

Science & Sentiment

A Quantitative Analysis of Warren Buffett's CEO Letters

The CEO's letter to shareholders is the Chief Executive's opportunity to speak to shareholders about the performance and prospects of the business in his or her own voice. Perhaps the most read of all CEO letters is the annual letter from Warren Buffett to the shareholders of Berkshire Hathaway. We wondered what draws people to Buffett's letters.

As part of an ongoing project exploring the application of a variety of data science disciplines to the field of governance, we analyzed Buffett's annual letters using a technique called natural language processing. This piece is one of a series in which we will look at the many ways machine learning and other new technologies can augment analysis and uncover new insights.

Understanding CEO Sentiment with Natural Language Processing

Natural language processing is the use of computer science to interpret human language. It allows us to analyze and process large amounts of text with objectivity and efficiency. Perhaps the best known application of natural language processing is sentiment analysis. Sentiment analysis guesses the human emotion expressed through text or speech, most commonly assessing positivity versus negativity. For example, sentiment analysis might be used to assess customer feedback forms to understand how customers are feeling about a service without reading every form. We employed sentiment analysis and other natural language processing techniques in an effort to understand just what makes one of the world's most popular CEOs so compelling.

In order to create a point of comparison, we also analyzed the shareholder letters of Alphabet Inc. (GOOG) (Google's parent company), General Electric Co. (GE), Johnson & Johnson (JNJ), JPMorgan Chase & Co. (JPM), and Chubb Ltd. (CB), in addition to the Berkshire Hathaway Inc. (BRK) letters, for the years 2008 to 2017.¹

Alphabet Inc., General Electric, and Johnson & Johnson were selected because they are U.S. conglomerates with similar size and structure to Berkshire Hathaway and therefore worthy comparators. We selected JP Morgan Chase & Co. and Chubb Ltd. because the shareholder letters written by their CEO's, Jamie Dimon and Evan Greenberg, respectively, are also well respected.

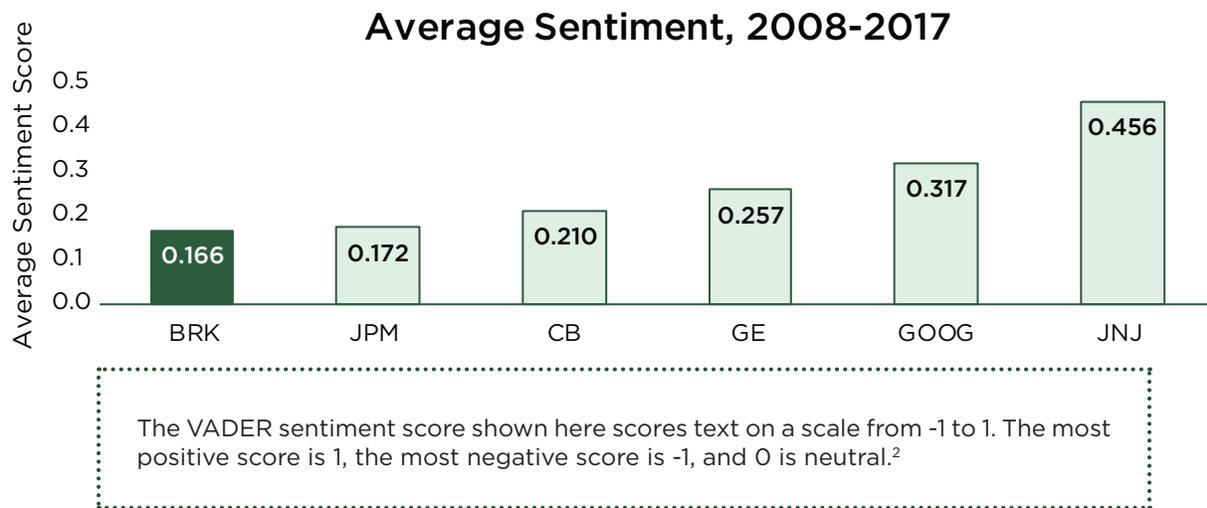
¹ General Electric's letters were written by Jeff Immelt from 2008 to 2016 and John Flannery in 2017. Alphabet Inc.'s letters are referred to as "Founders' Letters" and are written by Larry Page and/or Sergey Brin. The other companies had consistent authors over the ten years.

Length

The first observation of our study will not come as a surprise. Buffett's letters are impressively long. They are generally about 14,500 words and 30 odd pages, including tables. By comparison, the featured articles of the October 6th edition of The Economist were between approximately 1,000 and 2,500 words. Buffett's communications are about twice the length of the General Electric and Chubb Ltd. letters and 5 or 7 times the length of the Johnson & Johnson and Alphabet Inc. letters. Buffett's letters go beyond discussions of Berkshire Hathaway's financial performance. For example, it is not unusual to find paragraphs discussing new accounting principles, the state of America, and how the average person should invest.

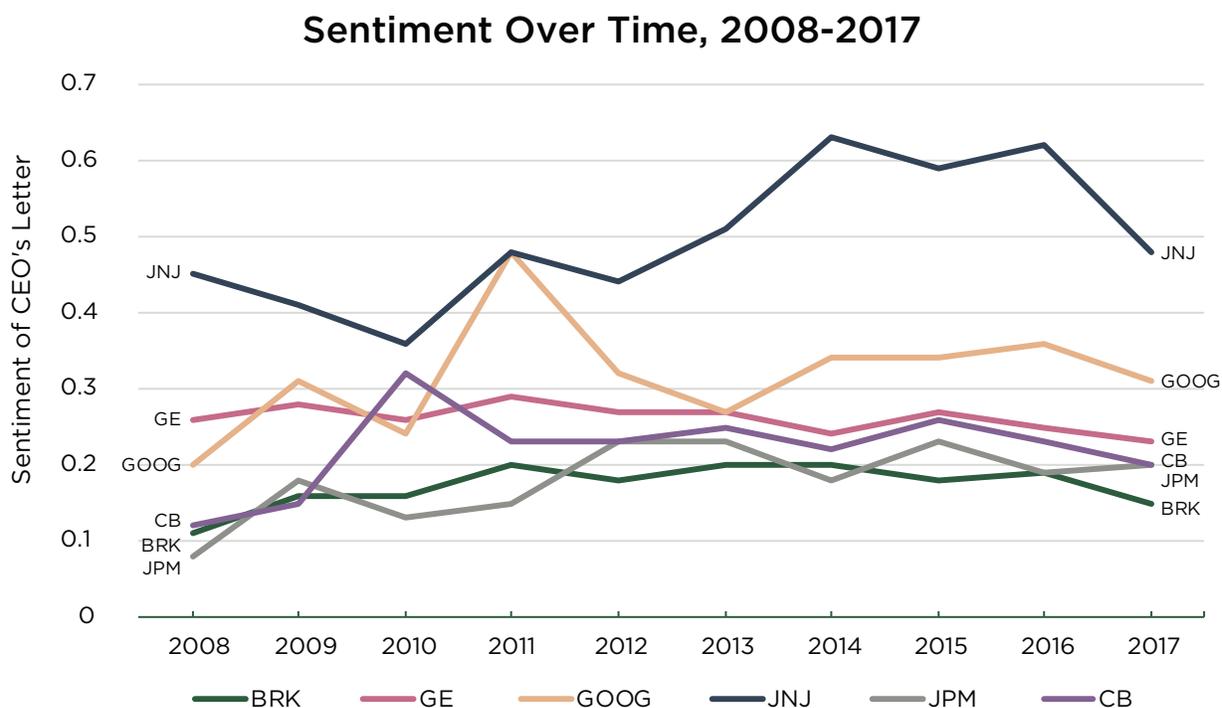
Neutrality

A unique and surprising trait of Warren Buffett's letters is the neutrality in their sentiment. Shareholder letters generally tend to take on a positive tone. Buffett's letters were the most neutral of the six letters studied, followed closely by Jamie Dimon's. Johnson & Johnson fell on the other end of the spectrum with consistently cheery letters over the ten years examined. Buffett's neutral tone might contribute to the credibility of his persona and make him appear frank.



² We relied on the VADER sentiment analysis model developed by Hunter, C.J., and Eric Gilbert. For more information please refer to the following paper:

Hunter, C.J., and Eric Gilbert. VADER: A Parsimonious Rule-Based Model for Sentiment Analysis of Social Media Text . Eighth International AAAI Conference on Weblogs and Social Media, 2014, www.aaai.org/ocs/index.php/ICWSM/ICWSM14/paper/download/8109/8122.



Share Price Correlation

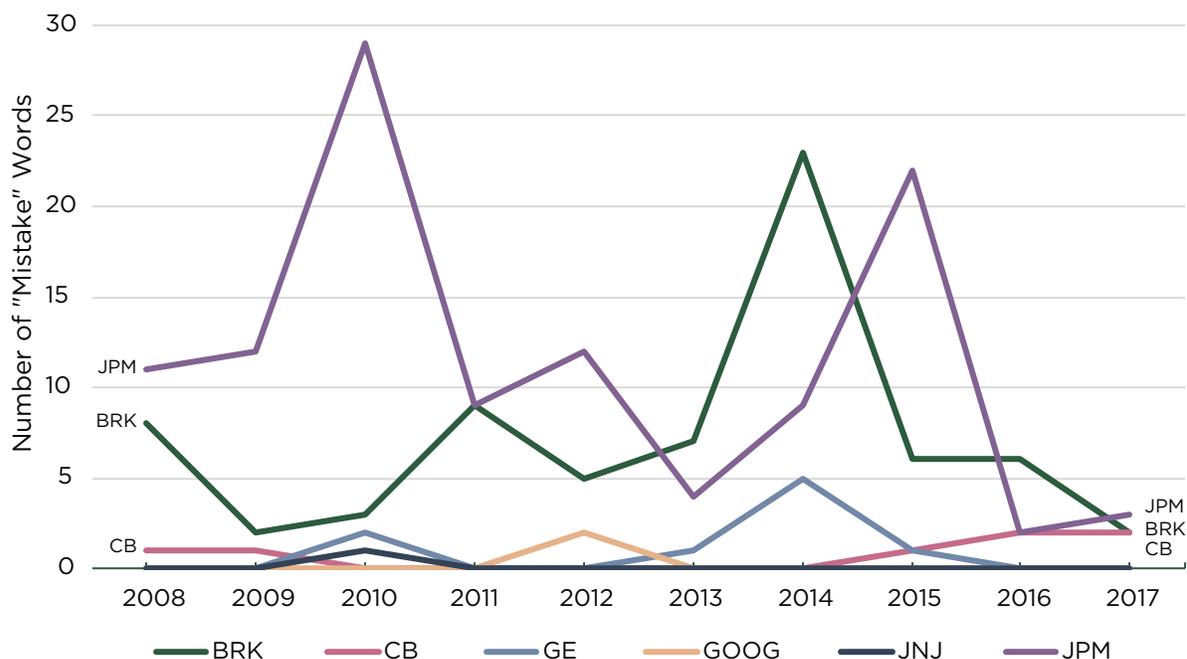
We wondered if CEO sentiment would change from year to year in accordance with company performance. To find out, we compared the sentiment of each letter with the change in the company's share price over the year.³ We found a statistically significant positive correlation between share performance and sentiment for Chubb Ltd. and JPMorgan Chase. If we extend the number of years studied to include 2007, Warren Buffett's sentiment also had a significant relationship with the share performance of Berkshire Hathaway. This is interesting because we only found evidence of this relationship for the three companies we chose as examples of effective shareholder letters. Warren Buffett, Jamie Dimon, and Evan Greenberg appear to share the tendency to adjust their tone in accordance with events that impact shareholder confidence. There is no statistical evidence that the other CEOs do the same. Shareholders may feel more inclined to trust CEOs that are candid about challenges facing the company.

Admitting their Mistakes

In the same vein, both Warren Buffett and Jamie Dimon were dramatically more likely to discuss mistakes compared to the other CEOs analysed. Buffett and Dimon used words like mistake, blunder, or error an average of more than 7 times per letter. Comparable discussions were almost non-existent in the other letters we reviewed.

³ Change in share price is calculated using the average share price for the first ten and last ten trading days of the year.

Use of "Mistake" Words, 2008-2017



Accessible Language

Buffett's comparatively accessible language may be one of many reasons people enjoy reading his letters. He used less corporate jargon and tech jargon, on a relative basis, than any other CEO by a significant margin. JPMorgan Chase had the second least corporate jargon, on a relative basis, but relied on tech jargon quite heavily. Johnson & Johnson had the highest use of corporate jargon but the lowest use of tech jargon, on a relative basis.

Praise for Senior Management

When we read a sample of Warren Buffett's letters we noticed that he lauds the accomplishments of his managers frequently and specifically, often calling them out by name. Our analysis supports that observation. Buffett uses the word manager(s) an average of 19 times a letter. JPMorgan Chase referred to managers 5 times per letter and the other CEOs referred to managers 0 to 1 times. Seventy percent of Buffett's sentences containing references to managers were positive or very positive and only fourteen percent were

From the Letters: Mistakes

"A few [operations], however - these are serious mistakes I made in my job of capital allocation - have very poor returns. In most of these cases, I was wrong in my evaluation of the economic dynamics of the company or the industry in which it operates, and we are now paying the price for my misjudgments. At other times, I stumbled in evaluating either the fidelity or the ability of incumbent managers or ones I later appointed. I will commit more errors; you can count on that. If we luck out, they will occur at our smaller operations."

— Warren Buffett, 2015

"We hope that in the future, the regulatory response to any mistakes - if and when they happen, and they will happen - will take into account the extraordinary effort to get it right."

— Jamie Dimon, 2015

negative. Based on our review of a sample of the negative sentences, none of the negative sentences were references to internal managers at Berkshire Hathaway. Warren Buffett appears to have a commendable trait of owning up to his own mistakes and focusing on the accomplishments of others.

Social Media

Anecdotally we know that Warren Buffett enjoys a great reputation. We wanted to see if that held true on the critical platform of Twitter. To that end, we collected the tweets posted from September 10th through October 17th that referred to the CEOs we studied.⁴ Over the period, there were more tweets about Buffett than any of the other CEOs. Buffett had twice as many tweets as Jamie Dimon and more than four times as many as Larry Page. The tweets about Buffett were also more positive than those about any other CEO, with the exception of Evan Greenberg. However, Greenberg had a total of just over 10 tweets in the period as compared to Buffett's 17,000, so the comparison is hardly fair. Buffett's tone and demeanour appear to be effective. His broad popularity cannot be explained solely by his financial success.

From the Letters: Praise

"USF's managers, Piet Dossche and Philippe Erramuzpe, came out of the gate fast, delivering a 40% increase in sales in 2017, during which their operation was integrated with Shaw's."

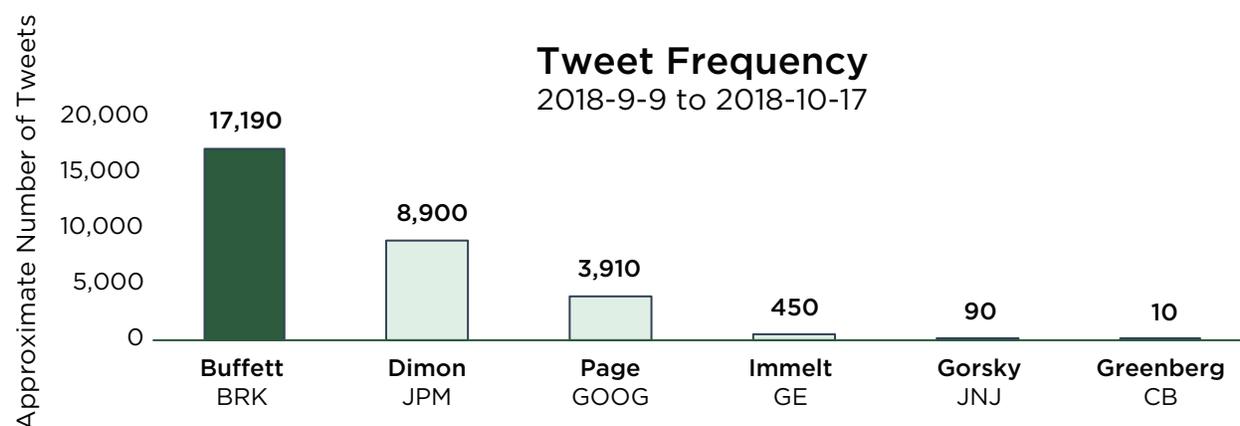
— Warren Buffett, 2017

"Under CEO Mark Donegan, PCC has become the world's premier supplier of aerospace components (most of them destined to be original equipment, though spares are important to the company as well). Mark's accomplishments remind me of the magic regularly performed by Jacob Harpaz at IMC, our remarkable Israeli manufacturer of cutting tools. The two men transform very ordinary raw materials into extraordinary products that are used by major manufacturers worldwide."

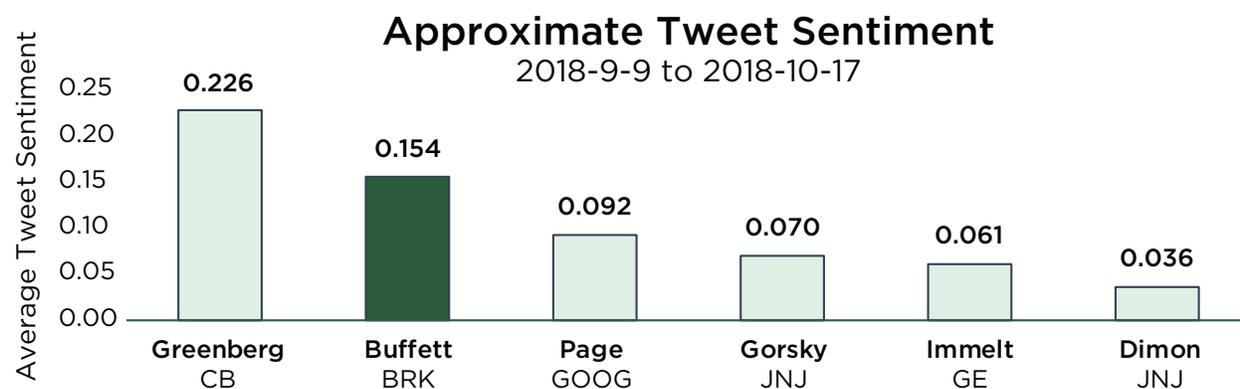
— Warren Buffett, 2015

"Dave Sokol and Greg Abel, the managers of this operation, have achieved results unmatched elsewhere in the utility industry. I love it when they come up with new projects because in this capital-intensive business these ventures are often large. Such projects offer Berkshire the opportunity to put out substantial sums at decent returns." (2008)

— Warren Buffett, 2008



4 The following twitter search terms were used: #warrenbuffett, Warren Buffett, #larrypage, Larry Page, Alex Gorsky, #alexgorsky, Jeff Immelt, @jeffimmelt, Jamie Dimon, #jamiedimon, Evan Greenberg Chubb.



Conclusions

Corporate results are communicated to shareholders through an array of regulatory filings. The CEO letter offers the opportunity to describe those results less formally and in the voice of the CEO. Shareholders and other stakeholders develop a sense for the Chief Executive's leadership style through the tone and content of those communications. In the case of Warren Buffett, the tone and content is unique and effective.

Natural language processing and sentiment analysis are useful tools for understanding the CEO's style of communication (including in comparison to others). This piece gives the CEO the opportunity to consider whether their existing style is effective in communicating his or her message or whether changes should be made.

The Intersection of Governance and Data Science

This piece is part of an ongoing series that aims to explore the intersection of data science and the latest trends and top-of-mind issues for boards, investors and governance professionals.

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