PROJECT 01
DISCOVER STOCKS

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PROJECT SCOPE: DYNAMIC DASHBOARD

Market Capitalization since 2006

YoY Historical Performance

Yield Curve Inversion Leading Indicator for Recessions → Sector Performance

MARKET CAP

- Tech sector on the rise from 2015 and dominating top 3 positions.
- Apple continues to stay at the top from 2010.
  - 2009 - $189B to 2022 - $2.95T
- Amazon exceptional growth 2015 – $323B to 2022- $1.65T.
- Sustainable Energy awareness on the rise in comparison with Oil and Gas industries.
  - Tesla – Market Cap from 2020
  - Exxon Mobile 2006 -2016
- Subprime mortgage crisis and recession between 2007 to 2010.
  - Bank of America – 2006
  - Citi group

YEAR-OVER-YEAR PERFORMANCE

Highlights

- In 2008 many stocks experienced a negative rate of change than in previous years
  - Recession
- Due to the impact of COVID in 2020, many stocks experienced a slower rate of growth, but the rate was still significant
- From 2006 till 2021 we see the continued fast paced growth of tech and tech related stocks
  - Tesla
  - Amazon
  - Facebook (Meta)
  - Nvidia

YIELD CURVE INVERSION → BEST PERFORMING SECTORS

- The yield curve has inverted before every recession that has taken place since the 1970s.
- Historical analysis comparing the 10YR/2YR and 10YR/3mo inversions over the last 15 years and subsequent performance of S&P 500 sectors.
- Typically, best performing sectors during a recession include:
  - Healthcare
  - Consumer Staples
  - Utilities
- '08-'09 Recession vs COVID-19 Recession.
- Last 10YR/2YR inversion took place April 1st, 2022.

PROJECT DIFFICULTIES

- Backfilling data was an obstacle we had not foreseen or did not realize the severity of its impact on the percent change operation in python/pandas.
- Compiling the top 10 companies in terms of market capitalization. At first tried an API but then manually compiled.
- Had challenges with the dashboard in general where the rendering of the plots were inconsistent across computers (resource / panel constraint?).

DATA COLLECTION & CLEANSING

- Keep the data collection limited but still gain insight at a macro level. We did this my limiting the analysis of the companies to top 10 by market cap for the years 2006 – 2021. This way we would cover the past losers & the recent winners as well.

- The union of this list of companies were done manually & we also picked up the ETFs per sector for our analysis. The data was sourced for the time period between 2006 & 2021.

- We used yfinance to primarily source all this data. To avoid the lack of data of non-US equities we decided to stick only to the US based companies.

- Since this is a stale data, we wanted to avoid downloading this data repeatedly & stored it in a csv which was then used for the subsequent analysis..

- This being a large time period, we had to deal with lack of data for recently IPOd companies. We used *fillna(method='backfill')* to make sure the pct_change() values are sane for the missing data.

PROJECT IMPROVEMENTS/ EXPANSION IDEAS

- If we had more time, it would have been nice to extend our analysis back to the 1970s since the recession that occurred at the end of that decade will be most like the next recession we will endure in respects to inflation.
- Dynamic Event-based filters to help the user analyze the stocks during macro events (like 08 Recession, Presidential Elections, Brexit & COVID).
- Sentiment Analysis on stocks.
- Monte Carlo simulation for Portfolio Analysis.
- Apply Company Earnings and predict performs for top trending stocks.

QUESTIONS?