



Stock Rating:
HOLD

Target Range: \$160 - \$173

Current Price: \$154.86

Analysts

Tyler Moy | tyler-moy@uiowa.edu
Jace Showalter | jace-showalter@uiowa.edu

Company Information

Company: Alphabet Inc.
Sector: Communications
Industry: Internet Content and Information
Exchange: NASDAQ [TXN]

Investment Thesis

We recommend a **HOLD** rating for Alphabet Inc. We expect Alphabet to enter a growth period throughout this year and into the next due to the AI boom. We are confident that Alphabet has a dominant market position and will take advantage of generative AI capabilities. We believe the stock offers a 3.31%-11.71% positive return through the end of the calendar year.

Drivers of Investment Thesis

Generative Artificial Intelligence: With the integration of artificial intelligence into all forms of business, Alphabet stands to gain from being one of the world leaders in generative AI. In providing Gemini AI to users, Alphabet will create profit through subscriptions and have another platform to display ads, their largest source of revenue.

AI Integration to Applications: Alphabet is exploring options with Apple to become its partner in making Gemini AI compatible with iOS devices. This could potentially raise subscription based revenue.

Risks to Investment Thesis

Regulatory Scrutiny and Antitrust Concerns: As a dominant player in multiple sectors, including search, advertising, and cloud computing, Alphabet's market power has gained attention from regulators worldwide.

Cybersecurity Breaches: With its vast ecosystem of products and services Alphabet collects and stores massive amounts of data. While important to AI learning, this also makes the company a prime target for cyber-attacks and data breaches.

Financial Snapshot

Model Prices

DCF/EP \$161.08
DDM \$87.37
Relative P/E \$160.80

Price Data

Current Price \$154.86
52-Week Range \$102.63-\$160.22
YTD Performance 10.86%

Key Statistics

Market Capitalization 1.976T
Shares Outstanding 12.47B
Beta 1.02
Dividend Yield 0.00%
EPS 2023 \$5.84
EPS 2024E \$5.04
Forward P/E Ratio 22.16
2023 Revenue \$307,394M
2024E Revenue \$331,988M

Company Description

Alphabet Inc. is a collection of businesses, the largest of which is Google. The company breaks their revenue down into three segments: Google Services, Google Cloud, and Other Bets. Google Services includes performance advertising, brand advertising, consumer subscriptions, platforms, and devices. The Google Cloud sector includes revenues from AI-optimized infrastructure, cybersecurity, databases and analytics, collaboration tools, and the AI platform/Duet AI for Google Cloud. Other bets are companies owned by Alphabet but operate as independent companies. Revenues from this category mainly come from the sale of healthcare-related services and internet services.

1-Year Stock Performance vs. Communications Sector and S&P 500



Company Analysis

Company Overview:

Alphabet Inc., the parent company of Google, stands out in the tech industry for its innovative approach and diversified portfolio. Renowned for its "moonshot" projects through its X division, Alphabet fosters a culture of experimentation and risk-taking, aiming to tackle grand challenges with groundbreaking solutions. Through its subsidiaries like Google, Waymo, and DeepMind, Alphabet integrates cutting-edge technology into various aspects of daily life, from search engines to self-driving cars and artificial intelligence.

While Alphabet's revenue streams are diverse, its primary source of income is advertising, predominantly through Google's search and display advertising platforms. Leveraging vast amounts of user data, Google offers targeted advertising solutions to businesses worldwide, driving significant revenue growth. Additionally, Alphabet generates revenue through its cloud computing services, hardware products, and other ventures, maintaining a strong financial position and a leading role in the global tech landscape.

Revenue Analysis and Decomposition:

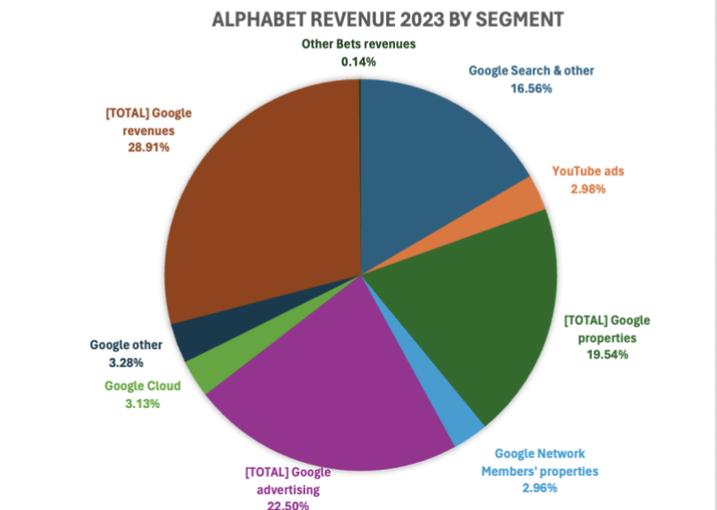
Google Services: Google Services encompasses a broad spectrum of offerings, ranging from performance advertising to consumer subscriptions. This segment leverages Google's extensive reach and data insights to deliver targeted advertising solutions, driving revenue through both performance and brand advertising. Additionally, Google Services includes platforms and devices, further expanding Alphabet's presence in the digital ecosystem. Google Services consists of subsegments, including Google Search & Other, YouTube Ads, Google Network, and Google Other.

Google Cloud: The Google Cloud sector, on the other hand, focuses on providing advanced cloud

computing solutions to businesses of all sizes. This segment offers AI-optimized infrastructure, cybersecurity, databases, analytics, and collaboration tools, catering to the growing demand for cloud-based services. With a strong emphasis on innovation and scalability, Google Cloud empowers organizations to leverage cutting-edge technologies to enhance their operations and drive growth.

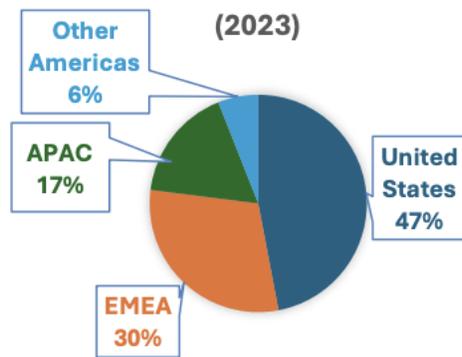
Other Bets: Alphabet's Other Bets category comprises companies operating as independent entities under the Alphabet umbrella. These ventures explore innovative solutions in various fields, with a particular focus on healthcare-related services and internet services. While these ventures may initially operate at a loss due to their experimental nature, they hold the potential to disrupt industries and generate substantial revenue in the long term. Overall, Alphabet's diverse revenue streams reflect its commitment to innovation and its ability to adapt to evolving market trends, ensuring sustained growth and competitiveness in the tech industry.

Annual Revenue of Alphabet from 2017 to 2023 by Segment (in million U.S. dollars)							
Characteristic	2017	2018	2019	2020	2021	2022	2023
Google Search & other	69,811	85,296	98,115	104,062	148,951	162,450	175,033
YouTube ads	8,150	11,155	15,149	19,772	28,845	29,243	31,510
[TOTAL] Google properties	77,961	96,451	113,264	123,834	177,796	191,693	206,543
Google Network Members' properties	17,616	20,010	21,547	23,090	31,701	32,780	31,312
[TOTAL] Google advertising	95,577	116,461	134,811	146,924	209,497	224,473	237,855
Google Cloud	4,056	5,838	8,918	13,059	19,206	26,280	33,088
Google other	10,914	14,063	17,014	21,711	28,032	29,055	34,688
[TOTAL] Google revenues	110,547	136,362	160,743	181,694	256,735	279,808	305,631
Other Bets revenues	477	595	659	657	753	1,068	1,527



Data from [2]

ALPHABET REVENUE BY GEOGRAPHY



Data from [5]

This graph displays Alphabet's revenue by geography in 2023. EMEA refers to Europe, the Middle East, and Africa. APAC refers to Asia-Pacific, and Other Americas refers to Central and South America.

Expense Analysis and Decomposition:

Alphabet structures its expenses into two components: the cost of revenues and operating expenses.

Cost of Revenues: Alphabet's cost of revenues category encompasses various essential expenses directly tied to the delivery of its products and services. One significant component is traffic acquisition costs (TAC), which represent the fees paid to partners and affiliates that drive traffic to Alphabet's platforms. Additionally, compensation costs related to data centers, content review, and product support ensure the efficient operation and maintenance of Alphabet's vast infrastructure. Content acquisition costs are also substantial, reflecting investments in licensing agreements and content creation to enhance the user experience across Alphabet's platforms. Depreciation related to technical infrastructure and inventory costs further underscores Alphabet's commitment to maintaining and upgrading its technological assets to meet evolving consumer demands.

Operating Expenses: Alphabet's operating expenses encompass broader categories that support the company's overall operations and growth initiatives. Research and development

(R&D) expenses represent a significant portion of this category, reflecting Alphabet's continuous investment in innovation and technology development. With R&D spending on the rise, Alphabet demonstrates its dedication to exploring new ideas and pushing the boundaries of what is possible in various fields, from artificial intelligence to healthcare. In 2023 Alphabet spent \$43.581B on R&D, a 14.87% increase from the previous year [3]. Sales and marketing expenses are also crucial for promoting Alphabet's products and services, ensuring widespread adoption and market penetration. Meanwhile, general and administrative costs cover essential functions such as corporate governance, legal compliance, and administrative support, enabling Alphabet to maintain operational efficiency and regulatory compliance as it navigates the complexities of the global business landscape.

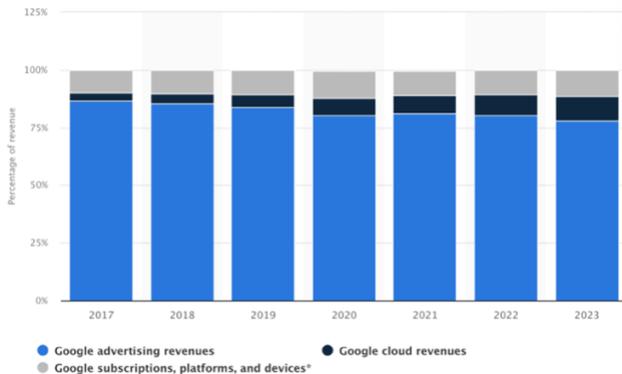
SWOT Analysis:

Strengths:

- Google holds 83.5% of the global search engine market [4], allowing it to have immense user data and valuable customer insights. They can use this data to refine their advertising capabilities and develop new products and services.
- Google has strong brand recognition, which demonstrates customer loyalty. Google is synonymous with reliability and innovation, making customers choose Google over competitors and giving Google a competitive advantage.
- Google has diverse products and revenues beyond advertising and search, including YouTube, cloud computing via Google Cloud, hardware (Android and Pixel devices), and many others. These all help Alphabet become less reliant on a few products or services.
- Alphabet has a strong financial position with consistently high revenue, so it can invest heavily in research and development, capital expenditures, and other initiatives. This strong financial position also allows them to weather economic downturns and take on longer-term projects.

Weaknesses:

- Like most large technology and communications companies, Google faces many privacy concerns. Instances of data breaches, unauthorized access to user information, and data privacy violation controversies have eroded trust among users. There have also been stricter data privacy laws recently. States such as California, Connecticut, Colorado, and others passed comprehensive consumer privacy laws in 2023, and all these pose challenges for Google in terms of compliance and reputation management.
- Google relies heavily on advertising for revenue, with 77.8% of its total revenue coming from advertising, in 2023 according to Statistica, as shown in the chart below [5]. Having this reliance on advertising revenue exposes Google to risks associated with fluctuations in the advertising market, changes in consumer behavior, and changes in advertising budgets and costs.



Data from [5]

Opportunities:

- Google has significant opportunities to expand into emerging markets, such as cloud computing, to compete with established services such as Amazon Web Services (AWS) and Microsoft Azure. With increasing demand for cloud services, Google can leverage its infrastructure, data analytics, and AI capabilities to capture market share and help drive revenue growth.
- Investing further into AI is another opportunity where Google can deepen the integration of AI into existing products, such as Google search, as well as expand into new AI-driven services; for example, developing AI-powered

solutions for sectors such as healthcare can open new revenue streams.

Threats:

- Alphabet's biggest threat is its intense competition from various technology and communications firms, such as Amazon, Microsoft, Apple, and Facebook, which are continuing to expand their products and services and pose competition in areas such as advertising, hardware, and AI. Their competition may innovate quicker or develop new products or services that can attract users away from Google's ecosystem.
- Another threat to Alphabet is regulatory risk, particularly concerning antitrust concerns and data privacy regulations. Google has already been facing antitrust investigations and lawsuits recently, which restrict their expansion and business practices. Compliance with evolving data privacy laws such as CCPA (California Consumer Privacy Act) and GDPR (General Data Protection Regulation) may involve significant resources and may restrict their ability to monetize user data.
- Another threat to Google would be changing user behavior and technological disruption. Emerging technologies such as quantum computing, augmented reality, and decentralized platforms may challenge their business model and change user behaviors, which can challenge Google's market share. If Google fails to adapt to these technological disruptions, it may lose its competitive advantage.

Industry Analysis

Alphabet Inc. is recognized as part of the internet content and information industry in the communication services sector. Companies in this sector offer content, internet navigation services, and reference guide information for the World Wide Web through various platforms, such as social media, search engines, and networking platforms. The internet content and information industry have a diverse product line, including advertising on their online platforms, content

creation, subscriptions, and data-related services. Companies within this sector rely heavily on making revenue through selling advertising space on their platforms but also make money from service and subscription fees. The internet content and information industries have a wide range of businesses ranging from search, social media, food delivery, music publishing, dating apps, and more.

Comparison to Industry Competition:

Symbol	GOOGL	META	SNAP	PINS
Company	Alphabet Cl A	Meta Platforms Inc	Snap Inc	Pinterest Inc
Price Information				
Key Statistics				
Market Capitalization, \$K	1,798,298,720	1,180,620,800	27,577,132	26,751,820
Annual Sales	282,836,000,000	116,609,000,000	4,601,850,000	2,802,570,000
Annual Net Income	59,972,000,000	23,200,000,000	-1,429,650,000	-96,050,000
Ratios				
Price/Earnings ttm	24.55	30.47	0.00	0.00
Profit Margin %	21.20%	19.50%	-31.07%	-3.43%
Debt/Equity	0.05	0.13	0.00	0.00
Price/Sales	5.80	9.05	5.88	9.07
Price/Book	6.23	7.10	10.48	9.03

Data from [6]

Listed above are some of the key financial metrics for Alphabet and its closest competitors in the industry. As shown in the table, Alphabet has positive financial metrics compared to its peers. For example, Alphabet has the lowest Price to Sales and Price to Book ratios, both indicating Alphabet has a fair valuation compared to its peers, which are trading at a higher premium or valuation. Alphabet also has the best profit margin, highest sales, and highest net income, and has a relatively good Price-to-earnings ratio compared to competitors.

Porter’s Five Forces Analysis:

Threat of New Entrants:

While it is relatively easy for a new company to form in the internet content and information industry, especially in today’s age, there is a low threat of new entrants because it is very difficult to establish a strong brand and loyal user base. Companies such as Google and Meta, which own both Facebook and Instagram, have an established brand and have a considerable advantage over new entrants due to their large network. Platforms like Facebook and Instagram benefit from network effects, meaning others use their platform, which brings more benefits to

current users. Essentially, the more people on the platform, the more beneficial it is for everyone on the platform. The network effect imposes a barrier to entry, as new entrants must attract large amounts of people to join their site or app to effectively compete with the incumbents. Furthermore, Google has 83.5% of the global search engine market, with its closest competitor being Bing at 9.2%, according to Statista [5].

Bargaining Power of Suppliers:

Google has been considered the “King of Search Engines” since it was the first to use algorithms that allow users to find the most relevant and precise information. As Google was developing as a company, it expanded its services to include Google Maps, Google Images, Gmail, and others. Offering a wide variety of services solidifies Google’s position in the market, which is proven by its global market share of 83.5% [5]. Considering these points, we can say that the bargaining power of suppliers is low because Google heavily relies on in-house technology and a well-established network of suppliers [7].

Bargaining Power of Buyers:

The bargaining power of buyers is moderate in this industry and is influenced by several factors. First, consumers could easily switch to another platform without extra thought; this puts pressure on companies to maintain competitive pricing and standards. However, Google has strategically lowered this threat by maintaining strong customer relationships, building brand and loyalty, and providing high-quality products and services. This reinforces Google’s market position and diminishes the bargaining power of suppliers.

Threat of Substitutes:

With the rapid pace of technological innovation, the threat of substitutes is relatively high in this industry, as new products or services can easily replace the current ones. However, as stated above, the current firms have a loyal customer base, and the few large companies have the vast majority of the market share, so a new technology would likely have to distinguish itself to be considered a threat for substitution. Thus, while the threat of substitutes is high, the position of

key firms and high switching costs for consumers serve as deterrents.

Intensity of Company Rivalry:

The intensity of rivalry in the internet content and information industry is relatively high, as top firms fight for market share. Google, Meta, Snapchat, and other companies fight to expand their customer base. These companies are constantly innovating and expanding, further fueling the intensity of company rivalry. Alphabet's dominant market position helps to alleviate some of this competition.

Economic Analysis

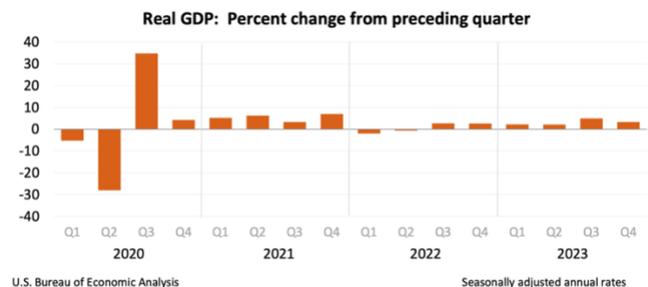
United States Real GDP Growth:

The United States Gross Domestic Product (GDP) plays a major role in influencing the communications sector of the market. As a key economic variable, GDP reflects the overall health and performance of the economy. It serves as an indicator of consumer spending, business investment, and government expenditures. In recent years, the communications sector has been closely tied to economic growth, with increased GDP often leading to higher demand for telecommunications and technology services. In a recent example, the surge in remote work and online presence during the COVID-19 pandemic showcased the sector's resilience and adaptability, contributing to its growth.

In recent history, as shown in the graph below, real GDP has been growing slowly. We expect this trend to change over the next few quarters. Although individuals' pandemic savings are running out, job openings in the U.S. are substantial, and wages have been rising over the past few years, oftentimes outpacing the rate of inflation. At a minimum, we expect consumer demand to remain largely consistent and to likely grow. As consumer demand grows, GDP will rise with it. This is evidenced by the most recent report for Q4 2023 real GDP, which came in at 3.3%, which was above analysts' expectations. We agree with the Conference Board and expect real GDP to change anywhere from 2% to 4% over the next four quarters [8]. Based on this forecast, we

expect the communication services industry to remain resilient over the next few quarters as the economy continues to expand and wage growth outpaces inflation. As GDP increases, individuals and businesses will continue spending on non-essential services offered by the communications sector. We believe media advertising and telecom services will see increased spending as the economy continues to moderate after the Covid stimulus, which helped cause the strong inflation that has been experienced in recent years.

Our short-term outlook is that GDP will continue to stay positive between 1 and 6 percent over the next four quarters, which will help support current or slightly elevated spending in the communications sector. Our long-term outlook is that the economy is headed into a period of expansion influenced by the AI boom (a minimum of at least 2.3% annual growth in real GDP each year). We feel this expansionary period will be great for demand across the communications sector, including but not limited to advertising, telecommunication, entertainment, etc.



Data from [9]

Technological Advancements:

Technological advancements constitute a crucial economic variable for the communications sector. Recent innovations have played a pivotal role in transforming the sector with developments such as the widespread adoption of 5G technology, the expansion of smart devices, and the introduction of Artificial Intelligence (AI) into the sector. Shown below is a graph from Yahoo Finance that depicts the communications sector compared to the S&P 500 and its growth over the past year. From this graph, we can see that over

the last year, the communications services industry has been consistently outperforming the index. Additionally, one of the main reasons the S&P 500 has been doing so well is because of the giant boost it is receiving from the communications services and technology sectors.

Our short-term outlook is that excitement surrounding the utilization of AI will slow. However, we expect the communications sector to grow 8-12% over the coming year. Over the long term, we expect the communications services industry's revenue growth to moderate at roughly 1.43% annually, which aligns with Statista estimates. We believe AI has been overhyped and that this industry will not continue to experience significant outperformance of the S&P 500. As revenue and overall growth within the communication services sector moderate, we believe industry growth will begin aligning with the S&P 500 instead of outpacing it. This means growth will slow and moderate within the communications services industry.



Data from [10]

Regulatory Environment:

The regulatory environment serves as a pivotal economic variable for the communications sector, profoundly impacting its operations and competition. Recent cases of regulatory intervention have posed challenges for sector expansion. For instance, stringent regulations regarding net neutrality have sparked debates on how internet service providers manage data traffic, potentially limiting their ability to prioritize certain services or content. Such regulations, while aiming to ensure fair and equal access to the internet, have raised concerns among industry players about potential limitations on innovation and investment. Government

organizations such as the Justice Department and the Federal Communications Commission closely regulate companies in the sector to ensure no unfair advantages are ascertained. A recent example includes how Google has been hit with an antitrust lawsuit from the Justice Department and will pay \$700 million to settle allegations of monopoly [11]. Other important considerations regarding the regulatory environment include the auction of C-bands to telecommunications companies and the recent discovery of lead cables that were used in the telecom industry in the 1960s. Future Federal Communications Committee C-band auctions could lead to the threat of new entrants or current players having to spend billions to prevent others from gaining a competitive advantage. Lead cables from the 1960s could also represent a significant financial liability should telecom companies such as VZ, LUMN, T, and many others be required to remove the lead cables due to the risk of contaminating groundwater suppliers.

Cases like these can impact individual companies and broader sub-sectors, such as telecommunications. Since the government has the final say in the regulatory environment, companies in the communications services industry must abide by all new regulations or face significant consequences, such as fines and legal battles. However, these regulations are typically industry-wide and should not give an unfair advantage to one specific company. That said, they could hurt or benefit certain industries in the communications sector.

Our short-term outlook is that the regulatory environment will not have a specific impact on the communication services industry as a whole but does have the potential to impact individual companies that ignore regulations or subindustries that experience increased or decreased regulation. When it comes to the long term, we are even more uncertain about future regulatory environment changes and are unsure of whether the impacts will benefit or damage industry profits. It is hard to quantify the likelihood of regulatory changes, the significance of their impact, and what industries will be

impacted. For this reason, we don't currently expect huge or significant regulatory changes in the communication services industry, but we will continue to watch for potential regulatory changes.

Personal Income and Outlays:

Personal income and outlays are integral economic variables that significantly influence the communications sector. As consumers' disposable income and spending patterns fluctuate, so does their demand for communication services. The rise of telecommuting and online education has fueled the demand for robust communication infrastructure. Variations in personal income, influenced by factors like employment rates and government stimulus measures, impact consumers' ability to afford communication services. In the data collected by the Bureau of Economic Analysis, the table below shows that personal income as well as personal consumption have only grown over the past five months.

Based on the recent historical data, we believe that in the short term, incomes will continue to rise at a rate of around 0.3% per month. As incomes slowly increase, we believe that people will be willing to spend more money in the communications services industry. This is especially true as inflation has been decreasing, which is mitigating its effect on decreasing consumers' purchasing power. In the long term, we expect consumers' wages to keep growing at a rate that outpaces inflation. This is evidenced by the fact that there are more jobs than people are looking for. This causes employers to raise wages to attract talent, in turn increasing consumers' ability to spend on a variety of services and products. This lack of employees is being further exacerbated by the birth rate (1.64 births per woman) in the U.S. being lower than the replacement rate (which is 2.1) and the fact that many baby boomers are reaching retirement age and leaving the workforce [12]. For these reasons, we feel that income growth will continue to significantly outpace inflation, enabling consumers to increase spending across various

products and services, including those in the communication service industry.

	2023				
	Aug.	Sept.	Oct.	Nov.	Dec.
	Percent change from preceding month				
Personal income:					
Current dollars	0.4	0.3	0.3	0.4	0.3
Disposable personal income:					
Current dollars	0.4	0.3	0.3	0.4	0.3
Chained (2017) dollars	0.0	-0.1	0.3	0.5	0.1
Personal consumption expenditures (PCE):					
Current dollars	0.3	0.7	0.0	0.4	0.7
Chained (2017) dollars	-0.1	0.4	0.0	0.5	0.5
Price indexes:					
PCE	0.4	0.4	0.0	-0.1	0.2
PCE, excluding food and energy	0.1	0.3	0.1	0.1	0.2
Percent change from month one year ago					
PCE	3.3	3.4	2.9	2.6	2.6
PCE, excluding food and energy	3.7	3.6	3.4	3.2	2.9

Data from [13]

Valuation Analysis

Revenue:

As discussed above, Alphabet is split into three main segments, with Google Services splitting into multiple subsegments, including Google Search & Other, YouTube Ads, Google Network, and Google Other. Google Search & Other is Alphabet's biggest revenue generator. We are forecasting this subsegment to grow 15% in 2024, 20% in 2025, 15% in 2026, and 12% in 2027 before reaching a steady continued growth of 8% in 2028 and beyond. This large short-term growth stems from Alphabet's AI integration discussions with Apple, which would make Apple users interact with Google advertising and search daily.

For the YouTube Ads revenue subsegment, we believe they will reach a constant growth of 5% due to the consistent growth of users. Over the past three years, YouTube's annual revenue has begun to stabilize as the platform has matured. Competition from firms, changing consumer behaviors, and technological advances continue to fluctuate, and YouTube may not see as strong of growth as Alphabet's other segments.

For Google Other, we forecast 15% growth in 2024, 18% in 2026, and then a consistent decline until hitting a steady continued growth rate of 5%. As Google perfects Gemini, there will be an influx of Gemini Ultra users, their subscription-based AI that works in other Google applications. This large growth forecast is aligned with the growth of AI in

the next few years, and Google is equipped to be an industry leader.

Cost of Revenue:

Alphabet has not provided guidance on the cost of revenues, so we used the average percentage of revenue over the most recent four years, or 38.907%.

R&D and SG&A:

Research & Development is a crucial expense for Alphabet as technology continues to change and advance. For Alphabet's R&D expense as a percent of net sales, we used the average over the past ten years, as their R&D expense has been consistent over this time. This gave us 14.96% as the forecast metric. Our group estimates that around \$40 billion will be spent on CapEx in 2024. Google emphasized in their conference call that they expect CapEx spending to be notably higher due to investing in the rise in demand for AI and other technologies. This \$40 billion estimate is in line with Wall Street analyst estimates and represents about a 25% increase in CapEx spending compared to 2023.

Cost of Equity:

We calculated Alphabet's cost of equity using the capital asset pricing model. For the risk-free rate, we used the 10-year Treasury bond, which was 4.518%. The beta we used was 1.02, which was the 5-year raw beta from Bloomberg. For the equity risk premium, we used the 1928-2020 geometric average over 10-year Treasury, which was 5.26%. Using these values, we calculated a cost of equity of 9.88%.

Cost of Debt:

As previously mentioned, we used the 10-year Treasury bond of 4.518% for our risk-free rate. We then found the pre-tax cost of debt by using the YTM on Alphabet's 20-year corporate bonds, which was 4.77%. The difference between these values gave us an implied default premium of 0.25%. Finally, we multiplied the pre-tax cost of debt by $(1 - \text{Alphabet's marginal tax rate})$ to get an after-tax cost of debt of 3.74%.

Weighted Average Cost of Capital:

Alphabet's weighted average cost of capital (WACC) is 9.80%. To calculate this, we used the previously mentioned cost of equity of 9.88% and the cost of debt of 3.74% and used their market value percentages of 98.70% and 1.30%, respectively. We used the computed WACC value as the discount factor in the DCF and EP valuation models.

Valuation Models

Discounted Cash Flow & Economic Profit:

To calculate the discounted cash flow (DCF) value, we started by forecasting free cash flow for the next 10 years, including the terminal value. We discounted each of these using the WACC value discussed above and summed these values to get the value of operating assets. We then adjusted for non-operating assets to find the total value of equity and divided that by Alphabet's total shares outstanding in 2023. This gave us a DCF value of \$161.08. For the economic profit method, we forecasted economic profits for the next 10 years, including the terminal value. We take the sum of the present value of these, add the invested capital from the last FYE, and make the same non-operating adjustments to arrive at the same \$161.08. We believe that these models are the most valuable estimates for Alphabet's intrinsic price based on future value.

Dividend Discount Model:

The Dividend Discount Model (DDM) is a valuation model that calculates a firm's stock price based on the present value of its expected future dividends. For this model, we calculated an implied stock price of \$87.37. However, we believe this valuation model is not valuable for Alphabet, as they have never paid a dividend to their investors. Alphabet reinvests their profits to expand its business and further develop its products and services; therefore, this model will imply a significantly lower stock price than the target price.

Relative Valuation Analysis:

For our relative valuation, we compared Alphabet to several of its peers in the communications services and technology sectors. These peers include Meta Platforms, Microsoft Corporation, Apple Inc., The Walt Disney Company, Netflix Inc., Pinterest Inc., and Baidu Inc. We calculated each of their expected Price-to-earnings ratios using their estimated 2023 and 2024 EPS. After averaging the given companies' P/E ratios, we multiplied the average by Alphabet's expected 2023 and 2024 EPS. This gave us an implied relative value of \$160.80 for 2024 and \$156.89 for 2025. We believe this is a valuable model because P/E ratios help investors determine the market value and future earnings growth compared to peers.

Sensitivity Analysis

Beta vs. Equity Risk Premium:

Both the beta and equity risk premium are very important when calculating a firm's cost of equity, which is used in the WACC calculation as well as the discount factor in the DDM. In our table, we used the range of 0.72-1.32 for beta and 4.96%-5.56% for the equity risk premium. As shown by the data table, when a firm's beta increases, the stock becomes more volatile compared to the market and is worth less to investors. Additionally, as ERP increases, the cost of equity will also increase, driving the price of the stock down.

		Beta						
		0.72	0.82	0.92	1.02	1.12	1.22	1.32
Equity Risk Premium	4.96%	254.51	219.25	192.61	171.80	155.09	141.38	129.94
	5.06%	248.70	214.34	188.38	168.07	151.76	138.38	127.21
	5.16%	243.15	209.65	184.32	164.50	148.58	135.51	124.59
	5.26%	237.84	205.17	180.44	161.08	145.53	132.75	122.08
	5.36%	232.76	200.87	176.72	157.81	142.60	130.11	119.67
	5.46%	227.90	196.75	173.15	154.66	139.79	127.57	117.36
	5.56%	223.23	192.80	169.73	151.65	137.09	125.13	115.14

Risk-Free Rate vs. Marginal Tax Rate:

In the comparison between the risk-free rate and marginal tax rate, we were able to make some interesting conclusions. To begin, as the risk-free rate increased, the price of the stock would decrease. This negative relationship shows that if an investor can get a higher risk-free investment, they will value Alphabet stock less. Secondly, as the company's marginal tax rate increased, its stock price decreased. We were able to conclude

from this that if their marginal tax were to rise, stock prices would fall because they could not retain as much of their profits, as well as having a higher discount rate, which lowers the present value of future cash flows, impacting the valuation models.

		Risk-Free Rate						
		4.22%	4.32%	4.42%	4.52%	4.62%	4.72%	4.82%
Marginal Tax Rate	161.08	172.18	168.52	165.02	161.66	158.43	155.34	152.36
	21.36%	171.96	168.30	164.80	161.45	158.23	155.13	152.16
	21.46%	171.73	168.08	164.58	161.23	158.02	154.93	151.96
	21.56%	171.50	167.86	164.37	161.02	157.81	154.72	151.76
	21.76%	171.27	167.63	164.15	160.81	157.60	154.52	151.56
	21.86%	171.05	167.41	163.93	160.59	157.39	154.32	151.36
	21.96%	170.82	167.19	163.71	160.38	157.18	154.11	151.16

WACC vs. Inflation Rate:

The WACC and inflation rate data table was a little more intuitive. As the cost of capital increases, a stock is valued less because financing costs are higher, which reduces the present value of cash flows and heightens risk perceptions. Inflation is a little harder to describe in the context of formulas, but as it rises, risk perceptions increase, causing a shift in investment preferences, which will ultimately cause a decrease in the stock's valuation.

		WACC						
		9.50%	9.60%	9.70%	9.80%	9.90%	10.00%	10.10%
Inflation Rate	161.08	172.44	168.67	165.07	161.62	158.31	155.13	152.08
	2.45%	172.28	168.51	164.92	161.47	158.16	154.99	151.94
	2.55%	172.11	168.36	164.76	161.32	158.01	154.84	151.79
	2.65%	171.95	168.20	164.61	161.16	157.86	154.70	151.65
	2.75%	171.79	168.04	164.45	161.01	157.71	154.55	151.51
	2.85%	171.63	167.88	164.29	160.86	157.56	154.40	151.37
	2.95%	171.46	167.72	164.14	160.71	157.41	154.26	151.22

Operating Lease Assets vs. Normal Cash:

This table displays that when operating lease assets increase the company is showing less financial commitment and an increase in earnings available to shareholders. Also, within this table, as normal cash increases overall assets increase, showing financial stability and raising the valuation of the stock.

		Operating Lease Assets						
		(17,091)	(16,091)	(15,091)	(14,091)	(13,091)	(12,091)	(11,091)
Normal Cash Estimate	161.08	161.26	161.34	161.42	161.51	161.59	161.67	161.75
	7.14%	161.12	161.20	161.28	161.36	161.45	161.53	161.61
	7.34%	160.98	161.06	161.14	161.22	161.30	161.39	161.47
	7.54%	160.83	160.92	161.00	161.08	161.16	161.25	161.33
	7.74%	160.69	160.77	160.86	160.94	161.02	161.10	161.19
	7.94%	160.55	160.63	160.72	160.80	160.88	160.96	161.05
	8.14%	160.41	160.49	160.57	160.66	160.74	160.82	160.90

Cost of Equity vs. CV Growth of NOPLAT:

In this table, we can see that as the cost of equity rises, financing costs increase, causing a lower return and valuation. Conversely, we can see that as CV growth of NOPLAT increases, so does the valuation of the stock. This is because an

increase in the value of NOPLAT over time suggests higher growth prospects and an increased valuation.

		Cost of Equity							
		161.08	9.58%	9.68%	9.78%	9.88%	9.98%	10.08%	10.18%
CV Growth of NOPLAT	4.70%	164.76	161.46	158.28	155.23	152.30	149.48	146.76	
	4.80%	166.98	163.56	160.29	157.14	154.12	151.21	148.41	
	4.90%	169.28	165.75	162.37	159.12	156.01	153.01	150.13	
	5.00%	171.69	168.04	164.54	161.19	157.97	154.88	151.91	
	5.10%	174.21	170.43	166.81	163.34	160.02	156.83	153.77	
	5.20%	176.85	172.93	169.18	165.59	162.15	158.86	155.70	
	5.30%	179.61	175.54	171.65	167.94	164.38	160.98	157.71	

G&A Expense vs. Pre-Tax Cost of Debt:

In this last table, we see that as G&A expense increases, the valuation of the stock decreases. This is understandable because if a company is spending more money than necessary on G&A it comes directly out of revenue, which will lower the valuation of the stock. Also, as the pre-tax cost of debt increases, the price of the stock drops because Alphabet would have to spend more money paying off its debt than returning money to investors.

		G&A Expense as a % of Sales							
		161.08	5.90%	6.10%	6.30%	6.50%	6.70%	6.90%	7.10%
Pre-Tax Cost of Debt	4.17%	164.96	163.71	162.45	161.19	159.94	158.68	157.43	
	4.37%	164.92	163.67	162.41	161.16	159.90	158.65	157.39	
	4.57%	164.89	163.63	162.38	161.12	159.87	158.61	157.36	
	4.77%	164.85	163.59	162.34	161.08	159.83	158.58	157.32	
	4.97%	164.81	163.55	162.30	161.05	159.79	158.54	157.29	
	5.17%	164.77	163.52	162.26	161.01	159.76	158.50	157.25	
	5.37%	164.73	163.48	162.23	160.97	159.72	158.47	157.22	

Conclusion

In conclusion, we recommend a HOLD rating for Alphabet Inc. as we anticipate a growth period fueled by the ongoing AI boom. Alphabet's strong market position and its strategic focus on generative AI capabilities position it well to capitalize on emerging opportunities in the AI space. Our analysis suggests a potential positive return of 3.31%-11.71% through the end of the calendar year, driven by several key factors.

Important Disclaimer

This report was created by students enrolled in the Applied Equity Valuation class at the University of Iowa. The report was originally created to offer an internal investment recommendation for the University of Iowa Krause Fund and its advisory board. The report also provides potential employers and other interested parties an example of the student's skills, knowledge, and abilities. Members of the Krause Fund are not registered investment advisors, brokers, or officially licensed financial professionals. The investment advice contained in this report does not represent an offer or solicitation to buy or sell any of the securities mentioned. Unless otherwise noted, facts and figures included in this report are from publicly available sources. This report is not a complete compilation of data, and its accuracy is not guaranteed. From time to time, the University of Iowa, its faculty, staff, students, or the Krause Fund may hold financial interest in the companies mentioned in this report.

References

- [1] “Economic Sector Performance Dashboards.” Yahoo! Finance, Yahoo!, finance.yahoo.com/sectors/communication-services/. Accessed 15 Apr. 2024.
- [2] Bianchi, Tiago. “Alphabet: Global Annual Revenue by Segment 2023.” www.statista.com/statistics/633651/alphabet-annual-global-revenue-by-segment/. Statista, 31 Jan. 2024.
- [3] “Alphabet Research and Development Expenses 2010-2023: GOOGL.” *Macrotrends*, www.macrotrends.net/stocks/charts/GOOGL/alphabet/research-development-expenses. Accessed 15 Apr. 2024.
- [4] Bianchi, Tiago. “Global Search Engine Desktop Market Share 2024.” *Statista*, 12 Feb. 2024, www.statista.com/statistics/216573/worldwide-market-share-of-search-engines/.
- [5] Bianchi, Tiago. “Revenue Distribution of Alphabet from 2015 to 2023, by Region.” *Statista*, 31 Jan. 2024, www.statista.com/statistics/266250/regional-distribution-of-googles-revenue/.
- [6] “Compare Stocks.” *Barchart.Com*, www.barchart.com/my/compare-stocks. Accessed 15 Apr. 2024.
- [7] Review, Hivelr Business. “Google (GOOGL): Porter’s Five Forces Industry and Competition Analysis.” *Hivelr*, 5 Jan. 2024, www.hivelr.com/2023/02/google-googl-porters-five-forces-industry-and-competition/.
- [8] “Global Economic Outlook.” *The Conference Board*, www.conference-board.org/topics/global-economic-outlook. Accessed 15 Apr. 2024.
- [9] “Gross Domestic Product, Fourth Quarter and Year 2023.” *Bureau of Economic Analysis*, www.bea.gov/sites/default/files/2024-01/gdp4q23-adv.pdf. Accessed 15 Apr. 2024.
- [10] “Economic Sector Performance Dashboards.” *Yahoo! Finance*, Yahoo!, finance.yahoo.com/sectors/communication-services/. Accessed 15 Apr. 2024.
- [11] “Google to Pay \$700 Million to U.S. States for Stifling Competition against Android App Store.” *CBS News*, CBS Interactive, www.cbsnews.com/news/google-trial-antitrust-settlement-700-million/. Accessed 15 Apr. 2024.
- [12] Bourne, Cole. “Issue Brief-Declining Birth Rates.” *LinkedIn*, 6 Dec. 2023, www.linkedin.com/pulse/issue-brief-declining-birth-rates-cole-bourne-vtixe/.
- [13] “Personal Income and Outlays, December 2023.” *Personal Income and Outlays, December 2023 | U.S. Bureau of Economic Analysis (BEA)*, www.bea.gov/news/2024/personal-income-and-outlays-december-2023. Accessed 15 Apr. 2024.
- [14] “Alphabet Inc. (GOOGL) Stock Price, News, Quote & History.” *Yahoo! Finance*, Yahoo!, 15 Apr. 2024, finance.yahoo.com/quote/GOOGL.
- [15] “Alphabet 2024 10-K.” *Form 10-K*, abc.xyz/assets/ff/7c/06d6f493f6462caf08e8502ffc33/596de1b094c32cf0592a08edfe84ae74.html. Accessed 15 Apr. 2024.
- [16] “Alphabet Inc. Filings.” *Edgar Entity Landing Page*, Securities and Exchange Commission, www.sec.gov/edgar/browse/?CIK=0001652044. Accessed 15 Apr. 2024.

Alphabet Inc.

Revenue Decomposition

Fiscal Years Ending Dec. 31	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
Google Search & Other	\$ 148,951	\$ 162,450	\$ 175,033	\$ 201,288	\$ 241,546	\$ 277,777	\$ 311,111	\$ 336,000	\$ 362,879	\$ 391,910	\$ 423,263	\$ 457,124	\$ 493,694
Growth Rate	43.14%	9.06%	7.75%	15.00%	20.00%	15.00%	12.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
YouTube Ads	28,845	29,243	31,510	33,086	34,740	36,477	38,301	40,216	42,226	44,338	46,555	48,882	51,326
Growth Rate	45.89%	1.38%	7.75%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Google Network	31,701	32,780	31,312	32,878	34,521	36,248	38,060	39,963	41,961	44,059	46,262	48,575	51,004
Growth Rate	37.29%	3.40%	-4.48%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Total Google Advertising	\$ 209,497	\$ 224,473	\$ 237,855	\$ 267,251	\$ 310,807	\$ 350,502	\$ 387,471	\$ 416,178	\$ 447,067	\$ 480,307	\$ 516,079	\$ 554,581	\$ 596,024
Growth Rate	42.59%	7.15%	5.96%	12.36%	16.30%	12.77%	10.55%	7.41%	7.42%	7.44%	7.45%	7.46%	7.47%
Google Other	28,032	29,055	34,688	39,891	47,072	51,779	55,921	59,836	63,426	66,597	69,927	73,423	77,094
Growth Rate	29.11%	3.65%	19.39%	15.00%	18.00%	10.00%	8.00%	7.00%	6.00%	5.00%	5.00%	5.00%	5.00%
Total Google Services	\$ 237,529	\$ 253,528	\$ 272,543	\$ 307,142	\$ 357,878	\$ 402,280	\$ 443,392	\$ 476,014	\$ 510,493	\$ 546,904	\$ 586,006	\$ 628,004	\$ 673,118
Growth Rate	40.85%	6.74%	7.50%	12.69%	16.52%	12.41%	10.22%	7.36%	7.24%	7.13%	7.15%	7.17%	7.18%
Google Cloud	19,206	26,280	33,088	36,397	40,036	44,040	48,444	53,289	58,617	64,479	70,927	78,020	85,822
Growth Rate	47.07%	36.83%	25.91%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Other Bets	753	1,068	1,527	1,603	1,683.52	1,767.69	1,856.08	1,948.88	2,046.33	2,148.64	2,256.07	2,368.88	2,487.32
Growth Rate	14.61%	41.83%	42.98%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Hedging Gains (losses)	149	1,960	236	-	-	-	-	-	-	-	-	-	-
Growth Rate	-15.34%	1215.44%	-87.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Revenues	\$ 257,637	\$ 282,836	\$ 307,394	\$ 345,142	\$ 399,598	\$ 448,088	\$ 493,692	\$ 531,251	\$ 571,156	\$ 613,531	\$ 659,189	\$ 708,393	\$ 761,427
Growth Rate	41.15%	9.78%	8.68%	12.28%	15.78%	12.13%	10.18%	7.61%	7.51%	7.42%	7.44%	7.46%	7.49%

Alphabet Inc.
Balance Sheet

<i>Fiscal Years Ending Dec. 31</i>	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
Assets													
Current Assets:													
Cash & cash equivalents	\$ 20,945	\$ 21,879	\$ 24,048	\$ 45,247	\$ 62,596	\$ 79,831	\$ 96,210	\$ 116,816	\$ 142,193	\$ 172,639	\$ 208,741	\$ 251,108	\$ 300,410
Marketable securities	118,704	91,883	86,868	91,190	95,726	100,489	105,488	110,736	116,245	122,028	128,099	134,472	141,162
Total cash, cash equivalents, & marketable securities	139,649	113,762	110,916	136,437	158,323	180,320	201,698	227,553	258,438	294,668	336,840	385,581	441,572
Accounts receivable, net	39,304	40,258	47,964	53,408	61,835	69,339	76,396	82,208	88,383	94,940	102,005	109,619	117,826
Inventory	1,170	2,670	-	1,448	1,677	1,880	2,071	2,229	2,396	2,574	2,766	2,972	3,195
Other current assets	7,054	8,105	12,650	13,279	13,940	14,633	15,362	16,126	16,928	17,770	18,654	19,582	20,557
Total current assets	188,143	164,795	171,530	204,573	235,774	266,172	295,526	328,115	366,145	409,952	460,265	517,754	583,150
Non-marketable securities	29,549	30,492	31,008	14,883	17,231	19,322	21,288	22,908	24,628	26,455	28,424	30,546	32,833
Deferred income taxes	1,284	5,261	12,169	4,015	4,774	5,446	6,076	6,588	7,133	7,715	8,344	9,025	9,761
Property & equipment, net	97,599	112,668	134,345	138,136	142,014	145,986	150,055	154,228	158,507	162,897	167,403	172,028	176,777
Operating lease assets	12,959	14,381	14,091	14,489	14,895	15,312	15,739	16,176	16,625	17,086	17,558	18,043	18,542
Intangible assets, net	1,417	2,084	-	-	-	-	-	-	-	-	-	-	-
Goodwill	22,956	28,960	29,198	29,198	29,198	29,198	29,198	29,198	29,198	29,198	29,198	29,198	29,198
Other non-current assets	5,361	6,623	10,051	10,551	11,076	11,627	12,205	12,813	13,450	14,119	14,822	15,559	16,333
Total assets	\$ 359,268	\$ 365,264	\$ 402,392	\$ 415,844	\$ 454,963	\$ 493,063	\$ 530,088	\$ 570,025	\$ 615,687	\$ 667,423	\$ 726,015	\$ 792,154	\$ 866,593
Liabilities and Stockholder's Equity													
Current Liabilities:													
Accounts payable	\$ 6,037	\$ 5,128	\$ 7,493	9,166	10,612	11,899	13,110	14,108	15,167	16,293	17,505	18,812	20,220
Short-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Accrued compensation & benefits	13,889	14,028	15,140	17,086	19,781	22,182	24,439	26,298	28,274	30,372	32,632	35,067	37,693
Accrued expenses & other current liabilities	31,236	37,866	46,168	38,630	44,725	50,153	55,257	59,461	63,927	68,670	73,780	79,288	85,223
Accrued revenue share	8,996	8,370	8,876	11,516	13,333	14,951	16,473	17,726	19,058	20,472	21,995	23,637	25,407
Deferred revenue	3,288	3,908	4,137	4,533	5,248	5,885	6,484	6,977	7,501	8,057	8,657	9,303	10,000
Income taxes payable, net	808	-	-	1,104	1,313	1,498	1,671	1,812	1,962	2,122	2,295	2,483	2,685
Total current liabilities	64,254	69,300	81,814	82,035	95,013	106,568	117,435	126,382	135,889	145,986	156,865	168,590	181,228
Long-term debt	14,817	14,701	13,253	7,830	8,271	8,685	9,090	9,459	9,846	10,251	10,678	11,131	11,609
Deferred revenue, non-current	535	599	911	852	986	1,106	1,219	1,311	1,410	1,515	1,627	1,749	1,880
Income taxes payable, net, non-current	9,176	9,258	8,474	7,903	7,333	6,762	6,192	5,621	5,050	4,480	3,909	3,339	2,768
Deferred income taxes	5,257	514	485	3,271	3,889	4,437	4,950	5,366	5,811	6,285	6,797	7,352	7,951
Operating lease liabilities	11,389	12,501	12,460	12,978	13,342	13,716	14,098	14,490	14,892	15,304	15,728	16,162	16,608
Other long-term liabilities	2,205	2,247	1,616	1,230	844	459	73	-	-	-	-	-	-
Total liabilities	107,633	109,120	119,013	116,100	129,679	141,733	153,056	162,630	172,899	183,820	195,605	208,322	222,044
Stockholder's Equity:													
Preferred stock	-	-	-	-	-	-	-	-	-	-	-	-	-
Class A, class B, & class C stock & additional paid-in capital	61,774	68,184	76,534	90,721	104,907	112,000	112,000	112,000	112,000	112,000	112,000	112,000	112,000
Accumulated other comprehensive income (loss)	(1,623)	(7,603)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)	(4,402)
Retained earnings	191,484	195,563	211,247	213,426	224,779	243,732	269,434	299,796	335,190	376,004	422,811	476,234	536,950
Total stockholders' equity	251,635	256,144	283,379	299,744	325,284	351,330	377,032	407,394	442,788	483,603	530,410	583,832	644,549
Total Liabilities and Stockholder's Equity	\$ 359,268	\$ 365,264	\$ 402,392	\$ 415,844	\$ 454,963	\$ 493,063	\$ 530,088	\$ 570,025	\$ 615,687	\$ 667,423	\$ 726,015	\$ 792,154	\$ 866,593

Alphabet Inc.

Historical Cash Flow Statement

Fiscal Years Ending Dec. 31	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Operating activities										
Net income	\$ 14,444	\$ 16,348	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795
Adjustments:										
Depreciation & impairment of property & equipment	3,523	4,132	5,267	6,103	8,164	10,856	12,905	11,555	15,287	11,946
Amortization & impairment of intangible assets	-	931	877	812	871	925	792	886	641	-
Stock-based compensation expense	4,279	5,203	6,703	7,679	9,353	10,794	12,991	15,376	19,362	22,460
Deferred income taxes	(104)	(179)	(38)	258	778	173	1,390	1,808	(8,081)	(7,763)
(Gain) loss on debt & equity securities, net	(1,025)	334	275	194	(6,650)	(2,798)	(6,317)	(12,270)	5,519	823
Other	87	212	174	137	(189)	(592)	1,267	(213)	1,030	4,330
Changes in assets and liabilities, net of effects of acquisitions:										
Accounts receivable, net	(1,641)	(2,094)	(2,578)	(3,768)	(2,169)	(4,340)	(6,524)	(9,095)	(2,317)	(7,833)
Income taxes, net	283	(179)	3,125	8,211	(2,251)	(3,128)	1,209	(625)	584	523
Other assets	459	(318)	312	(2,164)	(1,207)	(621)	(1,330)	(1,846)	(5,046)	(2,143)
Accounts payable	436	203	110	731	1,067	428	694	283	707	664
Accrued expenses & other liabilities	757	1,597	1,515	4,891	8,614	7,170	5,504	7,304	3,915	3,937
Accrued revenue share	245	339	593	955	483	1,273	1,639	1,682	(445)	482
Deferred revenue	(175)	43	223	390	371	37	635	774	367	525
Net cash flows provided by operating activities	22,376	26,024	36,036	37,091	47,971	54,520	65,124	91,652	91,495	101,746
Investing activities										
Purchases of property & equipment	(10,959)	(9,915)	(10,212)	(13,184)	(25,139)	(23,548)	(22,281)	(24,640)	(31,485)	(32,251)
Purchases of marketable securities	(56,310)	(74,368)	(84,509)	(92,195)	(50,158)	(100,315)	(136,576)	(135,196)	(78,874)	(77,858)
Maturities & sales of marketable securities	51,315	62,905	66,895	73,959	48,507	97,825	132,906	128,294	97,822	947
Purchases of non-marketable securities	(1,227)	(2,172)	(1,109)	(1,745)	(2,073)	(1,932)	(7,175)	(2,838)	(2,531)	(3,027)
Maturities & sales of non-marketable securities	-	-	494	533	1,752	405	1,023	934	150	86,672
Acquisitions, net of cash acquired, & purchases of intangible assets	-	-	-	-	-	-	-	-	(6,969)	-
Other investing activities	-	-	-	-	-	589	68	541	1,589	(1,051)
Net cash flows used in investing activities	(21,055)	(23,711)	(31,165)	(31,401)	(28,504)	(29,491)	(32,773)	(35,523)	(20,298)	(27,063)
Financing Activities										
Net proceeds (payments) related to stock-based award activities	(2,069)	(2,375)	(3,304)	(4,166)	(4,993)	(4,765)	(5,720)	(10,162)	(9,300)	(9,837)
Repurchases of stock	-	(1,780)	(3,693)	(4,846)	(9,075)	(18,396)	(31,149)	(50,274)	(59,296)	(61,504)
Proceeds from issuance of debt, net of costs	11,625	13,705	8,729	4,291	6,766	317	11,761	20,199	52,872	10,790
Repayments of debt	(11,643)	(13,728)	(10,064)	(4,377)	(6,827)	(585)	(2,100)	(21,435)	(54,068)	(11,550)
Proceeds from sale of interest in consolidated entities, net	-	-	-	800	950	220	2,800	310	35	8
Net cash flows used in financing activities	(2,087)	(4,225)	(8,332)	(8,298)	(13,179)	(23,209)	(24,408)	(61,362)	(69,757)	(72,093)
Effect of exchange rate changes on cash & cash equivalents	(433)	(434)	(170)	405	(302)	(23)	24	(287)	(506)	(421)
Net increase (decrease) in cash & cash equivalents	(551)	(1,798)	(3,631)	(2,203)	5,986	1,797	7,967	(5,520)	934	2,169
Cash & cash equivalents at beginning of period	18,898	18,347	16,549	12,918	10,715	16,701	18,498	26,465	20,945	21,879
Cash & cash equivalents at end of period	\$ 18,347	\$ 16,549	\$ 12,918	\$ 10,715	\$ 16,701	\$ 18,498	\$ 26,465	\$ 20,945	\$ 21,879	\$ 24,048

Alphabet Inc.
Forecasted Cash Flow Statement

Fiscal Years Ending Dec. 31	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
Operating activities										
Net income	\$ 65,179	\$ 77,503	\$ 88,411	\$ 98,632	\$ 106,939	\$ 115,799	\$ 125,241	\$ 135,454	\$ 146,502	\$ 158,450
Adjustments:										
Depreciation & impairment of property & equipment	22,767	23,409	24,066	24,739	25,429	26,136	26,861	27,605	28,369	29,153
Amortization & impairment of intangible assets	-	-	-	-	-	-	-	-	-	-
Change in deferred income taxes	8,154	(759)	(672)	(630)	(512)	(546)	(582)	(629)	(681)	(736)
Changes in working capital accounts:										
Change in accounts receivable	(5,444)	(8,427)	(7,503)	(7,057)	(5,812)	(6,175)	(6,557)	(7,065)	(7,614)	(8,207)
Change in inventory	(1,448)	(228)	(203)	(191)	(158)	(167)	(178)	(192)	(206)	(223)
Change in other current assets	(629)	(661)	(694)	(728)	(764)	(802)	(842)	(884)	(928)	(974)
Change in operating lease assets	(398)	(407)	(417)	(427)	(438)	(449)	(461)	(473)	(485)	(498)
Change in accounts payable	1,673	1,446	1,288	1,211	997	1,060	1,125	1,212	1,307	1,408
Change in accrued compensation	1,946	2,696	2,400	2,258	1,859	1,975	2,098	2,260	2,436	2,625
Change in accrued expenses & other liabilities	(7,538)	6,095	5,427	5,104	4,204	4,466	4,743	5,110	5,507	5,936
Change in accrued revenue	2,640	1,817	1,618	1,522	1,253	1,332	1,414	1,523	1,642	1,770
Change in deferred revenue	396	715	637	599	493	524	557	600	646	696
Change in income taxes payable	1,104	209	185	173	141	150	160	173	187	202
Change in deferred revenue, non-current	(59)	134	120	113	93	99	105	113	121	131
Change in income taxes, non-current	(571)	(571)	(571)	(571)	(571)	(571)	(571)	(571)	(571)	(571)
Change in operating lease liabilities	518	364	373	382	392	402	412	423	435	446
Change in other non-current liabilities	(386)	(386)	(386)	(386)	(73)	-	-	-	-	-
Net cash flows provided by operating activities	87,904	102,951	114,080	124,744	133,474	143,233	153,525	164,662	176,667	189,610
Investing activities										
Capital Expenditures	(26,557)	(27,288)	(28,038)	(28,809)	(29,601)	(30,415)	(31,252)	(32,111)	(32,994)	(33,902)
Change in non-marketable securities	16,125	(2,348)	(2,091)	(1,966)	(1,620)	(1,721)	(1,827)	(1,969)	(2,122)	(2,287)
Change in other non-current assets	(500)	(525)	(551)	(578)	(607)	(637)	(669)	(702)	(737)	(774)
Change in deferred income taxes	2,786	618	547	513	417	445	474	513	554	600
Change in marketable securities	(4,322)	(4,537)	(4,762)	(4,999)	(5,248)	(5,509)	(5,783)	(6,071)	(6,373)	(6,690)
Change in goodwill	-	-	-	-	-	-	-	-	-	-
Net cash flows used in investing activities	(12,468)	(34,079)	(34,895)	(35,840)	(36,659)	(37,838)	(39,058)	(40,341)	(41,672)	(43,053)
Financing Activities										
Change in long-term debt	(5,423)	441	415	405	369	386	405	428	452	478
Change in common stock	14,187	14,187	7,093	-	-	-	-	-	-	-
Repurchases of stock	(63,000)	(66,150)	(69,458)	(72,930)	(76,577)	(80,406)	(84,426)	(88,647)	(93,080)	(97,734)
Net cash flows provided by financing activities	(54,236)	(51,523)	(61,949)	(72,525)	(76,208)	(80,019)	(84,021)	(88,220)	(92,627)	(97,255)
Net increase (decrease) in cash & cash equivalents	21,199	17,349	17,235	16,378	20,607	25,376	30,447	36,101	42,368	49,302
Cash & cash equivalents at beginning of period	24,048	45,247	62,596	79,831	96,210	116,816	142,193	172,639	208,741	251,108
Cash & cash equivalents at end of period	\$ 45,247	\$ 62,596	\$ 79,831	\$ 96,210	\$ 116,816	\$ 142,193	\$ 172,639	\$ 208,741	\$ 251,108	\$ 300,410

Alphabet Inc.

Common Size Income Statement

Fiscal Years Ending Dec. 31	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
Costs and Expenses:													
Cost of revenues	38.23%	38.99%	39.49%	38.91%	38.91%	38.91%	38.91%	38.91%	38.91%	38.91%	38.91%	38.91%	38.91%
Depreciation and impairment of property and equipment	4.48%	5.40%	3.89%	6.60%	5.86%	5.37%	5.01%	4.79%	4.58%	4.38%	4.19%	4.00%	3.83%
Amortization and impairment of intangible assets	0.34%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Research & development expense	12.25%	13.97%	14.78%	14.96%	14.96%	14.96%	14.96%	14.96%	14.96%	14.96%	14.96%	14.96%	14.96%
Sales & marketing expense	8.89%	9.39%	9.08%	9.30%	9.30%	9.30%	9.30%	9.30%	9.30%	9.30%	9.30%	9.30%	9.30%
General & administrative expense	5.24%	5.56%	5.34%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%
European Commission fine	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total costs & expenses	69.45%	73.54%	72.58%	76.26%	75.52%	75.03%	74.67%	74.45%	74.24%	74.04%	73.85%	73.67%	73.49%
Income from operations:	30.55%	26.46%	27.42%	23.74%	24.48%	24.97%	25.33%	25.55%	25.76%	25.96%	26.15%	26.33%	26.51%
Other income (expense), net	4.67%	-1.24%	0.46%	0.36%	0.28%	0.22%	0.18%	0.14%	0.12%	0.10%	0.08%	0.07%	0.05%
Income before income taxes	35.22%	25.22%	27.89%	24.11%	24.76%	25.19%	25.50%	25.70%	25.88%	26.06%	26.23%	26.40%	26.56%
Provision for income taxes	5.71%	4.02%	3.88%	5.22%	5.36%	5.46%	5.52%	5.57%	5.61%	5.64%	5.68%	5.72%	5.75%
Net income	29.51%	21.20%	24.01%	18.88%	19.40%	19.73%	19.98%	20.13%	20.27%	20.41%	20.55%	20.68%	20.81%

Alphabet Inc.

Common Size Balance Sheet

Fiscal Years Ending Dec. 31	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
Assets													
Current Assets:													
Cash & cash equivalents	8.13%	7.74%	7.82%	13.11%	15.66%	17.82%	19.49%	21.99%	24.90%	28.14%	31.67%	35.45%	39.45%
Marketable securities	46.07%	32.49%	28.26%	26.42%	23.96%	22.43%	21.37%	20.84%	20.35%	19.89%	19.43%	18.98%	18.54%
Total cash, cash equivalents, & marketable securities	54.20%	40.22%	36.08%	39.53%	39.62%	40.24%	40.85%	42.83%	45.25%	48.03%	51.10%	54.43%	57.99%
Accounts receivable, net	15.26%	14.23%	15.60%	15.47%	15.47%	15.47%	15.47%	15.47%	15.47%	15.47%	15.47%	15.47%	15.47%
Inventory	0.45%	0.94%	0.00%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%
Other current assets	2.74%	2.87%	4.12%	3.85%	3.49%	3.27%	3.11%	3.04%	2.96%	2.90%	2.83%	2.76%	2.70%
Total current assets	73.03%	58.27%	55.80%	59.27%	59.00%	59.40%	59.86%	61.76%	64.11%	66.82%	69.82%	73.09%	76.59%
Non-marketable securities	11.47%	10.78%	10.09%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%
Deferred income taxes	0.50%	1.86%	3.96%	1.16%	1.19%	1.22%	1.23%	1.24%	1.25%	1.26%	1.27%	1.27%	1.28%
Property & equipment, net	37.88%	39.84%	43.70%	40.02%	35.54%	32.58%	30.39%	29.03%	27.75%	26.55%	25.40%	24.28%	23.22%
Operating lease assets	5.03%	5.08%	4.58%	4.20%	3.73%	3.42%	3.19%	3.04%	2.91%	2.78%	2.66%	2.55%	2.44%
Intangible assets, net	0.55%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Goodwill	8.91%	10.24%	9.50%	8.46%	7.31%	6.52%	5.91%	5.50%	5.11%	4.76%	4.43%	4.12%	3.83%
Other non-current assets	2.08%	2.34%	3.27%	3.06%	2.77%	2.59%	2.47%	2.41%	2.35%	2.30%	2.25%	2.20%	2.15%
Total assets	139.45%	129.14%	130.90%	120.48%	113.85%	110.04%	107.37%	107.30%	107.80%	108.78%	110.14%	111.82%	113.81%
Liabilities and Stockholder's Equity													
Current Liabilities:													
Accounts payable	2.34%	1.81%	2.44%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%
Accrued compensation & benefits	5.39%	4.96%	4.93%	4.95%	4.95%	4.95%	4.95%	4.95%	4.95%	4.95%	4.95%	4.95%	4.95%
Accrued expenses & other current liabilities	12.12%	13.39%	15.02%	11.19%	11.19%	11.19%	11.19%	11.19%	11.19%	11.19%	11.19%	11.19%	11.19%
Accrued revenue share	3.49%	2.96%	2.89%	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%	3.34%
Deferred revenue	1.28%	1.38%	1.35%	1.31%	1.31%	1.31%	1.31%	1.31%	1.31%	1.31%	1.31%	1.31%	1.31%
Income taxes payable, net	0.31%	0.00%	0.00%	0.32%	0.33%	0.33%	0.34%	0.34%	0.34%	0.35%	0.35%	0.35%	0.35%
Total current liabilities	24.94%	24.50%	26.62%	23.77%	23.78%	23.78%	23.79%	23.79%	23.79%	23.79%	23.80%	23.80%	23.80%
Long-term debt	5.75%	5.20%	4.31%	2.27%	2.07%	1.94%	1.84%	1.78%	1.72%	1.67%	1.62%	1.57%	1.52%
Deferred revenue, non-current	0.21%	0.21%	0.30%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Income taxes payable, net, non-current	3.56%	3.27%	2.76%	2.29%	1.84%	1.51%	1.25%	1.06%	0.88%	0.73%	0.59%	0.47%	0.36%
Deferred income taxes	2.04%	0.18%	0.16%	0.95%	0.97%	0.99%	1.00%	1.01%	1.02%	1.02%	1.03%	1.04%	1.04%
Operating lease liabilities	4.42%	4.42%	4.05%	3.76%	3.34%	3.06%	2.86%	2.73%	2.61%	2.49%	2.39%	2.28%	2.18%
Other long-term liabilities	0.86%	0.79%	0.53%	0.36%	0.21%	0.10%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total liabilities	41.78%	38.58%	38.72%	33.64%	32.45%	31.63%	31.00%	30.61%	30.27%	29.96%	29.67%	29.41%	29.16%
Stockholder's Equity:													
Preferred stock	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Class A, class B, & class C stock & additional paid-in capital	23.98%	24.11%	24.90%	26.28%	26.25%	25.00%	22.69%	21.08%	19.61%	18.26%	16.99%	15.81%	14.71%
Accumulated other comprehensive income (loss)	-0.63%	-2.69%	-1.43%	-1.28%	-1.10%	-0.98%	-0.89%	-0.83%	-0.77%	-0.72%	-0.67%	-0.62%	-0.58%
Retained earnings	74.32%	69.14%	68.72%	61.84%	56.25%	54.39%	54.58%	56.43%	58.69%	61.29%	64.14%	67.23%	70.52%
Total stockholders' equity	97.67%	90.56%	92.19%	86.85%	81.40%	78.41%	76.37%	76.69%	77.52%	78.82%	80.46%	82.42%	84.65%
Total Liabilities and Stockholder's Equity	139.45%	129.14%	130.90%	120.48%	113.85%	110.04%	107.37%	107.30%	107.80%	108.78%	110.14%	111.82%	113.81%

Alphabet Inc.
Value Driver Estimation

Fiscal Years Ending Dec. 31	2021	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
NOPLAT:													
Revenues	\$ 257,637	\$ 282,836	\$ 307,394	\$ 345,142	\$ 399,598	\$ 448,088	\$ 493,692	\$ 531,251	\$ 571,156	\$ 613,531	\$ 659,189	\$ 708,393	\$ 761,427
Operating Expenses:													
(-) Cost of Revenues	98,498	110,275	121,386	134,283	155,470	174,336	192,079	206,692	222,218	238,705	256,468	275,612	296,246
(-) Depreciation and impairment of property and equipment	11,555	15,287	11,946	22,767	23,409	24,066	24,739	25,429	26,136	26,861	27,605	28,369	29,153
(-) Amortization and impairment of intangible assets	886	641	-	-	-	-	-	-	-	-	-	-	-
(-) Research and Development	31,562	39,500	45,427	51,617	59,761	67,013	73,833	79,451	85,418	91,756	98,584	105,943	113,874
(-) Sales and Marketing	22,912	26,567	27,917	32,098	37,163	41,672	45,913	49,406	53,118	57,058	61,305	65,881	70,813
(-) General and Administrative	13,510	15,724	16,425	22,434	25,974	29,126	32,090	34,531	37,125	39,880	42,847	46,046	49,493
(+) Implied Interest on Operating Leases	582	618	686	672	691	711	730	751	772	793	815	838	861
EBITA	79,296	75,460	84,979	82,615	98,512	112,585	125,767	136,492	147,913	160,065	173,194	187,381	202,710
Provision for Tax Expense													
(+) Tax on implied interest on operating leases	14,701	11,356	11,922	18,021	21,429	24,444	27,271	29,567	32,017	34,627	37,451	40,506	43,809
(+) Tax on European Commission Fines	129	153	153	146	150	154	158	163	167	172	177	181	186
(-) Tax on Other Income	2,668	(871)	318	272	241	212	188	166	146	129	114	101	89
Total Adjusted Taxes	12,162	12,381	11,757	17,894	21,338	24,386	27,241	29,564	32,038	34,670	37,514	40,587	43,907
Change in Deferred Taxes	1,808	(8,081)	(7,763)	8,154	(759)	(672)	(630)	(512)	(546)	(582)	(629)	(681)	(736)
EBITA	79,296	75,460	84,979	82,615	98,512	112,585	125,767	136,492	147,913	160,065	173,194	187,381	202,710
Less Adjusted Taxes	12,162	12,381	11,757	17,894	21,338	24,386	27,241	29,564	32,038	34,670	37,514	40,587	43,907
Change in Deferred Taxes	1,808	(8,081)	(7,763)	8,154	(759)	(672)	(630)	(512)	(546)	(582)	(629)	(681)	(736)
NOPLAT	68,943	54,998	65,459	72,874	76,415	87,527	97,896	106,417	115,329	124,813	135,051	146,114	158,067
Invested Capital (IC):													
Operating Current Assets:													
Normal Cash (7.74%)	19,930	21,879	23,779	26,699	30,911	34,662	38,190	41,095	44,182	47,460	50,992	54,798	58,901
Accounts Receivable	39,304	40,258	47,964	53,408	61,835	69,339	76,396	82,208	88,383	94,940	102,005	109,619	117,826
Inventory	1,170	2,670	-	1,448	1,677	1,880	2,071	2,229	2,396	2,574	2,766	2,972	3,195
Other current assets	7,054	8,105	12,650	13,279	13,940	14,633	15,362	16,126	16,928	17,770	18,654	19,582	20,557
Total Operating Current Assets	67,458	72,912	84,393	94,835	108,363	120,514	132,019	141,658	151,889	162,745	174,417	186,972	200,478
Operating Current Liabilities:													
Accounts Payable	6,037	5,128	7,493	9,166	10,612	11,899	13,110	14,108	15,167	16,293	17,505	18,812	20,220
Accrued compensation benefits	13,889	14,028	15,140	17,086	19,781	22,182	24,439	26,298	28,274	30,372	32,632	35,067	37,693
Accrued expenses and other current liabilities	31,236	37,866	46,168	38,630	44,725	50,153	55,257	59,461	63,927	68,670	73,780	79,288	85,223
Accrued revenue share	8,996	8,370	8,876	11,516	13,333	14,951	16,473	17,726	19,058	20,472	21,995	23,637	25,407
Deferred revenue	3,288	3,908	4,137	4,533	5,248	5,885	6,484	6,977	7,501	8,057	8,657	9,303	10,000
Income taxes payable, net	808	-	-	1,104	1,313	1,498	1,671	1,812	1,962	2,122	2,295	2,483	2,685
Total Operating Current Liabilities	64,254	69,300	81,814	82,035	95,013	106,568	117,435	126,382	135,889	145,986	156,865	168,590	181,228
Total Net Operating Working Capital	3,204	3,612	2,579	12,800	13,350	13,947	14,584	15,276	16,000	16,759	17,552	18,382	19,250
(+) Net Property Plant & Equipment	97,599	112,668	134,345	138,136	142,014	145,986	150,055	154,228	158,507	162,897	167,403	172,028	176,777
(+) Net Other Operating Assets													
Operating lease assets	12,959	14,381	14,091	14,489	14,895	15,312	15,739	16,176	16,625	17,086	17,558	18,043	18,542
Intangible assets, net	1,417	2,084	-	-	-	-	-	-	-	-	-	-	-
Other non-current assets	5,361	6,623	10,051	10,551	11,076	11,627	12,205	12,813	13,450	14,119	14,822	15,559	16,333
(-) Other operating liabilities													
Deferred revenue, non-current	535	599	911	852	986	1,106	1,219	1,311	1,410	1,515	1,627	1,749	1,880
Income taxes payable, non-current	9,176	9,258	8,474	7,903	7,333	6,762	6,192	5,621	5,050	4,480	3,909	3,339	2,768
Invested Capital (IC)	110,829	129,511	151,681	167,220	173,016	179,003	185,173	191,560	198,122	204,867	211,799	218,926	226,254
Free Cash Flow (FCF):													
NOPLAT	68,943	54,998	65,459	72,874	76,415	87,527	97,896	106,417	115,329	124,813	135,051	146,114	158,067
Change in IC	23,367	18,682	22,170	15,539	5,797	5,987	6,170	6,386	6,562	6,745	6,932	7,127	7,328
FCF	45,575	36,316	43,289	57,335	70,618	81,541	91,726	100,030	108,767	118,068	128,119	138,987	150,738
Return on Invested Capital (ROIC):													
NOPLAT	68,943	54,998	65,459	72,874	76,415	87,527	97,896	106,417	115,329	124,813	135,051	146,114	158,067
Beginning IC	87,462	110,829	129,511	151,681	167,220	173,016	179,003	185,173	191,560	198,122	204,867	211,799	218,926
ROIC	78.83%	49.62%	50.54%	48.04%	45.70%	50.59%	54.69%	57.47%	60.21%	63.00%	65.92%	68.99%	72.20%
Economic Profit (EP):													
Beginning IC	87,462	110,829	129,511	151,681	167,220	173,016	179,003	185,173	191,560	198,122	204,867	211,799	218,926
x (ROIC - WACC)	69.02%	39.82%	40.74%	38.24%	35.90%	40.79%	44.89%	47.67%	50.40%	53.20%	56.12%	59.18%	62.40%
EP	60,369	44,135	52,763	58,006	60,024	70,567	80,350	88,265	96,552	105,393	114,969	125,352	136,607

Alphabet Inc.*Weighted Average Cost of Capital (WACC) Estimation***Cost of Equity:**

Risk-Free Rate	4.52%
Beta	1.02
Equity Risk Premium	5.26%
Cost of Equity	9.88%

ASSUMPTIONS:

10-Year Treasury Bond Yield as of 4/12/24
 5-Year Raw Beta (Bloomberg)
 1928-2020 geometric average over 10-year Treasury

Cost of Debt:

Risk-Free Rate	4.52%
Implied Default Premium	0.25%
Pre-Tax Cost of Debt	4.77%
Marginal Tax Rate	21.66%
After-Tax Cost of Debt	3.74%

10-Year Treasury Bond Yield as of 4/12/24

YTM on Alphabet's 20 Corp. Bond

Market Value of Common Equity:

Total Shares Outstanding	12,460
Current Stock Price	\$154.86
MV of Equity	1,929,555.60

MV Weights

98.68%

Market Value of Debt:

Short-Term Debt	0
Current Portion of LTD	0
Long-Term Debt	13,253
PV of Operating Leases	12,460
MV of Total Debt	25,713.00

1.32%

Market Value of the Firm

1,955,268.60

100.00%

Estimated WACC

9.80%

Alphabet Inc.*Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models*

Key Inputs:

CV Growth of NOPLAT	5.00%
CV Year ROIC	72.20%
WACC	9.80%
Cost of Equity	9.88%

Fiscal Years Ending Dec. 31	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
------------------------------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------

DCF Model:

Free Cash Flow (FCF)	57,335	70,618	81,541	91,726	100,030	108,767	118,068	128,119	138,987	150,738
Continuing Value (CV)										3,063,495
PV of FCF	52,217	58,573	61,594	63,102	62,672	62,062	61,355	60,634	59,906	1,320,419

Value of Operating Assets:	1,862,534
Non-Operating Adjustments	
(+ Non-marketable securities)	31,008
(+ Marketable securities)	86,868
(-) Operating lease assets	(14,091)
(-) Debt	(13,253)
Value of Equity	1,953,066
Shares Outstanding	12,460
Intrinsic Value of Last FYE	\$ 156.75
Implied Price as of Today	\$ 161.08

EP Model:

Economic Profit (EP)	58,006	60,024	70,567	80,350	88,265	96,552	105,393	114,969	125,352	136,607
Continuing Value (CV)										2,844,569
PV of EP	52,828	49,785	53,305	55,276	55,301	55,092	54,768	54,411	54,029	1,226,058

Total PV of EP	1,710,853
Invested Capital (last FYE)	151,681
Value of Operating Assets:	1,862,534
Non-Operating Adjustments	
(+ Non-marketable securities)	31,008
(+ Marketable securities)	86,868
(-) Operating lease assets	(14,091)
(-) Debt	(13,253)
Value of Equity	1,953,066
Shares Outstanding	12,460
Intrinsic Value of Last FYE	\$ 156.75
Implied Price as of Today	\$ 161.08

Alphabet Inc.*Dividend Discount Model (DDM) or Fundamental P/E Valuation Model*

Fiscal Years Ending	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E
----------------------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------

EPS	\$ 5.12	\$ 5.84	\$ 6.43	\$ 6.97	\$ 7.38	\$ 7.81	\$ 8.27	\$ 8.77	\$ 9.31	\$ 9.90
-----	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

Key Assumptions

CV growth of EPS	6.00%
CV Year ROE	27.14%
Cost of Equity	9.88%

Future Cash Flows

P/E Multiple (CV Year)	20.06
EPS (CV Year)	\$ 9.90
Future Stock Price	\$ 198.56
Dividends Per Share	
Discounted Cash Flows	\$ 85.02

Intrinsic Value as of Last FYE \$ 85.02

Implied Price as of Today **\$ 87.37**

Alphabet Inc.

Relative Valuation Models

Ticker	Company	Price	EPS		P/E 24	P/E 25
			2024E	2025E		
META	Meta Platforms	\$499.44	\$18.44	\$21.30	27.08	23.45
MSFT	Microsoft Corporation	\$423.01	\$10.78	\$12.37	39.24	34.20
AAPL	Apple Inc.	\$170.41	\$6.07	\$6.63	28.07	25.70
DIS	Walt Disney	\$120.20	\$4.31	\$5.06	27.89	23.75
NFLX	Netflix Inc.	\$630.34	\$15.88	\$19.61	39.69	32.14
PINS	Pinterest Inc.	\$35.73	\$1.35	\$1.69	26.47	21.14
BIDU	Baidu Inc.	\$103.75	\$11.15	\$12.30	9.30	8.43
Average					31.41	26.73

GOOGL Alphabet Inc. \$154.86 \$ 5.12 \$ 5.84 30.2 26.5

Implied Relative Value:

P/E (EPS24) \$ 160.80

P/E (EPS25) \$ 156.19

Alphabet Inc.
Sensitivity Tables

		Beta							
		161.08	0.72	0.82	0.92	1.02	1.12	1.22	1.32
Equity Risk Premium	4.96%	254.51	219.25	192.61	171.80	155.09	141.38	129.94	
	5.06%	248.70	214.34	188.38	168.07	151.76	138.38	127.21	
	5.16%	243.15	209.65	184.32	164.50	148.58	135.51	124.59	
	5.26%	237.84	205.17	180.44	161.08	145.53	132.75	122.08	
	5.36%	232.76	200.87	176.72	157.81	142.60	130.11	119.67	
	5.46%	227.90	196.75	173.15	154.66	139.79	127.57	117.36	
	5.56%	223.23	192.80	169.73	151.65	137.09	125.13	115.14	

		Risk-Free Rate							
		161.08	4.22%	4.32%	4.42%	4.52%	4.62%	4.72%	4.82%
Marginal Tax Rate	21.36%	172.18	168.52	165.02	161.66	158.43	155.34	152.36	
	21.46%	171.96	168.30	164.80	161.45	158.23	155.13	152.16	
	21.56%	171.73	168.08	164.58	161.23	158.02	154.93	151.96	
	21.66%	171.50	167.86	164.37	161.02	157.81	154.72	151.76	
	21.76%	171.27	167.63	164.15	160.81	157.60	154.52	151.56	
	21.86%	171.05	167.41	163.93	160.59	157.39	154.32	151.36	
	21.96%	170.82	167.19	163.71	160.38	157.18	154.11	151.16	

		WACC							
		161.08	9.50%	9.60%	9.70%	9.80%	9.90%	10.00%	10.10%
Inflation Rate	2.45%	172.44	168.67	165.07	161.62	158.31	155.13	152.08	
	2.55%	172.28	168.51	164.92	161.47	158.16	154.99	151.94	
	2.65%	172.11	168.36	164.76	161.32	158.01	154.84	151.79	
	2.75%	171.95	168.20	164.61	161.16	157.86	154.70	151.65	
	2.85%	171.79	168.04	164.45	161.01	157.71	154.55	151.51	
	2.95%	171.63	167.88	164.29	160.86	157.56	154.40	151.37	
	3.05%	171.46	167.72	164.14	160.71	157.41	154.26	151.22	

		Operating Lease Assets							
		161.08	(17,091)	(16,091)	(15,091)	(14,091)	(13,091)	(12,091)	(11,091)
Normal Cash Estimate	7.14%	161.26	161.34	161.42	161.51	161.59	161.67	161.75	
	7.34%	161.12	161.20	161.28	161.36	161.45	161.53	161.61	
	7.54%	160.98	161.06	161.14	161.22	161.30	161.39	161.47	
	7.74%	160.83	160.92	161.00	161.08	161.16	161.25	161.33	
	7.94%	160.69	160.77	160.86	160.94	161.02	161.10	161.19	
	8.14%	160.55	160.63	160.72	160.80	160.88	160.96	161.05	
	8.34%	160.41	160.49	160.57	160.66	160.74	160.82	160.90	

		Cost of Equity							
		161.08	9.58%	9.68%	9.78%	9.88%	9.98%	10.08%	10.18%
CV Growth of NOPLAT	4.70%	164.76	161.46	158.28	155.23	152.30	149.48	146.76	
	4.80%	166.98	163.56	160.29	157.14	154.12	151.21	148.41	
	4.90%	169.28	165.75	162.37	159.12	156.01	153.01	150.13	
	5.00%	171.69	168.04	164.54	161.19	157.97	154.88	151.91	
	5.10%	174.21	170.43	166.81	163.34	160.02	156.83	153.77	
	5.20%	176.85	172.93	169.18	165.59	162.15	158.86	155.70	
	5.30%	179.61	175.54	171.65	167.94	164.38	160.98	157.71	

		G&A Expense as a % of Sales							
		161.08	5.90%	6.10%	6.30%	6.50%	6.70%	6.90%	7.10%
Pre-Tax Cost of Debt	4.17%	164.96	163.71	162.45	161.19	159.94	158.68	157.43	
	4.37%	164.92	163.67	162.41	161.16	159.90	158.65	157.39	
	4.57%	164.89	163.63	162.38	161.12	159.87	158.61	157.36	
	4.77%	164.85	163.59	162.34	161.08	159.83	158.58	157.32	
	4.97%	164.81	163.55	162.30	161.05	159.79	158.54	157.29	
	5.17%	164.77	163.52	162.26	161.01	159.76	158.50	157.25	
	5.37%	164.73	163.48	162.23	160.97	159.72	158.47	157.22	

Alphabet Inc.*Valuation of Options Granted under ESOP*

Current Stock Price	\$154.86
Risk Free Rate	4.52%
Current Dividend Yield	0.00%
Annualized St. Dev. of Stock Returns	25.636%

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	338	104.93	2.50	\$ 63.63	\$ 21,507
Total	338	\$ 104.93	2.50	\$ 63.63	\$ 13,184,936