

FINANCIAL COURSE SERIES “STOCK AND INVESTMENT” LECTURE NOTES (1)

STOCK, COMPANY, AND VALUATION MODEL BASED ON INTEREST RATE



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Interest Rate: Time Value of Money



- Suppose you borrow a \$100 today from your friend. You agree to repay him \$105 in one year. The **interest rate** is 5%.

INTEREST = TIME VALUE OF MONEY

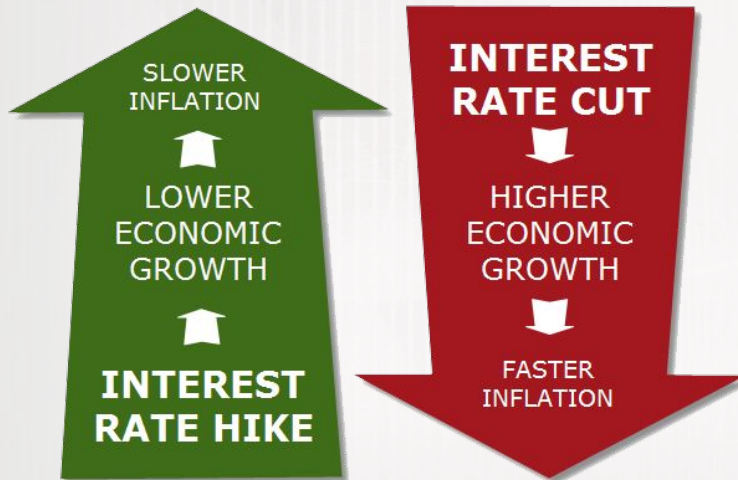
$$P = P_0 (1 + r)^n$$

Why Money has Time Value?

- Risk of default;
- Inflation;
- Loss of convenience or opportunity;

Nature of Interest Rate

- Linked to a specific time period;
- Can be compounded;
- Related to quality of borrower;



There exists a **risk-free interest rate**, like a bank deposit for individuals, or federal treasury note guaranteed by US government. This is the minimum return you can achieve with your money.

Case Analysis: Open a Business



- You decide to open a business, and you think a lemonade stand in the neighborhood is a good idea;
- You estimate the business needs \$100 to start with;
- You estimate it will make \$20 a year.

If current market interest rate is 5%, the business has to make more than \$5, because otherwise you will deposit the money into a bank.



COMPANY

is a system organized and operated intending to make profit higher than the prevailing benchmark interest rate.

Case Analysis: Open a Business



- **Where to get the \$100 to start your business?**
 - Option 1: You have that much saving yourself;
 - Option 2: Borrow from your mom / dad;
 - Option 3: You invited 4 friends, each of you pay \$20;
- Everyone has a ownership of 20% of the new business;
- **How to prove that 20% ownership?** The new business issues 100 stocks, each has a face value of \$1. Each of you own 20 shares of stock of the new company.



STOCK

means OWNERSHIP of a company, including (1) its current assets; (2) future income and (3) Rights of management.

Case Analysis: Open a Business



- **What is the value of your stock?**

If the new business proved to be earning \$20 a year consistently, or \$0.2 per share, then someone may be willing to pay you for: $\$0.2 / 0.05 = \4 (Think about why?) Because for him, this is equivalent to deposit money into a bank with a risk-free interest rate of 5%.

- **BUT HE IS NOT GOING TO PAY THAT MUCH, BECAUSE OF THE RISK.**

He probably would pay: $\$0.2 / 0.08 = \2.5 a share as he asking 3% as additional risk. He probably would pay: $\$0.2 / 0.02 = \10 a share if he is looking a growth of your business and willing to give you 3% as discount.

EPS and P/E Ratio

EPS
(Earning Per Share)

$$P = \frac{EPS}{R} \quad R: \text{Expected Return Rate}$$

P/E Ratio
(price/earning)

$$\frac{P}{E} = \frac{1}{R} \quad R: \text{Expected Return Rate}$$

$$R = r_{\text{market}} + r_{\text{risk premium}} = r_{\text{risk-free}} + r_{\text{market-risk premium}} + r_{\text{stock specific risk premium}}$$

Expected Return	2% (More Growth)	5% (market rate)	8% (More Risk)
EPS (Earning Per Share)	\$0.2	\$0.2	\$0.2
Stock Price	\$10	\$4	\$2.5
P/E Ratio	50	20	12.5

How much your stock is worth:

- Capability to make profit;
- Possibility you guys mess up...

**INTEREST RATE, OR PE RATIO,
IS THE PRICE TAG OF STOCKS.**

P/E Ratio is the “Price Tag” of a Stock

PE Ratio (Price-to-Earnings)

$$PE = \frac{\text{Stock Price}}{\text{Earnings Per Share}}$$

Trailing P/E Ratio (TTM)

Based on past 12-month earnings

Forward P/E Ratio (FWD)

Based on the prediction of future 12 months

Shiller P/E Ratio (CAPE)

Based on the average past 10 years earning

Apple Inc. (AAPL)

NasdaqGS - NasdaqGS Real Time Price. Currency in USD

★ Add to watchlist

127.45 +2.48 (+1.98%) **127.50** +0.00

At close: 4:00PM EDT

After hours: 4:07PM EDT

Summary Company Outlook + Chart Conversations Statistics

Previous Close	124.97	Market Cap	2.127T
Open	126.25	Beta (5Y Monthly)	1.20
Bid	127.42 x 2200	PE Ratio (TTM)	28.65
Ask	127.43 x 900	EPS (TTM)	4.45
Day's Range	125.85 - 127.88	Earnings Date	Jul 28, 2021 - Aug 02, 2021
52 Week Range	75.05 - 145.09	Forward Dividend & Yield	0.88 (0.70%)
Volume	77,970,942	Ex-Dividend Date	May 07, 2021
Avg. Volume	104,435,795	1y Target Est	159.74

Fair Value ⓘ +

40.06

Overvalued

-12% Est. Return

Related Research ⓘ +

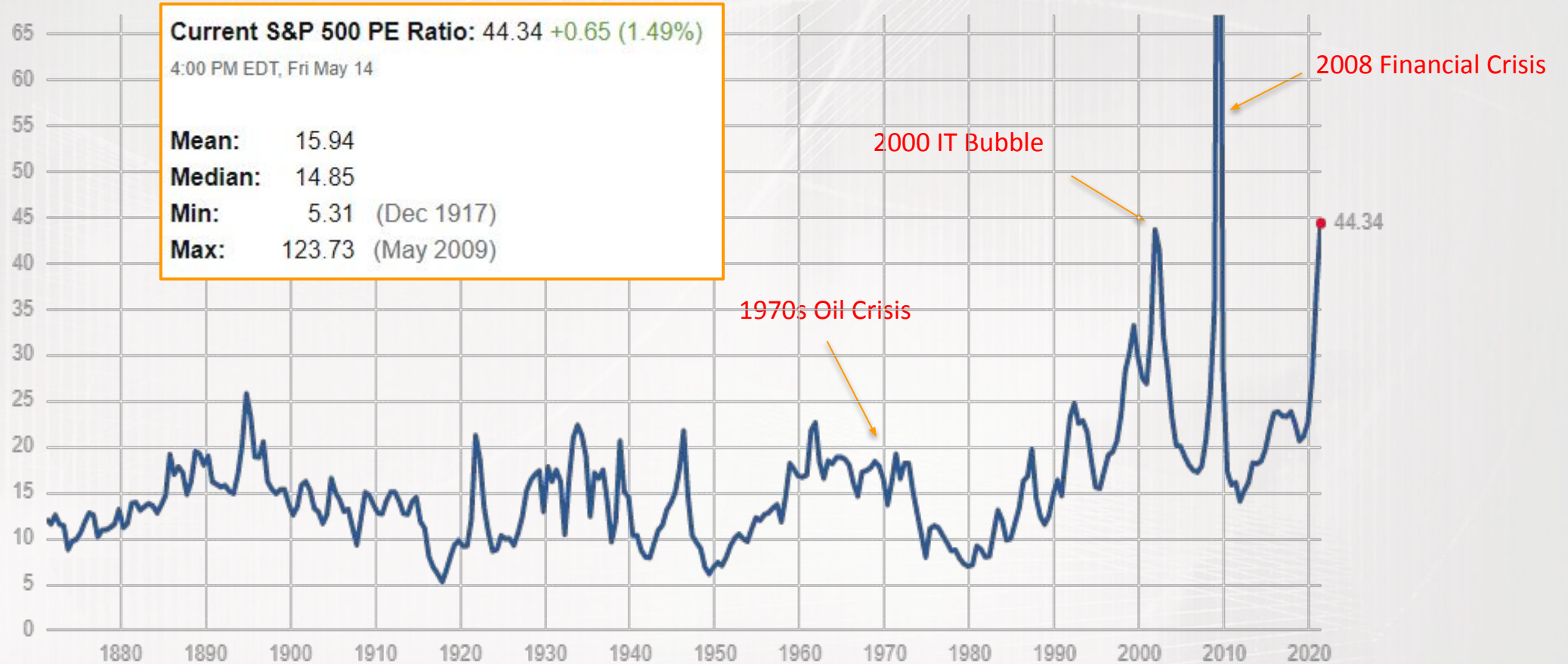
📄 Analyst Report: Apple Inc.

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1 / 28.65 = 3.49%

“P/E Ratio” indicates how expensive a stock is.

CURRENT AND HISTORICAL MARKET P/E (SPY 500)

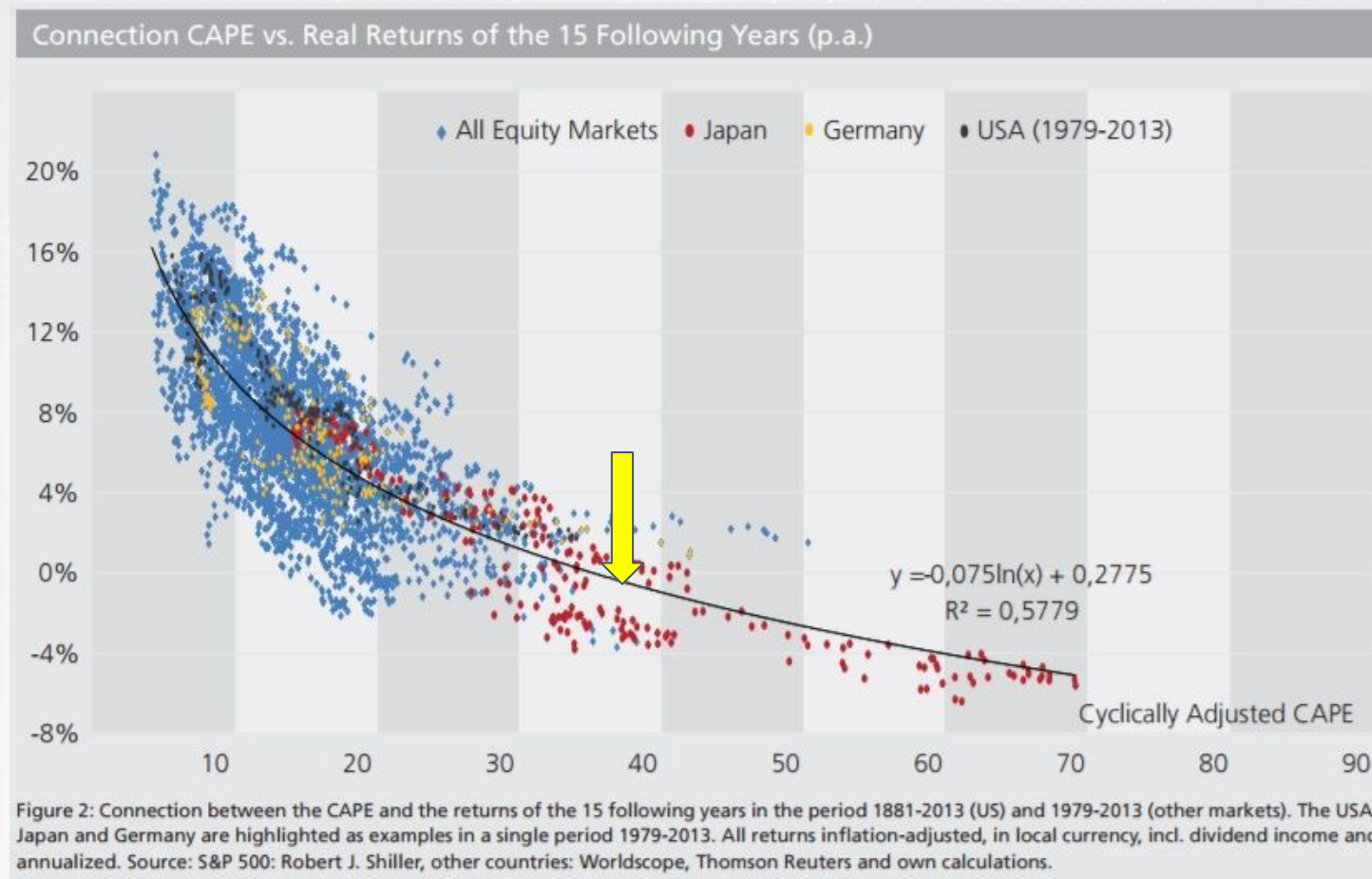


Current market P/E is 44.34 seems to be at a significantly higher level than historical average.

<https://www.multpl.com/s-p-500-pe-ratio>

Market is paying 2.26% rate (1/44.34) to SPY.

LOW P/E MEANS CHEAPER STOCK AND HIGHER RETURN




For general market, a lower P/E ratio means a cheaper stock market and a higher expected return. The CAPE ratio at 35 means a ZERO RETURN.

P/E RATIO FOR DIFFERENT INDUSTRIES



4:00 PM EDT, May 14, 2021

Sector	Number of Stocks	Shiller P/E	Regular P/E
Energy	<u>23</u>	20.50	-9.80
Financial Services	<u>68</u>	22.90	22.10
Consumer Defensive	<u>35</u>	27.50	25.50
Utilities	<u>28</u>	30.50	28.10
Industrials	<u>73</u>	33.30	74.90
Healthcare	<u>63</u>	36.30	35.30
Basic Materials	<u>21</u>	41.60	53.00
Technology	<u>72</u>	43.40	34.20
Communication Services	<u>26</u>	51.00	40.00
Real Estate	<u>29</u>	52.30	53.10
Consumer Cyclical	<u>66</u>	56.60	92.40
S&P 500	<u>500</u>	37.2	44.4

 Download Historical Data

https://www.gurufocus.com/sector_shiller_pe.php

This is because the nature of different business. Easy to flop, heavy capital investment, and low growth industries have lower P/E, like financial and energy.

Critical for a Company: EPS and P/E Ratio



127.45 +2.48 (+1.98%)	127.50 +0.00			
At close: 4:00PM EDT	After hours: 4:25PM EDT			
Summary	Company Outlook	Chart	Conversations	Statistics
Previous Close	124.97	Market Cap	2.127T	
Open	126.25	Beta (5Y Monthly)	1.20	
Bid	127.49 x 1400	PE Ratio (TTM)	28.65	
Ask	127.44 x 3000	EPS (TTM)	4.45	
Day's Range	125.85 - 127.88	Earnings Date	Jul 28, 2021 - Aug 02, 2021	
52 Week Range	75.05 - 145.09	Forward Dividend & Yield	0.88 (0.70%)	
Volume	77,970,942	Ex-Dividend Date	May 07, 2021	
Avg. Volume	104,435,795	1y Target Est	159.74	
Fair Value ⓘ +	40.06	Overvalued	Related Research ⓘ +	
-12% Est. Return		Analyst Report: Apple Inc.	Analyst Report: Apple Inc.	

3,222.90 +61.43 (+1.94%)	3,223.30			
At close: 4:00PM EDT	After hours: 4:25PM EDT			
Summary	Company Outlook	Chart	Conversations	Statistics
Previous Close	3,161.47	Market Cap	1.625T	
Open	3,185.56	Beta (5Y Monthly)	1.15	
Bid	3,218.30 x 1300	PE Ratio (TTM)	61.32	
Ask	3,227.98 x 1000	EPS (TTM)	52.56	
Day's Range	3,183.41 - 3,228.86	Earnings Date	Jul 28, 2021 - Aug 02, 2021	
52 Week Range	2,330.00 - 3,554.00	Forward Dividend & Yield	N/A (N/A)	
Volume	2,970,509	Ex-Dividend Date	N/A	
Avg. Volume	3,725,974	1y Target Est	4,213.71	
Fair Value ⓘ +	1,959.95	Near Fair Value	Related Research ⓘ +	
22% Est. Return		Analyst Report: Amazon.com Inc.	Market Update: AMZN, AVY, FHI...	
View details		View more		

Market is paying much higher price to AMZN.



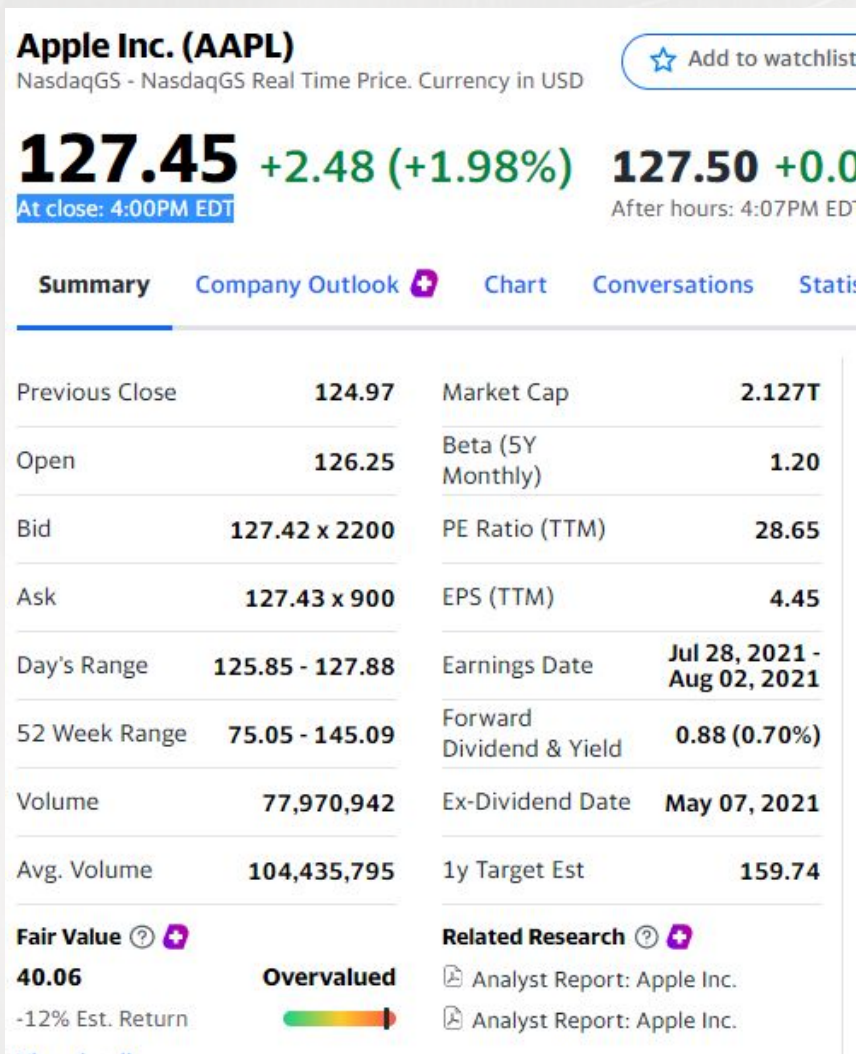
P/E Ratio and Growth Opportunity



VALUE VS GROWTH

[Finance.yahoo.com](https://finance.yahoo.com)

EARNING IS NOT YIELD (DIVIDEND)



Company's earnings typically way more than the dividend payout ratio (or yield), especially for the growth companies that have higher P/E ratio.

Question: Is high dividend a good thing?

Answer: mostly not. A higher rate to distribute your profit (dividend or yield) typically means lower growth opportunity.

OTHER PARAMETERS FOR COMPANY

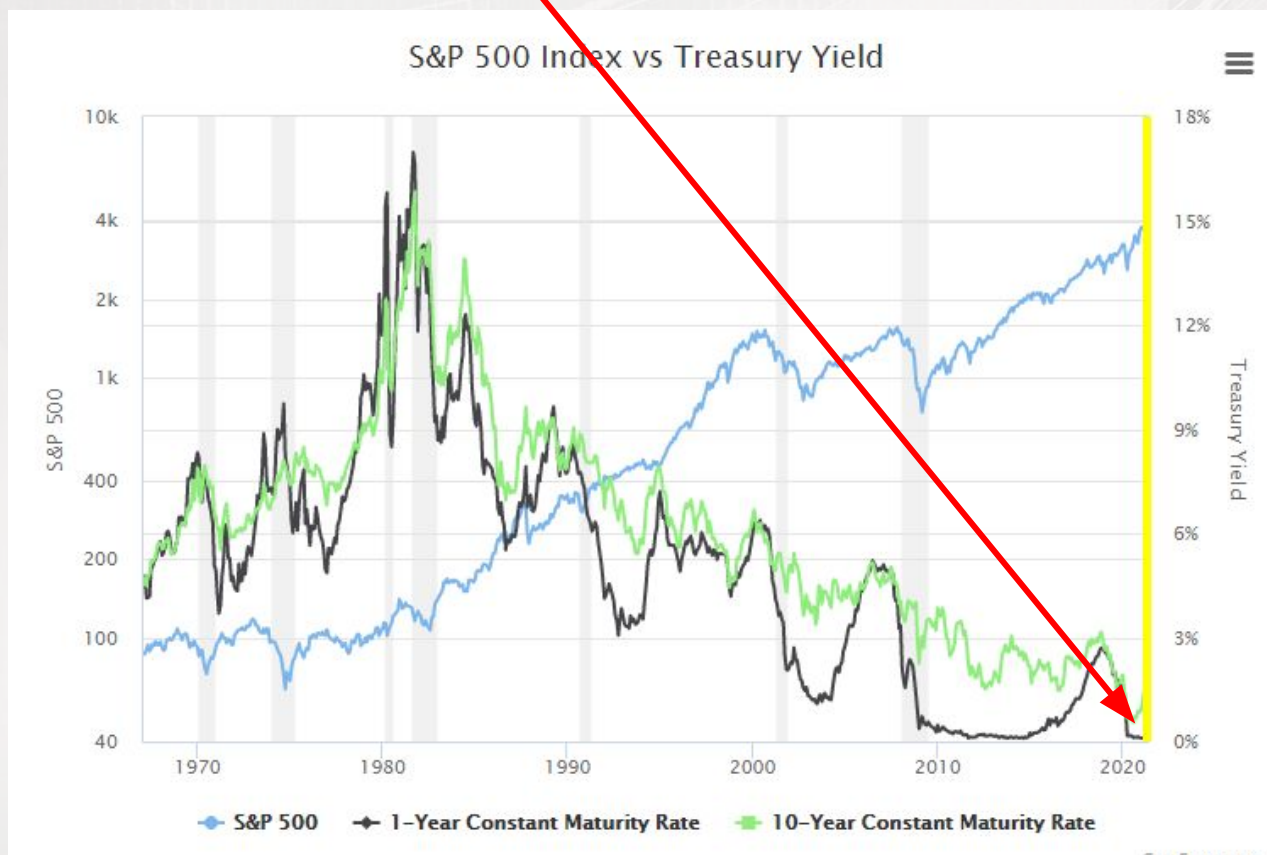
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EPS (Earning Per Share)	\$0.2	\$0.2	\$0.2
Stock Price	\$10	\$4	\$2.5
P/E Ratio	50	20	12.5
Book Value	\$100 (\$1/Share)	\$100 (\$1/Share)	\$100 (\$1/Share)
Price / Book Value	10	4	2.5
Market Cap <i>(share price x total shares)</i>	\$1000	\$400	\$250
Dividend to Pay	\$0.1	\$0.1	\$0.1
Yield (Dividend Ratio)	1.0%	2.5%	4.0%

Value Stock: Low P/E ratio, low P/B, high yield;
Growth Stock: High P/E ratio, high P/B, low yield

BENCHMARK INTEREST RATE: 10-YEAR TREASURY BOND RATE

$$R = r_{market} + r_{risk\ premium}$$

$$= r_{risk-free} + r_{market-risk\ premium} + r_{stock\ specific\ risk\ premium}$$



10-Year Treasury Bond rate is the basic RISK FREE rate. The lower and lower interest rate indicates the sufficient supply of capital money. A low interest rate is necessary to support the high pricing of stock market.

https://www.gurufocus.com/yield_curve.php

HOME WORK AFTER CLASS 2

1. Find the company names and stock tickers of all DOW 30 companies, top 30 of SPY 500 companies, and top 30 of Nasdaq companies; (according to market size, and many of them are duplicates) (These stocks will be the major stocks to be traded in this class)
2. For the above companies in Question 1, find their critical company information: Market Cap, EPS, P/E, and yield ratio. Then list them in the order of P/E ratio. Think about how they reflect the different industry aspects.
3. Plan your trade according to P/E ratio - think about your style. You may look value or may look growth. Try some trade and see how these stocks behave under the current volatile market.

GOOGLE IS YOUR BEST FRIEND!!!

