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Equity Valuation of Pfizer

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Resumo

Este projeto apresenta uma análise abrangente da avaliação do patrimônio líquido da Pfizer a 31 de dezembro de 2022, com o objetivo de fornecer insights sobre a saúde financeira e a posição de mercado.

A Pfizer foi fundada em 1849 pelos primos Charles Pfizer e Charles Erhart em Brooklyn, Nova York, e é uma das principais empresas farmacêuticas do mundo.

Usando uma combinação de demonstrações financeiras, dados de mercado e metodologias de avaliação, o estudo lança luz sobre o valor intrínseco da Pfizer e oferece uma avaliação de seu potencial de investimento. Somente então será possível fornecer aos potenciais investidores uma recomendação sobre se devem comprar, vender ou manter as ações da empresa.

Para determinar o valor intrínseco do patrimônio líquido da Pfizer, foram utilizadas duas metodologias de avaliação: a análise de fluxo de caixa descontado (DCF-FCFF) e avaliação relativa.

Essas metodologias utilizam projeções financeiras, múltiplos de mercado e referências relevantes da indústria para estimar o valor justo das ações da Pfizer.

A Pfizer, uma empresa listada na Bolsa de Valores de Nova York, tinha um valor por ação de \$51,24 a 31 de dezembro de 2022. Após a análise, foi constatado que esse preço estava sobrevalorizado, um aumento de 75.79% relativamente ao preço de \$29.15.

Palavras-chave: Avaliação Patrimonial, Pfizer, Fluxo de Caixa Descontado, Avaliação Relativa

Classificação JEL: G30; G32

Abstract

This project presents a comprehensive analysis of Pfizer's equity valuation as of December 31, 2022, with the aim of providing insights into financial health and market position.

Pfizer was founded in 1849 by cousins Charles Pfizer and Charles Erhart in Brooklyn, New York and is one of the world's leading pharmaceutical companies.

Using a combination of financial statements, market data, and valuation methodologies, the study sheds light on Pfizer's intrinsic value and offers an assessment of its investment potential. Only then will it be possible to provide potential investors with a recommendation on whether they should buy, sell, or hold the company's shares.

To determine the intrinsic value of Pfizer's equity, two valuation methodologies were employed: discounted cash flow analysis (DCF-FCFF) and relative valuation. These methodologies utilize financial projections, market multiples, and relevant industry benchmarks to estimate the fair value of Pfizer's shares.

Pfizer, a company listed in the New York Stock Exchange, had a value per share of 51,24 \$ on December 31, 2022. After the analysis was performed, this price was found to be overvalued, an increase of 75.79% relative to the price of \$29.15 obtained in the DCF.

Keywords: Equity Valuation, Pfizer, Discounted Cash Flow, Relative Valuation

JEL Classification System: G30; G32

Abbreviations/ Glossary

CAPEX	Capital Expenditure
CAPM	Capital Asset Pricing Model
COGS	Cost of Goods Sold
DCF	Discounted Cash Flow
EBIT	Earnings Before Interests and Taxes
EBT	Earnings before Taxes
EBITDA	Earnings Before Interests, Taxes, Depreciation and Amortization
EQV	Equity Value
ESG	Environmental, Social and Governance
EV	Enterprise Value
EV/EBITDA	Enterprise Valued/Earnings Before Interests Taxes and Amortization
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to the Firm
GDP	Gross Domestic Product
IMF	International Monetary Fund
IPO	Initial Public Offering
M&A	Mergers and Acquisitions
MRP	Market Risk Premium
PP&E	Property Plan & Equipment
P/E	Price to Earnings Ratio
NI	Net Income
NOPAT	Net Operating Profit After Taxes
NYSE	New York Stock Exchange
R&D	Research and Development
RV	Residual Value
ROA	Return on Assets
ROE	Return on Equity
ROIC	Return on Invested Capital
TV	Terminal Value
WACC	Weighted Average Cost of Capital
WC	Working Capital
YoY	Year Over Year

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1. Introduction

Equity valuation of a pharmaceutical company like Pfizer is particularly intriguing given the industry's unique dynamics and the constant need for innovation. Moreover, recent events, such as the global COVID-19 pandemic, have further highlighted the significance of pharmaceutical companies in addressing global health crises. Understanding the implications of these factors on Pfizer's equity value is crucial for investors seeking to make informed decisions in a rapidly evolving market environment.

This study aims to conduct a comprehensive equity valuation analysis of Pfizer as of 31st December 2022, exploring the factors that drive the company's value and assessing its attractiveness as an investment opportunity. Additionally, it seeks to gain insights into the inherent value of Pfizer's equity by utilizing fundamental analysis methods, including discounted cash flow (DCF) models and relative valuation techniques.

In performing this valuation, the objective will be to delve into understanding Pfizer's financial health and growth prospects. Starting with the literature review with the main goal of covering the main valuation techniques. Furthermore, chapter three provides a global overview of the sector, with a more profound coverage on trends in revenues and profits growths as well as Pfizer expenditure in pipeline for research and development.

Afterwards, chapter four and five will focus more on the pharmaceutical industry which focuses on the main statistics and in the history of Pfizer, providing a more in-depth overview of the company and the structure.

The focus of the sixth chapter will be to present a more extensive valuation of the company, derived from the Discounted Cash Flow approach (FCFF) and from the Relative Valuation methods.

Within this chapter, a sensitivity analysis will be carried out to evaluate the results obtained and how key factors in the valuation can affect the results of the share price, this valuation can support investors looking to invest in the pharmaceutical sector.

In the final chapter, the main conclusions will be presented, and a final recommendation will be given to investors on whether they should sell, hold or buy the shares of the company.

2. Methods of Valuation

The objective of the literature review is to examine the theories behind corporate valuations. Damodaran (2006) asserts that knowing what influences a firm's worth and how to assess it appears to be a beginning point for making rational judgments. The main premise of this concept is that valuation is the core of finance.

The valuation will mostly be done using discounted cash flows (DCF) and multiples. According to Fernández (2002) the cash flow discounting method is generally used because it is the only conceptually correct valuation method. In this approach the company is seen as a cash flow generator and the present value of the discounted cash flows is calculated by using a suitable discount rate.

Valuation is a powerful tool that can be used for a wider range of purposes as in buying and selling operations, as there is a buyer and a seller side where the buyer tells the highest price that is willing to pay to buy the company and the counterpart the lowest price in which will sell the company.

In addition, valuation is normally used in companies that are listed to compare the fair value obtained with the share's price on the stock market and to decide whether to sell, buy or hold the shares. In the end, DCF is a very powerful tool that can be used to price initial public offerings (IPOs) and other financial assets (Steiger, 2008).

2.1 Discounted Cash Flow (DCF)

Discounted cash flow is a way of collapsing the future performance of the company into a single number. A proposition that follows with the use of this model is that anything that does not increase cash flows does not create value. In other words, the Modigliani-Miller theory suggests that, under certain assumptions, the value of the firm is determined solely by its underlying cash flows and is independent of its capital structure.

According to this theorem, if a company substitutes debt for equity or issues debt to repurchase shares, it may seem like the cash flows are changing because the ownership structure is being altered. However, the overall cash flow generated by the company should remain the same. (Copeland et al., 2000)

The steps to perform a discount cash flow valuation start by forecasting the future cash flows expected to be generated by the investment, normally a forecast of the financials such as profit and loss statement and balance sheet which include financials like revenues, operating expenses, taxes, or other important factors.

Once the discounting cash flows are forecasted it is needed to apply the discount rate which is normally the weighted average cost of capital (WACC), this discounts the cash flow to its present value.

Adding the present value of all discounted cash flows we arrive at the DCF, this represents the estimated intrinsic value of the investment.

$$\text{Present Value of Cash Flow (Value of Firm)} = \sum_{t=1}^{\infty} \frac{CF_t}{(1+r)^t} \quad (2.1)$$

where:

- CF_T = Cash flow in period t ;
- r = Discount rate regarding the level of risk of the cash flow involved.

Other way of demonstrating the different cash flows is by using this formula where:

$$\text{Present Value of Cash Flows} = \frac{CF_1}{1+k} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \dots + \frac{CF_n + TV_n}{(1+k)^n} \quad (2.2)$$

- CF_i = cash flow generated by the company in the period i , it could be year 1, 2 or 3;
- n = period corresponding to the last forecasted cash flow;
- TV_n = terminal value of the company in the year n ;
- k or the WACC = appropriate discount rate for the cash flow's risk.

The formula above is just a simplification of the cash flows each year divided by the discount rate which is (k) but could also be described as that normally is the WACC.

2.1.1 Free Cash Flow to the Firm (FCFF)

FCFF usually are cash flows that are available to all shareholders and creditors after considering capital expenditures and changes in working capital thus FCFF are projected on an unlevered concept. It is an important metric for assessing a company's financial health and its ability to generate cash. When using the FCFF, the inputs have to be based on accounting figures that are calculated before any interest payments are paid out to debt holders (Steiger, 2008).

Using the FCFF as the foundation for the analysis will result in the enterprise value of the company whereas the FCFE will give the equity value. This model comes in different forms as there are assumptions on how the company is expected to growth and for how long can the company continue to grow. The growth rate and the forecasted years are crucial metrics for the valuation as changing

those parameters can provide different values when reaching an enterprise value and then a share price.

The main formula for the FCFF is as follows:

$$FCFF = EBIT * (1-t) + D\&A - CAPEX - \Delta WC \quad (2.3)$$

where:

- EBIT = Earnings Before Interest and Taxes;
- T = Corporate Tax Rate;
- D&A = Depreciation and Amortization;
- CAPEX = Capital Expenditure;
- ΔWC = Changes in Working Capital.

2.1.2 Enterprise Value

Calculating the present value of cash flows yields the Enterprise Value (EV) in the discounted cash flow (DCF) technique using the FCFF methodology. By discounting upcoming cash flows produced by the firm at the (WACC), the FCFF is used to determine the EV. The FCFF for each year is considered throughout the first 3 to 5 years, in this case 5 years. The Terminal Value (TV) is determined under the assumption that the firm will continue to exist over an unlimited time horizon and that the cash flows will grow at a constant yearly rate. The EV is finally calculated as follows:

$$EV = \sum_{t=1}^n \frac{FCFF_t}{(1+WACC)^t} + \frac{TV_n}{(1+WACC)^n} \quad (2.4)$$

where:

- EV = Enterprise Value;
- $FCFF_t$ = Free Cash Flow to the Firm at period t;
- WACC = Weighted Average Cost of Capital;
- TV_n = Terminal Value at the end of the time period;

2.1.3 Terminal Value (Residual Value)

The determination of terminal value (TV), also known as residual value (RV) or continuing value (CV), is one of the current issues with enterprise valuation models which are widely employed by the financial sector (Augusto & Reis, 2013).

The calculation of a firm's value typically consists of two steps: the quantification of the TV, which is basically making assumptions about the future performance and value of the investment, and the explicit period, which typically corresponds to a timespan of 5 years. In this stage, forecasts are more feasible, and volatility is less of a relevant factor.

According to Levin and Olsson (2000) a steady growth rate is essential so that we can have equality among DCF models. The authors begin with the fundamental presumption that the firm enters a steady condition of growth at infinity. Furthermore, Levin and Olsson (2000) stated that all flows estimated after the initial timespan would be determined by a growth rate applied to capital stocks that produce flows in accordance with a growth rate of business volume.

The calculation of the terminal value is obtained by dividing the cash flow expected ($FCFF_{n+1}$) by the discount rate minus the assumed growth rate.

The approach assumes that the company's cash flow will continue to grow at a constant rate indefinitely.

$$\text{Terminal Value (TV)} = \frac{FCFF_{n+1}}{WACC - g} \quad (2.5)$$

where:

- $FCFF_{n+1}$ = Free Cash flow to the Firm at the end of the time period;
- r is the discount rate used to discount cash flows, normally the r is the WACC;
- g = growth rate in perpetuity

2.1.4 Equity Value

Equity value (EQV) is the value remaining for shareholders after settling all debts. It is determined by adding the value of non-operating assets to enterprise value (EV) and subtracting the value of financial debt and non-operating liabilities.

$$EQV = EV + \text{Non - Operating assets} - \text{Non - Equity claims} \quad (2.6)$$

The non-operating assets are included in the formula for the equity value because these are assets that contribute to the overall worth of the company and can generate additional value for shareholders.

The last item considered is the non-equity claims which according to Damodaran (2002) include debt and preferred stock which are considered non-equity claims, despite the fact that the latter is frequently accounted for as equity in financial statements. Additionally, the non-equity claims that should be subtracted are expected liabilities on lawsuits, unfunded pension, health care obligations and deferred tax liability.

2.1.5 Free Cash Flow to Equity (FCFE)

The FCFE is basically the cash flow generated by the basic operations of a business after deducting investments in new capital expenditures. It is important to mention that these cash flows are after interest and debt cash flows. Fundamentally, it is a cash flow that can be withdrawn from the enterprise and transferred to the owner without the company being affected in any way (Jezkova et al., 2020).

According to Damodaran (2006) a free cash flow to equity model represents a model where we discount potential dividends rather than actual dividends. In other words, the method of valuing a firm that emphasizes anticipated dividends rather than dividends that have already been paid out to equity owners.

$$FCFE = Net\ Income + D\&A - CAPEX - \Delta WC + New\ Debt\ Issued - Debt\ Repayments \quad (2.7)$$

The outcome of the formula will be the cash flow that can be available to stockholders, and that can be in the form of dividends.

- NI= Net Income;
- D&A = Depreciation and Amortization;
- ΔWC = Changes in Working Capital;
- CAPEX = Capital Expenditures, net of disposals;
- (New Debt Issued – Debt Repayments) = this difference refers to the net effect of debt financing on cash flow.

2.1.6 Weighted Average Cost of Capital (WACC)

The discounted cash flow approach, which is popular in corporate finance and investment research, heavily relies on the Weighted Average Cost of Capital. Fundamentally, the WACC is seen not as a single cost or a single required return but a weighted average of a cost and a required return,(Fernández, 2011).

The WACC, which acts as the discount rate in this technique and represents the minimal rate of return necessary by investors to justify the investment's risk and opportunity cost, is the mechanism utilized to discount expected cash flows. When a firm uses more than a source of financial capital the after-tax costs of capital for separate sources of funding are averaged using as weights the proportions of those separate sources (Miller, 2009). In other words, the company decides based on their capital structure on what percentage of debt and equity they want to incorporate. The decision regarding the proportion of debt and equity to incorporate into the capital structure is typically driven by the company's goals and objectives.

The formula for the WACC stands as follows:

$$WACC = \frac{E}{E+D} * R_E + \frac{D}{E+D} * R_D * (1 - t) \quad (2.8)$$

- D = Value of Debt
- R_E = Cost of Equity, required return to levered equity
- E = Value of Equity
- R_D = Cost of debt, required return to debt
- t = Corporate Tax Rate
- WACC = Weighted Average Cost of Capital

2.2 Capital Asset Pricing Model (CAPM)

The CAPM is a financial model used to calculate the expected return on a risk-adjusted investment. As per Sharpe (1964) and Lintner (1965) were the primary developers of this model, which is mainly used to estimate firms' cost of capital and evaluate the performance of managed portfolios. Furthermore, the CAPM is a forward-looking model, it provides an assessment of what equity investors require to compensate them for time and risk over the period of interest. It assumes that investors are risk-averse and to expect higher returns in exchange for taking on greater risk (Chen, 2021).

The model for the CAPM stands as follows:

$$R_e = R_f + \beta \times (R_M - R_f) \quad (2.9)$$

Where:

- R_e = Cost of equity;
- R_f = Risk free rate is the return on a risk-free investment;
- β = Measure of the volatility of a security in relation to the overall market;
- $(R_M - R_f)$ = The market risk premium.

Using this methodology, investors can figure out the expected return on a security based on its risk and the expected return of the overall market. This model also suggests that diversification can reduce risk, in other words, holding a portfolio of securities with various betas, investors might lessen the risk associated with their entire portfolio.

2.2.1 Risk Free Rate (r_f)

The CAPM model initial input is the risk-free rate, and this input is normally obtained from short-term treasury bills or long-term treasury bonds. According to Mukherji (2011) the risk-free rate is a crucial model input since it impacts both the intercept and slope of the linear equation. A higher risk-free rate implies a higher intercept and flatter slope compared to a lower a rate.

2.2.2 Beta β

Beta in the CAPM supplies information regarding volatility and liquidity throughout the market, and it can also be defined as correlated relative volatility. It is a measure of a security volatility in relation to the overall market. The usage of beta is arguably useful because it signals the success in terms of portfolio management, for beta there are normally benchmarks that vary from 0, -1 or 1.

A zero beta indicates an absence from correlation between an asset and its benchmark whereas a negative beta indicates an inverse correlation. A positive beta indicates an asset whose systematic volatility reacts accurately to changes in the overall market. If the beta exceeds 1, it usually means that the investment is riskier and more volatile than the market.

The market portfolio, which is considered to have a beta of 1, is used as a benchmark to calculate the beta of individual securities. A stock with a beta of 1.2, for example, would be expected to have a

20% higher return than the market portfolio during periods of market gains. Similarly, during periods of market losses, it would be expected to have 20% more losses than the market

2.2.3 Market Risk Premium ($R_M - R_f$)

The last input of the CAPM is the market the risk premium which is simply the difference between the expected return on market portfolio and the risk-free rate. In other words, is the additional return an investor expects to receive from holding a risky asset instead of risk-free assets.

This market risk premium (MRP) is normally affected by inflation, economic growth, and interest rates thus it can be hard to estimate and predict. This input is crucial for investors as the higher the MRP, the higher the return an investor can expect to receive from investing in the market.

For example, assuming an expected return on a stock market index of 10% and the risk-free rate of 5%, the MRP would be 5%, and this value represents the additional return that investors expect to receive for taking on the risk associated with investing in the stock market.

2.3 Relative Valuation (Multiples Valuation)

To start using the multiples valuation it is better to start by explaining the concept of a valuation multiple. According to Suozzo et al. (2001), it is simply an expression of the market value relative to a key statistic. The key statistic in case could be a cash flow or the earnings of the company but most important they need to have a correlation with the value market observed otherwise it would be useless. Furthermore, it is how an asset is valued compared to other similar assets priced in the market. It compares the subject company to its peers in the industry, to identify the relative value of the company. According to Damodaran (2006) firms that belong in the same sector have similar risk, growth, and cash flow profiles thus they can be compared with much more legitimacy. However, this is harder to implement if there are fewer firms in that sector.

Relative valuation is typically used to complement comprehensive valuations, normally to calibrate those valuations and to obtain terminal values.

In comparison with the DCF, relative valuation focuses more on making a judgment on how much that asset is worth by examining what the market is paying for similar assets whereas in DCF valuation the main goal is to estimate the intrinsic value of an asset based upon its capacity to generate cash flows in the future. According to Morgan Stanley Dean Witter's analysts (2001) the DCF is the fifth method used whereas the PER and the EV/EBITDA were the most commonly used methods by Morgan Stanley Dean Witter's analysts (Fernandez, 2001)

Multiples Analysis

Firstly, choosing from a group of comparable businesses and calculating the average price to earnings ratio for that group is the most popular method for determining price to earnings ratios. A high price-to-earnings suggests that investors have high expectations for the company's future growth and are willing to pay a premium for its stock. Conversely, a low price to earnings ratio P/E indicates that the stock is undervalued or that the company's prospects is facing adversity.

Secondly, the enterprise value to earnings before interest, taxes, depreciation, and amortization ratio evaluates a company's enterprise value (EV) in relation to its EBITDA. The sum of a company's assets, including cash, debt, and market capitalization, is known as enterprise value.

Without considering taxes, finance expenses, and depreciation, the EV/EBITDA ratio serves as a criterion of a company's total value in relation to its operational success. It is helpful for comparing businesses with various capital structures or debt loads. An undervalued firm may have a lower EV/EBITDA ratio, whilst an overvalued company may have a higher ratio.

Like the P/E ratio, the EV/EBITDA ratio interpretation should consider industry standards and the unique circumstances of the firm. It can give a more complete picture of a company's worth and financial health, especially in sectors with high capital expenditures or a range of debt levels.

The formulas for the multiples are the following:

$$\text{Price to Earnings (P/E ratio)} = \frac{\text{Cost per Share}}{\text{Earnings per Share}} \quad (2.10)$$

$$\text{Enterprise Value to EBITDA} = \frac{\text{Enterprise Value}}{\text{EBITDA}} \quad (2.11)$$

According to Fernandez (2001) there are three multiples, multiples based on the company's capitalization (equity value), multiples based on the company's value (made of equity value and debt value) and growth-referenced multiples.

The P/E ratio is part of a multiple based on capitalization and the EV/EBITDA is a multiple based on the company value as it includes equity and debt.

3. Macroeconomic Outlook

The COVID-19 pandemic has had a significant impact on the global economy, and Pfizer has played a crucial role in the response to the crisis by developing and distributing COVID-19 vaccines. The rise of these vaccines has been contributory in reducing the severity of the pandemic, and it is expected to have a positive impact on Pfizer's financial performance in the coming years. The idea of this chapter is to cover some key indicators such as the Gross Domestic Product (GDP) and inflation rates on world economies.

From the graph it is possible to state that advanced economies suffered an economic contraction in 2020 of 4.5 % of GDP, with an increase of 5.2% in 2021 and 4.5% in 2022. According to the International Monetary Fund the U.S. the economic rate of growth declined in 2020 by -3.4%, greater than the rate of decline experienced during the 2007-2009 financial crisis but was estimated to grow by 6.0% in 2021 and 5.2% in 2022.

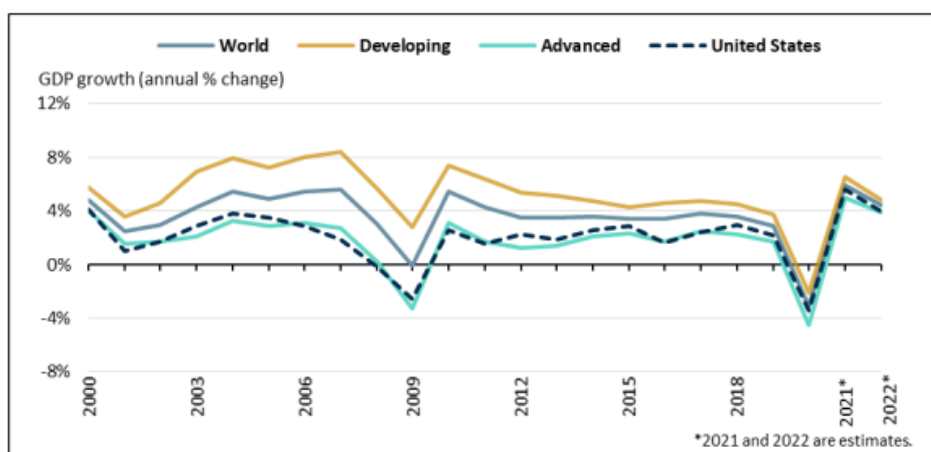


Figure 3.1 International Monetary Fund Forecast, Gross Domestic Product Update, 2021. Created by Congressional Research Service

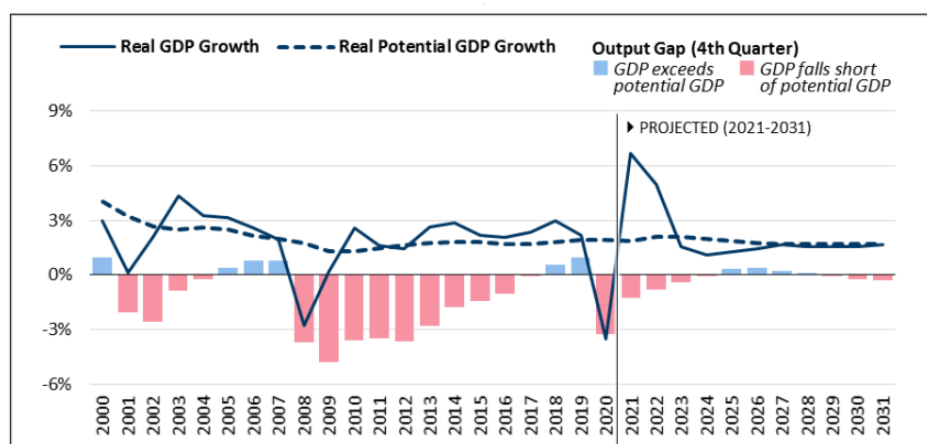
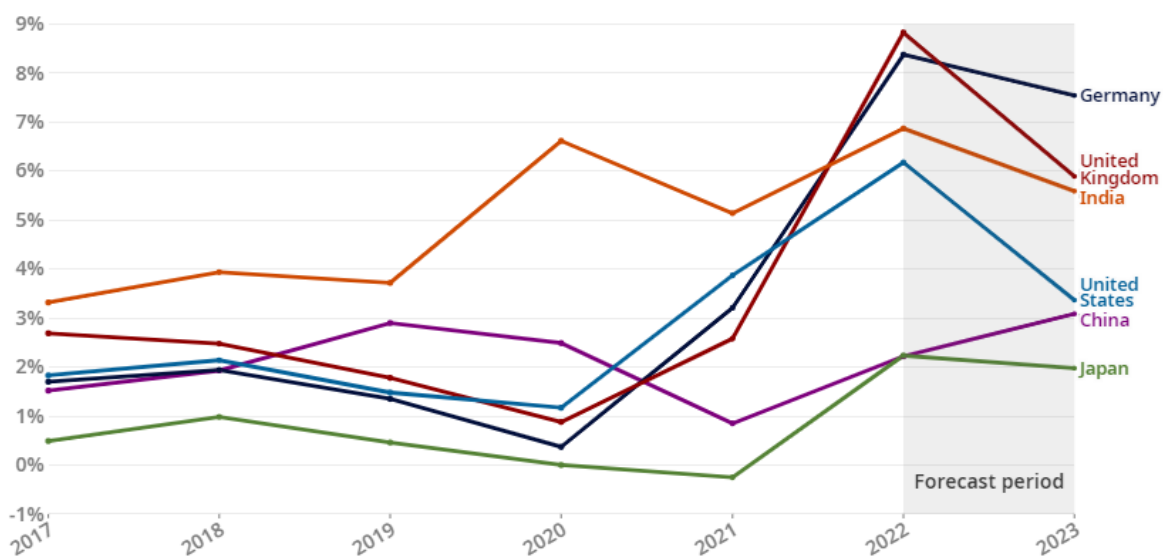


Figure 3.2 Real and Real Potential (Adjusted for Inflation) U.S. GDP and the Output Gap. Created by Congressional Research Service

From examining Figure 3.2, we can observe that the GDP experienced declines both during the financial crisis of 2007-2009 and the year 2020, mainly due to the onset of the COVID-19 pandemic. In contrast, the graph depicting real potential GDP growth remains constant throughout the forecasted period. However, when considering real GDP growth, which reflects the actual outcomes, the graph shows an initial increase from 2020 to 2021, followed by a gradual decline. Nevertheless, this increase has not been consistent during the projected period.

In Figure 3.3, the inflation values are analysed across various countries, with Pfizer having a prominent presence in the U.S, though it operates globally. Notably, the U.S witnessed a rise in inflation rates since 2020, likely influenced by the impact of COVID-19. In general, inflation rates increased across the board, but the United Kingdom and Germany observed the most substantial increases.



Source: [OECD Economic Outlook, Interim Report September 2022](#)

Figure 3.3 Inflation hitting on the world economy.

The rapid increase of inflation from 2020 to 2022 in the United States can affect Pfizer cost of production which can lead to higher cost for raw materials, equipment, labour, and other essential resources. On top of this, as pharmaceutical companies are heavily dependent on R&D, an increase in inflation can make the R&D more expensive, affecting the ability of companies to invest in new drug development.

A significant increase in inflation could limit the price on essential medications or prescription drugs as governments and consumers put pressure on pharmaceutical companies to limit price increases on those drugs.

When looking at Table 3.1, it analyses the values of inflation and GDP in the world, advanced economies, and the European Union. The values projected are the ones of 2023 and 2024 and it can be seen that inflation is still high but decreases on overall from year 2023, could be a result of the COVID-19 stabilizing thus prices would be reduced. As a result of this, Pfizer revenues would start to fall after year 2022 reaching previous pre-pandemic values.

Table 3.1 World Economic Outlook, IMF

Country Group Name	Subject Descriptor	Units	Scale	2020	2021	2022	2023	2024
World	Gross domestic product, constant prices	Percent change		-2.953	6.021	3.192	2.655	3.183
World	Inflation, average consumer prices	Percent change		3.232	4.704	8.751	6.520	4.132
Advanced economies	Gross domestic product, constant prices	Percent change		-4.404	5.197	2.427	1.107	1.595
Advanced economies	Inflation, average consumer prices	Percent change		0.683	3.105	7.223	4.377	2.382
European Union	Gross domestic product, constant prices	Percent change		-5.593	5.356	3.228	0.662	2.068
European Union	Inflation, average consumer prices	Percent change		0.676	2.896	9.172	6.753	2.959

4. Industry Outlook - Pharmaceutical

In this chapter, the study focuses on specific aspects of the pharmaceutical sector, commencing with an examination of industry revenue in the U.S. Additionally, it covers the comparison between domestic revenue with revenue made internationally. Employment, research, and development will also receive comprehensive coverage as they play a crucial role in the pharmaceutical field. Lastly, the analysis will focus on comparing profits between companies within the pharma sector and those listed in the S&P500, providing the reader with insight into the strong global presence of these companies.

Figure 4.1 represents the profit made by pharmaceutical companies within the periods of 2011 and 2021, in billions of dollars. The upward trend since 2014 is evident, possibly driven by the development of more efficient methods for producing medicinal drugs, leading to a continuous increase in revenue due to technological advancements. However, it is essential to note that this graph does not encompass the years affected by the global pandemic.

From 2013 onwards it is possible to observe that the pharmaceutical industry revenue has an upward trend, amidst the pandemic's peak in 2021 and 2022, the pharmaceutical industry experienced a significant surge in revenues, surpassing the \$550 billion mark. This substantial increase in profits was primarily driven by the urgent demand to develop a vaccine against COVID-19.

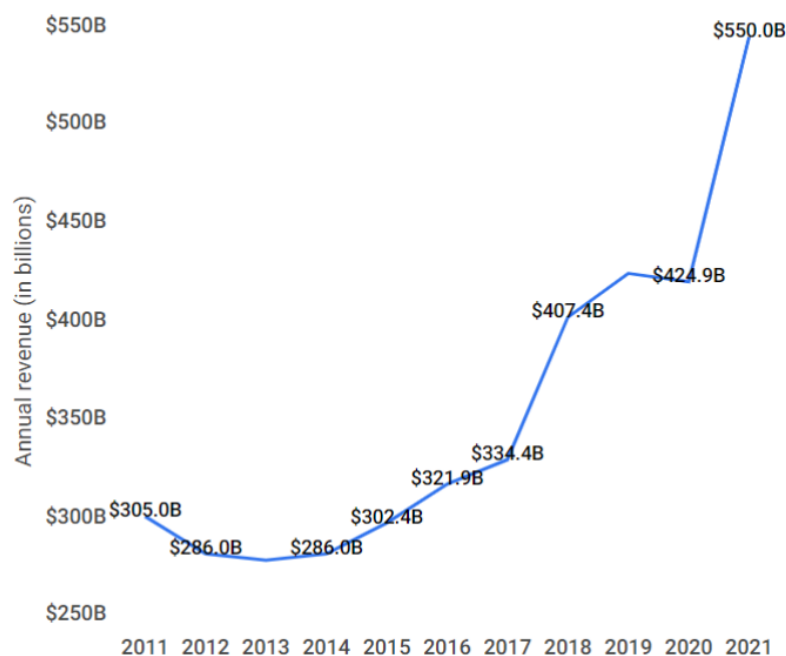


Figure 4.1 U. S Pharmaceutical Industry Revenue 2011-2021. Source Zippia

4.1 Pharmaceutical Statistics by Company

According to figure 4.2, Pfizer emerged as the leading pharmaceutical company globally in 2022 with a revenue of \$100.3 billion, surpassing Johnson & Johnson, which achieved \$94.9 billion in revenue. The success of Pfizer's COVID-19 vaccine played a crucial role in its rise to the top. In 2019, the U.S. pharmaceutical industry invested nearly \$83 billion in research and development, and this investment has consistently grown since 2011. This upward trend in R&D spending is promising as it creates favourable conditions for the development of ground-breaking life-saving drugs and medicines to combat various diseases.

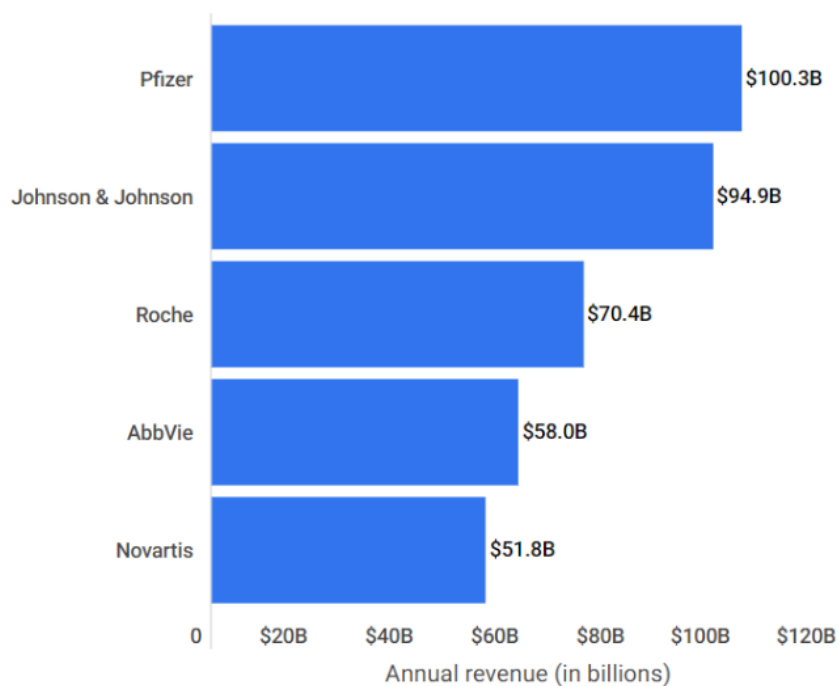


Figure 4.2 Top 5 Pharmaceuticals Companies Globally. Source Zippia

According to Figure 4.3 some pharma companies have massively increased their revenue with COVID-19. Pfizer went from having a \$40 billion revenue in 2020 to \$81 billion in 2021 as the graph indicates. Not only Pfizer increased but other pharmaceuticals have an upwards trend, Johnson & Johnson already was the company that generated the most profit but in 2021 that profit increased by 14%.

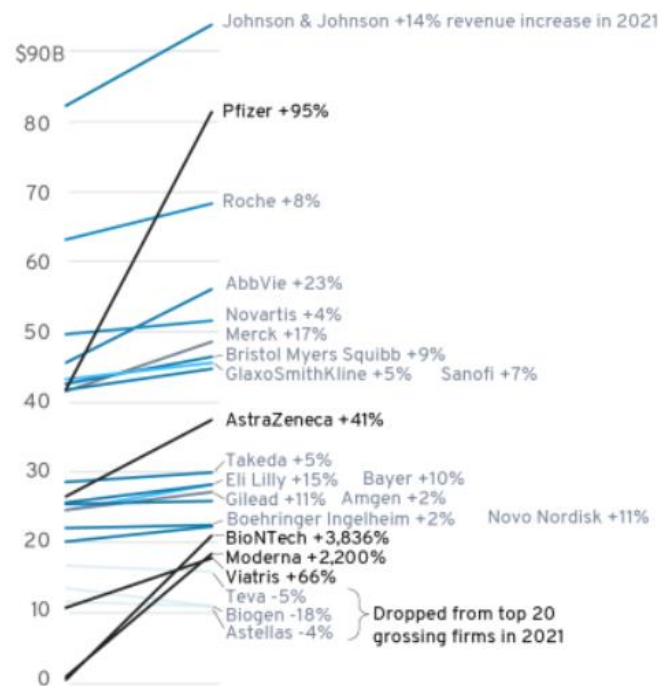


Figure 4.3 Pharma Companies skyrocketed in 2021. Source Fierce Pharma

4.2 Domestic vs International Revenue

Figure 4.4 represents the annual revenue in the U.S. of the pharmaceutical industry by looking at domestic and international revenue. Domestic revenue has been increasingly growing throughout the years whereas international has remained stagnant for the U.S. Just in 2020 the revenues accounted for a total of \$424 billion, \$307 billion generated domestically and \$117 billion internationally.

Over 4 million jobs are supported by the pharmaceutical business in the United States as of 2017. Of that amount 811,00 people are employed directly in the industry, but there are more than 3.2 million induced and indirect employment.

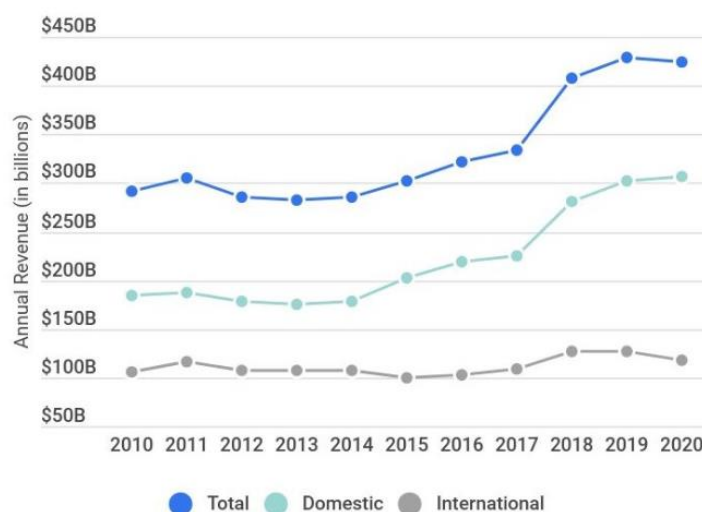


Figure 4.4 Domestic vs International U.S Annual Revenue. Source Zippia

4.3 Annual Research and Development Spending by Pharmaceutical Research and Manufactures of America (PhRMA)

The research and development by PhRMA have been increasing over the years. This sustained increase in R&D does not necessarily mean that there are new drugs or medicines, it means that there are other costs associated with research and development such as rising costs of labour and capital. In other words, finding the right skilled researchers to work in the field has a cost and having the facilities like laboratory technologies also carries a cost.

In 2021, the Congressional Budget Office highlighted that continuous growth in pharmaceutical research and development (R&D) does not automatically result in an increase in the number of new drugs. Furthermore, it was emphasized that not all R&D expenditures are focused solely on the development of new drugs. Pharmaceutical companies also allocate a portion of their R&D resources to discover improved combinations of existing medications, like in the case of newer human immunodeficiency virus treatments and preventive measures, or to explore novel drug-delivery methods such as insulin pumps.

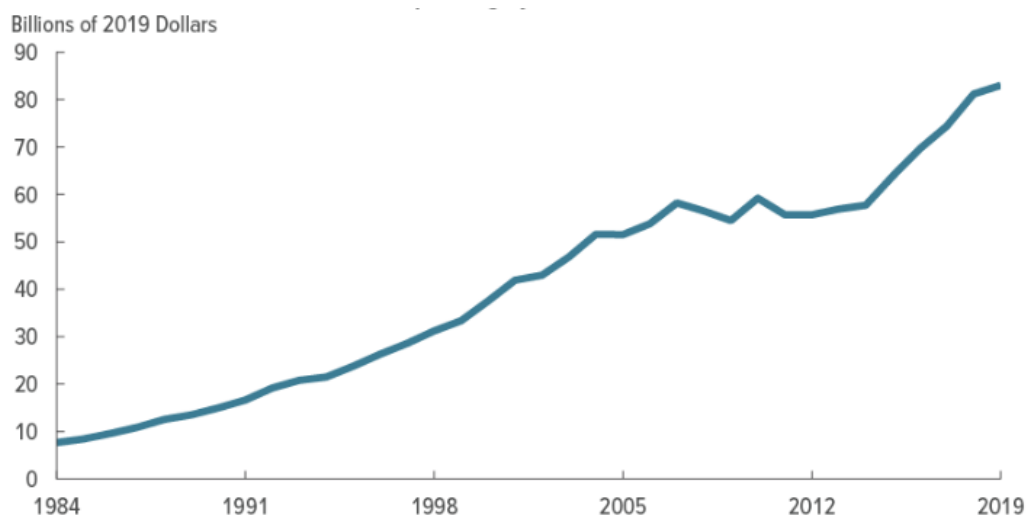


Figure 4.5 Annual R&D Spending by PhRMA Member Firms, Source Congressional Budget Office

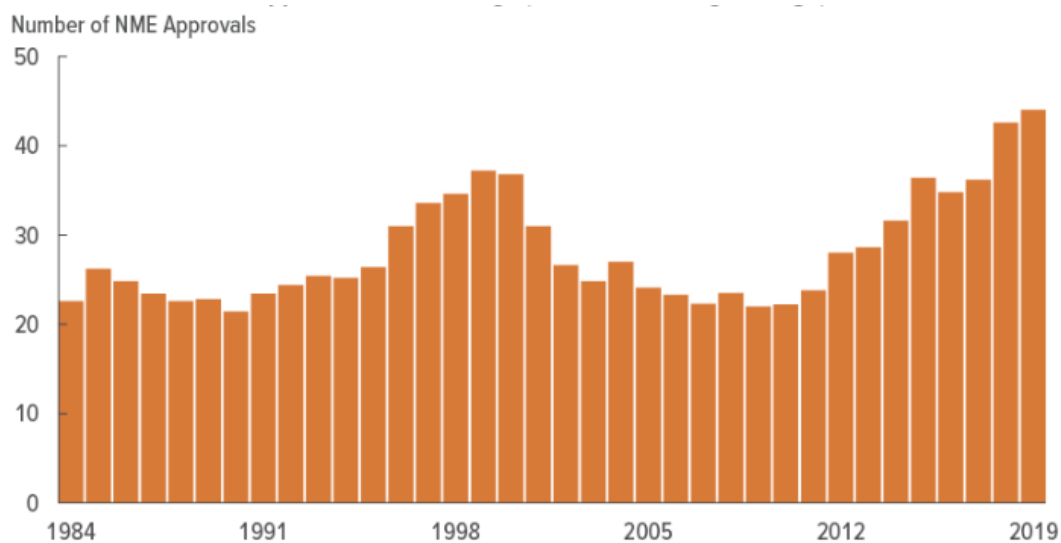


Figure 4.6 Approvals of New Drugs (Five-Year Moving Average), Source Congressional Budget Office

Figure 4.7 represents annual growth rate on pharmaceutical R&D expenditure in Europe, USA, and China. The latter had the most expenditure but has been decreasing over recent years, within 2007-2011 it achieved an annual growth rate of 33.3 %. From 2011 onwards the expenditure in Europe and USA increases but at a much lower rate than in China. In fact, the values in China have been decreasing since 2007, reaching a value of 12.9 % on between 2017 to 2021.

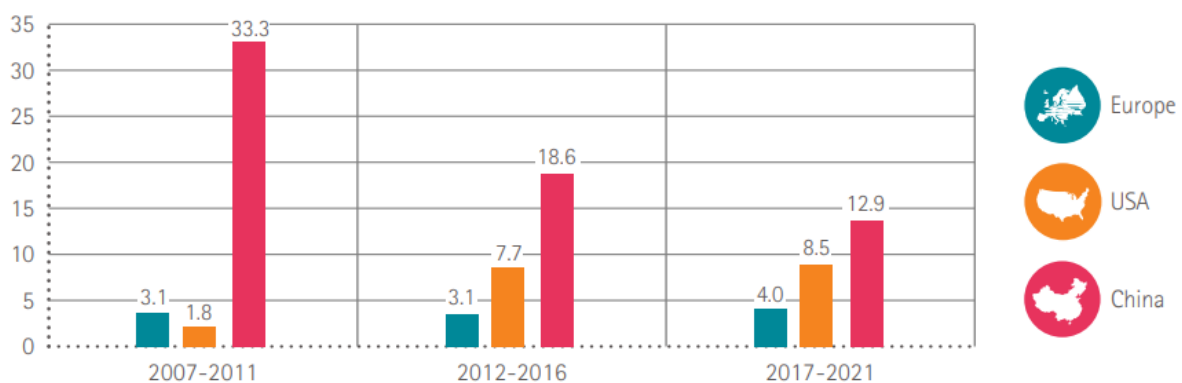


Figure 4.7 Annual Growth Rate on Pharmaceutical R&D expenditure. Source EFPIA, PhRMA, China Statistical Yearbook 2002-2021

4.4 Employment in the Pharmaceutical Industry

As the pharmaceutical industry expands and grows so does the number of people that companies need to employ. From Figure 4.8, it is possible to see that the numbers have been rising since 1990 until 2021 in countries in Europe, starting with a value 500,879 in 1990 and increasing to a value of 840,000

employees in 2021. The number also increases for people employed in the research and development department (see Figure 4.9), from a value of 76,126 employees in 1990 to a value of 125,000 in 2021, the numbers here are reflected for countries in Europe.

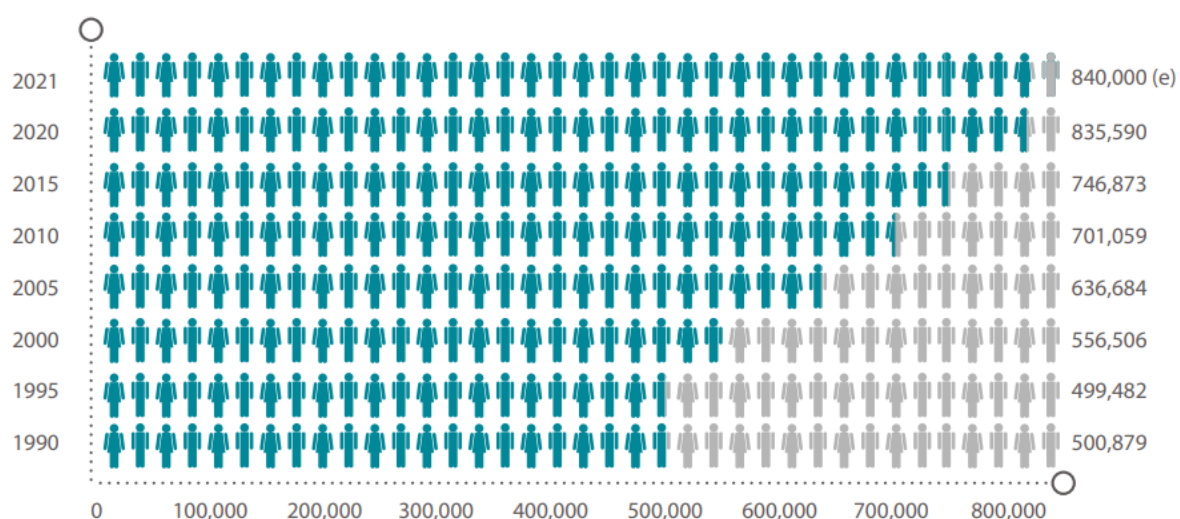


Figure 4.8 Employment in the Pharmaceutical Industry during (1990-2021). Source EFPIA member associations (official figures) - (e): EFPIA estimate.



Figure 4.9 Employment in the Pharmaceutical R&D (1990-2021). Source EFPIA member associations - (e): EFPIA estimate.

4.5 Comparison of Pharmaceuticals with S&P 500 Profits

Figure 4.10 compares different annual financial metrics and also some of those financial metrics as a percentage of the annual revenue between 35 large pharmaceutical companies and 357 companies from the S&P 500. The former group includes 631 fiscal years of data and the latter comprises 6258 fiscal years of data from 2000 to 2018.

In the figure, box plot lines represent the 25th percentile, median and 75th percentile. The analyses were performed with tests of median values and not the mean because with the Kolmogorov-Smirnov test it rejected the null hypothesis that corporate profit data was normally distributed ($P < 0.001$) thus it used the median and not the mean as it is not a normal distribution.

In terms of revenue when comparing pharmaceutical companies and companies in the S&P 500 there is not a significant difference, \$10.6 billion to \$8.4 billion when looking to the median. In terms of cost of goods sold the median in S&P 500 is higher but when comparing with the metric of research and development the median in pharmaceutical companies is normally higher. Additionally, by looking at Figure 4.10 the 35 pharmaceutical companies were superior in all annual financial metrics expect COGS.

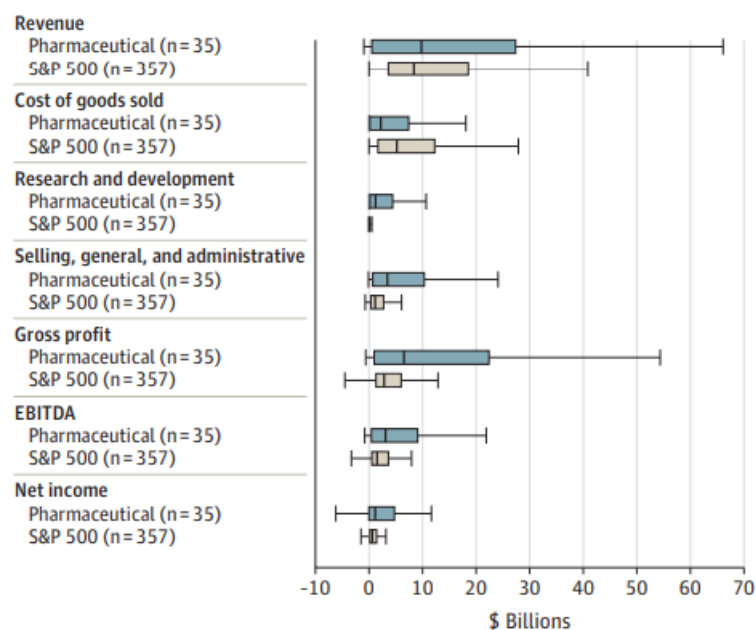


Figure 4.10 Annual Financial Metrics of 35 large pharmaceuticals companies and 357 companies from the S&P 500, 2000 -2018. Source JAMA, 323(9), 834–843.

From Figure 4.11, where is shown the percentage on annual revenue of some financial metrics, it is noticeable that the COGS had higher median values in the S&P 500 whereas the R&D median values were vastly superior in the pharmaceutical sector, which is normal as there is more expenditure in the developing of new drugs. The median values for gross profit, EBITDA and net income were superior in the pharmaceutical companies when compared to the median values of S&P 500 companies.

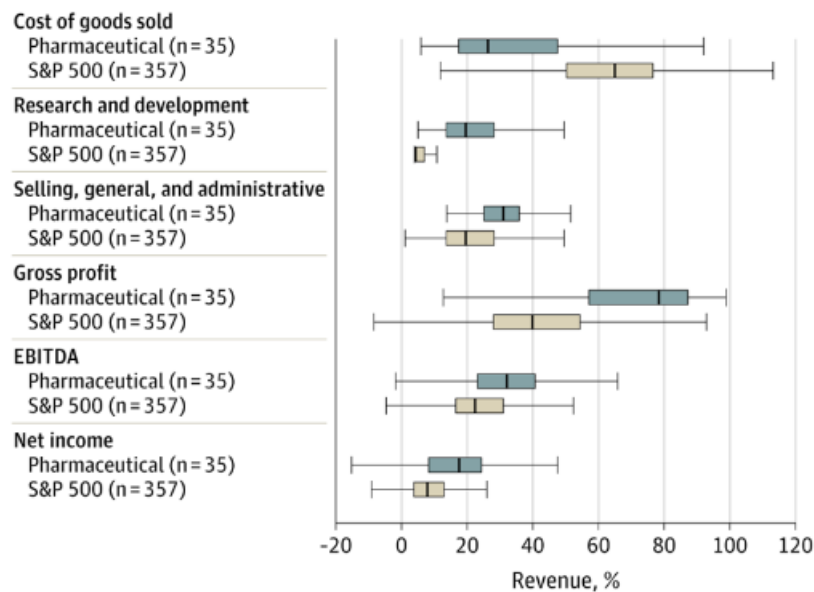


Figure 4.11 Annual Revenue of 35 large pharmaceutical companies and 357 companies from the S&P 500, 2000 -2018. Source JAMA, 323(9), 834–843.

The result from the figures is that the profitability of large pharmaceuticals which generate revenue primarily from the sale of pharmaceutical products was substantially more than other large, public companies. According to Ledley et.al (2020), the major difference was in the gross profit margin, which is a measure of the difference between the cost of goods sold and total revenue.

In general, the profitability of major pharmaceutical corporations was considerably higher compared to other sizable publicly traded companies. Nevertheless, this discrepancy became less prominent when considering factors such as company size, specific year, or research and development expenditures.

Data on the profits of pharmaceutical companies is useful and can be relevant to create evidence-based policies to lower the cost of medications.

5. Pfizer – Company Overview

The purpose of this chapter is to enlighten the reader about Pfizer by outlining the history of the firm as well as providing information of other areas such as: commercial operations, research & development and financials.

5.1 History of the Company

The international biopharmaceutical company Pfizer Inc. was built on research. Charles Pfizer and his relative Charles Erhart established the business in New York City in 1849. Pfizer is headquartered in New York however the research and development headquarters of Pfizer are located in Groton, Connecticut, United States. As of 2020, Pfizer had a number of employees of 78,500 with that number rising to 83,000 in 2022.

The company began as a producer of the anti-parasitic medication santonin, which is used to treat intestinal worms. During World War II, Pfizer had agreements to supply substantial quantities of penicillin, which was used to treat wounded soldiers. This marked a turning point for the company since it established Pfizer as a major player in the pharmaceutical industry.

Pfizer extends and significantly improves human life expectancy via research, production, marketing, sales, and distribution of biopharmaceutical products globally. Enhancing wellness, prevention, treatments, and cures in both developed and emerging markets are Pfizer's primary objectives. Pfizer also collaborates with governments, neighbourhood associations, and healthcare organizations to promote and expand access to trustworthy, affordable healthcare globally.

Pfizer believes that their medicines and vaccines provide significant value for medical professionals and patients because they improve the treatment of illnesses, promote health, wellbeing, and productivity, and lower other healthcare expenditures like emergency department or hospitalization. Pfizer derives its profits from the production and sale of biopharmaceutical products.

Pfizer also plays a vital role on Environmental, Social and Governance (ESG) strategy which goal is to create a serious impact in the future focusing on the main areas such as business ethics, product innovation, climate change and others. Strategically Pfizer capitalises by advancing their own products in the pipeline and by improving their existing products. Pfizer often seeks to achieve growth by pursuing opportunities and transactions that enhance the business and their capabilities.

In order to expand and diversify its product offering, acquire access to new markets, and boost shareholder value, Pfizer also participates in mergers and acquisitions deals. To mention a few, Warner-Lambert in (2000) is the largest M&A deal in pharmaceutical history, it gave Pfizer access to Lipitor which is a drug used to treat high cholesterol and it became one of the most sold drugs. Also,

in (2019), Pfizer acquires Array Biopharma for \$11 billion which gave them access to several-late oncology drugs.

5.2 Shareholder Structure

Table 5.1 shows the main three institutional holders for Pfizer: Vanguard Group, Blackrock and State Street Corporation see (Annex K) for more information on the top institutional holders of Pfizer. These are the ones who have the highest ownership, the highest percentage of shares is owned by institutional holder whereas the rest is owned by individual shareholders. The main insider shareholders are Frank A. D'Amelio who owns 555,941 shares as of February 2022, Mikael Dolsten who owns 421,855 as of November 2022 and Albert Bourla who owns 416,036 as of December 2022. (Johnston, 2022).

In the case of Pfizer INC (PFE) that is quoted in New York Stock Exchange (NYSE), individual shareholders own a relatively smaller percentage of the company's shares. The board of Pfizer is responsible for overseeing the company's operations and strategic direction, while the shareholders have the power to elect directors and vote on major decisions, such as mergers and acquisitions.

Table 5.1 Top 3 Institutional Holders of Pfizer (% of Capital)

Top Institutional Holders

Holder	Shares	Date Reported	% Out
Vanguard Group, Inc. (The)	501,636,220	Dec 30, 2022	8.89%
Blackrock Inc.	442,868,761	Dec 30, 2022	7.85%
State Street Corporation	284,152,008	Dec 30, 2022	5.03%

5.3 Commercial Operations

When looking at Pfizer annual reports of 2021 and 2022 there was a major difference in the global structure of commercial operations. At the beginning of the fiscal fourth quarter of 2021 Pfizer reorganizes their commercial operations and manages them through a new global structure of two operating segments, each one led by a single manager. Biopharma and PC1 (Pfizer Centre One), the former is a science-based biopharmaceutical business, and the latter is a global contract development and manufacturing organization and a leading supplier of specialty active pharmaceutical ingredients.

In 2021 Pfizer therapeutical areas consisted of Vaccines, Oncology, Internal Medicine, Hospital, Inflammation & Immunology and Rare Disease. Each one of these areas has certain medication and those medications solve diseases in that therapeutical area. When covering the area of vaccines, Pfizer

produces innovative vaccines for all ages and since the pandemic they produce vaccines against COVID-19.

Looking at the annual report of 2022, Pfizer decides to change its organisational structure to focus more on its areas of expertise and to gain advantage on potential new products. Additionally, Pfizer enhances their end-to-end R&D operations and further prioritizes their internal portfolio. With these changes they expect to optimize performance across three board customer groups: primary care, specialty care and oncology, each one of these customer groups also has key products.

Primary care includes former vaccines product portfolio, so vaccines across all ages with a special focus on infectious diseases and products for COVID-19 prevention and treatment. Specialty care focuses more on rare diseases product portfolio and inflammation & immunology product portfolio. Lastly, oncology customer group is more directed to the treatment of cancers with the help of innovative oncology brands of biologics, small molecules, or immunotherapies.

5.4 Research & Development in Pfizer

In the pharmaceutical sector research and development plays a vital role as there is the need to develop new drugs and provide new medicines to combat diseases, thus constant innovation should be a goal for pharmaceuticals as there is fierce competition within the sector but also to improve the therapies to patients in need.

The annual report of Pfizer in 2021 (Figure 5.1) included 89 projects that were divided in three phases and registration of projects. Normally the process of drug and biological product discovery can take more than 10 years and it is understandable as the drugs need to be tested and approved to see if they are effective and cause no harm. Phase 1 corresponds to experimental medicine test for first time in human clinical trials and the number amount to 27 projects. Phase 2 are trials focused on medicine's effectiveness, ideal dosage, and delivery method, in other words, the right quantity to take to combat the disease and how to take the medicine, the number of projects was 25 projects. Phase 3 are test results on earlier trials on larger populations in randomized trials and analyse risks and benefits, in phase 3 there were 27 projects. According to Figure 5.1 the last step was in the R&D pipeline is registration, this phase are the applications filled when trials result warrants, so after all the testing the drugs are approved with regulatory authorities.

As of January 2023, the research and development pipeline of Pfizer included 110 projects, 21 more than of 2022 noting that the pipeline of a pharmaceutical sector is constantly evolving and can change rapidly due to several factors.



Figure 5.1 Pfizer research and development pipeline as of 8 February 2022. Source Pfizer Annual Report 2021 10K

5.5 Pfizer Financial Analysis

From the Table 5.2 and Figure 5.2, it is possible to see that Pfizer revenues have increasing rapidly from 2020 onwards and the reason for that is mostly due to the pandemic. Values pre-pandemic were similar if we look at the value of 2019 and 2020. In 2019 the value was 41.172 M\$ were as 2020 it was 41.908 M\$, the variation wasn't significant in this case. The revenue growth was most impactful from 2020 to 2021 since the variation was 93.97% as it was almost the double of the value of 2020.

Table 5.2 Operating activity indicators 2019-2022 Source: Pfizer company reports

Operating activity indicators				
	2019	2020	2021	2022
Revenues (\$M)	41,172	41,908	81,288	100,330
Revenue growth %	-23.25%	1.79%	93.97%	23.43%
Operational Costs (\$M)	21,068	20,795	26,082	24,541
Operational costs growth %		-1%	25.42%	-5.91%
EBITDA Margin %	48.83%	50.38%	67.91%	75.54%
EBITDA (\$M)	20,104	21,113	55,206	75,789
EBITDA growth %		5.02%	161.48%	37.28%

From 2021 to 2022 the revenue continued to improve as there was an increase of 23.43% compared to the value of 2021 and reached the valued of 100,330 \$M. Operational costs during the previous years were mostly steady as there are no major deviations in value (an overall increase of 16.50% from 2019 to 2022).

The values of EBITDA increased massively from 2020 onwards, with a growth of 161.48% in 2021 and 37.28% in 2022. The EBITDA Margin also improved in the last 2 years, with a gain of more than 25 percentage point, going from 50.38% in 2020 to 75.54% in 2022.

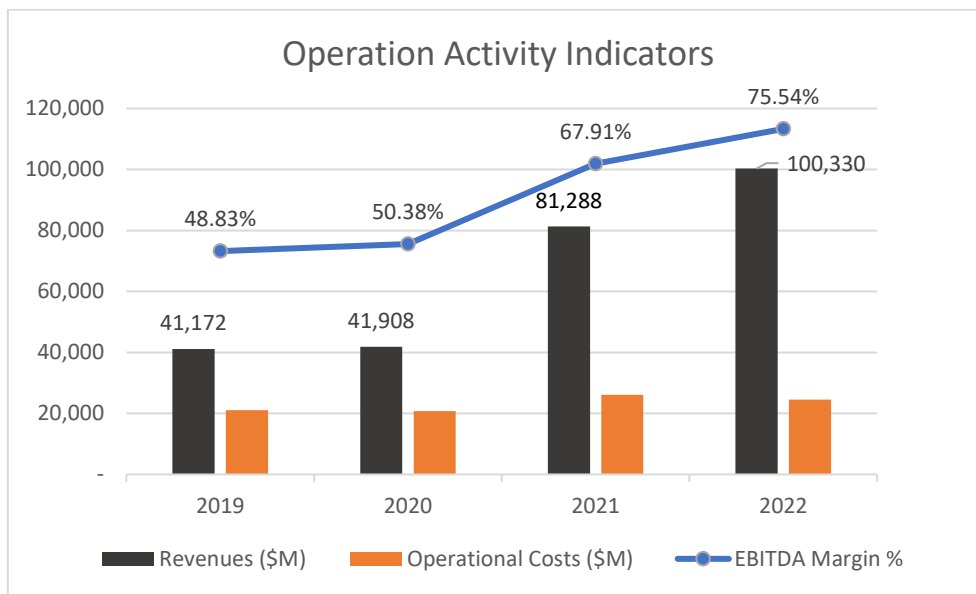


Figure 5.2 Operating Indicators 2019-2022 Source: Pfizer company reports

Looking now at the profitability ratios (see Figure 5.2), return on equity (ROE) experienced a decrease from 17% in 2019 to 11% which is the lowest and then had an increase to 33% in 2022. Both return on assets (ROA) and return on invested capital (ROIC) had similar values in 2019 and both had an upward trend until 2022, reaching a value of 16% for the former and 26% for the latter.

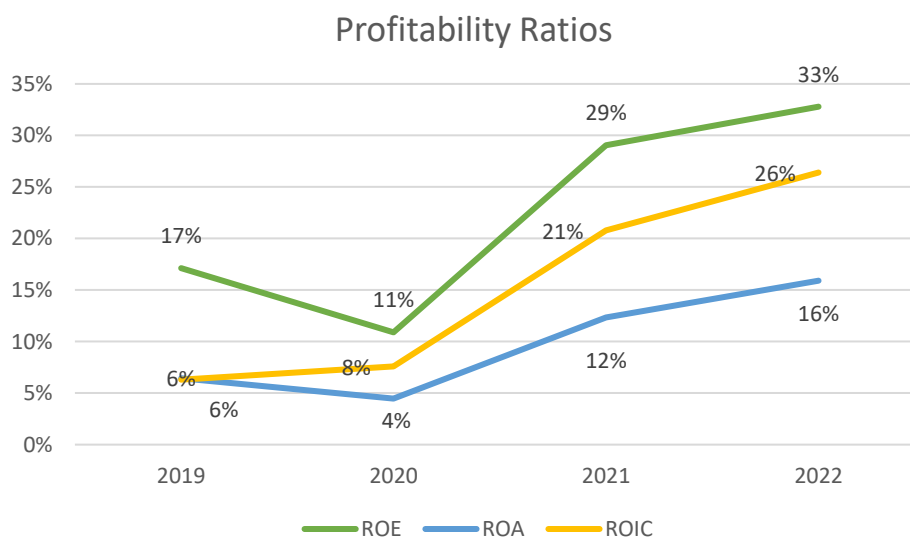


Figure 5.3 Profitability Ratios 2019-2022 Source: Pfizer company reports

5.6 Liquidity Ratios

In order to evaluate a company's capacity to handle its immediate cash flow requirements and pay short-term obligations, liquidity ratios are important financial measures. These ratios guarantee the organization's operational effectiveness and financial stability by offering useful insights into its liquidity status. The current ratio, quick ratio, and cash ratio are the liquidity ratios that are most frequently utilized.

The current ratio measures the company's ability to cover its short-term liabilities with its current assets. The quick ratio, also known as the acid-test ratio, is a more stringent measure of liquidity as it excludes inventory from current assets. Finally, the cash ratio focuses solely on the company's ability to pay off its immediate liabilities with its available cash and cash equivalents.

By analysing these liquidity ratios, investors, creditors, and stakeholders can make informed decisions regarding the company's financial health and its ability to navigate uncertain economic conditions.

The current ratio has been increasing until 2021 reaching the highest point of 1.40, it has an average of 1.21 between these four years. The only given point where it was below 1 was in 2018 where current assets value was far below to current liabilities. After this point, current assets increased over the years compared to current liabilities thus giving values of current ratio superior to 1.

When looking at Figure 5.4, the highest value was also in 2021 if we compare to the current ratio and it has an upward trend and then a decrease in 2022 same as the current ratio. These ratios have similar patterns which could be also due to the pandemic.

The last ratio observed was the cash ratio that has lower values due to the fact of the cash and cash equivalents that has a reduced value compared to current liabilities, the average of this ratio 0.04 which is quite low.

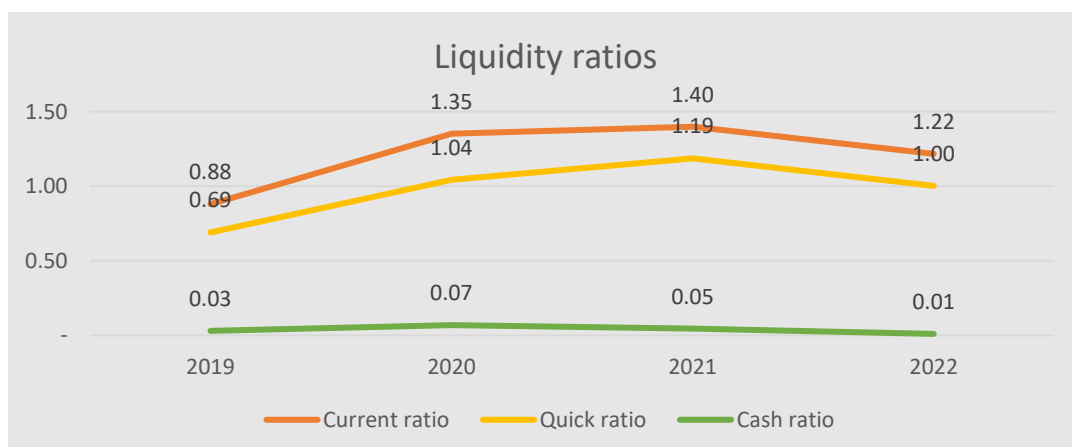


Figure 5.4 Liquidity Ratios 2019-2022 Source: Pfizer company reports

6. Pfizer Valuation

This chapter covers the valuation performed on the discounted cash flows which needs the forecast of future cash flows in order to reach the equity value. The historical data contained income statements, balance sheets, and cash flows statements from 2018 to 2022, which were used as support to estimate future cash flows.

In this stage is where critical thinking plays a bigger role since lots of assumptions must be made regarding the future cash flows values of Pfizer.

6.1 Assumptions Income Statement

This section covers the main assumptions made in the income statement, which will include historical data from Pfizer and estimated values for years 2023 to 2027. The most important assumptions were made on revenue, GOGS, expenses and depreciation and amortization.

6.1.1 Revenue and COGS

The first major assumption was the revenue on the income statement, the growth rate was calculated based on an average between 2018 to 2020. Basically calculating the growth rate of revenues between 2018 to 2019 which was a decrease of -23% and 2019 to 2020 there was an increase of 2%. Having these values then was calculated the average and use that value for the forecasted years. The reasoning for not including values of 2021 and 2022 is because of COVID-19 since they were atypical years.

COGS was calculated as a % of gross revenues from previous years and then use the average for the forecasted years as it is possible to see from Table 6.1 and Table 6.2, (Annex B).

Table 6.1 Revenue, GOGS and Gross Profit, 2018 to 2022 Historical Values source: company reports, and author estimates

in millions (\$)	2018	2019	2020	2021	2022
Revenue	53647	41172	41908	81288	100330
% for the growth rate		-23%	2%	94%	23%
COGS	9624	6828	7090	29222	33176
% of Revenue	18%	17%	17%	36%	33%
Gross Profit	44023	34344	34818	52066	67154

Table 6.2 Revenue, GOGS and Gross Profit, 2023 to 2027 Forecasted Values source: company reports, and author estimates

in millions (\$)	2023F	2024F	2025F	2026F	2027F
Revenue	89561	79949	71368	63708	56870
% for the growth rate	-11%	-11%	-11%	-11%	-11%
COGS	21577	19261	17194	15348	13701
% of Revenue	24%	24%	24%	24%	24%
Gross Profit	67985	60688	54174	48360	43169

6.1.2 Research & Development and Selling General & Administrative Expenses

In this section it covers the selling, general and administrative expenses and research and development expenses which were the main ones of Pfizer. Table 6.3 indicates the historical values from 2018 to 2022.

Table 6.3 R&D and SG&A 2018 to 2022 Historical Values source: company reports, and author estimates

Metrics for the Expenses (\$)	2018	2019	2020	2021	2022
Revenue	53647	41172	41908	81288	100330
SG&A Expenses	14383	12674	11400	12254	13115
% of Revenue	27%	31%	27%	15%	13%
Research and Development Expenses	7967	8394	9395	13828	11426
% of Revenue	15%	20%	22%	17%	11%

The Table 6.4 below indicates the forecasted values of the expenses, forecasted through calculating using the average of the last 5 years as a % of Revenue and then using that value to multiply to the revenue of each forecasted year, this method was applied to both expenses.

Table 6.4 R&D and SG&A 2023 to 2027 Forecasted Values source: company reports, and author estimates

Metrics for the Expenses (\$)	2023F	2024F	2025F	2026F	2027F
Revenue	89561	79949	71368	63708	56870
SG&A Expenses	20231	18059	16121	14391	12846
% of Revenue	23%	23%	23%	23%	23%
Research and Development Expenses	15415	13760	12283	10965	9788
% of Revenue	17%	17%	17%	17%	17%

6.1.3 Depreciation and Amortization

Tables 6.5 and 6.6 indicate the historical and forecasted values for the depreciation and amortization, the estimated values were calculated using the value of 2022, in this case 1.5% and 3.6% respectively and multiplying by the revenue for each year to get the value.

Table 6.5 Depreciation and Amortization 2018 to 2022 Historical Values source: company reports, and author estimates

Depreciation & Amortization Metrics (\$)	2018	2019	2020	2021	2022
Revenue	53647	41172	41908	81288	100330
Depreciation	1491	1333	1333	1491	1455
Depreciation as % of Revenue	2.8%	3.2%	3.2%	1.8%	1.5%
Amortization	4893	4462	3348	3700	3609
Amortization as % of Revenue	9.1%	10.8%	8.0%	4.6%	3.6%

Table 6.6 Depreciation and Amortization 2023 to 2027 Forecasted Values source: company reports, and author estimates

Depreciation & Amortization Metrics (\$)	2023F	2024F	2025F	2026F	2027F
Revenue	89561	79949	71368	63708	56870
Depreciation	1299	1159	1035	924	825
Depreciation as % of Revenue	1.5%	1.5%	1.5%	1.5%	1.5%
Amortization	3222	2876	2567	2292	2046
Amortization as % of Revenue	3.6%	3.6%	3.6%	3.6%	3.6%

6.1.4 Earnings Before Interest and Taxes (EBIT), EBT and Net Income

This section includes the values from the main rubrics of the income statement reaching to the final of the net income. From Table 6.7 it is possible to observe that the expenses within EBIT were calculated using an average of the historical values and for equity in affiliates (Pretax) the value considered was 0.

For the income tax, it was considered an average between the income tax and EBT and use that tax rate for the estimated years. Other rubrics within the net income it was considered a value of 0 since the values of the historical values were small to 0.

Table 6.7 Historical and Forecasted Values for rubrics within the Income Statement source: company reports, and author estimates

in millions (\$)	2018	2019	2020	2021	2022	2023F	2024F	2025F	2026F	2027F
EBIT	15289	7481	9342	20793	37549	27819	24833	22168	19789	17665
Unusual Expense	3622	4079	1645	-176	2120	2258	2258	2258	2258	2258
Non-Operating Income / Expense	1201	9384	676	4126	-149	3048	3048	3048	3048	3048
Non-Operating Interest Income	333	225	73	36	251	184	184	184	184	184
Equity in Affiliates (Pretax)	0	17	298	471	436	0	0	0	0	0
Interest Expense	1316	1573	1449	1291	1238	1373	1373	1373	1373	1373
EBT	11885	11455	7295	24311	34729	27419	24433	21768	19389	17265
Income Tax	706	618	370	1852	3328	1625	1588	1559	1316	1098
Consolidated Net Income	11179	10837	6925	22459	31401	25794	22846	20209	18073	16167
Minority Interest Expense	36	29	36	45	35	31	31	31	31	31
Net Income	11143	10808	6889	22414	31366	25763	22815	20178	18042	16136
Extraordinaries & Discontinued Operations	10	5435	2529	-435	6	0	0	0	0	0
Extra Items & Gain/Loss Sale of Assets	0	0	0	-167	7	0	0	0	0	0
Discontinued Operations	10	5435	2529	-268	-1	1541	1541	1541	1541	1541
Net Income After Extraordinaries	11133	5373	4360	22849	31360	25763	22815	20178	18042	16136
Net Income Available to Shareholders	11133	5373	4360	22682	31365	27304	24356	21719	19583	17677

6.2 Assumptions Balance Sheet

This section includes items on the balance sheet that were made assumptions for the estimated years. For working capital, the assumptions were made on the receivables and inventory that belong to the current assets as well as the items that belong to the current liabilities such as trade accounts payable, dividends payable and short-term borrowings. Additionally, there were assumptions made for capex and property, plant and equipment.

6.2.1 Working Capital Items

A key financial indicator of a company's operational effectiveness and short-term liquidity is net working capital. It symbolizes the gap between a company's current assets and current liabilities, which reflects the resources on hand to fund ongoing operations. A firm with a positive net working capital implies that it has enough current assets to satisfy its short-term liabilities, whereas one with a negative value has possible liquidity issues.

This indicator offers useful information about a company's capacity to control its operational cycle, deal with unforeseen costs, and embrace development possibilities. Optimizing inventory levels, simplifying accounts receivable and payable, and preserving a positive cash flow position are all essential components of net working capital management.

The operating current assets considered in the computation of Pfizer's net working capital include the items "Inventories" and "Accounts receivable. As per operating current liabilities, were considered the items "Trade Accounts payable", "Dividends payable" and "Short-term borrowing" which include a portion of short-term debt. Both the dividends payable and short-term borrowing are considered current liabilities and are paid or settle within a year thus they should be included.

The forecasts for “Inventories” were calculated as % of COGS and then used the historical data of the last 5 years as the average for the forecast. The “Receivables” and “Trade Accounts payable” were used as % of revenue, the value obtained as a percentage for receivables then use the average value of the historical years for the forecasted years.

Table 6.8 Net Working Capital Current Assets 2018 to 2022 Historical Values source: company reports, and author estimates

Current Assets (\$)	2018	2019	2020	2021	2022
Receivables	8025	6772	7930	11479	10952
Inventory	7508	7068	8046	9059	8981
Total	15533	13840	15976	20538	19933

Table 6.9 Net Working Capital Current Assets 2023 to 2027 Forecasted Values source: company reports, and author estimates

Current Assets (\$)	2023F	2024F	2025F	2026F	2027F
Receivables	13500	12051	10758	9603	8572
Inventory	8129	6397	4830	4312	3849
Total	21628	18448	15587	13914	12421

From Table 6.8 and Table 6.9 is it possible to observe that receivables, inventories, and accounts payable are reducing to pre pandemic values and also because the revenues are decreasing until 2027 so it is normal that these values also decrease, (Annex A & D).

Table 6.10 and 6.11 show the historical and forecasted values for the current liabilities, the value of short-term borrowings was the value of 2022 and then projected for the forecasted years.

Additionally, the dividends payable was also assumed constant from 2022 onwards. Lastly, the trade accounts payable was calculated as a percentage of the revenue for the historical values and then use the average for the forecasted years.

Table 6.10 Net Working Capital Current Liabilities 2018 to 2022 Historical Values source: company reports, and author estimates

Current Liabilities (\$)	2018	2019	2020	2021	2022
Trade accounts payable	4674	3887	4309	5578	6809
Dividends payable	2047	2104	2162	2249	2303
Short-term borrowings	4055	14733	701	605	385
Total	6721	5991	6471	7827	9112
Net Working Capital	8812	7849	9505	12711	10821
Changes in NWC		-963	1656	3206	-1890

Table 6.11 Current Liabilities 2023 to 2027 Forecasted Values source: company reports, and author estimates

Current Liabilities (\$)	2023F	2024F	2025F	2026F	2027F
Trade accounts payable	7523	6716	5995	5351	4777
Dividends payable	2303	2303	2303	2303	2303
Short-term borrowings	385	385	385	385	385
Total	9826	9019	8298	7654	7080
Net Working Capital	11802	9429	7290	6260	5341
Changes in NWC	-981	2373	2140	1030	919

6.2.2 CAPEX & PP&E

Investment in capital is essential to the expansion and development of pharmaceutical firms like Pfizer, it entails large expenditures in long-term resources including infrastructure, machinery, R&D facilities, and building stock. The correlation between CAPEX and the macroeconomic outlook is rooted in how a company's investment decisions are influenced by broader economic conditions. In periods of recession or economy contraction as seen during the COVID-19 companies are less confident in spending which can lead to a decrease in CAPEX spending thus having layoff or reduced expanding capacity. However, for pharmaceutical companies the situation is different since in the case of Pfizer the company is responsible for developing a vaccine so CAPEX could be increasing.

From previous years, most of Pfizer's capital expenditures originate from the investment in capex of fixed assets whereas capex investment in other assets is close to none which suggests that Pfizer has been focusing on expanding or modernizing its infrastructure and manufacturing capabilities. On the other hand, capex investment being almost non-existent could mean that Pfizer prioritizes its core business operations.

From Table 6.12 and 6.13 it is possible to observe that with the value of beginning PP&E it was then possible to obtain the value of ending PP&E, which was used for 2023, the formula used was the capex is equal to PP&E of the current period – PP&E of the prior period plus the depreciation.

Table 6.12 CAPEX and PPE Historical values source: company reports, and author estimates

Property Plant & Equipment Metric	2018	2019	2020	2021	2022
Revenue	53647	41172	41908	81288	100330
PPE	13385	12969	13900	14882	16274
PPE % of Revenue	25%	31%	33%	18%	16%
Capital Expenditures	-2042	-2176	-2252	-2711	-3326
Capex =PP&E (current period) - PP&E (prior period) + depreciation	-4%	-5%	-5%	-3%	-3%
Depreciation	1491	1333	1333	1491	1455
Beginning PPE					
Ending PPE					11493

Table 6.13 CAPEX and PPE Forecast 2023 to 2027 source: company reports, and author estimates

Property Plant & Equipment Metric	2023F	2024F	2025F	2026F	2027F
Revenue	89561	79949	71368	63708	56870
PPE	18558	20596	22416	24040	25490
PPE % of Revenue	25%	25%	25%	25%	25%
Capital Expenditures	3582	3198	2855	2548	2275
Capex =PP&E (current period) - PP&E (prior period) + depreciation	4%	4%	4%	4%	4%
Depreciation	1299	1159	1035	924	825
Beginning PPE	16274				
Ending PPE	18558	20596	22416	24040	25490

6.3 Weighted Average Cost of Capital (WACC)

This section mostly focuses on the main components of the WACC and their estimations. It starts by describing how to obtain the values of debt to equity and equity to debt ratio. Additionally, covers the risk-free rate as well as the beta computation that were used to obtain the value of the cost of equity that is used in the formula. The last entry considered was the cost of debt, which includes the short- and long-term debt.

6.3.1 Capital Structure

The capital structure for equity and debt was made through the market value of equity and the market value of debt (using the book value as proxy). The market value of equity was estimated by multiplying the number of outstanding shares by its stock price (as of 31st December) for each year. The market (book) value of debt was constant for these 5 years. With the yearly market values of equity and debt, the debt-to-equity ratios were determined. Additionally, the average D/E ratio for the 5 years was calculated, which resulted in a final value of the D/E ratio of 13.23%.

In these computations the only value that is changing is the value of equity whereas the value of debt remains constant for all years. So, the value of debt of Pfizer is significantly low and most of the capital structure is made of equity.

Table 6.14 Pfizer's Inc capital structure. Pfizer's Annual Reports, source: own author estimates

in million (\$)	2018	2019	2020	2021	2022
#Shares outstanding	5977	5675	5632	5708	5773
Share price as of the end of the year	40.76	36.92	36.74	58.40	51.24
Market value of Equity	243623	209521	206920	333347	295809
Book =Market value of Debt	37960	37960	37960	37960	37960
D/E %	16%	18%	18%	11%	13%

6.3.2 Risk-Free Rate and The Country Risk Premium

The risk-free rate and country risk premium are crucial concepts that play a major role on determining the cost of equity. The risk-free rate refers to the theoretical rate of return on an investment with zero risk, typically represented by government bonds or other highly stable financial instruments. It serves as a benchmark for determining the minimum return an investor should expect for taking on any level of risk. On the other hand, the country risk premium represents an additional compensation demanded by investors for investing in a particular country due to the associated political, economic, and social risks. It reflects the likelihood of experiencing adverse events such as political instability, economic downturns, currency fluctuations, and regulatory changes.

The former was obtained by using the yield on 10-year US treasury bonds which came to a value of 3.69 %, while the value for the country risk premium was obtained from Damodaran (2021), which yields a value of 0 % for the country risk premium, in this instance, the value has no bearing on the computation of the cost of equity.

6.3.3 Beta Computation

Beta can be calculated in two ways, levered or unlevered. In this thesis it was used the levered beta, (also known as equity beta) since we want to determine the cost of equity. It measures the sensitivity of a company's stock price to market movements, considering the financial leverage or debt of the company. It incorporates the effects of both the business risk (operating risk) and financial risk (related to the company's capital structure).

The value of beta it was obtained from a website of (Damodaran, 2021) that compares betas within different sectors in the US. According to Damodaran (2021) the value of beta in the industry of drugs (pharmaceutical) is 1.27.

6.3.4 Cost of Equity

As mentioned earlier on this study the cost of equity was calculated with the CAPM model, and later incorporated in the WACC. After having computed all the components of the equity required rate of return the value obtained was 11.23%.

Table 6.15 Components for the cost of equity estimation, source: own author estimates

Cost of Equity - CAPM	Inputs
Risk-Free Rate	3.69%
Beta	1.27
Market Return	9.63%
Equity Risk Premium	5.94%
Re	11.23%

6.3.5 Cost of Debt

The cost of debt was estimated with the interest expenses divided by the total of short-term and long-term debt. Since it was difficult to estimate the value forecast for short- and long-term debt the value was estimated as the average of the historical years. Additionally, the interest expense was the average of the historical years so from 2018 to 2022 as there is no major differences between the values. The cost of debt was the last value needed to calculate the WACC, the value obtained was 3.62%.

6.3.6 Summary

Using Equation 2.8 of the literature review we arrive at a WACC value of 10.11% discount rate. From Table 6.16 provides a summary of the inputs needed and the values used to achieve the WACC value:

Table 6.16 WACC calculation, source: own author estimates

WACC	
Re	11.23%
% of Equity	86.77%
% of Debt	13.23%
Rd	3.62%
Tax Rate	25.00%
WACC	10.11%

6.4 Discounted Cash Flow (DCF) Valuation

Based on the predictions stated in the previous section we are now able to calculate the Free Cash Flow to the Firm to finally arrive at the fair value of Pfizer share price as of 31 December 2022.

After 2027, it was anticipated that the firm would continue to exist with cash flows expanding continuously at a constant, steady growth rate, which was represented in the terminal value. Table 6.17 demonstrates the values obtained for the FCFF and for the discounted FCFF.

Table 6.17 FCFF forecasted and Discounted FCFF, source: own author estimates

Values in millions \$	2023	2024	2025	2026	2027
EBITDA	23889	24498	25122	22425	20018
(-) Depreciation	1299	1159	1035	924	825
(=) EBIT	22590	23339	24087	21501	19194
Tax Rate	0	0	0	0	0
(-) Taxes	5648	5835	6022	5375	4798
NOPLAT	16943	17504	18065	16126	14395
(+) Depreciation	1299	1159	1035	924	825
(+) Amortization	3222	2876	2567	2292	2046
(=) Operational Cash Flow	21463	21540	21667	19342	17266
(-) Capex net of disposals	-3582	-3198	-2855	-2548	-2275
(-) Changes in NWC	-981	2373	2140	1030	919
(=) FCFF	16900	20715	20952	17823	15910
DCF	Year 1	Year 2	Year 3	Year 4	Year 5
Discounted FCFF	15348	17086	15696	12126	133536

6.4.1 Terminal Value

When it comes to terminal value, the growth rate estimated would be a conservative 2% based on values of cash flows from 2023 to 2027. The reasoning is that these cash flows are based on values pre-pandemic where revenues are lower than 2021 or 2022. It makes sense that between 2023 to 2027 the cash flows will decrease to similar values as 2018 to 2022 even though there were slightly increases in the cash flows in 2024 and 2025.

To estimate the value of terminal value the Equation 2.5 was used where in this context refers to the value of Pfizer at the end of the projected period of cash flows. More specifically, using the FCFF value of 2027 and then dividing by the WACC subtracted by the perpetuity growth rate, the value obtained was \$200,192.

6.4.2 Fair Value

The predicted enterprise value at the end of the year 2023 is \$193,793 million which considers the discounted FCFF.

To go from the enterprise value to the equity value the following adjustment must were made, those calculations are included in Table 6.18 and Table 6.19:

- Added the value of non-operating assets, which include “Cash & cash equivalents” and “Other Non-current assets” which amounted to \$13.579 M.
- Subtracted the value of non-equity claims, which include “Short-term borrowings”, “Portion of Long-term debt”, “Long term Debt & Capital Lease Obligation”, “Pension and

Postretirement benefit obligations” and “Non-Current Deferred Liabilities” which totalled \$39.102 M.

Table 6.18 Enterprise Value: own author estimates

Enterprise Value	2023F	2024F	2025F	2026F	2027F
FCFF	16900	20715	20952	17823	15910
Discounted FCFF	15348	17086	15696	12126	133536
TV	200192				
Enterprise Value	193793				

Table 6.19 Equity Value and Share price: own author estimates

Equity Value & Share Price (\$)	
NOA	13579
Net Debt	39102
Equity Value	168270
# Shares outstanding	5773
Share price	29.15

From Table 6.19 it is possible to observe that an equity value of \$168,270 M was obtained, which, when divided by the total number of outstanding shares, produced a target price of 29.15 per share as of December 31, 2022 (lower than the stock's actual closing price of \$51.24).

6.4.3 Sensitivity Analysis

The aim of this section is to cover variations in the share price based on changes in the main drivers that are the WACC and the growth rate. By modifying these two values it is possible to analyse the impact on the share price of Pfizer. The increments were done by 1pp in the WACC and for the growth rate it was assumed an increment of 0.25pp. It was important to introduce the value of WACC and growth rate used in the valuation to see the where the price stands compared to increases or decreases in the drivers.

From Table 6.20 it is possible to visualize that the lowest share price would be where the WACC is the highest, (at 15%), and the growth rate is the lowest, (at 0.25%) at a price of 15.67 \$. Conversely, the highest share price would be where the growth rate is the highest, (at 2%), and the WACC is the lowest, (at 9%), reaching a peak price of 34.17\$.

According to Table 6.20 the green colour represents an increase in price compared to the price obtained in the valuation, 29.13\$. On the other hand, the red colour means that the share price of Pfizer is losing its value and thus it can be seen as a bad sign for the company. The yellow colour marks the share price at the growth rate and WACC obtained when doing the DCF valuation. A lower WACC combined with an increasing growth rate positively affects the share price of Pfizer since it is higher.

A small increment for example of 1pp on the WACC can be detrimental to the share price of Pfizer as it devaluates, the share price mostly values if the WACC remains at 9% and the growth rate can potentially increase, and it would be beneficial for Pfizer.

Table 6.20 Sensitivity analysis: company reports, and author estimates.

\$	WACC								
	\$ 29.15	9.00%	10.00%	10.11%	11.00%	12.00%	13.00%	14.00%	15.00%
Growth Rate	0.25%	28.59	25.35	25.03	22.70	20.50	18.65	17.05	15.67
	0.50%	29.24	25.85	25.52	23.11	20.83	18.91	17.27	15.86
	0.75%	29.94	26.39	26.05	23.53	21.17	19.19	17.50	16.05
	1.00%	30.68	26.96	26.60	23.97	21.52	19.47	17.74	16.24
	1.25%	31.47	27.55	27.18	24.44	21.89	19.77	17.98	16.45
	1.50%	32.31	28.19	27.79	24.93	22.28	20.09	18.24	16.66
	1.75%	33.20	28.86	28.44	25.44	22.69	20.41	18.51	16.88
	2%	34.17	29.57	29.13	25.99	23.11	20.75	18.78	17.11

Table 6.21 represents values obtained in the sensitivity analysis in % of the actual price, \$29.13. The values in green demonstrate positive variations and if it compared to the Table 6.20 represent profit for Pfizer as the share price increases whereas the values in red demonstrate negative variations and losses for Pfizer as the share price devaluates. The yellow colour represents the base estimate of the share price obtained.

Additionally, from Table 6.21 it is possible to see that increases in WACC or in growth rate affect massively the share price of Pfizer. The positive values to consider are when the WACC remains at 9% and the growth rate is above 0.50%. Small increases of the WACC and growth rate mean negatively impact the share price of Pfizer as the majority of the table is red.

Table 6.21 Values in % of the actual price: company reports, and author estimates.

\$	WACC								
	29.13	9%	10%	10.11%	11%	12%	13%	14%	15%
Growth Rate	0.25%	-1.9%	-13.0%	-14.1%	-22.1%	-29.6%	-36.0%	-41.5%	-46.2%
	0.50%	0.4%	-11.2%	-12.4%	-20.7%	-28.5%	-35.1%	-40.7%	-45.6%
	0.75%	2.8%	-9.4%	-10.6%	-19.2%	-27.3%	-34.1%	-39.9%	-44.9%
	1.00%	5.3%	-7.5%	-8.7%	-17.7%	-26.1%	-33.1%	-39.1%	-44.2%
	1.25%	8.0%	-5.4%	-6.7%	-16.1%	-24.9%	-32.1%	-38.3%	-43.5%
	1.50%	10.9%	-3.2%	-4.6%	-14.4%	-23.5%	-31.0%	-37.4%	-42.8%
	1.75%	14.0%	-0.9%	-2.4%	-12.7%	-22.1%	-29.9%	-36.5%	-42.0%
	2.00%	17.3%	1.5%	0.0%	-10.8%	-20.7%	-28.8%	-35.5%	-41.3%

6.5 Relative Valuation

A relative value study was also carried out to support the concept of DCF valuation and to provide a more comprehensive picture of a valuation exercise. The plan is to compare Pfizer to a group of pharmaceutical firms with a global presence as benchmark peers. There are 12 firms with significant market capitalizations in this analysis. In addition, the P/E ratio and the EV/EBITDA ratio were employed as multiples. The outcomes are summarized in the Table 6.22:

Table 6.22 Summary Peer Group, own estimates.

Peer group				
31-Dec-22				
Company	Country	Market Cap (US\$Bn)	P/E	EV/EBITDA
Johnson & Johnson	USA	461.80	26.2	-
AbbVie Inc	USA	285.80	24.4	11
Merck & Co.	USA	281.30	19.4	11.3
Amgen	USA	140.10	21.7	10.5
Bristol-Myers Squibb	USA	153.00	24.4	9.43
Eli Lilly & Company	USA	347.60	53	38.2
Roche	Switzerland	262.60	18.9	11
GlaxoSmithKline (GSK)	United Kingdom	70.90	3.93	7.23
Bayer	Germany	50.80	11.5	5.83
Novartis AG	Switzerland	218.00	28.3	10.9
Takeda Pharmaceutical	Japan	48.50	23.9	8.54
Cipla	India	10.50	32.7	17.8
Average			24.03	12.88
Standard Deviation			11.88	8.93
Average + Standard deviation			35.91	21.81
Average - Standard deviation			12.15	3.96
Average excluding outliers (outliers in red)			24.43	10.35

Table 6.23 Relative Valuation Summary, own estimates.

Relative Valuation		
(\$ millions)	P/E Valuation	EV/EBITDA Valuation
Peer group Multiple	24.43	10.35
Pfizer Inc: Net income	31,366	-
Pfizer Inc: EBITDA	-	42,613
Enterprise Value	-	441,172
Equity Value	766,376	415,649
# Shares outstanding in Millions	5,773	5,773
Pfizer Share price	132.75	72.00

To reach the final share price of each multiple the following process was conducted:

1. Extract each company's financial information, including its market capitalization, P/E ratio, and EV/EBITDA ratio.
2. Next, determine the outliers by determining the geometric averages of the two ratios and determining their standard deviation. The geometric average is more accurate in terms of

returns as it considers compounding that occurs from period to period were the arithmetic does not.

3. By multiplying Pfizer's 2022 Net Income of 31,366 M\$ with the P/E ratio from the peer group multiple we get the implied equity value of 766,376 M\$. Adjusting it to the number of shares outstanding, it delivers a share price of 132,75\$, which provides an upside potential of 159.07%.
4. By multiplying Pfizer's EBITDA of 2022 with value of 42,613 M\$ to the average multiple of 10.35, we achieve the enterprise value of 441,172 M\$. Adjusting it to the non-operating assets and non-equity claims, we get the Equity Value of 415,649 M\$. This represents an implied share price of 72.00\$, demonstrating an upside potential of 40.52%.

6.6 Valuation Results Summary

The fair values provided by the DCF, and the relative valuation were significantly different from the actual share price.

From figure 6.19 it is possible to see that the highest change occurs with the price of the P/E of 132.75\$ to 51.24\$, a difference of 81.51\$. On the other hand, the lowest change is obtained with the EV/EBITDA multiple with a share value of 72\$ compared to 51.24\$, a difference of 20.76\$.

Based on the analysis of the share price of \$51.24 in comparison to the values obtained through discounted cash flow (DCF), P/E ratio multiple, and EV/EBITDA multiple, a critical opinion can be formed regarding the current valuation.

Firstly, the DCF approach calculates the intrinsic value of a company based on its expected future cash flows. If the DCF-derived value of \$29.15 is significantly lower than the actual share price of \$51.24, it suggests that the market is currently overvaluing the stock. On this case there was a decrease of 43.12% from Pfizer share price as of December 31st to the DCF valuation. This raises concerns about the sustainability and accuracy of the valuation performed in this study.

Secondly, with the P/E ratio multiple valuation the value of the share is 132.75\$ which is again notably higher than the actual share price. A high P/E ratio indicates that investors are willing to pay a premium for each dollar of earnings generated by the company. However, such a significant deviation from the actual share price may imply an inflated valuation, potentially driven by the value obtained in the peer group multiple.

Lastly, with the EV/EBITDA multiple valuation of 72.00\$ the value is closer to the end value of Pfizer of 51.24\$ however there is still a discrepancy of 20.76\$. This multiple is used to assess the company's operating performance and profitability. This suggests that investors are attributing a premium value to the company's earnings before interest, taxes, depreciation, and amortization

(EBITDA). However, such a substantial deviation from the actual share price may indicate an overvaluation.

Considering these factors, a major disparity is noticeable between the market's current valuation of \$51.24 and the values derived from the DCF, P/E ratio, and EV/EBITDA multiples. This raises concerns about the share price being potentially overvalued, namely the P/E ratio as the value of the share is fairly superior as the one obtained in the valuation and as the price of Pfizer share indicating a need for further analysis and scrutiny.

It is essential for investors to exercise caution and carefully evaluate the company's fundamentals, market conditions, and future prospects to make informed investment decisions. Further research and a deeper understanding of the underlying factors driving the market's valuation are warranted to assess the sustainability and accuracy of the current share price.

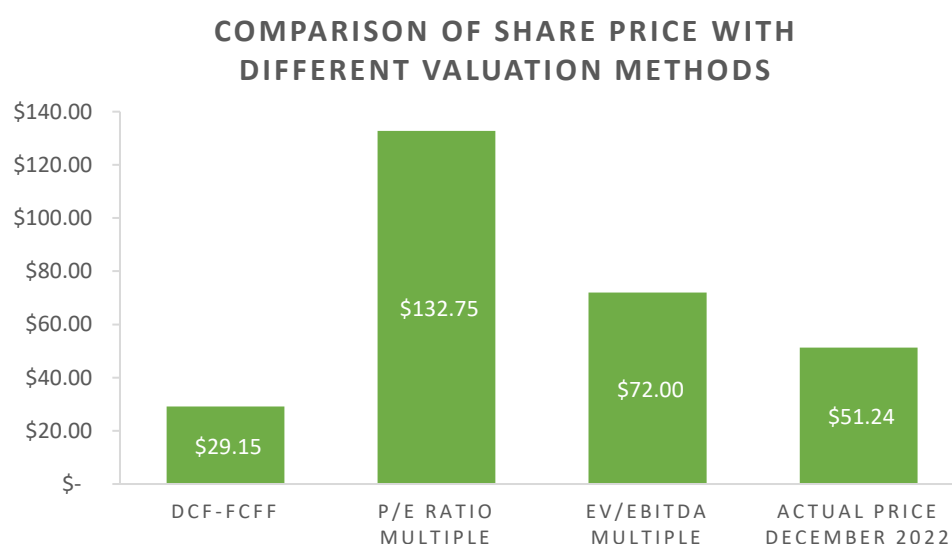


Figure 6.1 Comparison of share price with different valuation methods

Conclusion

The aim of this project was to find the fair value of Pfizer Inc, estimating the fair price of its share as of 31 December 2022 and compare it with the actual share close price. A DCF analysis was performed, as well as a relative valuation and sensitivity analysis.

There were two approaches used in this procedure. First, the DCF valuation utilizing the FCFF method, in which the projected future cash flows were discounted at a rate that took both equity and debt holders' risk into consideration. An investigation of the sensitivity to changes in the WACC value and the growth rate of the cash flows was also used to support the DCF valuation. The second method of valuation compares Pfizer to a group of listed companies that are similar to it in terms of traits and sector in order to determine its indicated value, the multiples selected were the P/E ratio and EV/EBITDA.

The DCF analysis shows that the price share of Pfizer, as of 31st December 2022 was overvalued by 75.79%, from 29.15\$ obtained in the DCF as compared to \$51.24 in the market. Additionally, from performing a sensitivity analysis it is possible to observe that small increments in the WACC and in the growth rate negatively affect the share price of Pfizer causing the share price of Pfizer to decrease from 29.15 which is the base value.

When considering the relative valuation, it is noticeable that the share price of Pfizer, as of 31st December 2022 is undervalued since the results obtained in the P/E ratio and the EV/EBITDA show major disparities within the values. This could be a sign that the results are not accurate and could be classified as a drawback. There was a decrease in value of 61.30% from \$132.75 to \$51.24 with the P/E multiple and a decrease of 28.83% from \$72 to \$51.24 with the EV/EBITDA multiple. The difference in values is enormous and only in certain scenarios those major differences could be seen in the market.

Looking at the value obtained in the DCF valuation compared to the market price, investors were trading Pfizer share price above its true price as of 31st December 2022. This represents a loss in value for buyers and a gain in value for sellers of the Pfizer's shares

When it comes to the limitations, as the study was performed through years of COVID, the values obtained are fairly superior prior to COVID. A more realistic view of the company would have been possible to see if there was no COVID, in a normal scenario the values of the annual reports could be closer to the reality of 2018 or 2019 when there was no COVID. Other limitation that could affect the result of the study is the access to information, without annual reports of Pfizer it would have been a challenge to obtain historical values therefore not being able to do the projections.

To conclude, a future equity valuation of Pfizer should consider subsequent years of COVID as a more accurate representation of financial values which can bring added valued to investors.

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Appendixes

Balance Sheet					
In million \$	2018	2019	2020	2021	2022
Cash & Cash Equivalents	1139	1121	1784	1944	416
Short-term investments	17694	8525	10437	29125	22316
Receivables	8025	6772	7930	11479	10952
Inventory	7508	7068	8046	9059	8981
Current Tax Assets	3374	2736	3264	4266	3577
Other Current Assets	2461	2357	3438	3820	5017
Current Assets of discounted operations and other assets for sale	9725	4224	167	0	0
Total Current Assets	49926	32803	35066	59693	51259
Equity-Method Investments/ Long Term Investments	2766	20147	20262	21526	15069
Property, Plant and Equipment	13385	12969	13900	14882	16274
Intangible Assets	35211	33936	28471	25146	43370
Goodwill	53411	48202	49577	49208	51375
Noncurrent deferred tax assets and other noncurrent	1924	1911	2383	3341	6693
Other Noncurrent assets	2799	17626	4569	7679	13163
Total Non Current Assets	109496	134791	119162	121782	145944
Total Assets	159422	167594	154228	181475	197203
Liabilities and Equity					
Short-term borrowings	4055	14733	701	605	385
Portion of Long term debt included in short borrowings	4776	1462	2002	1636	2560
Trade accounts payable	4674	3887	4309	5578	6809
Dividends payable	2047	2104	2162	2249	2303
Income taxes payable	1265	980	1049	1266	1587
Accrued compensation and related items	2397	2390	3058	3332	3407
Current liabilities of discontinued operations	10753	9334	12640	3067	2520
Other Current liabilities	1890	2413	-	24939	22568
Total Current Liabilities	31857	37303	25921	42672	42139
Long Term Debt & Capital Lease Obligation	32909	35955	37133	36195	32884
Pension and Postretirement benefit obligations	6610	6217	5411	3724	2250
Non Current Deferred Liabilities	3700	5652	4063	349	1023
Other Taxes Payable	14737	12126	11560	11331	9812
Other Noncurrent liabilities	5850	6894	6669	9743	13180
Total Liabilities	95663	104147	90757	104014	101288
Common Stock Net	467	468	470	473	476
Preferred Stock	19	17	-	-	-
Additional Paid in Capital	86253	87428	88674	90591	91802
Treasure Stock	-101610	-110801	-110998	-111361	-113969
Retained Earnings	89554	97670	96770	103394	125656
Accumulated Other Comprehensive Loss	-11275	-11640	-11688	-5897	-8304
Total Shareholders Equity	63408	63142	63228	77200	95661
Equity Attributable to Noncontrolling Interests	351	303	235	262	256
Total Equity	63759	63445	63463	77462	95917
Total Liabilities and equity	159422	167592	154220	181476	197205

Appendix A. Historical Balance Sheet. Pfizer Annual Reports 2018,2019,2020,2021 & 2022

INCOME STATEMENT					
in millions (\$)	2018	2019	2020	2021	2022
Revenue	53647	41172	41908	81288	100330
% for the growth rate		-23%	2%	94%	23%
COGS	9624	6828	7090	29222	33176
% of Revenue	18%	17%	17%	36%	33%
Gross Profit	44023	34344	34818	52066	67154
Research and Development Expenses	7967	8394	9395	13828	11426
SG&A Expenses	14383	12674	11400	12254	13115
EBITDA	21673	13276	14023	25984	42613
Depreciation	1491	1333	1333	1491	1455
Amortization	4893	4462	3348	3700	3609
EBIT	15289	7481	9342	20793	37549
Unusual Expense	3622	4079	1645	-176	2120
Non-Operating Income / Expense	1201	9384	676	4126	-149
Non-Operating Interest Income	333	225	73	36	251
Equity in Affiliates (Pretax)	0	17	298	471	436
Interest Expense	1316	1573	1449	1291	1238
EBT	11885	11455	7295	24311	34729
Income Tax	706	618	370	1852	3328
Consolidated Net Income	11179	10837	6925	22459	31401
Minority Interest Expense	36	29	36	45	35
Net Income	11143	10808	6889	22414	31366
Extraordinaries & Discontinued Operations	10	5435	2529	-435	6
Extra Items & Gain/Loss Sale of Assets	0	0	0	-167	7
Discontinued Operations	10	5435	2529	-268	-1
Net Income After Extraordinaries	11133	5373	4360	22849	31360
Net Income Available to Shareholders	11133	5373	4360	22682	31365

Appendix B. Income Statement. Pfizer Annual Reports 2018,2019,2020,2021 & 2022

Cash Flow Statement					
Millions of US dollars					
	2018	2019	2020	2021	2022
Operating Activities					
Net Income before allocation to noncontrolling interests	11188	16302	9652	22025	31407
Discounted Operations - net of tax	0	0	2631	-434	6
Net Income from continuing operations before allocation to non controlling interests	11188	16302	7021	22459	31401
Total Depreciation and Amortization - Cash Flow	6384	6010	4777	5191	5064
Asset Write - Offs	3398	2953	2049	276	550
TCJA impact	-596	-323	0	0	0
Gain on completion of Consumer healthcare JV transaction net of cash Conveyed	0	-8233	-6	0	0
Deferred taxes from continuing operations	-2205	614	-1468	-4293	-3764
Share based compensation expense	949	718	756	1182	872
Benefits plans contributions in excess of income/expense	-1095	-336	-1790	-3123	-1158
Other adjustments (net)	-1270	-1086	-478	-1574	758
Trade Accounts receivables	-644	-742	-1249	-3811	261
Inventories	-717	-1050	-736	-1125	592
Other assets	-16	795	-146	-1057	-4506
Trade Accounts payable	431	-564	353	1242	1191
Other Liabilities	98	267	2741	18721	-1449
Other tax accounts, net	-78	-2737	-1238	-1166	-545
Net Cash Flow from Operations Activities	15827	12588	10586	32922	29267
Investing Activities					
Capex	-2042	-2176	-2252	-2711	-3236
Purchases of short - term investments	-11677	-6835	-13805	-38457	-36384
Proceeds from redemptions/sales of short-term investments	17581	9183	11087	27447	44821
Net proceeds from redemption/sales of short-term investments with original maturities of three months or less	-3917	6925	920	-8088	-483
Purchases of long - term investments	-1797	-201	-597	-1068	-1913
Proceeds from redemptions/sales of long-term investments	6244	232	723	649	641
Acquisitions of business, net of cash acquired	-	-10861	-	-	-22997
Dividend received from the consumer healthcare JV	-	-	-	-	3960
Other investing activities, net	133	-212	-264	-306	-192
Net Cash provided in Investing Activities	4525	-3945	-4188	-22534	-15783
Proceeds from short-term borrowings	3711	16455	12352	-	3891
Payments on short-term borrowings	-4437	-8378	-22197	-	-3887
Net proceeds from short - borrowings with original maturities of three mon	-1617	2551	-4129	-96	-222
Proceeds from issuances of long-term debt	4974	4942	5222	997	0
Payments on long-term debt	-3566	-6806	-4003	-2004	-3298
Purchases of common stock	-12198	-8865	-	-	-2000
Cash dividends paid	-7978	-8043	-8440	-8729	-8983
Other investing activities, net	670	-341	-445	16	-335
Net cash used in financing activities	-20441	-8485	-21640	-9816	-14834
Effect of exchange-rate changes on cash and cash equivalents	-116	-32	-8	-59	-165
Cash and Cash equivalents , at the beginning of period	1431	1225	1350	1825	1983
Cash and Cash equivalents , at end of period	1225	1350	1825	1983	468

Appendix C. Cash Flow Statement. Pfizer Annual Reports 2018,2019,2020,2021 & 2022

Balance Sheet					
In million \$	2023F	2024F	2025F	2026F	2027F
Cash & Cash Equivalents	1281	1281	1281	1281	1281
Short-term investments	22316	22316	22316	22316	22316
Receivables	13500	12051	10758	9603	8572
Inventory	8129	6397	4830	4312	3849
Current Tax Assets	5291	4723	4216	3763	3359
Other Current Assets	5054	4512	4027	3595	3209
Current Assets of discounted operations and other assets for sale	0	0	0	0	0
Total Current Assets	55570	51279	47428	44870	42587
Equity-Method Investments/ Long Term Investments	15954	15954	15954	15954	15954
Property, Plant and Equipment	14282	14282	14282	14282	14282
Intangible Assets	33227	33227	33227	33227	33227
Goodwill	51375	51375	51375	51375	51375
Noncurrent deferred tax assets and other noncurrent	6693	6693	6693	6693	6693
Other Noncurrent assets	13163	13163	13163	13163	13163
Total Non Current Assets	134694	134694	134694	134694	134694
Total Assets	190264	185973	182122	179564	177281
Liabilities and Equity					
Short-term borrowings	385	385	385	385	385
Portion of Long term debt included in short borrowings	2560	2560	2560	2560	2560
Trade accounts payable	7523	6716	5995	5351	4777
Dividends payable	2303	2303	2303	2303	2303
Income taxes payable	1587	1587	1587	1587	1587
Accrued compensation and related items	3407	3407	3407	3407	3407
Current liabilities of discontinued operations	2520	2520	2520	2520	2520
Other Current liabilities	11205	10003	8929	7971	7115
Total Current Liabilities	31491	29480	27686	26084	24654
Long Term Debt & Capital Lease Obligation	35015	35015	35015	35015	35015
Pension and Postretirement benefit obligations	2250	2250	2250	2250	2250
Non Current Deferred Liabilities	1023	1023	1023	1023	1023
Other Taxes Payable	9812	9812	9812	9812	9812
Other Noncurrent liabilities	12303	10983	9804	8752	7812
Total Liabilities	91894	88563	85590	82936	80567
Common Stock Net	473	473	473	473	473
Preferred Stock	0	0	0	0	0
Additional Paid in Capital	91802	91802	91802	91802	91802
Treasure Stock	-111538	-112498	-113377	-113280	-113194
Retained Earnings	125656	125656	125656	125656	125656
Accumulated Other Comprehensive Loss	-8304	-8304	-8304	-8304	-8304
Total Shareholders Equity	98089	97129	96250	96347	96433
Equity Attributable to Noncontrolling Interests	281	281	281	281	281
Total Equity	98370	97410	96531	96628	96714
Total Liabilities and equity	190264	185973	182121	179564	177281

Appendix D. Projections Balance Sheet. Own author estimates

INCOME STATEMENT					
in millions (\$)	2023F	2024F	2025F	2026F	2027F
Revenue	89561	79949	71368	63708	56870
% for the growth rate	-11%	-11%	-11%	-11%	-11%
COGS	21577	19261	17194	15348	13701
% of Revenue	24%	24%	24%	24%	24%
Gross Profit	67985	60688	54174	48360	43169
Research and Development Expenses	15415	13760	12283	10965	9788
SG&A Expenses	20231	18059	16121	14391	12846
EBITDA	32340	28869	25770	23004	20535
Depreciation	1299	1159	1035	924	825
Amortization	3222	2876	2567	2292	2046
EBIT	27819	24833	22168	19789	17665
Unusual Expense	2258	2258	2258	2258	2258
Non-Operating Income / Expense	3048	3048	3048	3048	3048
Non-Operating Interest Income	184	184	184	184	184
Equity in Affiliates (Pretax)	0	0	0	0	0
Interest Expense	1373	1373	1373	1373	1373
EBT	27419	24433	21768	19389	17265
Income Tax	1625	1588	1559	1316	1098
Consolidated Net Income	25794	22846	20209	18073	16167
Minority Interest Expense	31	31	31	31	31
Net Income	25763	22815	20178	18042	16136
Extraordinaries & Discontinued Operations	0	0	0	0	0
Extra Items & Gain/Loss Sale of Assets	0	0	0	0	0
Discontinued Operations	1541	1541	1541	1541	1541
Net Income After Extraordinaries	25763	22815	20178	18042	16136
Net Income Available to Shareholders	27304	24356	21719	19583	17677

Appendix E. Projections Income Statement. Own author estimates

Current Assets (\$)	2018	2019	2020	2021	2022	2023F	2024F	2025F	2026F	2027F
Receivables	8025	6772	7930	11479	10952	13500	12051	10758	9603	8572
Inventory	7508	7068	8046	9059	8981	8129	6397	4830	4312	3849
Total	15533	13840	15976	20538	19933	21628	18448	15587	13914	12421

Appendix F. Current Assets for WC Historical and Projections

Current Liabilities (\$)	2018	2019	2020	2021	2022	2023F	2024F	2025F	2026F	2027F
Trade accounts payable	4674	3887	4309	5578	6809	7523	6716	5995	5351	4777
Dividends payable	2047	2104	2162	2249	2303	2303	2303	2303	2303	2303
Short-term borrowings	4055	14733	701	605	385	385	385	385	385	385
Total	6721	5991	6471	7827	9112	9826	9019	8298	7654	7080
Net Working Capital	8812	7849	9505	12711	10821	11802	9429	7290	6260	5341
Changes in NWC		-963	1656	3206	-1890	-981	2373	2140	1030	919

Appendix F.1. Current Assets for WC Historical and Projections

Estimations	2023F
Risk Free Estimation	
US Treasury 10 year Bond Yield	3.69%
30 Year Government Bond Yield	3,77%

Appendix G. Estimation of the Risk-Free Rate

Values in millions \$	2023	2024	2025	2026	2027
EBITDA	23889	24498	25122	22425	20018
(-) Depreciation	1299	1159	1035	924	825
(=) EBIT	22590	23339	24087	21501	19194
Tax Rate	0	0	0	0	0
(-) Taxes	5648	5835	6022	5375	4798
NOPLAT	16943	17504	18065	16126	14395
(+) Depreciation	1299	1159	1035	924	825
(+) Amortization	3222	2876	2567	2292	2046
(=) Operational Cash Flow	21463	21540	21667	19342	17266
(-) Capex net of disposals	-3582	-3198	-2855	-2548	-2275
(-/+) Changes in NWC	-981	2373	2140	1030	919
(=) FCFF	16900	20715	20952	17823	15910
DCF	Year 1	Year 2	Year 3	Year 4	Year 5
Discounted FCFF	15348	17086	15696	12126	133536

Appendix H. Projections FCFF & Discounted FCFF

Peer group				
31-Dec-22				
Company	Country	Market Cap (US\$Bn)	P/E	EV/EBITDA
Johnson & Johnson	USA	461.80	26.2	-
AbbVie Inc	USA	285.80	24.4	11
Merck & Co.	USA	281.30	19.4	11.3
Amgen	USA	140.10	21.7	10.5
Bristol-Myers Squibb	USA	153.00	24.4	9.43
Eli Lilly & Company	USA	347.60	53	38.2
Roche	Switzerland	262.60	18.9	11
GlaxoSmithKline (GSK)	United Kingdom	70.90	3.93	7.23
Bayer	Germany	50.80	11.5	5.83
Novartis AG	Switzerland	218.00	28.3	10.9
Takeda Pharmaceutical	Japan	48.50	23.9	8.54
Cipla	India	10.50	32.7	17.8
Average			24.03	12.88
Standard Deviation			11.88	8.93
Average + Standard deviation			35.91	21.81
Average - Standard deviation			12.15	3.96
Average excluding outliers			24.43	10.35

Appendix I. Peer Group P/E & EV/EBITDA

Relative Valuation		
(\$ millions)	P/E Valuation	EV/EBITDA Valuation
Peer group Multiple	24.43	10.35
Pfizer Inc: Net income	31,366	-
Pfizer Inc: EBITDA	-	42,613
Enterprise Value	-	441,172
Equity Value	766,376	415,649
# Shares outstanding in Millions	5,773	5,773
Pfizer Share price	132.75	72.00

Appendix J. Relative Valuation P/E & EV/EBITDA multiples

Top Institutional Holders

Holder	Shares	Date Reported	% Out
Vanguard Group, Inc. (The)	501,636,220	Dec 30, 2022	8.89%
Blackrock Inc.	442,868,761	Dec 30, 2022	7.85%
State Street Corporation	284,152,008	Dec 30, 2022	5.03%
Capital World Investors	256,096,804	Dec 30, 2022	4.54%
Wellington Management Group, LLP	199,329,574	Dec 30, 2022	3.53%
Geode Capital Management, LLC	109,275,578	Dec 30, 2022	1.94%
Morgan Stanley	79,499,361	Dec 30, 2022	1.41%
Charles Schwab Investment Management, Inc.	73,340,479	Dec 30, 2022	1.30%
Northern Trust Corporation	66,731,427	Dec 30, 2022	1.18%
Bank of America Corporation	62,459,891	Dec 30, 2022	1.11%

Appendix K. Top institutional holders for Pfizer

Liquidity ratios				
	2019	2020	2021	2022
Current ratio	0.88	1.35	1.40	1.22
Quick ratio	0.69	1.04	1.19	1.00
Cash ratio	0.03	0.07	0.05	0.01

Appendix L. Liquidity Ratios for Pfizer, historical years

Profitability Ratios	2019	2020	2021	2022
ROE	17%	11%	29%	33%
ROA	6%	4%	12%	16%
ROIC	6%	8%	21%	26%

Appendix L. Profitability Ratios for Pfizer, historical years