Stock Analysis
using CAPM and Sentiment Analysis

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Introduction

- This project will determine if a particular stock is worth investing in depending on the user's entered market return
- Running that through our function, the user will get a VCS (value of common stock) which they can then compare to the actual stock price to determine if the stock is investable for them
- Another measurement we'll use is NLP sentiment, which is mining for meaningful patterns from text data
- It'll help us understand the "general attitude" of the stock which can then help us gather insightful information given the context
- We've chose Intel because it tells an interesting story

VCS calculation

Vcs - *Value of common stock*: what the value of the stock should be from our inputted numbers

DIV - *dividend payment*: what the stock pays its investors in certain intervals

Gr - *growth rate*: the percentage change of a stock price within a specific time period, calculated in the table

ROE - *Return on equity*: the profitability of a corporation in relation to stockholders' equity. The higher the ROE, the more efficient a company's management is at generating income and growth from its selling its shares.

Pr - *profit retention*: percentage of net income that is retained to grow the business

Dpr - *dividend payout ratio*: percentage of net income returned to its shareholders

B - *beta coefficient*: how likely the price of a stock/security will change in relation to movement in the market price

Rf - *risk-free rate*: interest rate an investor can expect to earn on an investment that carries zero risk, commonly equal to the interest paid on a three-month government treasury bill

Mr - *market returns*: what the user expects from the stock

Kcs/RRR - *Required rate of return of investor:* minimum return an investor will accept for owning stock, as compensation for a given level of risk associated with holding the stock.

VCS calculation (2)

- We chose the CAPM model to find VCS using the following equations:
  - $\text{Stock Return} = \alpha + \beta_{stock} R_{market}$
  - $\mathbf{E(R)} = RFR + \beta_{stock} \times (R_{market} - RFR)$
- For example if this is run for INTC, using 3% as mr we get the following:
- ```
  Enter a number to be used as market return: 3
  [1] "Using an expected market return of 3 % the VCS of the stock would be: $ 48.36"
  ```
- The VCS for this investor is $48.36 which means if the actual value of intel is within 1 standard deviation the stock is worth investing in:
-

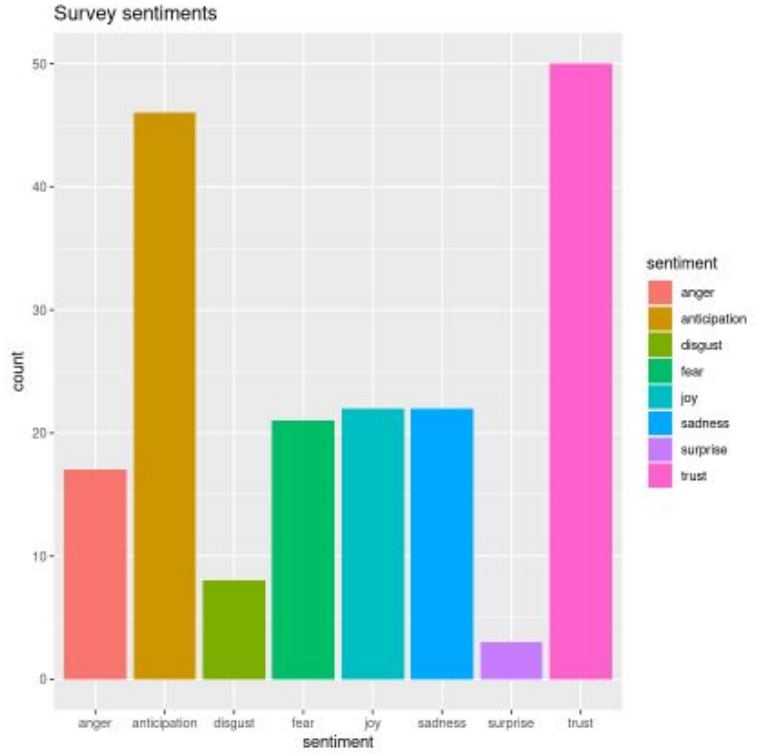
SD	-2 SD's	-1 SD's	Average (52 week)	+1 SD's	+2 SD's
32.64%	$14.69	$28.51	$42.33	$56.15	$69.97
  ```

VCS calculation (3)

- Anything less than $42 would be a fair price and anything near the 1st standard deviation of $56 would also be a relatively fair price
- **Intel Corporation (INTC)**
  NasdaqGS - NasdaqGS Real Time Price. Currency in l

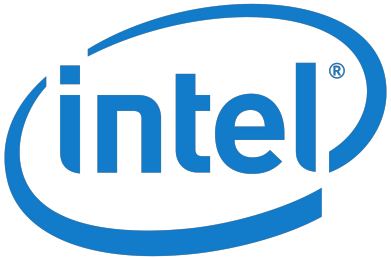
  53.62 -1.42 (-2.58%)
- The actual price of intel is $53.62 and our price to invest using 3 mr was $48.36
- Which means if the investor is satisfied with a market return of 3% then they are within their means to invest

NLP Sentiment



NLP Sentiment (2)

- The most common sentiment was trust and anticipation
- Although fear and sadness share a close second place
- The focus on the articles aside from the company's name was related to manufacturing concerns as there is a chip shortage due to disruptions in China
- This is supported by the wordbank: “amd, share, first quarter, and most importantly “decline share”
- Leading to Intel being in a precarious position where some analysts are predicting the stock price will decrease



Conclusion

- The VCS shows mathematically that Intel is a fairly investable stock (mr:3)
- The most common sentiment regarding Intel was trust and anticipation
- However these aren't the only factors determining Intel's stock price
- When the world cloud is analyzed there are clear concerns with the future regarding chip shortages with words such as: semiconductor, Taiwan, manufacturer
- Therefore it's important to recognize that exogenous variables can greatly offset the accuracy of the VCS calculation
- So although the VCS calculation is fairly accurate, it's still vital to make informed decision and not rely on numbers alone

Conclusion (2)

- Link