

# *Financial Analytics Project on Proctor & Gamble*

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*Procter & Gamble*

# *Business Analysis*



# History

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William Procter and James Gamble, both from the United Kingdom, migrated to the United States and settled in Cincinnati, Ohio, where they met after marrying sisters Elizabeth and Olivia Norris

William Arnett Procter, William Procter's grandson, implemented a profit-sharing program for the company's employees in 1887, which helped to minimize the likelihood of strikes

Procter & Gamble became a major international corporation, advertising its products in magazines, on radio and later on television, sponsoring and producing a significant number of soap operas that aired for over six decades



# *Products and Services*

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P&G produces and markets a wide range of consumer goods, including personal care products, cleaning agents, pet food, and food and beverage products

P&G's products are sold in over 180 countries, and the company operates through five business segments: Fabric and Home Care, Baby, Feminine and Family Care, Beauty, Grooming, and Health Care

P&G is known for its focus on research and development and has a reputation for being an innovator in the consumer goods industry

# *Industrial Competitors*

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PROCTER & GAMBLE IS A MAJOR CONSUMER GOODS COMPANY WITH VARIOUS COMPETITORS THAT AIM TO TARGET ITS SEGMENTS INDIVIDUALLY



THE COMPANY'S TOP-SELLING BUSINESS SEGMENT, REPRESENTING 33% OF ITS NET SALES IN 2019, IS FABRIC AND HOME CARE



IN THE BEAUTY SEGMENT, AVON IS A MAJOR COMPETITOR TO PROCTER & GAMBLE, ALONG WITH OTHER COMPANIES SUCH AS COLGATE-PALMOLIVE, ESTEE LAUDER, REVLON, AND UNILEVER



# *Valuation Analysis*



# Liquidity Ratio

Current Assets = \$21,653 Billion

Current liabilities = \$33,081 Billion

Cash and Cash Equivalent = \$ 7,214 Billion

Inventories = \$ 6,924 Billion

## Current Ratio

Current Ratio = Current Assets/Current Liabilities

Current Ratio = 21,653/33,081

Current Ratio = 0.65

## Quick Ratio

Quick Ratio = (Current Assets-Inventories)/Current Liabilities

Quick Ratio = (21,653-6,924)/33,081

Quick Ratio = 0.49

## Cash Ratio

Cash Ratio = Cash and Cash Equivalent/Current Liabilities

Cash Ratio = 7,214/33,081

Cash Ratio = 0.22



A LIQUIDITY RATIO IS A TYPE OF FINANCIAL RATIO USED TO DETERMINE A COMPANY'S ABILITY TO PAY ITS SHORT-TERM DEBT OBLIGATIONS



THE METRIC HELPS DETERMINE IF A COMPANY CAN USE ITS CURRENT, OR LIQUID, ASSETS TO COVER ITS CURRENT LIABILITIES



CASH RATIO = CASH AND CASH EQUIVALENT/CURRENT LIABILITIES

# Profitability Ratio

## Gross Profit Margin

$$\text{Gross Profit Margin} = (\text{Gross Income} / \text{Sales}) * 100$$

$$\text{Gross Profit Margin} = (38,212 / 80,187) * 100$$

$$\text{Gross Profit Margin} = 47.65\%$$

## Return on Assets (ROA)

$$\text{Return on Assets (ROA)} = (\text{Net Income} / \text{Total Assets}) * 100$$

$$\text{ROA} = (14,742 / 117,208) * 100$$

$$\text{ROA} = 12.47\%$$

## Return on Equity (ROE)

$$\text{Return on Equity (ROE)} = (\text{Net Income} / \text{Shareholders' Equity}) * 100$$

$$\text{ROE} = (14,742 / 46,589) * 100$$

$$\text{ROE} = 31.65\%$$



PROFITABILITY RATIOS REFER TO FINANCIAL MEASURES THAT ANALYSTS AND INVESTORS UTILIZE TO ASSESS A COMPANY'S CAPACITY TO GENERATE PROFIT OR INCOME RELATIVE TO OPERATING COSTS, BALANCE SHEET ASSETS, REVENUE, AND SHAREHOLDERS' EQUITY WITHIN A SPECIFIC TIME FRAME



ESSENTIALLY, THESE RATIOS REFLECT A COMPANY'S EFFICIENCY IN UTILIZING ITS RESOURCES TO PRODUCE PROFIT AND INCREASE VALUE FOR SHAREHOLDERS



COMPANIES TYPICALLY STRIVE FOR A HIGHER RATIO OR VALUE AS IT INDICATES STRONG PERFORMANCE, WITH CONSISTENT REVENUES, PROFITS, AND CASH FLOW



# CAPM Analysis

## Formula for CAPM

$$\underline{Ra = Rf + \beta a(Rm - Rf)}$$



THE CAPITAL ASSET PRICING MODEL IS A THEORETICAL MODEL THAT OUTLINES HOW FINANCIAL MARKETS VALUE SECURITIES AND PREDICTS THE RETURNS ON CAPITAL INVESTMENTS



IT PROVIDES A WAY TO ESTIMATE THE EXPECTED RETURN ON EQUITY BY ANALYZING RISK AND CONVERTING THAT RISK INTO PROJECTED RETURNS

*The cost of equity for stock valuation and determining whether to include a stock in a diversified portfolio can be calculated using the CAPM*

Where:

$R_a$  = The Required/expected return for the asset/investment

$R_f$  = The risk-free rate

$\beta_a$  = The beta of the asset/investment

$R_m$  = The expected market return (market risk premium)



# Result of CAPM

$$R_f = 2\%$$

$$\beta_a = 0.42$$

*$R_a = 8 \text{ to } 10\%$  (based on historical average return of the S&P 500)*

*Calculating CAPM:*

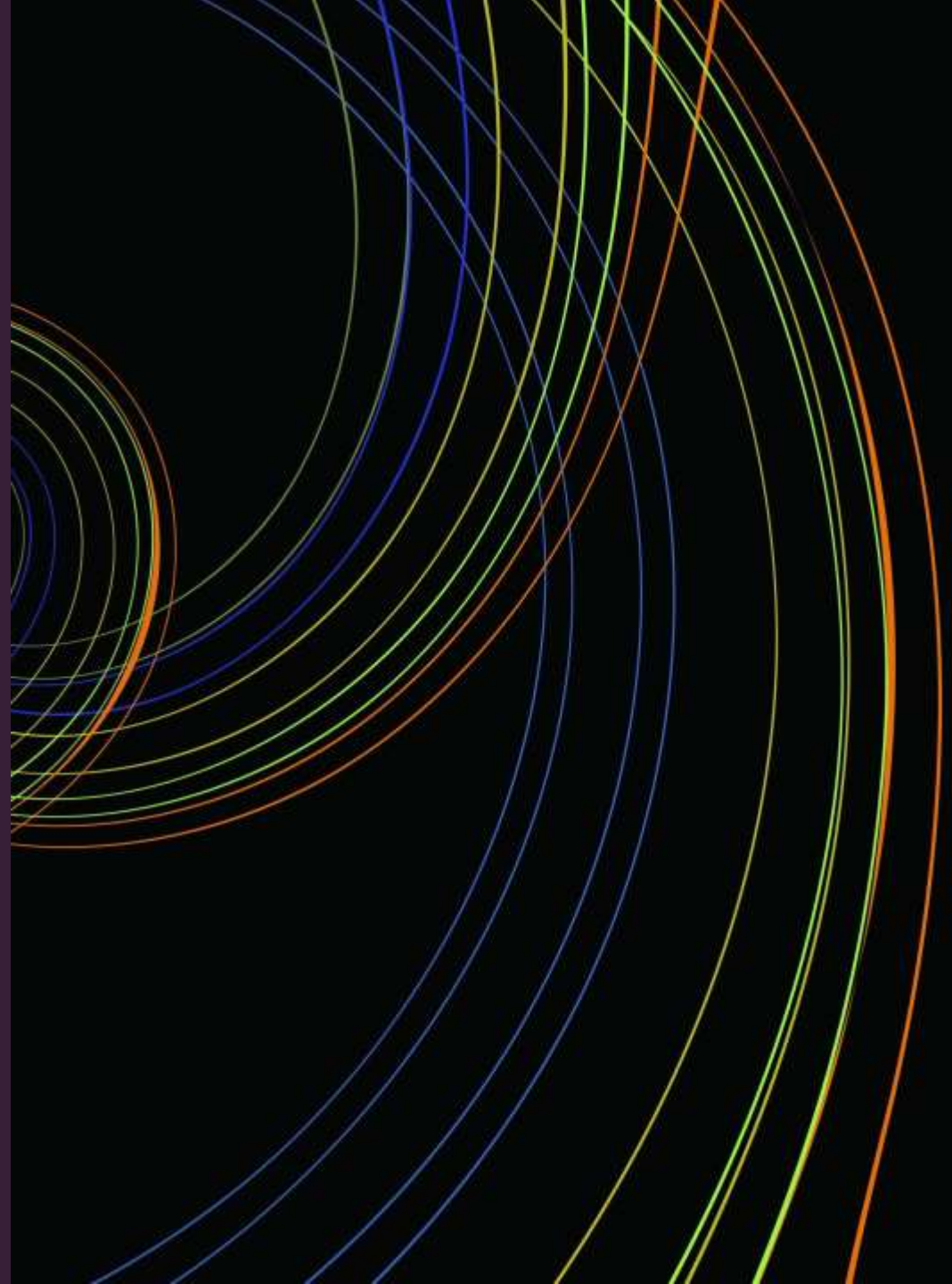
$$r = 2\% + 0.42(8\%) = 5.36\%$$

To calculate the CAPM value for our P&G stock we have taken the following into consideration:

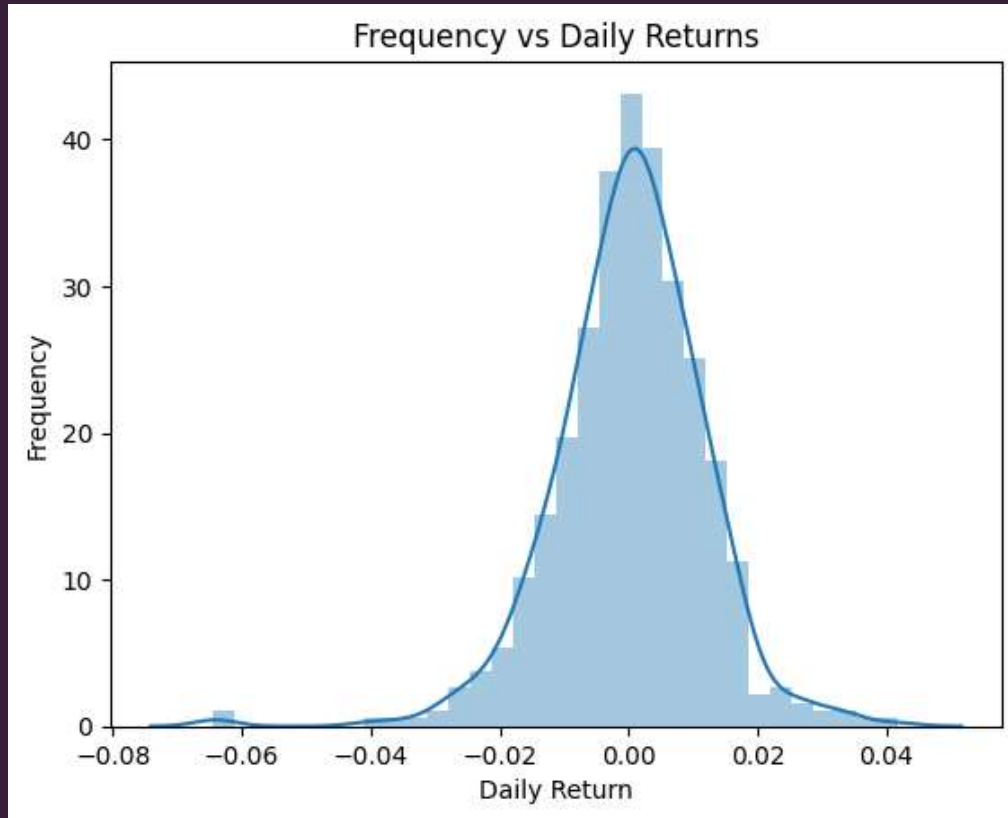
- Hence, an investor can anticipate a return of 5.36% on investing in P&G stock, as per the CAPM value derived from factors such as the risk-free rate, P&G stock's beta, and the projected market return

# *Monte Carlo Simulation*

Monte Carlo simulations are employed to model the probability of different outcomes in a process that is challenging to forecast due to the intervention of random variables. This approach helps in grasping the impact of risk and uncertainty on forecasting and predictive models. Monte Carlo simulations can address a variety of problems in nearly all fields, such as Engineering, finance, supply chain management, and science. A simulation that incorporates multiple probabilities is another term for Monte Carlo simulation



# *Following graph shows the relation between Frequency and Daily Return*



The Monte Carlo Simulation, also referred to as the Monte Carlo Method or a multiple probability simulation, is a mathematical approach utilized for approximating the potential outcomes of an unpredictable event

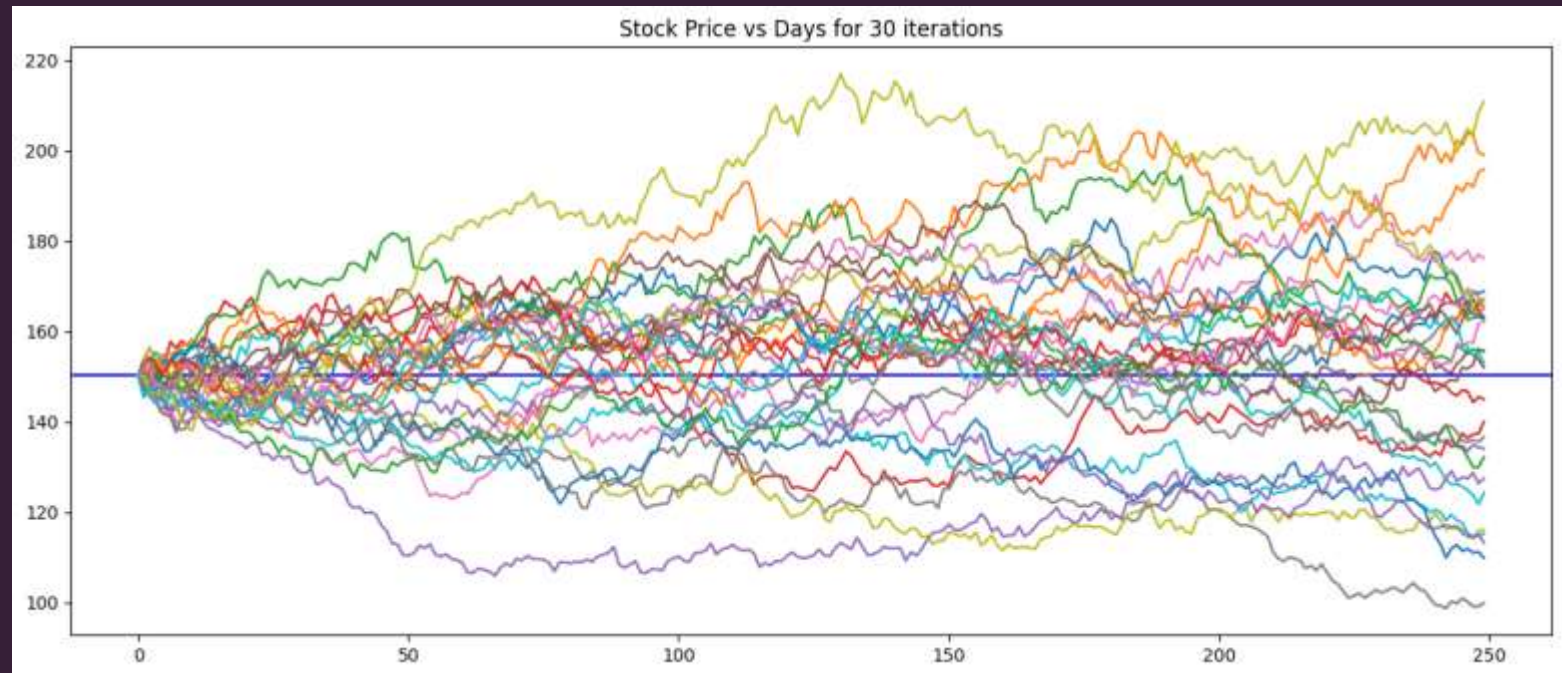
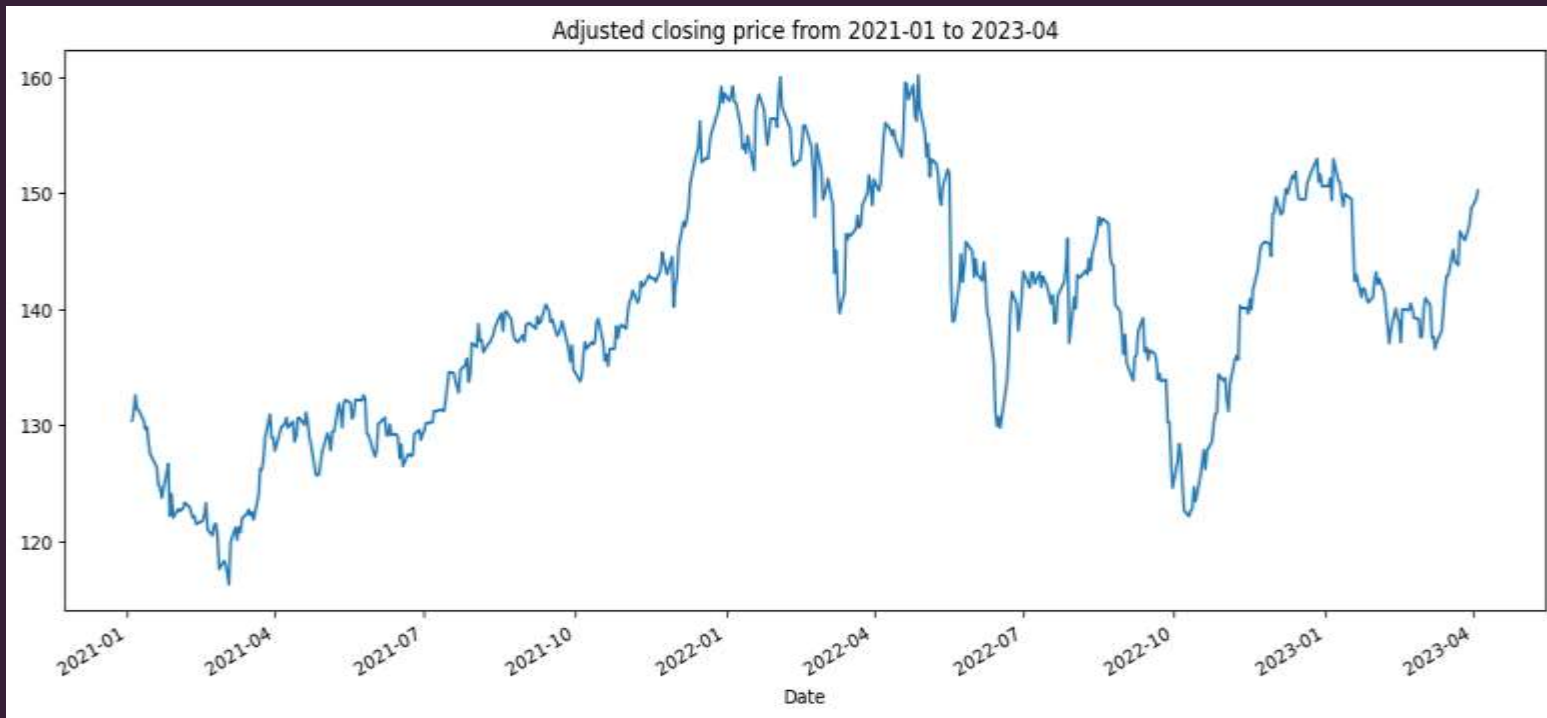
Since its inception, the Monte Carlo Simulation has been utilized to evaluate the effects of risk in various practical situations, such as stock prices, sales projections, project management, and pricing



*Following graph shows the adjusted closing price from 2021-01 to 2023-04.*

This technique was developed by John Von Neumann and Stanislaw Ulam in World War 2 to enhance decision-making in uncertain circumstances

*Following graph shows the Stock Price vs Days for 30 iterations*



# *Moving Average*

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A common technical indicator called the moving average is utilized to eliminate random short-term price changes, also known as "noise", to create a smoother representation of price trends

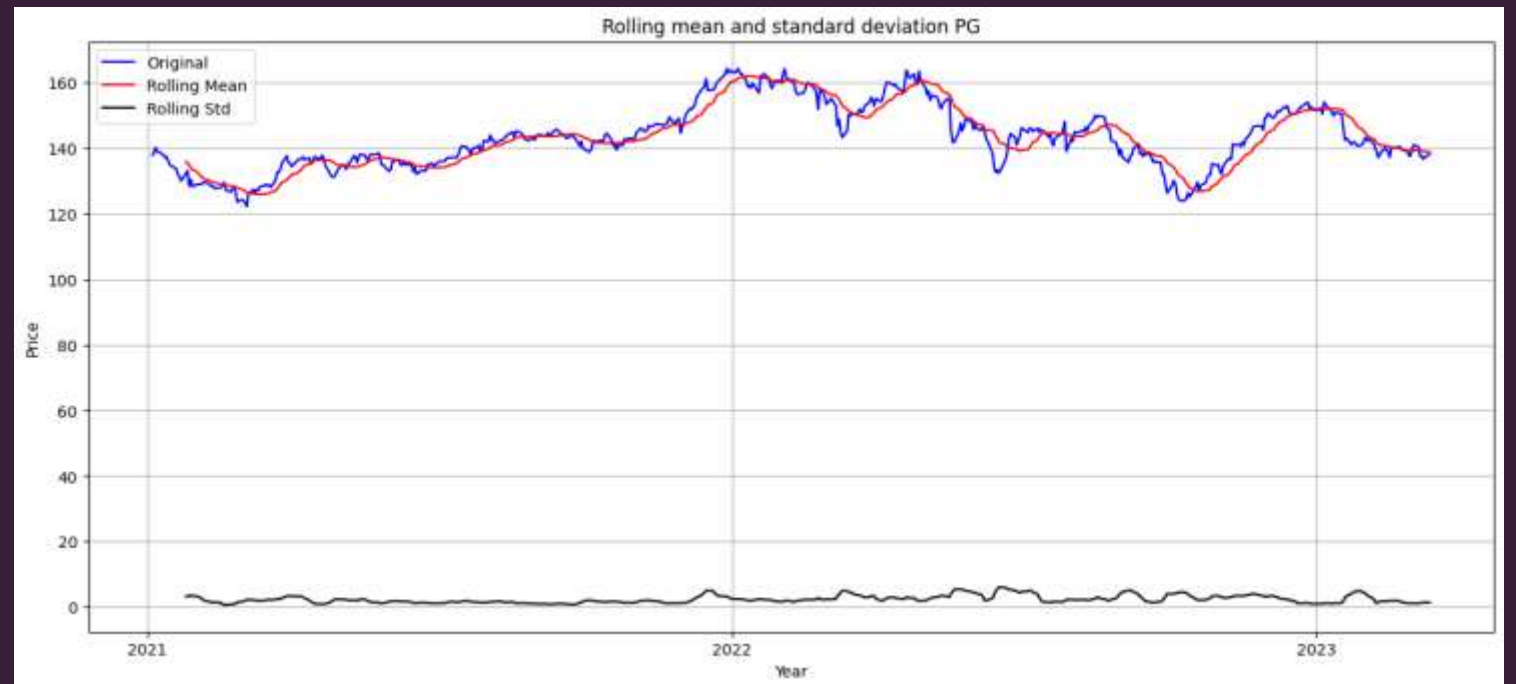
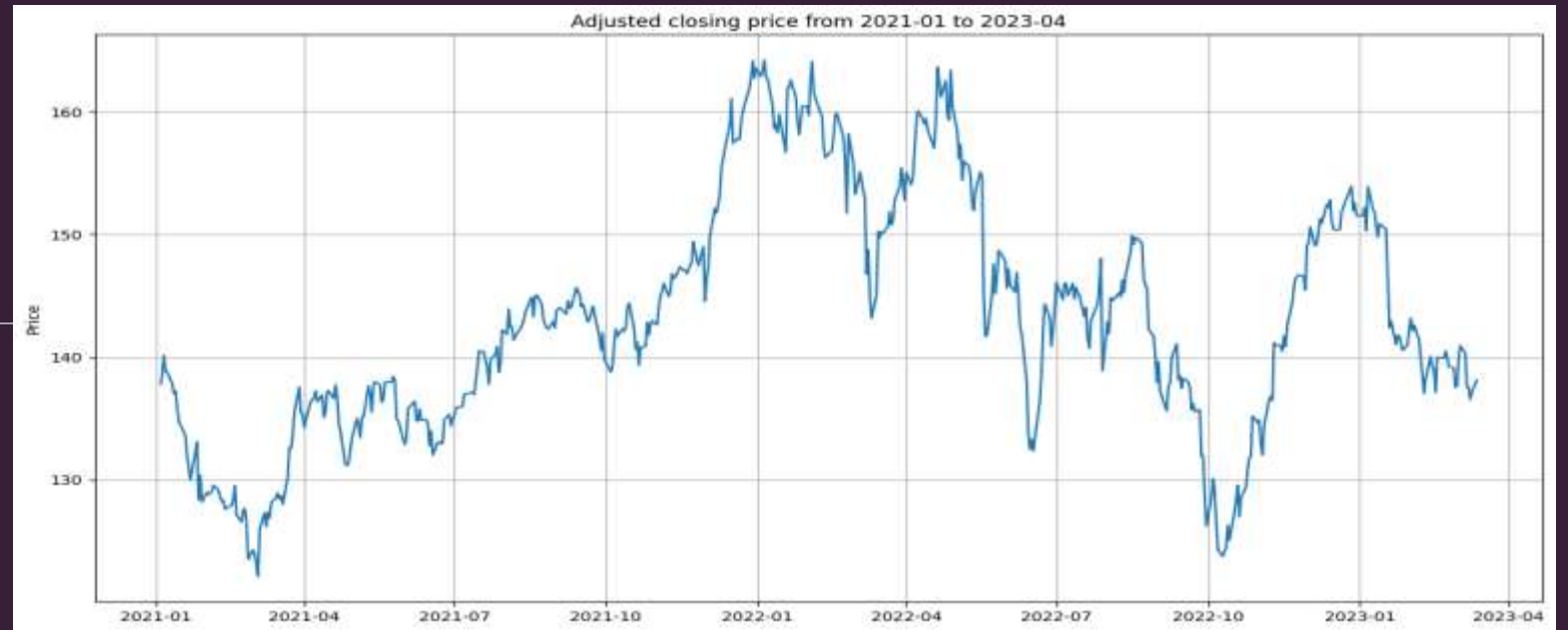
Moving average can be constructed in several separate ways and employ different numbers of days for the averaging interval

# SMA

A moving average is a technique used to analyze data by creating a series of averages of different subsets of the data

SMA can be used to identify trends, support, and resistance levels, and overbought and oversold conditions

A simple moving average is a type of moving average that is calculated by adding recent prices and then dividing that figure by the number of time periods in the calculation





	Date	Close	SMA20	SMA50	Signal	Position
14912	2021-03-30 00:00:00	135.45	129.354	128.926	1	Buy
14968	2021-06-18 00:00:00	132.03	135.277	135.429	0	Sell
14988	2021-07-19 00:00:00	140.44	136.102	135.946	1	Buy
15043	2021-10-05 00:00:00	139.33	142.826	142.843	0	Sell
15067	2021-11-08 00:00:00	144.95	142.833	142.828	1	Buy
15137	2022-02-17 00:00:00	159.82	159.722	159.851	0	Sell
15176	2022-04-14 00:00:00	158.57	155.006	154.773	1	Buy
15201	2022-05-20 00:00:00	141.79	154.751	154.753	0	Sell
15244	2022-07-25 00:00:00	143.99	144.078	143.974	1	Buy
15276	2022-09-08 00:00:00	137.86	143.826	144.128	0	Sell
15322	2022-11-11 00:00:00	140.97	133.042	132.853	1	Buy
15372	2023-01-26 00:00:00	141.15	148.372	148.395	0	Sell

# EMA



	Date	Close	EMA20	EMA50	Signal	Position
14854	2021-01-05 00:00:00	138.7	137.904	137.855	1	Buy
14861	2021-01-14 00:00:00	135.8	137.807	137.857	0	Sell
14911	2021-03-29 00:00:00	137.57	130.445	130.32	1	Buy
14969	2021-06-21 00:00:00	133.07	134.633	134.712	0	Sell
14979	2021-07-06 00:00:00	135.98	134.771	134.705	1	Buy
15055	2021-10-21 00:00:00	139.33	141.86	141.862	0	Sell
15060	2021-10-28 00:00:00	142.68	141.876	141.859	1	Buy
15145	2022-03-02 00:00:00	153.79	157.163	157.272	0	Sell
15172	2022-04-08 00:00:00	160.1	154.421	154.386	1	Buy
15196	2022-05-13 00:00:00	153.62	156.316	156.341	0	Sell
15260	2022-08-16 00:00:00	149.93	145.416	145.326	1	Buy
15270	2022-08-30 00:00:00	140.18	145.201	145.431	0	Sell
15323	2022-11-14 00:00:00	140.98	134.992	134.725	1	Buy
15373	2023-01-27 00:00:00	140.57	146.006	146.125	0	Sell



An exponential moving average is a type of moving average that places more weight on recent data points than older data points



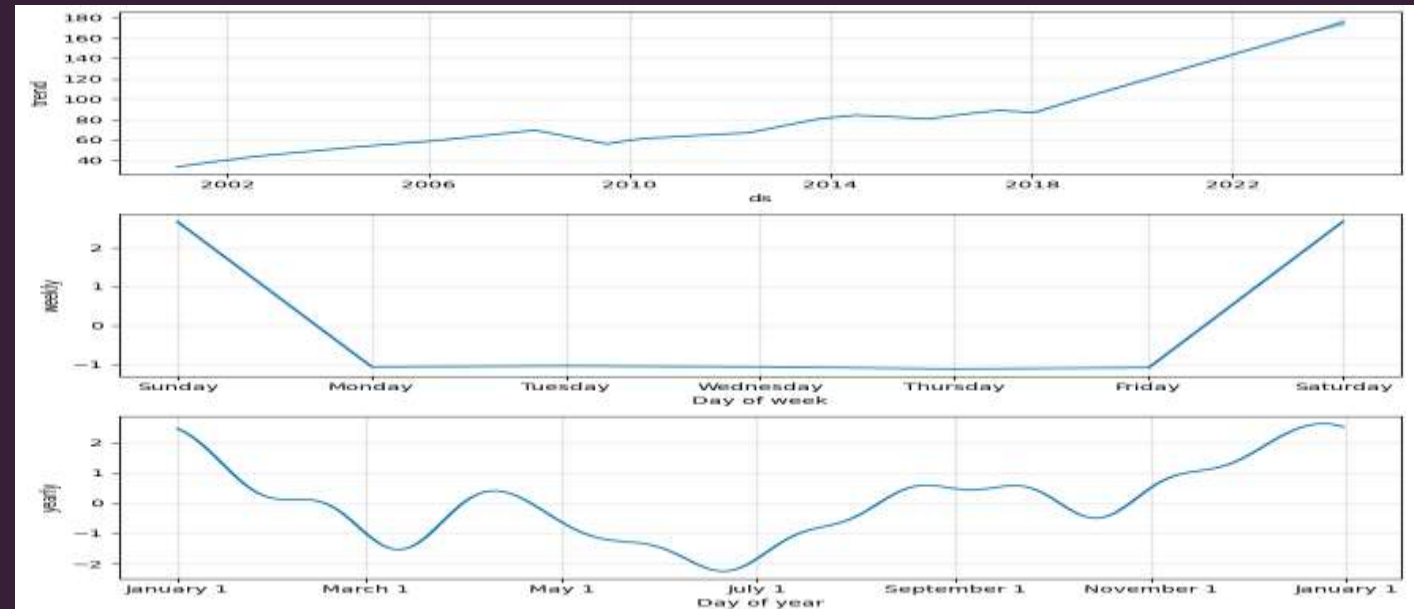
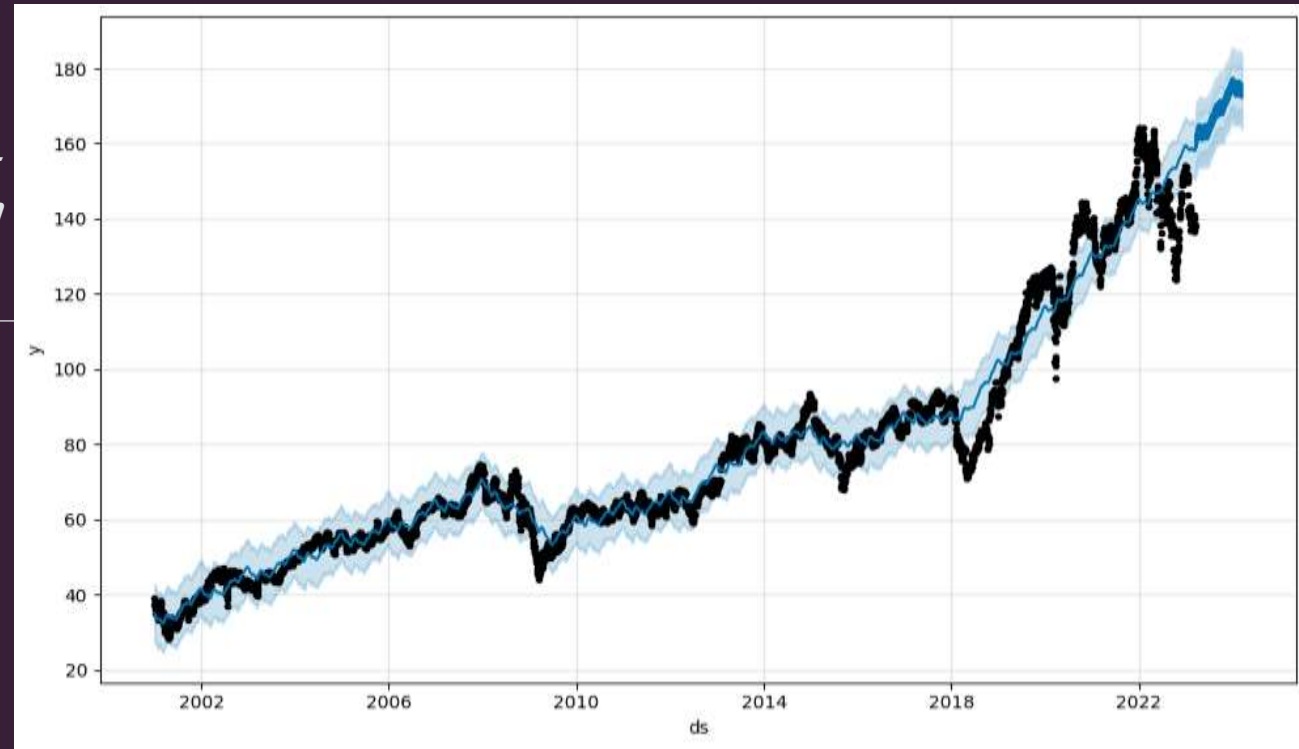
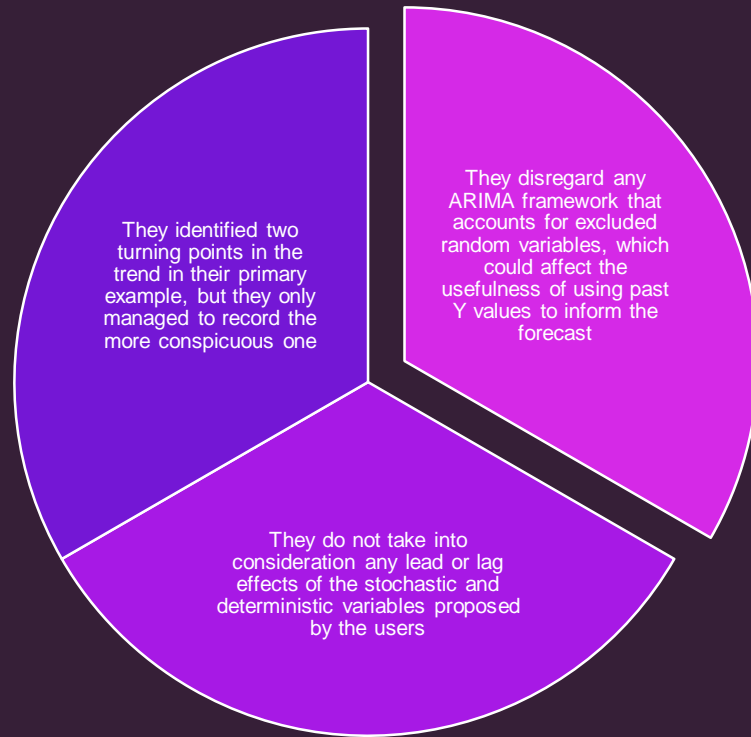
EMAs are often used in technical analysis to identify trends and support and resistance levels



EMAs are a versatile tool that can be used to identify trends, support and resistance levels, and trading signals




**Facebook Prophet :** *The Facebook Prophet is a forecasting software that can be accessed through R or Python and assists users in analyzing and predicting time-series data. It is frequently utilized by corporations to evaluate performance in relation to a reference point.*




# *Recommendation*

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According to the various ratios and the results of the CAPM and Monte Carlo simulations, it can be concluded that investing in P&G has the potential to yield greater returns, but this also means accepting a higher level of risk



Nevertheless, the company's revenue, gross profit, and valuation have been consistently increasing over the years



Therefore, based on the financial analysis, it can be stated that P&G is an exceptionally strong company with a high revenue

# References

- 1) <https://ca.finance.yahoo.com/quote/PG?p=PG&.tsrc=fin-srch>
- 2) <https://www.investopedia.com/terms/m/montecarlo-simulation.asp>
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