# FINANCIAL ANALYSIS REPORT

# FOR

# amazon

Group Members:

- Dhyey Shaileshkumar Patel (0795590)
- Alejandro Rodriguez Orama (0795089)
- Olabisi Fadahunsi (0801587)
- Nelson Nwachia (0793347)
- Abhijeet Satish Chaudhari (0792238)
- Arzitha Rachakonda

## Table of Contents

## 1 Company Overview

Amazon, founded in 1994 by Jeff Bezos, initially focused on online book sales. Overcoming challenges of limited selection and logistical complexities, Amazon's commitment to customer satisfaction, competitive pricing, and innovation fueled its growth. With the internet's widespread adoption, Amazon expanded its offerings beyond books to include electronics, toys, clothing, and more. Investments in infrastructure and logistics improved order fulfillment. Amazon diversified into digital streaming with Prime Video, cloud computing with AWS, and artificial intelligence with Echo and Alexa. Today, Amazon is the world's largest online retailer and a leader in cloud services, entertainment streaming, and smart home devices. Its innovation, customer-centric approach, and efficiency have established Amazon as a highly influential and valuable company.

### 1.1 Current Operations

Amazon operates in various sectors, including:

1. E-commerce: Operating the world's largest online marketplace, offering a wide range of products across distinct categories.

2. Amazon Web Services (AWS): Providing cloud computing services, offering scalable infrastructure and storage in the cloud.

3. Prime Membership: Subscription-based service with benefits like fast shipping and access to streaming services.

4. Physical Retail: Expansion into physical retail through acquisitions and the launch of Amazon Go stores.

5. Content Streaming: Offering streaming services with a vast library of movies, TV shows, and music.

6. Devices and Technology: Developing consumer electronic devices that integrate with Amazon's services.

7. Logistics and Delivery: Building a robust logistics network utilizing advanced technologies for efficient order fulfillment and fast shipping.

### 1.2 Macroeconomic Environment

Amazon operates in the consumer-packaged goods (CPG) industry, which is less affected by macroeconomic trends compared to industries like airlines or automobiles. However, there are still several macroeconomic factors that can impact the industry:

a. Political Factors: Government policies and regulations, such as tax rules, foreign trade policies, and labor laws, influence Amazon's operations. Government support in areas like cybersecurity and e-commerce benefits Amazon.

b. Environmental Concerns: Amazon's focus on sustainability and waste management presents growth opportunities. However, there are still environmental concerns related to packaging and transportation.

c. Social Factors: Online shopping popularity and convenience benefit Amazon, but decreased job opportunities due to automation can be a challenge. Growing consumerism supports Amazon's business.

d. Technological Factors: Amazon's innovation and technological capabilities enhance customer experience and delivery services. However, data privacy and security risks need to be addressed to maintain consumer trust.

e. Economic Factors: Economic stability in developing countries provides growth opportunities for Amazon. Managing taxes, particularly in Asian countries, remains a constant challenge.

f. Legal Factors: Compliance with industry regulations, consumer laws, and safety regulations is important for Amazon's operations. Intellectual property disputes may arise due to its diverse product offerings and technological innovations.

Understanding these factors helps assess Amazon's growth opportunities, potential challenges, and strategies to remain competitive. Amazon's adaptability, innovation, and customer-centric approach have enabled it to navigate and thrive in various macroeconomic conditions.

### 1.3 Cyclicality

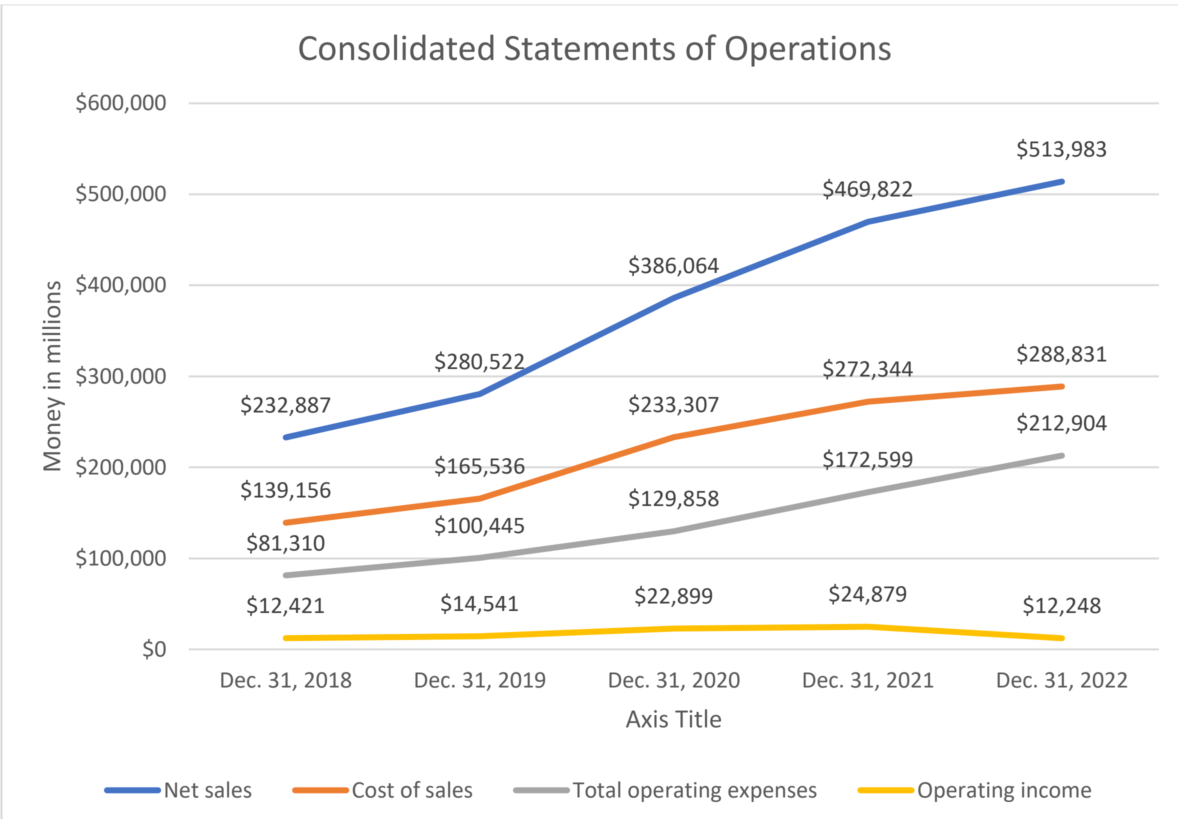
Amazon's cyclicality can be classified as moderately cyclical. While economic cycles can impact consumer spending patterns and demand for certain product categories, Amazon's diversified business model and focus on essential goods help mitigate these effects. The company has demonstrated resilience in adapting to changing consumer behavior and maintaining stable consumer demand. Additionally, Amazon Web Services (AWS), its cloud computing division, provides stability and acts as a counterbalance to potential cyclicality observed in other parts of the business. Overall, Amazon's ability to adapt, diversify across sectors, and maintain a strong customer base contribute to a less pronounced cyclicality compared to more discretionary-focused industries.

### 1.4 Industry Overview

Amazon operates in the consumer-packaged goods (CPG) market, offering a wide range of products used daily by consumers. The global CPG market is projected to reach $2.46 trillion by 2028, with a CAGR of 3.0%. Amazon competes with key players in the industry such as Procter & Gamble, Nestle, Coca-Cola, and Unilever. Its dominance in e-commerce is complemented by expansion into physical retail, including the acquisition of Whole Foods Market. Amazon leverages its robust logistics network, technological capabilities, and customer-centric approach to gain a competitive edge and capture a significant market share.

## 2. Valuation

In the following chart we represent the operations money flow during the years 2018 to 2022 for Net Sales, Cost of Sales, Total Operating Expenses, and Operating income which will be useful to calculate the FCF and stock price.




With the information obtained from the Consolidated Statements of Operations for the years 2018-2022, it was possible to calculate the Free Cash Flow (FCF) for the years 2023-2027, and subsequently determine the stock price for Amazon. To derive the Future Cash Flow, the future value of the following operations was calculated step by step in the Projected Financials sheet of the Financial Report where we also share the values we used for the required investment, tax rate, WACC (Weighted Average Cost of Capital), and number of shares.

The table below presents the calculated FCF values for each year:

| Amazon Future Cash Flow | | | | | |
|---|---|---|---|---|---|
| **Years** | 2023 | 2024 | 2025 | 2026 | 2027 |
| **FCF** | 36,809 | 51,417 | 70,867 | 96,645 | 130,675 |
| **Horizon value** | | | | 1,071,108 | |
| **Present value** | 32,417 | 39,878 | 48,404 | 977,479 | |
| **Total PV** | 1,098,178 | | | | |
| **Share price** | 107.45 | | | | |
| **Market price** | 129.78 | | | | |
| **Difference** | (22.33) | | | | |

The table reveals a negative difference of $22.33 between the share price calculated using the FCF method and the actual market price. These calculations suggest that the market may be overvaluing Amazon's stock due to the surge in sales during the years 2020-2021 because of the pandemic. It is worth noting that Amazon recorded a net loss of $2.722 billion in 2022, despite generating a revenue of $513.98 billion. This indicates that the company was not profitable during that year, and even though they presented a 9% of growth rate in 2022 from 2021 we believe that this growth rate is not sustainable, and that is why we have selected a long-term growth rate of 5%. After analyzing the current situation of Amazon, we recommend selling Amazon stocks as we anticipate a decline in the stock price.

**Capital Asset Pricing Model**

The **CAPM (Capital Asset Pricing Model)** is a financial model used to estimate the expected return on investment based on its systematic risk. It provides a framework for calculating the required rate of return for an investment by considering the risk-free rate, the market risk premium, and the beta of the investment.

The key components of the CAPM model are:

1. Risk-Free Rate: It represents the return expected from a risk-free investment, such as government bonds. It serves as a benchmark for the risk associated with investing in a particular asset.
2. Market Risk Premium: It is the additional return investors require for taking on the systematic risk of investing in the overall market rather than a risk-free asset. It reflects the compensation for bearing the average risk of the market.
3. Beta: Beta measures the sensitivity of an investment's returns to changes in the overall market returns. It quantifies the systematic risk of an investment relative to the market. A beta of 1 indicates that the investment moves in line with the market, while a beta greater than 1 suggests higher volatility, and a beta less than 1 indicates lower volatility compared to the market.

The CAPM formula is as follows:

Expected Return = Risk-Free Rate + Beta * (Market Risk Premium) by using the CAPM model, investors can estimate the appropriate required rate of return for an investment based on its level of risk and the overall market conditions. It provides a valuable tool for valuing investments and making informed investment decisions.

A negative market yield on 10-year constant maturity US Treasury securities means that investors are willing to accept a slight loss on their investment in exchange for the security and stability offered by US Treasury bonds. In this case, a yield of **-0.21%** suggests that investors are willing to pay a premium for the safety of US Treasury securities, even if it means receiving slightly less money than they originally invested. This negative yield reflects the current low-interest-rate environment and investor preference for low-risk investments.

A beta value of **1.32** for Amazon (AMZN) stocks over the past ten years indicates that Amazon's stock price has been, on average, 32% more volatile than the broader market. In other words, Amazon's stock has experienced larger price swings compared to the overall market. A beta greater than 1 suggests that the stock is expected to be more sensitive to market fluctuations. Investors often use beta as a measure of systematic risk, where a higher beta implies a higher level of risk associated with the stock.

A risk-free rate (Rf) of **4.05%** represents the expected return that investors would typically receive from investing in a completely risk-free asset. In practice, risk-free assets are often considered to be government bonds, specifically those issued by financially stable governments. The 4.05% risk-free rate implies that investors can expect to earn a 4.05% return on their investment without taking on any additional risk. The risk-free rate serves as a benchmark for comparing the expected returns of other investments, which are expected to provide a higher return due to the associated risks.

If Rm represents the market rate of return and is equal to **0.84%**, it implies the average return of the overall market during the specified period, which in this case is the last 10 years.

For Amazon's last 10 years of data, it means that the market, as measured by the chosen benchmark, has generated an average return of **0.84%** per year. This market return serves as a reference point for evaluating the performance of Amazon's stock during that period.

To assess how Amazon has performed relative to the market, you would need to compare Amazon's stock returns over the same time frame to see if it outperformed or underperformed the market average.

## Weighted Average Cost of Capital and Stock price

The WACC (Weighted Average Cost of Capital) is a financial metric that represents the average rate of return a company needs to generate to compensate its investors for the risk associated with investing in the company. It is calculated by considering the proportion of debt and equity in the company's capital structure and the respective costs of debt and equity. From calculation,

**Amazon's WACC = 13.55%.**

This means that, on average, Amazon needs to generate a return of 13.2% on its investments to meet the expectations of its investors and creditors i.e. it suggests that Amazon's overall capital structure requires a minimum return of 13.2% to compensate investors and creditors for the risks associated with their investment in the company. A higher WACC indicates higher financing costs and higher expectations from investors for the company to generate returns on its investments.

## Stock price discrepancies

From the stock price calculations, Amazon's share was calculated to be **$107.45** but it is currently selling at **$129.78** on the stock market.

From the chart below, the prediction by **Facebook prophet aligns with the calculated stock price**. The difference between the calculated stock price and the actual market price for Amazon can be attributed to various factors:

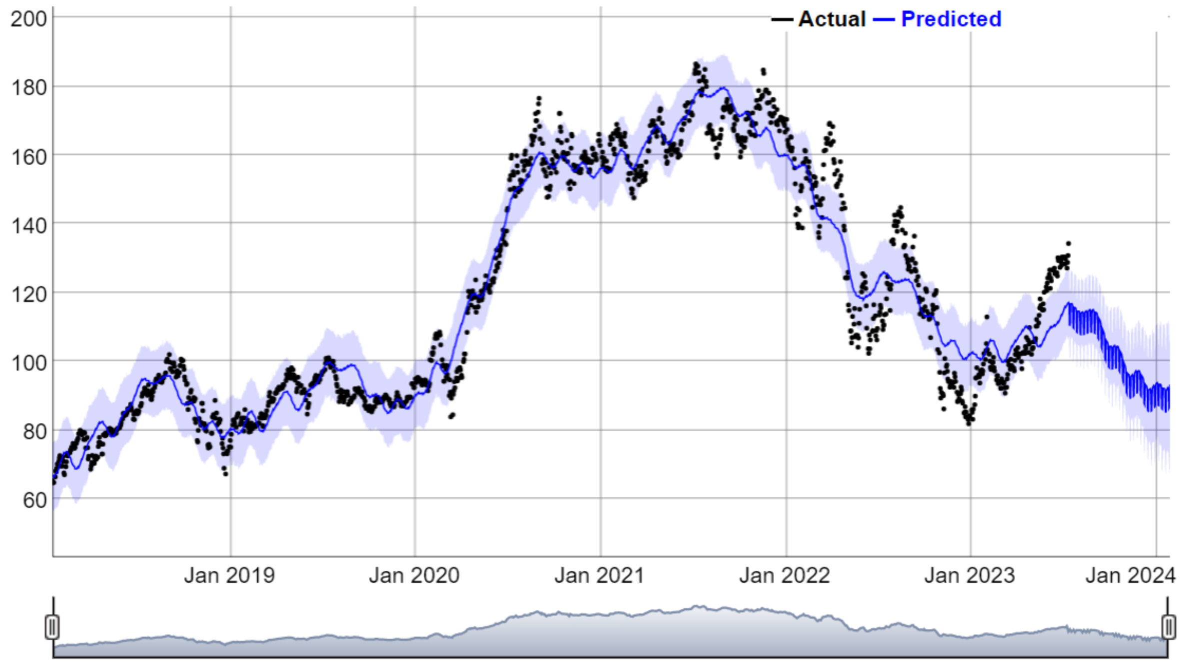



Fig  : Facebook Prophet Prediction for Amazon Stock Price

a. **Market Sentiment and Investor Perception**: The market price of a stock is influenced by investor sentiment and perception. Amazon is a highly popular and widely followed stock, and investor sentiment and expectations can drive the market price above or below its calculated value. Positive sentiment, high demand, and a bullish market outlook on the company's prospects may contribute to a higher market price.
b. **Growth Potential and Future Earnings Expectations**: Amazon is known for its strong growth potential and innovation. Investors may have high expectations for the company's future earnings and revenue growth, leading them to assign a higher value to the stock compared to its calculated value. Expectations of continued expansion, market dominance, and successful expansion into new markets can influence the market price.
c. **Market Dynamics and Supply/Demand Imbalance**: The market price of a stock is also influenced by the balance between supply and demand. If there is a high demand for Amazon shares compared to the available supply, it can drive the market price above its calculated value. Factors such as institutional buying, market speculation, and momentum trading can contribute to supply/demand imbalances and impact the market price.
d. **Market Efficiency and Information Accessibility**: The stock market is influenced by the actions and decisions of numerous market participants, including individual investors, institutional investors, analysts, and traders. The market incorporates a vast amount of information, opinions, and analysis into the stock price. It is possible that the market price reflects information or factors that are not accounted for in the simple calculated value, such as new product announcements, industry trends, or analyst reports.

e. **Long-Term Growth and Investment Horizon**: Investors may have a longer-term investment horizon and are willing to pay a premium for Amazon's stock due to its record of accomplishment of growth, market dominance, and potential future expansion. The market price may reflect the market's assessment of the company's long-term growth prospects, market position, and competitive advantage.

It is important to remember that stock prices are dynamic and subject to market forces, investor sentiment, and a wide range of factors beyond the calculated value. Market prices reflect the collective assessment and expectations of market participants, and they can deviate from calculated values based on a variety of reasons.

## 3. Financial ratios

Financial ratios are essential tools in financial analysis due to their ability to simplify complex financial data, as they use systematic approach to provide insights into a company's financial performance and position, facilitate comparison and benchmarking, and assist in decision-making processes for various stakeholders. The following financial ratios will be used to evaluate Amazon's performance.

**a. Liquidity Ratio:** It measures the ability of a company to pay its short-term financial obligations as they become due. The ratios below provide insights into Amazon's liquidity, which is its ability to convert assets into cash to cover its short-term liabilities. The higher the ratios, the better the company's liquidity position.

a) Current Ratio = Current Assets / Current Liabilities

| | |
|---|---|
| Current Assets | 462,675 |
| Current Liabilities | 155,393 |
| Current Ratio | 2.98 |

In the table above, the current ratio of 2.98 indicates that Amazon has 2.98 times more current assets than current liabilities. A current ratio above 1 is considered favorable, as it suggests that the company has enough assets to cover its short-term obligations. A higher current ratio indicates better liquidity and financial stability, as there is a larger margin of safety to meet the company's current obligations.

b) Quick Ratio / Acid-test Ratio = (Current Assets – inventory)/ Current Liabilities: More stricter than current ratio as we subtract inventory from current assets because inventory is not as liquid as other current assets

| | |
|---|---|
| Current Assets | 462,675 |
| Inventory | 34,405 |
| Current Liabilities | 155,393 |
| Quick Ratio | 2.76 |

The quick ratio of 2.76 suggests that Amazon has 2.76 times more liquid assets (excluding inventory) than current liabilities. This ratio provides a more conservative measure of the Amazon's ability to meet short-term obligations. A higher quick ratio indicates better short-term liquidity and a lower risk of financial distress.

c) Cash ratio = Cash + Cash equivalents + Marketable securities / Current Liabilities : Most strict as it considers a company's most liquid assets – cash, Cash equivalents, and marketable securities only

| | |
|---|---|
| Cash and Cash equivalents | 53,888 |
| Marketable securities | 16,138 |
| Current Liabilities | 155,393 |
| Cash Ratio | 0.45 |

The cash ratio of 0.45 indicates that Amazon has liquid assets (cash, cash equivalents, and marketable securities) equivalent to 45% of its current liabilities. This ratio provides the most conservative measure of liquidity and highlights the company's ability to meet its short-term obligations using only its most liquid assets. A higher cash ratio indicates a stronger ability to meet immediate obligations using highly liquid assets. It reflects a conservative approach to liquidity management, focusing on having readily available funds to cover short-term liabilities.

By monitoring these ratios over time, Amazon can make informed decisions regarding its financial management, such as adjusting its working capital or managing inventory levels.

**b. Profitability Ratio**: Profitability ratios are financial metrics that assess a company's ability to generate profits from its operations and provide insights into its overall profitability and financial performance. These ratios measure the company's efficiency in generating profits relative to its sales, assets, equity, or investments.

a) Gross Profit Margin = Gross Profit/Net Sales

| | |
|---|---|
| Net Sales | 513,983 |
| Gross Profit | 67,640 |
| GPM | 13.16% |

The Gross Profit Margin is approximately 13.16%. This means that for every dollar of revenue generated, Amazon retains around 13.16 cents as gross profit. A higher GPM indicates better profitability, as it implies that Amazon is effectively managing its production costs and generating a healthy margin on its products or services.

b) Operating Profit Margin or Return on Sales = Operating Earnings / Net Sales

| | |
|---|---|
| Net Sales | 513,983 |
| Operating profit | 12,248 |
| Operating profit margin | 2.38% |

The Operating Profit Margin is approximately 2.38%. This indicates that, after accounting for both COGS and operating expenses, the company retains approximately 2.38 cents of operating profit for every dollar of net sales. A higher Operating Profit Margin implies better operational efficiency and profitability, as it shows that Amazon is effectively managing its costs and generating a satisfactory profit from its core operations.

c) Return on Assets = Net Income / Total Assets

| | |
|---|---|
| Net Income | -2,722 |
| Total Assets | 462,675 |
| ROA | -0.59% |

The Return on Assets is approximately -0.59%. A negative ROA indicates that the company has incurred a net loss, resulting in a negative return relative to its assets. This suggests that Amazon's assets have not generated sufficient income or that its expenses have exceeded its revenue. It is important for Amazon to analyze the factors contributing to the negative ROA and take appropriate actions to improve profitability and asset utilization.

d) Return on equity = Net income /shareholder's equity

| | |
|---|---|
| Net Income | -2,722 |
| Shareholder's equity | 62,060 |
| ROE | -4.39% |

The Return on Equity is approximately -4.39%. A negative ROE indicates that the company has incurred a net loss, resulting in a negative return for shareholders' investments. It suggests that the company's profitability has not been sufficient to generate a positive return on the shareholders' equity. It is crucial for Amazon to address the factors contributing to the negative ROE and work towards improving profitability and shareholder value.

c. **Solvency Ratio:** are financial metrics that evaluate a company's long-term financial health and its ability to meet its long-term obligations. These ratios provide insights into Amazon's ability to cover its debts and continue its operations in the long run. Solvency ratios are essential for assessing a company's financial stability, creditworthiness, and ability to attract financing.

a) Solvency Ratio = (Net Income + Depreciation) / All Liabilities (Short-term + Long-term Liabilities)

| | |
|---|---|
| Net Income | -2,722 |
| Depreciation | 41,921 |
| Total Liabilities | 155,393 |
| Solvency Ratio | 25.23% |

The Solvency Ratio is approximately 25.23%. This ratio indicates that Amazon's net income, along with depreciation, can cover approximately 25.23% of its total liabilities. A higher solvency ratio suggests better long-term financial stability, as it indicates Amazon's capacity to meet its obligations using available income and depreciation.

b) Debt to Equity Ratio = Total Debt (total Liabilities)/ Shareholders' Equity

| | |
|---|---|
| Total Debt | 155,393 |
| Shareholder's equity | 146,043 |
| Debt to Equity | 106.40% |

The Debt-to-Equity Ratio is approximately 106.40%. This ratio indicates that Amazon has a higher amount of debt compared to its shareholders' equity. A higher debt to equity ratio suggests a higher proportion of financing coming from debt sources rather than shareholders' investments. It indicates a higher financial risk, as Amazon has more debt obligations to fulfill.

d. **Turnover ratios:** also known as activity ratios, are financial metrics that assess a company's efficiency in managing its assets and liabilities. These ratios measure how effectively a company utilizes its resources, such as inventory, accounts receivable, and accounts payable, to generate sales or fulfill its obligations.

a) Inventory Turnover Ratio = Costs of Goods sold/Average Inventory

| | |
|---|---|
| COGS | 446,343 |
| Inventory Beginning of 2022 | 32,640 |
| Inventory End of 2022 | 34,405 |
| Inventory Turnover Ratio | 13.3 |

The Inventory Turnover Ratio is approximately 13.3. This implies that, on average, Amazon sells and replenishes its inventory approximately 13.3 times during the year. A higher inventory turnover ratio indicates better inventory management and efficient sales.

b) Accounts Receivable Turnover Ratio = Net Credit Sales / Average Accounts Receivables
(Assuming 100 million in Cash Sales)

| | |
|---|---|
| Net Credit Sales (Net Sales - Minus Cash Sales) | 513,883 |
| AR Beginning of 2022 | 32,891 |
| AR End of 2022 | 42,360 |
| Accounts Receivable Turnover Ratio | 13.7 |

The Accounts Receivable Turnover Ratio is approximately 13.7. This indicates that, on average, Amazon collects its accounts receivable approximately 13.7 times during the year. A higher accounts receivable turnover ratio suggests more efficient management of credit sales and quicker collection of outstanding payments.

c) Payable turnover ratio = Net credit purchases/average accounts payable (Assuming 200 B in Credit purchases)

| | |
|---|---|
| Net Credit Purchases (Net Purchases - Minus Cash Purchases) | 200,000 |
| AP Beginning of 2022 | 78,664 |
| AP End of 2022 | 79,600 |
| Payable turnover ratio | 2.5 |

The Payable Turnover Ratio is approximately 2.5. This implies that, on average, Amazon pays its accounts payable approximately 2.5 times during the year. A higher payable turnover ratio suggests efficient management of payables and timely payment to suppliers.

e. **Earning Ratio**: These profitability ratio help evaluate a company's ability to generate profits, manage costs, and utilize its resources efficiently. They are crucial for assessing the company's financial performance, comparing it to industry peers, and making informed decisions related to investment, financial planning, and strategic management

a) P/E Ratio = Market value per share/Earnings per share (EPS)

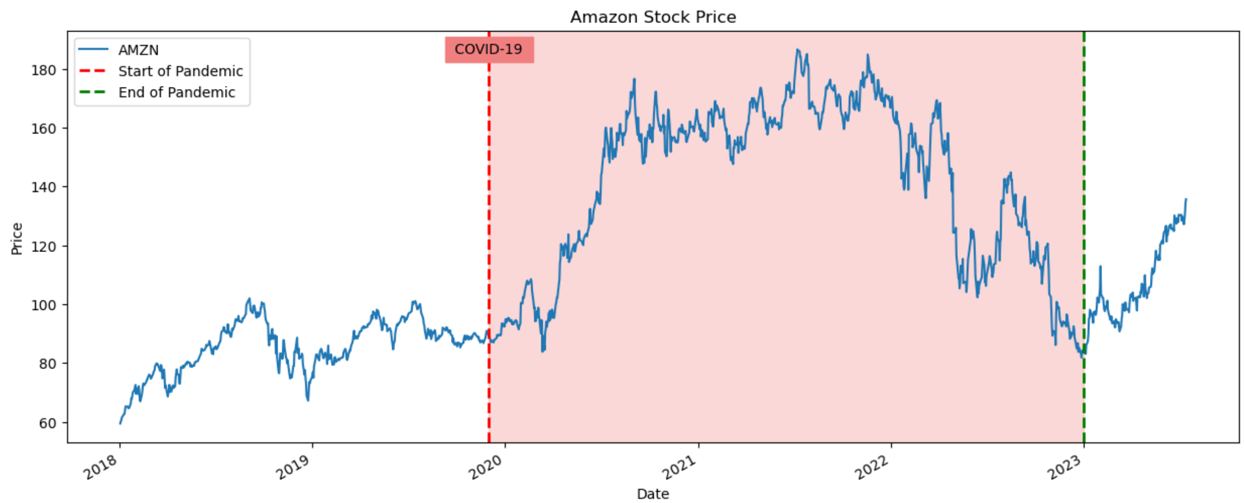
| | |
|---|---|
| Stock Price | 129.78 |
| EPS | 0.27 |
| PE Ratio | 480.7 |

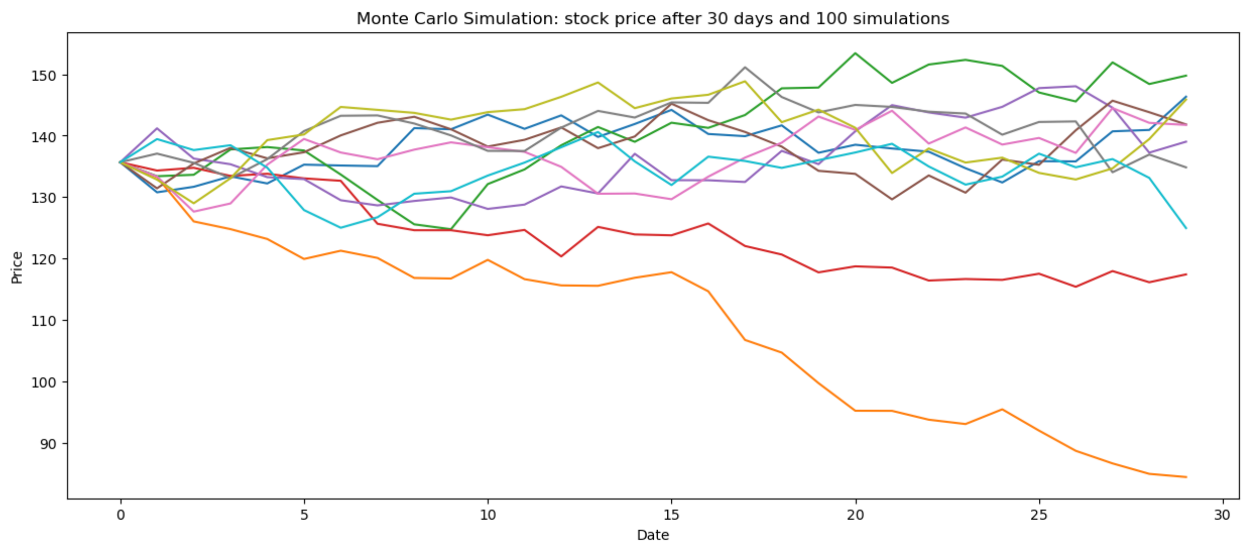
The P/E ratio is approximately 480.7. This means that investors are willing to pay 480.7 times the company's earnings per share to own one share of the stock. A higher P/E ratio indicates that the market has higher expectations for the company's future earnings growth and is willing to pay a premium for it. It may suggest that investors have confidence in the company's prospects and are willing to invest more for each dollar of earnings. However, a high P/E ratio can also indicate an overvalued stock or excessive market optimism.

## 4. Technical Analysis & Monte Carlo Simulation

### 4.1 Monte Carlo Simulation

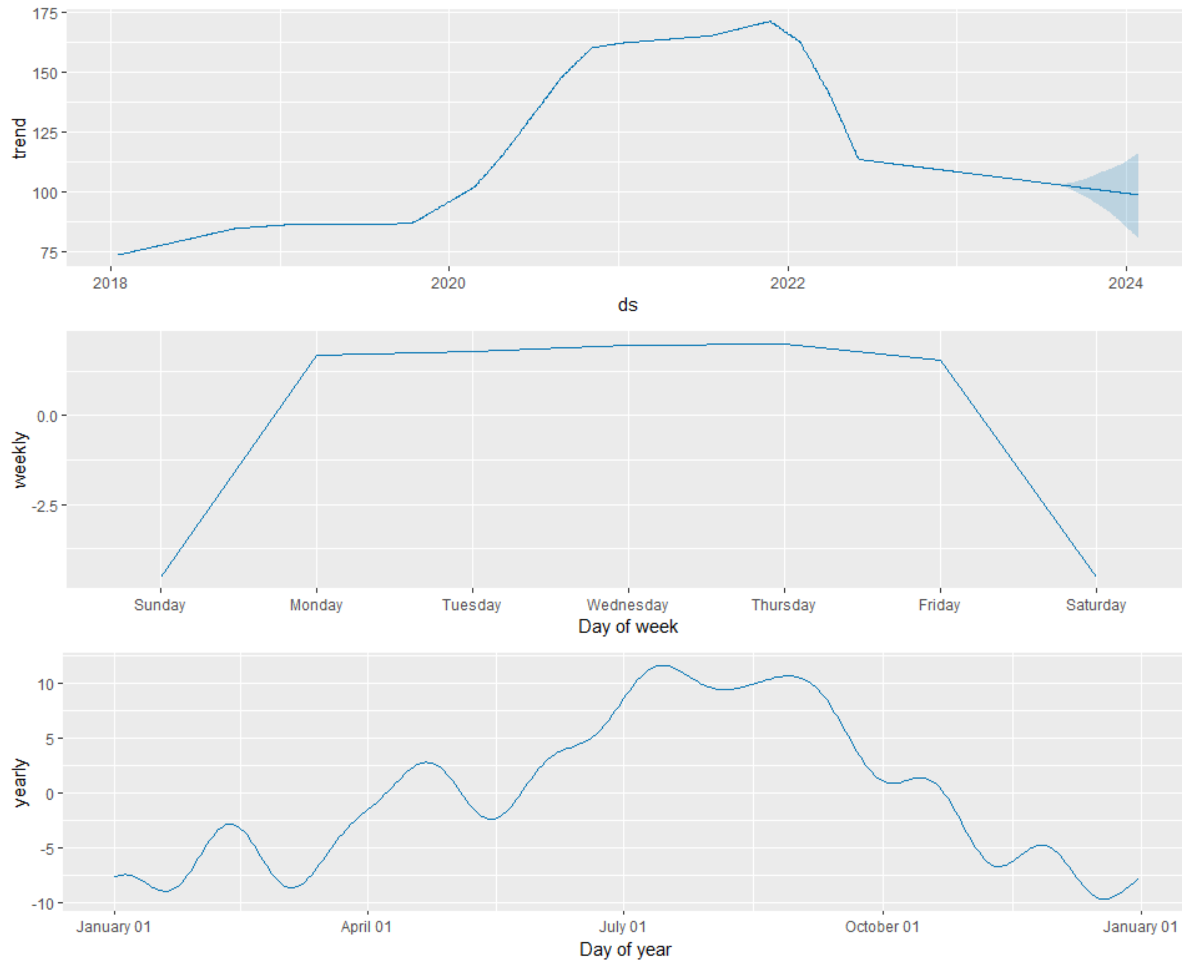
Monte Carlo Simulation is widely used in various fields, including finance, engineering, project management, and risk analysis. It helps to quantify uncertainty, assess the impact of different variables on outcomes, and make more informed decisions in the face of uncertainty. From the chart below, we see a spike in the price of the Amazon stock with a high of $180+ in mid-2021(peak of the pandemic) and then it begins to taper down when the Covid-19 pandemic eased out.




From the above Monte Carlo simulation for the next 30 days, Amazon stock is not expected to exceed $150 and most of the simulations suggest that the price will go down.

**Seasonality trends**




## 5. Recommendations

**For Amazon**

1. Capital Allocation: Amazon should evaluate the cost of capital, as measured by the WACC, to guide decision-making regarding capital allocation. Consider investment opportunities that have the potential to generate returns higher than the WACC, thereby creating value for shareholders.

2. Growth Strategies: Amazon should capitalize on growth opportunities aligned with Amazon's core competencies and long-term strategy. This may involve expanding into new markets, developing new products or services, and leveraging technology to maintain a competitive edge and sustain revenue growth.

**For Stockholders**

1. COVID-19 pandemic caused a significant exponential increase in Amazon sales from 2020 to 2021. Throughout the pandemic, sales remained stable until the beginning of 2022 when they started to gradually decline back to pre-pandemic levels. It is important to note that the current sales numbers are not indicative of normal sales values. Therefore, we recommend selling.

2. As seen in the seasonality chart above, there does not appear to be any significant differences in sales based on the day of the week. However, there is a notable variation between the months of July to October compared to the rest of the year. This difference can be attributed to events such as Amazon Prime Days (July 11 and 12) and the start of the school year in September. As a result, we suggest buying during the beginning or end of the year and selling during the months from July to September, which represents the high season of sales on Amazon.

### 6. Reference


https://www.edrawmax.com/article/amazon-pestel-analysis.html

https://panmore.com/amazon-com-inc-pestel-pestle-analysis-recommendations

https://finance.yahoo.com/news/consumer-packaged-goods-cpg-market-171824915.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAG1gd2Kbu1W2cThhxRoxF4Brk2vhVra91Y9iiriT3AqMuAwHTfsXE0Sq80Ib_JVK4oXfU-N3zWVrVCxY0FyckoujfmA1e4AT4oSfD3MmrS4qJppcIFtLxdtKycYLTB0EOP2lY-itwwJumitmxfRzYhdXUf61HcS-2NZTu7tO5XJ3