



Accounting Analytics Final Project  
ACCT 745  
Fall 2023

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December 10, 2023

## **Executive Summary**

“Accounting is fundamentally about information”(Li, 2010). This is why it is so important to understand the text within corporate disclosures. By understanding and analyzing the text, we are opened to an immense amount of information regarding markets, investments, and the economy we live in as a whole. This paper provides a financial statement and textual sentiment analysis into the corporation that has been known as Google Inc. in the past and more recently known as Alphabet Inc. All financial information was obtained through the SEC’s Electronic Data Gathering, Analysis, and Retrieval system (EDGAR), where all annual reports (10k’s) are published for public use.

First, Google’s financial statements were analyzed in order to overall determine the year over year financial health from 2004, when Google Inc. became public up until 2021. Using XBRL, information from the balance sheet and income statement from this 17 year period was populated to further analyze the company through financial ratios and Excel visualizations. Second, using Rapid Automatic Keyword Extraction (RAKE) Algorithm to extract keywords, and the NRC lexicon for sentiment analysis, the management discussion and analysis (MD&A) section was analyzed. Using these tools, the relationship and correlation between the sentiment and the company’s overall financial performance was explored through an analytic lens.

## **Introduction**

Google Inc. is an American global technology firm that first started its business as a search engine company. The company was founded on September 4, 1998 by two PhD students out of Stanford University, Larry Page and Sergey Brin. Since then, it has erupted into a multiplatform diversified company with their footprint within the many different industries. These industries include, but are not limited to, artificial intelligence, online advertising, search engine technology, cloud computing, hardware and software. By 2004, the company had gained enough capital and recognition to go public via an IPO. It is at this point that Google Inc. was able to fully expand to their ultimate capabilities.

Through the next decade, they achieved many milestones in their respective industries that had an impact on their financial health and performance within those respective time periods. It is after this decade of growth and consolidation that a huge restructuring took place in 2015. Alphabet Inc. acquired and became the parent company of Google Inc. and several former Google Inc. subsidiaries such as Google X, Google Ventures, Nest, etc. Looking back and ultimately to the future, it is safe to say that Google will continue to thrive and grow in terms of profits, workforce, and overall services and products.

### **Google Inc.'s Timeline 2004-2010**

Google made a groundbreaking announcement in 2004 with the introduction of Gmail, a revolutionary webmail service that addressed user complaints by providing ample storage, efficient search capabilities, and organized conversation threads. The platform quickly became a game-changer in the email service landscape.

The year 2005 witnessed the launch of Google Maps, significantly enhancing navigation capabilities. Additionally, Google forged a research partnership with NASA, laying the foundation for advancements in space exploration and technology.

In 2006, Google's strategic foresight led to the acquisition of YouTube, anticipating the surge in online video consumption. This move paid off, turning YouTube into a highly lucrative marketing hub and solidifying Google's influence in the digital content realm.

The year 2007 marked significant developments, as Google acquired DoubleClick for \$3.1 billion, expanding its footprint into display advertising. Simultaneously, the introduction of Street View, facilitated by camera-equipped cars, raised privacy concerns but showcased Google's commitment to innovative technologies.

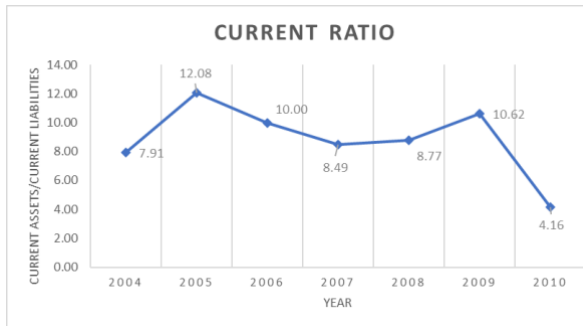
In September 2008, Google introduced the Chrome browser, offering users an improved web experience. The same year, the company released the Android operating system, a transformative platform that now powers over 2.5 billion devices with a user-friendly interface.

The recognition of Sergey Brin and Larry Page as the fifth most powerful people globally by Forbes in November 2009 underscored Google's influence and leadership in the tech industry.

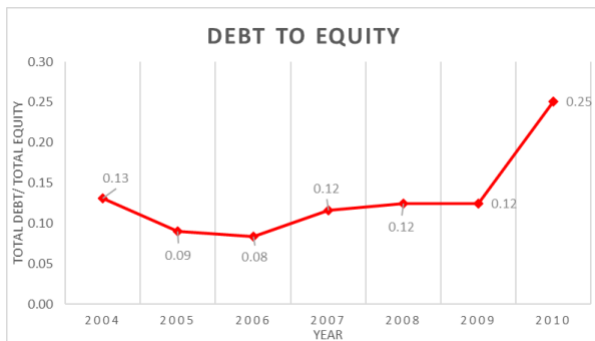
The year 2010 marked Google's inaugural foray into direct consumer phone sales with the Nexus One. Developed in collaboration with HTC and T-Mobile, the phone impressed users with its compact design, powerful camera, and revamped home screen, further establishing Google's presence in the mobile technology market.

### **Google Inc.'s Financial Health 2004-2010**

In analyzing Google Inc.'s overall financial health and performance over the 17 year period of the company being public, it made the most sense to split the financials into three periods in order to compare financials to the overall timeline of events in the company. By doing this, the story of investors, customers and the overall company can be told in an accurate way that depicts the economic, internal, and social environment that the company was truly in at the time.



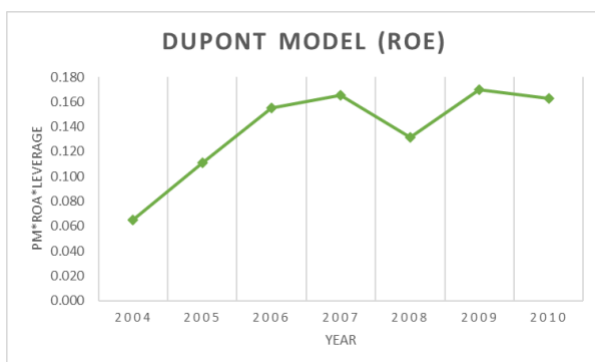
The current ratio within the growth period of the company was noticeably higher than an established company within the industry. These high ratios show that Google inc. was not using their assets in the most efficient way. There would be no need for the company to have 12 times the amount of current assets to pay off current liabilities. You can see it continues to decrease in the long run.



This time period shows a consistent debt to equity ratio with the exception of an increase in the time period of 2009-2010. This can be explained by a significant increase in securities lending payable, in connection with a program that involved a reverse repurchase agreement. This entails the sale of securities with the agreement that Google inc. will repurchase them for a higher rate in the future.



In 2006, Google Inc. was making a profit of \$0.60 for every \$1.00 of revenue. In Google's case, this is optimal as their cost of goods sold is on the lower side. In 2006, Google Inc. launched Youtube, and in 2010, Google Inc. released the Nexus One. This makes sense that this is where they would be peaking with the most profit.



The Dupont Model can be split into three parts to show what is really happening in the return on equity. As we pick apart the equation, Google Inc. has substantially become better in terms of leveraging and profit margin. The dip in 2008 can be attributed to the economy with less trust from investors.

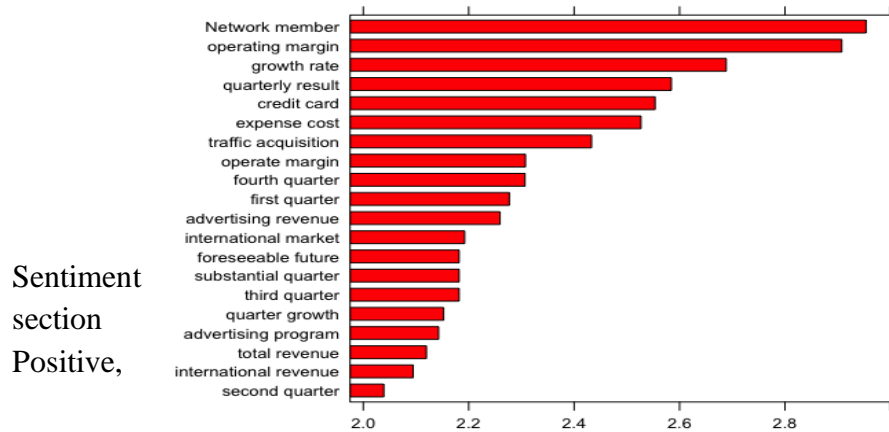
## Google Inc.'s MD&A Textual & Sentiment Analysis 2004-2010

Based on the yearly Management Discussion & Analysis, a consolidated WordCloud was created for the years 2004 to 2010 along with the frequencies of the word. The WordCloud provides a snapshot of the topics that dominated the discussions behind the closed walls of Google’s boardroom. Two words (“increase” , “revenues”) dominated, and we suspect, still dominate the discussions at Google, not just for the growth epoch, but throughout the history of the company. Increasing revenues was an important objective for Google, particularly during the early years of going public.



Although WordCloud gives a snapshot of the topics discussed in the MD&A section of the 10-K filings, it is limited to analyzing single words. Words combined together (keywords or phrases) may give a completely different picture of the topics discussed. For example, the phrase ‘negative growth’ appearing on the discussion board, will be picked up by WordCloud as ‘negative’ and ‘growth’. Therefore, we extracted the keywords using RAKE (Rapid Automated Keyword Extraction). Through RAKE we are able to identify not just words associated with expansion like ‘growth rate’ ‘international market’ ‘operating margin’ etc, but also costs involved in accessing the international market, like ‘traffic acquisition costs’.

Years 2004-2010 - Keywords identified by RAKE

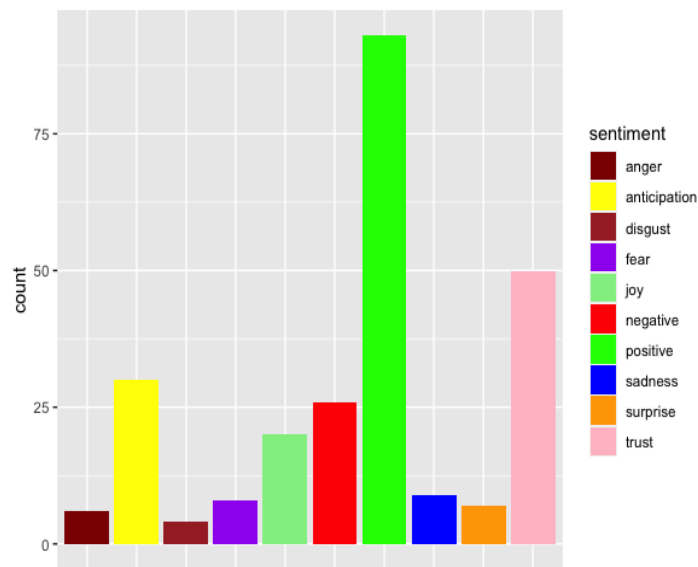


Sentiment  
section  
Positive,

Analysis on the MD&A  
would typically yield  
Negative or Neutral  
sentiments. But we  
extract slightly nuanced

wanted to emotions out of these discussions. Therefore, we have used 'nrc' lexicon to identify 8 different emotions (anger, anticipation, disgust, fear, joy, sadness, surprise and trust) on top of 'Positive' or 'Negative' sentiments. We concede here that not all emotions are expected to be played out in boardroom discussions, it makes sense to track a few key emotions like 'anticipation', 'fear', 'trust' etc. For example, we can see for the years between 2004 & 2010, the Positive sentiment has been consistently high, along with the columns for 'anticipation' and 'trust'.

Sentiments for Years 2004 - 2010



### Google Inc.'s Timeline 2011-2015

In 2011, Google underwent a significant leadership transformation when co-founder Larry Page assumed the position of CEO, succeeding Eric Schmidt, who transitioned to the role of Executive Chairman.

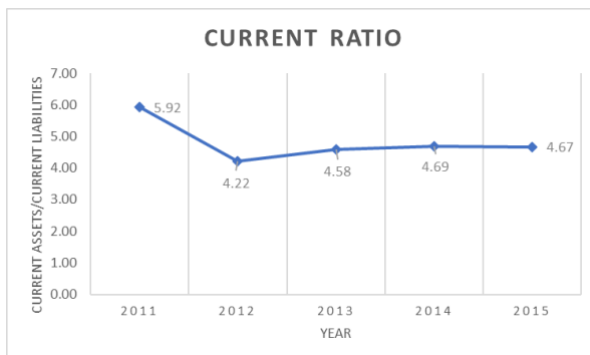
The year 2012 marked a milestone for Google with the acquisition of Motorola Mobility for \$12.5 billion, marking the company's largest acquisition to date. The deal, announced on August 15, was completed on May 22, 2012.

In 2013, Google continued to innovate with the launch of Chromecast, a dongle that allowed users to stream content seamlessly from their phones or computers to a TV, enhancing the digital entertainment experience.

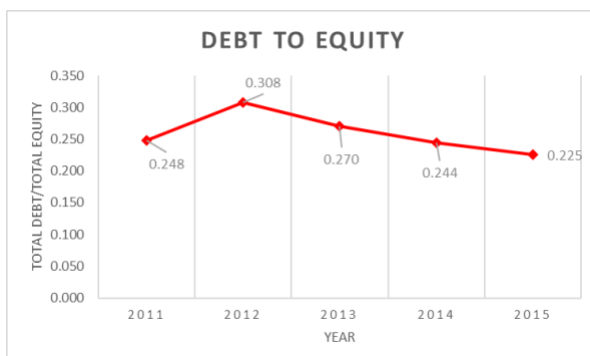
Moving to 2014, Google made strategic moves by selling Motorola Mobility to Lenovo for \$2.9 billion. Simultaneously, Google secured valuable patents from the transaction and invested \$3.2 billion in Nest Lab, marking its entry into the emerging field of home automation.

The year 2015 witnessed a major corporate restructuring as Google transformed into Alphabet, a holding company. This shift, articulated by Larry Page, aimed to safeguard the core brand, enable independent management of diverse activities, and foster autonomy for riskier ventures. This restructuring positioned Google for greater flexibility and strategic focus within the evolving tech landscape.

### **Google Inc.'s Financial Health 2011-2015**



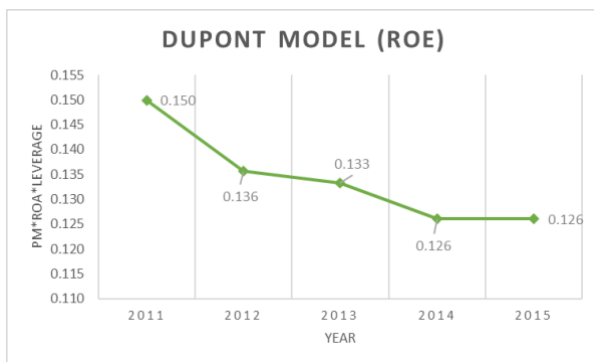
During Google Inc.'s consolidation years, it is clear they are using their assets in a more efficient and effective way even though they still aren't using them to their full potential. Although, during this time period, a lot of investments were made such as Chromecast and Motorola which makes an influx of cash very useful.



During this time period Google Inc. spiked to \$0.30 of debt for every \$1.00 of equity meaning that they are still funded primarily by shareholders but are beginning to take in more debt. This makes sense and is nothing to worry about because debt was taken out to finance the acquisition of Motorola in 2012.



It is clear that Google Inc. is retaining more of their profits however, still could find ways to be more efficient in terms of cost of goods sold. It would make sense that profit margins seem to take a dip due to this time period consisting of heavy investments, multiple CEO changes, and acquisitions.



There is a higher return on Equity in the beginning of this growth stage until 2013 when the return dips back into the numbers that occurred during the growth stage. Since the profit margin and leverage decreased it makes sense that the ROE would follow suit.

## Google Inc.'s MD&A Textual & Sentiment Analysis 2011-2015

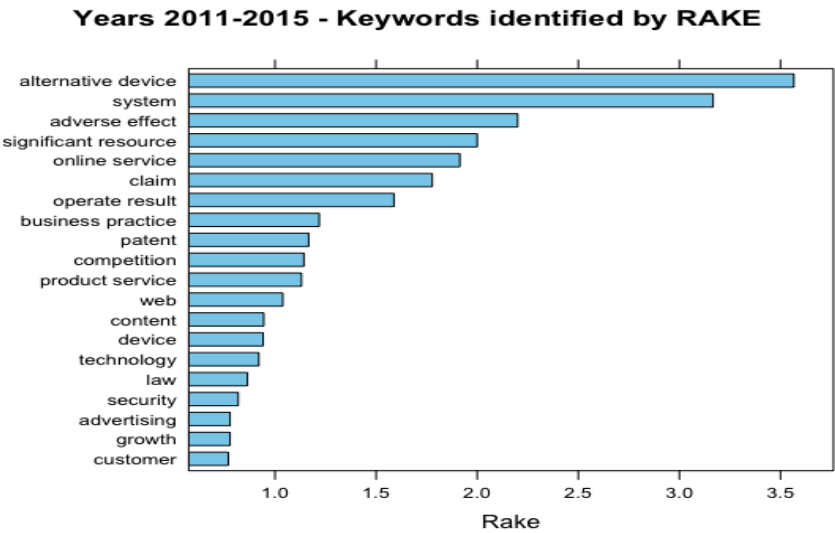


As we can see from the WordCloud for years 2011 to 2015, increasing revenues has been the top priority for this period, as it was for the previous period, there were words involving costs (235 times) and expenses (211 times) that have started to appear in the discussions. To reinforce this, RAKE has extracted bigrams like ‘adverse effect’, ‘business practice’ etc along with words

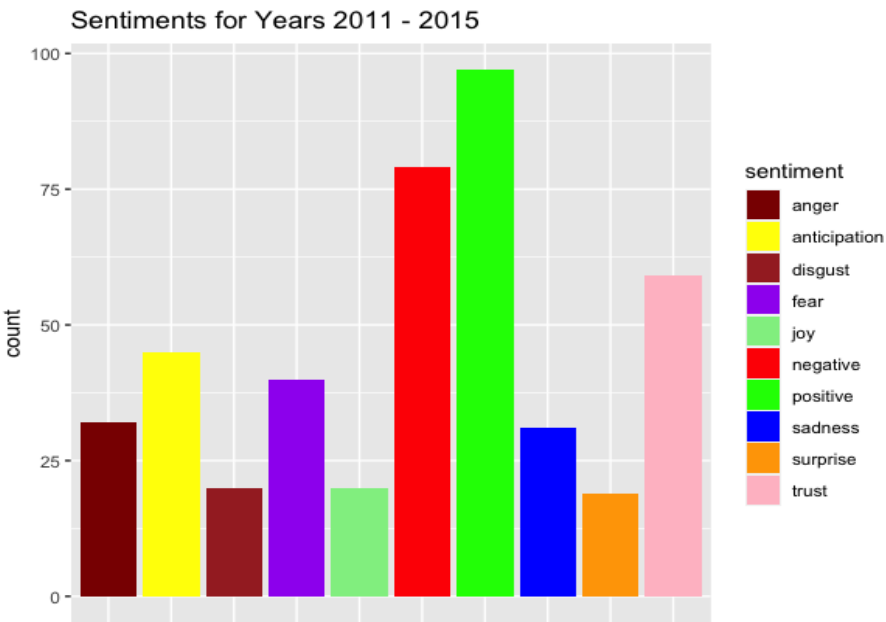


like ‘claim’, ‘patent’, ‘competition’, ‘law’ etc, revealing a growing mood of anxiety before the big restructuring Google went through.

This  
the sentiment  
where the  
sentiment  
grown from  
from the last  
Columns for  
‘anticipation’  
increased,  
‘trust’ measure, showing that even though Google was going through a major period of change,  
‘trust’ was not lacking in the new leadership or structure.



is reflected in  
analysis,  
negative  
index has  
25 to 75,  
period.  
‘fear’ and  
have also  
but so has the



### **Google Inc.'s Timeline 2016-2021**

In 2016, Google faced challenges with EU antitrust complaints, resulting in fines. Despite this, the company demonstrated its commitment to technological advancements by introducing Tensor Processing Units (TPUs) for AI acceleration and launching Pixel smartphones, solidifying its presence in the mobile device market.

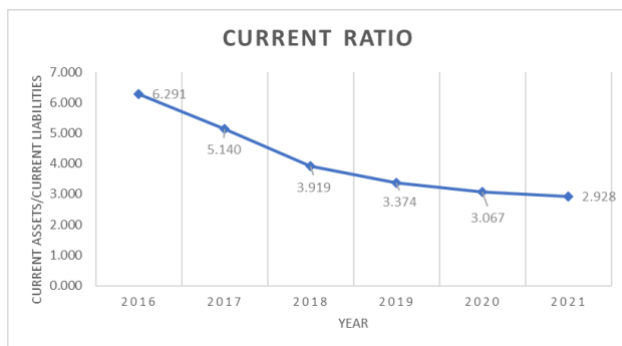
The following year, in September 2017, Google underwent a notable corporate restructuring, streamlining its businesses under Alphabet Inc. Simultaneously, Google acquired HTC for \$1.1 billion, securing crucial smartphone expertise and concluding its Nexus-related collaboration. A noteworthy milestone occurred in 2017 when Alphabet, Google's parent company, achieved historic success, with total revenue crossing \$100 billion (\$110 billion) for the first time in its two-decade history.

Moving to 2018, Google continued its trajectory of innovation by introducing BERT, a groundbreaking Natural Language Processing (NLP) framework that significantly enhanced search precision. The same year, Alphabet's annual sales surpassed \$100 billion, underscoring the robustness of its advertising sales business.

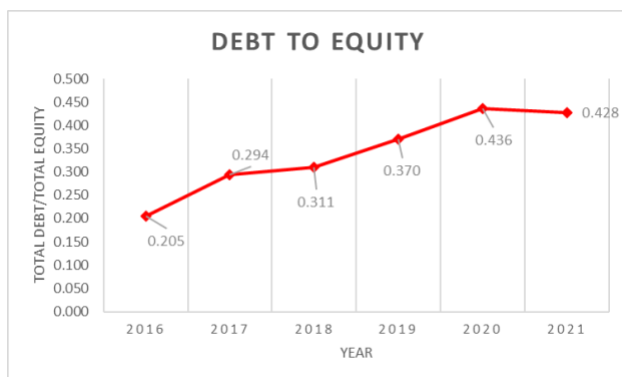
The subsequent years, 2019 and 2020, saw Google responding to the challenges posed by the COVID-19 pandemic by implementing cost-cutting measures. These measures included reduced hiring and increased reliance on machine capabilities. During this period, the company swiftly addressed three service outages that affected Google Drive, YouTube, and its suite of applications.

In 2021, Google faced major controversies, including a lawsuit over Chrome's incognito mode and investigations into harassment and discrimination. Simultaneously, Australia proposed legislation requiring Google to pay media companies. Noteworthy partnerships were formed in January 2021, as Ubisoft and Take-Two collaborated to bring games to Stadia, showcasing Google's ongoing efforts in the gaming industry.

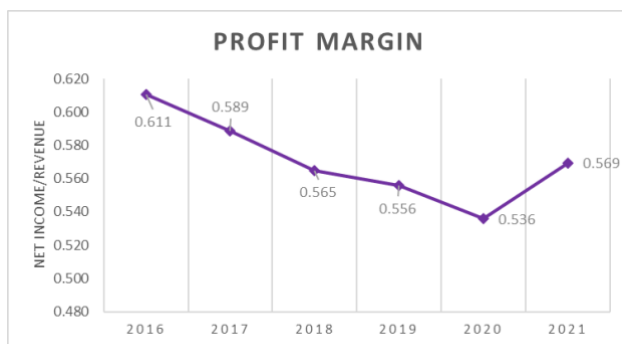
### **Google Inc.'s Financial Health 2016-2021**



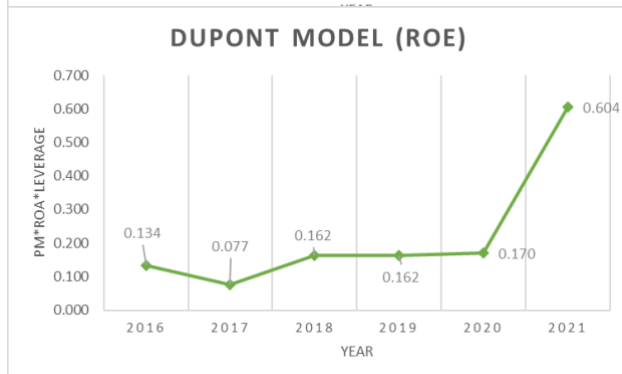
As shown in the previous two epoch's Google Inc. continuously has proven to use their assets in a more effective and efficient manner. After years of having a high current ratio, they seem to have reached closer to the industry average. The decline is seen immediately after the acquisition by Alphabet Inc.



By the year 2021, the debt to equity ratio had climbed to \$0.43 of debt for every \$1.00 of equity. During these restructuring years, it would make sense that Google Inc. has a higher debt heavy structure while they are branching out and reacclimating to their new structure. It is imperative that investors watch this number if it continues to climb or if it continues to fall after the effects of the COVID-19 pandemic.



The profit margin within this period, is nowhere near their top profit margin that was achieved within the consolidation epoch. The decrease hits a low as the market did in 2020 due to the COVID-19 pandemic and then climbs back due to more people being online nowadays. The cost of revenues for everything have continued to increase and therefore lowers the gross profit that much more.



The most noticeable change in the Dupont model for the restructuring time period is from 2020 to 2021. It is safe to say the profit margin spike had a great deal to do with this but it is also obvious that the increase and while the leverage didn't increase, assets, and in turn the return on those assets increased as well to cause the spike we are seeing in the model here.

### Google Inc.'s MD&A Textual & Sentiment Analysis 2016-2021

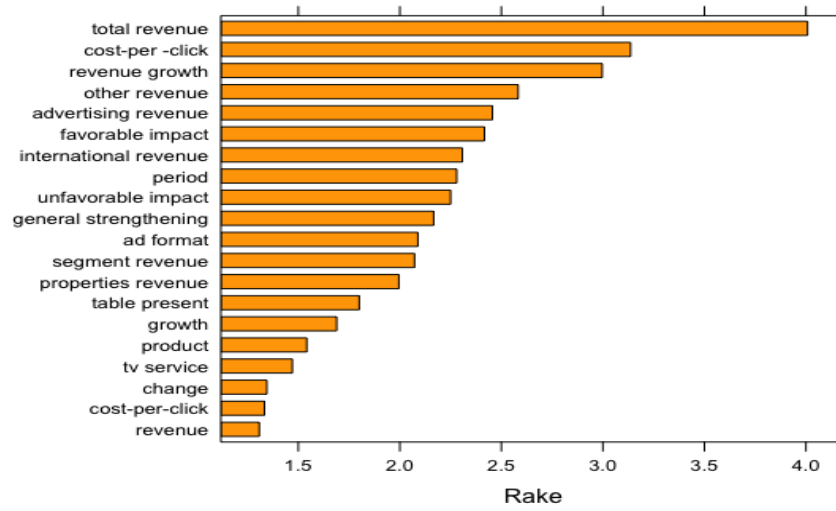


word	freq
revenues	1029
increase	330
expenses	314
growth	290
properties	267
billion	257
income	245
cash	243
advertising	241
tax	234

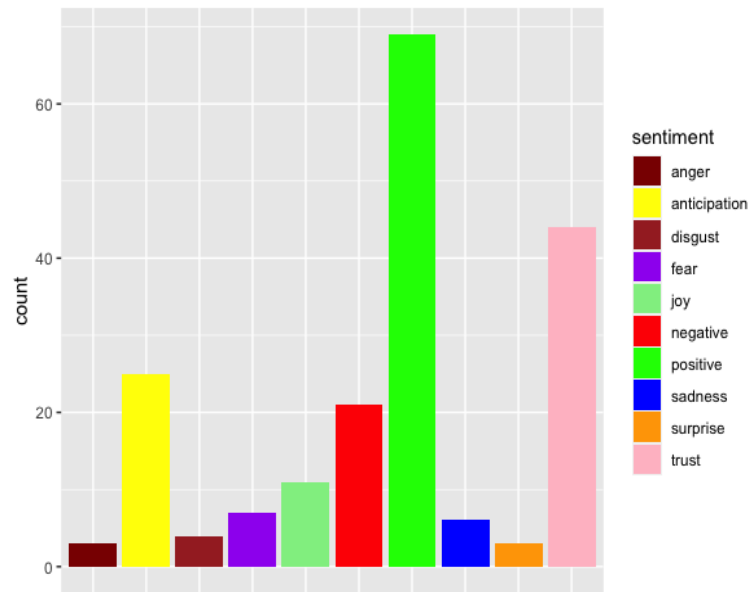
This period signifies the epoch of consolidation, when Google having restructured and absorbed into Alphabet, has clearly cemented its leadership position. The WordCloud brings up words like ‘revenue’, ‘growth’, ‘properties’ ‘billions’, spelling out an unprecedented era of revenue growth. RAKE shows discussions moving towards finer metrics like ‘cost-per-click’, ‘ad format’ tv service’ etc.

In terms of sentiments detected from the MD&As, Negative sentiments have gone down, so have the positive sentiments, when compared from the previous epoch. Emotions of Trust, and Anticipation have decreased but they feature high among words that could describe the other emotions.

### Years 2016-2021 - Keywords identified by RAKE



### Sentiments for Years 2016 - 2021



## **Conclusion**

Since the time it was formed by Larry Page and Sergey Brin in 1998, Google (now Alphabet) has been a trailblazing company with a very unique business model. We have traced this extraordinary journey through Google's major milestones, its financial performance and also the sentiments and emotions detected through Management Discussion & Analysis section of the 10-K filings. The fact that words like 'revenue', 'income', 'increase', 'growth' etc dominated the discussions right through the years, bears testimony to Google's commitment to increasing the value for its shareholders.

Through our analysis of Google's financial performance combined with the textual analysis of the MD&A for every year, we were able to form a coherent narrative of the events that happened during these years and the effect they had in Google's boardroom. For example, we were able to detect the change in the debt-equity ratio being mirrored in the discussions, in the immediate years after Google went public. Similarly we could see more nuanced emotions of 'fear' and 'anticipation' increasing in the discussions, coinciding with the stock market crash of 2008. Words like 'currency', 'exchange rate' etc dominated the discussions.

Even though Google has established itself as a market leader in the international market, it had its share of challenges leading up to the change of leadership, followed by the major restructure. And this is reflected in the sentiment analysis, when the Negative sentiment reached an all-time high, along with 'fear' and 'anticipation'. Through some exemplary vision and leadership, we see Google allay the fears and turbulence in the international market and cementing its dominance and zooming ahead of its competitors. This was justly reflected in the 'Trust' index growing, along with the positive sentiments.

Our analysis was for the years 2004 to 2021. But by far the most important event / challenge Google had to face, surfaced on 30th November, 2022 - the introduction of CHAT GPT by Open AI, which directly challenged the well set business model of Google. But given its resilient history, we believe Google will come up with a suitable answer. As we write this report, Google's latest LLM Gemini is being released. Whether it is the answer or not, only time can tell, but surely, these events will trigger heated discussions in Google's boardroom, that are worth analyzing.

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