

The Henry Fund

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ALPHABET INC. (GOOGL)

November 17, 2022

Communication Services – Internet Content & Information

Stock Rating

BUY

Investment Thesis

We recommend a **BUY** rating for Alphabet with a target price range of \$115-125, representing a 19% - 30% upside from the current price level of \$96. We see strong growth driven by the continued migration of companies adopting cloud-based enterprise systems. Google is the world's premiere search engine, and we expect Alphabet to retain a strong market share for several years. YouTube has provided healthy revenues specifically thanks to its new shorts and live shopping features.

Drivers of Thesis

- The continued migration of companies adopting more cloud-based systems will grow Google Cloud by an average of 25% over the next three years.
- With \$139.6 billion in cash and equivalents paired with only \$14.8 billion in long-term debt, we believe Alphabet is in a comfortable position to weather an economic downturn.
- It is a leader in cutting-edge technological shifts such as self-driving vehicles, quantum computing, drone delivery, smart homes, and wearables.

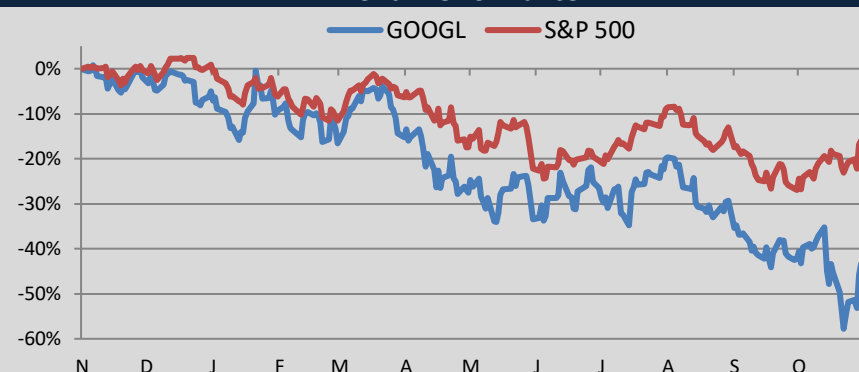
Risks to Thesis

- Government regulation is a continued threat, particularly with its Android operating system and its Google Play store.
- An economic slowdown will cause companies to limit their advertising expenses directly impacting Google Search and YouTube ads revenues.
- Rising costs for both hardware components and skilled labor could become more of an issue given its initiative to become 20% more efficient.

Earnings Estimates

Year	2019	2020	2021	2022E	2023E	2024E
EPS	\$2.48	\$2.96	\$5.69	\$4.73	\$5.31	\$6.21
HF est.				\$6.08	\$7.84	\$9.83
growth	12.1%	19.3%	92.5%	6.7%	29.0%	25.4%

12 Month Performance



Target Price

\$115-125

Henry Fund DCF	\$99
Henry Fund DDM	\$119
Relative Multiple	\$158

Price Data

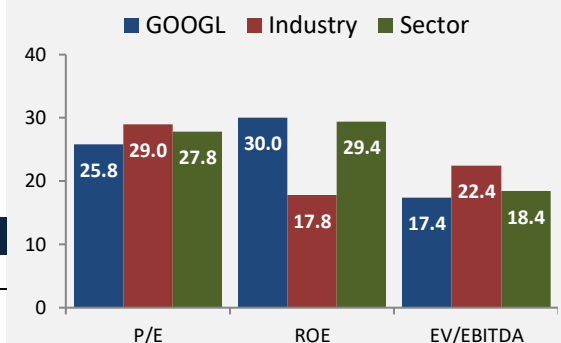
Current Price	\$96.41
52wk Range	\$83 – 152
Consensus 1yr Target	\$129

Key Statistics

Market Cap (B)	\$1,250
Shares Outstanding (M)	13,353
Institutional Ownership	78.8%
Beta	1.15
Dividend Yield	0.0%
Est. 5yr Growth	8.95%
Price/Earnings (5Y Avg)	33.1
Price/Earnings (FY21)	25.8
Price/Sales (TTM)	7.6
Price/Book (mrq)	7.6

Profitability

Operating Margin	32.8%
Net Margin	29.5%
Return on Assets (TTM)	22.4%
Return on Equity (TTM)	32.1%



Company Description

Alphabet, Inc was created in 2015 as a holding company for Google. Google was originally founded in 1998 by Larry Page and Sergey Brin and is currently headquartered in Mountain View, CA. Alphabet operates through two major segments, Google and Other Bets. The Google business segment includes products such as ads, Android, Chrome, hardware, Google Cloud, Google Maps, Google Play, Search, and YouTube. The Other Bets business segment consists of businesses such as Access, Calico, GV, Verily, Waymo, and X.

Important disclosures appear on the last page of this report.

COMPANY DESCRIPTION

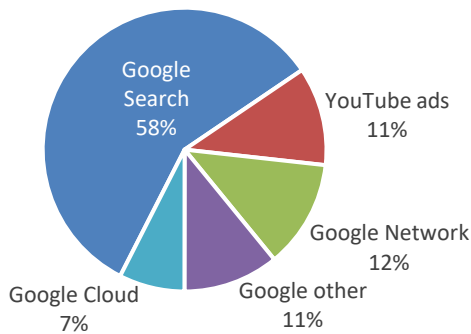
Alphabet, Inc was created in 2015 to act as a holding company for Google. Google was originally founded in 1998 by Larry Page and Sergey Brin. The company is currently headquartered in Mountain View, CA, and headed by CEO Sundar Pichai who was been with Google since 2004. Alphabet reports two major segments, Google Services, and Google Cloud. Revenues can be broken down further into the following segments: Google Search, YouTube ads, Google Network, Google other, and Google Cloud. In 2021, Google Search was the largest segment consisting of 58% of total revenues. The remaining revenues are relatively evenly distributed amongst the remaining segments. In FY21, 51% of total sales came from the Americas followed by Europe and Asia with 21% and 18%, respectively.^{1,2}

Google Services

This segment generates revenues from Google search properties along with several core products and platforms including ads, Android, Chrome, hardware, Gmail, Google Drive, Google Maps, Google Photos, Google Play, Search, and YouTube. It continues to invest heavily in hardware products including Pixel 5a 5G and Pixel 6 phones, the Fitbit Charge 5, Chromecast with Google TV, Google Nest Cams, and Nest Doorbells. The Google Services business segment is Alphabet’s largest business segment accounting generating \$149.0 billion in 2021 representing 57.9% of its total revenues. This segment had a record year in FY21 increasing 43% YoY. Over the past four years, it has averaged an annual growth rate of 22%. We expect this growth rate to decline slightly, primarily because the previous couple of years are skewed due to the Covid-19 pandemic which caused unconventional growth rates.^{1,2}

Business Segments (2021)

Total Sales \$257.6 billion

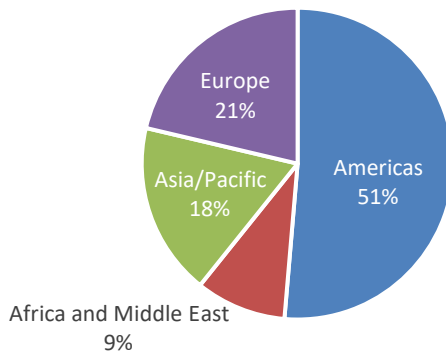


Source: GOOGL 10-k

The Google search engine maintains a dominant 85.6% market share of the worldwide desktop search engines. The next closest competitors are Bing and Yahoo! with 7.6% and 2.9% of the market share, respectively. We expect this trend to continue as there are no new major entrants into this space and current competition has had very little growth in the past decade.⁷

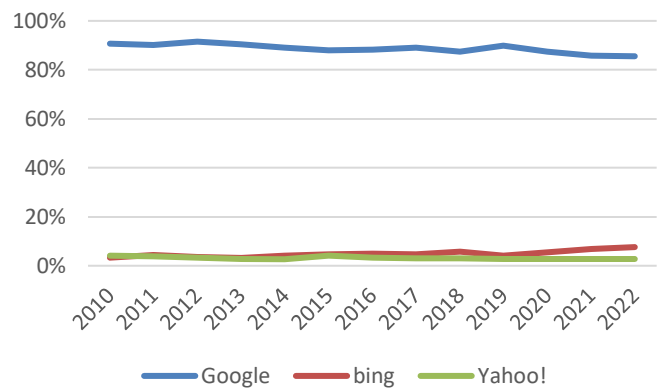
Revenue by Region (2021)

Total Sales \$257.6 billion



Source: GOOGL 10-k

Worldwide Desktop Search Engine Market Share

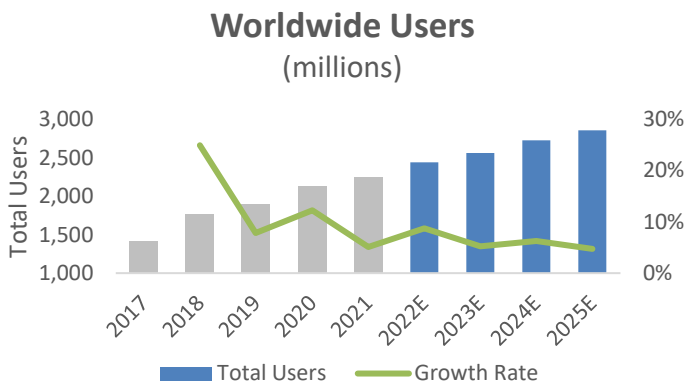


Source: Statista

YouTube ads

Google purchased YouTube in 2006 for \$1.65 billion. Today it is valued at \$183 billion representing a more than 100x return in just 16 years. In 2021 YouTube had 2.24 billion active users which equates to 28.6% of the world’s population. Over the past four years, YouTube has seen its

total active users grow by an average of 13%. Over the next four years, this growth rate is expected to slow to 6% reaching 2.85 billion active users by 2025.^{1,2}



Source: Statista

The YouTube ads business segment reported \$28.8 billion in revenue in FY21 accounting for 11.2% of total sales. This was a \$9.1 billion increase from 2020 to 2021. Growth was driven by the direct response and brand advertising products. The direct response product growth was driven by increased advertiser spending as well as improvements to ad formats and delivery. The brand advertising product growth was driven by increased spending by its advertisers. This segment has grown an average of 37% over the last four years. We are forecasting this segment to continue strong growth averaging 27% over the next two years. We also see this segment growing to 11.4% and 11.8% of total sales in 2022 and 2023, respectfully.^{1,2}

Google Network

The Google Network segment increased \$8.6 billion or 37% from 2020 to 2021 reporting \$31.7 billion in total revenue. This growth was primarily driven by strength in AdMob, Google Ad Manager, and AdSense. Over the last four years, the Google Network segment has averaged an annual growth rate of 16%. We believe this growth rate will slow to 11% annually over the next four years. This segment also saw increased costs due to a revenue mix shift from Google Network properties to Google Search & other properties. The cost of revenues as a percentage of revenues generated from ads placed on Google Network properties is significantly higher than the cost of revenues as a percentage of revenues generated from ads placed on Google Search & other properties because most of the advertiser revenues from ads served on Google Network properties are paid as traffic acquisition costs (TAC) to its Google Network partners.^{1,2}

Google Cloud

More and more of today's digital experiences are being built in the cloud, Google Cloud products help businesses of all sizes take advantage of the latest technological advances to operate more efficiently. The Google Cloud business segment is comprised of two sub-segments, Google Cloud Platform and Google Workspace. Google Cloud Platform generates revenues from infrastructure, platform, and other services. It enables developers to build, test, and deploy applications on its highly scalable and reliable infrastructure. Google Workspace generates revenues from cloud-based collaboration tools for enterprises, such as Gmail, Docs, Drive, Calendar, and Meet. Alphabet devotes significant resources to develop and deploy enterprise-ready cloud services. It incurs costs to build and maintain infrastructure to support cloud computing services and hire talent, particularly to support and scale its salesforce.²

In FY21 Google Cloud reported 19,206 million in revenue accounting for 7.5% of sales. Google Cloud has averaged an annual growth rate of 48% over the last four years. We anticipate this growth rate to remain elevated as more and more businesses adopt cloud-based operations and systems. We do believe this growth will slow as the economy enters a period of slower growth. We are forecasting Google Cloud to grow an average of 22% annually over the next three years and taper down to a CV rate of 3% in 2030.¹

Other Bets

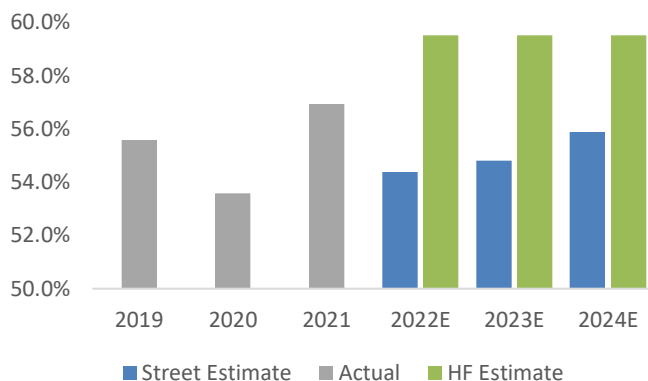
Alphabet is using technology to try to solve big problems that affect a wide variety of industries. Alphabet's investment in the portfolio of Other Bets includes emerging businesses at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization, and its goal is for them to become thriving, successful businesses in the medium to long term. While these early-stage businesses naturally come with considerable uncertainty, some of them are already generating revenue and making important strides in their industries. Revenues from Other Bets are generated primarily from the sale of health technology and internet services. The Other Bets business segment consists of businesses such as Access, Calico, CapitalG, GV, Verily, Waymo, and X.² It generated \$753 million in revenue in FY21 accounting for <1% of total revenues. It has averaged 8% growth over the last three

years, and we expect this to remain stable with 11% growth in FY22 and 10% in FY23.²

Cost Structure Analysis

Alphabet maintains a healthy gross margin of at least 50%. In FY21 it reported gross margin of 56.9% which increased from 55.6% and 53.6% in FY19 and FY20, respectively. We are forecasting gross margin to increase to 59.5% for years 2022 through 2024. The Street is more conservative projecting gross margin to fall to 54.4% in FY22 and increase to 54.8% and 55.9% in FY23 and FY24, respectively. The Street is expecting higher input cost particularly in the hardware segment as supply chain disruptions continue to increase costs.¹

Gross Margin



Source: FactSet

Debt Maturity Analysis

Five-Year Debt Maturity Schedule

Fiscal Year	Payment (\$mil)
2022	\$187
2023	146
2024	1,159
2025	1,162
2026	2,165
Thereafter	10,621
Total	\$15,440

Source: GOOGL 10-k

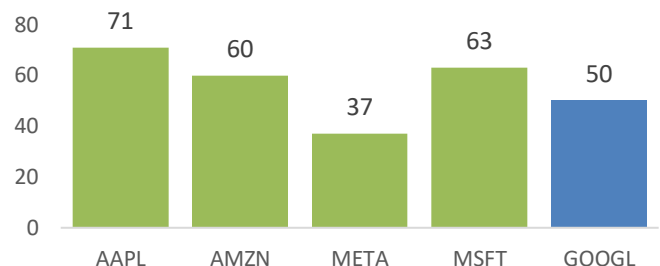
Alphabet's market value of debt is \$27.8B accounting for only 2.1% of the firm's total value. In FY21 GOOGL had \$14.8B of long-term debt on its balance sheet and \$20.9B of cash and cash equivalents. At FYE 2021, it had a current ratio of 2.9x and has averaged 3.7x over the last five years. This ratio implies that GOOGL has more current assets than current liabilities and has enough liquid assets to

cover its debts. It has a cash ratio of 2.2x at FYE 21 and a 5Y average of 2.9x. This indicates that the company has 2.2x more cash and equivalents than current liabilities. With \$15.4B total debt listed on their five-year maturity schedule, we are confident that Alphabet will be able to fully cover its debts.^{1,2}

ESG Analysis

Sustainability is one of Alphabet's core values and it continues to be a leader on the climate change front. It has a storied history of being on the vanguard of innovation and sustainability. In 2007, Google became the first major company to become carbon neutral. In 2017 it became the first major company to match 100% of its annual electricity use with renewable energy. In 2020, it issued \$5.75 billion in sustainability bonds-the largest green bond issuance by any company in history. The proceeds from this issuance were used to fund environmentally and socially responsible projects. By 2030 Alphabet aims to achieve net-zero emissions across all operations and value chains. It also plans to become the first major company to run solely on carbon-free energy. Even with Alphabet's strong initiative within the environmental space, its ESG score takes a hit from the governance portion of the score. Alphabet has had regulatory issues in the past and has been accused of anti-competitive practices. The combination of these factors results in an ESG score of 50 out of 100 for Alphabet. For reference the higher the ESG score, the healthier and more sustainable a company is.¹

Overall ESG Score



Source: FactSet

RECENT DEVELOPMENTS

Recent Earnings Announcement

Alphabet reported Q3 earnings on October 26th missing on top and bottom lines. Earnings per share were \$1.06, 15% lower than the Street's estimate of \$1.25. Revenues were also lower than expected, reporting \$69.1 billion which is

2% below the Street’s forecast of \$70.6 billion. YouTube advertising revenue dropped 2% to \$7.1 billion from \$7.2 billion a year ago. Google Cloud revenue did perform strongly reporting \$6.9 billion vs the Street’s estimate of \$6.7 billion. CEO Sundar Pichai stated on the earnings call that we wanted to make the company 20% more efficient. This could mean job layoffs and product cuts. The company has a total full-time headcount of 186,779 which is up nearly 25% from 150,028 a year ago. Pichai stated “Our actions to slow the pace of hiring will become more apparent in 2023”. Google also canceled the next generation of its Pixelbook laptop and cut funding to its Area 120 in-house incubator. It also shut down its gaming service Stadia to cut costs. Alphabet did not issue guidance for Q4 FY22, but the Street is expecting EPS to decline 22% from \$1.53 in Q4 FY21 to \$1.19. The Street expects revenues for Q4 FY22 to grow 2% to \$76.9 billion from \$75.3 in Q4 FY21.⁸

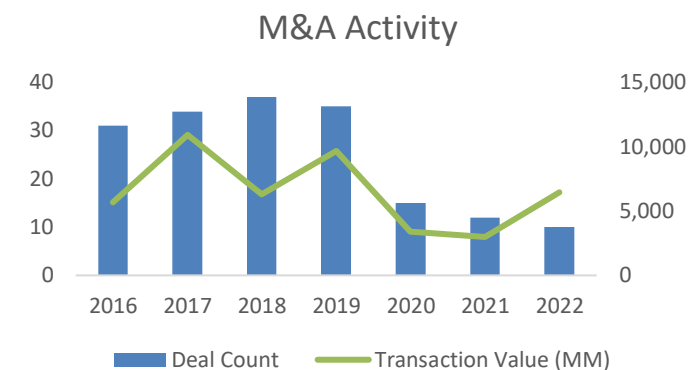
Stock Split

In February 2022 Alphabet announced that it was performing a 20-for-1 stock split. This stock split went into effect in July of 2022 bringing the price level down into the \$100 range. This price level makes Alphabet cheaper for retail investors that may have wanted to purchase shares but didn’t have the capital. This new price point also makes Alphabet eligible to be added to the Dow Jones Industrial Average. The Dow Jones is a price-weighted index meaning the more expensive a stock the more weight it has on the index. At Alphabet’s old price range, it would have had too much impact on the index. If added to the Dow Jones, index funds tracking the Dow would have to buy Alphabet shares to match the index potentially boosting the stock.²

Mergers & Acquisitions

M&A has traditionally been a major source of growth for Alphabet. Deal volume has slowed in recent years primarily due to the Covid-19 pandemic. Alphabet continues to evaluate and enter into discussions regarding a wide array of potential strategic transactions. Some of these transactions could create unforeseen operating difficulties and expenditures. In January 2021, Alphabet closed the acquisition of Fitbit, a leading wearables brand for \$2.1 billion. During FY21, Alphabet also spent \$885 million on other acquisitions. Deal flow has remained relatively low throughout FY22, we anticipate M&A activity to remain low throughout the first half of FY23 as

companies determine how severe the economic slowdown will be.²



Source: FactSet

INDUSTRY TRENDS

Government Regulation

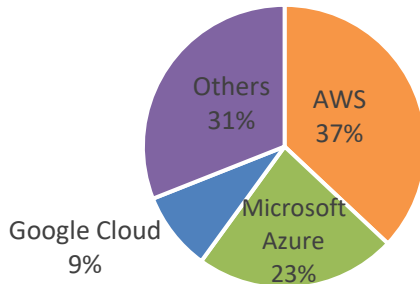
Congress has threatened to limit the expansion and power of big tech companies. Alphabet has had to pay fines to the EU of more than \$9.5 billion between 2017 and 2019 because of anti-competitive practices regarding its search and advertising business. Alphabet could be facing another multibillion-dollar fine from the EU next year as it is being investigated again for antitrust practices. In the United States, regulation concerns may have subsided for a bit with the republican party taking control of the House of Representatives. This creates a split congress with the Democrats controlling the Senate. A divided congress is less likely to pass any radical new bills or enact any antitrust measures. Regulatory risk is still a major threat and Alphabet must be strategic on how and where they expand operations.¹⁴

Cloud Infrastructure

Companies are continually collecting more and more data each day. To properly utilize and secure this data firms are migrating to cloud-based systems. These cloud-based systems offer more computing power which increases querying speeds. They also offer more protection as the data is housed in multiple servers rather than an isolated point. Users can also access these databases from home which is vital given the shift to remote work. Employees may also not have a very powerful laptop at home, but the cloud gives them the ability to perform complex tasks using more powerful servers remotely. The cloud services industry is projected to grow 20% annually over the next

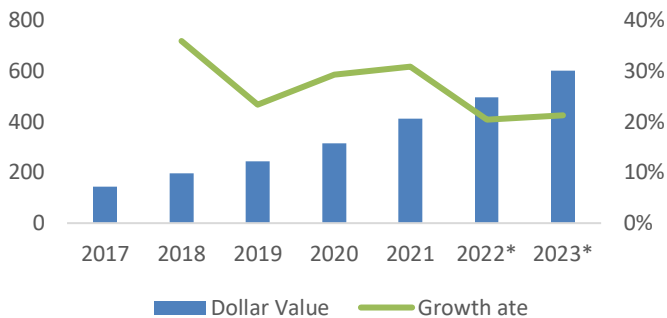
two years to \$600 billion. Spending on cloud infrastructure services increase by 34.9% and 37.5% in 2020 and 2021, respectively. Spending is projected to grow by 30+% for the next several years as companies race to gain market share.⁷

Cloud Infrastructure Market Share (2021)



Source: Statista

Cloud Services Spending (billions)



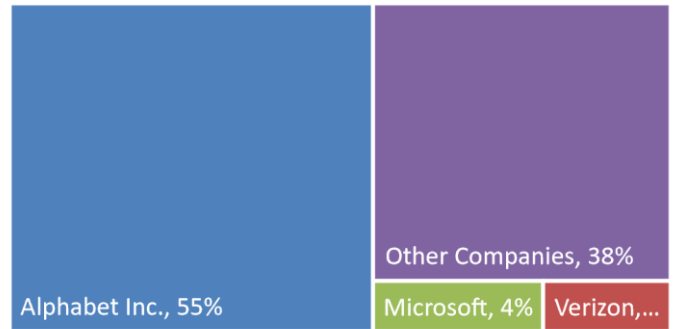
Source: Statista

Search Engines

Google is the dominant search engine in the US accounting for 55% of the market share in 2022. Google has increased its market share by 15% annually since 2017. Alphabet's search engine operations generated \$57.2 billion in revenue resulting in \$16.3 billion in net income in FY21. We anticipate this growth to slow mildly as more people shift to using more secure browsers. It is also important that Alphabet grows its laptop market share so it can then set Chrome as the default search engine. Competitors Microsoft and Apple set their own search engines, Bing, and Safari, as the defaults which most users never change.

Alphabet also must be careful because if Google grows too large it could draw anti-trust action.⁴

US Search Engine Market Share (2022)



Source: IBIS World

MARKETS AND COMPETITION

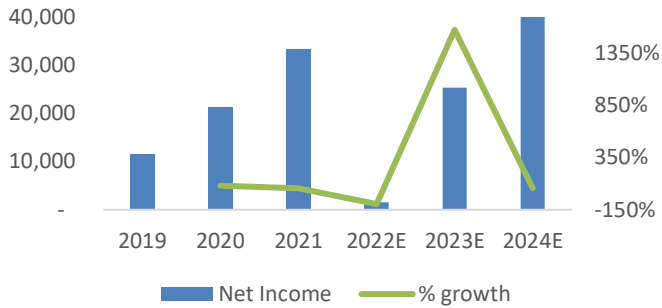
Alphabet is a major player in several industries which can lead to an unconventional peer group. It also has a market capitalization of \$1.25 trillion so we elected to only include peers with large market caps. We ultimately selected four peers Amazon, Apple, Meta Platforms, and Microsoft. Each of these peers competes directly with Alphabet in some capacity. They all have more than 50,000 employees and have market capitalizations of at least \$300 billion.¹

Amazon (AMZN)

Amazon is a multinational technology company headquartered in Seattle, WA, and originally founded by Jeff Bezos in 1994. Amazon operates through several business segments including Online Stores, Third-party Seller Services, Amazon Web Services, and a few smaller segments. Amazon Web Services (AWS) is one of Alphabet's major competitors in the cloud infrastructure market. AWS commands a 37% market share with Google Cloud accounting for 9% of the market share. This industry will be a major source of growth going forward and several companies will have opportunities to capitalize. Amazon and Alphabet are also leaders in the smart speaker industry with 26.4% and 20.5% market share in 2021, respectively.^{1,7}

In 2021 Amazon reported a record year with \$76,033 million in net income and \$257,637 million in revenues. Amazon is projected to have a 95.5% drop in net income down to \$1,512 million in 2022. It is then projected to bounce back in 2023 with a 1,575.6% increase in net income to \$25,335 million.¹

AMZN Net Income (\$MM)

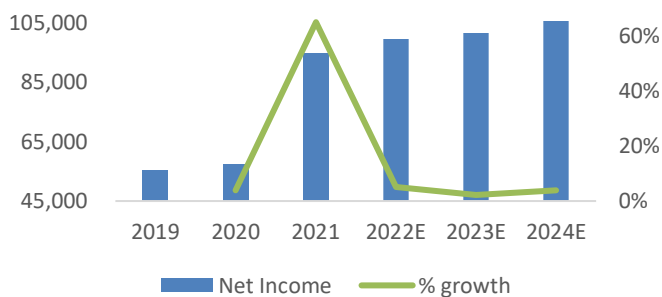


Source: FactSet

Apple (AAPL)

Apple was founded by Steve Jobs and Steve Wozniak in 1976 and is currently headquartered in Cupertino, CA. The company engages in the design, manufacture, and sales of smartphones, personal computers, tablets, wearables, and accessories. It also operates a variety of related services. Apple reports the following business segments: iPhone, Services, Wearables, Mac, and iPad. Alphabet primarily competes with Apple in the hardware space, specifically on phone and laptop sales. Apple and Samsung dominate the industry with 55% and 27% market shares, respectively. Smaller companies such as Alphabet, LG, and Lenovo are beginning to gain market share.^{1,7}

AAPL Net Income (\$MM)



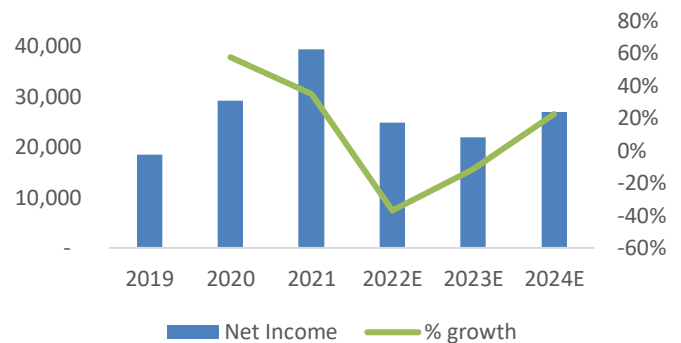
Source: FactSet

Apple had a record year in 2021 as consumers had pent-up demand for new products. Inflation was still low, which means consumers had greater discretionary income. In 2021 Apple's net income increased 64.9% to \$94,680 million and revenue increased by 33.3% to \$365,817 million. Its net income is projected to increase an average of 3.7% YoY for the next 3 years.¹

Meta Platforms (META)

Meta Platforms, formerly known as Facebook, was created in 2004 and is currently headquartered in Menlo Park, CA. Meta develops social media applications that help people connect, find communities, and grow businesses. It operates brands such as Facebook, Instagram, Messenger, and WhatsApp. Alphabet primarily competes with Meta across the original content space. Both companies compete for users with their social media platforms. Meta's Facebook leads the social media industry with 2.9 billion active users. Alphabet's YouTube is second with 2.5 billion active monthly users. In terms of global active usage penetration, YouTube was the leading social network with 62% penetration in 2021, and Facebook was second with 61% penetration. Social media is a growing industry that is becoming more saturated with new networks such as TikTok and BeReel.^{1,7}

META Net Income (\$MM)



Source: FactSet

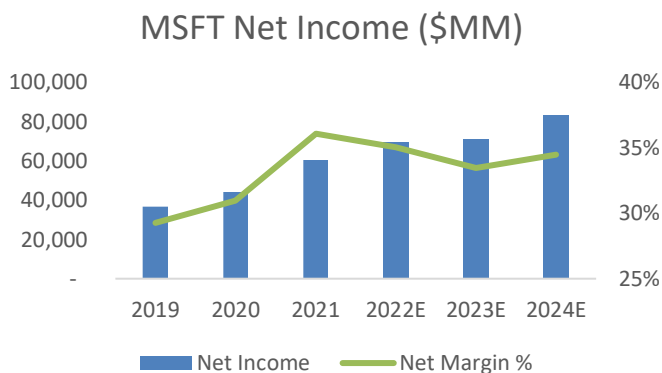
Meta is expected to see net income fall 37% in FY22 followed by a 12% drop in FY23 as the company continues to reinvent itself. Founder and CEO, Mark Zuckerberg believes the metaverse will be the company's next major source of growth and has invested \$36 billion in building out its metaverse.¹

Microsoft (MSFT)

Microsoft was founded by Bill Gates and Paul Allen in 1975 and is headquartered in Redmond, WA. It operates through three business segments: Productivity and Business Processes, Intelligent Cloud, and More Personal Computing. Microsoft is most well-known for its Windows operating systems and software products such as Word, PowerPoint, and Excel. Microsoft owns Xbox, LinkedIn, Skype, and GitHub, and operates in the cloud services

space through Azure. Alphabet primarily competes with Microsoft in the cloud infrastructure and hardware devices markets. Microsoft's Azure is the second largest cloud infrastructure provider with a 23% market share. Alphabet's Google Cloud is third with a 9% market share as of 2021. This continues to be a growing industry as more companies adopt cloud-based enterprise systems to manage their growing databases. Smaller players such as Google Cloud are well poised to grow their market share. Microsoft and Alphabet also compete in the hardware space, primarily in the laptop market. Microsoft accounted for 10% of the laptop ownership in 2022 and Alphabet-owned less than 1% market share.^{1,7}

Microsoft has seen net income grow an average of 29% over the past two years. The Street expects net income to slow to an average rate of 11% over the next three years. The Street is also expecting the net margin to grow to an average of 34% in the next three years. Microsoft is well positioned to grow revenues, particularly in the cloud infrastructure space and the software programming industry.¹



Source: FactSet

Multiples Summary

When comparing common multiples across the selected peers we can spot key differences. The first metric is the market capitalization in billions. All the peers are large-cap firms with the largest being Apple which has a market cap of \$2.4 trillion. Larger firms have more capital which can make it easier and cheaper to expand operations. The second metric is the price-to-earnings ratio. Amazon is the only outlier with a P/E of 52x. A high P/E may indicate that the share price is high relative to the company's earnings. The market could be pricing in high growth rates, or the stock may be overvalued. We also compared the return on equity and noticed Apple is the major outlier with an ROE

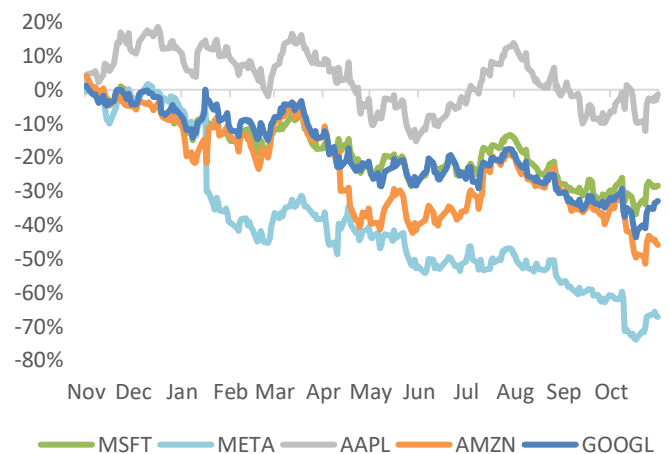
of 176x. This shows that Apple is very efficient at turning equity financing into profits. The last metric we compared is the current ratio which is total current assets divided by total current liabilities. A higher current ratio indicates the company has more current assets than current liabilities and can likely cover any short-term expenses. Meta, Microsoft, and Alphabet all have high current ratios indicating a healthy balance sheet. These companies may be better positioned in an economic downturn.¹

	Market Cap (\$B)	P/E	ROE	Current Ratio
Amazon	991	51.5	28.8	1.1
Apple	2,367	24.6	175.5	0.9
Meta Platforms	300	24.4	31.1	3.2
Microsoft	1,802	26.6	47.2	1.8
Alphabet	1,280	25.8	32.1	2.9

Source: FactSet

Price Returns

Share Price Return TTM



Source: FactSet

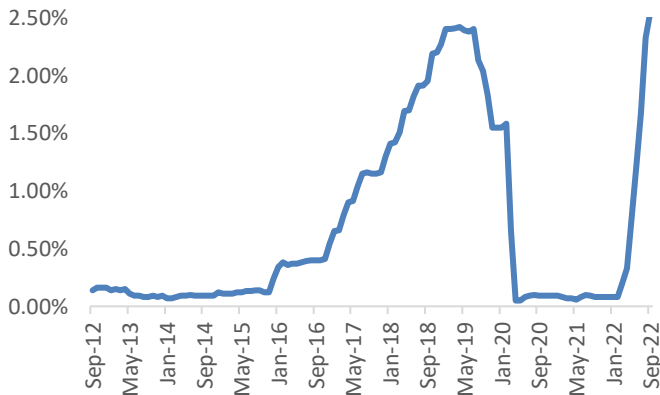
Over the past twelve months, the S&P 500 has fallen 15.8% and the Nasdaq is down 30.0%. The best-performing peer has been Apple which is flat over the past year. Meta Platforms is the worst-performing peer down 67.6%. Microsoft and Amazon are down 28.7% and 46.8%, respectively while Alphabet is in the middle of its peer group down 33.6%. The technology sector has been hit particularly hard this year given all the uncertainty in the markets. Macroeconomic and geopolitical factors such as the war in Ukraine, high inflation, increasing rates, midterm election, and supply chain constraints have caused the market to sell off. Investors are selling riskier technology holdings and transitioning to safer equities and bonds.¹³

ECONOMIC OUTLOOK

Interest Rates

Interest rate volatility continues to disrupt the market as the Federal Reserve has been increasing rates aggressively to combat high inflation. Post the Great Recession in 2008-09, the Fed Funds Rate remained near zero until 2016 when the Fed started slowly hiking rates. In 2019 the Fed then began decreasing rates due to lower-than-expected GDP which was partially caused by the trade war with China. Then in early 2020, the Federal Reserve slashed rates to near zero due to the COVID-19 pandemic. As the economy ground to a halt, the Federal Reserve wanted to stimulate spending making it cheaper to borrow. Now as inflation runs rampant, the fed is aggressively increasing rates. So far in 2022 alone the fed has increased rates 350 basis points to a target range of 375-400. One more rate hike of 50 basis points is expected in December pushing the target range to 425-450. We expect the fed to begin slowing its rate increase, but we do still expect several rate increases in the first half of 2023. The higher rates are causing the cost of borrowing to increase, thankfully Alphabet utilizes little debt, so these higher rates won't have a huge impact on its debt structure. A higher rate will however affect their customer's capital expenditures and debt structures which could limit ad revenue.⁹

Federal Funds Rate



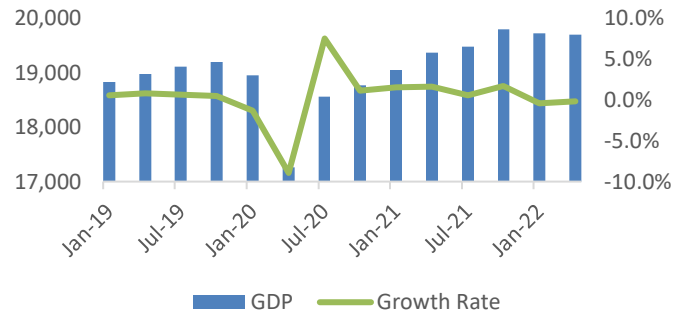
Source: FRED

GDP

The Gross Domestic Product of the United States had seen steady growth since the Great Recession until 2020. In 2020, the US had back-to-back quarters of negative GDP growth with GDP falling 1.3% and 8.9% in Q1 and Q2,

respectively. Two consecutive quarters of negative GDP growth is the technical definition of a recession. The negative GDP growth only lasted two quarters and rebounded strongly in 2021. Then Q1 and Q2 of 2022 saw small declines of .4% and .1% which technically means were in a recession. GDP growth for Q3 came in positive at 2.6% which indicates the economy may be turning around and inflation concerns may be subsiding.¹²

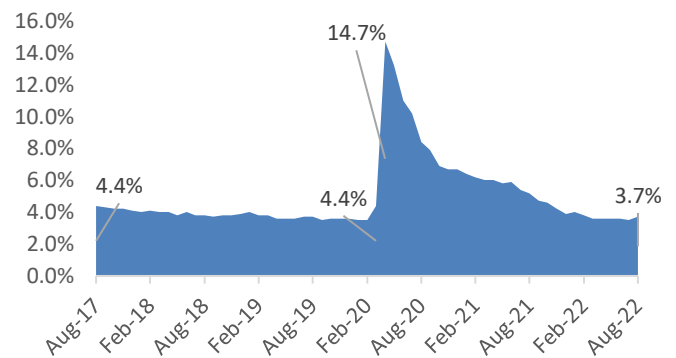
Gross Domestic Product (\$B)



Source: FRED

Unemployment

Unemployment Rate



Source: FRED

As Covid-19 hit the world in the spring of 2020, the unemployment rate reached a record 14.7% as millions of workers were either laid-off or furloughed. Since the spring of 2020 unemployment has fallen consistently with a small increase in the most report to 3.7% from 3.5%. The labor market is one of the primary reasons we aren't already in a recession. Companies are beginning however to reduce hiring especially in the technology sector. As the federal reserve continues to hike interest rates, we expect to see more companies slowing hiring resulting in higher unemployment. At the end of FY21, Alphabet had 156,500 employees. Throughout FY22, the total number of

employees has increased by nearly 25% to 186,779. Alphabet has announced that new hiring will be reduced by 50% in Q4. This is one of CEO Sundar Pichai's steps to make the company 20% more efficient.^{8,9}

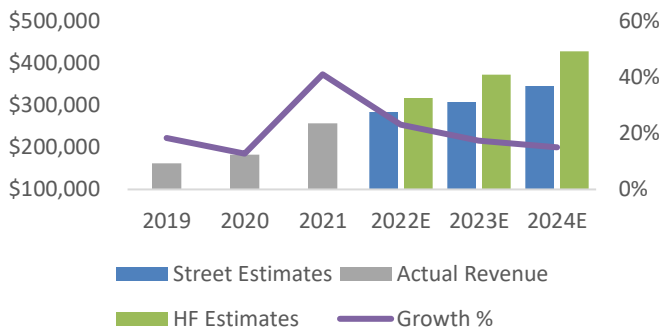
VALUATION

Revenue Projections

Alphabet saw a 41% increase in revenues in FY21 and has averaged a 24% growth rate over the last five years. We are forecasting growth to slow to an average annualized rate of 16% over the next five years with the Street forecasting only 11% growth over the same period. The main reason for this difference is we see more potential in the Google Cloud and Other Bet segments than the Street.¹

Revenue Projections (\$MM)

Total Sales FY21: \$257.6B



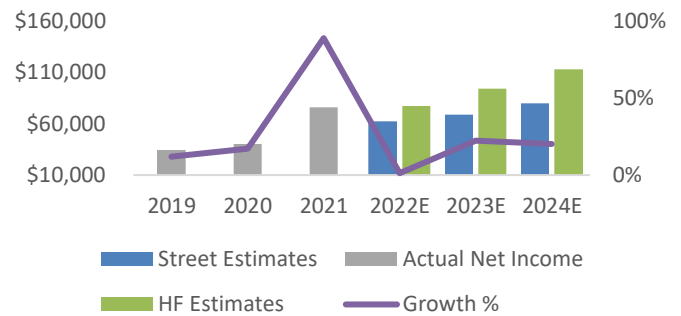
Source: FactSet

Net Income Projections

Alphabet saw net income jump 89% in FY21 to \$76 billion. Strong profits from the YouTube ads and Google Cloud segments contributed to this increase. We project net income to slow to only 1.2% in FY22 followed by strong growth of 22% and 20% in FY23 and FY24, respectively. The Street is forecasting lower net income partially due to lower top-line growth rates. In FY22 the Street is forecasting an 18% drop in net income due to lower-than-expected Cloud revenues and reduced ad revenue as firms continue to cut costs. The Street does see strong growth in the following years averaging 14% between FY23 and FY25.¹

Net Income Projections (\$MM)

Net Income FY21: \$76.0B



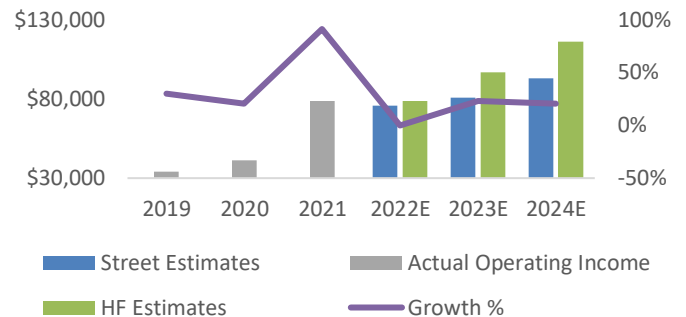
Source: FactSet

Operating Income Projections

Operating net income jumped 91% in FY21 thanks to demand for cloud contracts being pulled forward also healthy increases in advertising revenue. We along with the Street are forecasting slight declines in operating income for FY22. We do expect to see a strong recovery with an average growth rate of 17% for the years 2023 through 2025. The Street sees similar growth with an average rate of 13% over the same period.¹

Operating Income Projections (\$MM)

Op Income FY21: \$78.7B



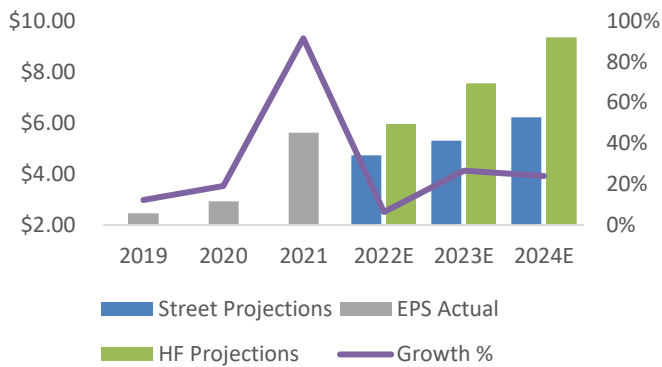
Source: FactSet

EPS Projections

EPS increased 92% to \$5.61 in FY21 driven by an 89% increase in net income and Alphabet buying back over \$50 billion in stock. Our EPS projections are much higher than the Street largely due to our high stock repurchase forecasts. We are forecasting EPS to grow at an annualized rate of 17% over the next four years. The Street is forecasting a 16% drop in EPS in FY22 followed by average growth of 16% for years 2023 through 2025.¹

EPS Projections

EPS FY21: \$5.69



Source: FactSet

Discounted Cash Flow/Economic Profit

We valued Alphabet using three different models, the first being the discounted cash flows model (DCF). This model yielded a projected share price of **\$99** which represents a premium of 3% above its current share price of \$96. The DCF model was created using a CV growth of NOPLAT of 2.68%, a weighted average cost of capital (WACC) of 9.92%, and a cost of equity of 10.06%. We projected cash flows out ten years to a terminal year of 2031.¹

Dividend Discount Model

The dividend discount model produced a projected price of **\$120** representing a 25% discount from the current price of \$41.71. The primary reason for the low price is due to the low CV growth of the EPS rate of 5.44%. Even though we expect EPS to grow over the coming years we tapered down our terminal year's growth rate causing an undervalued stock price. This model is a good representation of what could happen to the stock price if the EPS growth does slow.

Relative Peers

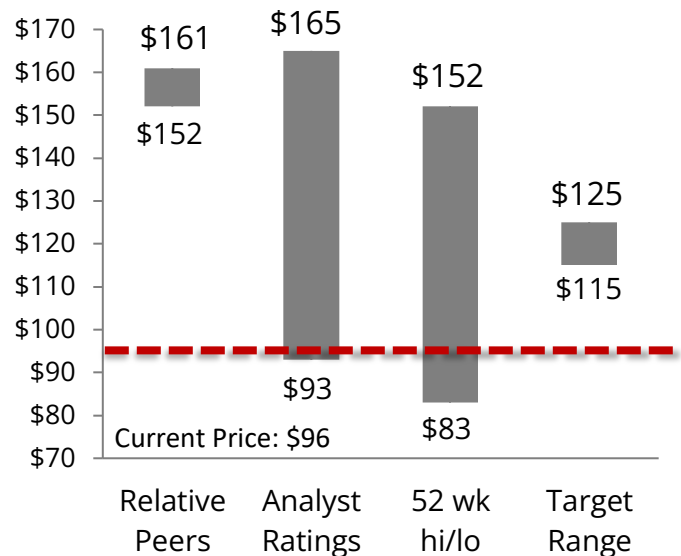
For our relative peers' model, we selected four competitors from the communications equipment sector. Our competitors include Amazon, Apple, Meta Platforms, and Microsoft. Our model returned a projected share price range of **\$136 to \$158**, representing a 42%-64% upside.

Valuation Summary

We are recommending a price target range of \$115-\$125 representing an upside of 19%-30%. To calculate this range, we used a weighted average of all three models. We

used a 40% weight on the DCF and a 25% weight on the relative peer models and dividend discount model. We decided to give the DCF/EP model the highest weight since it considers the most factors. Also, Alphabet does not pay dividends so this model we felt was less applicable. Our target range falls in the middle of the current 52-week high/low range of \$83-\$152 and the street analyst's range of \$93-\$165.

Valuation Summary



Source: GOOGL model + FactSet

KEYS TO MONITOR

Drivers of Thesis

Cloud Adoption: As companies collect more and more data, they require larger and faster systems to handle their data sets. Cloud-based applications provide more storage, security, and faster processing speeds. This migration to cloud-based systems will be Alphabet's main catalyst for growth.

Healthy Financials: Alphabet maintains a healthy balance sheet with \$139.6 billion in cash and equivalents but only \$14.8 billion in long-term debt. It is well poised to handle an economic slowdown and has plenty of capital to expand operations.

Technological Innovations: Alphabet is on the cutting edge of technological shifts such as machine learning, self-driving vehicles, quantum computing, drone delivery, smart homes, and wearables. Each of these fields offers massive long-term growth potential.

Risks to Thesis

Government Regulation: Congress continues to threaten Big Tech with regulatory changes. Alphabet has come under fire, particularly for its anti-competitive practices in the Search and Advertising market along with its Android operating system. However, with the Republican party taking control of the House of Representatives, this splits congress which means major regulatory changes are less likely to be passed in the next few years.

Economic Downturn: As the federal reserve continues to hike interest rates to combat high inflation, this could push the economy into a mild recession. If rates are hiked too high too fast, we will likely see more layoffs and lower capital expenditures. Lower capital expenditures will directly impact Alphabet's Google Search and YouTube ads revenues.

Rising Costs: With persistent high inflation many companies are increasing prices which are increasing input costs for Alphabet's hardware products. Alphabet does maintain lower hardware sales than some of its peers such as Apple and Microsoft which makes them better positioned to handle rising costs. Companies are also being forced to increase wages to accommodate higher costs of living.

Summary

We recommend a **BUY** rating on Alphabet with a target range of \$115 – 125 representing a 19% - 30% upside from the current price level of \$96. Given the strong growth potential in the cloud infrastructure industry and the steady revenues from the Google Search and YouTube ads segments, we believe Alphabet has promising upside potential.

11. CME Group – Rate Hike Probability
12. Bureau of Economic Analysis (BEA)
13. Tradingview
14. Reuters

DISCLAIMER

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REFERENCES

1. FactSet
2. GOOGL 10-k
3. Bloomberg
4. IBIS World
5. Net Advantage
6. Yahoo Finance
7. Statista
8. CNBC - Google Q3 Earnings
9. FRED
10. Bureau of Labor Statistics

Alphabet Inc.
Revenue Decomposition

Fiscal Years Ending Dec. 31	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Business Segments															
Google Search & other	69,811	85,296	98,115	104,062	148,951	186,189	217,841	250,517	283,084	311,393	336,304	356,482	374,306	389,279	400,957
growth %		22%	15%	6%	43%	25%	17%	15%	13%	10%	8%	6%	5%	4%	3%
YouTube ads	8,150	11,155	15,149	19,772	28,845	36,056	43,989	51,907	60,212	67,437	74,181	80,115	84,922	89,168	91,843
growth %		37%	36%	31%	46%	25%	22%	18%	16%	12%	10%	8%	6%	5%	3%
Google Network	17,616	20,010	21,547	23,090	31,701	36,456	40,831	44,914	48,507	52,388	55,531	58,863	61,806	64,896	66,843
growth %		14%	8%	7%	37%	15%	12%	10%	8%	8%	6%	6%	5%	5%	3%
Google other	10,914	14,063	17,014	21,711	28,032	33,638	39,693	46,044	52,490	58,789	64,668	69,842	74,032	76,993	79,303
growth %		29%	21%	28%	29%	20%	18%	16%	14%	12%	10%	8%	6%	4%	3%
Google Services total	106,491	130,524	151,825	168,635	237,529	292,340	342,354	393,382	444,293	490,007	530,684	565,302	595,067	620,336	638,947
growth %		23%	16%	11%	41%	23%	17%	15%	13%	10%	8%	7%	5%	4%	3%
Google Cloud	4,056	5,838	8,918	13,059	19,206	24,968	31,210	37,452	43,069	48,668	53,535	57,283	60,147	62,553	64,429
growth %		44%	53%	46%	47%	30%	25%	20%	15%	13%	10%	7%	5%	4%	3%
Other Bets	477	595	659	657	753	836	919	1,002	1,082	1,158	1,228	1,289	1,341	1,394	1,436
growth %		-41%	25%	11%	0%	15%	11%	10%	9%	8%	7%	6%	5%	4%	3%
Total	110,855	136,819	161,857	182,527	257,488	318,143	374,483	431,836	488,445	539,833	585,447	623,874	656,554	684,283	704,812
growth %		22.8%	23.4%	18.3%	12.8%	41.1%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%
Percent of Total (%)															
Google Search & other	62.98%	62.34%	60.62%	57.01%	57.85%	58.52%	58.17%	58.01%	57.96%	57.68%	57.44%	57.14%	57.01%	56.89%	56.89%
YouTube ads	7.35%	8.15%	9.36%	10.83%	11.20%	11.33%	11.75%	12.02%	12.33%	12.49%	12.67%	12.84%	12.93%	13.03%	13.03%
Google Network	15.89%	14.63%	13.31%	12.65%	12.31%	11.46%	10.90%	10.40%	9.93%	9.70%	9.49%	9.44%	9.41%	9.48%	9.48%
Google other	9.85%	10.28%	10.51%	11.89%	10.89%	10.57%	10.60%	10.66%	10.75%	10.89%	11.05%	11.19%	11.28%	11.25%	11.25%
Google Services	96.06%	95.40%	93.80%	92.39%	92.25%	91.89%	91.42%	91.10%	90.96%	90.77%	90.65%	90.61%	90.63%	90.65%	90.65%
Google Cloud	3.66%	4.27%	5.51%	7.15%	7.46%	7.85%	8.33%	8.67%	8.82%	9.02%	9.14%	9.18%	9.16%	9.14%	9.14%
Other Bets	0.43%	0.43%	0.41%	0.36%	0.29%	0.26%	0.25%	0.23%	0.22%	0.21%	0.21%	0.21%	0.20%	0.20%	0.20%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Geographic Segments															
United States	52,449	63,269	74,843	85,014	117,854	145,616	171,403	197,654	223,565	247,085	267,963	285,551	300,509	313,201	322,597
growth %		22.6%	20.6%	18.3%	38.6%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%	3.0%
EMEA	36,046	44,567	50,645	55,370	79,107	97,742	115,051	132,671	150,063	165,851	179,864	191,670	201,710	210,230	216,537
growth %	#VALUE!	23.6%	13.6%	9.3%	42.9%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%	3.0%
APAC	16,235	21,374	26,928	32,550	46,123	56,988	67,080	77,353	87,494	96,699	104,869	111,752	117,606	122,573	126,251
growth %	#VALUE!	31.7%	26.0%	20.9%	41.7%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%	3.0%
Other Americas	6,125	7,609	8,986	9,417	14,404	17,797	20,949	24,157	27,324	30,199	32,750	34,900	36,728	38,279	39,428
growth %	#VALUE!	24.2%	18.1%	4.8%	53.0%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%	3.0%
Total	110,855	136,819	161,402	182,351	257,488	318,143	374,483	431,836	488,445	539,833	585,447	623,874	656,554	684,283	704,812
growth %		22.8%	23.4%	18.0%	13.0%	41.2%	23.6%	17.7%	15.3%	13.1%	10.5%	8.4%	6.6%	5.2%	4.2%

Alphabet Inc.
Balance Sheet

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Assets													
Current assets:													
Cash and cash equivalents	18,498	26,465	20,945	50,003	81,450	136,676	199,329	273,637	359,716	450,768	546,540	645,033	742,653
Marketable securities	101,177	110,229	118,704	123,512	128,514	133,719	139,134	144,769	150,632	156,733	163,080	169,685	176,558
Total cash, cash equivalents, and market:	119,675	136,694	139,649	173,514	209,964	270,395	338,463	418,406	510,348	607,501	709,621	814,718	919,210
Accounts receivable, net of allowance	25,326	30,930	39,304	50,742	60,105	68,021	77,746	85,867	92,842	99,158	104,301	108,661	111,970
Income taxes receivable, net	2,166	454	966	2,081	1,595	2,094	2,548	2,578	2,896	3,106	3,217	3,382	3,482
Inventories	999	728	1,170	1,559	1,676	2,004	2,282	2,481	2,714	2,892	3,035	3,169	3,263
Prepaid revenue share, expenses and oth	4,412	5,490	7,054	8,984	10,697	12,118	13,817	15,280	16,520	17,637	18,557	19,332	19,919
Total current assets	152,578	174,296	188,143	236,880	284,038	354,632	434,856	524,612	625,320	730,294	838,731	949,261	1,057,845
Non-marketable investments	13,078	20,703	29,549	32,760	41,329	47,218	52,537	58,889	63,617	67,651	71,387	74,320	76,537
Deferred income taxes	721	1,084	1,284	1,631	2,003	2,225	2,544	2,827	3,044	3,254	3,426	3,566	3,675
Property and equipment, net	73,646	84,749	97,599	103,989	116,507	121,264	127,968	136,006	142,556	151,296	162,273	175,686	193,038
Operating lease assets	10,941	12,211	12,959	19,597	22,319	24,686	29,040	31,710	34,221	36,735	38,534	40,151	41,408
Intangible assets, net	1,979	1,445	1,417	2,719	2,742	3,076	3,744	3,978	4,324	4,662	4,865	5,079	5,240
Goodwill	20,624	21,175	22,956	22,956	22,956	22,956	22,956	22,956	22,956	22,956	22,956	22,956	22,956
Prepaid revenue share, expenses and oth	2,342	3,953	5,361	6,038	7,670	8,675	9,695	10,872	11,724	12,481	13,169	13,706	14,118
Total assets	275,909	319,616	359,268	426,569	499,564	584,733	683,341	791,851	907,763	1,029,329	1,155,341	1,284,725	1,414,817
Liabilities and Stockholders' Equity													
Current liabilities:													
Accounts payable	5,561	5,589	6,037	9,376	10,426	11,623	13,713	14,905	16,119	17,306	18,139	18,909	19,500
Accrued compensation and benefits	8,495	11,086	13,889	16,981	20,675	23,666	26,602	29,596	32,022	34,102	35,932	37,427	38,550
Accrued expenses and other current liabi	23,067	28,631	31,236	44,605	52,504	60,545	68,482	75,687	82,082	87,470	92,052	95,940	98,818
Accrued revenue share	5,916	7,500	8,996	11,937	14,050	16,202	18,326	20,254	21,966	23,407	24,633	25,674	26,444
Deferred revenue	1,908	2,543	3,288	4,081	4,804	5,539	6,266	6,925	7,510	8,003	8,422	8,778	9,041
Income taxes payable, net	274	1,485	808	1,391	2,062	1,923	2,335	2,656	2,765	3,000	3,163	3,273	3,385
Total current liabilities	45,221	56,834	64,254	88,370	104,520	119,499	135,724	150,023	162,464	173,288	182,341	190,000	195,738
Long-term debt	4,554	13,932	14,817	17,177	23,447	25,063	28,434	32,185	34,321	36,696	38,751	40,251	41,505
Deferred revenue, non-current	358	481	535	734	876	968	1,122	1,238	1,333	1,428	1,501	1,563	1,611
Income taxes payable, non-current	9,885	8,849	9,176	15,395	16,538	18,449	22,025	23,748	25,722	27,662	28,947	30,191	31,141
Deferred income taxes	1,701	3,561	5,257	5,347	7,080	8,078	8,861	10,033	10,817	11,480	12,138	12,629	13,002
Operating lease liabilities	10,214	11,146	11,389	11,772	10,694	9,714	8,824	8,016	7,281	6,614	6,009	5,458	4,958
Other long-term liabilities	2,534	2,269	2,205	3,886	4,145	4,583	5,519	5,935	6,422	6,917	7,233	7,544	7,783
Total liabilities	74,467	97,072	107,633	142,681	167,300	186,354	210,508	231,178	248,361	264,085	276,919	287,636	295,738
Stockholders' equity:													
Class A and Class B common stock, and C	50,552	58,510	61,774	61,833	61,893	61,952	62,012	62,071	62,130	62,190	62,249	62,308	62,368
Accumulated other comprehensive incon	(1,232)	633	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)	(1,623)
Retained earnings	152,122	163,401	191,484	223,678	271,994	338,049	412,444	500,226	598,895	704,677	817,796	936,404	1,058,335
Total stockholders equity	201,442	222,544	251,635	283,888	332,264	398,378	472,833	560,674	659,402	765,244	878,422	997,089	1,119,079
Total liabilities and stockholders equit	275,909	319,616	359,268	426,569	499,564	584,733	683,341	791,851	907,763	1,029,329	1,155,341	1,284,725	1,414,817

Alphabet Inc.

Historical Cash Flow Statement

Fiscal Years Ending Dec. 31	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Operating activities										
Net income	10,737	12,920	14,444	16,348	19,478	12,662	30,736	34,343	40,269	76,033
Adjustments:										
Depreciation and impairment of property and equipment	1,988	2,781	3,523	4,132	5,267	6,103	8,164	10,856	12,905	11,555
Amortization and impairment of intangible assets	974	1,158	1,456	931	877	812	871	925	792	886
Stock-based compensation expense	2,692	3,343	4,279	5,203	6,703	7,679	9,353	10,794	12,991	15,376
Deferred income taxes	(266)	(437)	(104)	(179)	(38)	258	778	173	1,390	1,808
Gain / loss on debt and equity securities, net	(188)	(700)	(1,025)	-	-	-	(6,650)	(2,798)	(6,317)	(12,270)
Other	(28)	106	87	546	449	331	(189)	(592)	1,267	(213)
Change in assets and liabilities										
Accounts receivable	(787)	(1,307)	(1,641)	(2,094)	(2,578)	(3,768)	(2,169)	(4,340)	(6,524)	(9,095)
Income taxes, net	1,492	401	283	(179)	3,125	8,211	(2,251)	(3,128)	1,209	(625)
Prepaid revenue share, expenses and other assets	(532)	(930)	459	(318)	312	(2,164)	(1,207)	(621)	(1,330)	(1,846)
Accounts payable	(499)	605	436	203	110	731	1,067	428	694	283
Accrued expenses and other liabilities	762	713	757	1,597	1,515	4,891	8,614	7,170	5,504	7,304
Accrued revenue share	299	254	245	339	593	955	483	1,273	1,639	1,682
Deferred revenue	163	233	(175)	43	223	390	371	37	635	774
Net cash provided by operating activities	16,619	18,659	22,376	26,024	36,036	37,091	47,971	54,520	65,124	91,652
Investing activities										
Purchases of property and equipment excluding proceeds from dispo	(3,273)	(7,358)	(10,959)	(9,915)	(10,212)	(13,184)	(25,139)	(23,548)	(22,281)	(24,640)
Purchases of marketable securities	(33,410)	(45,444)	(56,310)	(74,368)	(84,509)	(92,195)	(50,158)	(100,315)	(136,576)	(135,196)
Maturities and sales of marketable securities	35,180	38,314	51,315	62,905	66,895	73,959	48,507	97,825	132,906	128,294
Purchases of non-marketable investments excluding maturities and s	(696)	(569)	(1,227)	(2,172)	(1,109)	(1,745)	(2,073)	(1,932)	(7,175)	(2,838)
Maturities and sales of non-marketable investments	-	-	-	-	494	533	1,752	405	1,023	934
assets	(10,568)	(1,448)	(4,888)	(236)	(986)	(287)	(1,491)	(2,515)	(738)	(2,618)
Proceeds from disposals of property and equipment	-	-	-	-	240	99	98	589	68	541
Net cash used in / provided by investing activities	(13,056)	(13,679)	(21,055)	(23,711)	(31,165)	(31,401)	(28,504)	(29,491)	(32,773)	(35,523)
Financing activities										
Net payments / proceeds related to stock-based award activities	(287)	(781)	(2,069)	(2,375)	(3,304)	(4,166)	(4,993)	(4,765)	(5,720)	(10,162)
Repurchases of capital stock	-	-	-	(1,780)	(3,693)	(4,846)	(9,075)	(18,396)	(31,149)	(50,274)
Proceeds from issuance of debt, net of costs	16,109	10,768	11,625	13,705	8,729	4,291	6,766	317	11,761	20,199
Repayments of debt	(14,781)	(11,325)	(11,643)	(13,728)	(10,064)	(4,377)	(6,827)	(585)	(2,100)	(21,435)
Proceeds from sale of subsidiary shares	-	-	-	-	-	800	950	220	2,800	310
Net cash provided by / used in financing activities	1,229	(857)	(1,439)	(3,677)	(8,332)	(8,298)	(13,179)	(23,209)	(24,408)	(61,362)
Effect of exchange rate changes on cash and cash equivalents	3	(3)	(433)	(434)	(170)	405	(302)	(23)	24	(287)
Net decrease / increase in cash and cash equivalents	4,795	4,120	(551)	(1,798)	(3,631)	(2,203)	5,986	1,797	7,967	(5,520)
Cash and cash equivalents at beginning of period	9,983	14,778	18,898	18,347	16,549	12,918	10,715	16,701	18,498	26,465
Cash and cash equivalents at end of period	14,778	18,898	18,347	16,549	12,918	10,715	16,701	18,498	26,465	20,945

Alphabet Inc.

Forecasted Cash Flow Statement

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Cash flow from Operating Activities										
Net Income	77,194	94,666	113,796	123,568	138,429	150,836	159,515	168,462	175,613	180,645
Add: Depreciation & amortization	18,610	14,981	25,493	26,571	28,564	33,713	35,549	37,741	40,177	41,597
Changes in Working Capital:										
Accounts receivable, net of allowance	(11,438)	(9,363)	(7,916)	(9,725)	(8,121)	(6,975)	(6,316)	(5,143)	(4,359)	(3,309)
Income taxes receivable, net	(1,115)	486	(499)	(454)	(30)	(318)	(210)	(111)	(164)	(100)
Inventories	(389)	(117)	(327)	(279)	(199)	(233)	(177)	(143)	(134)	(94)
other assets excluding inventories	(1,930)	(1,713)	(1,421)	(1,700)	(1,463)	(1,240)	(1,117)	(920)	(775)	(588)
Accounts payable	3,339	1,050	1,197	2,091	1,192	1,214	1,187	833	770	591
Accrued compensation and benefits	3,092	3,694	2,991	2,936	2,994	2,426	2,080	1,830	1,495	1,122
Accrued expenses and other current liabilities	13,369	7,899	8,041	7,937	7,205	6,395	5,388	4,582	3,888	2,878
Accrued revenue share	2,941	2,114	2,152	2,124	1,928	1,711	1,442	1,226	1,040	770
Deferred revenue	793	723	736	726	659	585	493	419	356	263
Income taxes payable, net	583	671	(138)	412	321	109	235	163	110	112
Net cash flow from Operating Activities:	105,048	115,090	144,104	154,208	171,480	188,224	198,067	208,939	218,017	223,888
Cash flow from Investing Activities										
Marketable securities	(4,808)	(5,002)	(5,205)	(5,416)	(5,635)	(5,863)	(6,101)	(6,348)	(6,605)	(6,872)
Non-marketable investments	(3,211)	(8,569)	(5,889)	(5,319)	(6,353)	(4,727)	(4,034)	(3,736)	(2,933)	(2,217)
Deferred income taxes	(347)	(373)	(222)	(319)	(283)	(217)	(210)	(172)	(140)	(110)
Property and equipment, net	(25,000)	(27,500)	(30,250)	(33,275)	(36,603)	(40,263)	(44,289)	(48,718)	(53,590)	(58,949)
Operating lease assets	(6,638)	(2,722)	(2,367)	(4,354)	(2,669)	(2,512)	(2,514)	(1,799)	(1,617)	(1,257)
Intangible assets, net	(1,302)	(22)	(334)	(668)	(235)	(346)	(338)	(202)	(215)	(161)
Goodwill	-	-	-	-	-	-	-	-	-	-
Prepaid revenue share, expenses and other a	(677)	(1,632)	(1,005)	(1,020)	(1,177)	(852)	(756)	(688)	(537)	(412)
Net cash flow from Investing Activities:	(41,983)	(45,820)	(45,273)	(50,370)	(52,954)	(54,779)	(58,242)	(61,663)	(65,636)	(69,977)
Cash flow from Financing Activities										
Long-term debt	2,360	6,269	1,616	3,371	3,751	2,136	2,375	2,055	1,500	1,254
Deferred revenue, non-current	199	142	92	154	116	95	95	73	62	49
Income taxes payable, non-current	6,219	1,143	1,911	3,576	1,724	1,973	1,941	1,284	1,245	949
Deferred income taxes	90	1,733	998	782	1,172	785	662	658	490	374
Operating lease liabilities	383	(1,078)	(980)	(890)	(808)	(734)	(667)	(606)	(550)	(500)
Other long-term liabilities	1,681	259	439	936	416	487	495	316	311	239
Accumulated other comprehensive income	-	-	-	-	-	-	-	-	-	-
Shares repurchases	(45,000)	(46,350)	(47,741)	(49,173)	(50,648)	(52,167)	(53,732)	(55,344)	(57,005)	(58,715)
Class A and Class B common stock, and Clas	59	59	59	59	59	59	59	59	59	59
Net cash flow from Financing Activities:	(34,008)	(37,823)	(43,605)	(41,185)	(44,218)	(47,366)	(48,772)	(51,504)	(53,888)	(56,291)
Net Increase (decrease) in cash	29,058	31,448	55,226	62,653	74,308	86,079	91,052	95,772	98,493	97,620
Beginning cash	20,945	50,003	81,450	136,676	199,329	273,637	359,716	450,768	546,540	645,033
Ending cash	50,003	81,450	136,676	199,329	273,637	359,716	450,768	546,540	645,033	742,653

Alphabet Inc.

Common Size Income Statement

<i>Fiscal Years Ending Dec. 31</i>	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Revenues	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of revenues	-44.42%	-46.42%	-43.06%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%	-40.49%
Research and development	-16.07%	-15.11%	-12.25%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%	-14.82%
Sales and marketing	-11.41%	-9.83%	-8.89%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%	-10.74%
General and administrative	-5.90%	-6.05%	-5.24%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%	-5.87%
Total costs and expenses	-78.85%	-77.41%	-69.45%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%	-71.92%
Income from operations	21.15%	22.59%	30.55%	24.76%	25.97%	27.09%	25.94%	26.33%	26.46%	26.24%	26.34%	26.35%	26.31%
Other income / expense, net	3.33%	3.76%	4.67%	3.93%	3.48%	3.14%	2.88%	2.72%	2.61%	2.54%	2.52%	2.51%	2.54%
Income before income taxes	24.48%	26.34%	35.22%	28.68%	30.08%	31.33%	30.03%	30.48%	30.61%	30.37%	30.49%	30.49%	30.45%
Provision for income taxes	-3.26%	-4.28%	-5.71%	-4.42%	-4.80%	-4.97%	-4.73%	-4.84%	-4.85%	-4.80%	-4.83%	-4.83%	-4.82%
Net income / loss	21.22%	22.06%	29.51%	24.26%	25.28%	26.35%	25.30%	25.64%	25.76%	25.57%	25.66%	25.66%	25.63%

Alphabet Inc.

Common Size Balance Sheet

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Assets													
Current assets:													
Cash and cash equivalents	11.43%	14.50%	8.13%	15.72%	21.75%	31.65%	40.81%	50.69%	61.44%	72.25%	83.24%	94.26%	105.37%
Marketable securities	62.51%	60.39%	46.07%	38.82%	34.32%	30.97%	28.49%	26.82%	25.73%	25.12%	24.84%	24.80%	25.05%
Total cash, cash equivalents, and marketable securities	73.94%	74.89%	54.20%	54.54%	56.07%	62.62%	69.29%	77.51%	87.17%	97.38%	108.08%	119.06%	130.42%
Accounts receivable, net of allowance	15.65%	16.95%	15.26%	15.95%	16.05%	15.75%	15.92%	15.91%	15.86%	15.89%	15.89%	15.88%	15.89%
Income taxes receivable, net	1.34%	0.25%	0.37%	0.65%	0.43%	0.48%	0.52%	0.48%	0.49%	0.50%	0.49%	0.49%	0.49%
Inventories	0.62%	0.40%	0.45%	0.49%	0.45%	0.46%	0.47%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
Prepaid revenue share, expenses and other as a result of advertising agreements	2.73%	3.01%	2.74%	2.82%	2.86%	2.81%	2.83%	2.83%	2.82%	2.83%	2.83%	2.83%	2.83%
Deferred income taxes	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 current assets	94.27%	95.49%	73.03%	74.46%	75.85%	82.12%	89.03%	97.18%	106.81%	117.06%	127.75%	138.72%	150.09%
Non-marketable investments	8.08%	11.34%	11.47%	10.30%	11.04%	10.93%	10.76%	10.91%	10.87%	10.84%	10.87%	10.86%	10.86%
Deferred income taxes	0.45%	0.59%	0.50%	0.51%	0.53%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
Property and equipment, net	45.50%	46.43%	37.88%	32.69%	31.11%	28.08%	26.20%	25.19%	24.35%	24.25%	24.72%	25.67%	27.39%
Operating lease assets	6.76%	6.69%	5.03%	6.16%	5.96%	5.72%	5.95%	5.87%	5.85%	5.89%	5.87%	5.87%	5.88%
Intangible assets, net	1.22%	0.79%	0.55%	0.85%	0.73%	0.71%	0.77%	0.74%	0.74%	0.75%	0.74%	0.74%	0.74%
Goodwill	12.74%	11.60%	8.91%	7.22%	6.13%	5.32%	4.70%	4.25%	3.92%	3.68%	3.50%	3.35%	3.26%
Prepaid revenue share, expenses and other as a result of advertising agreements	1.45%	2.17%	2.08%	1.90%	2.05%	2.01%	1.98%	2.01%	2.00%	2.00%	2.01%	2.00%	2.00%
Total assets	170.46%	175.11%	139.45%	134.08%	133.40%	135.41%	139.90%	146.68%	155.05%	164.99%	175.97%	187.75%	200.74%
Liabilities and Stockholders' Equity													
Current liabilities:													
Accounts payable	3.44%	3.06%	2.34%	2.95%	2.78%	2.69%	2.81%	2.76%	2.75%	2.77%	2.76%	2.76%	2.77%
Accrued compensation and benefits	5.25%	6.07%	5.39%	5.34%	5.52%	5.48%	5.45%	5.48%	5.47%	5.47%	5.47%	5.47%	5.47%
Accrued expenses and other current liabilities	14.25%	15.69%	12.12%	14.02%	14.02%	14.02%	14.02%	14.02%	14.02%	14.02%	14.02%	14.02%	14.02%
Accrued revenue share	3.66%	4.11%	3.49%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%	3.75%
Deferred revenue	1.18%	1.39%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%	1.28%
Income taxes payable, net	0.17%	0.81%	0.31%	0.44%	0.55%	0.45%	0.48%	0.49%	0.47%	0.48%	0.48%	0.48%	0.48%
Short-term debt	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%
Securities lending payable	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 current liabilities	27.94%	31.14%	24.94%	27.78%	27.91%	27.67%	27.79%	27.79%	27.75%	27.78%	27.77%	27.77%	27.77%
Long-term debt	2.81%	7.63%	5.75%	5.40%	6.26%	5.80%	5.82%	5.96%	5.86%	5.88%	5.90%	5.88%	5.89%
Deferred revenue, non-current	0.22%	0.26%	0.21%	0.23%	0.23%	0.22%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
Income taxes payable, non-current	6.11%	4.85%	3.56%	4.84%	4.42%	4.27%	4.51%	4.40%	4.39%	4.43%	4.41%	4.41%	4.42%
Deferred income taxes	1.05%	1.95%	2.04%	1.68%	1.89%	1.87%	1.81%	1.86%	1.85%	1.84%	1.85%	1.85%	1.84%
Operating lease liabilities	6.31%	6.11%	4.42%	3.70%	2.86%	2.25%	1.81%	1.48%	1.24%	1.06%	0.92%	0.80%	0.70%
Other long-term liabilities	1.57%	1.24%	0.86%	1.22%	1.11%	1.06%	1.13%	1.10%	1.10%	1.11%	1.10%	1.10%	1.10%
Total liabilities	46.01%	53.18%	41.78%	44.85%	44.67%	43.15%	43.10%	42.82%	42.42%	42.33%	42.18%	42.03%	41.96%
Stockholders' equity:													
Class A and Class B common stock, and Class C common stock	31.23%	32.06%	23.98%	19.44%	16.53%	14.35%	12.70%	11.50%	10.61%	9.97%	9.48%	9.11%	8.85%
Accumulated other comprehensive income / (loss)	-0.76%	0.35%	-0.63%	-0.51%	-0.43%	-0.38%	-0.33%	-0.30%	-0.28%	-0.26%	-0.25%	-0.24%	-0.23%
Retained earnings	93.99%	89.52%	74.32%	70.31%	72.63%	78.28%	84.44%	92.66%	102.30%	112.95%	124.56%	136.84%	150.16%
Total stockholders equity	124.46%	121.92%	97.67%	89.23%	88.73%	92.25%	96.80%	103.86%	112.63%	122.66%	133.79%	145.71%	158.78%
Total liabilities and stockholders equity	170.46%	175.11%	139.45%	134.08%	133.40%	135.41%	139.90%	146.68%	155.05%	164.99%	175.97%	187.75%	200.74%

Alphabet Inc.

Value Driver Estimation

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
NOPLAT:													
Revenues	161,857	182,527	257,637	318,143	374,483	431,836	488,445	539,833	585,447	623,874	656,554	684,283	704,812
Cost of revenues	(71,896)	(84,732)	(110,939)	(128,831)	(151,645)	(174,870)	(197,794)	(218,603)	(237,075)	(252,635)	(265,869)	(277,098)	(285,411)
Research and development	(26,018)	(27,573)	(31,562)	(47,138)	(55,486)	(63,984)	(72,372)	(79,986)	(86,744)	(92,438)	(97,280)	(101,388)	(104,430)
Sales and marketing	(18,464)	(17,946)	(22,912)	(34,169)	(40,220)	(46,380)	(52,460)	(57,979)	(62,878)	(67,005)	(70,515)	(73,493)	(75,698)
General and administrative	(9,551)	(11,052)	(13,510)	(18,667)	(21,973)	(25,338)	(28,660)	(31,675)	(34,352)	(36,606)	(38,524)	(40,151)	(41,356)
Depreciation & amortization	(11,781)	(13,697)	(12,441)	(18,610)	(14,981)	(25,493)	(26,571)	(28,564)	(33,713)	(35,549)	(37,741)	(40,177)	(41,597)
Implied operating lease expense	(366)	(500)	(553)	(575)	(868)	(989)	(1,094)	(1,286)	(1,405)	(1,516)	(1,627)	(1,707)	(1,779)
European commission fine	(1,697)	-	-	-	-	-	-	-	-	-	-	-	-
EBIT:	22,084	27,027	65,720	70,153	89,308	94,781	109,495	121,739	129,281	138,124	144,998	150,269	154,542
Adjusted Taxes:													
Provision for income taxes	(5,282)	(7,813)	(14,701)	(14,051)	(17,979)	(21,482)	(23,107)	(26,104)	(28,376)	(29,973)	(31,705)	(33,029)	(33,972)
Marginal tax rate	17.20%	22.07%	22.20%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%	22.2%
Tax on lease interest	(1,882)	(2,695)	(2,877)	(4,351)	(4,955)	(5,480)	(6,447)	(7,040)	(7,597)	(8,155)	(8,555)	(8,914)	(9,193)
Tax on interest & other income	(928)	(1,514)	(2,668)	(2,777)	(2,889)	(3,006)	(3,128)	(3,254)	(3,386)	(3,523)	(3,666)	(3,814)	(3,969)
Adjusted Taxes:	(8,092)	(12,022)	(20,246)	(21,178)	(25,823)	(29,968)	(32,682)	(36,397)	(39,360)	(41,652)	(43,925)	(45,757)	(47,134)
Change in deferred taxes	453	1,497	1,496	(256)	1,361	776	463	889	568	453	487	350	264
NOPLAT	14,445	16,502	46,970	48,718	64,846	65,589	77,276	86,231	90,489	96,925	101,559	104,862	107,672
growth %	18.5%	14.2%	184.6%	3.7%	33.1%	1.1%	17.8%	11.6%	4.9%	7.1%	4.8%	3.3%	2.7%
Invested Capital (IC):													
Operating current assets													
+ Normal cash	13,158	14,839	20,945	25,864	30,444	35,107	39,709	43,887	47,595	50,719	53,376	55,630	57,299
+ Accounts receivable, net of allowan	25,326	30,930	39,304	50,742	60,105	68,021	77,746	85,867	92,842	99,158	104,301	108,661	111,970
+ Income taxes receivable, net	2,166	454	966	2,081	1,595	2,094	2,548	2,578	2,896	3,106	3,217	3,382	3,482
+ Inventories	999	728	1,170	1,559	1,676	2,004	2,282	2,481	2,714	2,892	3,035	3,169	3,263
+ Prepaid revenue share, expenses an	4,412	5,490	7,054	8,984	10,697	12,118	13,817	15,280	16,520	17,637	18,557	19,332	19,919
Current liabilities													
- Accounts payable	5,561	5,589	6,037	9,376	10,426	11,623	13,713	14,905	16,119	17,306	18,139	18,909	19,500
- Accrued compensation and benefits	8,495	11,086	13,889	16,981	20,675	23,666	26,602	29,596	32,022	34,102	35,932	37,427	38,550
- Accrued expenses and other current	23,067	28,631	31,236	44,605	52,504	60,545	68,482	75,687	82,082	87,470	92,052	95,940	98,818
- Accrued revenue share	5,916	7,500	8,996	11,937	14,050	16,202	18,326	20,254	21,966	23,407	24,633	25,674	26,444
- Deferred revenue	1,908	2,543	3,288	4,081	4,804	5,539	6,266	6,925	7,510	8,003	8,422	8,778	9,041
- Income taxes payable, net	274	1,485	808	1,391	2,062	1,923	2,335	2,656	2,765	3,000	3,163	3,273	3,385
Long-term operating assets													
Property and equipment, net	73,646	84,749	97,599	103,989	116,507	121,264	127,968	136,006	142,556	151,296	162,273	175,686	193,038
Operating lease assets	10,941	12,211	12,959	19,597	22,319	24,686	29,040	31,710	34,221	36,735	38,534	40,151	41,408
Intangible assets, net	1,979	1,445	1,417	2,719	2,742	3,076	3,744	3,978	4,324	4,662	4,865	5,079	5,240
Long-term liabilities													
Deferred revenue, non-current	358	481	535	734	876	968	1,122	1,238	1,333	1,428	1,501	1,563	1,611
Income taxes payable, non-current	9,885	8,849	9,176	15,395	16,538	18,449	22,025	23,748	25,722	27,662	28,947	30,191	31,141
Invested Capital (IC):	77,163	84,682	107,449	111,036	124,151	129,454	137,984	146,778	154,150	163,828	175,370	189,335	207,129
Free Cash Flow (FCF):													
NOPLAT	14,445	16,502	46,970	48,718	64,846	65,589	77,276	86,231	90,489	96,925	101,559	104,862	107,672
Change in IC	23,909	7,518	22,767	3,587	13,115	5,303	8,530	8,794	7,372	9,678	11,542	13,965	17,795
FCF	(9,463)	8,984	24,203	45,131	51,731	60,286	68,747	77,437	83,117	87,247	90,017	90,898	89,877
Return on Invested Capital (ROIC):													
NOPLAT	14,445	16,502	46,970	48,718	64,846	65,589	77,276	86,231	90,489	96,925	101,559	104,862	107,672
Beginning IC	53,255	77,163	84,682	107,449	111,036	124,151	129,454	137,984	146,778	154,150	163,828	175,370	189,335
ROIC	27.13%	21.39%	55.47%	45.34%	58.40%	52.83%	59.69%	62.49%	61.65%	62.88%	61.99%	59.79%	56.87%
Economic Profit (EP):													
Beginning IC	53,255	77,163	84,682	107,449	111,036	124,151	129,454	137,984	146,778	154,150	163,828	175,370	189,335
x (ROIC - WACC)	17.21%	11.47%	45.55%	35.42%	48.49%	42.91%	49.78%	52.58%	51.73%	52.96%	52.08%	49.88%	46.95%
EP	9,165	8,851	38,573	38,064	53,836	53,278	64,440	72,549	75,935	81,640	85,315	87,473	88,898

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

Risk-Free Rate	4.15%
Beta	1.15
Equity Risk Premium	5.15%
Cost of Equity	10.06%

ASSUMPTIONS:

*10-year Treasury bond
Average of 1 yr, 3 yr, and 5 yr raw and adjusted betas
Henry Fund Estimate*

Cost of Debt:

Risk-Free Rate	4.15%
Implied Default Premium	0.28%
Pre-Tax Cost of Debt	4.43%
Marginal Tax Rate	22.20%
After-Tax Cost of Debt	3.45%

10-year Treasury bond

YTM on company's 10-year corporate bond

Market Value of Common Equity:

Total Shares Outstanding	13,353
Current Stock Price	\$96.41
MV of Equity	1,287,363

MV Weights

97.89%

Market Value of Debt:

Short-Term Debt	
Current Portion of LTD	
Long-Term Debt	14,817
PV of Operating Leases	12,971
MV of Total Debt	27,788

2.11%

Market Value of the Firm

1,315,151

100.00%

Estimated WACC

9.92%

Alphabet Inc.

Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models

Key Inputs:

CV Growth of NOPLAT	2.68%
CV Year ROIC	56.87%
WACC	9.92%
Cost of Equity	10.06%

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
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DCF Model:

Free Cash Flow (FCF)	45,131	51,731	60,286	68,747	77,437	83,117	87,247	90,017	90,898	89,877
Continuing Value (CV)										1,417,823
PV of FCF	41,059	42,819	45,398	47,099	48,267	47,134	45,012	42,252	38,816	605,459

Value of Operating Assets:	1,003,315
Non-Operating Adjustments	
+ Excess cash	24,139
+ Marketable securities	123,512
- PV of operating leases	11,772
- Long-term debt	17,177
Value of Equity	1,179,915
Shares Outstanding	12,895
Intrinsic Value of Last FYE	\$ 91.50
Implied Price as of Today	\$ 99.39

EP Model:

Economic Profit (EP)	38,064	53,836	53,278	64,440	72,549	75,935	81,640	85,315	87,473	88,898
Continuing Value (CV)										1,228,489
PV of EP	34,630	44,561	40,121	44,149	45,220	43,061	42,120	40,045	37,354	524,607

Total PV of EP	895,866
Invested Capital (last FYE)	107,449
Value of Operating Assets:	1,003,315
Non-Operating Adjustments	
+ Excess cash	24,139
+ Marketable securities	123,512
- PV of operating leases	11,772
- Long-term debt	17,177
Value of Equity	1,179,915
Shares Outstanding	12,895
Intrinsic Value of Last FYE	\$ 91.50
Implied Price as of Today	\$ 99.39

Alphabet Inc.

Dividend Discount Model (DDM) or Fundamental P/E Valuation Model

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
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EPS	\$ 5.99	\$ 7.59	\$ 9.43	\$ 10.57	\$ 12.20	\$ 13.69	\$ 14.89	\$ 16.15	\$ 17.28	\$ 18.22
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Key Assumptions

CV growth of EPS	5.44%
CV Year ROE	16.14%
Cost of Equity	10.06%

Future Cash Flows

P/E Multiple (CV Year)										1436.88%
EPS (CV Year)										\$ 18.22
Future Stock Price										\$ 261.83
Dividends Per Share	0	0	0	0	0	0	0	0	0	0
Discounted Cash Flows	0	0	0	0	0	0	0	0	0	110.54

Intrinsic Value as of Last FYE \$ 110.54

Implied Price as of Today **\$ 120.07**

Alphabet Inc.*Relative Valuation Models*

Ticker	Company	Price	EPS		P/E 22	P/E 23	Est. 5yr EPS gr.	PEG 22	PEG 23	EV/EBITDA		WACC Most Recent
			2023E	2024E						2023E	2024E	
META	Meta Platforms, Inc,	\$90.70	\$7.98	\$10.00	11.37	9.07	-17.5	(0.65)	(0.52)	4.8	4.1	8.2
AMZN	Amazon.com	\$90.98	\$1.85	\$3.17	49.18	28.70	26.0	1.89	1.10	12.2	9.6	7.7
AAPL	Apple, Inc.	\$138.14	\$6.26	\$6.83	22.07	20.23	8.9	2.48	2.28	17.9	17.1	8.4
MSFT	Microsoft	\$221.34	\$9.53	\$11.18	23.23	19.80	13.0	1.79	1.52	15.9	13.7	8.1
Average					26.46	19.45		1.38	1.10			8.1

GOOGL Alphabet Inc. \$96.41 \$5.99 \$7.59 16.1 12.7 16.5 1.0 0.8 9.1 7.9 9.92%

Implied Relative Value:

P/E (EPS23) \$ 158.39
P/E (EPS24) \$ 147.68
PEG (EPS23) \$ 135.79
PEG (EPS24) \$ 137.01

Alphabet Inc.

Effects of ESOP Exercise and Share Repurchases on Common Stock Account and Number of Shares Outstanding

Number of Options Outstanding (shares):	22
Average Time to Maturity (years):	<u>2.50</u>
Expected Annual Number of Options Exercised:	9

Current Average Strike Price:	\$ 8.62
Cost of Equity:	10.06%
Current Stock Price:	\$96.41

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Increase in Shares Outstanding:	9	9	9	9	9	9	9	9	9	9
Average Strike Price:	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62	\$ 8.62
Increase in Common Stock Account:	76	76	76	76	76	76	76	76	76	76
Share Repurchases (\$)	45,000	46,350	47,741	49,173	50,648	52,167	53,732	55,344	57,005	58,715
Expected Price of Repurchased Shares:	\$ 96.41	\$ 106.10	\$ 116.77	\$ 128.52	\$ 141.44	\$ 155.66	\$ 171.31	\$ 188.54	\$ 207.50	\$ 228.36
Number of Shares Repurchased:	467	437	409	383	358	335	314	294	275	257
Shares Outstanding (beginning of the year)	13,353	12,895	12,467	12,067	11,693	11,344	11,018	10,713	10,428	10,162
Plus: Shares Issued Through ESOP	9	9	9	9	9	9	9	9	9	9
Less: Shares Repurchased in Treasury	467	437	409	383	358	335	314	294	275	257
Shares Outstanding (end of the year)	12,895	12,467	12,067	11,693	11,344	11,018	10,713	10,428	10,162	9,914

Alphabet Inc.*Valuation of Options Granted under ESOP*

Current Stock Price	\$96.41
Risk Free Rate	4.15%
Current Dividend Yield	0.00%
Annualized St. Dev. of Stock Returns	40.00%

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	126	5.00	2.24	\$ 91.85	\$ 11,574
Range 2	289	9.00	5.40	\$ 89.23	\$ 25,789
Range 3	250	10.00	4.35	\$ 88.07	\$ 22,018
Total	665	\$ 8.62	4.41	\$ 89.24	\$ 59

Alphabet Inc.
Sensitivity Tables

DCF		Equity Risk Premium						
	99.39	4.40%	4.65%	4.90%	5.15%	5.40%	5.65%	5.90%
Beta	1.00	121.87	117.40	113.29	109.50	105.98	102.72	99.68
	1.05	117.91	113.56	109.56	105.87	102.46	99.29	96.35
	1.10	114.23	109.99	106.10	102.51	99.19	96.12	93.26
	1.15	110.80	106.67	102.88	99.39	96.17	93.18	90.41
	1.20	107.60	103.57	99.88	96.48	93.35	90.45	87.75
	1.25	104.60	100.67	97.08	93.77	90.72	87.90	85.28
	1.30	101.79	97.96	94.45	91.23	88.26	85.52	82.97

DCF		Forecasted Marginal Tax Rate						
	99.39	21.45%	21.70%	21.95%	22.20%	22.45%	22.45%	22.45%
Cost of Equity	9.31%	99.19	99.06	98.93	98.80	98.68	98.68	98.68
	9.56%	99.39	99.26	99.13	99.00	98.87	98.87	98.87
	9.81%	99.58	99.45	99.32	99.19	99.06	99.06	99.06
	10.06%	99.78	99.65	99.52	99.39	99.26	99.26	99.26
	10.31%	99.97	99.84	99.71	99.58	99.45	99.45	99.45
	10.56%	100.17	100.04	99.91	99.78	99.65	99.65	99.65
	10.81%	100.36	100.23	100.10	99.97	99.84	99.84	99.84

DCF		Pre-Tax Cost of Debt						
	99.39	3.68%	3.93%	4.18%	4.43%	4.68%	4.93%	5.18%
Risk-Free Rate	3.40%	109.70	109.52	109.35	109.17	109.00	108.82	108.65
	3.65%	106.17	106.00	105.83	105.67	105.50	105.34	105.18
	3.90%	102.89	102.73	102.57	102.42	102.26	102.10	101.95
	4.15%	99.84	99.69	99.54	99.39	99.24	99.09	98.94
	4.40%	96.99	96.85	96.71	96.56	96.42	96.28	96.14
	4.65%	94.33	94.20	94.06	93.92	93.79	93.65	93.52
	4.90%	91.84	91.71	91.58	91.45	91.32	91.19	91.06

DCF		ROI						
	99.39	3.30%	3.55%	3.80%	4.05%	4.30%	4.55%	4.80%
CAPEX growth rate	9.25%	100.36	100.24	100.12	99.99	99.86	99.73	99.60
	9.50%	100.16	100.04	99.92	99.79	99.67	99.53	99.40
	9.75%	99.96	99.84	99.72	99.59	99.46	99.33	99.20
	10.00%	99.75	99.64	99.51	99.39	99.26	99.13	98.99
	10.25%	99.55	99.43	99.31	99.18	99.05	98.92	98.79
	10.50%	99.34	99.22	99.10	98.97	98.85	98.71	98.58
	10.75%	99.13	99.01	98.89	98.76	98.64	98.50	98.37

DCF		CV Growth of NOPLAT						
	99.39	2.51%	2.76%	3.01%	3.26%	3.51%	3.76%	4.01%
WACC	9.17%	108.75	110.78	112.97	115.35	117.94	120.77	123.88
	9.42%	105.05	106.88	108.86	111.00	113.32	115.84	118.60
	9.67%	101.61	103.27	105.06	106.99	109.07	111.33	113.79
	9.92%	98.41	99.92	101.54	103.28	105.16	107.19	109.39
	10.17%	95.42	96.79	98.27	99.84	101.54	103.37	105.35
	10.42%	92.62	93.88	95.22	96.65	98.19	99.85	101.63
	10.67%	90.00	91.15	92.37	93.68	95.08	96.58	98.19

DDM		Share repurchase growth rate						
	120.07	2.25%	2.50%	2.75%	3.00%	3.25%	3.50%	3.75%
CV Growth of EPS	5.36%	116.75	117.43	118.13	118.85	119.57	120.31	121.07
	5.61%	120.39	121.11	121.86	122.62	123.39	124.18	124.98
	5.86%	124.46	125.23	126.03	126.84	127.66	128.50	129.36
	6.11%	129.04	129.88	130.72	131.59	132.47	133.38	134.29
	6.36%	134.25	135.14	136.06	136.99	137.94	138.91	139.90
	6.61%	140.21	141.18	142.16	143.17	144.20	145.24	146.31
	6.86%	147.10	148.15	149.22	150.32	151.43	152.57	153.73

