to deliver growth. If you make this assumption, what expected growth rate can you use in your terminal value computation?

- What if the stable growth rate = inflation rate? Is it okay to make this assumption then?

4. Be internally consistent

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- Risk and costs of equity and capital: Stable growth firms tend to
 - ▣ Have betas closer to one
 - ▣ Have debt ratios closer to industry averages (or mature company averages)
 - ▣ Country risk premiums (especially in emerging markets should evolve over time)
- The excess returns at stable growth firms should approach (or become) zero. ROC → Cost of capital and ROE → Cost of equity
- The reinvestment needs and dividend payout ratios should reflect the lower growth and excess returns:
 - ▣ Stable period payout ratio = $1 - g / \text{ROE}$
 - ▣ Stable period reinvestment rate = g / ROC