

Are CEOs Compensated on The Contribution they Make to the Success of their Companies?

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- Peta Roberts July 2019

An analysis using API data on Jupyter notebooks with python libraries

Questions Asked

What is the range of CEO Salaries?

For Fortune 500 companies, are CEOs compensated for their contribution to the success of their company?

What other factors explain CEO Salaries?

1. Range of CEO Salary (across 2700 companies)

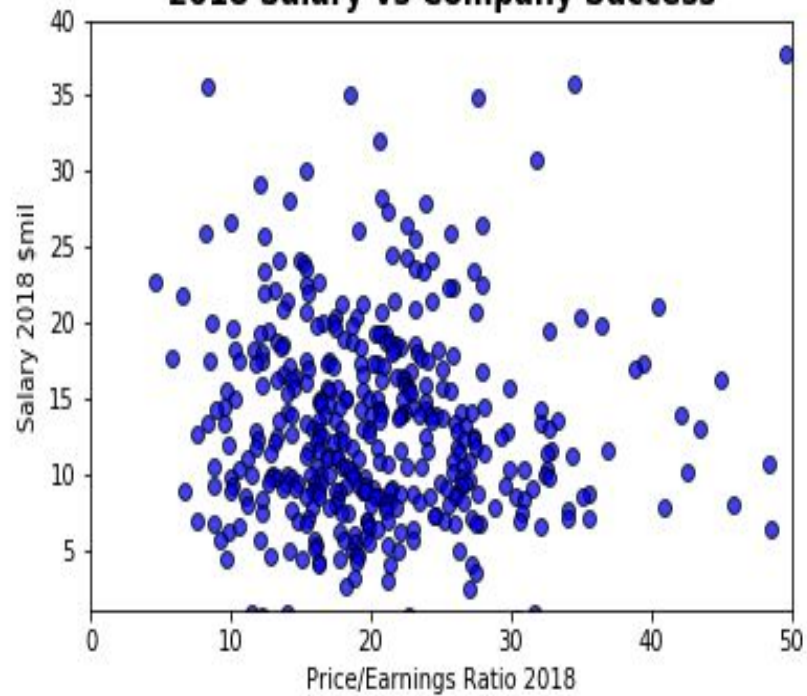
- Average salary is \$7.4 million
- Warren Buffet, Berkshire Hathaway, is paid 5% of average
- Elon Musk gets paid \$2.2 billion, ten times more than the second highest paid CEO , Patrick Smith
- Patrick of Axxon Enterprises is paid \$246 million, twice as much as 3rd highest paid CEO, David Zaslav of Discover
- Jack Dorsey (Twitter, Square), Larry Page (Alphabet), Nicholas Woodman (GoPro) are paid \$1

2. Are CEOs compensated for their contribution to the success of their company?

To compare companies with different stock prices, and various number of stocks, I used the Price/Earnings ratio which uses:

1. Stock price
2. Number of shares issued
3. Earnings.

2018 Salary vs Company Success



Making Sense of the Scattergram with Line of Best Fit



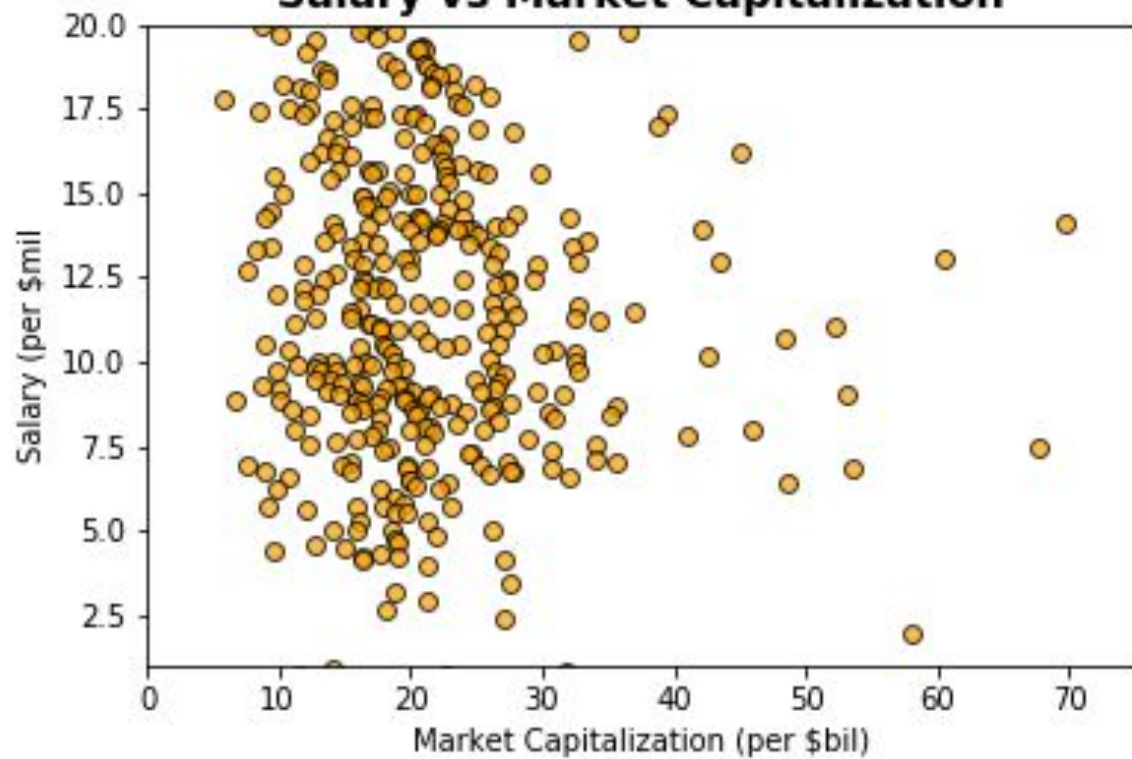
The Regression graph shows no real relationship between CEO Salary and their contribution to the success of their company as measured with the price/earnings ratio

3. What other factors explain CEO Salary?

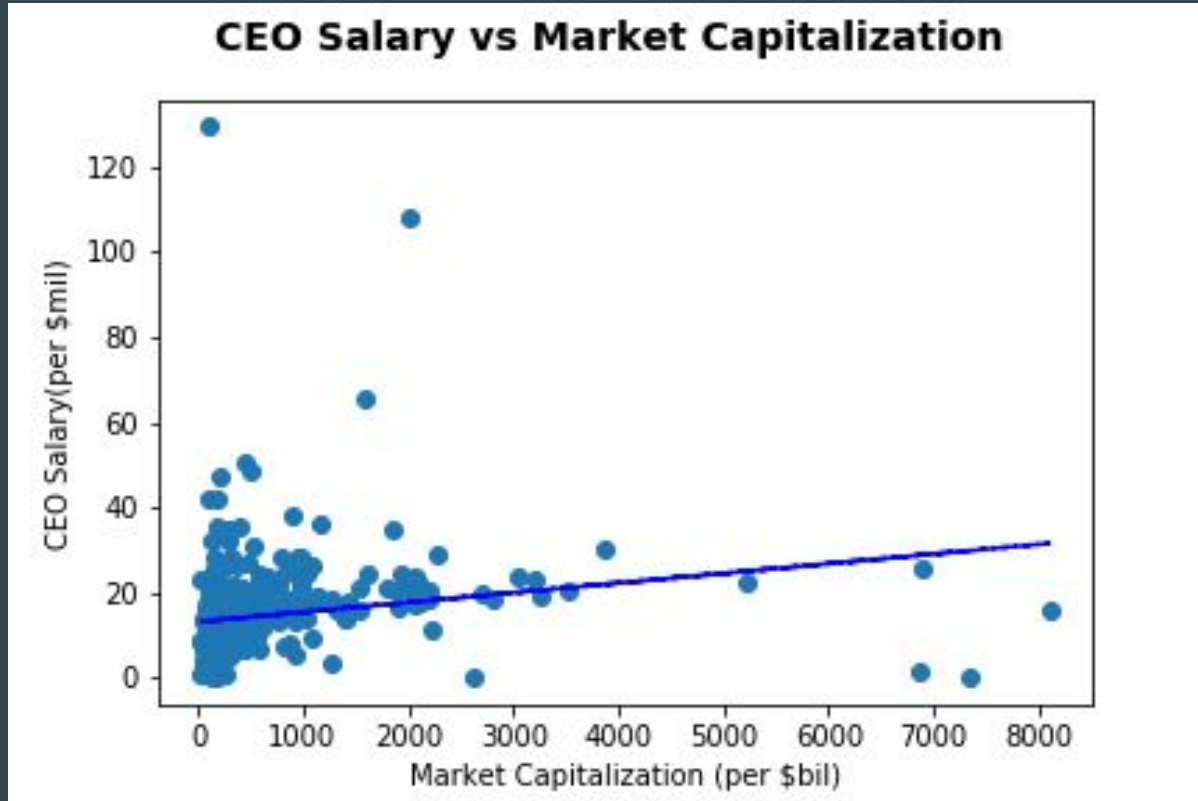
Let's look at market capitalization - maybe CEOs are paid big salaries depending on how big their company is

Then let's look at what industry they are in - maybe we can see industry trends

Salary vs Market Capitalization



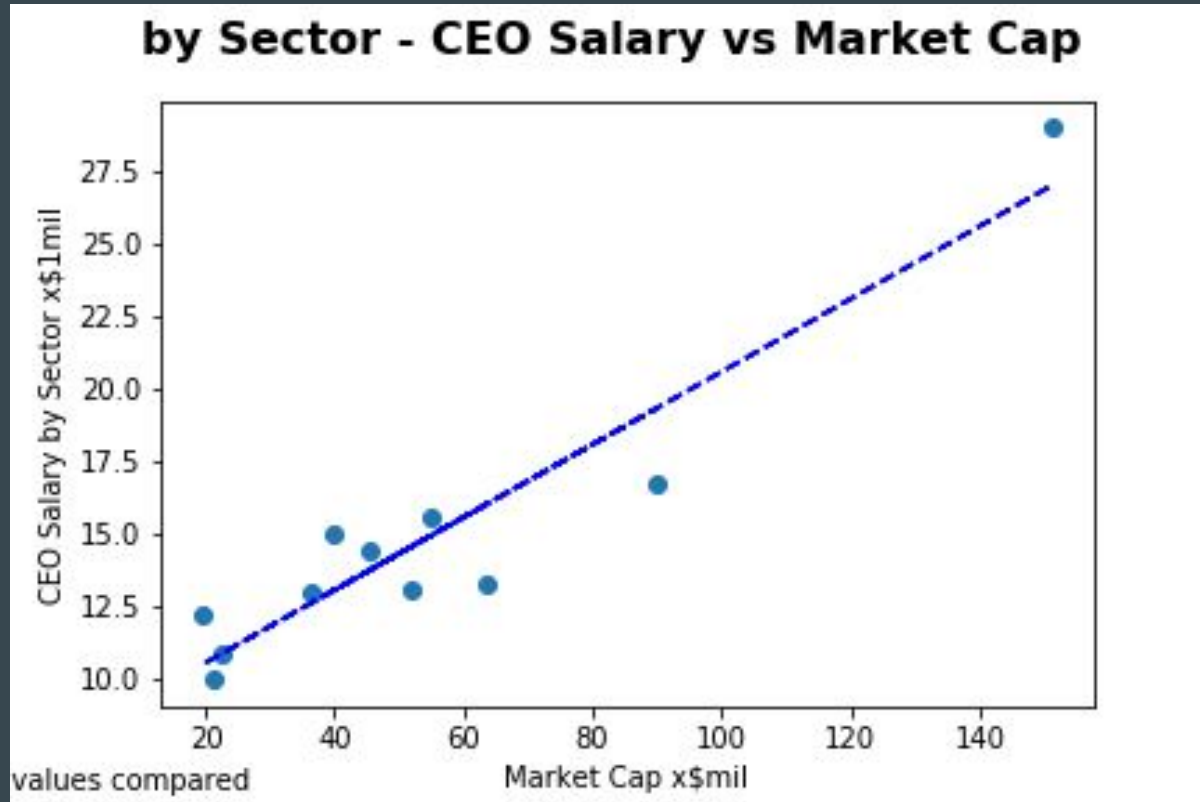
Making Sense of the Scattergram with Line of Best Fit



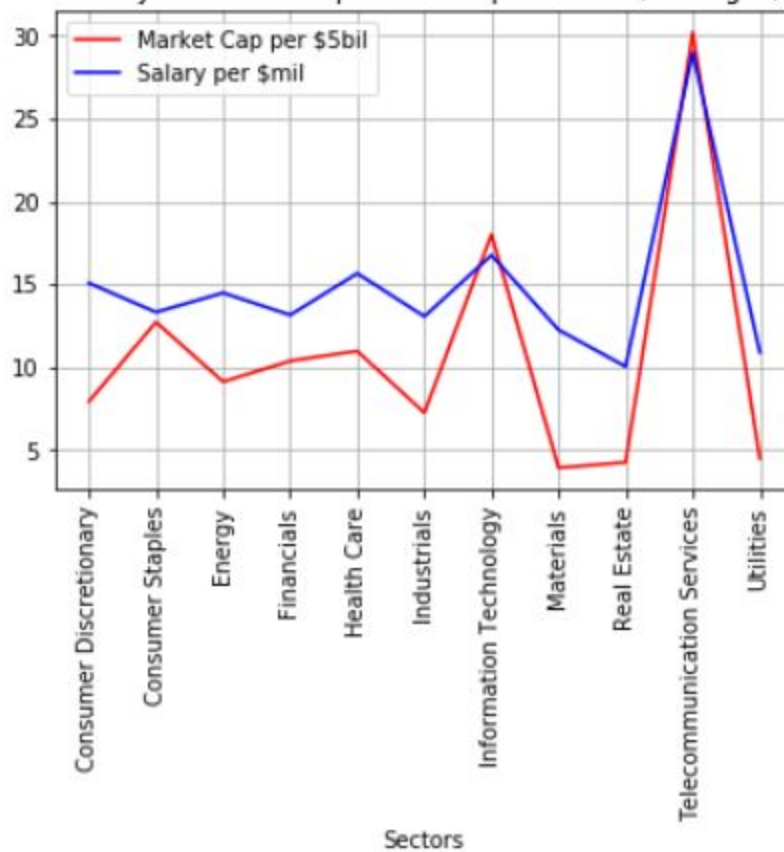
There is a better relationship between CEO salary and market capitalization, than there is with price/earnings ratio

Are there industry sector trends? Let's group companies by sector and take a look at line of best fit

Making Sense of the Scattergram with Line of Best Fit



Salary vs Market Capitalization per Sector (Averages)



Conclusion

Price/Earnings ratio is not a good variable that explains CEO salaries.

Rather, market capitalization better explains CEO salaries - the bigger the company, generally the higher the salary.

And CEO salary seems to be correlated with industry sector. The ttest has a p value of 0.006, much less than 0.05

Limitations on Project

1. Data collected for 2018, but exact periods during the year the datasets were collected do not match up
2. Although I have data on 2700 companies using AFL-CIO data, the Fortune 500 dataset was used for most of the analysis for the 'industry sector field'
3. Doesn't include government sector, small and privately held businesses, so maybe CEO compensation is based on entirely different factors

References

For company information with PE earnings, data was from DataHub.

<https://datahub.io/core/s-and-p-500-companies-financials/consituent-financials.csv>

CEO Salaries

AFL-CIO Executive Paywatch data for 2018

<https://aflcio.org/2018/5/22/executive-paywatch-2018-gap-between-ceo-and-worker-compensation-continues-grow>

Data on Fortune 1000 companies

<https://www.kaggle.com/Eruditepanda/fortune-1000-2018>