## **Closure in Valuation**

The Big Enchilada

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#### **Getting Closure in Valuation**

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

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:

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

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## Ways of Estimating Terminal Value

Approach	Inputs and Value	Types of business
Liquidation Value	Liquidation value of assets held by the firm in the terminal year.	Businesses built around a key person or a time- limited competitive advantage (license or patent)
Going Concern (Perpetuity)	TV in year n = $CF_{n+1}/(r-g)$ , where g = growth rate forever	Going concerns with long lives (>40 years)
Going Concern (Finite)	TV in year n = PV of CF in years n+1 to n+ k, where k is finite	Going concerns with shorter lives
Pricing	Terminal Year Operating Metric * Estimated Multiple of Metric	Never appropriate in an intrinsic valuation.

#### 1. With perpetual growth, obey the growth cap

- 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)
    - 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 lower.
  - If the economy is composed of high growth and stable growth firms, the growth rate of the latter will be lower than the growth rate of the economy.
  - The stable growth rate can be negative, for companies in declining businesses.
  - If you use **nominal cashflows and discount rates**, the growth rate should be nominal in the currency in which the valuation is denominated.

#### Risk free Rates and Nominal GDP Growth

- Risk free Rate = Expected Inflation + Expected Real Interest Rate
- The real interest rate is what borrowers agree to return to lenders in real goods/services.
- Nominal GDP Growth = Expected Inflation
  + Expected Real Growth
- 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 <u>cannot be lower than the real interest rate</u>, since the growth in goods/services has to be enough to cover the promised rate.
- 2. In the long term, the real growth rate <u>can be higher than the real interest rate</u>, 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.

Time Period	Ten-year T.Bond rate	Inflation rate	Real GDP growth	Nominal GDP Growth Rate	
1954-2021	5.59%	3.55%	2.94%	6.50%	
1954-1980	5.83%	4.49%	3.50%	7.98%	
1981-2008	6.88%	3.26%	3.04%	6.30%	
2011-2021	2.25%	1.76%	1.70%	3.46%	

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

- You are <u>implicitly making assumptions about nominal growth</u> 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...

- Most growth firms have difficulty sustaining their growth for long periods, especially while earning excess returns. Assuming long growth periods for all firms is ignoring this reality.
- 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. Do not forget that growth has to be earned..

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- The reinvestment rate in stable growth will be a function of the stable growth rate and return on capital in perpetuity
  - Reinvestment Rate = Stable growth rate/ Stable period ROC = g/ ROC

 $EBIT_{n+1} (1-t)(1-\frac{g}{ROC})$ 

(Cost of Capital-g)

Terminal Value in year n =

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

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#### 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.



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## 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.
- a. If you make this assumption, what expected growth rate can you use in your terminal value computation?

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

#### 4. Be internally consistent

- 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/ ROE
  - Stable period reinvestment rate = g/ ROC

# Beyond Inputs: Choosing and Using the Right Model

Choosing the right model

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#### Summarizing the Inputs

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- In summary, at this stage in the process, we should have an estimate of the
  - the current cash flows on the investment, either to equity investors (dividends or free cash flows to equity) or to the firm (cash flow to the firm)
  - the current cost of equity and/or capital on the investment
  - the expected growth rate in earnings, based upon historical growth, analysts forecasts and/or fundamentals
- The next step in the process is deciding
  - which cash flow to discount, which should indicate
  - which discount rate needs to be estimated and
  - what pattern we will assume growth to follow

## Which cash flow should I discount?

#### Use Equity Valuation

(a) for firms which have stable leverage, whether high or not, and

(b) if equity (stock) is being valued

#### Use Firm Valuation

(a) for firms which have leverage which is too high or too low, and expect to change the leverage over time, because debt payments and issues do not have to be factored in the cash flows and the discount rate (cost of capital) does not change dramatically over time.

(b) for firms for which you have partial information on leverage (eg: interest expenses are missing..)

(c) in all other cases, where you are more interested in valuing the firm than the equity. (Value Consulting?)

# Given cash flows to equity, should I discount dividends or FCFE?

#### Use the Dividend Discount Model

(a) For firms which pay dividends (and repurchase stock) which are close to the Free Cash Flow to Equity (over a extended period)(b)For firms where FCFE are difficult to estimate (Example: Banks and Financial Service companies)

#### Use the FCFE Model

(a) For firms which pay dividends which are significantly higher or lower than the Free Cash Flow to Equity. (What is significant? ... As a rule of thumb, if dividends are less than 80% of FCFE or dividends are greater than 110% of FCFE over a 5-year period, use the FCFE model)

(b) For firms where dividends are not available (Example: Private Companies, IPOs)

## What discount rate should I use?

- Cost of Equity versus Cost of Capital
  - If discounting cash flows to equity -> Cost of Equity
  - If discounting cash flows to the firm -> Cost of Capital
- What currency should the discount rate (risk free rate) be in?
  - Match the currency in which you estimate the risk free rate to the currency of your cash flows
- Should I use real or nominal cash flows?
  - If discounting real cash flows -> real cost of capital
  - If nominal cash flows -> nominal cost of capital
  - If inflation is low (<10%), stick with nominal cash flows since taxes are based upon nominal income
  - If inflation is high (>10%) switch to real cash flows

## Which Growth Pattern Should I use?

#### □ If your firm is

- large and growing at a rate close to or less than growth rate of the economy, or
- constrained by regulation from growing at rate faster than the economy
- has the characteristics of a stable firm (average risk & reinvestment rates)

#### Use a Stable Growth Model

#### □ If your firm

- is large & growing at a moderate rate (≤ Overall growth rate + 10%) or
- has a single product & barriers to entry with a finite life (e.g. patents)

#### Use a 2-Stage Growth Model

#### □ If your firm

- is small and growing at a very high rate (> Overall growth rate + 10%) or
- has significant barriers to entry into the business
- has firm characteristics that are very different from the norm

Use a 3-Stage or n-stage Model

## The Building Blocks of Valuation

Choose a			
Cash Flow	Dividends	Cashflows to Equity	Cashflows to Firm
	Expected Dividends to		
	Stockholders	Net Income	EBIT (1- tax rate)
		- (1- δ) (Capital Exp Deprec'n)	- (Capital Exp Deprec'n)
		- $(1 - \delta)$ Change in Work. Capital	- Change in Work. Capital
		= Free Cash flow to Equity (FCFE)	= Free Cash flow to Firm (FCFF)
		$[\delta = \text{Debt Ratio}]$	
& A Discount Rate	Cost of	f Equity	Cost of Capital
	• Basis: The riskier the investment	WACC = $k_e (E/(D+E))$	
	• Models:	+ k <sub>d</sub> ( D/(D+E))	
	CAPM: Riskfree Rate + Beta	$k_d = Current Borrowing Rate (1-t)$	
	APM: Riskfree Rate + $\Sigma$ Beta	a <sub>j</sub> (Risk Premium <sub>j</sub> ): <i>n factors</i>	E,D: Mkt Val of Equity and Debt
& a growth pattern	Stable Growth	Two-Stage Growth	Three-Stage Growth
	g g	g	
		<u> </u>	<b></b>
	t	High Growth Stable	High Growth Transition Stable

## Tying up Loose Ends

## The trouble starts after you tell me you are done..

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## But what comes next?

Value of Operating Assets	Since this is a discounted cashflow valuation, should there be a real option premium?
+ Cash and Marketable Securities	Operating versus Non-opeating cash Should cash be discounted for earning a low return?
+ Value of Cross Holdings	How do you value cross holdings in other companies? What if the cross holdings are in private businesses?
+ Value of Other Assets	What about other valuable assets? How do you consider under utlilized assets?
Value of Firm	Should you discount this value for opacity or complexity? How about a premium for synergy? What about a premium for intangibles (brand name)?
- Value of Debt	What should be counted in debt? Should you subtract book or market value of debt? What about other obligations (pension fund and health care? What about contingent liabilities? What about minority interests?
= Value of Equity	Should there be a premium/discount for control? Should there be a discount for distress
- Value of Equity Options	What equity options should be valued here (vested versus non-vested)? How do you value equity options?
= Value of Common Stock	Should you divide by primary or diluted shares?
/ Number of shares	
= Value per share	Should there be a discount for illiquidity/ marketability? Should there be a discount for minority interests?

#### 1. The Value of Cash

- The simplest and most direct way of dealing with cash and marketable securities is to keep it out of the valuation - the cash flows should be before interest income from cash and securities, and the discount rate should not be contaminated by the inclusion of cash. (Use betas of the operating assets alone to estimate the cost of equity).
  - Once the operating assets have been valued, you should add back the value of cash and marketable securities.
  - In many equity valuations, the interest income from cash is included in the cashflows. The discount rate has to be adjusted then for the presence of cash. (The beta used will be weighted down by the cash holdings). Unless cash remains a fixed percentage of overall value over time, these valuations will tend to break down.

## An Exercise in Cash Valuation

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	Company A	Company B	Company C
Enterprise Value	\$1,000.0	\$1,000.0	\$1,000.0
Cash	\$100.0	\$100.0	\$100.0
Return on invested capital	10%	5%	22%
Cost of capital	10%	10%	12%
Trades in	US	US	Argentina

In which of these companies is cash most likely to be

- a) A Neutral Asset (worth \$100 million)
- b) A Wasting Asset (worth less than \$100 million)
- c) A Potential Value Creator (worth >\$100 million)

# Should you ever discount cash for its low returns?

- There are some analysts who argue that companies with a lot of cash on their balance sheets should be penalized by having the excess cash discounted to reflect the fact that it earns a low return.
  - Excess cash is usually defined as holding cash that is greater than what the firm needs for operations.
  - A low return is defined as a return lower than what the firm earns on its non-cash investments.
- This is the wrong reason for discounting cash. If the cash is invested in riskless securities, it should earn a low rate of return. As long as the return is high enough, given the riskless nature of the investment, cash does not destroy value.
- There is a right reason, though, that may apply to some companies... Managers can do stupid things with cash (overpriced acquisitions, pie-in-the-sky projects....) and you have to discount for this possibility.

#### Cash: Discount or Premium?

Market Value of \$ 1 in cash: Estimates obtained by regressing Enterprise Value against Cash Balances



#### A Detour: Closed End Mutual Funds

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Assume that you have a closed-end fund that invests in 'average risk" stocks. Assume also that you expect the market (average risk investments) to make 11.5% annually over the long term. If the closed end fund underperforms the market by 0.50%, estimate the discount on the fund.

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