Final Project Report

**Time Series Analysis – Google- Alphabet**

**“GOOGL”**



**FE-511-A/WS- Introduction to Bloomberg & Thomson-Reuters**

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For the stock analysis of GOOGL - ALPHABET, I have collected data from the Wharton Research Data Services

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Alphabet – INC -CL A is basically a holding company that provides web-based search. Where one can find any data like advertisement, maps, software’s etc. It acts like a search engine. Here, I have extracted data to show linear regression among them.

**DES-** Extracted consolidated financial information for Alphabet – INC -CL A through DES

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# Company Description

Alphabet Inc. is an American multinational technology conglomerate holding company headquartered in Mountain View, California. It was created through a restructuring of Google on October 2, 2015 and became the parent company of Google and several former Google subsidiaries.

# OVERVIEW

Alphabet is the world's third-largest technology company by revenue and one of the world's most valuable companies. The establishment of Alphabet Inc. was prompted by a desire to make the core Google business "cleaner and more accountable" while allowing greater autonomy to group companies that operate in businesses other than Internet services. Founders Larry Page and Sergey Brin announced their resignation from their executive posts in December 2019, with the CEO role to be filled by Sundar Pichai, also the CEO of Google. This growth has transformed Alphabet into one of the largest companies in the world, with a market capitalization of nearly $1.9 trillion. The company has trailing 12-month (TTM) net income of $62.9 billion and TTM revenue of $220.3 billion.

# Operations

# The parent also is involved on a broad array of businesses, including cloud computing, software and hardware, advertising services, and mobile and desktop applications.

Alphabet Inc. has a diverse set of operations representing various products. As a result, productivity criteria vary, depending on the subsidiary and the goods or services involved. Some of the productivity criteria applicable to Google’s operations management are as follows:

* Rate of software error or bug correction – This criterion measures the productivity of software development personnel and their teams.
* Rate of release of mobile app updates – This productivity criterion matches current information technology trends, and measures Alphabet’s operations management effectiveness in supporting product development and rollout.
* Rate of installation of Google Fiber connections – This factor measures the productivity of Alphabet’s Google Fiber teams in satisfying market demand for Internet connection service.

# Company Background

The establishment of Alphabet was prompted by a desire to become a technology conglomerate which makes the core Google internet services business “cleaner and more accountable” while allowing greater autonomy to group companies that operate in businesses other than Internet services. The company is engaged in the business of acquisition and operation of different companies.

**FA** – Extracted the Company Fundamentals through FA function.

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Through fundamentals, we see that the market capitalization of BRK-A has increased from

$723,340.7M USD in 2018 to $1,233,676.2M USD currently. Total debt in 2018 was $4012M USD and currently, the debt has marginally increased to $29336M USD. The latest EPS or the earnings per share has been $5.10 USD with a growth of 133% YOY. The net income in 2018 was $30697M USD and currently, it is $67983.8M USD. The cash from operations has increased marginally from $47971M USD to $92815M USD, still, GOOGL has a ton of money and more than some countries’ GDP. The stock is trading at a P/E ratio of 18.9. Normally its P/E ratio ranges from 18-25.

**TRA**- Total Return Analysis (TRA) function provides a rich set of options for calculating returns between a start date and an end date.

The company’s cumulative total return is -34.59% which is not great looking at the magnitude of the company. The daily volumes are very low 20-30shares are traded daily. The security price is 95.19 which is the same as the dividend adjusted value. The Divs reinvested at 4.325%

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# EM - Emerging market equity funds offer investors access to countries and regions that are undergoing economic transition.

We see that quarterly projected EPS for the Q1 Mar 2023 is 1.20 and for Q1 2024 is 1.46. For Q2 June 2023 projected EPS is 1.29 and for Q2 Jun 2024 projected EPS is 152. For Q3 Sept 2023 projected EPS is 1.33 and for Q3 Sept 2024 projected EPS is 1.59. For Q4 Dec 2023 projected EPS is 1.49 and for Q4 Dec 2024 projected EPS is 1.67.

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# SURP- Surprise Analysis was used to analyze historical data on earnings surprises and share price changes

Most of the times, we see a positive surprise in GOOGL results. In Q1 2021, we saw a nearly

+37.21% surprise when the company reported 1.315 beating the street estimates of 1.073

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# GF – Graph Fundamentals

In this graph, the brown line represents Revenues, and the blue line represents Earnings per share over the 5-year time period. We see that at most of the times the earnings per share is higher as compared to the revenue. We could notice that during Q4 of 2021 both were equivalent.

Chart, line chart

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# Modl – It provides all the reported data across regions. MODL combines detailed disclosures with analyst expectations and models.

# Here we can see Google Total Revenue as 76,888.45 and there are different services that comes under google are also shown below. Its operating income is 19,213.12. It has a diluted EPS of 1.23

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# Firstly, Alphabet's Google Search & Other business performed very well in Q2 2022 notwithstanding macroeconomic challenges, and this bodes well for the long-term outlook for the company and its core business.

# According to its [Q2 2022 10-Q filing](https://seekingalpha.com/filing/6598343?source=content_type%3Areact%7Csection%3Amain_content%7Cbutton%3Abody_link), revenue for the Google Search & Other service grew by +13.5% YoY from $35.9 billion in Q2 2021 to $40.7 billion for Q2 2022. Alphabet's actual Q2 2022 revenue for the Google Search & Other business also beat the market's consensus forecast by approximately +1% as per *S&P Capital IQ* data.

# Google Search & Other is the most important business for Alphabet, as it is the company's largest revenue contributor accounting for [58%](https://seekingalpha.com/filing/6174407?source=content_type%3Areact%7Csection%3Amain_content%7Cbutton%3Abody_link) of its top line FY 2021. At its [Q2 2022 earnings briefing](https://seekingalpha.com/article/4526113-alphabet-inc-goog-ceo-sundar-pichai-on-q2-2022-results-earnings-call-transcript?source=content_type%3Areact%7Csection%3Amain_content%7Cbutton%3Abody_link), Alphabet stressed that the company's strategy is to provide products and services that are "helpful to people and businesses during uncertain moments" and "for the long term" as well. Specifically, GOOG highlighted that Google Search serves the purpose of enabling people "to find anything from anywhere."

# Financial Performance

# Alphabet spent approximately $15.2 billion on share buybacks in Q2 2022, and this means that it has allocated around $28.5 billion to share buybacks in 2H 2022, this will work out o be a decent annualized share buyback yield of 4%

**TIME SERIES ANALYSIS USING Python**

**Time Series Analysis - Google.ipynb**

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2022-12-16

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* Likewise for all Volume, Low and Open graphs are present in the notebook.
* It’s clear from the plots that there is an overall increase in the trend, with some seasonality in above plot

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The most used is the Dickey-fuller Test: This is one of the statistical tests for checking stationarity. First, we consider the null hypothesis: the time series is non- stationary. The result from the rest will contain the test statistic and critical value for different confidence levels. The idea is to have Test statistics less than critical value, in this case we can reject the null hypothesis and say that this Time series is indeed stationary.

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This is not stationary because:

• mean is increasing even though the std is small.

• Test stat is > critical value.

• Note: the signed values are compared and the absolute values.

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There is some noise in realizing the forward trend here. There are some methods to model these trends and then remove them from the series. Some of the common ones are:

**• Smoothing: using rolling/moving average**

**• Aggression: by taking the mean for a certain time period (year/month)**

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**Chart

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In an ACF plot, each bar represents the size and direction of the correlation. Bars that extend across the red line are statistically significant.

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**Conclusion:**

We were successfully able to evaluate Time Series analysis of GOOG over a certain period. It helped us to understand better about the stocks.