



THE PRICING GAME: A COVID UPDATE!

Revisiting the Pricing Game



Price versus Value

The Lead in

Price vs Value

Tools for intrinsic analysis

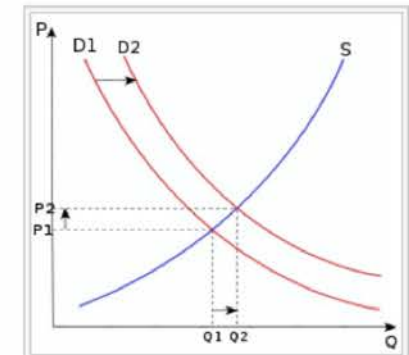
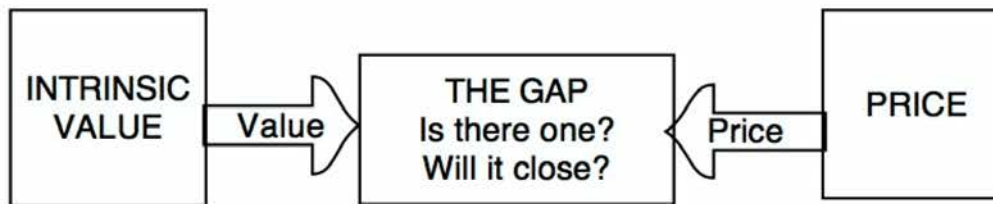
- Discounted Cashflow Valuation (DCF)
- Intrinsic multiples
- Book value based approaches
- Excess Return Models

Tools for "the gap"

- Behavioral finance
- Price catalysts

Tools for pricing

- Multiples and comparables
- Charting and technical indicators
- Pseudo DCF



Drivers of intrinsic value

- Cashflows from existing assets
- Growth in cash flows
- Quality of Growth


Drivers of "the gap"

- Information
- Liquidity
- Corporate governance

Drivers of price

- Market moods & momentum
- Surface stories about fundamentals

Test 1: Are you pricing or valuing?

 **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

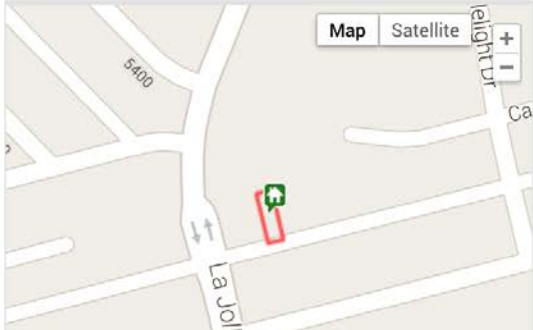
★★★★★
47 client reviews

\$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?

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

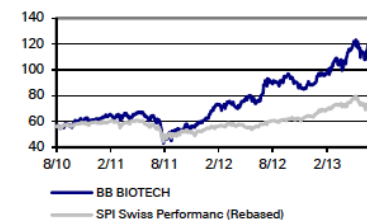
In the first 6M of 2013, BB Biotech increased its NAV by 36%, which marks good outperformance against the Nasdaq Biotech Index (NBI)'s 27%. This is a remarkable performance after 2012 when BBB's NAV increase of 45% also

Key changes

Target Price 106.50 to 164.50 ↑ 54.5%

Source: Deutsche Bank

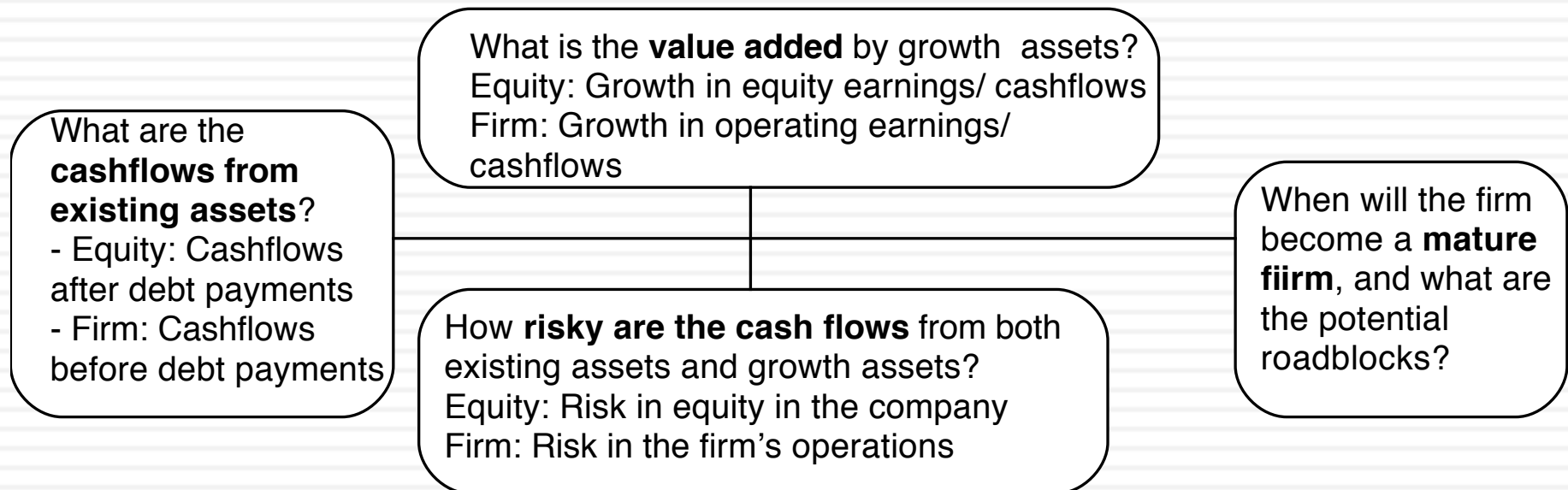
Price/price relative



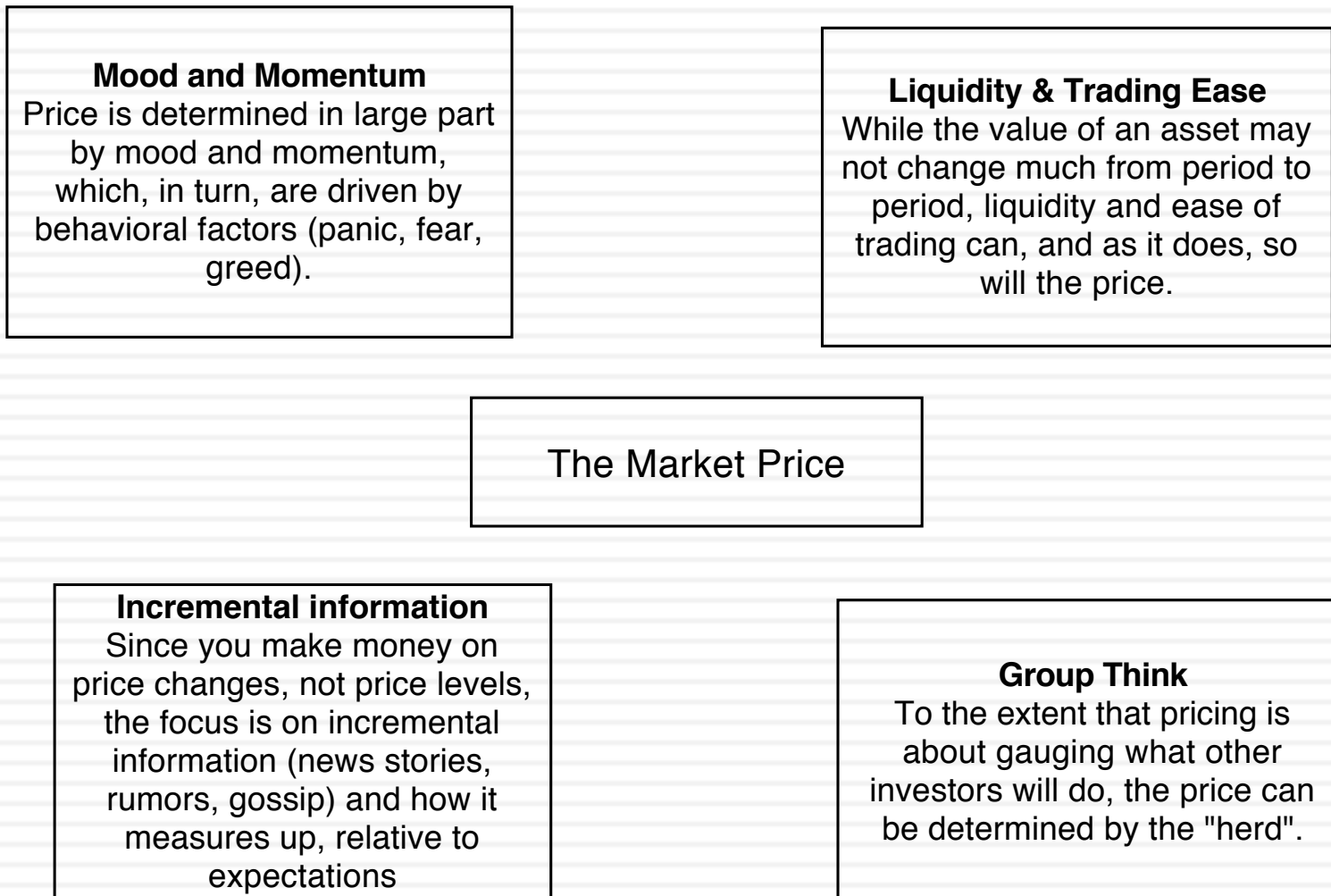
| Performance (%) | 1m | 3m | 12m |
|--------------------------|------|------|------|
| Absolute | -1.4 | 5.4 | 37.4 |
| SPI Swiss Performance IX | 0.5 | -1.4 | 26.4 |

Source: Deutsche Bank

The determinants of value



The determinants of price



1. Upper and Lower Bounds

- Since price is determined by demand and supply, and there is nothing that requires that those buying and selling in markets have to be constrained, at least in the near term, by fundamentals, it follows that there is no upper or lower bound to prices.
- Value on the other hand has both upper and lower bounds, with both bounds being set by expected cash flows, growth and risk. The upper bound is set by those who are more optimistic about a stock and the lower bound by those who are most pessimistic about that same stock, in terms of future expectations or liquidation value.
 - It is possible, for some stocks, especially early in the life cycle and with substantial uncertainty about the future, for the lower bound on value to be zero,
 - Stocks collectively cannot have that lower bound. For equities collectively to be worth nothing, you would require an apocalyptic scenario, one in which there is little point thinking about investments anyway.

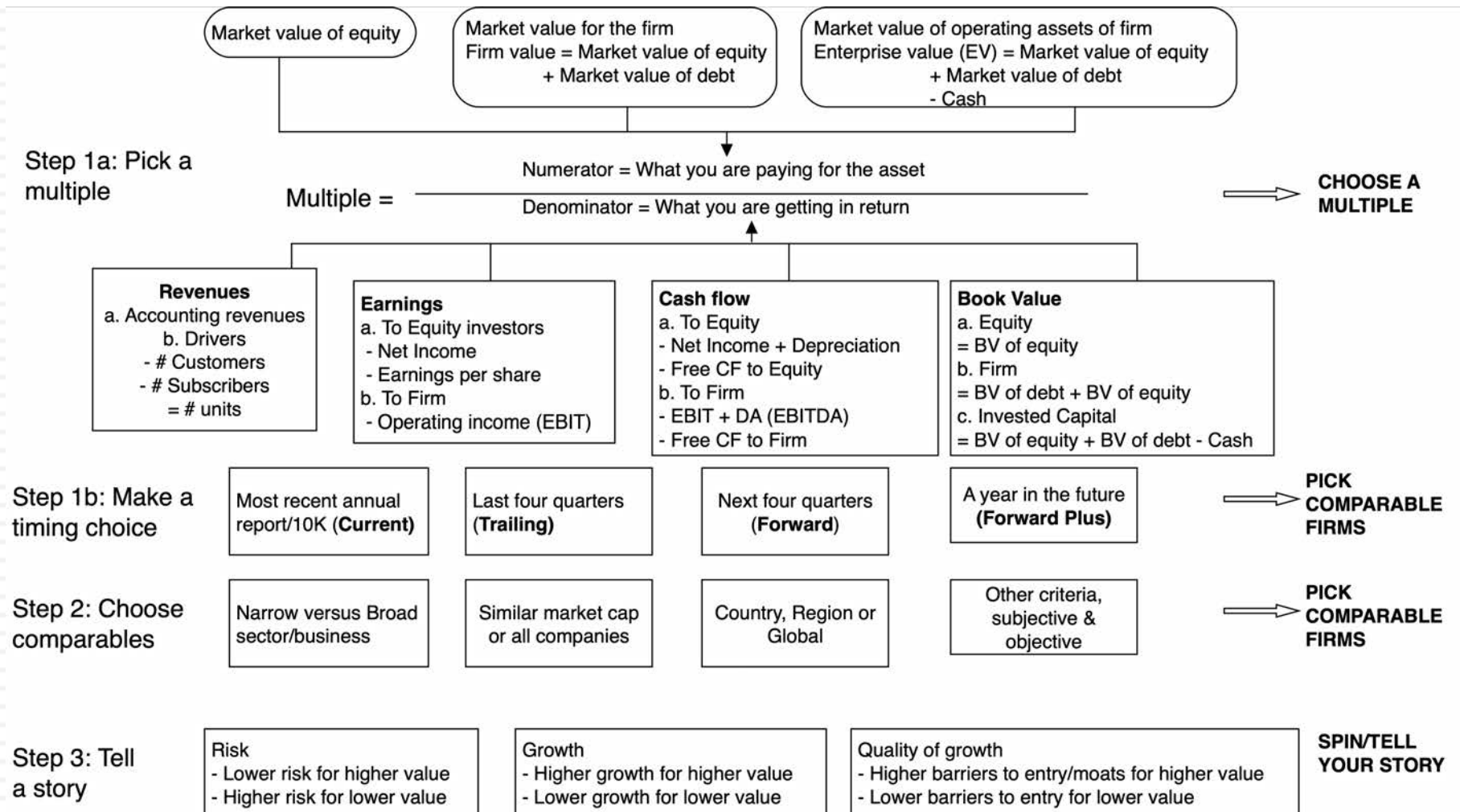
2. Price is reactive, value is proactive

- Incremental Information versus Fundamental Information: Pricing forces can take information that, at least at first sight, seems insignificant to long term value and cause price changes that are disproportional. Thus, when the mood is upbeat, small pieces of good news can result in big jumps in stock prices, but if that mood turns sour, small pieces of bad news can cause large drops in stock prices.
- Reactive versus Proactive: Traders react to the incremental information to adjust the price and put little thought into whether the starting price itself has a basis to it. Value is driven by expectations of cash flows, growth and risk, and information has to be used to reassess those expectations, a more difficult task, but one that forces you to separate the wheat from the chaff.

3. Price may never converge on value...

- Old time value investors live by the adage that the price can go up and down, with little relationship to value, but that it will eventually converge to value.
- Absent a catalyst causing the convergence, price will not only diverge from value in the short term, but it could do so in the long term. Keynes was close to the truth when he said that the "market can stay irrational longer than you and I can stay solvent".
- So what is it that keeps investors toiling at the fundamentals, hoping to get rewarded? The answer is faith, faith that they can estimate value and faith that the price will adjust to value. It is faith because I can offer you no proof for either proposition, and it is faith, because its strength will be tested by markets like this one.

Deconstructing Pricing



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.

Consistency Rules

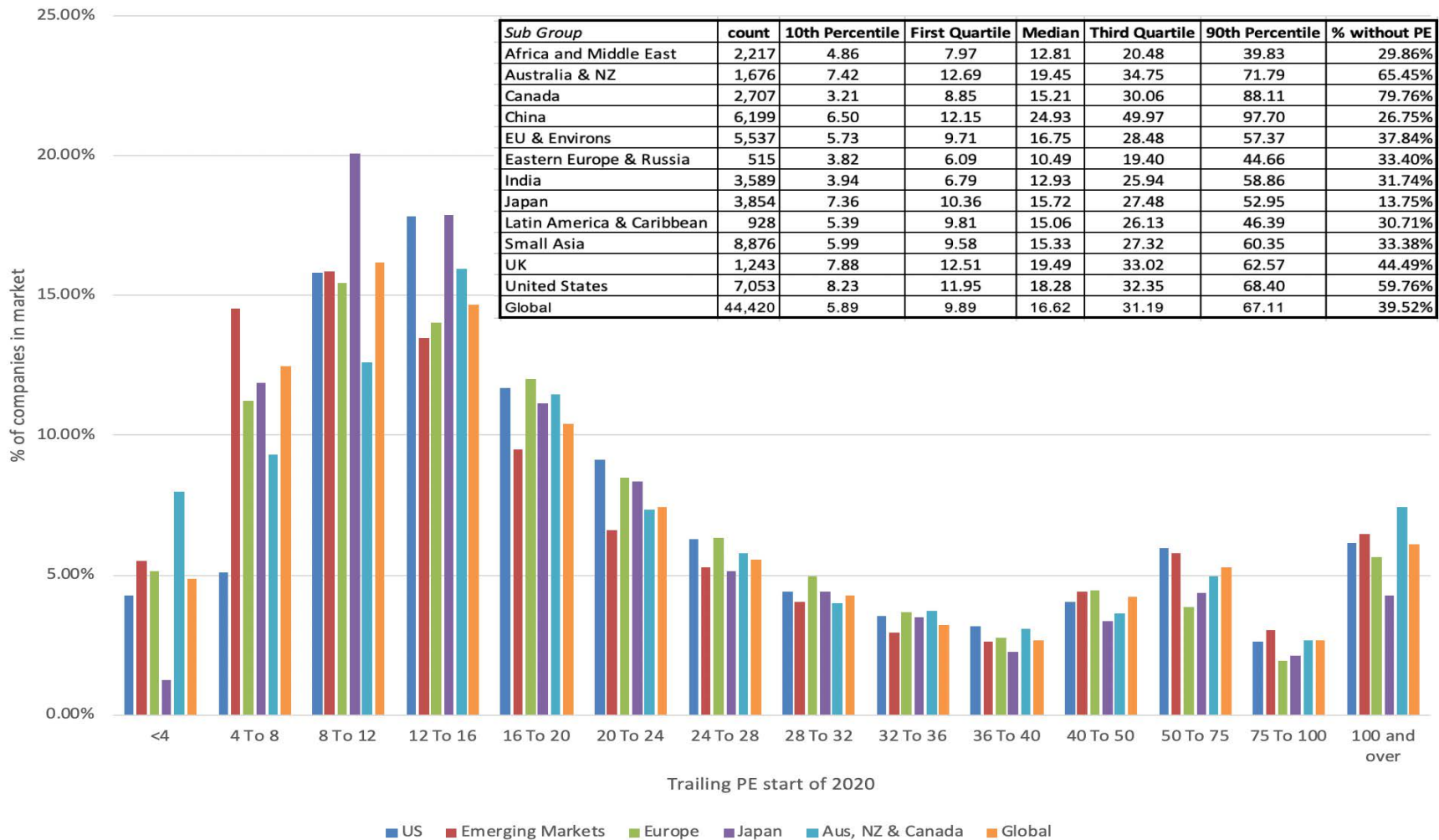
- Equity/Firm: The first is that if the numerator is an equity value, the denominator should be an equity value as well, while if the numerator is a firm or enterprise value, the denominator has to be an operating value. Thus, PE (market cap, an equity value, is divided by earnings per share, an equity value) and EV to EBITDA (EV is a market value of operating assets and EBITDA is a measure of operating cash flow) are consistent, but Price to EBITDA is an inconsistent abomination and Price to Sales is almost as badly constructed.
- Timing: The second is that multiples are constructed for comparisons across companies, not as stand alone measures. It follows therefore that you should be consistent in how you measure your scaling variable (revenues, book value, earnings) across companies. Thus, if you choose to use trailing earnings for your company to compute PE, you have to use trailing earnings for all your companies.

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?

PE Ratios at the start of 2020

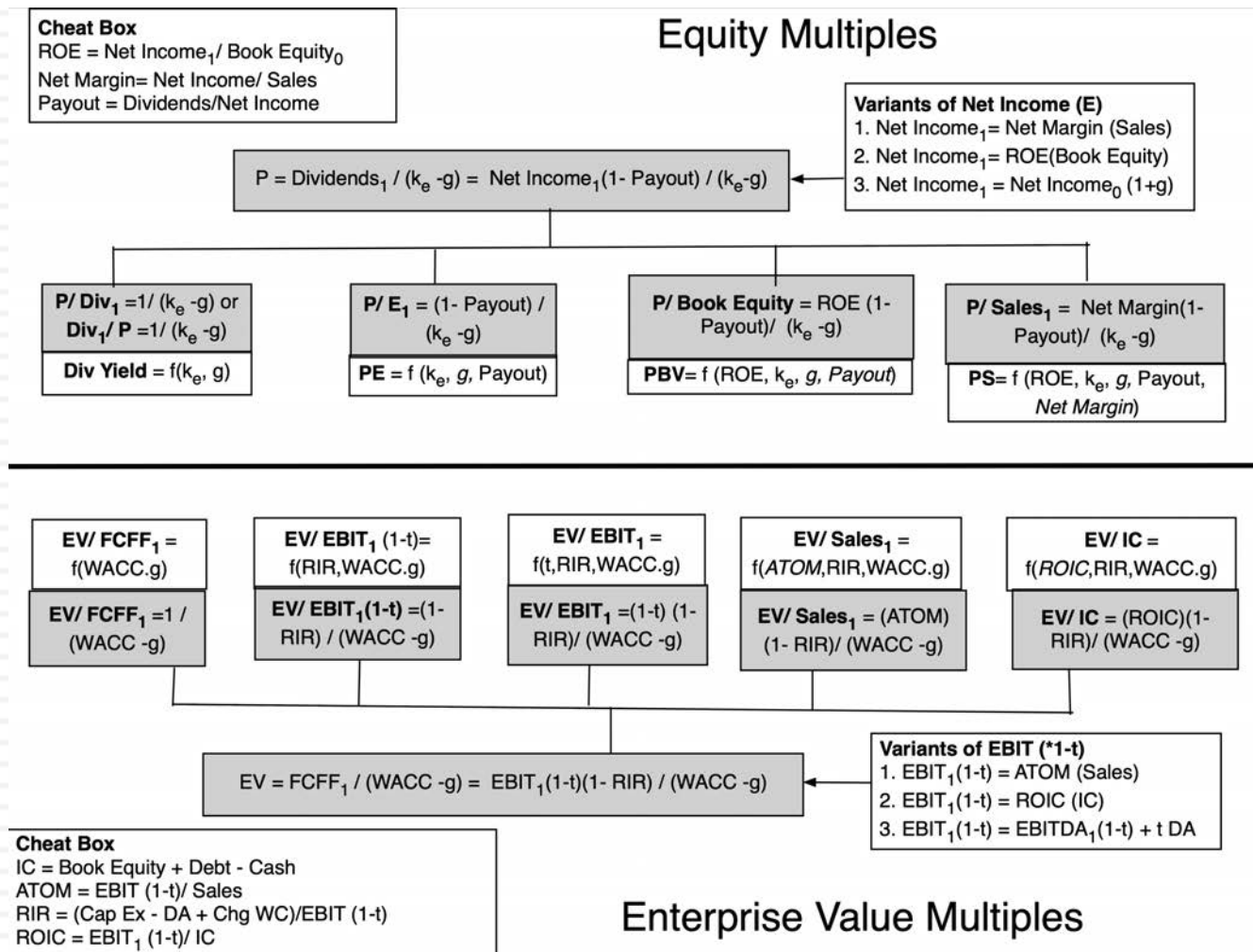
PE Ratios across the globe: January 2020



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...



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.



A COVID Break

Crisis times?

The lead up to the crisis... On February 14..



A Crisis hits.. Damage assessment on March 20, 2020

| | Index | Country/Region | Level on 3/20 | % Change | |
|-------------------------------|-----------------|----------------|---------------|-----------|------------|
| | | | | 3/13-3/20 | Last Month |
| <i>Americas</i> | S&P 500 | US | 2305 | -14.98% | -30.94% |
| | NASDAQ | US | 6994 | -12.52% | -25.96% |
| | TSX | Canada | 11852 | -13.59% | -33.58% |
| | IPC Mexico | Mexico | 34270 | -10.02% | -23.51% |
| | Bovespa | Brazil | 67069 | -18.88% | -41.00% |
| <i>Europe</i> | FTSE 100 | UK | 5191 | -3.27% | -29.89% |
| | DAX | Germany | 8929 | -3.28% | -34.25% |
| | CAC 40 | France | 4131 | -1.67% | -33.31% |
| | S&P Euro 350 | Europe | 1181 | 1.59% | -31.32% |
| <i>Asia</i> | Nikkei 225 | Japan | 16553 | -10.81% | -29.50% |
| | Shanghai 50 | China | 2628 | -6.09% | -11.45% |
| | Hang Seng | Hong Kong | 22805 | -5.11% | -16.49% |
| | BSE | India | 29916 | -12.28% | -25.88% |
| <i>Australia & NZ</i> | ASX 50 | Australia | 4828 | -12.87% | -31.97% |
| | NZX 50 | New Zealand | 9202 | -6.36% | -23.79% |
| <i>Africa</i> | FTSE JSE top 40 | South Africa | 36302 | -8.04% | -29.62% |
| | NSE All-Share | Nigeria | 22198 | -2.36% | -18.95% |

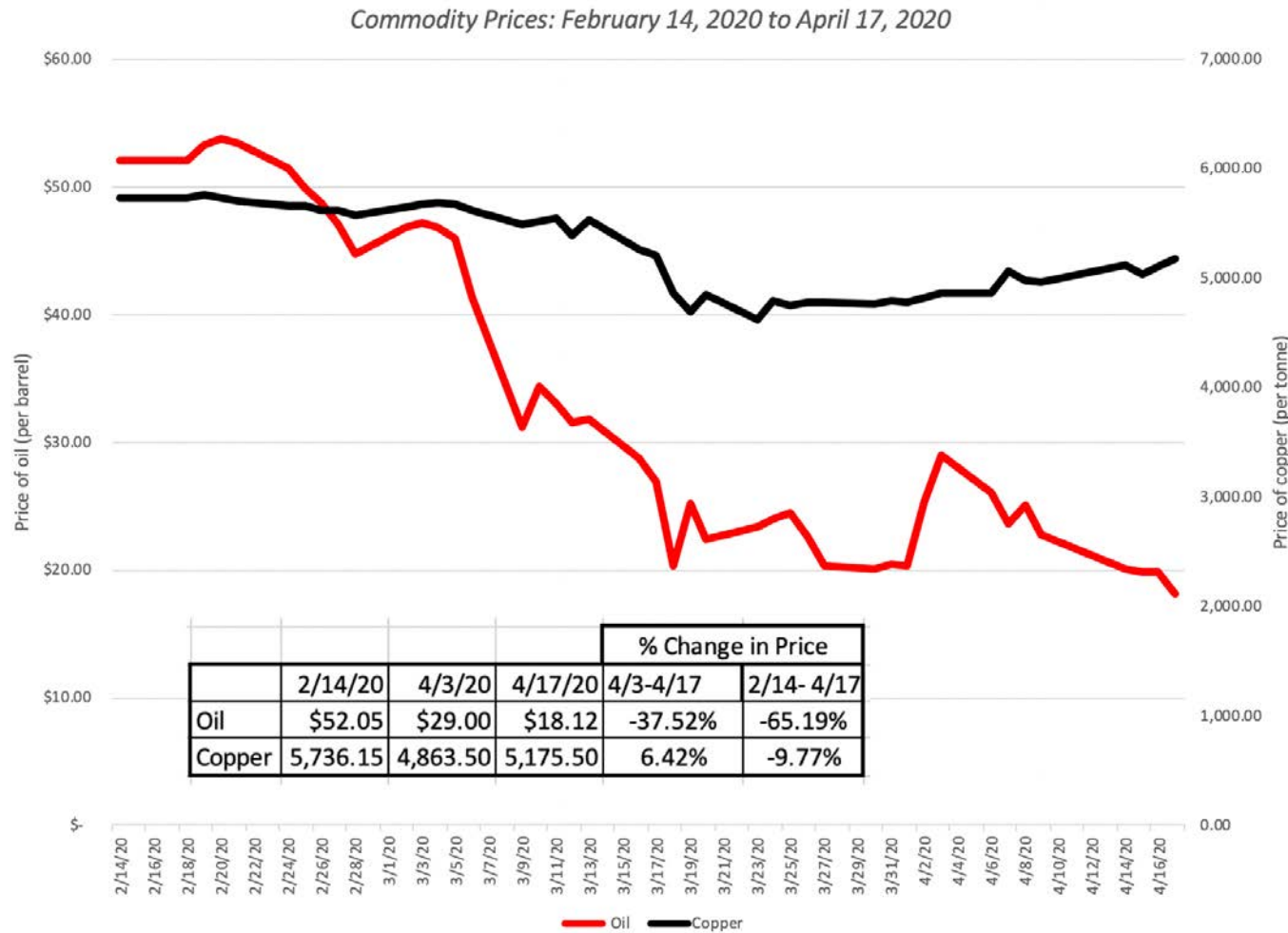
A Come back or False Security? From 3/17-4/17

| | <i>Index</i> | <i>Country/Region</i> | <i>Level on 4/17</i> | <i>% Change</i> | |
|---------------------------|-----------------|-----------------------|----------------------|------------------|------------------|
| | | | | <i>4-10-4/17</i> | <i>3/17-4/17</i> |
| <i>Americas</i> | S&P 500 | US | 2875 | 2.68% | 4.09% |
| | NASDAQ 100 | US | 8832 | 0.85% | 6.00% |
| | TSX | Canada | 14360 | 2.02% | 22.51% |
| | IPC Mexico | Mexico | 34743 | 0.37% | -2.22% |
| | iBovespa | Brazil | 78990 | 0.20% | 18.08% |
| <i>Europe</i> | FTSE 100 | UK | 5787 | -0.08% | 13.90% |
| | DAX | Germany | 10626 | -0.66% | 25.87% |
| | CAC 40 | France | 4499 | -0.66% | 20.27% |
| | S&P Europe 350 | Europe | 1341 | -0.11% | 19.55% |
| <i>Asia</i> | Nikkei 225 | Japan | 19897 | 2.05% | 18.96% |
| | Shanghai 50 | China | 2809 | 2.15% | 6.98% |
| | Hang Seng | Hong Kong | 24380 | -0.23% | 9.37% |
| | Sensex | India | 27591 | 2.93% | 9.42% |
| <i>Australia & NZ</i> | ASX 200 | Australia | 5068 | -0.01% | 10.79% |
| | NZX 50 | New Zealand | 9935 | 7.21% | 14.00% |
| <i>Africa</i> | FTSE/JSE TOP 40 | South Africa | 44599 | -1.18% | 29.75% |
| | NSE All Share | Nigeria | 21099 | 1.75% | 1.60% |

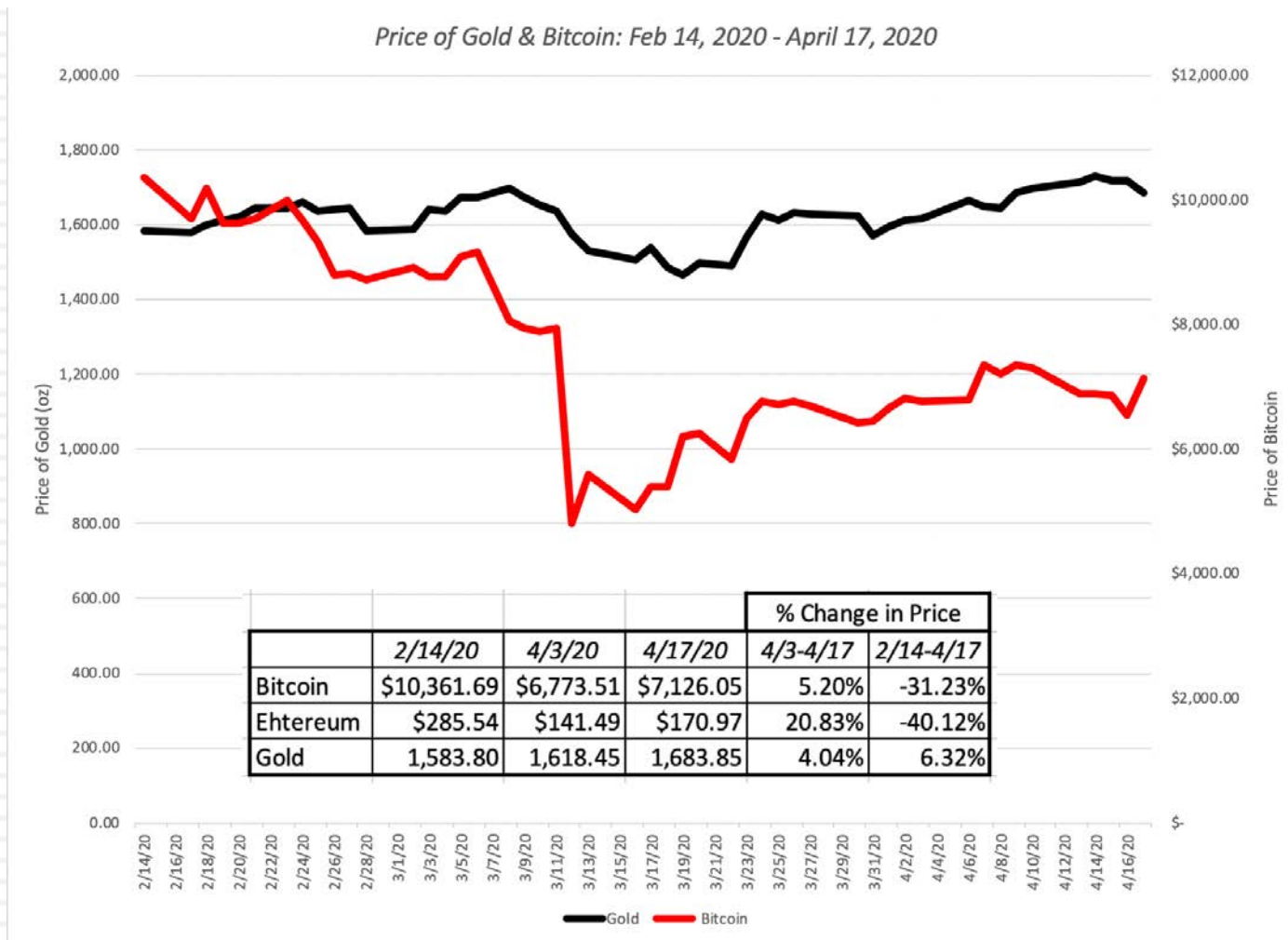
A Flight to Safety? Treasuries

| | Yields on US Treasuries | | | |
|-----------------|--------------------------------|---------------|----------------|----------------|
| Maturity | 2/14/20 | 4/3/20 | 4/10/20 | 4/17/20 |
| 3 month | 1.58% | 0.10% | 0.25% | 0.12% |
| 2 year | 1.42% | 0.23% | 0.23% | 0.20% |
| 5 year | 1.42% | 0.39% | 0.41% | 0.36% |
| 10 year | 1.59% | 0.62% | 0.73% | 0.65% |
| 20 year | 1.89% | 1.05% | 1.15% | 1.08% |
| 30 year | 2.04% | 1.24% | 1.35% | 1.27% |
| | Yield curve slope | | | |
| 2 yr - 3 month | -0.16% | 0.13% | -0.02% | 0.08% |
| 10 yr - 2 yr | 0.17% | 0.39% | 0.50% | 0.45% |
| 30 yr - 10 yr | 0.45% | 0.62% | 0.62% | 0.62% |

Divergent Stories: Oil and Copper



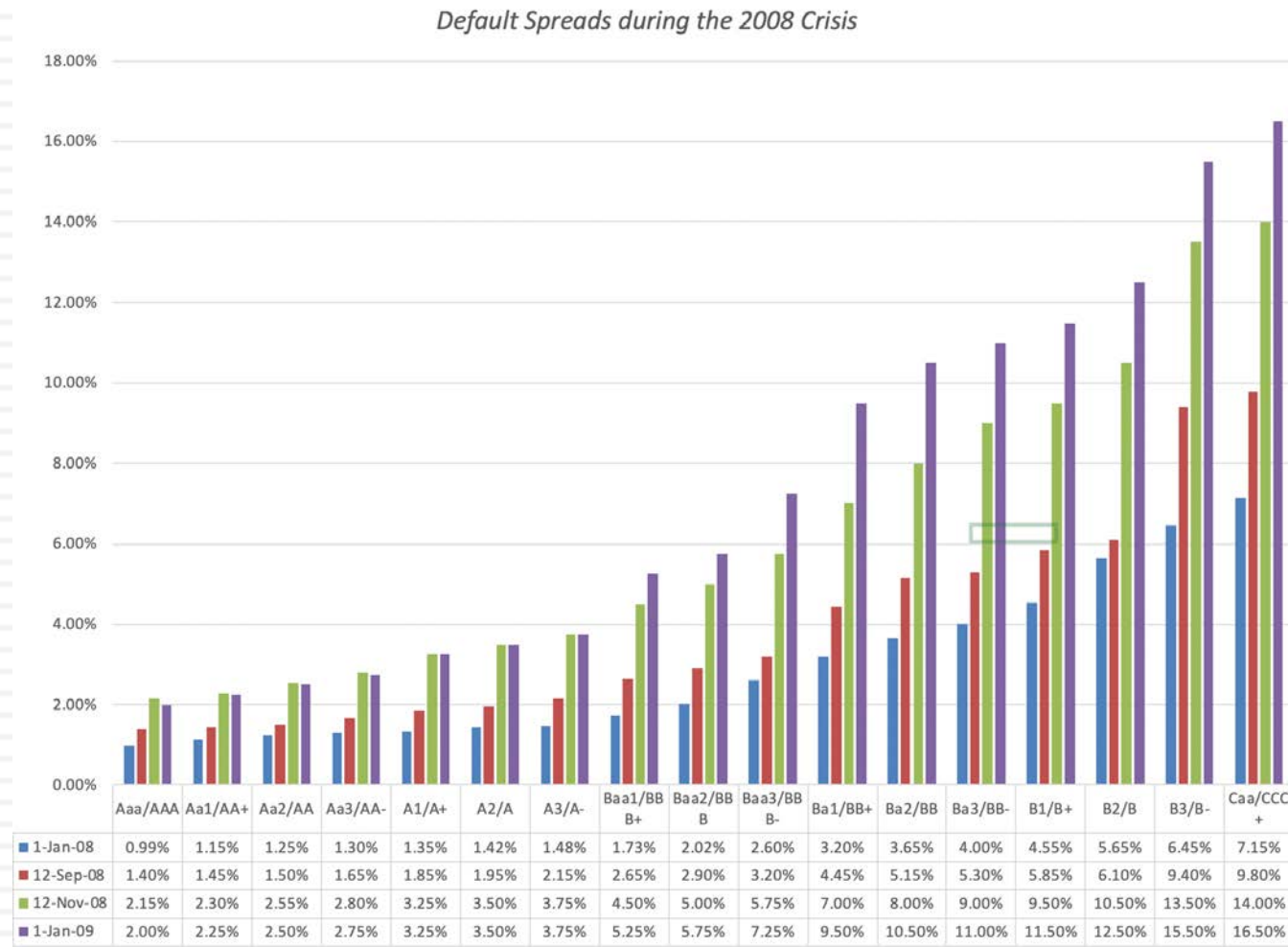
Crisis Asset: Gold and Bitcoin



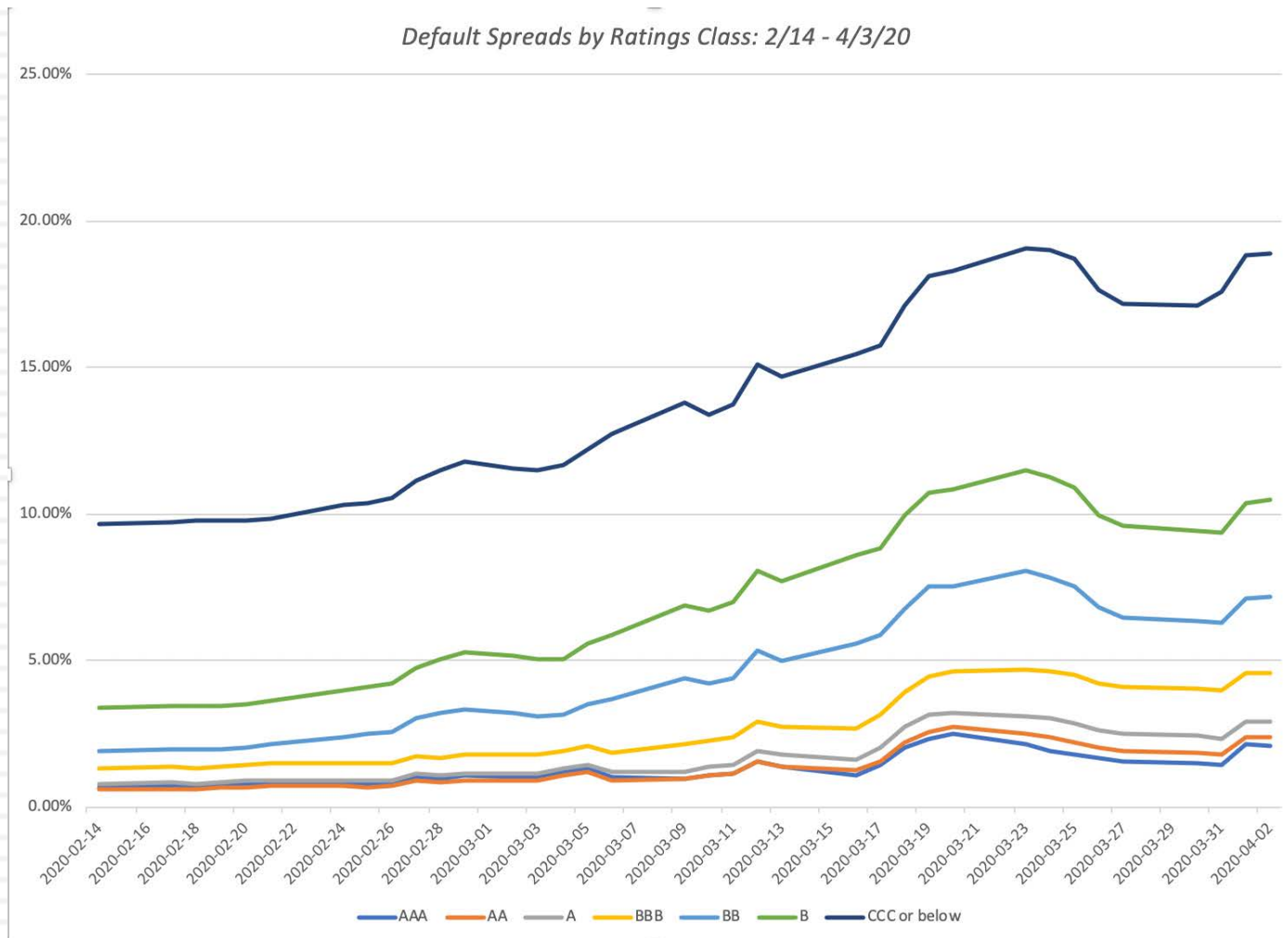
The price of risk: Determinants

- The price of risk changes on a day-to-day basis, and is determined by a combination of variables that encompass almost everything going on in the world from
 - ▣ uncertainty about future economic growth (more uncertainty -> higher price for risk) to
 - ▣ political stability (more instability -> higher price for risk) to
 - ▣ worries about catastrophes/disasters (more worries -> higher price for risk) to
 - ▣ investor risk aversion (greater risk aversion -> higher price for risk) to
 - ▣ information availability/reliability (less reliable and accessible information -> higher risk premiums).
- The more general point though that emerges from identifying the determinants is that changes in these determinants will play out as changing prices for risk, and since investing and valuation has to be based upon current and update prices for risk, you need measurement approaches that capture these day-to-day changes.

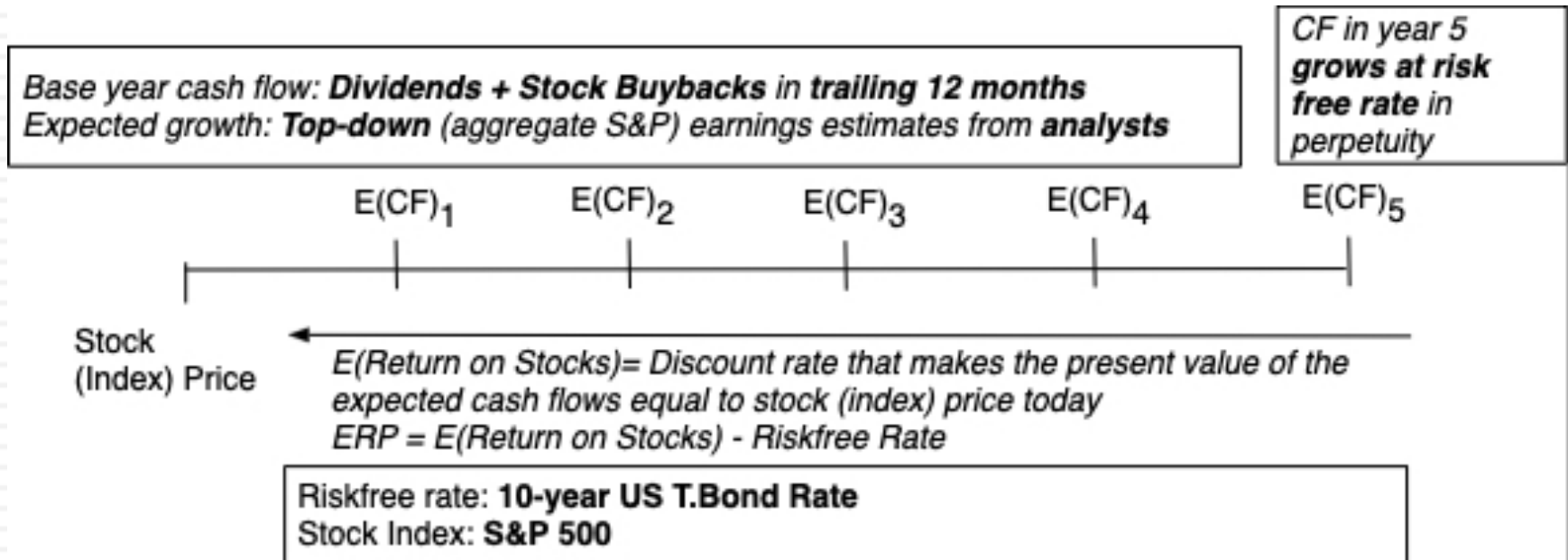
Bond Default Spreads during the 2008 crisis



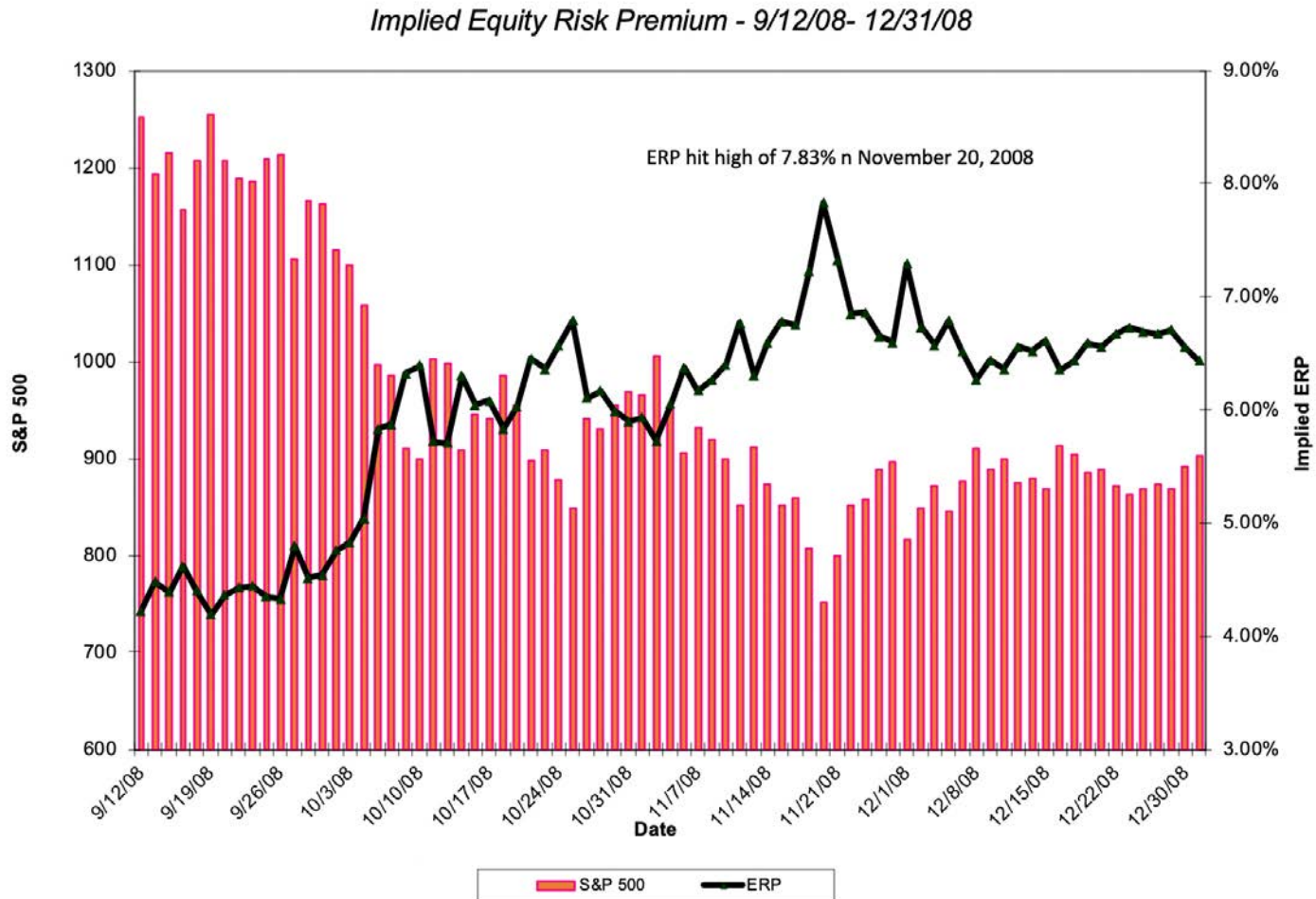
Bond Market Default Spreads: The COVID crisis



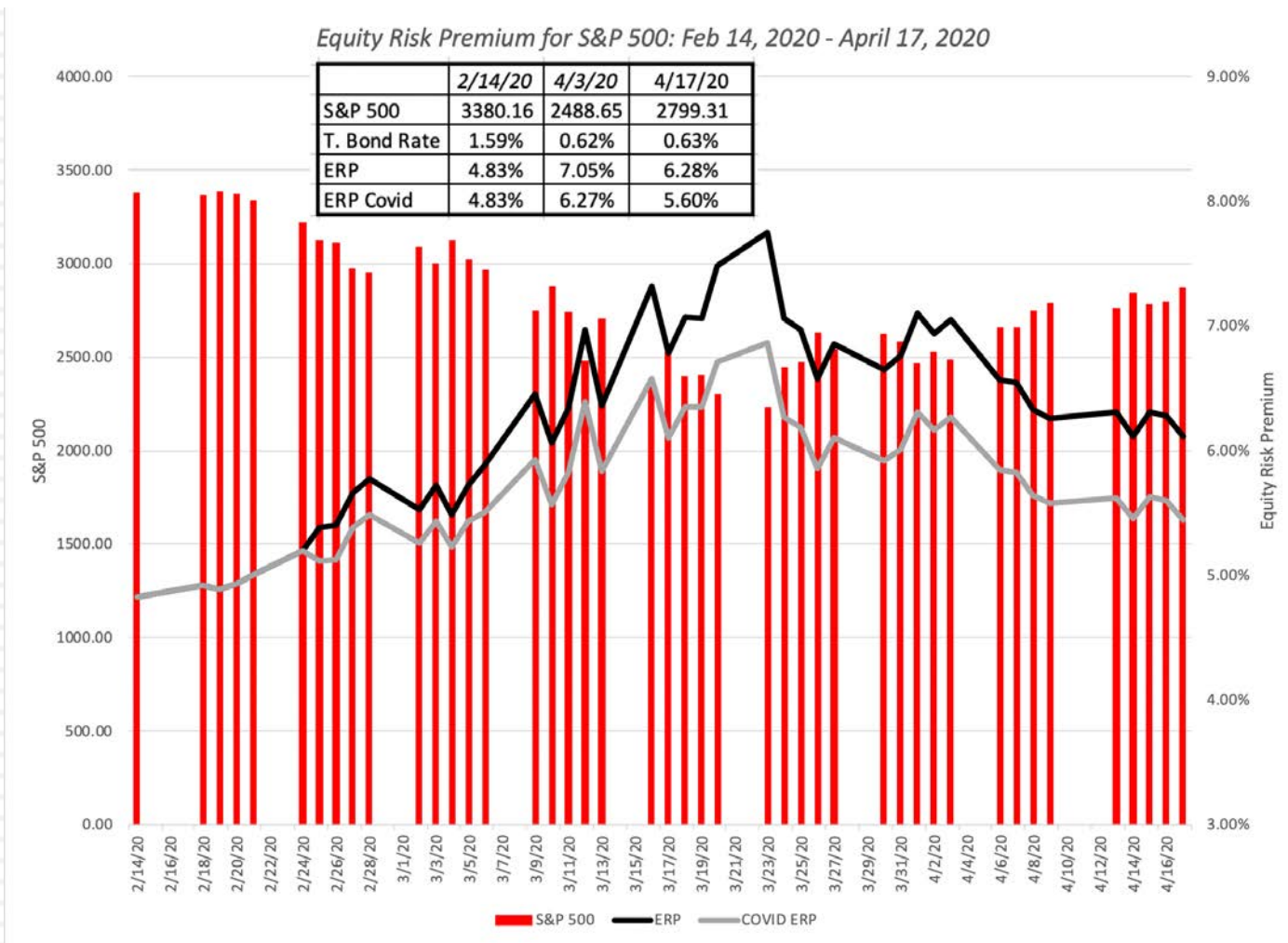
An Equity Market Price of Risk



The 2008 Crisis



The Price of Risk: Equities



Equities: By Region

| Sub Region | Number of firms | Mkt Cap (2/14) | Mkt Cap (4/3) | Mkt Cap (4/17) | Mkt Cap: 4/3- 4/17 | | Mkt Cap: 2/14 - 4/17 | |
|---------------------------|-----------------|----------------|---------------|----------------|--------------------|----------|----------------------|----------|
| | | | | | \$ Change | % Change | \$ Change | % Change |
| Africa | 652 | \$ 579,706 | \$ 352,644 | \$ 381,099 | \$ 28,455 | 8.07% | \$ (198,607) | -34.26% |
| Australia & NZ | 1,356 | \$ 1,617,545 | \$ 1,038,217 | \$ 1,193,976 | \$ 155,759 | 15.00% | \$ (423,569) | -26.19% |
| Canada | 1,576 | \$ 2,234,720 | \$ 1,508,434 | \$ 1,690,178 | \$ 181,744 | 12.05% | \$ (544,542) | -24.37% |
| China | 6,161 | \$ 14,027,134 | \$ 12,659,745 | \$ 13,253,719 | \$ 593,974 | 4.69% | \$ (773,415) | -5.51% |
| Eastern Europe & Russia | 414 | \$ 816,760 | \$ 564,470 | \$ 580,852 | \$ 16,382 | 2.90% | \$ (235,908) | -28.88% |
| EU & Environs | 4,770 | \$ 13,667,991 | \$ 9,893,062 | \$ 10,757,788 | \$ 864,727 | 8.74% | \$ (2,910,202) | -21.29% |
| India | 1,941 | \$ 2,201,867 | \$ 1,410,184 | \$ 1,602,062 | \$ 191,879 | 13.61% | \$ (599,805) | -27.24% |
| Japan | 3,811 | \$ 6,041,538 | \$ 4,742,114 | \$ 5,232,948 | \$ 490,834 | 10.35% | \$ (808,590) | -13.38% |
| Latin America & Caribbean | 934 | \$ 2,373,918 | \$ 1,376,023 | \$ 1,527,171 | \$ 151,148 | 10.98% | \$ (846,747) | -35.67% |
| Middle East | 1,150 | \$ 3,073,924 | \$ 2,719,466 | \$ 2,665,047 | \$ (54,419) | -2.00% | \$ (408,877) | -13.30% |
| Small Asia | 7,694 | \$ 5,061,281 | \$ 3,772,641 | \$ 4,175,157 | \$ 402,516 | 10.67% | \$ (886,124) | -17.51% |
| UK | 1,094 | \$ 3,072,497 | \$ 2,052,755 | \$ 2,298,374 | \$ 245,618 | 11.97% | \$ (774,123) | -25.20% |
| United States | 4,928 | \$ 35,642,353 | \$ 25,634,234 | \$ 29,784,527 | \$4,150,293 | 16.19% | \$ (5,857,826) | -16.44% |
| Global | 36,481 | \$ 90,411,233 | \$ 67,723,989 | \$ 75,142,899 | \$7,418,910 | 10.95% | \$ (15,268,334) | -16.89% |

Equities: By Sector

| Primary Sector | Number of firms | Mkt Cap (2/14) | Mkt Cap (4/3) | Mkt Cap (4/17) | Mkt Cap: 4/3- 4/17 | | Mkt Cap: 2/14 - 4/17 | |
|------------------------|-----------------|----------------|---------------|----------------|--------------------|----------|----------------------|----------|
| | | | | | \$ Change | % Change | \$ Change | % Change |
| Communication Services | 1,682 | \$ 7,341,638 | \$ 5,771,726 | \$ 6,396,994 | \$ 625,268 | 10.83% | \$ (944,644) | -12.87% |
| Consumer Discretionary | 4,945 | \$ 10,158,898 | \$ 7,308,734 | \$ 8,555,018 | \$1,246,284 | 17.05% | \$ (1,603,880) | -15.79% |
| Consumer Staples | 2,298 | \$ 7,118,491 | \$ 6,080,159 | \$ 6,548,231 | \$ 468,073 | 7.70% | \$ (570,260) | -8.01% |
| Energy | 1,316 | \$ 5,938,328 | \$ 4,339,633 | \$ 4,383,093 | \$ 43,460 | 1.00% | \$ (1,555,234) | -26.19% |
| Financials | 3,844 | \$ 14,919,508 | \$ 10,094,701 | \$ 10,933,915 | \$ 839,214 | 8.31% | \$ (3,985,593) | -26.71% |
| Global | 36,481 | \$ 90,411,233 | \$ 67,723,989 | \$ 75,142,899 | \$7,418,910 | 10.95% | \$(15,268,334) | -16.89% |
| Health Care | 3,411 | \$ 8,968,840 | \$ 7,582,188 | \$ 8,581,301 | \$ 999,113 | 13.18% | \$ (387,539) | -4.32% |
| Industrials | 6,564 | \$ 10,121,550 | \$ 7,170,567 | \$ 7,951,424 | \$ 780,857 | 10.89% | \$ (2,170,126) | -21.44% |
| Information Technology | 4,875 | \$ 13,601,118 | \$ 10,328,554 | \$ 11,798,990 | \$1,470,437 | 14.24% | \$ (1,802,128) | -13.25% |
| Materials | 4,414 | \$ 4,991,381 | \$ 3,736,573 | \$ 4,139,741 | \$ 403,168 | 10.79% | \$ (851,640) | -17.06% |
| Real Estate | 2,311 | \$ 4,050,062 | \$ 2,859,551 | \$ 3,164,030 | \$ 304,479 | 10.65% | \$ (886,032) | -21.88% |
| Utilities | 817 | \$ 3,200,581 | \$ 2,450,935 | \$ 2,689,435 | \$ 238,500 | 9.73% | \$ (511,146) | -15.97% |
| All firms | 36,481 | \$ 90,411,233 | \$ 67,723,989 | \$ 75,142,899 | \$7,418,910 | 10.95% | \$(15,268,334) | -16.89% |

Equities: Most & least damaged Industries

| | Worst Performing Industries (2/14 - 4/17) | | | | | | |
|---------------------------------------|---|---------------|----------------|--------------------|----------|----------------------|----------|
| | | | | Mkt Cap: 4/3- 4/17 | | Mkt Cap: 2/14 - 4/17 | |
| Industry | Mkt Cap (2/14) | Mkt Cap (4/3) | Mkt Cap (4/17) | \$ Change | % Change | \$ Change | % Change |
| Oil/Gas (Production and Exploration) | \$ 692,554 | \$ 386,341 | \$ 404,834 | \$ 18,493 | 4.79% | \$ (287,719) | -41.54% |
| Homebuilding | \$ 247,004 | \$ 126,947 | \$ 154,145 | \$ 27,198 | 21.43% | \$ (92,859) | -37.59% |
| Air Transport | \$ 559,439 | \$ 306,560 | \$ 350,468 | \$ 43,908 | 14.32% | \$ (208,971) | -37.35% |
| Broadcasting | \$ 164,761 | \$ 93,291 | \$ 107,844 | \$ 14,553 | 15.60% | \$ (56,917) | -34.55% |
| Oilfield Svcs/Equip. | \$ 741,428 | \$ 445,056 | \$ 488,541 | \$ 43,485 | 9.77% | \$ (252,887) | -34.11% |
| Food Wholesalers | \$ 93,056 | \$ 52,910 | \$ 61,559 | \$ 8,649 | 16.35% | \$ (31,497) | -33.85% |
| Oil/Gas Distribution | \$ 653,462 | \$ 386,630 | \$ 437,227 | \$ 50,597 | 13.09% | \$ (216,235) | -33.09% |
| Hotel/Gaming | \$ 717,777 | \$ 394,003 | \$ 490,025 | \$ 96,022 | 24.37% | \$ (227,752) | -31.73% |
| Aerospace/Defense | \$ 1,217,331 | \$ 683,209 | \$ 832,292 | \$ 149,082 | 21.82% | \$ (385,039) | -31.63% |
| Reinsurance | \$ 180,550 | \$ 109,101 | \$ 123,655 | \$ 14,554 | 13.34% | \$ (56,895) | -31.51% |
| | Best Performing Industries (2/14 - 4/17) | | | | | | |
| | | | | Mkt Cap: 4/3- 4/17 | | Mkt Cap: 2/14 - 4/17 | |
| Industry | Mkt Cap (2/14) | Mkt Cap (4/3) | Mkt Cap (4/17) | \$ Change | % Change | \$ Change | % Change |
| Retail (Online) | \$ 2,455,790 | \$ 2,081,460 | \$ 2,483,956 | \$ 402,496 | 19.34% | \$ 28,166 | 1.15% |
| Drugs (Biotechnology) | \$ 1,409,166 | \$ 1,242,047 | \$ 1,422,584 | \$ 180,537 | 14.54% | \$ 13,417 | 0.95% |
| Precious Metals | \$ 418,906 | \$ 350,674 | \$ 417,290 | \$ 66,616 | 19.00% | \$ (1,616) | -0.39% |
| Software (Internet) | \$ 226,911 | \$ 173,926 | \$ 224,558 | \$ 50,632 | 29.11% | \$ (2,353) | -1.04% |
| Healthcare Information and Technology | \$ 772,828 | \$ 656,136 | \$ 759,471 | \$ 103,335 | 15.75% | \$ (13,357) | -1.73% |
| Drugs (Pharmaceutical) | \$ 3,623,939 | \$ 3,190,552 | \$ 3,497,146 | \$ 306,594 | 9.61% | \$ (126,793) | -3.50% |
| Food Processing | \$ 1,792,176 | \$ 1,617,124 | \$ 1,718,626 | \$ 101,502 | 6.28% | \$ (73,550) | -4.10% |
| Retail (General) | \$ 1,054,814 | \$ 903,932 | \$ 1,004,714 | \$ 100,781 | 11.15% | \$ (50,100) | -4.75% |
| Healthcare Products | \$ 1,829,639 | \$ 1,500,672 | \$ 1,723,383 | \$ 222,710 | 14.84% | \$ (106,257) | -5.81% |
| Household Products | \$ 1,453,345 | \$ 1,260,149 | \$ 1,358,804 | \$ 98,655 | 7.83% | \$ (94,541) | -6.51% |

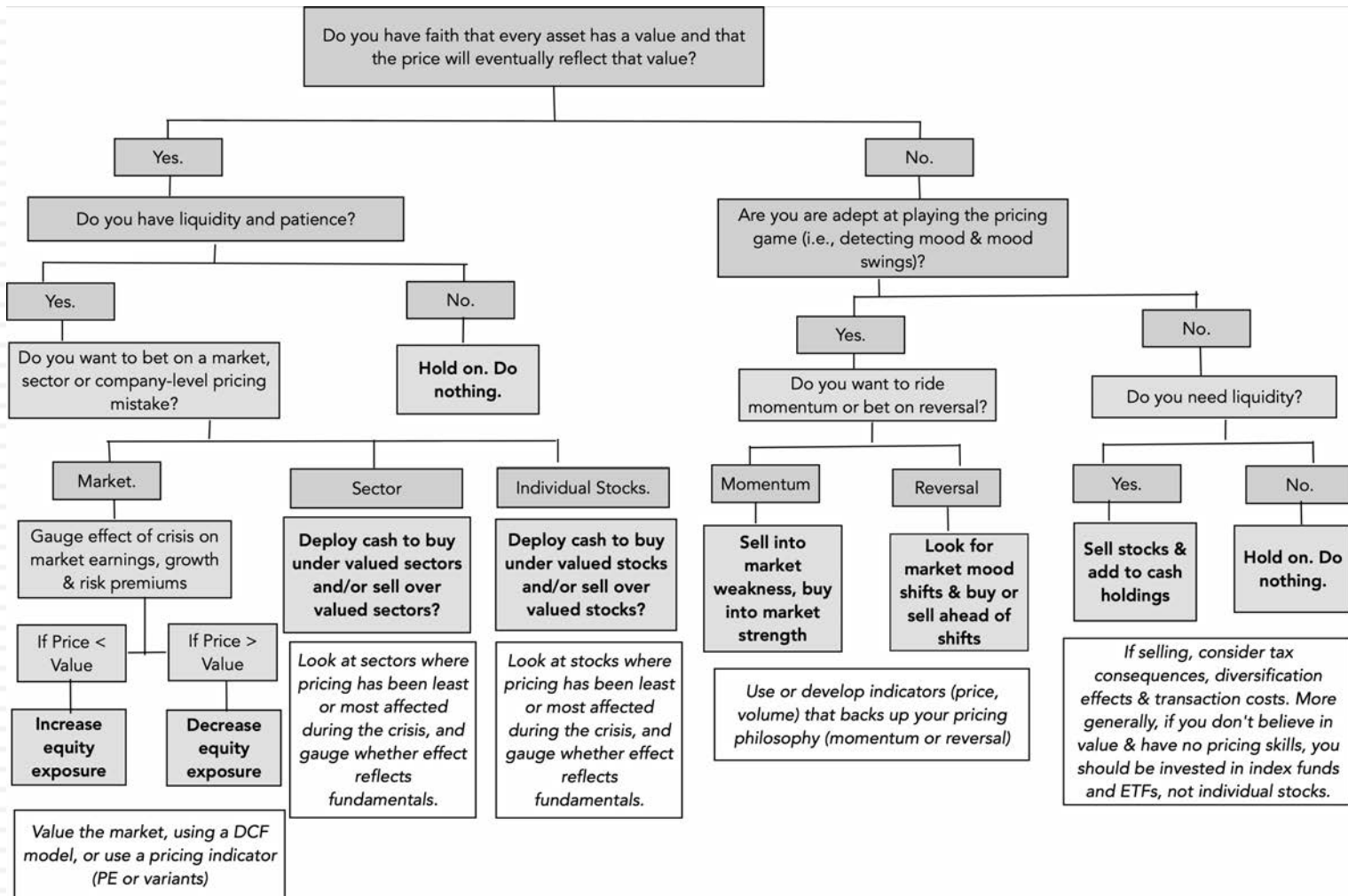
Equities: Net Debt Ratios

| Net Debt to EBITDA | Number of firms | Mkt Cap (2/14) | Mkt Cap (4/3) | Mkt Cap (4/17) | Mkt Cap: 4/3- 4/17 | | Mkt Cap: 2/14 - 4/17 | |
|--------------------|-----------------|----------------|---------------|----------------|--------------------|----------|----------------------|----------|
| | | | | | \$ Change | % Change | \$ Change | % Change |
| Bottom decile | 2,549 | \$ 2,438,332 | \$ 2,001,936 | \$ 2,180,230 | \$ 178,294 | 8.91% | \$ (258,102) | -10.59% |
| 2nd decile | 2,550 | \$ 5,077,547 | \$ 4,147,232 | \$ 4,602,779 | \$ 455,548 | 10.98% | \$ (474,768) | -9.35% |
| 3rd decile | 2,550 | \$ 8,075,126 | \$ 6,468,172 | \$ 7,272,203 | \$ 804,031 | 12.43% | \$ (802,922) | -9.94% |
| 4th decile | 2,549 | \$ 8,668,340 | \$ 7,068,705 | \$ 7,520,089 | \$ 451,383 | 6.39% | \$ (1,148,252) | -13.25% |
| 5th decile | 2,550 | \$ 13,089,926 | \$ 10,206,289 | \$ 11,465,333 | \$ 1,259,044 | 12.34% | \$ (1,624,593) | -12.41% |
| 6th decile | 2,550 | \$ 12,069,805 | \$ 9,099,941 | \$ 10,091,424 | \$ 991,483 | 10.90% | \$ (1,978,382) | -16.39% |
| 7th decile | 2,549 | \$ 10,285,530 | \$ 7,492,767 | \$ 8,351,601 | \$ 858,833 | 11.46% | \$ (1,933,929) | -18.80% |
| 8th decile | 2,550 | \$ 8,192,083 | \$ 5,881,602 | \$ 6,639,747 | \$ 758,145 | 12.89% | \$ (1,552,336) | -18.95% |
| 9th decile | 2,550 | \$ 6,872,631 | \$ 4,676,233 | \$ 5,291,833 | \$ 615,600 | 13.16% | \$ (1,580,798) | -23.00% |
| Top decile | 2,550 | \$ 2,620,044 | \$ 1,721,135 | \$ 1,907,582 | \$ 186,447 | 10.83% | \$ (712,462) | -27.19% |
| EBITDA negative | 10,984 | \$ 13,021,868 | \$ 8,959,977 | \$ 9,820,078 | \$ 860,101 | 9.60% | \$ (3,201,790) | -24.59% |



Pricing in a Crisis Market

Game plan?

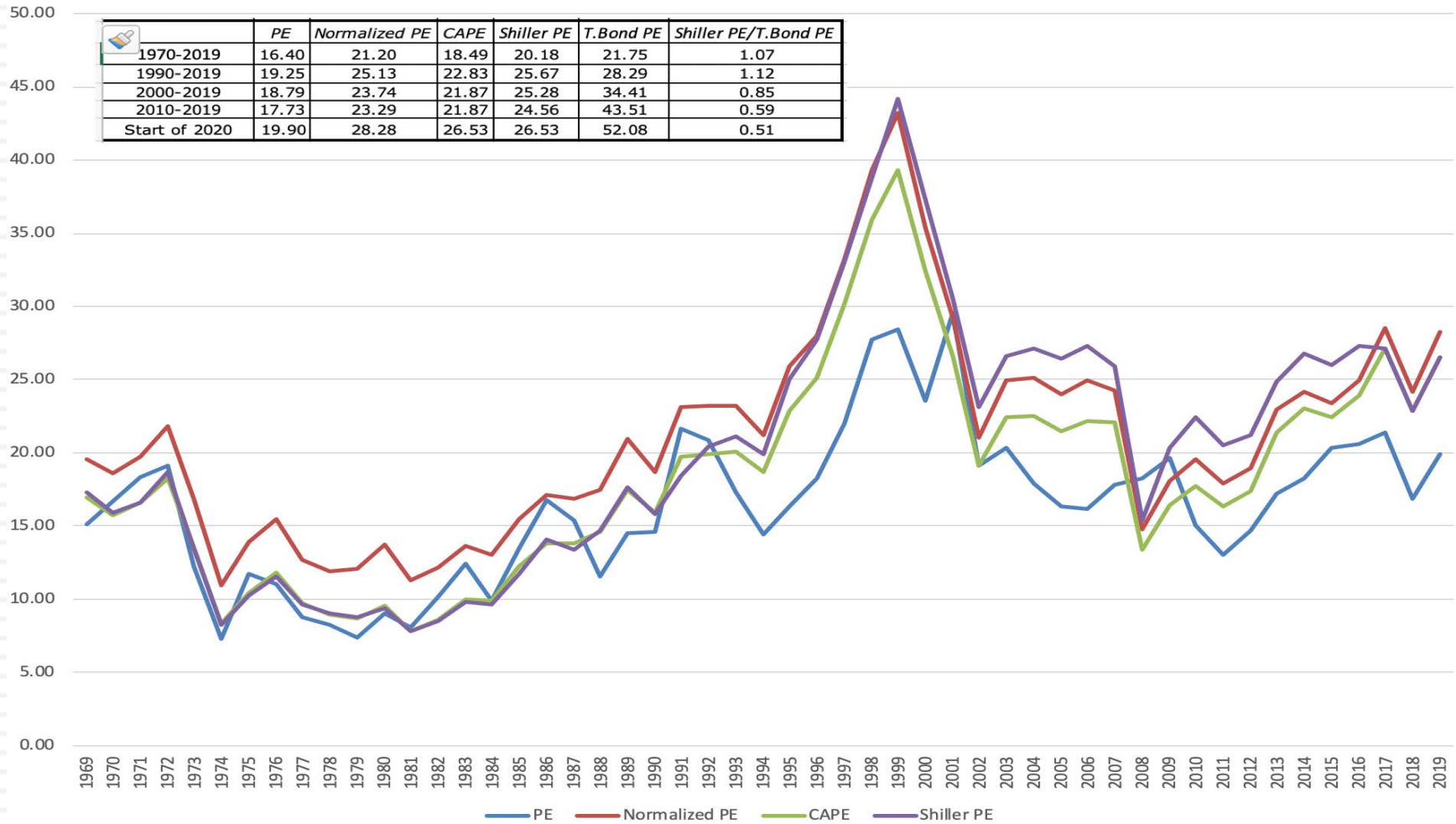


A Pricing Market?

- I have argued that just because uncertainty has increased, there is no excuse for abandoning valuation first principles or process and argued that you can still value companies, albeit with a much wider range of outcomes.
- One common counter that I got to this argument was that valuation was pointless, when the uncertainty was so great and while most did not bother presenting alternatives, my guess is that many will fall back on pricing metrics to decide whether and what to buy or sell.
- Put simply, they will use a PE ratio or an enterprise value multiple of EBITDA or sales to decide what stocks to buy or sell, acting under the delusion that this will allow them to escape having to make assumptions in the future.

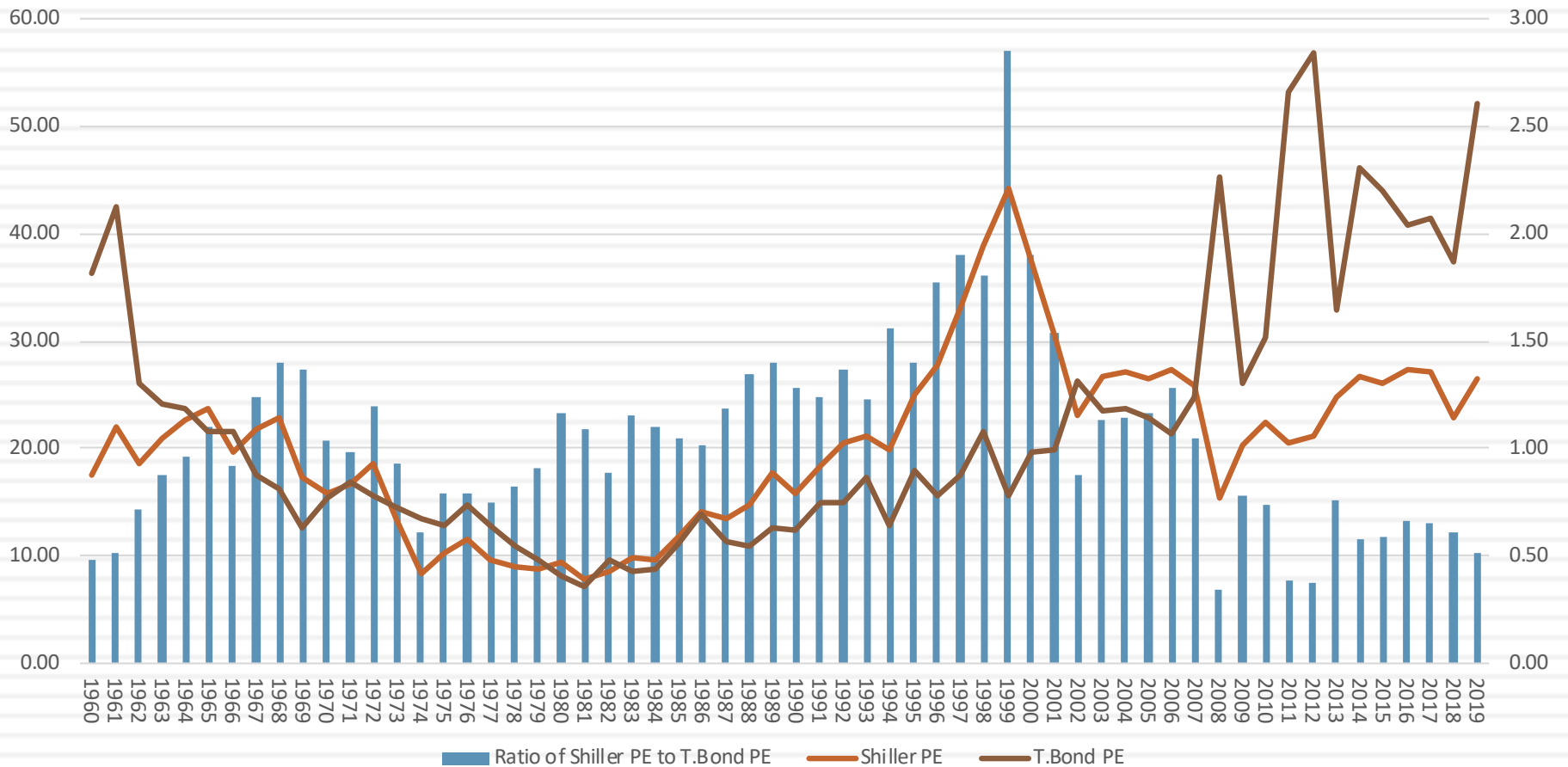
Pricing a Market: The S&P 500 at the start of 2020

PE Ratios for S&P 500 & Shiller PE: 1969 to 2019



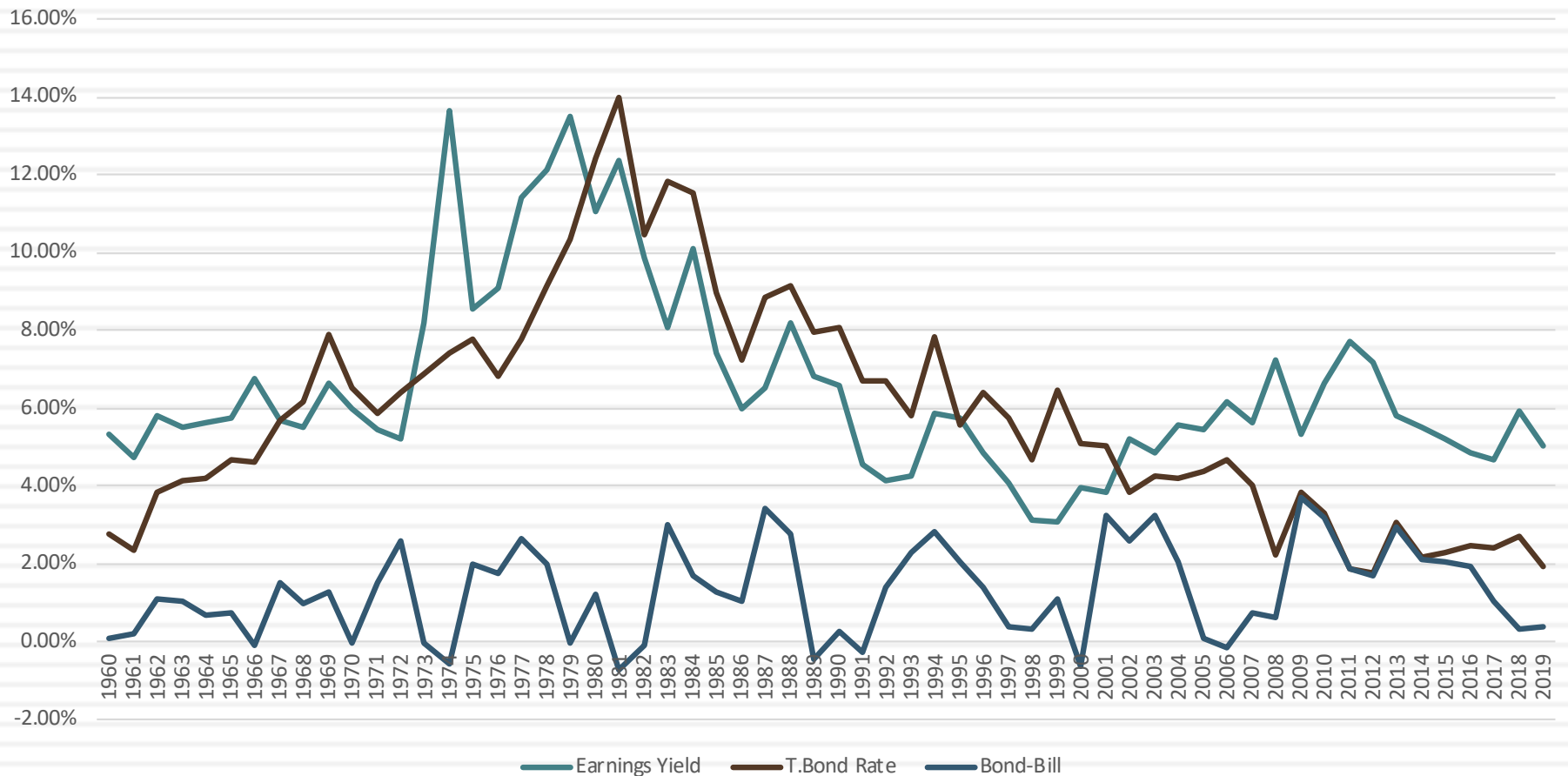
Bringing in the alternatives...

Shiller PE versus T.Bond PE



The Tie Breaker: E/P Ratios , T.Bond Rates and Term Structure: Updated..

EP Ratios and Treasury Rates: 1960 - 2019



Regression Results

| | EP | T.Bond | T.Bill |
|-------------|---------|---------|--------|
| EP | 1.0000 | | |
| T.Bond | 0.6214 | 1.0000 | |
| Bond - Bill | -0.1283 | -0.0739 | 1.0000 |

Correlation between E/P and interest rates

- In the following regression, using 1960-2019 data, we regress E/P ratios against the level of T.Bond rates and a term structure variable (T.Bond - T.Bill rate)

$$\text{EP Ratio} = 0.0373 + 0.5222 \text{ T.Bond Rate} - 0.1718 (\text{T.Bond Rate} - \text{T.Bill Rate})$$

(5.71)
(5.95)
(-0.80)

R squared = 39.29%

- Going back to 2008, this is what the regression looked like:

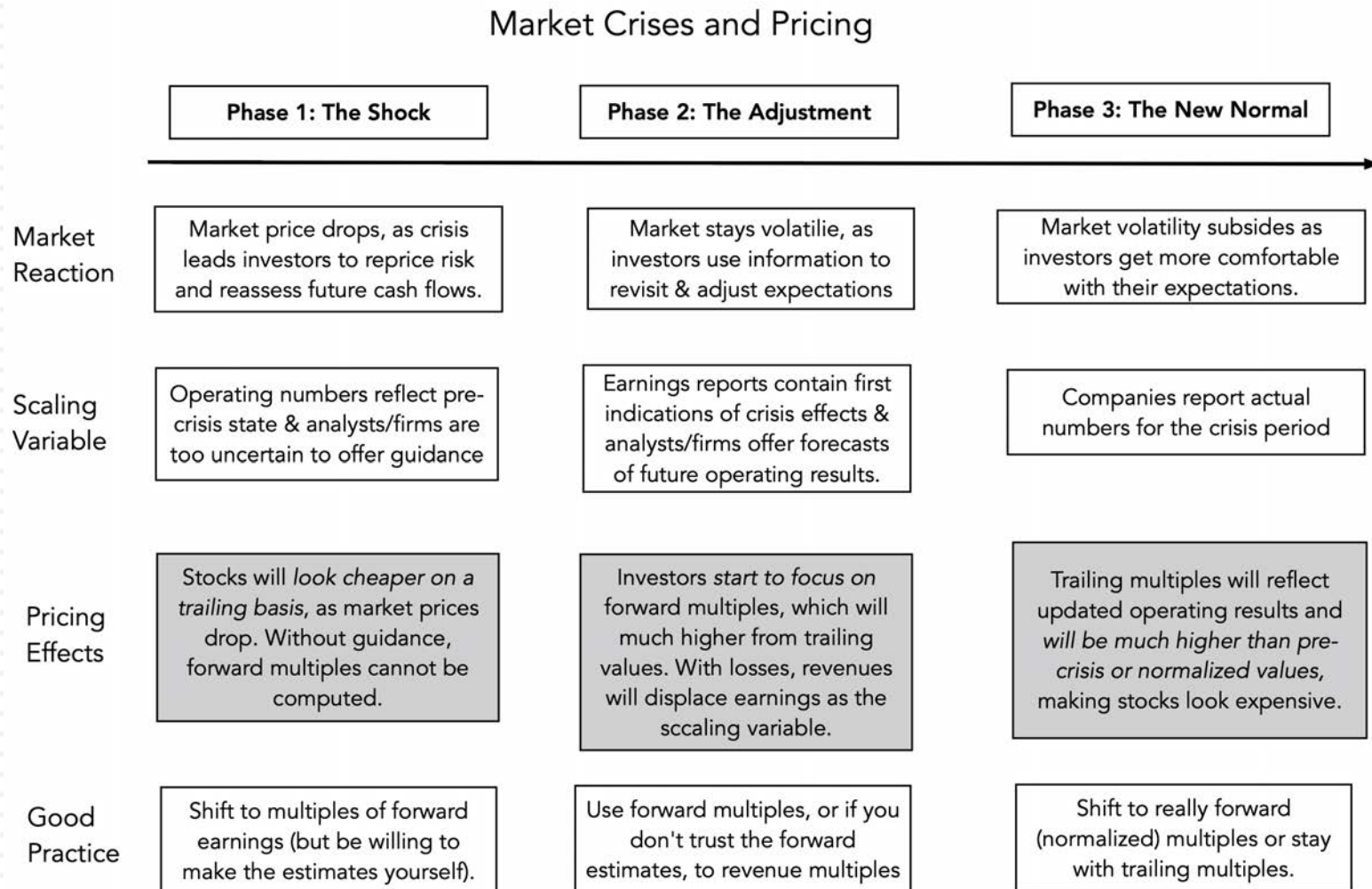
$$\text{E/P} = 2.56\% + 0.7044 \text{ T.Bond Rate} - 0.3289 (\text{T.Bond Rate} - \text{T.Bill Rate})$$

(4.71)
(7.10)
(1.46)

R squared = 50.71%

The R-squared has dropped and the differential with the T.Bill rate has lost significance. How would you read this result?

The Timing Effect: Pricing in a Crisis



Regional Pricing: The COVID effect

| Sub Region | Market Capitalization | | Trailing Net Income | | Trailing PE | | Enterprise Value | | Trailing Revenues | | EV/Sales | |
|---------------------------|-----------------------|---------------|---------------------|------------------|-------------|---------|------------------|---------------|-------------------|------------------|----------|---------|
| | 1/1/20 | 4/17/20 | LTM thru 1/1/20 | LTM thru 4/17/20 | 1/1/20 | 4/17/20 | 1/1/20 | 4/17/20 | LTM thru 1/1/20 | LTM thru 4/17/20 | 1/1/20 | 4/17/20 |
| Africa | \$ 602,927 | \$ 381,099 | \$ 35,530 | \$ 38,724 | 16.97 | 9.84 | \$ 598,016 | \$ 386,863 | \$ 385,783 | \$ 429,492 | 1.55 | 0.90 |
| Australia & NZ | \$ 1,587,941 | \$ 1,193,976 | \$ 76,536 | \$ 70,092 | 20.75 | 17.03 | \$ 2,052,175 | \$ 1,770,472 | \$ 683,728 | \$ 732,201 | 3.00 | 2.42 |
| Canada | \$ 2,167,437 | \$ 1,690,178 | \$ 94,098 | \$ 110,956 | 23.03 | 15.23 | \$ 1,930,814 | \$ 1,695,978 | \$ 1,242,344 | \$ 1,353,786 | 1.55 | 1.25 |
| China | \$ 13,922,636 | \$ 13,253,719 | \$ 772,575 | \$ 828,606 | 18.02 | 16.00 | \$ 15,945,308 | \$ 15,957,070 | \$ 9,302,106 | \$ 9,967,255 | 1.71 | 1.60 |
| Eastern Europe & Russia | \$ 826,177 | \$ 580,852 | \$ 111,656 | \$ 131,695 | 7.40 | 4.41 | \$ 916,769 | \$ 707,384 | \$ 819,619 | \$ 913,013 | 1.12 | 0.77 |
| EU & Environs | \$ 13,542,156 | \$ 10,757,788 | \$ 715,323 | \$ 744,298 | 18.93 | 14.45 | \$ 16,890,750 | \$ 14,809,760 | \$ 10,766,716 | \$ 11,241,700 | 1.57 | 1.32 |
| India | \$ 2,168,366 | \$ 1,602,062 | \$ 51,119 | \$ 53,477 | 42.42 | 29.96 | \$ 2,947,357 | \$ 2,351,699 | \$ 821,927 | \$ 1,292,910 | 3.59 | 1.82 |
| Japan | \$ 6,156,869 | \$ 5,232,948 | \$ 414,961 | \$ 358,188 | 14.84 | 14.61 | \$ 6,256,725 | \$ 5,693,556 | \$ 7,446,882 | \$ 7,673,662 | 0.84 | 0.74 |
| Latin America & Caribbean | \$ 2,422,143 | \$ 1,527,171 | \$ 134,160 | \$ 134,678 | 18.05 | 11.34 | \$ 3,860,250 | \$ 2,671,959 | \$ 1,578,743 | \$ 1,628,911 | 2.45 | 1.64 |
| Middle East | \$ 3,211,880 | \$ 2,665,047 | \$ 189,723 | \$ 166,013 | 16.93 | 16.05 | \$ 3,176,350 | \$ 2,763,122 | \$ 939,171 | \$ 939,350 | 3.38 | 2.94 |
| Small Asia | \$ 5,195,524 | \$ 4,175,157 | \$ 328,180 | \$ 273,916 | 15.83 | 15.24 | \$ 5,360,207 | \$ 4,728,309 | \$ 4,990,894 | \$ 5,069,035 | 1.07 | 0.93 |
| UK | \$ 3,131,108 | \$ 2,298,374 | \$ 140,987 | \$ 136,642 | 22.21 | 16.82 | \$ 2,943,496 | \$ 2,464,666 | \$ 2,086,704 | \$ 2,387,791 | 1.41 | 1.03 |
| United States | \$ 34,066,742 | \$ 29,784,527 | \$ 1,326,457 | \$ 1,330,281 | 25.68 | 22.39 | \$ 43,454,615 | \$ 41,102,137 | \$ 15,594,487 | \$ 16,315,385 | 2.79 | 2.52 |
| Global | \$ 89,001,908 | \$ 75,142,899 | \$ 4,391,305 | \$ 4,377,566 | 20.27 | 17.17 | \$ 106,332,834 | \$ 97,102,977 | \$ 56,659,105 | \$ 59,944,491 | 1.88 | 1.62 |

Sector Pricing: A COVID update

| Primary Sector | Market Capitalization | | Trailing Net Income | | Trailing PE | | Enterprise Value | | Trailing Revenues | | EV/Sales | |
|------------------------|-----------------------|---------------|---------------------|------------------|-------------|---------|------------------|---------------|-------------------|------------------|----------|---------|
| | 1/1/20 | 4/17/20 | LTM thru 1/1/20 | LTM thru 4/17/20 | 1/1/20 | 4/17/20 | 1/1/20 | 4/17/20 | LTM thru 1/1/20 | LTM thru 4/17/20 | 1/1/20 | 4/17/20 |
| Communication Services | \$ 7,061,144 | \$ 6,396,994 | \$ 272,240 | \$ 268,340 | 25.94 | 23.84 | \$ 8,394,815 | \$ 8,204,313 | \$ 3,075,462 | \$ 3,275,528 | 2.73 | 2.50 |
| Consumer Discretionary | \$ 10,001,063 | \$ 8,555,018 | \$ 400,379 | \$ 422,756 | 24.98 | 20.24 | \$ 11,670,561 | \$ 10,923,729 | \$ 8,521,352 | \$ 8,837,248 | 1.37 | 1.24 |
| Consumer Staples | \$ 7,119,228 | \$ 6,548,231 | \$ 253,891 | \$ 252,124 | 28.04 | 25.97 | \$ 8,249,126 | \$ 7,914,722 | \$ 5,338,559 | \$ 5,590,613 | 1.55 | 1.42 |
| Energy | \$ 6,451,348 | \$ 4,383,093 | \$ 432,428 | \$ 324,381 | 14.92 | 13.51 | \$ 7,947,389 | \$ 6,218,676 | \$ 6,101,367 | \$ 6,159,010 | 1.30 | 1.01 |
| Financials | \$ 15,098,560 | \$ 10,933,915 | \$ 1,176,914 | \$ 1,389,056 | 12.83 | 7.87 | \$ 17,472,728 | \$ 14,789,327 | \$ 7,181,276 | \$ 8,270,695 | 2.43 | 1.79 |
| Global | \$ 89,001,908 | \$ 75,142,899 | \$ 4,391,305 | \$ 4,377,566 | 20.27 | 17.17 | \$ 106,332,834 | \$ 97,102,977 | \$ 56,659,105 | \$ 59,944,491 | 1.88 | 1.62 |
| Health Care | \$ 8,632,427 | \$ 8,581,301 | \$ 187,642 | \$ 218,959 | 46.00 | 39.19 | \$ 9,283,692 | \$ 9,527,167 | \$ 3,427,878 | \$ 3,884,560 | 2.71 | 2.45 |
| Industrials | \$ 10,017,689 | \$ 7,951,424 | \$ 492,859 | \$ 450,654 | 20.33 | 17.64 | \$ 12,471,645 | \$ 11,013,498 | \$ 9,882,375 | \$ 10,347,296 | 1.26 | 1.06 |
| Information Technology | \$ 12,471,842 | \$ 11,798,990 | \$ 436,974 | \$ 404,289 | 28.54 | 29.18 | \$ 12,549,738 | \$ 12,140,677 | \$ 4,716,370 | \$ 4,860,140 | 2.66 | 2.50 |
| Materials | \$ 5,122,449 | \$ 4,139,741 | \$ 328,775 | \$ 220,595 | 15.58 | 18.77 | \$ 6,455,495 | \$ 5,541,436 | \$ 4,727,861 | \$ 4,787,420 | 1.37 | 1.16 |
| Real Estate | \$ 3,953,469 | \$ 3,164,030 | \$ 271,496 | \$ 255,331 | 14.56 | 12.39 | \$ 6,549,674 | \$ 5,752,049 | \$ 1,445,509 | \$ 1,618,764 | 4.53 | 3.55 |
| Utilities | \$ 3,071,852 | \$ 2,689,435 | \$ 137,701 | \$ 171,080 | 22.31 | 15.72 | \$ 5,287,148 | \$ 5,076,670 | \$ 2,241,086 | \$ 2,313,215 | 2.36 | 2.19 |
| All firms | \$ 89,001,908 | \$ 75,142,899 | \$ 4,391,305 | \$ 4,377,566 | 20.27 | 17.17 | \$ 106,332,834 | \$ 97,102,977 | \$ 56,659,105 | \$ 59,944,491 | 1.88 | 1.62 |

Pricing: A Wrap

- As companies start to report their first quarter earnings, you are starting to get a glimpse of the damage created by the crisis and my guess is that you will start to see more analysts and companies start to forecast forward numbers.
 - For those companies where forward earnings are positive, you can switch to forward PE ratios, but expect these numbers to be much, much higher than historical norms.
 - For those companies that have negative forward earnings, you will see revenue multiples or creative variations on future earnings.
- Later this year, as companies report numbers for the second and third quarters of 2020, the trailing operating numbers will finally catch up with the crisis, and you may be able to shift back to trailing multiples.
- Put simply, if you are abandoning or refusing to do intrinsic valuation, because you feel uncomfortable with having to make assumptions, the same uncertainty is going to pervade your pricing as well.