VALUE AND PRICING: BASICS

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Price versus Value: The Set up

Drivers of intrinsic value
- Cashflows from existing assets
- Growth in cash flows
- Quality of Growth

Drivers of price
- Market moods & momentum
- Surface stories about fundamentals

Accounting Estimates

Valuation Estimates

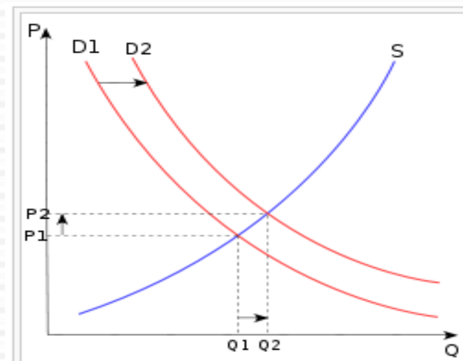
INTRINSIC VALUE

Value

THE GAP
Is there one?
If so, will it close?
If it will close, what will cause it to close?

Price

PRICE



The essence of intrinsic value

- In intrinsic valuation, you value an asset based upon its fundamentals (or intrinsic characteristics).
- For cash flow generating assets, the intrinsic value will be a function of the magnitude of the expected cash flows on the asset over its lifetime and the uncertainty about receiving those cash flows.
- Discounted cash flow valuation is a tool for estimating intrinsic value, where the expected value of an asset is written as the present value of the expected cash flows on the asset, with either the cash flows or the discount rate adjusted to reflect the risk.

The two faces of discounted cash flow valuation

- The value of a risky asset can be estimated by discounting the expected cash flows on the asset over its life at a risk-adjusted discount rate:

$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \ldots.. + \frac{E(CF_n)}{(1+r)^n}$$

where the asset has an n-year life, $E(CF_t)$ is the expected cash flow in period t and r is a discount rate that reflects the risk of the cash flows.

- Alternatively, we can replace the expected cash flows with the guaranteed cash flows we would have accepted as an alternative (certainty equivalents) and discount these at the riskfree rate:

$$\text{Value of asset} = \frac{CE(CF_1)}{(1+r_f)} + \frac{CE(CF_2)}{(1+r_f)^2} + \frac{CE(CF_3)}{(1+r_f)^3} \ldots.. + \frac{CE(CF_n)}{(1+r_f)^n}$$

where CE(CFt) is the certainty equivalent of $E(CF_t)$ and r_f is the riskfree rate.

DCF Choices: Equity Valuation versus Firm Valuation

Firm Valuation: Value the entire business

Assets			**Liabilities**
Existing Investments Generate cashflows today Includes long lived (fixed) and short-lived(working capital) assets	Assets in Place	Debt	Fixed Claim on cash flows Little or No role in management *Fixed Maturity* *Tax Deductible*
Expected Value that will be created by future investments	Growth Assets	Equity	Residual Claim on cash flows Significant Role in management *Perpetual Lives*

Equity valuation: Value just the equity claim in the business

The determinants of value

What are the **cashflows from existing assets**?
- Equity: Cashflows after debt payments
- Firm: Cashflows before debt payments

What is the **value added** by growth assets?
Equity: Growth in equity earnings/ cashflows
Firm: Growth in operating earnings/ cashflows

How **risky are the cash flows** from both existing assets and growth assets?
Equity: Risk in equity in the company
Firm: Risk in the firm's operations

When will the firm become a **mature fiirm**, and what are the potential roadblocks?

DCF as a tool for intrinsic valuation

Value of growth
The future cash flows will reflect expectations of how quickly earnings will grow in the future (as a positive) and how much the company will have to reinvest to generate that growth (as a negative). The net effect will determine the value of growth.
Expected Cash Flow in year t = E(CF) = Expected Earnings in year t - Reinvestment needed for growth

Cash flows from existing assets
The base earnings will reflect the earnings power of the existing assets of the firm, net of taxes and any reinvestment needed to sustain the base earnings.

$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \ldots\ldots + \frac{E(CF_n)}{(1+r)^n}$$

Steady state
The value of growth comes from the capacity to generate excess returns. The length of your growth period comes from the strength & sustainability of your competitive advantages.

Risk in the Cash flows
The risk in the investment is captured in the discount rate as a beta in the cost of equity and the default spread in the cost of debt.

1. Cash Flows

To get to cash flow	Here is why
Operating Earnings	This is the earnings before interest & taxes you generate from your existing assets. Operating Earnings = Revenues * Operating Margin Measures the operating efficiency of your assets & can be grown either by growing revenues and/or improving margins.
(minus) Taxes	These are the taxes you would pay on your operating income and are a function of the tax code under which you operate & your fidelity to that code.
(minus) Reinvestment	Reinvestment is designed to generate future growth and can be in long term and short term assets. Higher growth usually requires more reinvestment, and the efficiency of growth is a function of how much growth you can get for your reinvestment.
Free Cash Flow to the Firm	This is a pre-debt cash flow that will be shared by lenders (as interest & principal payments) and by equity investors (as dividends & buybacks).

2. Discount Rates

Expected Return on a Risky Investment = Cost of Equity

=

Risk free Rate
Rate of return on a long term, default free bond.

Will vary across currencies and across time.

+

Beta
Relative measure of risk added to a diversified portfolio.

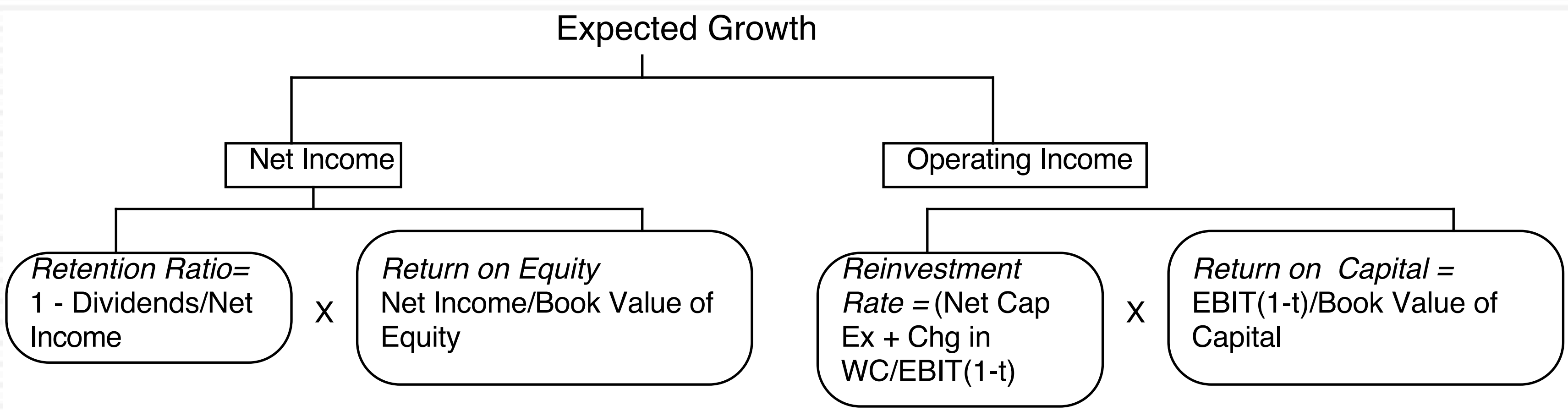
Determined by the business or businesses that you operate it, with more exposure to macro economic risk translating into a higher beta.

X

Equity Risk Premium
Premium investors demand over and above the risk free rate for investing in equities as a class.

Function of the countries that you do business in and how much value you derive from each country.

3. Growth



- Quality growth is rare requires that a firm be able to reinvest a lot and reinvest well (earnings more than your cost of capital) at the same time.
- The larger you get, the more difficult it becomes to maintain quality growth.
- You can grow while destroying value at the same time.

4. The Terminal Value

This tax rate locks in forever. Does it make sense to use an effective tax rate?

Are you reinvesting enough to sustain your stable growth rate?
Reinv Rate = g/ ROC
Is the ROC that of a stable company?

$$\text{Terminal Value}_n = \frac{\text{EBIT}_{n+1}\ (1 - \text{tax rate})\ (1 - \text{Reinvestment Rate})}{\text{Cost of capital - Expected growth rate}}$$

This is a mature company. It's cost of capital should reflect that.

This growth rate should be less than the nomlnal growth rate of the economy

If your job is assessing value, here are you challenges…

Value of Growth

Company's history
Look at **past growth in revenues & earnings** and **how much the company has had to invest** to generate this growth.

Competitors
Look at the **growth, profitability & reinvestment at competitors** & determine your competitive advantages

Market potential
Make a judgment on the **size, growth potential & profitablity of the overall market** served by the company.

Cash flows from existing assets
Based on the **current financial statements** of the company, make assessments of earnings and cash flows from existing assets.

$$\text{Value of asset} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \,.....+ \frac{E(CF_n)}{(1+r)^n}$$

Steady state
Look at the **largest and most mature companies** your peer group to make a judgment on when stablity will come to your company & what it will look like.

Risk in the Cash Flows

Past earnings
Look at the variability of past earnings and the sources of the variability.

Past market prices
If your company has been traded historically, get a measure the variability in stock prices

Peer group
Look at the costs of funding faced by peer group companies, similar to yours.

Starting numbers

Twitter Pre-IPO Valuation: October 27, 2013

	Last 10K	Trailing 12 month
Revenues	$316.93	$534.46
Operating income	-$77.06	-$134.91
Adjusted Operating Income		$7.67
Invested Capital		$955.00
Adjusted Operatng Margin		1.44%
Sales/ Invested Capital		0.56
Interest expenses	$2.49	$5.30

Revenue growth of 51.5% a year for 5 years, tapering down to 2.5% in year 10

Pre-tax operating margin increases to 25% over the next 10 years

Sales to capital ratio of **1.50** for incremental sales

Stable Growth
g = 2.5%; Beta = 1.00;
Cost of capital = 8%
ROC= **12**%;
Reinvestment Rate=2.5%/12% = 20.83%

Terminal Value$_{10}$= 1466/(.08-.025) = $26,657

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Revenues	$ 810	$1,227	$1,858	$2,816	$4,266	$6,044	$7,973	$9,734	$10,932	$11,205
Operating Income	$ 31	$ 75	$ 158	$ 306	$ 564	$ 941	$1,430	$1,975	$ 2,475	$ 2,801
Operating Income after tax	$ 31	$ 75	$ 158	$ 294	$ 395	$ 649	$ 969	$1,317	$ 1,624	$ 1,807
- Reinvestment	$ 183	$ 278	$ 421	$ 638	$ 967	$1,186	$1,285	$1,175	$ 798	$ 182
FCFF	$(153)	$ (203)	$ (263)	$ (344)	$ (572)	$ (537)	$ (316)	$ 143	$ 826	$ 1,625

Terminal year (11)

EBIT (1-t)	$ 1,852
- Reinvestment	$ 386
FCFF	$ 1,466

Operating assets	$9,705
+ Cash	321
+ IPO Proceeds	1295
- Debt	214
Value of equity	11,106
- Options	713
Value in stock	10,394
/ # of shares	582.46
Value/share	$17.84

Cost of capital = 11.12% (.981) + 5.16% (.019) = 11.01%

Cost of capital decreases to 8% from years 6-10

Cost of Equity
11.12%

Cost of Debt
(2.5%+5.5%)(1-.40)
= 5.16%

Weights
E = 98.1% D = 1.9%

Riskfree Rate:
Riskfree rate = 2.5%

+

Beta
1.40

X

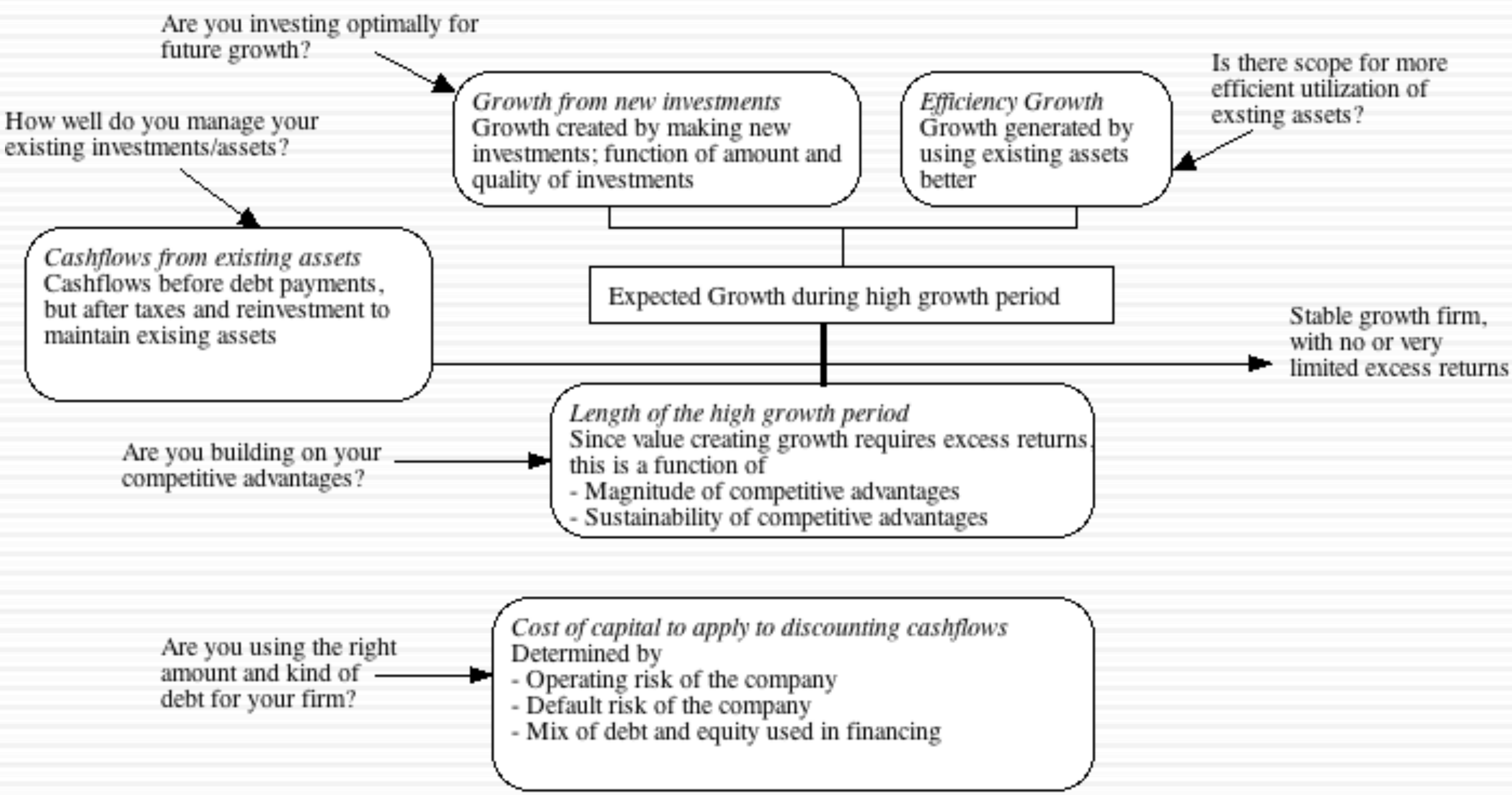
Risk Premium
6.15%

75% from US(5.75%) + 25% from rest of world (7.23%)

90% advertising (1.44) + 10% info svcs (1.05)

D/E=1.71%

If your job is enhancing value, its got to come from changing the fundamentals



The determinants of price

Mood and Momentum
Price is determined in large part by mood and momentum, which, in turn, are driven by behavioral factors (panic, fear, greed).

Liquidity & Trading Ease
While the value of an asset may not change much from period to period, liquidity and ease of trading can, and as it does, so will the price.

The Market Price

Incremental information
Since you make money on price changes, not price levels, the focus is on incremental information (news stories, rumors, gossip) and how it measures up, relative to expectations

Group Think
To the extent that pricing is about gauging what other investors will do, the price can be determined by the "herd".

A more general tool: Multiples and Comparable Transactions

Market value of equity

Market value for the firm
Firm value = Market value of equity
+ Market value of debt

Market value of operating assets of firm
Enterprise value (EV) = Market value of equity
+ Market value of debt
- Cash

Step 1: Pick a multiple

Multiple = $\dfrac{\text{Numerator = What you are paying for the asset}}{\text{Denominator = What you are getting in return}}$ ⇒ **CHOOSE A MULTIPLE**

Revenues
a. Accounting revenues
b. Drivers
- # Customers
- # Subscribers
= # units

Earnings
a. To Equity investors
- Net Income
- Earnings per share
b. To Firm
- Operating income (EBIT)

Cash flow
a. To Equity
- Net Income + Depreciation
- Free CF to Equity
b. To Firm
- EBIT + DA (EBITDA)
- Free CF to Firm

Book Value
a. Equity
= BV of equity
b. Firm
= BV of debt + BV of equity
c. Invested Capital
= BV of equity + BV of debt - Cash

Step 2: Choose comparables

Narrow versus Broad sector/business	Similar market cap or all companies	Country, Region or Global	Other criteria, subjective & objective

⇒ **PICK COMPARABLE FIRMS**

Step 3: Tell a story

Risk - Lower risk for higher value - Higher risk for lower value	Growth - Higher growth for higher value - Lower growth for lower value	Quality of growth - Higher barriers to entry/moats for higher value - Lower barriers to entry for lower value

SPIN/TELL YOUR STORY

Pricing Twitter- October 2013

Just Facebook and Linkedin							
Company	*EV*	*Market Cap*	*EV/Sales*	*EV/EBITDA*	*PE*	*Market Cap/User*	*Market Cap/Employee*
Facebook, Inc. (NasdaqGS:FB)	$100,017.00	$107,909.00	16.35	36.20	193.73	$97.22	$20.36
LinkedIn Corporation (NYSE:LNKD)	$28,448.50	$29,321.90	22.87	179.26	729.40	$130.32	$6.91
Facebook + Linkedin	$128,465.50	$137,230.90	17.45	43.97	229.79	$102.79	$14.38
Social Media/Internet Medley							
Facebook, Inc. (NasdaqGS:FB)	$100,017.00	$107,909.00	16.35	36.20	193.73	$97.22	$20.36
Google Inc. (NasdaqGS:GOOG)	$248,856.30	$296,078.30	4.46	14.64	25.45	$270.89	$6.61
LinkedIn Corporation (NYSE:LNKD)	$28,448.50	$29,321.90	22.87	179.26	729.40	$130.32	$6.91
Netlfix	$13,959.00	$14,539.00	3.54	81.20	304.80	$403.86	$7.11
OpenTable, Inc. (NasdaqGS:OPEN)	$1,641.70	$1,733.70	9.45	30.35	59.99	$15.34	$3.02
Pandora Media, Inc. (NYSE:P)	$4,163.40	$4,232.30	7.89	NA	NA	$21.16	$5.72
RetailMeNot	$1,723.60	$1,715.00	10.20	34.20	64.96	$147.84	$4.60
Trulia, Inc. (NYSE:TRLA)	$1,647.39	$1,853.10	17.75	NA	NA	$59.02	$3.57
Yelp, Inc. (NYSE:YELP)	$4,006.10	$4,102.90	22.42	NA	NA	$41.03	$2.67
Zillow, Inc. (NasdaqGS:Z)	$3,419.80	$3,589.50	22.48	NA	NA	$78.20	$5.22
Yahoo! Inc. (NasdaqGS:YHOO)	$27,262.80	$29,854.60	5.65	21.24	7.19	$106.24	$2.55
Groupon	$5,857.00	$7,039.00	2.42	44.04	NA	$168.80	$0.62
Travelzoo Inc. (NasdaqGS:TZOO)	$347.20	$421.10	2.23	12.81	23.39	$16.20	$0.95
Aggregate	*$441,349.79*	*$502,389.40*	5.82	*20.43*	*30.76*	*$151.57*	*$5.96*
Median			*8.67*	*32.27*	*59.99*	*101.73*	*4.91*
Average			*10.97*	*47.44*	*159.96*	*121.98*	*5.42*

*Twitter's value based on revenues = $543 million * ?*

*Twitter's value based on # users = 237 million * ?*

Rules for the road: Relative valuation

1. Be consistent: Both the value (the numerator) and the standardizing variable (the denominator) should be to the same claimholders in the firm. In other words, the value of equity should be divided by equity earnings or equity book value, and firm value should be divided by firm earnings or book value.
2. Play Moneyball: Look at the cross sectional distribution of a multiple and form judgments, based on the data, of what is cheap and what is expensive.
3. Make your implicit assumptions explicit: Multiples are standardized values, and as a consequence are driven by exactly the same variables that determine value – cash flows, growth and risk.
4. Control for differences (and go past story telling): No matter how carefully you control for differences across companies, there will still be residual differences on the fundamentals across the firms. You have to go beyond story telling and use the data to analyze how the market treats these differences.