




Price or Value? What's your game?

January 2017

Aswath Damodaran

Test 1: Are you pricing or valuing?

2

 **5369 La Jolla Mesa Dr**
La Jolla, CA 92037
Status: Active





\$995,000
Price

3 Beds

2.5 Baths


1,440 Sq. Ft.
\$691 / Sq. Ft.

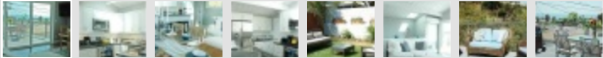
Built: 1955 Lot Size: 3,000 Sq. Ft. On Redfin: 12 days

Favorite X-Out Share... Tour Home

Overview Property Details Tour Insights Property History Public Records Activity Schools Neighborhood & Offer Insights Similar Homes




1 of 25  [Play Video](#)

Lisa Padilla
REDFIN Real Estate Agent

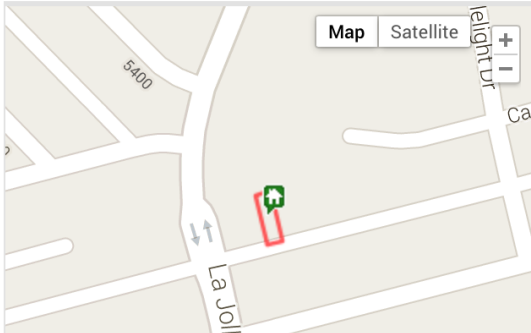
★★★★★
47 client reviews

\$8,726 commission refund

 [Go Tour This Home](#)

[Ask Lisa a Question](#) or [Start an Offer](#)

1 of 4 Redfin Agents in this area



Test 2: Are you pricing or valuing?

3

Rating
Buy

Europe
Switzerland

Biotechnology
Biotechnology

Company
BB BIOTECH

Reuters
BION.S

Bloomberg
BION SW

Exchange
SWX

Ticker
BION

Date
13 August 2013

Forecast Change

Price at 12 Aug 2013 (CHF)	124.00
Price Target (CHF)	164.50
52-week range (CHF)	128.40 - 84.90

Strong sector and stock-picking continue

Impressive performance

Over the past two years, BB Biotech shares have roughly tripled, which could tempt investors to take profits. However, this performance has been well backed by a deserved revival of the biotech industry, encouraging fundamental news, M&A, and increased money flow into health care stocks. In addition, BBB returned to index outperformance by modifying its stock-picking approach. Hence, despite excellent performance, the shares still trade at a 23% discount to the net asset value of the portfolio. Hence, the shares are an attractive value vehicle to capture growth opportunities in an attractive sector.

Biotech industry remains attractive

With the re-rating of the pharma sector, investors have also showed increased interest in biotech stocks. Established biotech stocks have delivered encouraging financial results and approvals, while there has also been substantial industry consolidation, which is not surprising in times of "cheap" money and high liquidity. BB Biotech remains an attractive vehicle to capture the future potential of the biotech sector. In addition, investors benefit from a 23% discount to NAV and attractive cash distribution policy of 5% yield p.a. Hence, we reiterate our Buy on BB Biotech shares.

BB Biotech shares remain attractive

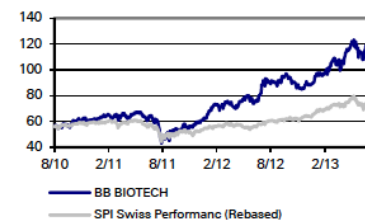
In the first 6M of 2013, BB Biotech increased its NAV by 36%, which marks good outperformance against the Nasdaq Biotech Index (NBI)'s 27%. This is a remarkable performance after 2012 when BBB's NAV increase of 45% also

Key changes

Target Price 106.50 to 164.50 ↑ 54.5%

Source: Deutsche Bank

Price/price relative



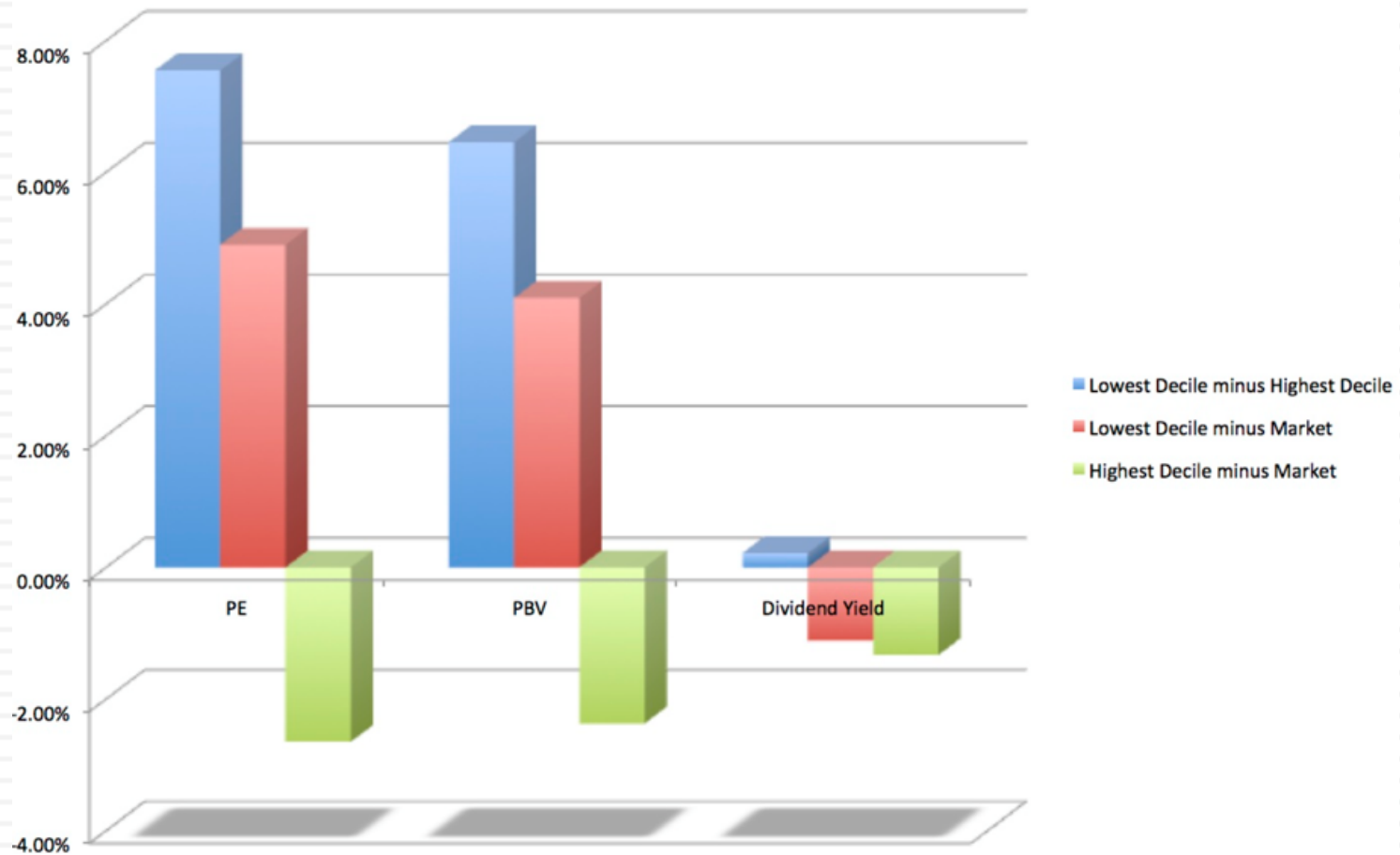
Performance (%)	1m	3m	12m
Absolute	-1.4	5.4	37.4
SPI Swiss Performance IX	0.5	-1.4	26.4

Source: Deutsche Bank

Test 3: Are you pricing or valuing?

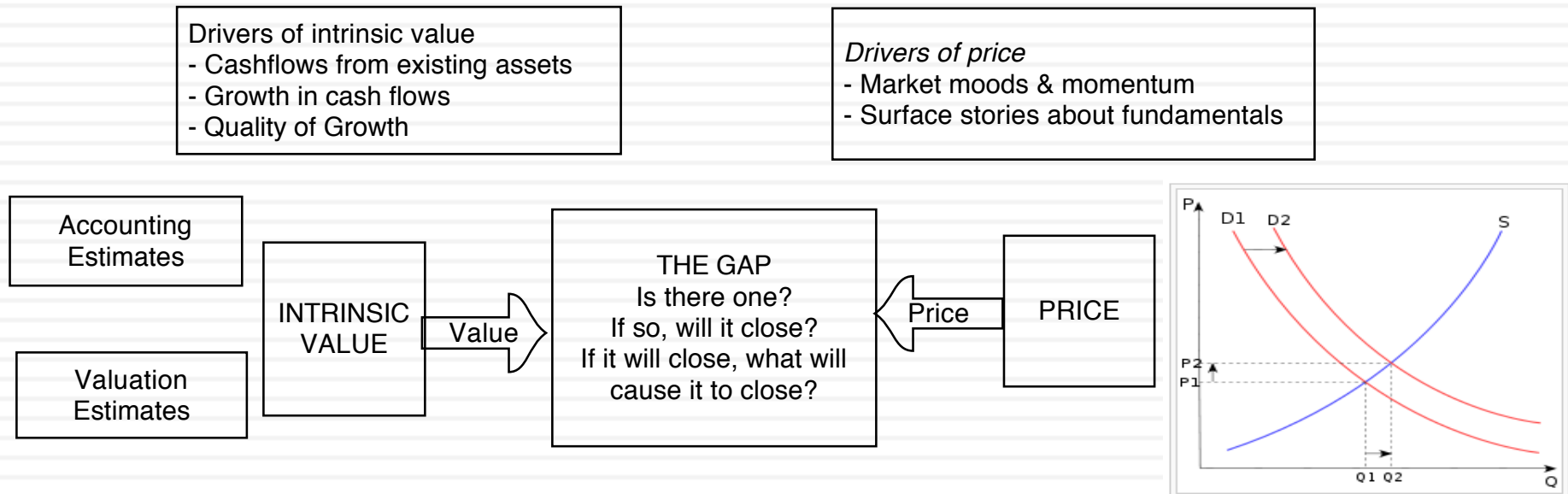
4

PE, PBV and Dividend Yield: Excess Annual Returns from 1952-2010



Price versus Value: The Set up

5



Intrinsic Value: The Essence

6

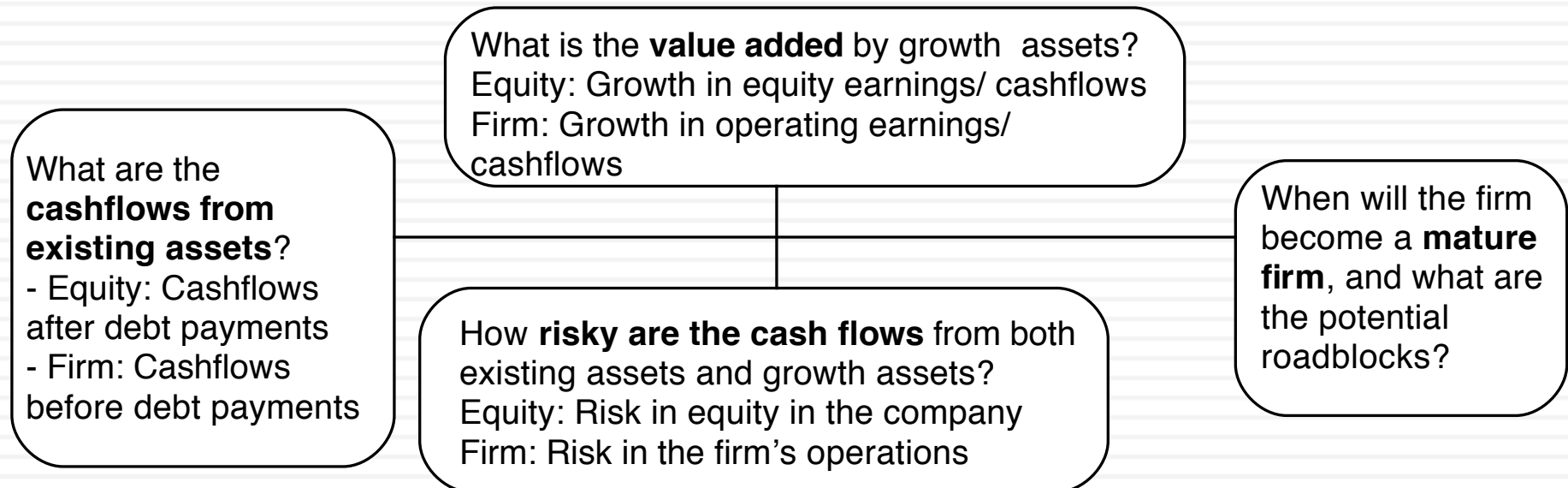
- The value of a risky asset can be estimated by discounting the expected cash flows on the asset over its life at a risk-adjusted discount rate:

$$\text{Value of asset} = \frac{E(\text{CF}_1)}{(1+r)} + \frac{E(\text{CF}_2)}{(1+r)^2} + \frac{E(\text{CF}_3)}{(1+r)^3} \dots + \frac{E(\text{CF}_n)}{(1+r)^n}$$

1. *The IT Proposition:* If “it” does not affect the cash flows or alter risk (thus changing discount rates), “it” cannot affect value.
2. *The DUH Proposition:* For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.
3. *The DON'T FREAK OUT Proposition:* Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.

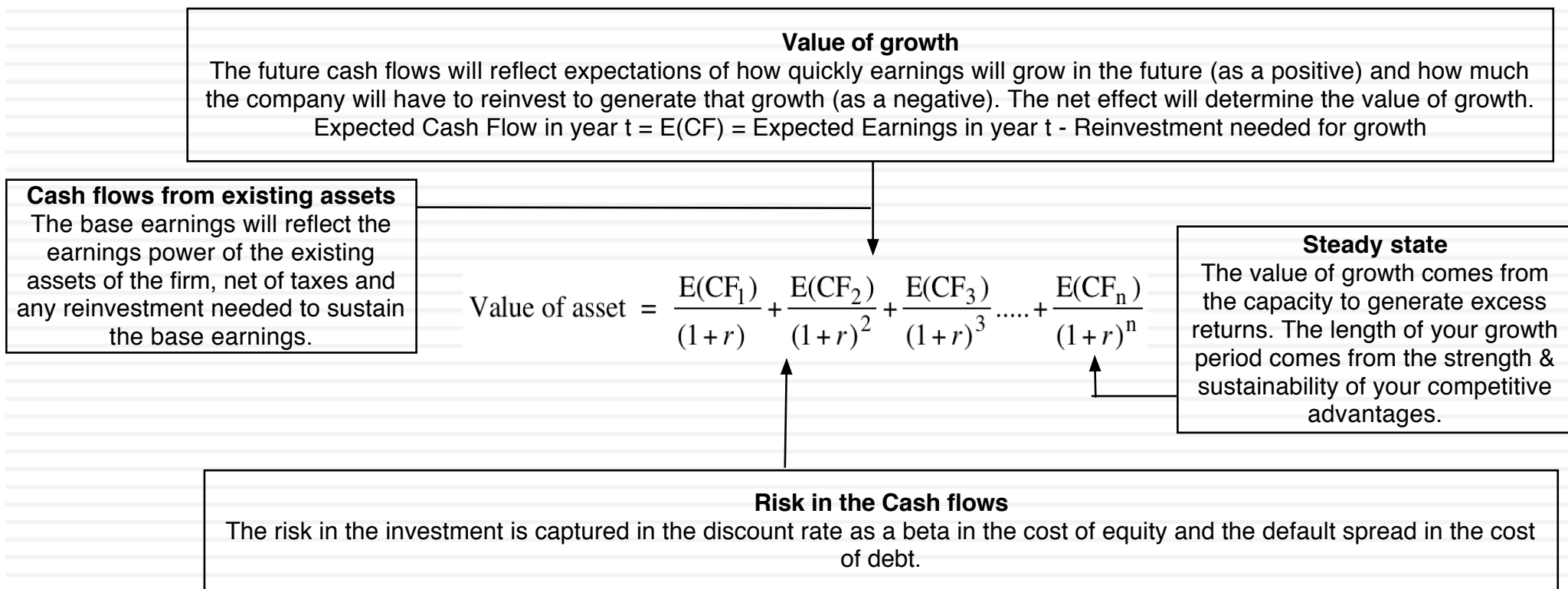
The drivers of value..

7



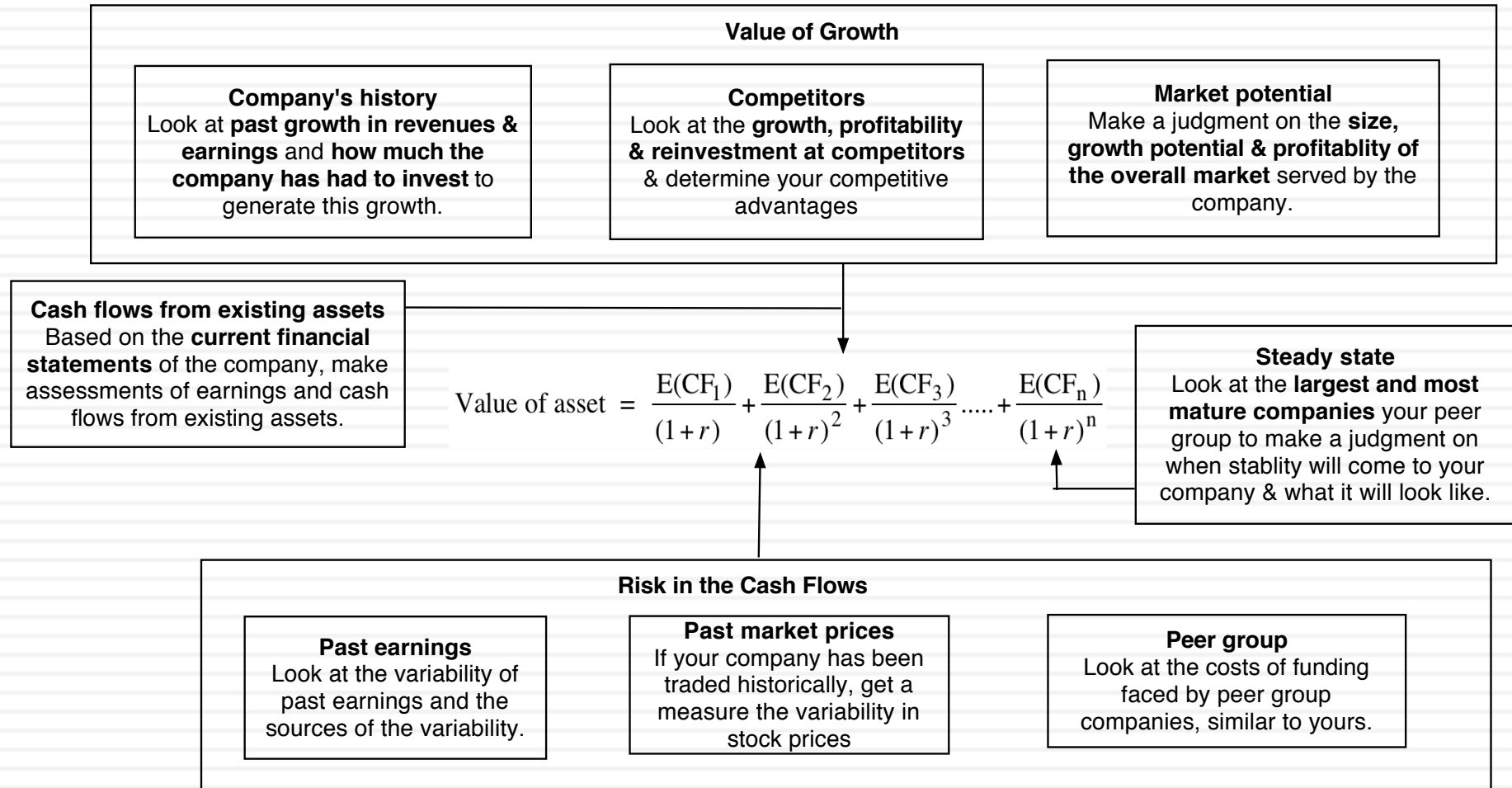
DCF as a tool for intrinsic valuation

8



If your job is assessing value, here are your challenges...

9



Twitter: Setting the table in October 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

Twitter: Priming the Pump for Valuation

1. Make small revenues into big revenues

	2011		2012		2013	
	%	\$	%	\$	%	\$
Google	32.09%	\$27.74	31.46%	\$32.73	33.24%	\$38.83
Facebook	3.65%	\$3.15	4.11%	\$4.28	5.04%	\$5.89
Yahoo!	3.95%	\$3.41	3.37%	\$3.51	3.10%	\$3.62
Microsoft	1.27%	\$1.10	1.63%	\$1.70	1.78%	\$2.08
IAC	1.15%	\$0.99	1.39%	\$1.45	1.47%	\$1.72
AOL	1.17%	\$1.01	1.02%	\$1.06	0.95%	\$1.11
Amazon	0.48%	\$0.41	0.59%	\$0.61	0.71%	\$0.83
Pandora	0.28%	\$0.24	0.36%	\$0.37	0.50%	\$0.58
Twitter	0.16%	\$0.14	0.28%	\$0.29	0.50%	\$0.58
Linkedin	0.18%	\$0.16	0.25%	\$0.26	0.32%	\$0.37
Millennial Media	0.05%	\$0.04	0.07%	\$0.07	0.10%	\$0.12
Other	55.59%	\$48.05	55.47%	\$57.71	52.29%	\$61.09
Total Market	100%	\$86.43	100.00%	\$104.04	100.00%	\$116.82

2. Make losses into profits

Company	Operating Margin
Google Inc. (NasdaqGS:GOOG)	22.82%
Facebook, Inc. (NasdaqGS:FB)	29.99%
Yahoo! Inc. (NasdaqGS:YHOO)	13.79%
Netflix	3.16%
Groupon	2.53%
LinkedIn Corporation (NYSE:LNKD)	5.18%
Pandora Media, Inc. (NYSE:P)	-9.13%
Yelp, Inc. (NYSE:YELP)	-6.19%
OpenTable, Inc. (NasdaqGS:OPEN)	24.90%
RetailMeNot	45.40%
Travelzoo Inc. (NasdaqGS:TZOO)	15.66%
Zillow, Inc. (NasdaqGS:Z)	-66.60%
Trulia, Inc. (NYSE:TRLA)	-6.79%
Aggregate	20.40%

		Annual growth rate in Global Advertising Spending				
		2.00%	2.50%	3.00%	3.50%	4.00%
Online advertising share of market	20%	\$124.78	\$131.03	\$137.56	\$144.39	\$151.52
	25%	\$155.97	\$163.79	\$171.95	\$180.49	\$189.40
	30%	\$187.16	\$196.54	\$206.34	\$216.58	\$227.28
	35%	\$218.36	\$229.30	\$240.74	\$252.68	\$265.16
	40%	\$249.55	\$262.06	\$275.13	\$288.78	\$303.04

My estimate for 2023: Overall online advertising market will be close to \$200 billion and Twitter will have about 5.7% (\$11.5 billion)

My estimate for Twitter: Operating margin of 25% in year 10

3. Reinvest for growth

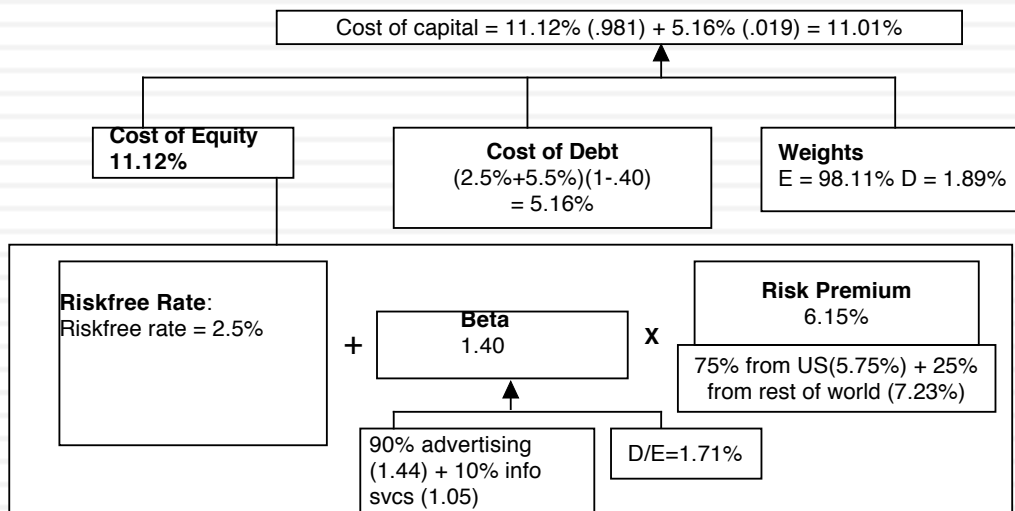
	Sales/ Invested Capital
Twitter (2013)	1.10
Advertising Companies	1.40
Social Media Companies	1.05

My estimate for Twitter: Sales/Capital will be 1.50 for next 10 years

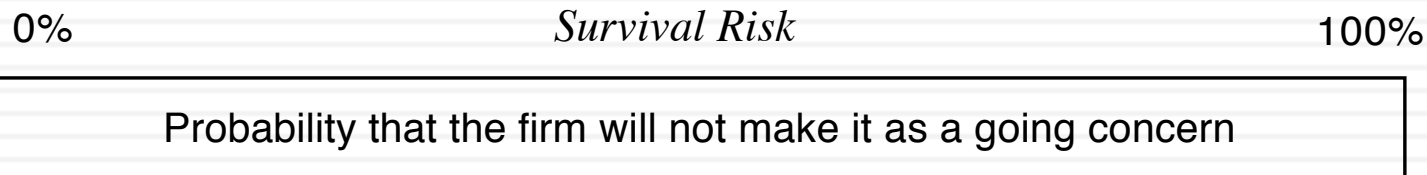
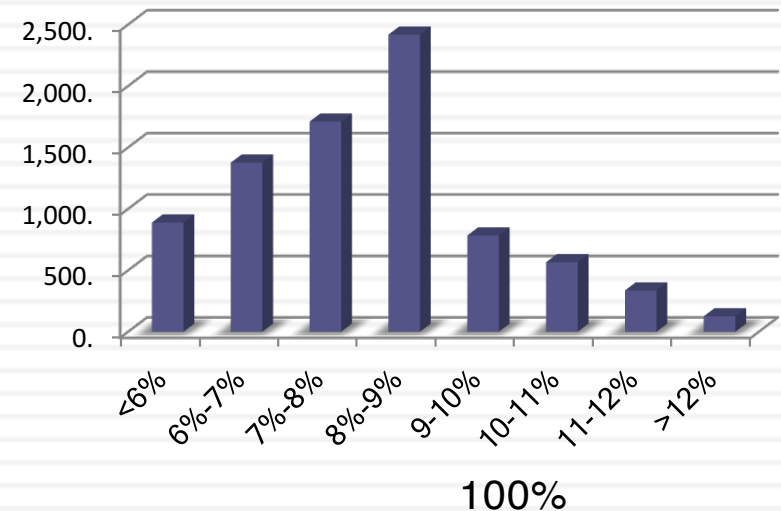
Sweating the small stuff: Risk and Required Return

Risk in the discount rate

My estimate for Twitter



Cost of Capital: US - Nov '13



Certain to make it as going concern

Certain to fail

My assumption for Twitter

Starting numbers

	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

Twitter Pre-IPO Valuation: October 27, 2013

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%

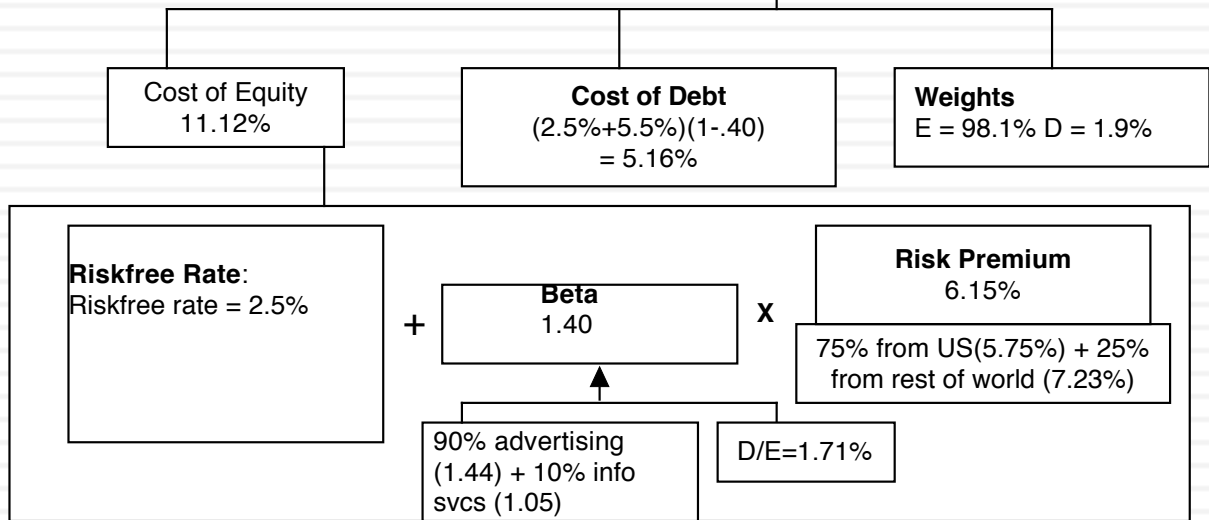
Terminal Value₁₀ = 1466 / (.08 - .025) = \$26,657

		1	2	3	4	5	6	7	8	9	10
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										
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

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

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



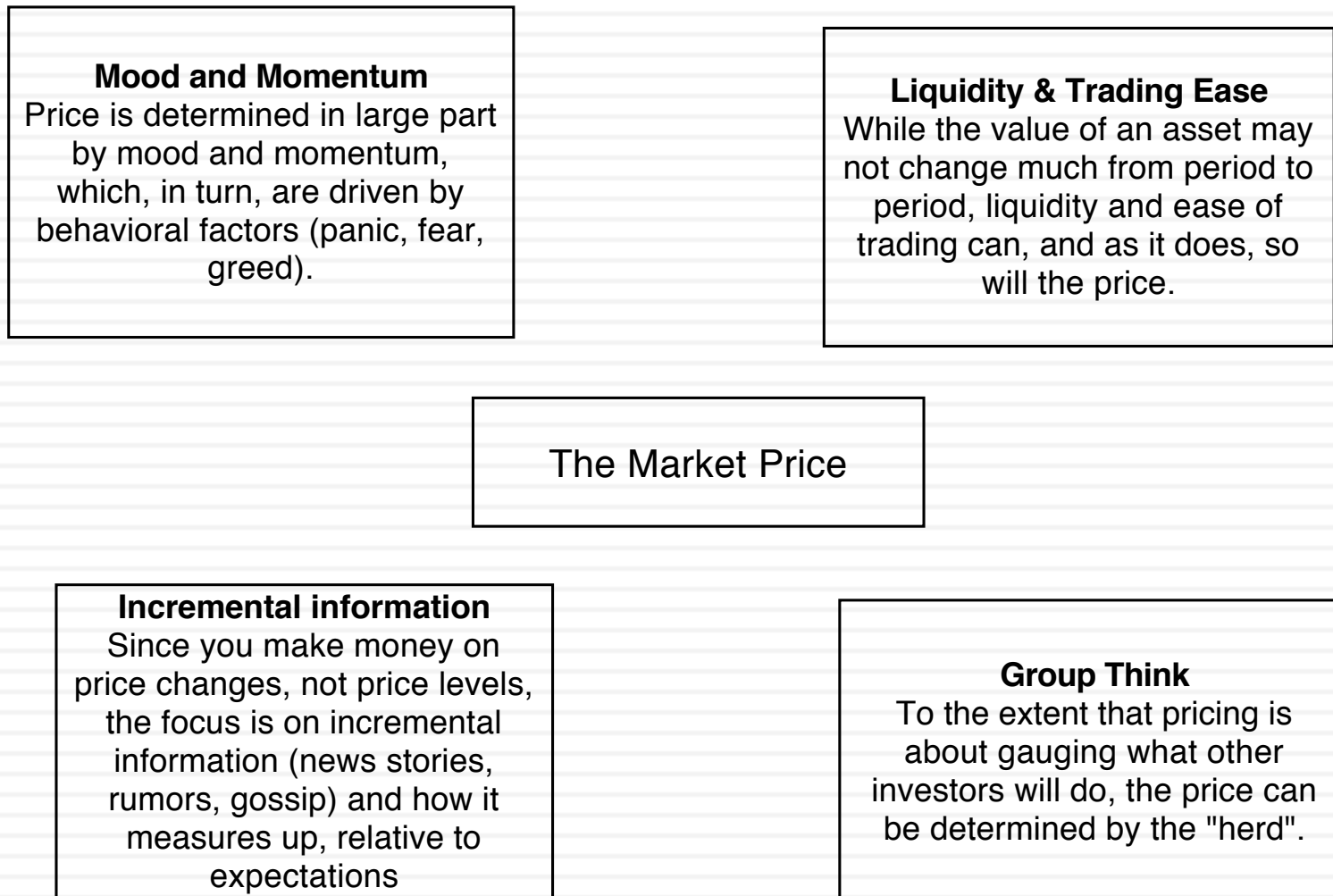
Five simple suggestions for better intrinsic valuation

14

1. Be honest about your biases/preconceptions: The biggest bogeyman in most valuations is that your preconceptions and biases will lead your choices. While you can never be unbiased, being aware of your biases is a start.
2. Keep it simple: Less is more in valuation. While it is easy to build bigger models and you have more access to data, parsimonious valuations often do a better job than complex ones.
3. Be flexible: For every rule in valuation, there are a hundred exceptions. You need to be pragmatic and flexible.
4. Have a narrative: A valuation without a story is just a collection of numbers. A good intrinsic valuation connects a story to numbers.
5. Face up to uncertainty: Uncertainty is a feature, not a bug. Make the best estimates you can, with the information you have, recognize that everyone else faces the same uncertainty. You don't have to be right, just less wrong than everyone else.

The determinants of price

15

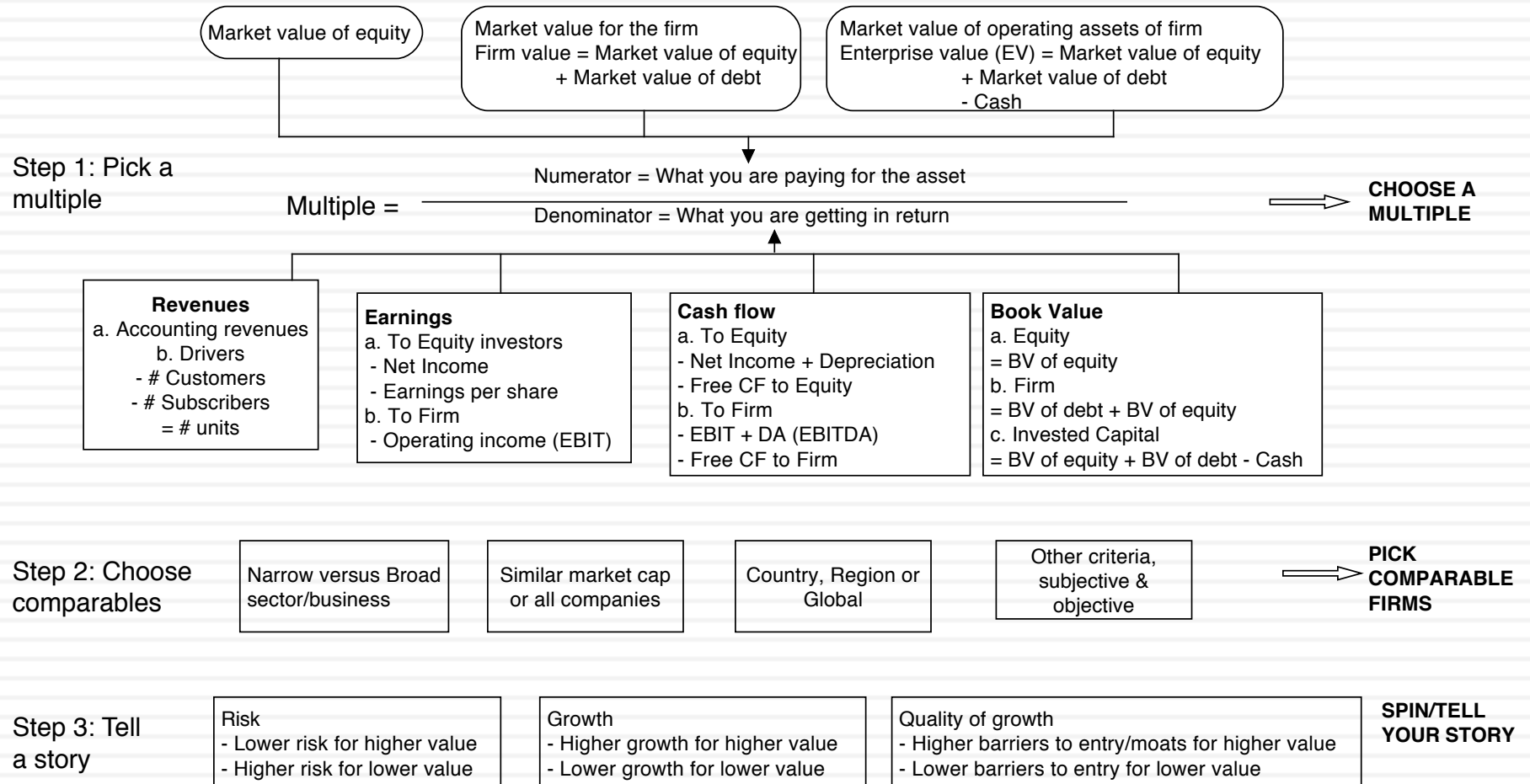


Tools for Pricing: Technical Analysis & Charting

16



A more general tool: Multiples and Comparable Transactions



To be a better pricer, here are four suggestions

- Check your multiple or consistency/uniformity
 - ▣ In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated
- Look at all the data, not just the key statistics
 - ▣ Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.
- Don't forget the fundamentals ultimately matter
 - ▣ It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- Don't define comparables based only on sector
 - ▣ Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

1. Check the Multiple

- Is the multiple consistently defined?
 - ▣ The consistency principle: 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.
 - ▣ The cost of mismatching: Assets that are not cheap (expensive) will look cheap (expensive), because your mismatch will skew the numbers.
- Is the multiple uniformly estimated?
 - ▣ The uniformity rule: The variables used in defining the multiple should be estimated uniformly across assets in the “comparable firm” list.
 - ▣ The cost of ignoring this rule: You will be comparing non-comparable numbers and drawing all the wrong conclusions.

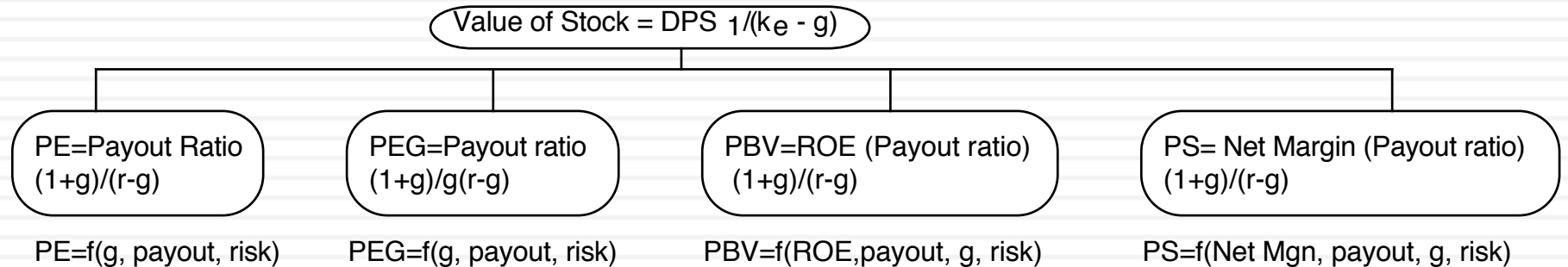
2. Play Moneyball: Let the numbers talk (not the analysts)

- What is the average and standard deviation for this multiple, across the universe (market)?
- What is the median for this multiple?
 - The median for this multiple is often a more reliable comparison point.
- How large are the outliers to the distribution, and how do we deal with the outliers?
 - Throwing out the outliers may seem like an obvious solution, but if the outliers all lie on one side of the distribution (they usually are large positive numbers), this can lead to a biased estimate.
- Are there cases where the multiple cannot be estimated? Will ignoring these cases lead to a biased estimate of the multiple?
- How has this multiple changed over time?

3. Understand your “implicit” assumptions

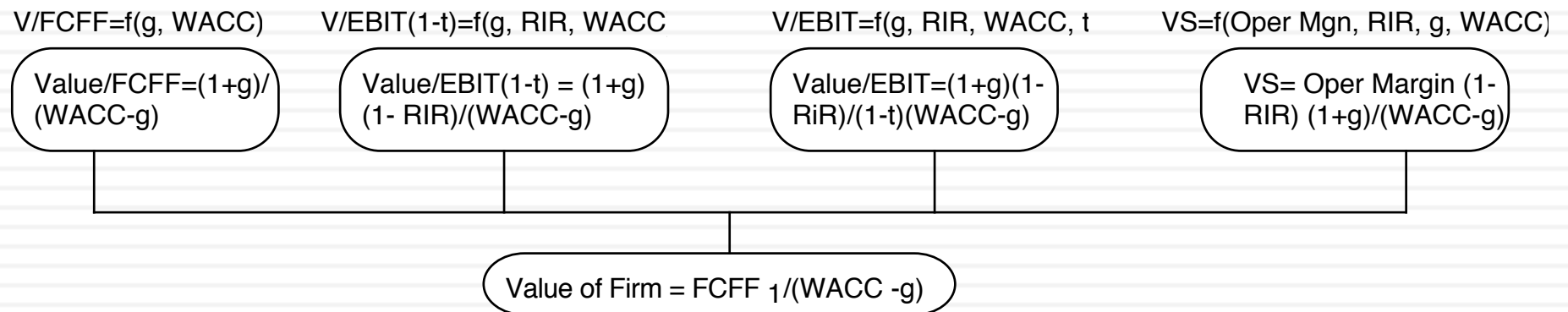
- What are the fundamentals that determine and drive these multiples?
 - ▣ Proposition 1: Embedded in every multiple are all of the variables that drive every discounted cash flow valuation - growth, risk and cash flow patterns.
 - ▣ In fact, using a simple discounted cash flow model and basic algebra should yield the fundamentals that drive a multiple
- How do changes in these fundamentals change the multiple?
 - ▣ The relationship between a fundamental (like growth) and a multiple (such as PE) is seldom linear. For example, if firm A has twice the growth rate of firm B, it will generally not trade at twice its PE ratio
 - ▣ Proposition 2: It is impossible to properly compare firms on a multiple, if we do not know the nature of the relationship between fundamentals and the multiple.

The Determinants of Multiples...



Equity Multiples

Firm Multiples



4. Define “comparable” broadly & control for differences

- Given the firm that we are valuing, what is a “comparable” firm?
 - ▣ While traditional analysis is built on the premise that firms in the same sector are comparable firms, valuation theory would suggest that a comparable firm is one which is similar to the one being analyzed in terms of fundamentals.
 - ▣ Proposition 4: There is no reason why a firm cannot be compared with another firm in a very different business, if the two firms have the same risk, growth and cash flow characteristics.
- Given the comparable firms, how do we adjust for differences across firms on the fundamentals?
 - ▣ Proposition 5: It is impossible to find an exactly identical firm to the one you are valuing.

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
Netflix	\$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 * ?*

The market price of Twitter

25

Twitter Inc

NYSE: TWTR - Apr 13, 7:21 PM EDT

17.37 USD ▲0.80 (4.83%)

After-hours: 17.35 ▲0.02 (0.12%)

1 day 5 day 1 month 3 month 1 year 5 year max



Open 16.68
High 17.40
Low 16.68

Mkt cap 12.16B
P/E ratio -
Div yield -

Google Finance - Yahoo Finance - MSN Money

Disclaimer

Rules for the road: Relative valuation

26

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.

What's your game?

27

- The transactors
 - ▣ Traders: Oscar Wilde's definition of a cynic: "knows the price of everything, the value of nothing".
 - ▣ Salespeople: Caveat emptor!
 - ▣ Deal intermediaries: Get the deal done (even if it is not a good deal)!
- The muddled middle
 - ▣ Academic value: The cognitive dissonance of the "efficient market"
 - ▣ Accounting value: Rule maker, rule maker, make up your mind!
 - ▣ Legal value: The bane of the expert witness!
- The investors
 - ▣ Owners of businesses: Except if you want to run it for the long term.
 - ▣ Investors in companies: With faith and patience, you can take advantage of Mr. Market.
 - ▣ Long term consultants: You have to live with the consequences of the advice that you mete out to your clients.

In the investing world, there are three views of “the gap”

28

	View of the gap	Investment Strategies
The Efficient Marketer	The gaps between price and value, if they do occur, are random.	Index funds
The “value” extremist	You view pricers as dilettantes who will move on to fad and fad. Eventually, the price will converge on value.	Buy and hold stocks where value > price
The pricing extremist	Value is only in the heads of the “eggheads”. Even if it exists (and it is questionable), price may never converge on value.	(1) Look for mispriced securities. (2) Get ahead of shifts in demand/momentum.

The pricer's dilemma..

29

- No anchor: If you do not believe in intrinsic value and make no attempt to estimate it, you have no moorings when you invest. You will therefore be pushed back and forth as the price moves from high to low. In other words, everything becomes relative and you can lose perspective.
- Reactive: Without a core measure of value, your investment strategy will often be reactive rather than proactive.
- Crowds are fickle and tough to get a read on: The key to being successful as a pricer is to be able to read the crowd mood and to detect shifts in that mood early in the process. By their nature, crowds are tough to read and almost impossible to model systematically.

The valuer's dilemma

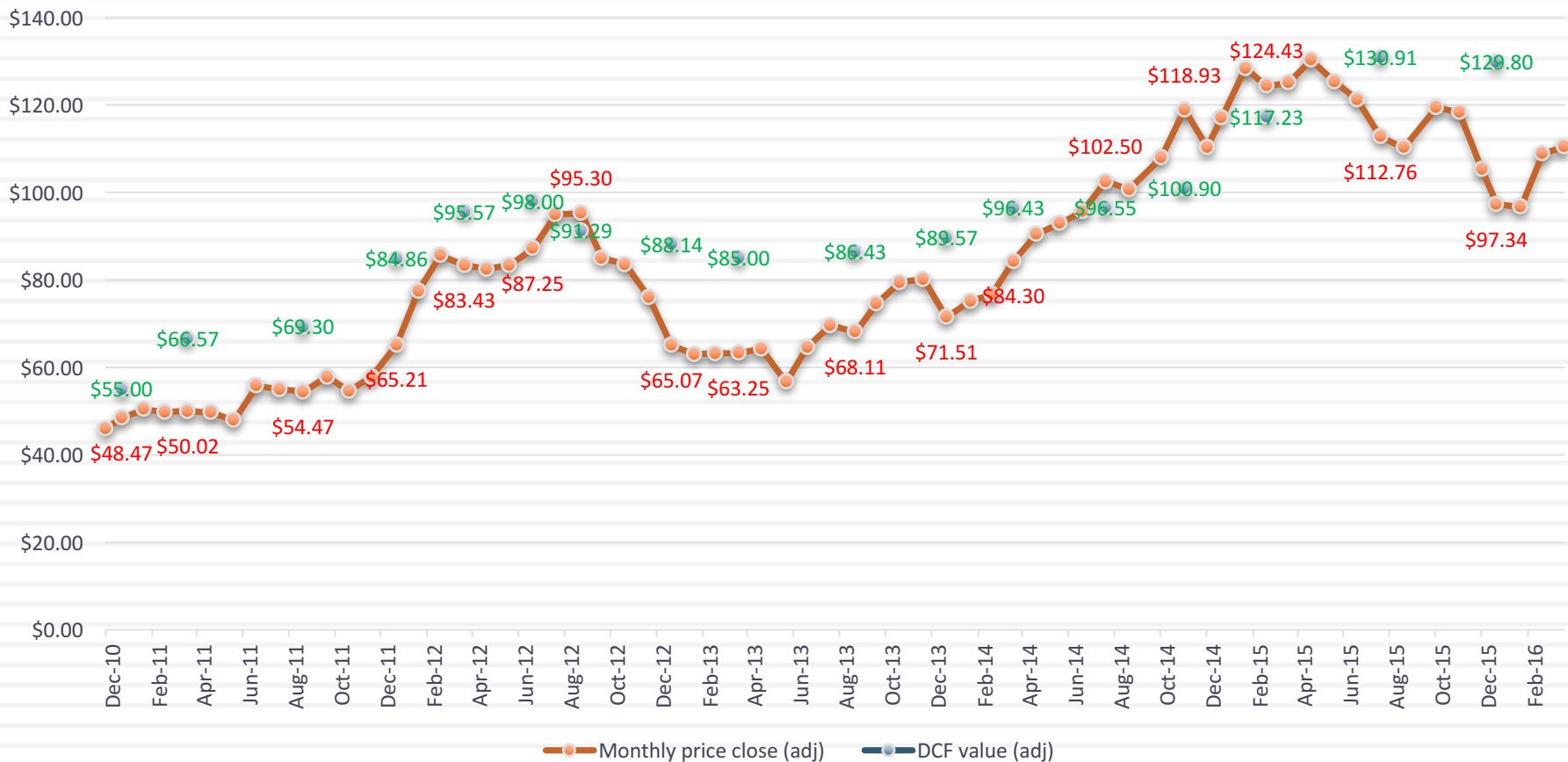
30

- Uncertainty about the magnitude of the gap:
 - ▣ Margin of safety: Many value investors swear by the notion of the “margin of safety” as protection against risk/uncertainty.
 - ▣ Collect more information: Collecting more information about the company is viewed as one way to make your investment less risky.
 - ▣ Ask what if questions: Doing scenario analysis or what if analysis gives you a sense of whether you should invest.
 - ▣ Confront uncertainty: Face up to the uncertainty, bring it into the analysis and deal with the consequences.
- Uncertainty about gap closing: This is tougher and you can reduce your exposure to it by
 - ▣ Lengthening your time horizon
 - ▣ Providing or looking for a catalyst that will cause the gap to close.

The Righteous Win: Apple – Price versus Value (my estimates) from 2011 to 2016

31

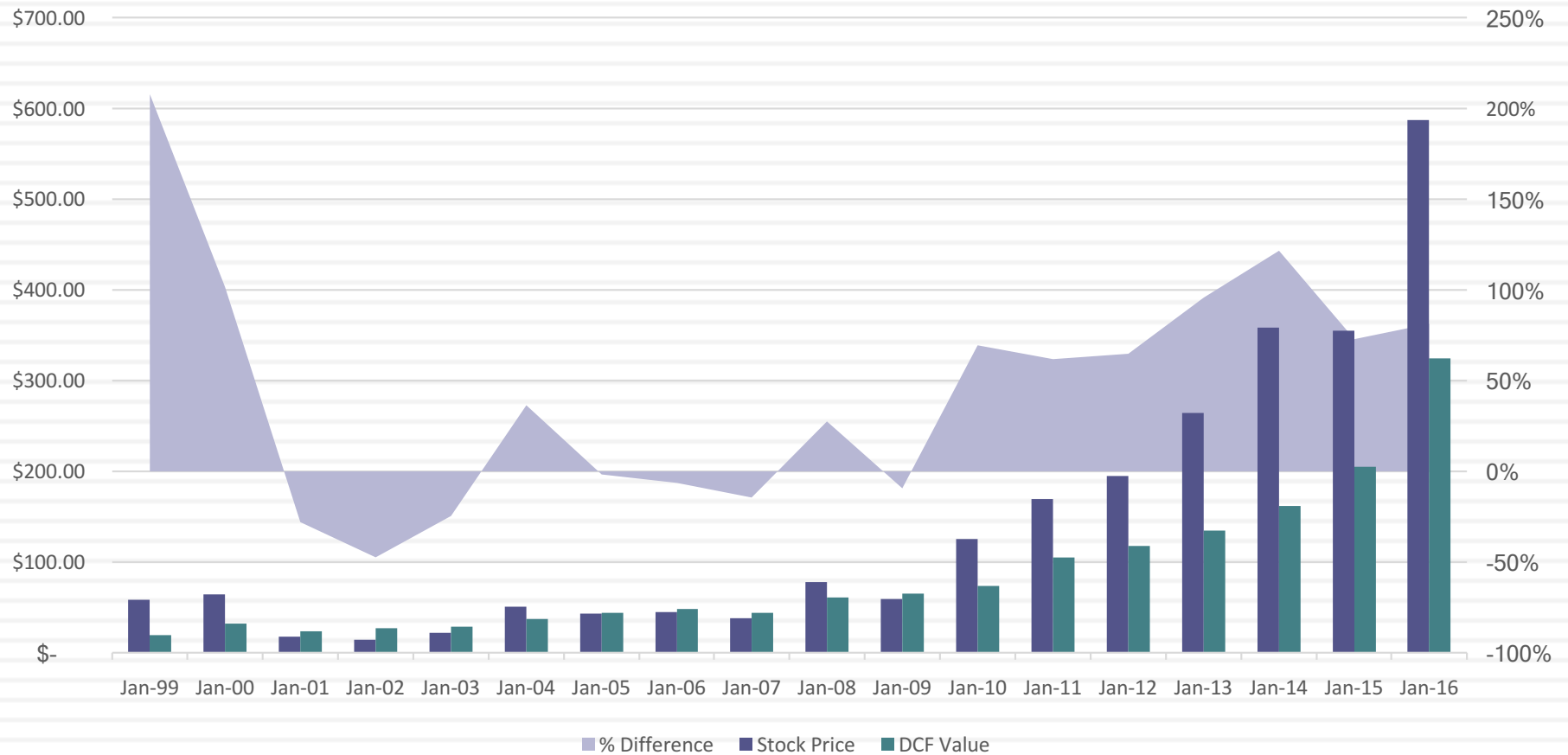
Apple: Stock Price versus DCF Value (My Estimates)



Where is the convergence? Amazon – Price versus Value

32

Amazon: Price versus DCF value - 1999 to 2015



The choice is yours (and there is no right one)

33

1. Play to your strengths: To be a successful investor, you have to know what makes you tick and pick the approach that best fits you.
2. Don't be delusional: If you are pricing an asset, don't get distracted too much by fundamentals and intrinsic value concerns. If you are valuing an asset, don't let the pricing process (mood & momentum) feed back into your valuation.
3. Stop being righteous: Stop labeling investors as good or bad, based on how they pick stocks, how long they hold them and which direction they bet (long or short).
4. Don't expect to be rewarded: The notion that if you do all the "right things", you will be rewarded is not only wrong but dangerous.