

Three views of “the gap”

	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 “pricers” dilemma..

- 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 and ways of dealing with it...

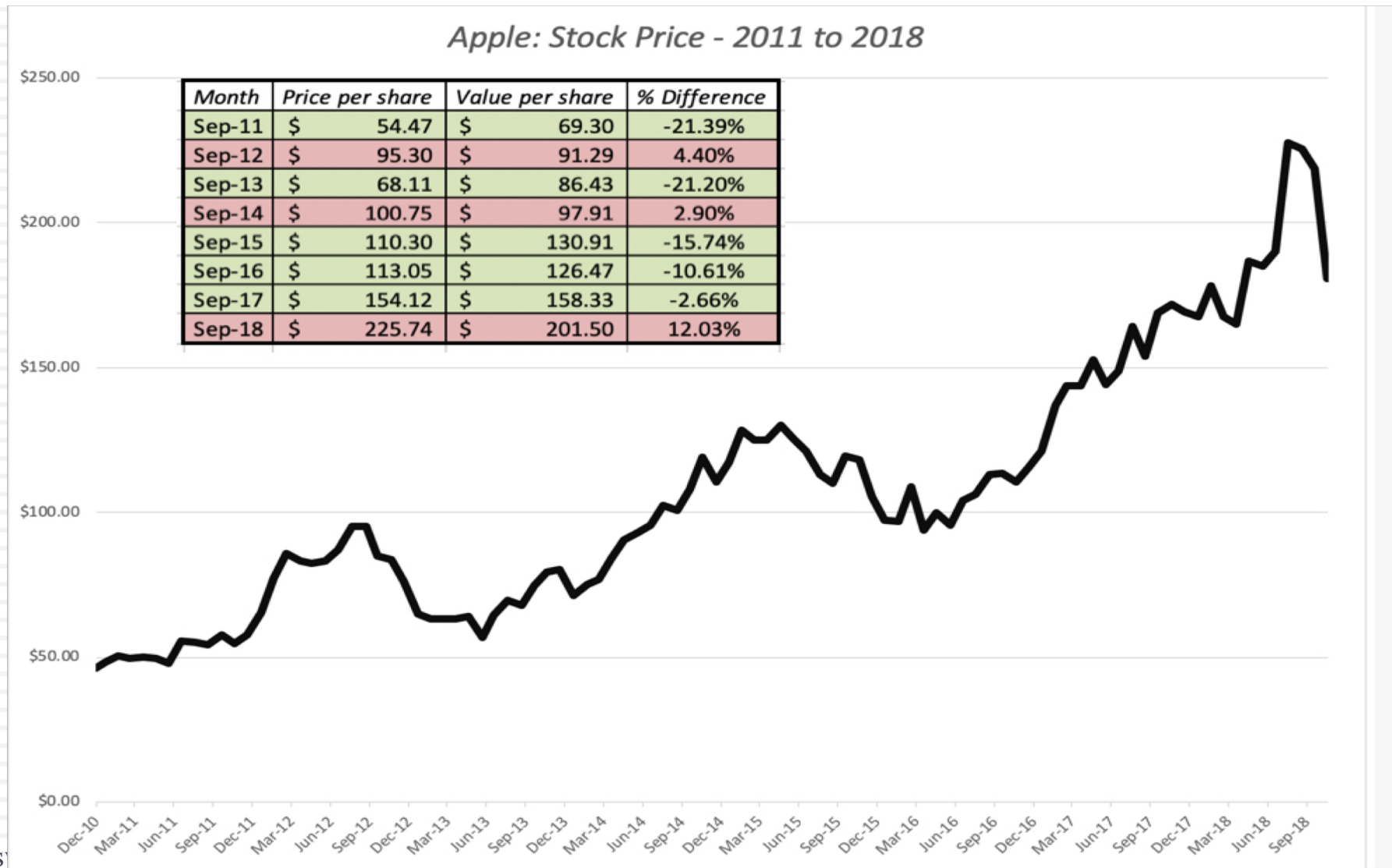
- Uncertainty about the magnitude of the gap:
 - ▣ Margin of safety: Many value investors swear by the notion of the “margin of safety” as protection against risk/uncertainty.
 - ▣ Collect more information: Collecting more information about the company is viewed as one way to make your investment less 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.

Strategies for managing the risk in the “closing” of the gap

- The “karmic” approach: In this one, you buy (sell short) under (over) valued companies and sit back and wait for the gap to close. You are implicitly assuming that given time, the market will see the error of its ways and fix that error.
- The catalyst approach: For the gap to close, the price has to converge on value. For that convergence to occur, there usually has to be a catalyst.
 - If you are an activist investor, you may be the catalyst yourself. In fact, your act of buying the stock may be a sufficient signal for the market to reassess the price.
 - If you are not, you have to look for other catalysts. Here are some to watch for: a new CEO or management team, a “blockbuster” new product or an acquisition bid where the firm is targeted.

An example: Apple – Price versus Value (my estimates) from 2011 to 2018


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A closing thought...

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VALUATION: PACKET 2

RELATIVE VALUATION, ASSET-BASED VALUATION AND PRIVATE COMPANY VALUATION

1/5/19

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The Essence of Relative Valuation (Pricing)

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- In relative valuation, the value of an asset is compared to the values assessed by the market for similar or comparable assets.
- To do relative valuation then,
 - ▣ we need to identify comparable assets and obtain market values for these assets
 - ▣ convert these market values into standardized values, since the absolute prices cannot be compared This process of standardizing creates price multiples.
 - ▣ compare the standardized value or multiple for the asset being analyzed to the standardized values for comparable asset, controlling for any differences between the firms that might affect the multiple, to judge whether the asset is under or over valued

Relative valuation is pervasive...

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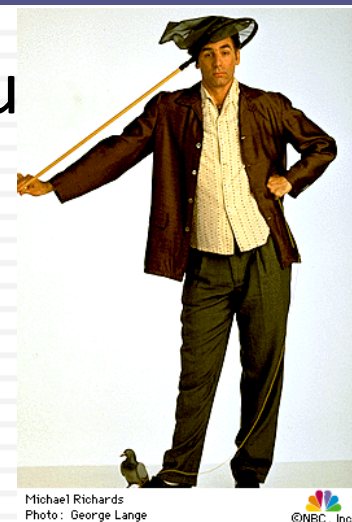
- Most asset valuations are relative.
- Most equity valuations on Wall Street are relative valuations.
 - Almost 85% of equity research reports are based upon a multiple and comparables.
 - More than 50% of all acquisition valuations are based upon multiples
 - Rules of thumb based on multiples are not only common but are often the basis for final valuation judgments.
- While there are more discounted cashflow valuations in consulting and corporate finance, they are often relative valuations masquerading as discounted cash flow valuations.
 - The objective in many discounted cashflow valuations is to back into a number that has been obtained by using a multiple.
 - The terminal value in a significant number of discounted cashflow valuations is estimated using a multiple.

Why relative valuation?

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“If you think I’ m crazy, you should see the gu
lives across the hall”

Jerry Seinfeld talking about Kramer in a Seinfeld episode



“ A little inaccuracy sometimes saves tons of explanation”

H.H. Munro

“ If you are going to screw up, make sure that you have
lots of company”

Ex-portfolio manager

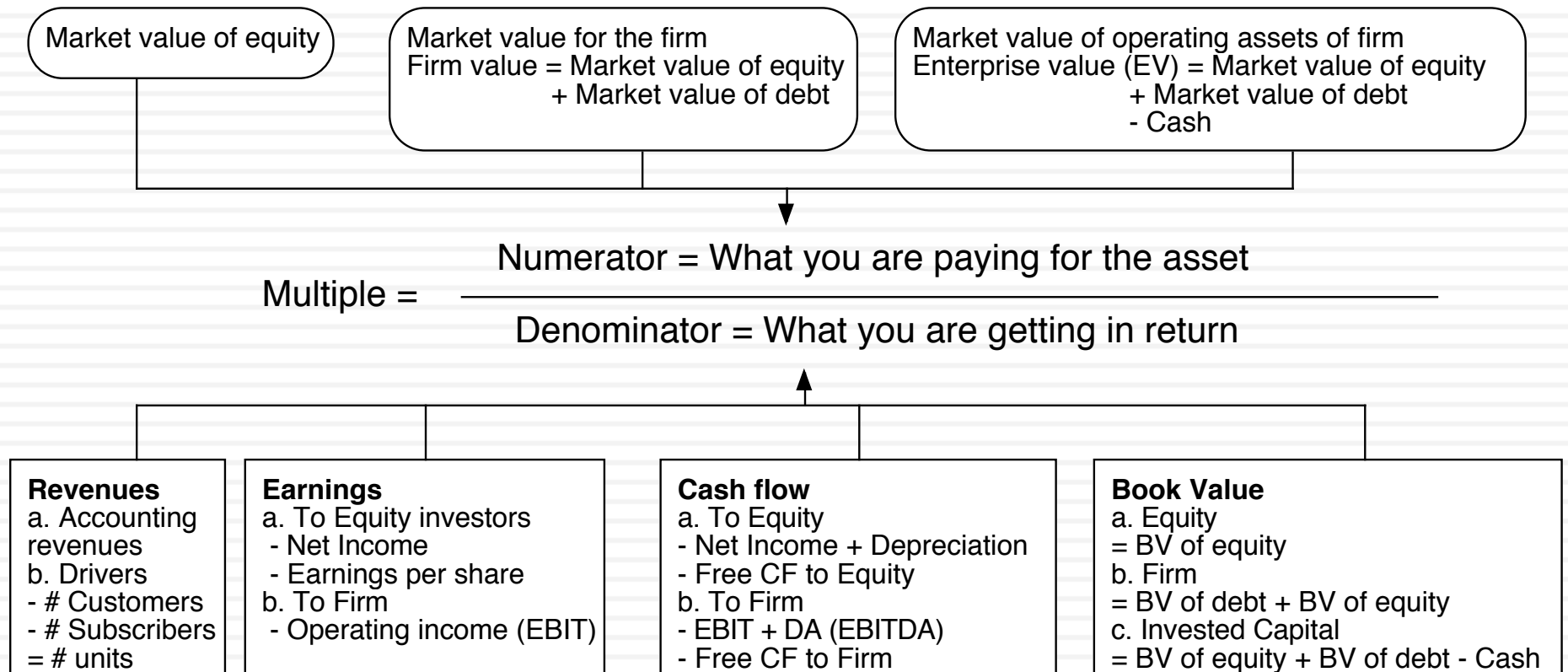
The Market Imperative....

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- Relative valuation is much more likely to reflect market perceptions and moods than discounted cash flow valuation. This can be an advantage when it is important that the price reflect these perceptions as is the case when
 - ▣ the objective is to sell a security at that price today (as in the case of an IPO)
 - ▣ investing on “momentum” based strategies
- With relative valuation, there will always be a significant proportion of securities that are under valued and over valued.
- Since portfolio managers are judged based upon how they perform on a relative basis (to the market and other money managers), relative valuation is more tailored to their needs
- Relative valuation generally requires less information than discounted cash flow valuation (especially when multiples are used as screens)

Multiples are just standardized estimates of price...

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The Four Steps to Deconstructing Multiples

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- Define the multiple
 - 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
- Describe the multiple
 - 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.
- Analyze the multiple
 - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.
- Apply the multiple
 - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.

Definitional Tests

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- Is the multiple consistently defined?
 - Proposition 1: 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.
- Is the multiple uniformly estimated?
 - The variables used in defining the multiple should be estimated uniformly across assets in the “comparable firm” list.
 - If earnings-based multiples are used, the accounting rules to measure earnings should be applied consistently across assets. The same rule applies with book-value based multiples.

Example 1: Price Earnings Ratio: Definition

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$PE = \text{Market Price per Share} / \text{Earnings per Share}$

- There are a number of variants on the basic PE ratio in use. They are based upon how the price and the earnings are defined.

Price: is usually the current price

is sometimes the average price for the year

EPS: EPS in most recent financial year

EPS in trailing 12 months

Forecasted earnings per share next year

Forecasted earnings per share in future year

Example 2: Staying on PE ratios

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- Assuming that you are comparing the PE ratios across technology companies, many of which have options outstanding. What measure of PE ratio would yield the most consistent comparisons?
 - a. Price/ Primary EPS (actual shares, no options)
 - b. Price/ Fully Diluted EPS (actual shares + all options)
 - c. Price/ Partially Diluted EPS (counting only in-the-money options)
 - d. Other

Example 3: Enterprise Value /EBITDA Multiple

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- The enterprise value to EBITDA multiple is obtained by netting cash out against debt to arrive at enterprise value and dividing by EBITDA.

$$\frac{\text{Enterprise Value}}{\text{EBITDA}} = \frac{\text{Market Value of Equity} + \text{Market Value of Debt} - \text{Cash}}{\text{Earnings before Interest, Taxes and Depreciation}}$$

1. Why do we net out cash from firm value?
2. What happens if a firm has cross holdings which are categorized as:
 - ▣ Minority interests?
 - ▣ Majority active interests?

Example 4: A Housing Price Multiple

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The bubbles and busts in housing prices has led investors to search for a multiple that they can use to determine when housing prices are getting out of line. One measure that has acquired adherents is the ratio of housing price to annual net rental income (for renting out the same house). Assume that you decide to compute this ratio and compare it to the multiple at which stocks are trading. Which valuation ratio would be the one that corresponds to the house price/rent ratio?

- a. Price Earnings Ratio
- b. EV to Sales
- c. EV to EBITDA
- d. EV to EBIT

Descriptive Tests

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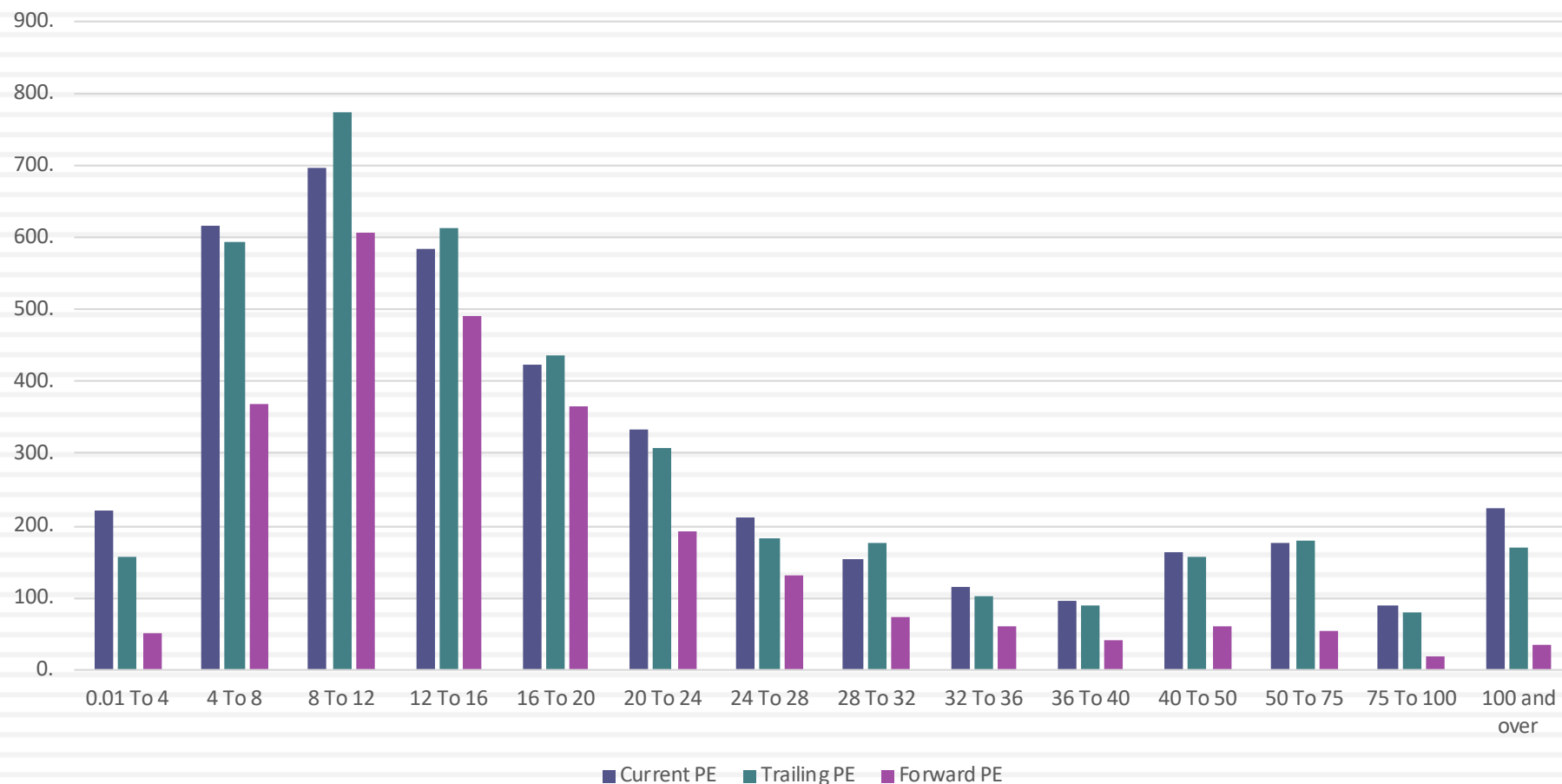
- What is the average and standard deviation for this multiple, across the universe (market)?
- What is the median for this multiple?
 - The median for this multiple is often a more reliable comparison point.
- How large are the outliers to the distribution, and how do we deal with the outliers?
 - Throwing 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?

1. Multiples have skewed distributions...

US company PE Ratios

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PE Ratios for US Companies: January 2019



2. Making statistics “dicey”

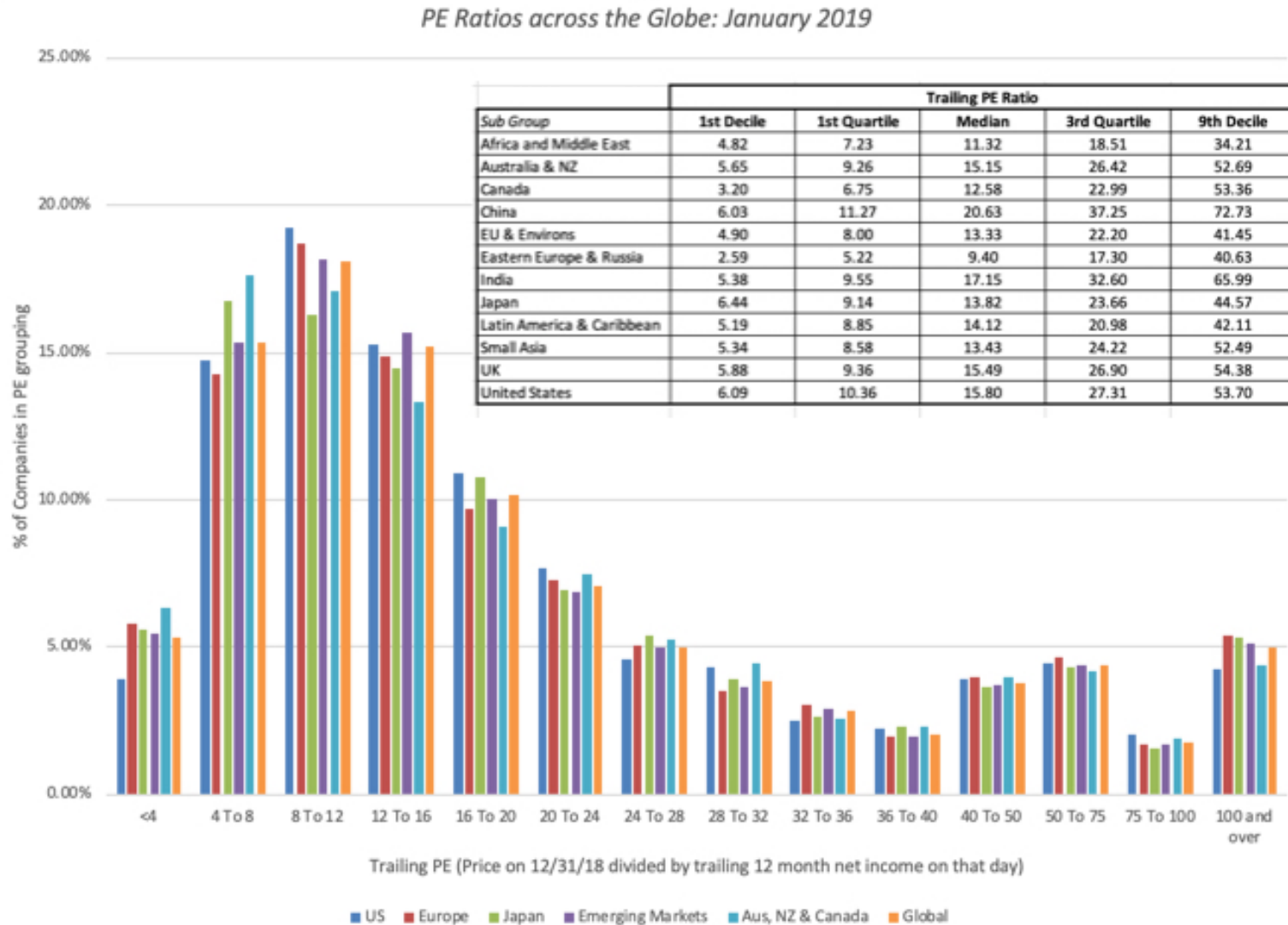
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	Current PE	Trailing PE	Forward PE
Number of firms	7,209	7,209	7,209
Number with PE	2,965	2,957	2,489
Average	77.18	35.33	26.91
Median	18.61	15.80	14.44
Minimum	0.68	1.94	2.65
Maximum	48700.00	3400.00	1769.64
Standard deviation	990.76	118.07	66.67
Standard error	18.20	2.17	1.34
Skewness	41.60	15.55	13.63
25th percentile	11.70	10.36	10.12
75th percentile	32.35	27.31	23.16

US firms in January 2019

3. Markets have a lot in common : Comparing Global PEs

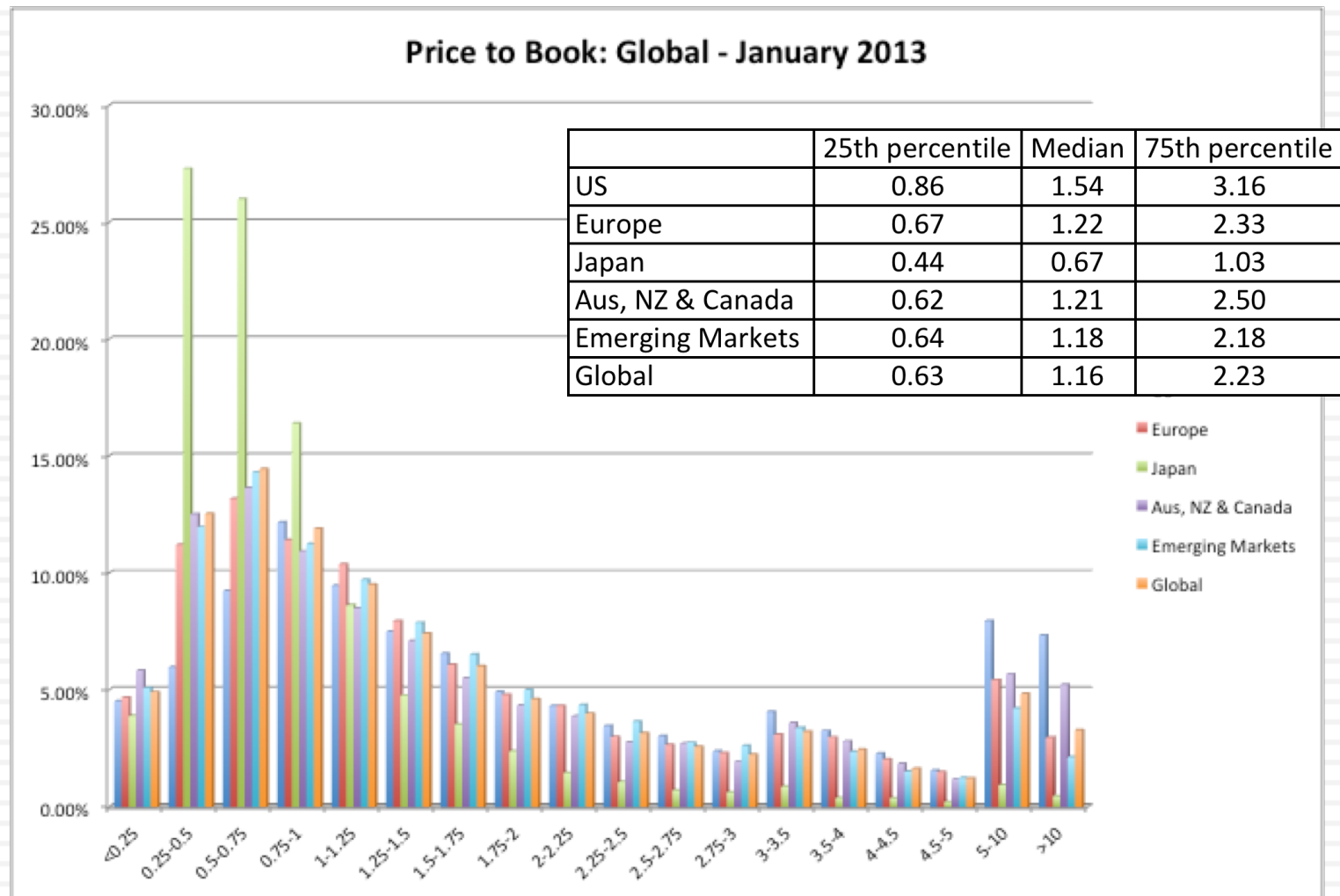
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3a. And the differences are sometimes revealing...

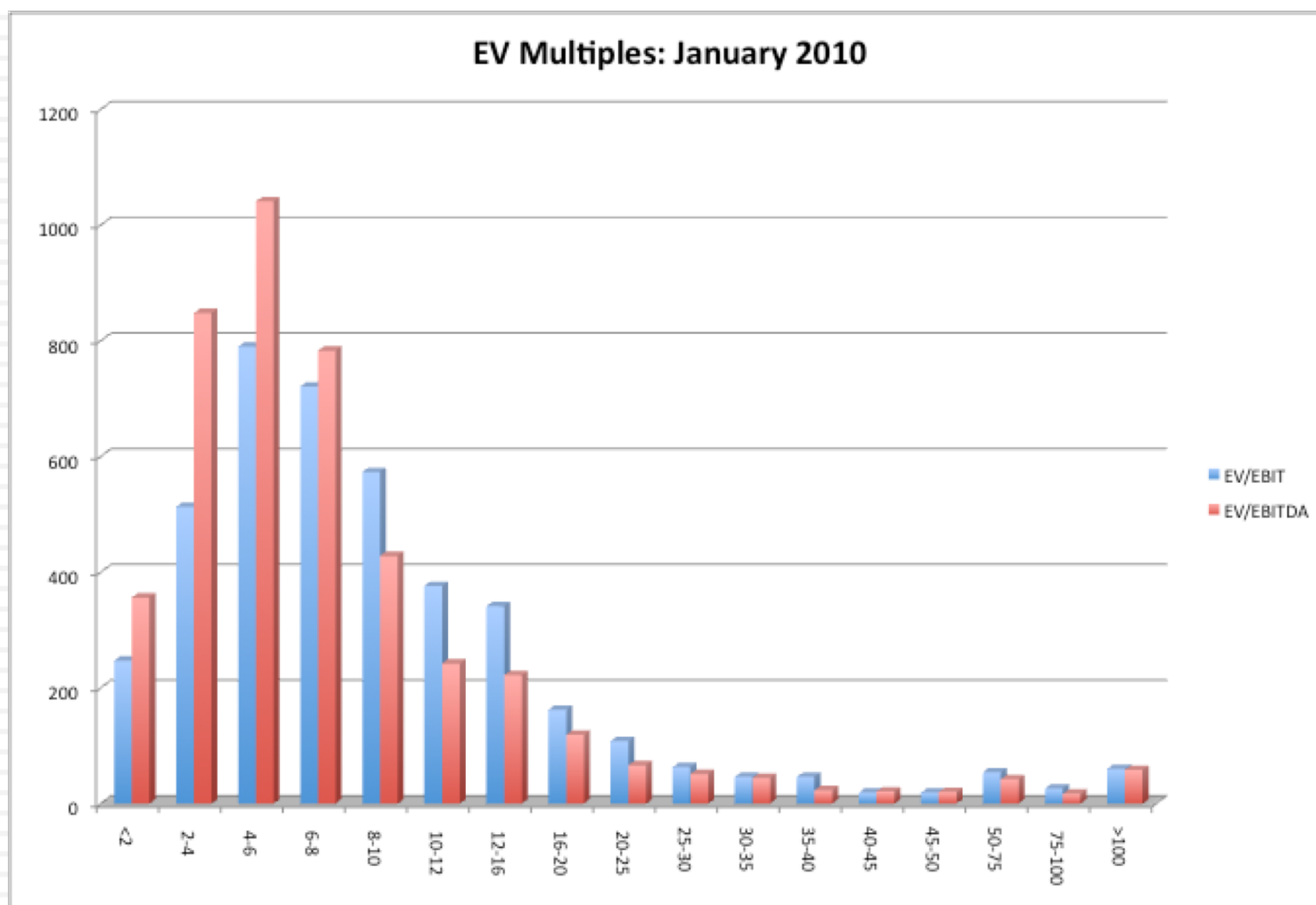
Price to Book Ratios across globe – January 2013

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4. Simplistic rules almost always break down...6 times EBITDA was not cheap in 2010...

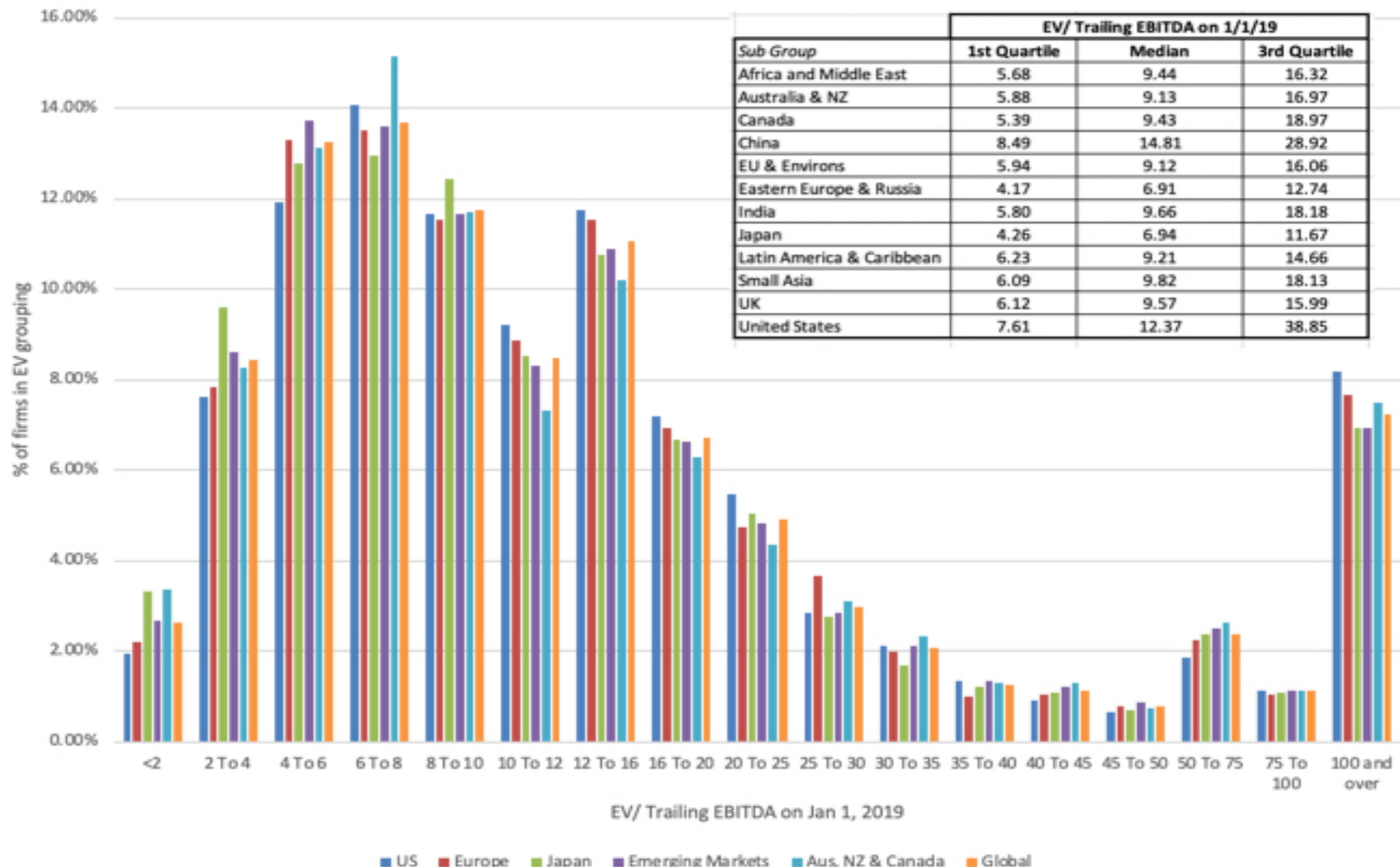
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But it may be in 2019, unless you are in Russia..

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EV/EBITDA - Global Distribution in January 2019



Analytical Tests

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- What are the fundamentals that determine and drive these multiples?
 - Proposition 2: Embedded in every multiple are all of the variables that drive every discounted cash flow valuation - growth, risk and cash flow patterns.
- How do changes in these fundamentals change the multiple?
 - The relationship between a fundamental (like growth) and a multiple (such as PE) is almost never linear.
 - Proposition 3: It is impossible to properly compare firms on a multiple, if we do not know how fundamentals and the multiple move.

A Simple Analytical device

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	<p><i>Start with a basic intrinsic value model</i></p>	<p><i>Divide both sides of the equation by the denominator of the multiple that you are trying to deconstruct..</i></p>	<p><i>You should end up with an intrinsic version of your multiple, which should relate it to fundamentals.</i></p>
If Equity Multiple	<p>Start with a dividend or FCFE model, preferably simple.</p>	<p>Divide your dividend or FCFE model by denominator of equity multiple.</p>	<p>Intrinsic version of equity multiple, with drivers of value</p>
	<p>Price= $EPS * Payout / (r - g)$</p>	<p>Price/Book = $ROE * Payout / (r - g)$</p>	<p>Price/Book = $f(ROE, r, g, Payout)$</p>
If EV Multiple	<p>Start with a operating asset value model, preferably simple.</p>	<p>Divide your operating asset model by denominator of EV multiple.</p>	<p>Intrinsic version of EV multiple, with drivers of value</p>
	<p>EV= $EBIT (1-t) (1- RIR)/ (WACC -g)$</p>	<p>EV/Sales = $After-tax Operating Margin (1- RIR)/ (WACC -g)$</p>	<p>EV/Sales = $f(After-tax Operating Margin, RIR, WACC, g)$</p>

I . PE Ratios

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- To understand the fundamentals, start with a basic equity discounted cash flow model.

- ▣ With the dividend discount model,

$$P_0 = \frac{DPS_1}{r - g_n}$$

- ▣ Dividing both sides by the current earnings per share,

$$\frac{P_0}{EPS_0} = PE = \frac{\text{Payout Ratio} * (1 + g_n)}{r - g_n}$$

- ▣ If this had been a FCFE Model,

$$P_0 = \frac{FCFE_1}{r - g_n}$$

$$\frac{P_0}{EPS_0} = PE = \frac{(FCFE/\text{Earnings}) * (1 + g_n)}{r - g_n}$$

Using the Fundamental Model to Estimate PE For a High Growth Firm

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- The price-earnings ratio for a high growth firm can also be related to fundamentals. In the special case of the two-stage dividend discount model, this relationship can be made explicit fairly simply:

$$P_0 = \frac{EPS_0 * \text{Payout Ratio} * (1+g) * \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r-g} + \frac{EPS_0 * \text{Payout Ratio}_n * (1+g)^n * (1+g_n)}{(r-g_n)(1+r)^n}$$

- For a firm that does not pay what it can afford to in dividends, substitute FCFE/Earnings for the payout ratio.
- Dividing both sides by the earnings per share:

$$\frac{P_0}{EPS_0} = \frac{\text{Payout Ratio} * (1+g) * \left(1 - \frac{(1+g)^n}{(1+r)^n}\right)}{r-g} + \frac{\text{Payout Ratio}_n * (1+g)^n * (1+g_n)}{(r-g_n)(1+r)^n}$$

A Simple Example

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- Assume that you have been asked to estimate the PE ratio for a firm which has the following characteristics:

<i>Variable</i>	<i>High Growth Phase</i>	<i>Stable Growth Phase</i>
Expected Growth Rate	25%	8%
Payout Ratio	20%	50%
Beta	1.00	1.00
Number of years	5 years	Forever after year 5

Riskfree rate = T.Bond Rate = 6%

Required rate of return = 6% + 1(5.5%)= 11.5%

$$\frac{P_0}{EPS_0} = \frac{.20 * (1.25)^5 * \left(1 - \frac{(1.25)^5}{(1.115)^5}\right)}{.115 - .25} + \frac{.50 * (1.25)^5 * (1.08)}{(.115 - .08)(1.115)^5} = 28.75$$

a. PE and Growth: Firm grows at x% for 5 years, 8% thereafter

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PE Ratios and Expected Growth: Interest Rate Scenarios

