

DISCOUNTED CASH FLOW VALUATION OF PFIZER INC.

The image features a large, faint watermark of the Mahidol University logo in the background. The logo is circular, with a blue center containing a golden emblem of a traditional Thai stupa. The outer ring of the logo contains Thai text. Overlaid on this watermark is the author's name.

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**A THEMATIC PAPER SUBMITTED IN PARTIAL
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DISCOUNTED CASH FLOW VALUATION OF PFIZER INC.

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ABSTRACT

This thematic paper explores the intrinsic value of Pfizer Inc. (PFE) share price by using the discounted cash flow valuation method (DCF) to assess if a stock is overvalued or undervalued to empower investors to navigate the market more effectively. According to the DCF analysis in this paper, the implied share value of Pfizer is \$48.96 per share, which is 39% higher than the latest stock price as of November 10, 2023. This suggests that Pfizer's intrinsic value is higher than its market price, and the current price of \$29.68 per share is undervalued. Hence, the recommendation is to "BUY"

**KEY WORDS: PFIZER/ PFE/ VALUATION/ DISCOUNTED CASH FLOW VALUATION
(DCF)/ PHARMACEUTICALS**

58 pages

CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBREVIATIONS	x
CHAPTER I PFIZER EXPLORED: INSIDE THE PHARMACEUTICAL POWERHOUSE	1
1.1 Introduction to Pfizer	1
1.2 Pfizer's Ownership	2
1.3 Business Overview	2
1.3.1 Operational Segments and Revenue Streams	2
1.3.2 Global Reach and Market Diversification	4
1.3.3 Marketing Strategies and Sales Channels	5
1.4 Research, Development, and Innovation	6
1.4.1 Pfizer's R&D Dynamics	6
1.4.2 Navigating the Patent Landscape	7
1.5 Strategic Outlook	7
1.5.1 Pfizer's Strategic Vision	7
1.5.2 A Record of Growth: Financial Milestones	8
1.6 Comprehensive SWOT Analysis	9
CHAPTER II INDUSTRY ANALYSIS: MACROECONOMICS AND BENCHMARK	11
2.1 Overview of the Pharmaceutical Industry	11
2.1.1 Historical Significance and Current Landscape	11
2.1.2 R&D as a Competitive Edge	12

CONTENTS (cont.)

	Page
2.2 Key Macroeconomic Influences	14
2.2.1 Demographic Shifts	14
2.2.2 Technological Advancements	15
2.2.3 Pandemic Response and Adaptation	15
2.2.4 Changing Healthcare Behaviors	15
2.3 Economic and Market Dynamics	16
2.3.1 U.S. Economic Resilience	16
2.3.2 Population and Healthcare Consumption Trends	18
2.4 Selecting Benchmark Companies	20
CHAPTER III FINANCIAL ANALYSIS	22
3.1 Growth Analysis	22
3.1.1 Sales Revenue Growth	22
3.1.2 Research and Development Expense	24
3.1.3 Goodwill and Intangible Assets	25
3.1.4 Net Income	26
3.1.5 Earnings per Share	27
3.2 Competitor Ratios Analysis	28
3.2.1 Dupont Analysis	29
CHAPTER IV VALUATION - DISCOUNTED CASH FLOW METHOD	31
4.1 Free Cash Flow to Firm Projection	31
4.1.1 EBIT Projection	32
4.1.2 Depreciation and Amortization	36
4.1.3 Capital Expenditure	37
4.1.4 Change in Working Capital	37
4.1.5 FCFE Projection	38
4.2 WACC and Terminal Growth Rate	39
4.2.1 Weighted Average Cost of Capital (WACC)	39
4.2.2 Terminal Growth Rate	43

CONTENTS (cont.)

	Page
4.3 Discounting Cash Flows	43
4.3.1 Finding Present Value of FCFF	43
4.3.2 Implied Share Price	44
4.3.3 Sensitivity Analysis	45
4.4 Valuation Recommendation	47
CHAPTER V INVESTMENT RISKS	49
5.1 Business Risk	49
5.1.1 R&D Risk	49
5.1.2 Patent Risk	50
5.1.3 Cybersecurity Risk	50
5.2 Market Risk.	50
5.2.1 Outbreak Risks	50
5.2.2 Competitor and Counterfeit Risk	50
5.3 Geographical & Regulatory Risk	50
5.4 Financial Risk	51
5.4.1 Foreign Exchange Risk	51
5.4.2 Interest Rate Risk	51
CHAPTER VI CONCLUSIONS	52
REFERENCES	55
BIOGRAPHY	58

LIST OF TABLES

Table	Page
3.1 Pfizer's Sales Revenue and CAGR Before and During the Pandemic	23
3.2 Pfizer's R&D Expense CAGR Before and During the Pandemic	24
3.3 Goodwill and Intangible Assets CAGR Before and During the Pandemic	26
3.4 Pfizer's Net Income CAGR Before and During the Pandemic	27
3.5 Pfizer and its Competitors Dupont Analysis	30
4.1 Pfizer's Revenue Breakdown 2017-2022	32
4.2 Pfizer's Revenue 5-Year Projection	34
4.3 Pfizer's COGS and Operating Expense 5-Year Projection	35
4.4 EBIT Calculation with 5-year projection	36
4.5 Pfizer's CAPEX, Depreciation, and Amortization with 5-year Projection	36
4.6 Pfizer's Change in Net Working Capital with 5-year projection	38
4.7 Pfizer's FCFF 5-year projection	38
4.8 Pfizer's Capital Structure	40
4.9 Pfizer's Cost of Debt	41
4.10 Pfizer's Cost of Debt	42
4.11 Pfizer's WACC Calculation	42
4.12 Present Value of Free Cash Flow to Firm	43
4.13 Sensitivity of WACC and Terminal Growth Rate to Implied Share Price	46

LIST OF FIGURES

Figure	Page
1.1 Pfizer's Commercial Operation and Revenue Contribution	3
1.2 Revenues by Country as Percentage of Total Revenue	4
1.3 Discovery Projects Pipeline 2022	6
1.4 2022 Total Revenues	8
1.5 Pfizer's 2022 Cash Flow from Operations	9
1.6 Pfizer's SWOT Analysis	10
2.1 Pharmaceutical Market: Worldwide Revenue 2001-2022	12
2.2 Research and Development Expenditure: U.S. Pharmaceutical Industry 1995-2022	13
2.3 Ranking of Industrial Sectors by Overall Sector R&D Intensity	13
2.4 Top Pharmaceutical Companies Based on Their Absolute R&D Spending Levels In 2022	14
2.5 GDP growth (annual %) - United States	16
2.6 The U.S. GDP per Capita	17
2.7 Breakdown of the world pharmaceutical market - 2022 Sales	17
2.8 Global Pharma Market Share by Top Companies 2022	18
2.9 The U.S. Population growth rate 1950-2023	19
2.10 Exporters and Importers of Pharmaceutical Products	19
3.1 Pfizer's Sales Growth 2013-2022	23
3.2 Pfizer's R&D Expense Growth 2013-2022	24
3.3 Pfizer's Goodwill and Intangible Assets Growth 2013-2022	25
3.4 Pfizer's Net Income Growth 2013-2022	26
3.5 Pfizer's EPS Growth 2013-2022	27
3.6 Pfizer and its Competitor Ratios Analysis	28
4.1 Pfizer's Anticipated Long-Term Growth Excluding COVID-19 Products	33
4.2 Pfizer's 2023 Financial Guidance: Other Components	34

LIST OF FIGURES (cont.)

Figure	Page
4.3 Implied Share Price of Pfizer	45
4.4 Sensitivity Graph of WACC and Terminal Growth Rate to Implied Share Price	46
4.5 Wall Street Analyst Estimation on Pfizer's Share Price	47
5.1 Risk Matrix	49
6.1 Expected 17 billion in Loss of Exclusivity Revenue Decline	52
6.2 Pfizer's Target Price by Analysts	53
6.3 Implied Share Price from DCF Valuation	53

LIST OF ABBREVIATIONS

CAGR	Compound Growth Rate
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
COGS	Cost of Goods Sold
COVID-19	Coronavirus disease starting in 2019
D&A	Depreciation and Amortization
DCF	Discounted Cash Flow
EBIT	Earnings Before Interest and Taxes
FCFF	Free Cash Flow to the Firm
GBP	Great Britain Pound
GPD	Global Product Development Organization
MRP	Market Risk Premium
NOPAT	Net Operating Profit After Taxes
NWC	Net Working Capital
PC1	Pfizer CentreOne
R&D	Research and Development
SG&A	Selling, General, and Administrative
USD	U.S. Dollar
WACC	Weighted Average Cost of Capital
WRDM	Worldwide Research, Development, and Medical Organization

CHAPTER I

PFIZER EXPLORED: INSIDE THE PHARMACEUTICAL POWERHOUSE

In this first chapter, we provide a detailed overview of Pfizer, tracing its background and examining its current stature as a key pharmaceutical industry leader. This chapter covers Pfizer's introduction (1.1), its company ownership details (1.2), a deep dive into its diverse business operations (1.3), Research and Development (R&D) pillar (1.4), strategic vision and financial performance (1.5), and a SWOT analysis (1.6), offering a complete view of its position and influence in the worldwide health sector.

1.1 Introduction to Pfizer

Pfizer's journey from a 19th-century chemical company to a 21st-century pharmaceutical leader reflects its dedication to healthcare innovation and global reach (Pfizer, 2023). From pioneering penicillin production during World War II to developing life-changing medications like Viagra, Pfizer has consistently been at the forefront of medical breakthroughs.

Today, as a global entity addressing a range of health concerns—from cardiovascular diseases to cancer—Pfizer stands as an example of scientific excellence and patient-centered care (Hoover's Inc., a Dun & Bradstreet Company, 2023). With operations in over 185 countries, Pfizer's commitment extends beyond treatment development to ensure that these advances are accessible to patients around the world, striving to create a healthier future for all.

1.2 Pfizer's Ownership

Pfizer's ownership is characterized by a significant institutional presence, with entities like the Vanguard Group Inc. holding a substantial portion of its shares—70.99% of the company's equity is in the hands of institutional investors, a prominent figure in the pharmaceutical industry (Bloomberg, 2023). The remaining 29.01% is owned by individual shareholders, reflecting a balanced investor base (Bloomberg, 2023). This structure underlines the confidence of professional investors in Pfizer's market leadership and strategic direction.

1.3 Business Overview

This section provides an in-depth look at Pfizer's various business segments, how they contribute to the company's revenue, and the company's marketing strategies.

1.3.1 Operational Segments and Revenue Streams

After the organizational changes in the third quarter of 2022, Pfizer's commercial operations are strategically divided into two main segments, Biopharma and Pfizer CentreOne as shown in Figure 1.1. Each plays a significant role in the company's revenue generation and market positioning.

1.3.1.1 Biopharma

Biopharma, the primary segment, accounts for approximately 98% of Pfizer's total revenue, underscoring its dominance in the company's portfolio. Biopharma focuses on science-based medicines and serves three key customer groups: primary care, specialty care, and oncology (Pfizer, 2023).

- **Primary Care:** This group includes a diverse range of products such as internal medicine, innovative vaccines, and treatments for COVID-19. Pfizer is also exploring future potential in mRNA and antiviral domains, anticipating growth in these areas.
- **Specialty Care:** Focused on targeted treatments, the products emphasis on inflammation and immunology, rare diseases, and hospital care solutions.

- **Oncology:** A critical component of Pfizer's portfolio, this group involves a set of oncology products, emphasizing Pfizer's commitment to cancer treatment and research.

1.3.1.2 Pfizer CentreOne (PC1) and Other Business Activities

PC1, the second operational segment, contributes around 2% to Pfizer's total revenue. As a global contract development and manufacturing organization, PC1 specializes in producing specialty active pharmaceutical ingredients. This segment, while smaller in revenue contribution, plays a key role in supporting Pfizer's broader product range and supply chain.

In addition to these core segments, Pfizer's operational strategy includes significant R&D investments managed by the Worldwide Research, Development, and Medical (WRDM) organization (Pfizer, 2023). The organization provides initial research projects for the Biopharma portfolio until proof-of-concept, at which point they transition to the Global Product Development (GPD) organization for clinical and commercial development (Pfizer, 2023). These investments are important for the continuous development of new and innovative treatments, maintaining Pfizer's competitive edge in the pharmaceutical industry.

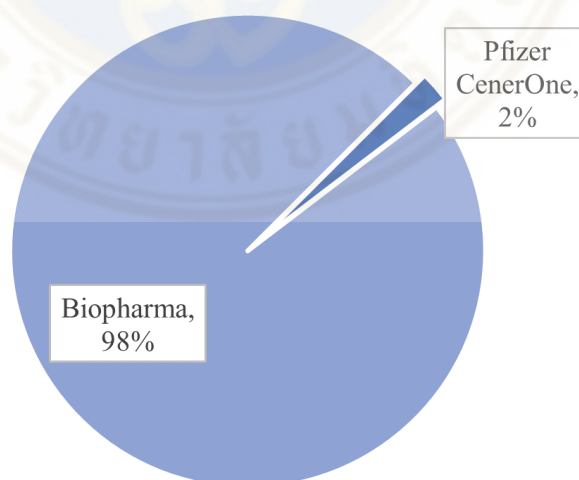


Figure 1.1 Pfizer's Commercial Operation and Revenue Contribution

Source: From 2022 Form 10-K by Pfizer, 2023, p.32

1.3.2 Global Reach and Market Diversification

Pfizer's global strategy is characterized by an expansive and strategic diversification, with the U.S. remaining the predominant market, contributing 42% to total revenue in 2022, as shown in Figure 1.2. The company's operations expand across various economic landscapes, with emerging and developed markets each playing a pivotal role in the revenue structure.

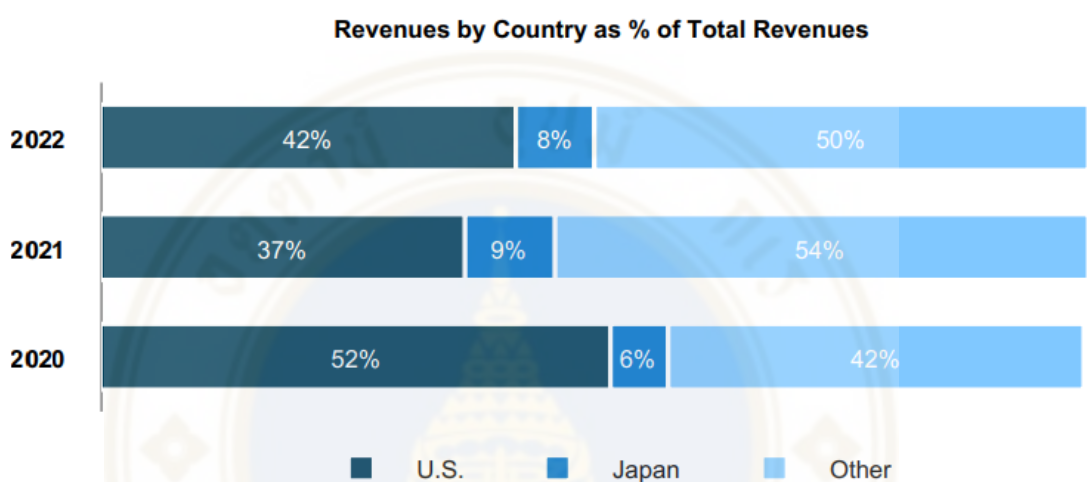


Figure 1.2 Revenues by Country as Percentage of Total Revenue

Source: From 2022 Form 10-K by Pfizer, 2023, p.6

Emerging Markets: Pfizer has strategically expanded into emerging markets across Asia, Latin America, Eastern and Central Europe, the Middle East, Turkey, and Africa. Collectively, these regions account for a significant slice of revenue, indicative of Pfizer's ability to leverage growth opportunities in areas experiencing rapid economic development.

Developed European Market: With over 20% revenue contribution (Pfizer, 2023), developed European markets, including Western Europe, Scandinavia, and Finland, remain essential to Pfizer's international portfolio, benefiting from the company's strong brand presence and established healthcare infrastructure.

Broader Developed Countries: Japan, Canada, South Korea, Australia, and New Zealand contribute significantly to Pfizer's revenue, making up approximately 15%

of the revenue (Hoover's Inc., a Dun & Bradstreet Company, 2023). These countries provide stable markets for Pfizer's advanced and specialized healthcare products.

Pfizer's presence in more than 185 countries and territories proves their global presence. Notably, Figure 1.2 shows a shift in revenue distribution with a decrease in the U.S. revenue share from 52% in 2020 to 42% in 2022, while the contributions from Japan and other countries have remained stable or increased, highlighting the importance of Pfizer's international market strategies. The company's adaptability to treatments and various regions, combined with its strategic partnerships, strengthens its global distribution of vaccines and treatments, and ensures a strong international market presence.

1.3.3 Marketing Strategies and Sales Channels

Pfizer's marketing strategies and sales channels are vital to its global success as they demonstrate a tailored approach to different market needs. The company has created a direct sales network that targets key healthcare providers, including hospitals, clinics, and government agencies.

Targeted U.S. Distribution: In the United States, Pfizer's distribution strategy is robust, with the company serving as a primary vaccine provider to the federal government, the Centers for Disease Control and Prevention (CDC), pharmacies, and healthcare providers (Pfizer, 2023). These channels are vital for ensuring widespread access to essential medications.

Global Sales Reach: Internationally, Pfizer approaches both governmental and private sectors. Strategic partnerships with leading wholesale distributors like McKesson, Cardinal Health, and AmerisourceBergen are pivotal, accounting for 20% of their revenue (Hoover's Inc., a Dun & Bradstreet Company, 2023). These relationships underline the importance of a strong distribution network for Pfizer's global operations.

Advertising and Public Engagement: Pfizer's commitment to public health education is reflected in its substantial advertising budget, which has seen a consistent increase from \$1.8 billion in 2020 to approximately \$2.8 billion in 2022 (Pfizer, 2023). These investments in advertising show Pfizer's strategy to not only promote its products but also to educate the public on health issues, disease prevention, and wellness.

Healthcare Collaboration and Digital Innovation in Marketing: To enhance healthcare affordability, Pfizer collaborates with payers and insurers, integrating its

products into healthcare solutions that are financially accessible. During the COVID-19 pandemic, the company demonstrated agility by using digital platforms to engage with healthcare professionals and consumers, ensuring the continuous flow of critical health information (Pfizer, 2023).

1.4 Research, Development, and Innovation

This section explores Pfizer's R&D activities, highlighting the strategic role of innovation in sustaining their competitive edge and addressing future healthcare challenges.

1.4.1 Pfizer's R&D Dynamics

Pfizer's R&D division harnesses advanced science and technology to not only create new therapies but also enhance existing treatments and identify novel applications for established drugs (Pfizer, 2023). They collaborate with universities, biotech companies, and other firms, sharing knowledge and resources to foster an ecosystem where knowledge and resources are pooled to accelerate product development. Pfizer structures R&D operations into various units—WRDM, which is responsible for early-stage development, and GPD, which manages clinical trials and regulatory submissions—facilitating a whole transition from laboratory insights to market-ready solutions. The company manages R&D operations globally, adapting resource allocation to meet the demands of their expansive project portfolio, which includes 110 diverse R&D initiatives as of January 2023, as illustrated in Figure 1.3.



Figure 1.3 Discovery Projects Pipeline 2022

Source: From 2022 Form 10-K by Pfizer, 2023, p.5

This extensive project array reflects their commitment to developing future medications despite drug discovery and development's lengthy, costly, and unpredictable nature.

1.4.2 Navigating the Patent Landscape

Pfizer's intellectual property rights are their business's foundation, including patents covering various products, formulations, uses, and manufacturing processes. The duration of these patents is varied by several factors, including the initial filing date, the patent laws of each country, and regulatory exclusivity that often accompanies new drug approvals (Pfizer, 2023). Pfizer's patent portfolio in 2023 includes nineteen critical product patents, such as the patent for the COVID-19 vaccine, which are integral to the company's revenue, given the competitive landscape they operate in (Pfizer, 2023).

However, the pharmaceutical industry is marked by the perpetual risk of patent expiration. This reality could lead to an increase in cheaper generic and biosimilar products, potentially weakening Pfizer's market share and revenue. In response to these challenges, Pfizer actively engages in defending its patent rights against infringement. However, despite these efforts, Pfizer's revenues remain vulnerable as it has experienced patent expiration, and they expect more in the upcoming years (Pfizer, 2023).

1.5 Strategic Outlook

This section highlights Pfizer's principal business strategies, including its focus on research, patient-centric models, and market expansion.

1.5.1 Pfizer's Strategic Vision

Pfizer's strategic vision is committed to enhancing its product pipeline and maximizing the value of its existing products through sustained R&D efforts (Pfizer, 2023). The company's guiding principle is to broaden the accessibility and affordability of its medical solutions globally, prioritizing fair distribution. By forging partnerships across the healthcare ecosystem, Pfizer aims to improve healthcare delivery and access.

Innovating for the Future: Pfizer put significant investment into R&D, fostering a culture of innovation and creating strategic alliances with leading scientists (Pfizer, 2023).

Expanding Horizons: The company's approach to diversification mitigates market-specific risks and ensures revenue stability. Global expansion, particularly into emerging markets, is a key aspect of Pfizer's growth strategy.

Collaboration for Advancement: Strategic partnerships strengthen Pfizer's R&D pipeline, speeding up the development and launch of breakthrough treatments (Pfizer, 2023).

Focus on Patients: Central to Pfizer's philosophy is a patient-centric approach, ensuring treatments not only adhere to regulatory standards but also meet patient needs.

1.5.2 A Record of Growth: Financial Milestones

This section looks at a snapshot of Pfizer's recent financial performance and emphasizing revenue growth and operational achievements.

1.5.2.1 Total Revenue Growth

Pfizer's financial track has been marked by strong growth, with the total revenue climbing from \$41.7 billion in 2020 to \$100.3 billion in 2022 (Pfizer, 2023). This upward trend, as illustrated in Figure 1.4, reflects a substantial operational increase, driven by the success of COVID-19 treatments like Paxlovid medicine and the Comirnaty vaccine.

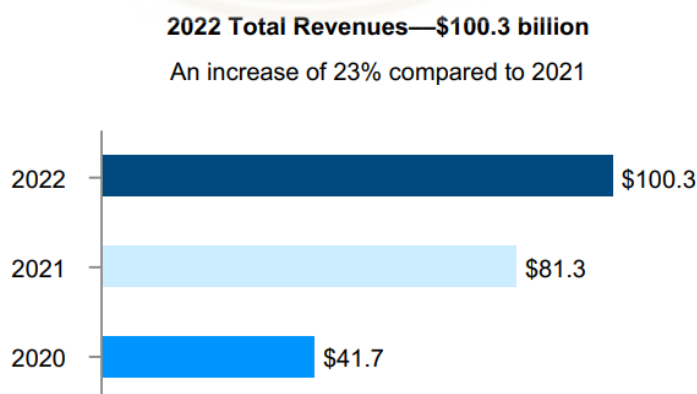


Figure 1.4 2022 Total Revenues

Source: From 2022 Form 10-K by Pfizer, 2023, p.26

1.5.2.2 Net Cash Flow from Operations

Pfizer's financial strength is not only in its revenue growth but also in its operational cash flow. Despite a 10% decrease from 2021, the 2022 net cash flow from operations remained strong at \$29.3 billion, down from \$32.6 billion the previous year but still significantly higher than the \$14.4 billion reported in 2020 (Pfizer, 2023). This performance, as depicted in Figure 1.5, reflects Pfizer's operational efficiency and ability to generate cash despite market fluctuations.

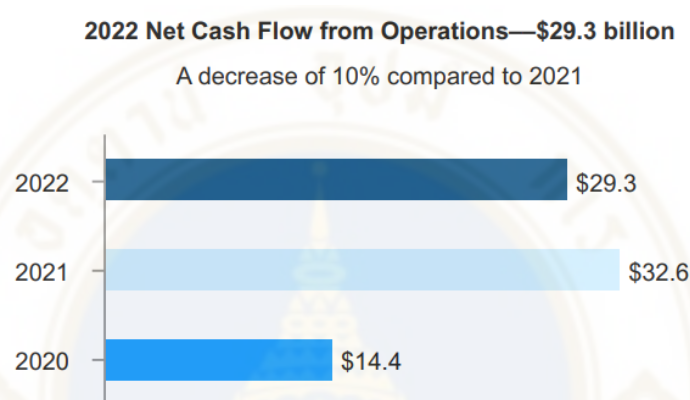


Figure 1.5 Pfizer's 2022 Cash Flow from Operations

Source: From 2022 Form 10-K by Pfizer, 2023, p.26

1.6 Comprehensive SWOT Analysis

In this section, a SWOT analysis is conducted to assess Pfizer's strengths, weaknesses, opportunities, and threats in the current pharmaceutical landscape.

"Innovative Research" and "Brand Recognition and Global Presence" are strengths that speak to Pfizer's R&D expertise and its extensive market reach (Pfizer, 2023).

Weaknesses such as "Dependency on Patents" and "Regulatory Challenges" highlight potential areas of vulnerability (Pfizer, 2023).

Opportunities like "Emerging Markets" and "Technological Advancements" indicate areas for growth and innovation.

Threats, including "Generic Competition" and "Market Competition", are challenges Pfizer must overcome in the pharmaceutical industry.

Strengths	Weaknesses
<ul style="list-style-type: none"> • Innovative Research • Brand Recognition and Global Presence 	<ul style="list-style-type: none"> • Dependency on Patents • Regulatory Challenges • R&D Risks
Opportunities	Threats
<ul style="list-style-type: none"> • Emerging Markets • Technological Advancements • Strategic Partnerships • Focus on Rare Diseases 	<ul style="list-style-type: none"> • Generic Competition • Market Competition • Regulatory Changes

Figure 1.6 Pfizer's SWOT Analysis

Source: Own Elaborate



CHAPTER II

INDUSTRY ANALYSIS: MACROECONOMICS AND BENCHMARK

This chapter offers an insight into the macroeconomic factors that shape the pharmaceutical industry and their influence on Pfizer's strategies. It will begin with a historical perspective, illustrating how the industry has evolved and highlighting Pfizer's prominence in the current market, substantiated by significant R&D investment figures (2.1). It then explores the broader economic trends, demographic shifts, and technological advances that have shaped Pfizer's competitive environment, leading to an assessment of key benchmarks against industry peers (2.2 and 2.3).

2.1 Overview of the Pharmaceutical Industry

This section will go through the pharmaceutical industry's journey from its essential role during historical conflicts to its status as an example of innovation, highlighting the industry's market capitalization to underscore its economic significance.

2.1.1 Historical Significance and Current Landscape

Growing in prominence from the American Civil War to the world wars, the pharmaceutical industry has been an integral part of modern society since the 19th century and advancing through intense competition and significant research and development efforts. These advancements have not only improved global health but have also created a dynamic business landscape (Pharmaphorum, 2023).

Today, the industry stands on the frontier of innovation, diving into new territory like genomics and advanced cancer treatments, underscoring its critical role in our lives. In 2022, the industry's market capitalization reached \$1.48 trillion (Figure 2.1), indicating its impact and importance.

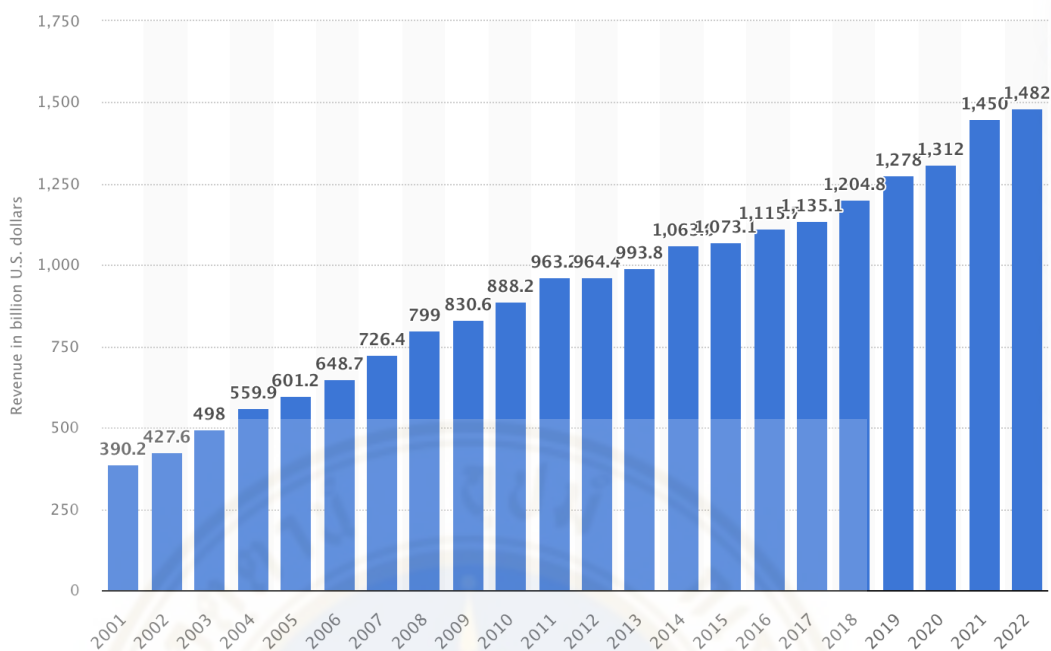


Figure 2.1 Pharmaceutical Market: Worldwide Revenue 2001-2022

Source: From Statista “Revenue of the worldwide pharmaceutical market from 2001 to 2022 (in billion U.S. dollars)” by Matej Mikulic, 2023

2.1.2 R&D as a Competitive Edge

R&D is considered the lifeblood of the pharmaceutical sector, fueling competitive advantage through innovation, product development, and differentiation. U.S. pharmaceutical firms have steadily increased their R&D investment, from \$48.6 billion in 2011 to over \$100 billion by 2022 (Figure 2.2), reflecting the sector's commitment to progress.

Moreover, the pharmaceutical industry leads in R&D investment compared to other sectors (Figure 2.3), with Pfizer ranking among the top global pharmaceutical companies in R&D spending (Figure 2.4), cementing its position as an industry leader in innovation.

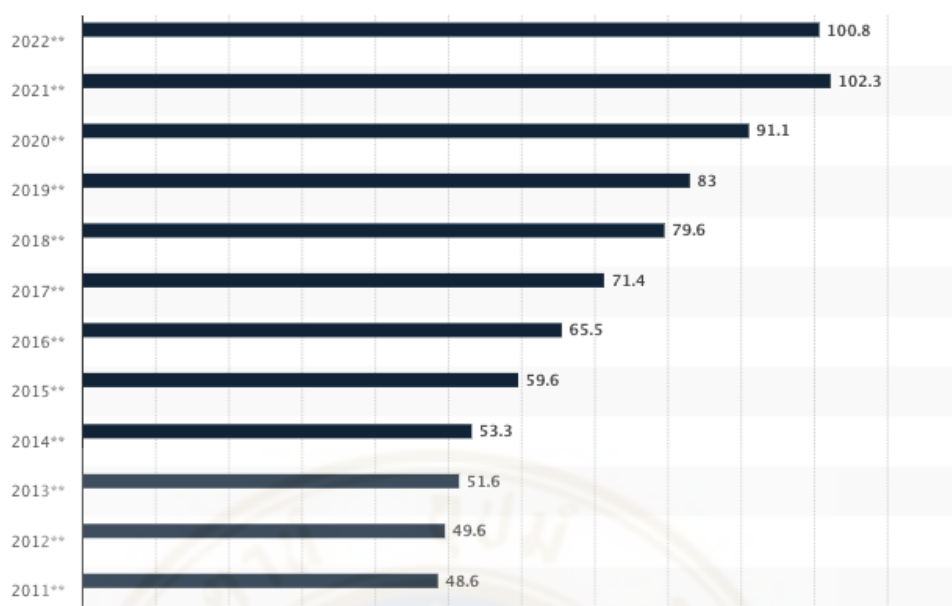


Figure 2.2 Research and Development Expenditure: U.S. Pharmaceutical Industry 1995-2022

Source: From Statista “R&D Expenditure of Total U.S. Pharmaceutical Industry From 1995 To 2022 (In Billion U.S. Dollars)” by Matej Mikulic, 2023

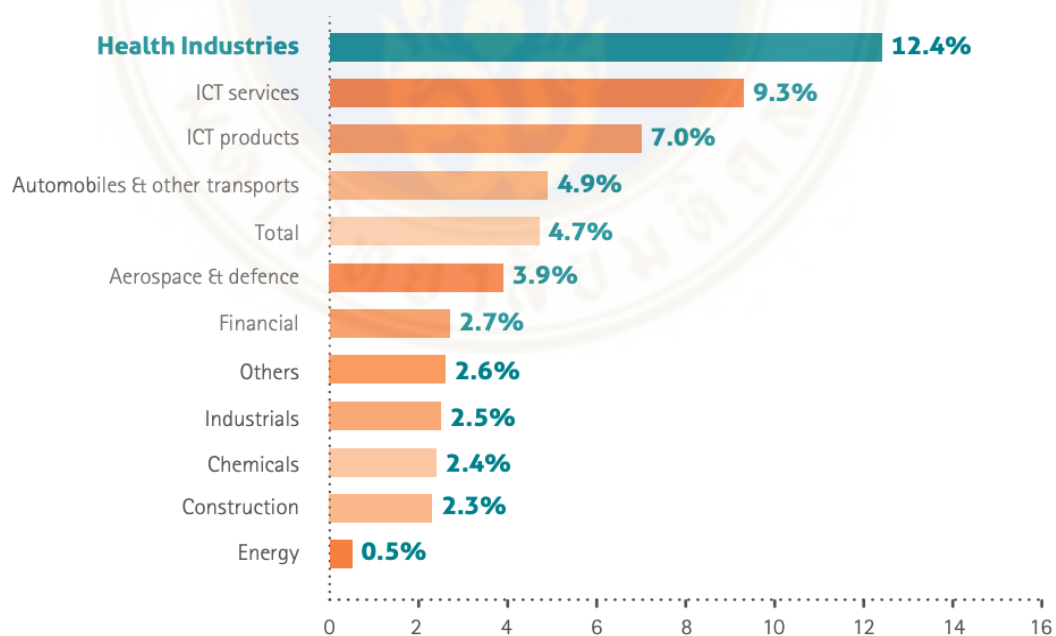


Figure 2.3 Ranking of Industrial Sectors by Overall Sector R&D Intensity

Source: From EFPIA report “The pharmaceutical Industry in Figures - Key Data 2023”, 2023, p.10

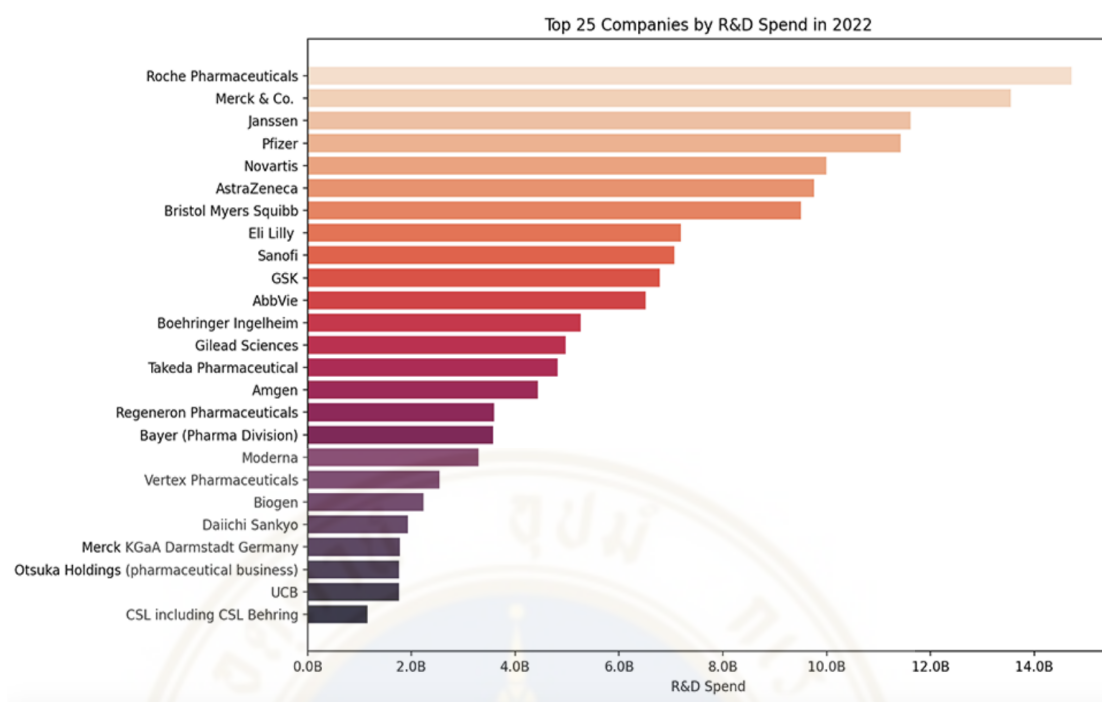


Figure 2.4 Top Pharmaceutical Companies Based on Their Absolute R&D Spending Levels In 2022

Source: From Drug Discovery & Development “The big spenders: The top 25 pharma companies in R&D investments” by Brian Buntz, 2023

2.2 Key Macroeconomic Influences

This section will explore the external factors that significantly affect industry’s growth and opportunity.

2.2.1 Demographic Shifts

The global population is aging at an unprecedented rate, leading to substantial changes in pharmaceutical demands. With an increasing need for medications directed toward older individuals, pharmaceutical companies have found opportunities to explore new markets and develop drugs specifically designed for age-related and chronic conditions like Alzheimer's, Parkinson's disease, and osteoarthritis (WHO, 2022).

2.2.2 Technological Advancements

The pharmaceutical sector is a key driver of innovation in healthcare, channeling significant resources into research and development, especially in genetics and biotechnology. R&D is a critical investment for large pharmaceutical companies to maintain their competitive edge (Pfizer, 2023). Such investments bring the betterment of healthcare for the people in terms of personalized medicine and in the frontier of cancer. However, these advancements come with high costs and inherent risks. As the industry progresses, pharmaceutical companies face the dual challenge of funding intensive R&D and navigating the competitive pressures from emerging biotech and genomics firms that are introducing alternative medical solutions.

2.2.3 Pandemic Response and Adaptation

There have been several pandemics throughout history from black death and Spanish flu to HIV, SARS and recently COVID-19. In each pandemic wave, pharmaceutical companies are on the front lines. However, these periods often witness a decline in revenue growth due to economic slowdowns, as observed during the COVID-19 pandemic (Frontiers, 2023). Moreover, due to substantially high R&D cost, a pharmaceutical company's markup price for the vaccines would also be so huge that it becomes the subject of controversy and is questioned for ethics. Thus, pharmaceutical companies must be proactive and responsible during these periods to contribute to public welfare and maintain their financial performance and ethical standing.

2.2.4 Changing Healthcare Behaviors

The rise in chronic diseases due to sedentary lifestyles and poor dietary habits has boosted the demand for medications to treat conditions like obesity, diabetes, and cardiovascular disorders. Pharmaceutical companies are responding by innovating in these areas. Additionally, the focus on preventive medicine and health awareness has driven demand for lifestyle-related health products and medications, leading pharmaceutical companies to develop products like vitamins, supplements, and vaccines to meet this need (WHO, 2022).

2.3 Economic and Market Dynamics

This section will review the stability of the U.S. economy and its influence on the pharmaceutical sector, providing background for Pfizer's financial health.

2.3.1 U.S. Economic Resilience

The U.S. has generally maintained a stable Gross Domestic Product (GDP) growth rate, with only a minor dip during the COVID-19 pandemic (Figure 2.5). This resilience mirrors the pharmaceutical industry's performance and the swift, coordinated efforts of major pharmaceutical companies worldwide in addressing the global crisis. As of 2022, the economy has made a significant recovery, resulting in a notable increase in GDP per capita (Figure 2.6).

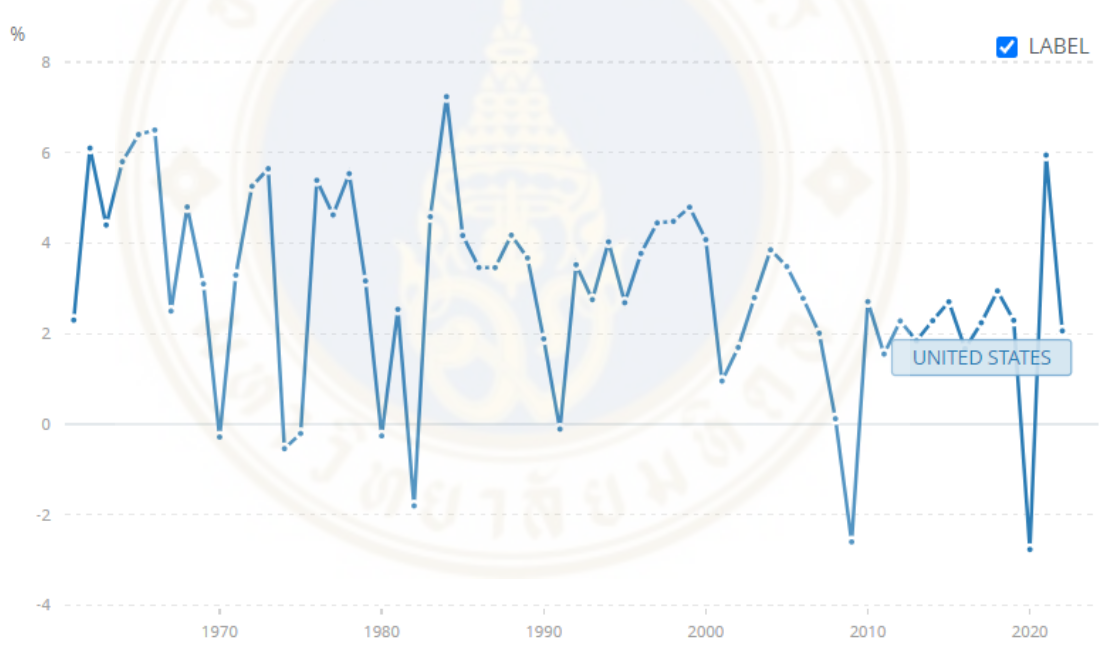


Figure 2.5 GDP growth (annual %) - United States

Source: From World Bank, “GDP growth (annual %) - United States”, 2023 (<https://data.worldbank.org/>)



Figure 2.6 The U.S. GDP per Capita

Source: From World Bank, “GDP per capita growth (annual %) - United States”, 2023
(<https://data.worldbank.org/>)

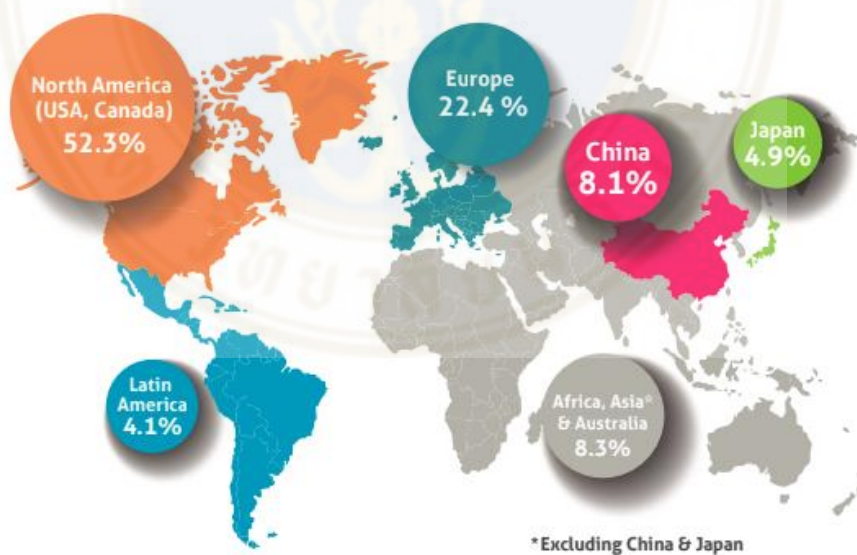


Figure 2.7 Breakdown of the world pharmaceutical market - 2022 Sales

Source: From EFPIA report “The pharmaceutical Industry in Figures - Key Data 2023”, 2023, p.14

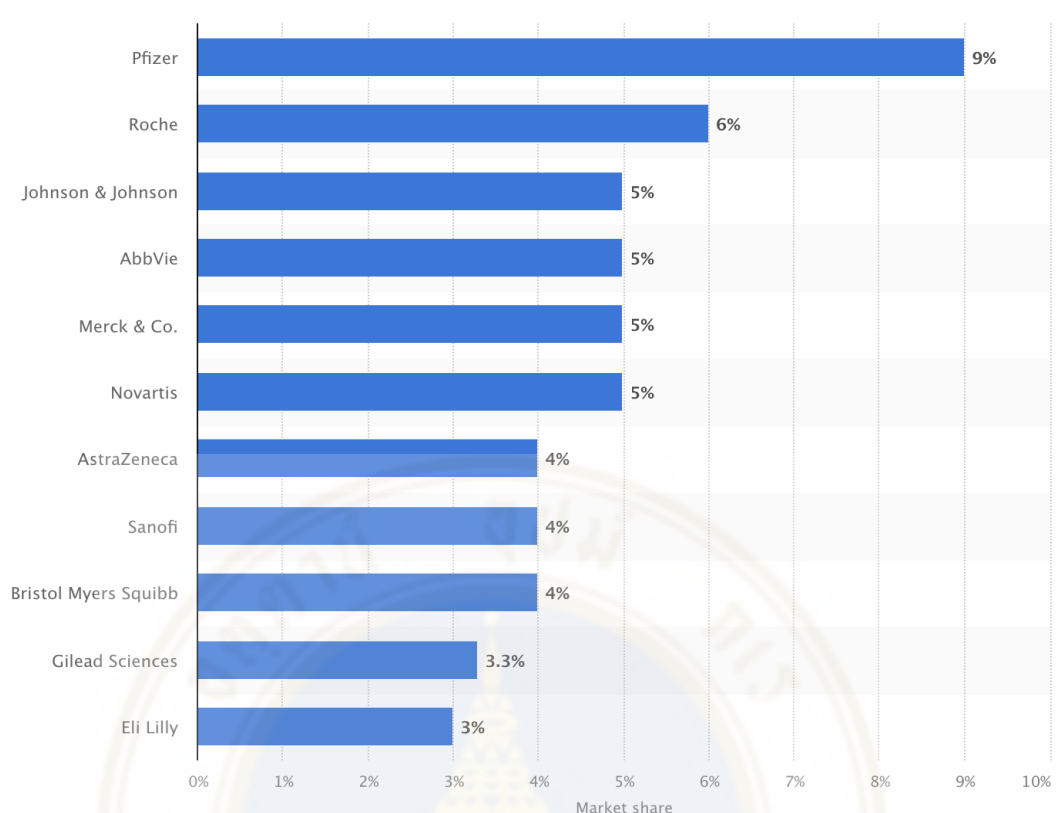


Figure 2.8 Global Pharma Market Share by Top Companies 2022

Source: From Statista “Leading pharmaceutical companies worldwide based on market share in 2022” by Matej Mikulic, 2023 (<https://www.statista.com>)

The U.S. pharmaceutical sector contributes 45% of the global share and accounts for 22% of worldwide production (Atradius, 2022). Furthermore, it reveals that as of 2022, North America constitutes 52.3% of total pharmaceutical sales (Figure 2.7). In terms of healthcare spending as a percentage of GDP, the OECD health statistics for 2022 indicate that the U.S. allocates 17.8% of its GDP to healthcare. Among them, Pfizer stands as the top global pharmaceutical company with a market share of 9% (Figure 2.8).

2.3.2 Population and Healthcare Consumption Trends

This section will examine the interplay between U.S. population growth, healthcare spending, and Pfizer's sales and marketing strategies.

Over the years, the U.S. population has shown a steady growth trend, indicating an upward trajectory in overall consumption (Figure 2.9). Simultaneously, healthcare

expenditure has also risen, reflecting an increased demand for pharmaceutical products in the market, which has been consistently on the rise. Consequently, examining the country's import and export dynamics in this context is essential.

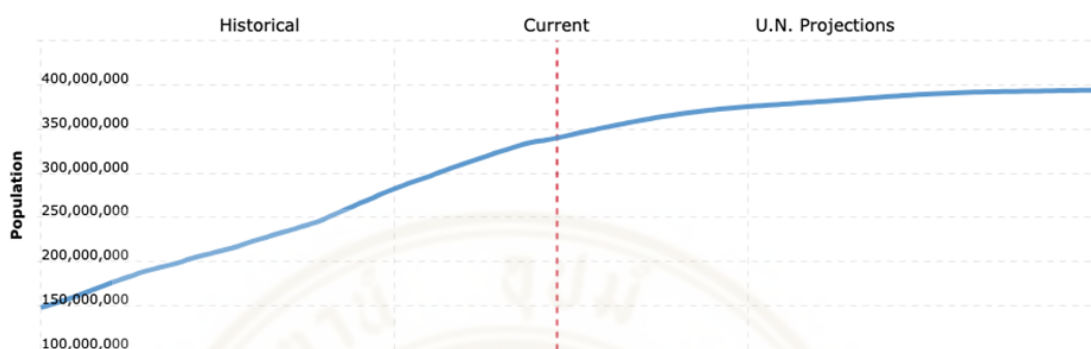


Figure 2.9 The U.S. Population growth rate 1950-2023

Source: United Nations, World Population Prospects, 2023 (<https://www.macrotrends.net>)

As depicted in Figure 2.10, the United States has held a prominent position as both an exporter and importer of pharmaceutical products globally. This phenomenon may be, in part, due to the appreciation of the USD following the post-COVID pandemic reopening. Nevertheless, the market and trade of the pharmaceutical industry have been the biggest in the U.S. compared to other countries across the globe, and the pharmaceutical companies, including Pfizer, can enjoy this benefit along the way.

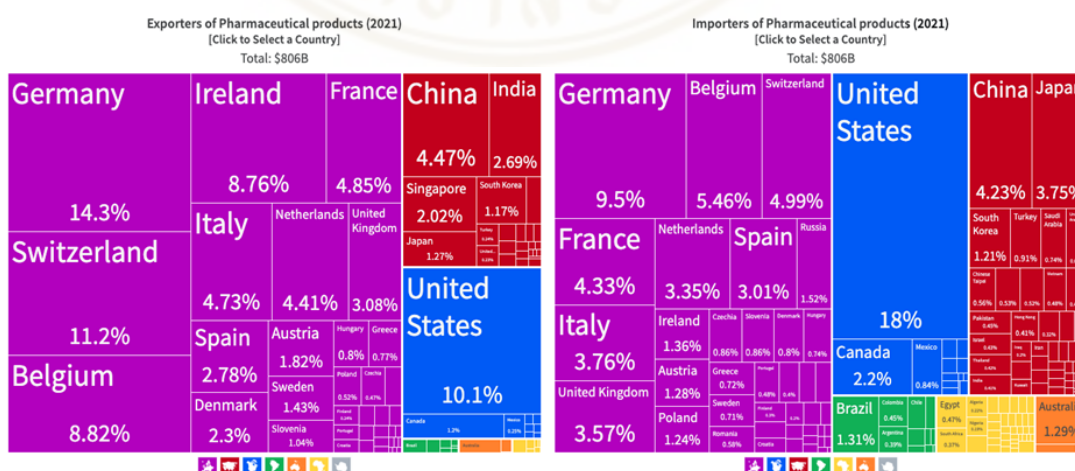


Figure 2.10 Exporters and Importers of Pharmaceutical Products

Source: From BACI HS6 REV. 1992 (1995 - 2021), 2023 (<https://oec.world/>)

2.4 Selecting Benchmark Companies

This section will justify the selection of benchmark companies based on criteria such as geographical reach and product range, which will serve as a comparative basis for evaluating Pfizer's performance.

The selection of benchmarks for Pfizer is based on the following key criteria:

1. Geographical Coverage: As Pfizer is a multinational company with outreach to almost all countries across the globe, the companies with similar geographical coverage are taken.

2. Range of Products: Pfizer's diverse product portfolio, encompassing primary care, specialty care, and oncology products, prompted the selection of benchmark companies with a wide range of offerings.

3. Company Size: Considering Pfizer's substantial market capitalization of 170 billion USD, we benchmark companies of comparable or bigger market capitalization.

4. Age: Pfizer's rich history dates back to 1849. Being one of the pioneers in the modern pharmaceutical industry led to the choice of benchmark companies with a similarly prestigious company age (Pfizer, 2023).

Based on these considerations, the benchmark companies are as follows:

- GlaxoSmithKline (GSK)

A British multinational company listed on the London Stock Exchange, GSK is known for its focus on vaccines, prescription medicines, and consumer health products. Their research areas include respiratory, HIV, vaccines, and global health improvement, with a market capitalization of 63 billion GBP.

- Sanofi (SAN)

Sanofi is listed on Euronext Paris with a market capitalization of 224.28 billion USD. They specialize in pharmaceuticals, vaccines, and healthcare solutions, with a focus on areas such as diabetes, cardiovascular diseases, oncology, and vaccines. Founded in 1896, Sanofi has a history that aligns with Pfizer's prestigious background.

- Johnson & Johnson (JNJ)

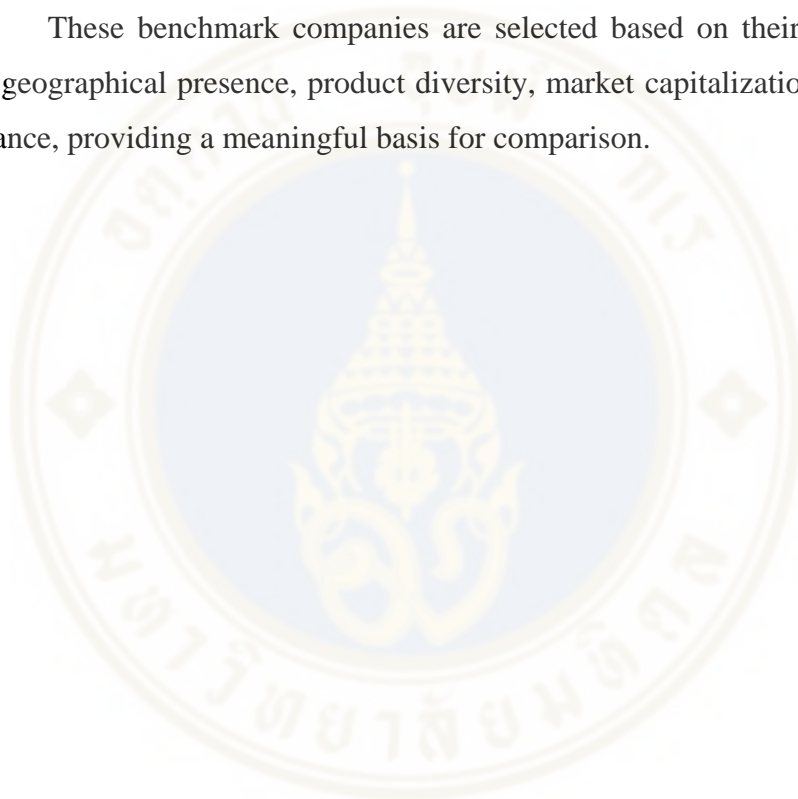
An American pharmaceutical giant listed on the New York Stock Exchange (NYSE), JNJ has a diverse portfolio ranging from pharmaceuticals and medical devices to consumer health products. Their focus includes pharmaceutical research and development,

medical innovation, and wellness. With a market capitalization of 383 billion USD and being founded back in 1886, JNJ aligns with Pfizer's historical significance in the industry.

- Roche (ROG)

Roche is a Swiss multinational healthcare company founded in 1886, specializing in pharmaceuticals and diagnostics. They are particularly renowned for their innovations in oncology, where they provide a broad range of cancer therapies and diagnostics. Roche also works in areas such as neuroscience, immunology, and infectious diseases. It is listed on the Swiss Exchange with a market cap of 383 billion USD.

These benchmark companies are selected based on their alignment with Pfizer's geographical presence, product diversity, market capitalization, and historical significance, providing a meaningful basis for comparison.



CHAPTER III

FINANCIAL ANALYSIS

This chapter will examine various financial metrics, providing insights into Pfizer's growth trends of its critical financial indicators (3.1). It also includes a comprehensive competitor analysis, comparing Pfizer's financial health with its benchmark companies to contextualize its market position and prospects (3.2). This chapter offers a clear understanding of Pfizer's financial landscape and competitive environment.

3.1 Growth Analysis

To begin our financial analysis, we start with a growth analysis of key figures extracted from the income statement and key ratios. It is also important to note Pfizer's critical role as a major pharmaceutical player globally, particularly in the context of the COVID-19 pandemic. Consequently, our subsequent analysis will separate the periods before and after the pandemic, realizing the substantial impact on Pfizer's operations.

3.1.1 Sales Revenue Growth

Pfizer revenue stream is coming from the U.S. and the rest of the world. Over the 10-year period from 2013 to 2022, a significant turning point was the COVID-19 pandemic, which happened in 2020 and marked a pivotal moment for the company. The impact of this event can be seen in the sales revenue, particularly following the successful development of the COVID-19 vaccine in 2021. On August 23, 2021, Pfizer is the first company to be approved by the U.S. FDA to produce the vaccine leading to the substantial increment in its revenue.

Before the pandemic, the international market experienced a significant decline, with a Compound Annual Growth Rate (CAGR) of -6.76% from 2013 to 2019, contrasting with the relatively stable the U.S. market. The overall CAGR also saw a decrease to -3.69%. This decline can be attributed, in part, to new entrants in the pharmaceutical

sector, lifestyle changes, and challenging conditions in 2019 and 2020, marked by the onset of the COVID-19 pandemic. During the initial pandemic year, sales revenue declined considerably as the company prioritized vaccine development (Figure 3.1)

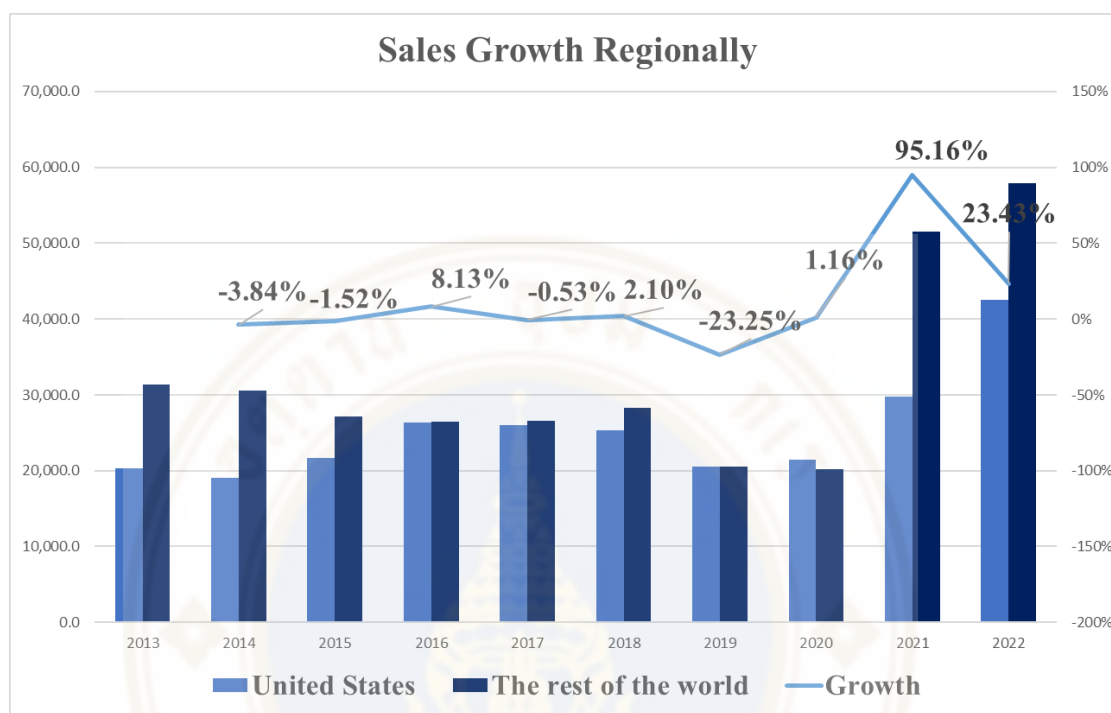


Figure 3.1 Pfizer's Sales Growth 2013-2022

Source: Own Calculation

Table 3.1 Pfizer's Sales Revenue and CAGR Before and During the Pandemic

Sales Revenue	Total CAGR	CAGR before Pandemic (2013-2019)	CAGR during Pandemic (2020-2022)
United States	8.56%	0.26%	40.70%
The rest of the world	7.06%	-6.76%	69.26%
Total	7.67%	-3.69%	55.20%

Source: Own Calculation

Fortunately, Pfizer emerged as the first company to successfully develop a COVID-19 vaccine, leading to a remarkable increase in revenue. The CAGR for these two years alone represents an impressive 55.2%. However, growth decelerated sharply in 2022, indicating a potential future decline in revenue. This suggests that when the

COVID-19 trend decreases and vaccine sales drop in the next year or two. As such, investors can anticipate a decline in overall revenue.

3.1.2 Research and Development Expense

R&D holds a pivotal role, especially in major pharmaceutical companies, serving as the frontline in looking for solutions for diseases and pathogens.

Pfizer's R&D expenses have increased, particularly in response to the pandemic in 2020. The surge in R&D expenditure continued in the subsequent two years, 2021 and 2022, as this became a crucial factor for competitive advantage in the pharmaceutical sector (Figure 3.2).

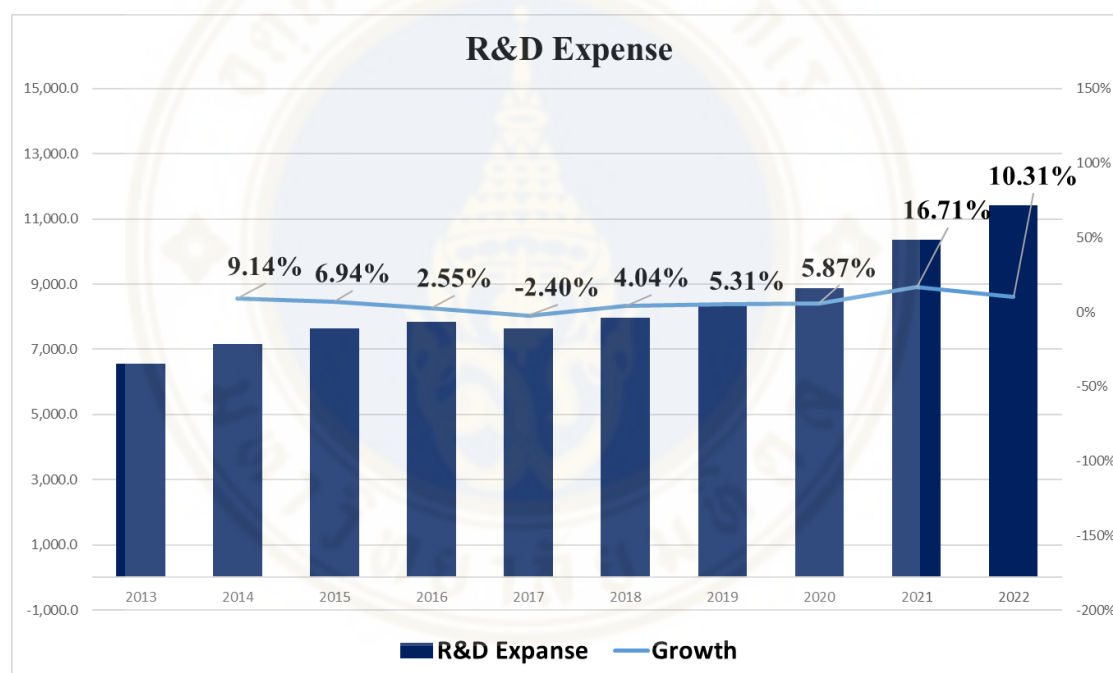


Figure 3.2 Pfizer's R&D Expense Growth 2013-2022

Source: Own Calculation

Table 3.2 Pfizer's R&D Expense CAGR Before and During the Pandemic

Total CAGR	CAGR before Pandemic (2013-2019)	CAGR during Pandemic (2020-2022)
6.38%	4.20%	13.46%

Source: Own Calculation

Before the pandemic, CAGR for R&D expenses was only 4.2% over a six-year period. However, there has been a significant increase with a CAGR of +13.46% over the past two years. This upward trend is expected to persist in the coming years, as the company needs to consistently invest in R&D to align with the increased revenue from the preceding two years. Failure to do so may negatively impact investor sentiment, leading to unfavorable outcomes for the firm.

3.1.3 Goodwill and Intangible Assets

Another crucial aspect for pharmaceutical companies is the goodwill and intangible assets from the balance sheet. This primarily includes the cost of patents, which are essential for developing medications and protecting Intellectual Property (IP). The competitive advantage of these companies lies in the innovation and development of drugs based on these IP; for those, the trend for patents is relatively stable for Pfizer.

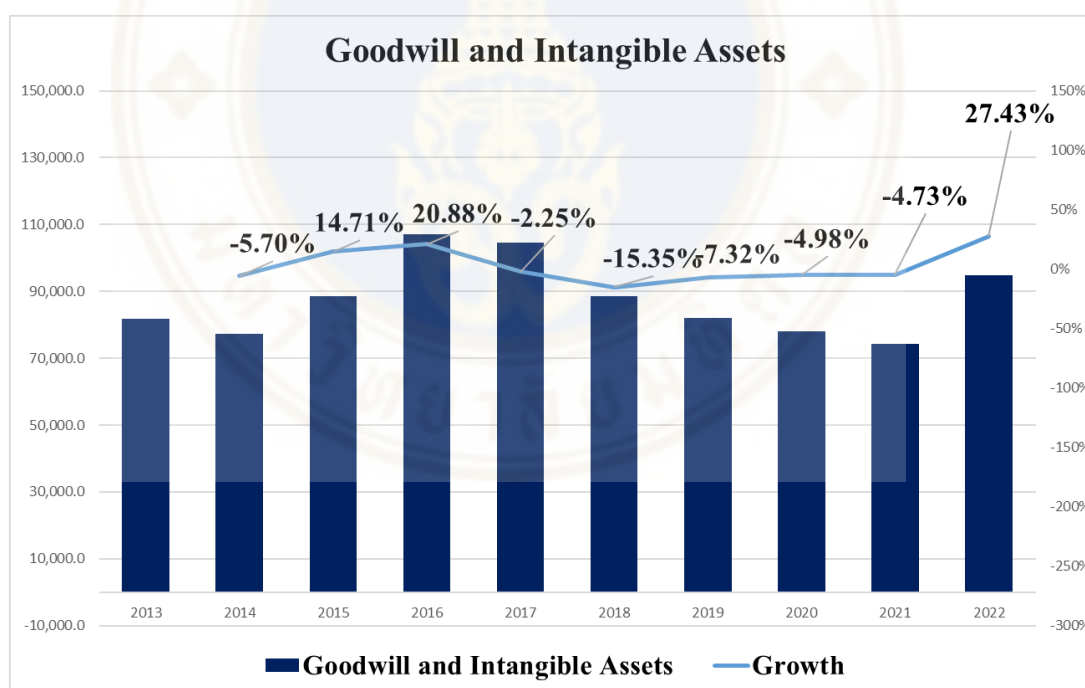


Figure 3.3 Pfizer's Goodwill and Intangible Assets Growth 2013-2022

Source: Own Calculation

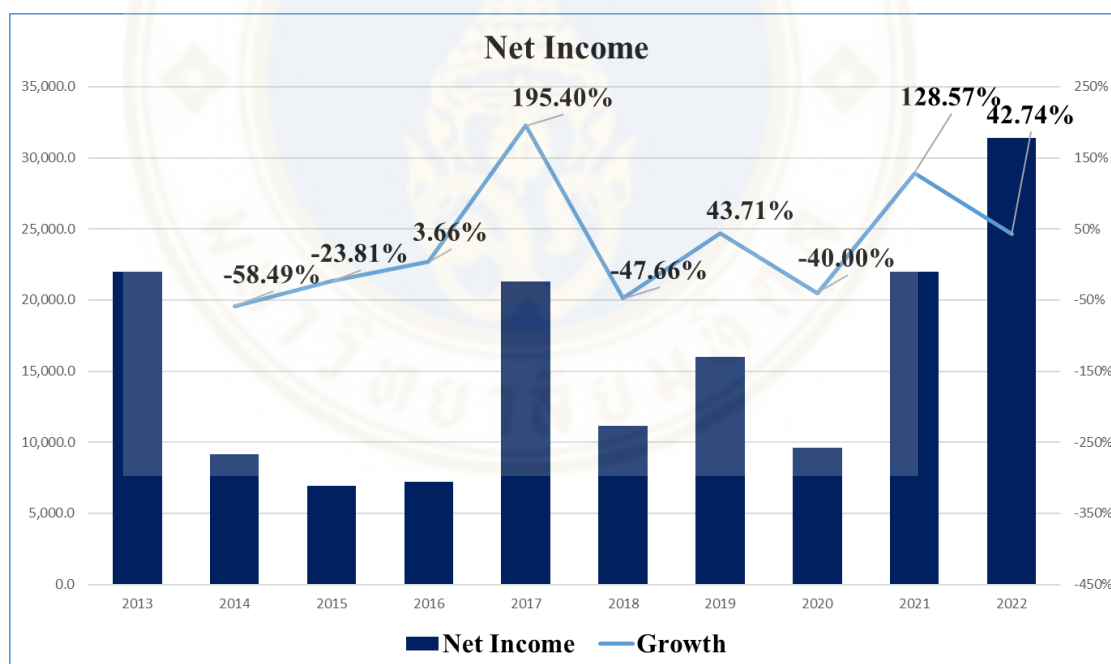
Table 3.3 Goodwill and Intangible Assets CAGR Before and During the Pandemic

Total CAGR	CAGR before Pandemic (2013-2019)	CAGR during Pandemic (2020-2022)
1.63%	0.05%	10.18%

Source: Own Calculation

3.1.4 Net Income

Prior to the pandemic, Pfizer's net income experienced a continuous decline until 2020. However, following the pandemic and the subsequent introduction of the Covid vaccine, there was a significant increase in net income. This is evident in the Compound Annual Growth Rate (CAGR) of +80.62% observed from 2020 to 2022. Before the pandemic, net income growth faced unfavorable conditions, even reaching -5.14% over the six-year period.

**Figure 3.4 Pfizer's Net Income Growth 2013-2022**

Source: Own Calculation

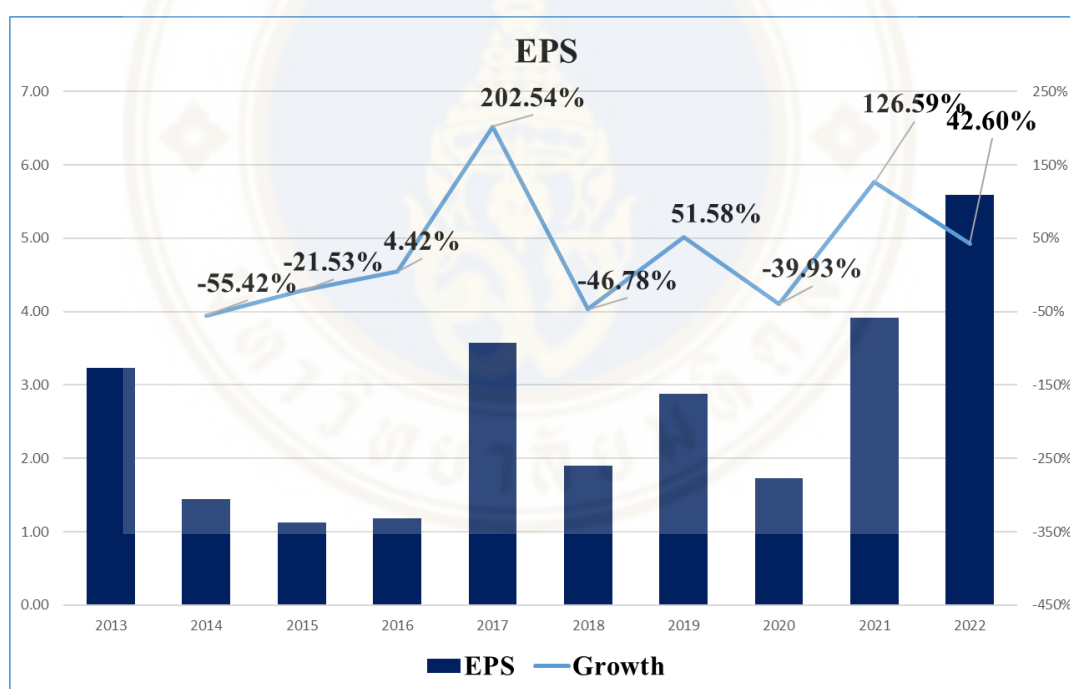
Table 3.4 Pfizer's Net Income CAGR Before and During the Pandemic

Total CAGR	CAGR before Pandemic (2013-2019)	CAGR during Pandemic (2020-2022)
4.02%	-5.14%	80.62%

Source: Own Calculation

3.1.5 Earnings per Share

As a result, the Earnings Per Share (EPS) has shown a consistent increase over the years, providing investors with positive returns during the two years of the pandemic. Looking ahead, it is crucial for the company to sustain these positive outcomes in the coming years. Failure to do so may lead to a decline in net income, aligning with the downward trend of the COVID-19 pandemic.

**Figure 3.5 Pfizer's EPS Growth 2013-2022**

Source: Own Calculation

3.2 Competitor Ratios Analysis

After examining Pfizer's growth, we continue to assess the company's ratios alongside those of its main industry competitors, as mentioned in Chapter 2.4. The selected competitors are GlaxoSmithKline plc (GSK) from the United Kingdom and Johnson & Johnson (JNJ) from the U.S.

All three competitors operate in similar product lines and have comparable market capitalization. GSK, with a market cap exceeding 63 billion GBP, focuses on healthcare product and vaccine research and development. JNJ, a pharmaceutical giant with a market cap of 383 billion USD, engages in pharmaceutical research and wellness products. Notably, all these companies experienced significant benefits and turning points due to the pandemic.

An essential ratio for pharmaceutical companies is the return on research capital which indicates how much revenue the company generates from its investment in research and development. This ratio reflects the company's productivity from R&D investments, calculated by dividing the current year's revenue by the previous year's R&D cost. Pfizer stands out among competitors, particularly in the post-pandemic years, attributed to the successful development and global commercial production of the COVID-19 vaccine.

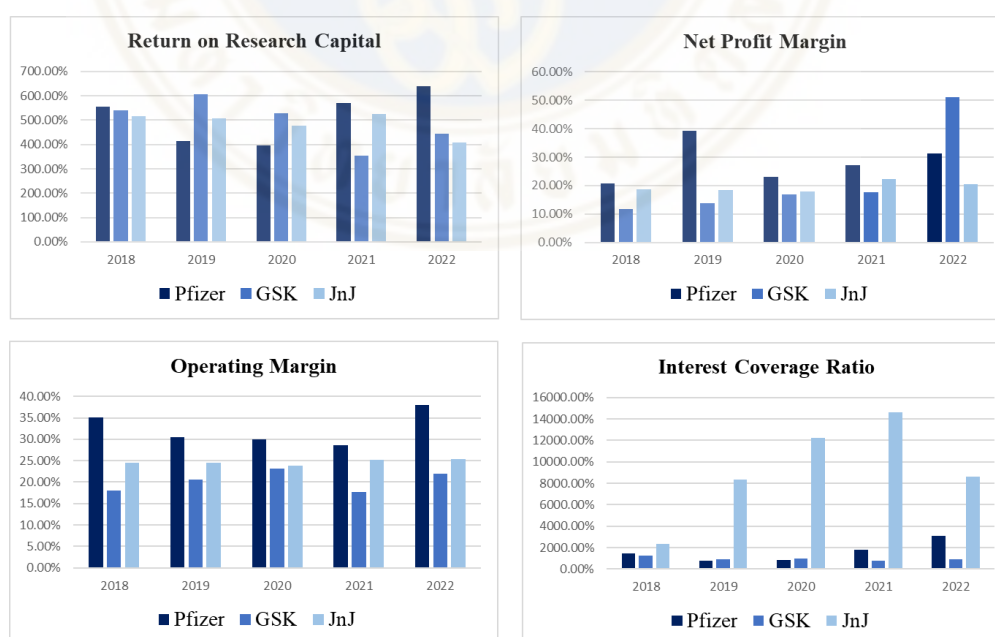


Figure 3.6 Pfizer and its Competitor Ratios Analysis

Source: Own Calculation

An essential ratio for pharmaceutical companies is the return on research capital which indicates how much revenue the company generates from its investment in research and development. This ratio reflects the company's productivity from R&D investments, calculated by dividing the current year's revenue by the previous year's R&D cost. Pfizer stands out among competitors, particularly in the post-pandemic years, attributed to the successful development and global commercial production of the COVID-19 vaccine.

In terms of operating profit, Pfizer has consistently outperformed its competitors over the past five years. Regarding net profit margin, GSK leads in 2022, benefiting from a substantial non-operating income due to its demerger with Haleon plc (GSK, 2022).

For the interest coverage ratio, JNJ holds the highest position, followed by Pfizer. This ratio reflects a company's capacity to repay debt, which is crucial for capital-intensive pharmaceutical businesses. As these companies require leverage, their ability to cover interest costs with operating profit is pivotal for credit ratings and liquidity.

3.2.1 Dupont Analysis

Another crucial ratio is Dupont ROE, which involves breaking down the components of ROE for analysis. At first glance, GSK has the highest ROE, followed by Pfizer and JNJ. However, a detailed breakdown reveals that the increase in GSK's ROE is mainly due to its high leverage ratio, reaching almost 600%. This indicates that GSK is using a substantial amount of debt compared to Pfizer and JNJ.

Pfizer stands out with the highest Return on Assets (ROA) among the three, reflecting their efficiency in utilizing assets. Simultaneously, Pfizer also has the highest net profit margin organically in the last year of 2022, while GSK's increase in net margin is attributed to the demerger process.

This analysis shows that Pfizer has benefited most from the pandemic, as its ROA increased significantly in the last two years, whereas GSK and JNJ maintained relatively stable figures over the years.

In summary, this detailed analysis provides more information about ROE, offering potential investors valuable insights for making informed decisions.

Table 3.5 Pfizer and its Competitors Dupont Analysis

Pfizer	2018	2019	2020	2021	2022
ROA	34%	24%	27%	45%	51%
Leverage Ratio	250%	264%	243%	234%	206%
Net Profit Margin	21%	39%	23%	27%	31%
DuPont ROE	17%	25%	15%	28%	33%

GSK	2018	2019	2020	2021	2022
ROA	53%	42%	42%	31%	49%
Leverage Ratio	1581%	434%	387%	371%	596%
Net Profit Margin	12%	14%	17%	18%	51%
DuPont ROE	99%	25%	28%	21%	148%

JNJ	2018	2019	2020	2021	2022
ROA	53%	52%	47%	52%	43%
Leverage Ratio	256%	265%	276%	246%	244%
Net Profit Margin	19%	18%	18%	22%	20%
DuPont ROE	26%	25%	23%	28%	21%

Source: Own Calculation

CHAPTER IV

VALUATION - DISCOUNTED CASH FLOW METHOD

Investing in a company requires careful analysis and decision-making to maximize potential returns. One vital aspect of company analysis is determining whether the market stock price of that company is overvalued or undervalued in comparison to its intrinsic worth (Singh, 2023). Recognizing the differences helps investors gain more confidence to buy or avoid potential loss and make informed investment choices (Singh, 2023). In this section, we will use the discounted cash flow methods to assess if a stock is overvalued or undervalued to empower investors to navigate the market more effectively.

The discounted cash flow (DCF) method is widely used to estimate the intrinsic value of a business based on its fundamentals. This part will cover the valuation of estimated fair price of Pfizer using the DCF method by projecting the 5-year free cash flow to the firm (4.1), calculating the WACC and Growth Rate (4.2) before discounting them to realize the present firm value and implied share price (4.3)

4.1 Free Cash Flow to Firm Projection

Free Cash Flow to the Firm (FCFF) is an important measure in DCF analysis because it represents the cash flow available to debt and equity holders after the business pays for everything it needs to continue operating.

To arrive at FCFF, Earnings Before Interest and Taxes (EBIT) (4.1.1) will be adjusted for taxes to get Net Operating Profit After Taxes (NOPAT), add back depreciation and amortization (4.1.2), and adjust for changes in working capital and capital expenditures (CAPEX) (4.1.3). FCFF offers an insight into a company's financial health and potential for long-term growth, making it a key figure of DCF valuations used for investment decision-making.

4.1.1 EBIT Projection

Earnings Before Interest and Taxes or EBIT is a fundamental starting point for calculating FCFF. It represents the company's operational earnings before the impact of its financial structure and tax obligations.

To get EBIT, key financial items that need to be forecasted are Revenue, Cost of Sales, and Operating Expense.

4.1.1.1 Revenue Projection

Pfizer's revenue forecast bases the data from sales by geography with the separation of COVID-19 product sales to be another segment (Table 4.1). Pfizer has rearranged their operating structure a few times over the past three years, which complicates the sales tracking. Hence, we decided to use sales by geography. Moreover, Pfizer's revenue from the year 2020-2022 is dominated by the COVID-19 products sales. The domination accounted for 40%-60% of the total. However, investors are expecting a significant sales drop due to the recovery of the pandemic around the world and Pfizer is also aware of the situation. Hence, separating the COVID-19 products' revenue from the total revenue could show us a better judgement of Pfizer's revenue.

Table 4.1 Pfizer's Revenue Breakdown 2017-2022

Pfizer's Revenue Breakdown 2017-2022 (in million)						
	2017E	2018E	2019E	2020E	2021E	2022E
Total Revenue	52,546	53,647	41,172	41,651	81,288	100,330
<i>YoY %</i>	<i>-1%</i>	<i>2%</i>	<i>-23%</i>	<i>1%</i>	<i>95%</i>	<i>23%</i>
US	26,026	25,329	20,593	21,301	21,861	23,184
<i>YoY % Growth</i>	<i>-1%</i>	<i>-3%</i>	<i>-19%</i>	<i>3%</i>	<i>3%</i>	<i>6%</i>
International	26,520	28,318	20,579	20,196	22,570	20,406
<i>YoY % Growth</i>	<i>0%</i>	<i>7%</i>	<i>-27%</i>	<i>-2%</i>	<i>12%</i>	<i>-10%</i>
Covid-19 Product	-	-	-	154	36,857	56,740
<i>YoY % Growth</i>					<i>23833%</i>	<i>54%</i>

Source: Own Calculation

- Geography Segment Revenue excluding COVID-19 Products

The sales forecast for 2023-2027 is broken down into two parts of estimation. First, the forecast of 2023, we based our assumption on the previous 3-year average growth, which is about 4% for the U.S. revenue and 0.1% for the international revenue. And last, the forecast for 2024-2027 is based on the anticipated growth rate of

2022-2030 from Pfizer's fourth quarter 2022 earnings report (Figure 4.1). Pfizer expected the growth to be about 6% from the new products sales (Pfizer, 2022).

Based on that growth rate data, we assume the sales growth in the year 2027 to be 6% and then build up the growth gradually over the forecast year (Table 4.2).

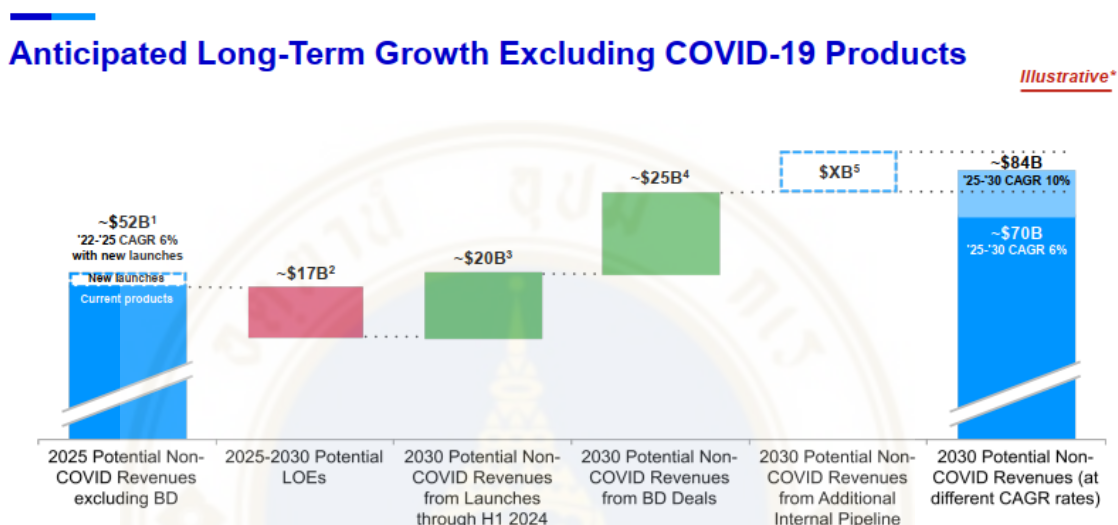


Figure 4.1 Pfizer's Anticipated Long-Term Growth Excluding COVID-19 Products.

Source: From "Fourth Quarter 2022 Earnings", Pfizer, 2023, p.8

- COVID-19 Products Revenue

Contrary to the above, the revenue from COVID-19 products such as Comirnaty (COVID-19 vaccine) and Paxlovid (COVID-19 treatment oral pill) is expected to decrease substantially because of the visible improvement of pandemic situation such as fewer primary vaccinations and lower compliance (Pfizer, 2023). Its sales revenue in 2023 is estimated to decrease by 70% and continues to decrease at a 13%-14% rate (Table 4.2).

Table 4.2 Pfizer's Revenue 5-Year Projection

Pfizer's Revenue 5-year Projection (in million)						
	2022E	2023A	2024A	2025A	2026A	2027A
Total Revenue	100,330	61,605	60,656	60,773	61,947	63,580
<i>YoY %</i>	23.4%	-38.6%	-1.5%	0.2%	1.9%	2.6%
US	23,184	24,121	25,253	26,603	28,199	29,891
<i>YoY % Growth</i>	6.1%	4.0%	4.7%	5.3%	6.0%	6.0%
International	20,406	20,427	20,849	21,690	22,992	24,371
<i>YoY % Growth</i>	-9.6%	0.1%	2.1%	4.0%	6.0%	6.0%
Covid-19 Product	56,740	17,058	14,554	12,480	10,757	9,318
<i>YoY % Growth</i>	53.9%	-69.9%	-14.7%	-14.2%	-13.8%	-13.4%

Source: Own Calculation

In conclusion, the sales revenue projection for the year 2023 will drop by almost 39% from the year 2022 before increasing gradually throughout the year 2027.

4.1.1.2 Cost of Sales and Operating Expense Forecast

For the cost of sales and operating expense, we estimated the 5-year projection based on the company's financial guidance from Pfizer's fourth quarter 2022 earnings report (Figure 4.2).

2023 Financial Guidance¹: Other Components

Adjusted ¹ Cost of Sales as a Percentage of Revenues	28.0% to 30.0%
Adjusted ¹ S&A Expenses	\$13.8 to \$14.8 Billion
Adjusted ¹ R&D Expenses	\$12.4 to \$13.4 Billion
Acquired IPR&D Expenses ^{1,2}	Approximately \$0.1 billion
Adjusted ¹ Other (Income)/Deductions	Approximately \$1.5 billion of income
Effective Tax Rate on Adjusted ¹ Income	Approximately 15.0%

Figure 4.2 Pfizer's 2023 Financial Guidance: Other Components

Source: From "Fourth Quarter 2022 Earnings", Pfizer, 2023, p.18

The cost of goods sold (COGS) is determined from the COGS%-to-revenue given in the guidance, which is between 28.0% to 30.0% (Pfizer, 2023). I apply the 29.0% margin into the COGS forecast, assuming the medium percentage from Pfizer's guidance. The selling, general, and administrative (SG&A) expenses are expected to be between \$13.8-\$14.8 billion, which would account for 23% of total revenue. This incremental SG&A is reported to support the upcoming new product launches, acquired assets, and the anticipated commercial launch of COVID-19 products (Pfizer, 2023). Lastly, R&D expenses are expected to be between \$12.4-\$13.4 billion to support the increasing volume of pipeline programs and acquired assets to maintain business growth. This is because the company expected around \$17 billion of revenue loss from the patent expiration starting from 2025 (Pfizer, 2023). From that, I apply R&D margin of 21% to the R&D expense forecast.

Based on the above assumption, we project 5-year COGS, SG&A expense, and R&D expense in Table 4.3.

Table 4.3 Pfizer's COGS and Operating Expense 5-Year Projection

Pfizer's Cost of Sales and Operating Expense 5-year Projection (in million)						
	2022E	2023A	2024A	2025A	2026A	2027A
Total Revenue	100,330	63,263	64,663	66,349	68,322	70,580
Cost of Sales	34,344	18,346	18,752	18,255	18,827	19,482
<i>Gross Margin (%)</i>	34.2%	29.0%	29.0%	29.0%	29.0%	29.0%
SG&A (excl R&D)	19,614	14,550	14,872	14,478	14,932	15,451
<i>SG&A Margin (%)</i>	19.5%	23.0%	23.0%	23.0%	23.0%	23.0%
R&D Expense	11,428	13,285	13,579	13,219	13,634	14,108
<i>R&D Margin (%)</i>	11.4%	21.0%	21.0%	21.0%	21.0%	21.0%

Source: Own Calculation

4.1.1.3 Composing EBIT calculation with 5-year projection

In Table 4.4, we have outlined Pfizer's anticipated EBIT for the coming five-year span. This table concludes the calculated projections, showcasing reasonable growth in Pfizer's core operations. The projection in the table suggests that EBIT in 2023 will equal 16.63 billion and slowly increase to 19.64 billion in 2027.

Table 4.4 EBIT Calculation with 5-year projection

Composing EBIT with 5-year Projection						
	2022E	2023A	2024A	2025A	2026A	2027A
Total Revenue	100,330	61,605	60,656	60,773	61,947	63,580
(-) Cost of Sales	34,344	17,865	17,590	16,638	16,979	17,452
Gross Profit	65,986	43,740	43,066	44,135	44,968	46,128
(-) Operating Expense	31,042	27,106	26,689	25,244	25,761	26,479
(+) SG&A Expense	19,614	14,169	13,951	13,196	13,466	13,841
(+) R&D Expense	11,428	12,937	12,738	12,048	12,295	12,638
EBIT	34,944	16,633	16,377	18,891	19,208	19,649

Source: Own Calculation

4.1.2 Depreciation and Amortization

Depreciation and Amortization (D&A) is one of the important adjustments in the calculation of FCFF. While D&A are considered as non-cash expenses that reduce reported net income, they do not affect the actual cash flow of a company. Therefore, in the FCFF calculation, D&A are added back to net income or EBIT after taxes.

Table 4.5 shows Pfizer's D&A with a 5-year projection number. The amount is calculated by multiplying the beginning fixed assets by the average margin of D&A to the fixed assets. In this forecast, the margin of 5.34% is multiplied by the beginning fixed assets to realize the forecast year D&A.

Table 4.5 Pfizer's CAPEX, Depreciation, and Amortization with 5-year Projection

Pfizer's CAPEX, Depreciation, and Amortization with 5-year Projection						
	2022E	2023A	2024A	2025A	2026A	2027A
Property, Plant, and Equipment (PPE)	19,275	18,808	18,541	18,371	18,293	18,308
Intangibles assets (incl. Goodwill)	94,746	92,453	91,139	90,300	89,920	89,992
Fixed Assets (PPE+Intangible)	114,021	111,261	109,681	108,671	108,214	108,300
Depreciation&Amortization	5,064	6,088	5,940	5,856	5,802	5,777
Depreciation/FA %	5.50%	5.34%	5.34%	5.34%	5.34%	5.34%
CAPEX	3,236	3,328	4,360	4,846	5,345	5,863
CAPEX/FA%	3.51%	2.92%	3.92%	4.42%	4.92%	5.42%

Source: Own Calculation

4.1.3 Capital Expenditure

CAPEX represents the funds a company uses to purchase, upgrade, or maintain physical assets such as property, industrial buildings, or equipment. In the FCFE calculation, CAPEX is subtracted because it is a cash outflow necessary for maintaining or expanding the company's asset base.

In Table 4.5, Pfizer's CAPEX is calculated by multiplying the beginning fixed assets by the average margin of CAPEX to the fixed assets. In this forecast, the margin of 2.34% is multiplied by the beginning fixed assets (CAPEX of 2022) to realize the CAPEX in 2023. Then, we assume the CAPEX growth increases at the rate of 0.5% every year.

4.1.4 Change in Working Capital

Working Capital is the difference between a company's current assets and current liabilities. In the FCFE calculation, an increase in Net Working Capital is subtracted, while a decrease is added back. This adjustment is important because it reflects the cash invested in or released from short-term operational assets and liabilities.

Table 4.6 exhibits the projection of Pfizer's net working capital (NWC) and its changes over the period. NWC is calculated by deducting the account payable (AP), which represents the current liabilities from the summation of the company's account receivable (AR) and inventory (INV), which represents the current assets. To forecast 2023-2027 NWC, we must project the number of AR, INV, and AP first. We multiply average day sales outstanding with the daily revenue (Current year revenue/365) to get AR. Next, we multiply average days inventory outstanding with the daily COGS (Current year COGS/365) to get INV. Then, we multiply average account payable turnover with the daily COGS (Current year COGS/365) to get AP. Finally, we calculate the NWC and find the change in NWC over the forecast year.

Table 4.6 Pfizer's Change in Net Working Capital with 5-year projection

Pfizer's Change in Net Working Capital with 5-year Projection						
	2022E	2023A	2024A	2025A	2026A	2027A
Working Capital	13,124	10,416	12,521	12,189	12,571	13,008
Change in Working Cap	- 1,836	- 2,708	2,105	- 332	382	437
Account Receivable	10,952	7,834	8,787	8,554	8,822	9,129
Inventory	8,981	6,719	8,811	8,577	8,846	9,154
Account Payable	6,809	4,138	5,077	4,942	5,097	5,275
Days Sales Outstanding	40.8	49.6	49.6	49.6	49.6	49.6
Days Inventory Outstanding	95.9	171.5	171.5	171.5	171.5	171.5
Accounts Payable Turnover Days	65.8	98.8	98.8	98.8	98.8	98.8
Cash Conversion Cycle	70.8	122.3	122.3	122.3	122.3	122.3

Source: Own Calculation

4.1.5 FCFF Projection

Having projected all the key components necessary for the FCFF calculation, we have outlined Pfizer's FCFF from 2023 to 2027 (Table 4.7). Utilizing a 15% tax rate, based on Pfizer's 2023 guidance (Figure 4.2), NOPAT is realized. Then, the D&A is added back before deducting the change in net working capital and CAPEX to get FCFF. The projected FCFF values for these years are \$19,880 million, \$13,899 million, \$17,703 million, \$16,556 million, and \$16,299 million, respectively.

Table 4.7 Pfizer's FCFF 5-year projection

Fiscal Year	Calculate the FCF					
	2022A	2023E	2024E	2025E	2026E	2027E
EBIT	\$ 34,944	\$ 16,633	\$ 16,377	\$ 18,891	\$ 19,208	\$ 19,649
(-) Tax Expense	3,328	2,495	2,457	2,834	2,881	2,947
NOPAT	31,616	14,138	13,921	16,057	16,327	16,701
(+) Depreciation	5,064	6,088	5,940	5,856	5,802	5,777
(-) Change in Working Capital	- 1,836	- 2,981	1,602	- 636	227	316
(-) Capital Expense (CAPEX)	3,236	3,328	4,360	4,846	5,345	5,863
Free cash flow to firm	\$ 35,280	\$ 19,880	\$ 13,899	\$ 17,703	\$ 16,556	\$ 16,299

Source: Own Calculation

These FCFF figures offer a clear picture of the cash Pfizer is expected to generate after covering operational and investment expenses. This projection shows a generally positive trend, with some fluctuations, reflecting the dynamic nature of the pharmaceutical market and Pfizer's strategic initiatives.

4.2 WACC and Terminal Growth Rate

After obtaining the FCFF, the next step is to determine the Weighted Average Cost of Capital (WACC) and the terminal growth rate. These elements are crucial for an accurate Discounted Cash Flow (DCF) analysis, as they will provide the discount rate to be applied to the projected FCFF, offering a comprehensive view of Pfizer's valuation.

4.2.1 Weighted Average Cost of Capital (WACC)

WACC, or Weighted Average Cost of Capital, is a key component in DCF Analysis. It represents the average rate a company pays to finance its assets through debt and equity. In DCF, WACC is used as the discount rate to calculate the present value of future cash flows, which is crucial for assessing a company's valuation. The formula for WACC is:

$$\text{WACC} = (W_e \times R_e) + ((W_d \times R_d) \times (1 - T))$$

Where:

W_e = Weight of Equity

R_e = Cost of Equity

W_d = Weight of Debt

V = Total Value of Capital

R_d = Cost of Debt

T = Tax Rate

Now we go through components by components to eventually realize the WACC number for our DCF Analysis.

4.2.1.1 Capital Structure

The capital structure refers to the mix of debt and equity a company uses to finance its operations and growth. To find the Weight of Debt and Weight of Equity, which are basic components of the WACC calculation, I follow these steps:

Table 4.8 Pfizer's Capital Structure

Market Value of Debt	
St Debt	3,565.00
Lt Debt	35,481.00
Total Debt	39,046
Market Value of Equity	
PFE Stock Price (as of 10/11/2023)	29.68
Weighted-average shares-diluted	5733
Market Capitalization	170,155
Market Value of Capital	209,201
Weight of Debt (Wd)	18.66%
Weight of Equity (We)	81.34%

Source: Own Calculation

- Determine Market Value of Debt: Represented by total debt which consists of short-term debt and long-term debt as of December 31, 2022. Pfizer's total debt or market value of debt is \$39,046 million (Pfizer, 2023).
- Determine Market Value of Equity: Represented by market capitalization (Market Cap). The price of Pfizer as of November 10, 2023, is multiplied with diluted weight-average shares as of 5,733 million shares outstanding as of December 31, 2022 (Pfizer, 2023). Pfizer's market cap or market value of equity is \$170,155 million.
- Sum both values to realize the Market Value of Capital at \$209,201 million.
- Determine the Weight of Debt and Weight of Equity: Divide the obtained market value of debt and market capitalization with market value of capital to find proportion of debt and equity.
- Weight of Debt equals 18.66% and Weight of Equity equals 81.34% (Table 4.8).

4.2.1.2 Cost of Debt

Cost of Debt represents the effective rate that a company pays on its current debt. The cost of debt for Pfizer is determined by using the borrowing rate on the company's long-term note that is due in 2024 at 3.90%. Then, we applied a tax rate of 9.58% as reported in the 2022 10-K report of Pfizer. The cost of debt after tax is equal to 3.53% (Table 4.9).

Table 4.9 Pfizer's Cost of Debt

Cost of Debt (After Tax)	3.53%
Long-Term Debt Loans Rate	3.90%
Tax Rate	9.58%

Source: Own Calculation

4.2.1.3 Cost of Equity

The Cost of Equity represents the compensation the market demands in exchange for owning the asset and bearing the risk of ownership. To determine the cost of equity, we used the Capital Asset Pricing Model (CAPM) as it is widely used because it considers the stock's sensitivity to market movements and the premium investors require for taking on higher risk. Formula for CAPM is:

$$R_e = R_f + \beta \times MRP$$

Where:

R_f = The Risk-Free Rate

β = The Equity Beta

MRP = Market Risk Premium

Table 4.10 Pfizer's Cost of Debt

Cost of Equity	
CAPM	8.06%
Risk-Free Rate (10Y U.S Gov Bond)	4.65%
Market Risk Premium	5.00%
Beta	0.68

Source: Own Calculation

The 4.65% risk-free rate is derived from the yield of 10-year U.S as of November 10, 2023. This choice is based on the widespread perception that government bonds are among the safest underlying assets. Additionally, since Pfizer primarily operates in the United States, utilizing the yield from U.S. government bonds is a reasonable approach.

Also, given that our projection is five years, it is an appropriate duration. For the market risk premium (MRP) and beta (β), we based the number from Professor Damodaran's equity risk premium calculation and from Bloomberg Terminal, respectively. MRP is equals to 5.00% as of July 14, 2023 (Damodaran, 2023) and 0.68 as of November 10, 2023 (Bloomberg, 2023). Then, we insert these values in CAPM formula. The result for estimated cost of equity for Pfizer is 8.06%

4.2.1.4 WACC Estimate

After all the WACC components are realized, the estimated WACC is equal to 7.22% (Table 4.11).

Table 4.11 Pfizer's WACC Calculation

WACC Calculation	
Weight of Equity	81.34%
Cost of Equity	8.06%
Weight of Debt	18.66%
Cost of Debt After Tax	3.53%
WACC	7.22%

Source: Own Calculation

4.2.2 Terminal Growth Rate

The Terminal Growth Rate in DCF Analysis is an estimate of a company's growth rate beyond the forecast period. It is used to calculate the terminal value, which represents the present value of all future cash flows in perpetuity. The terminal growth rate used for this valuation is 2.06% based on the U.S. GDP growth as of 2022.

After determining WACC and the terminal growth rate for Pfizer, the next crucial step in our Discounted Cash Flow (DCF) analysis involves the process of discounting the projected cash flows.

4.3 Discounting Cash Flows

This section is to apply the previously calculated WACC to discount Pfizer's forecasted FCFF to their present value (4.3.1) and to finally find the implied share price for Pfizer (4.3.2)

4.3.1 Finding Present Value of FCFF

Each year's FCFF is adjusted using a discount factor that reflects the time value of money and the company's cost of capital. For example, the FCFF for 2023, the amount of \$19,880 million, is discounted at a factor of 0.93, giving us a present value of \$18,542 million.

Table 4.12 Present Value of Free Cash Flow to Firm

Discounting Cash Flows					
Fiscal Year	2023A	2024A	2025A	2026A	2027A
FCFF	\$ 19,880	\$ 13,899	\$ 17,703	\$ 16,556	\$ 16,299
Projection Year	1	2	3	4	5
Discount Factor	0.93	0.87	0.81	0.76	0.71
Present Value of Free Cash Flow	\$ 18,542	\$ 12,091	\$ 14,364	\$ 12,530	\$ 11,505

Source: Own Calculation

4.3.2 Implied Share Price

Before finding the implied share price, first we determine the Terminal Value of Pfizer. Terminal Value can be calculated using this formula:

$$TV = FCFF \times (1+g) / (WACC - g)$$

Where:

FCFF = the free cash flow to the firm in the last forecast year

g = the perpetual growth rate

WACC = the weighted average cost of capital

The terminal value is \$322,771 million which then discounted back to its present value using the WACC. The present value (PV) of terminal value is equal to \$227,828 million. Combining the sum of PV of FCFF and terminal value, the PV of Firm Value is realized at \$296,859 million (Figure 4.3).

To realize the implied share rate, we subtract the amount of total debt before adding back cash and marketable securities to get equity value of firm. Then, the equity value is divided by the number of diluted shares outstanding which is 5,733 million shares. The implied share price of Pfizer should be \$48.94 per share, which is higher than the latest share price of \$29.68 as of November 10, 2023, by 39%. When the DCF analysis suggests a higher intrinsic value than the current market price, fundamentally it would indicate the undervaluation of the current share price.

Implied Share Price Calculation	
Sum of PV of FCF	69,031
Terminal Growth Rate	2.06%
WACC	7.22%
Terminal Value	322,771
PV of Terminal Value	227,828
PV of Firm Value	\$ 296,859
(-) Total Debt	39,046
(+) Cash & Marketable Securities	22,732
Equity Value	\$ 280,545
Weighted-average shares—diluted	5,733
Implied Share Price	\$ 48.94
Current Share Price (10/11/2023)	\$ 29.68
	39% Undervalued

Figure 4.3 Implied Share Price of Pfizer

Source: Own Calculation

4.3.3 Sensitivity Analysis

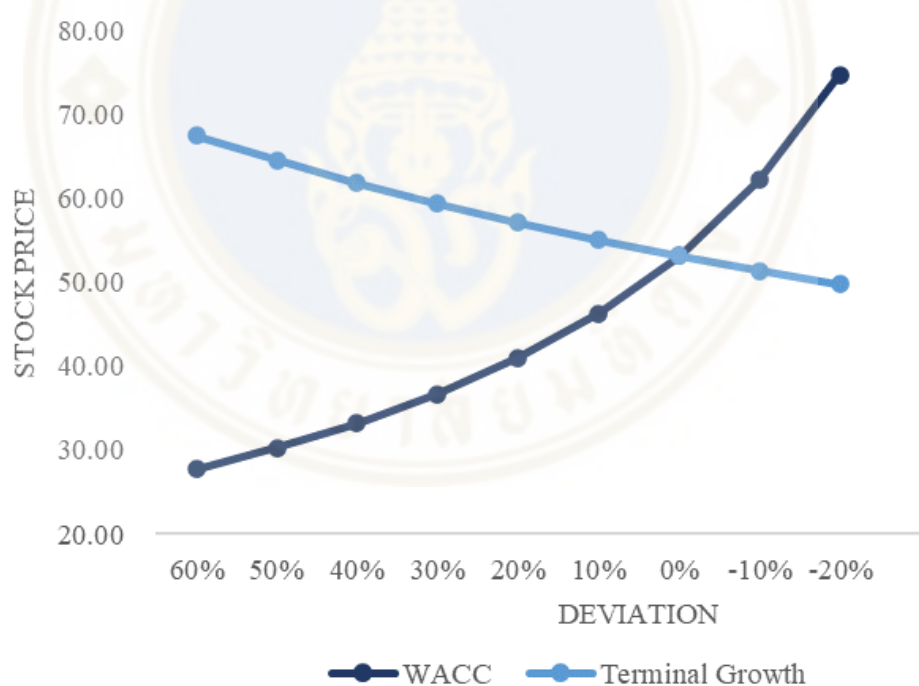
In the valuation of Pfizer using the DCF method, it's important to understand how sensitive the company's value is to changes in key variables like WACC and terminal growth rate. Small changes in these factors can significantly alter the valuation. Therefore, we conducted a sensitivity analysis to see how adjustments to these key variables might affect Pfizer's valuation. This step helps us make better investment decisions and manage risks more effectively.

We made a deviation in WACC and terminal growth rate to observe the degree of impact on the share price (Table 4.13) and draw a graph so see the trend (Figure 4.4). The deviation range is set between 60% and -20%

Table 4.13 Sensitivity of WACC and Terminal Growth Rate to Implied Share Price

Sensitivity of WACC and Terminal Growth Rate to Pfizer's Stock Price						
n	WACC	Stock Price	Change in Value	Terminal Growth	Stock Price	Change in Value
60%	11.54%	25.67	-48%	3.30%	62.12	27%
50%	10.82%	27.95	-43%	3.09%	59.37	21%
40%	10.10%	30.65	-37%	2.89%	56.89	16%
30%	9.38%	33.87	-31%	2.68%	54.63	12%
20%	8.66%	37.79	-23%	2.47%	52.57	7%
10%	7.94%	42.68	-13%	2.27%	50.67	4%
0%	7.22%	48.94	0%	2.06%	48.94	0%
-10%	6.49%	57.22	17%	1.86%	47.33	-3%
-20%	5.77%	68.73	40%	1.65%	45.84	-6%

Source: Own Calculation

Figure 4.4 Sensitivity Graph of WACC and Terminal Growth Rate to Implied Share Price

Source: Own Calculation

The observation reveals how Pfizer's share price might respond to fluctuations in WACC and terminal growth rate. Looking at both the table and graph, we notice that WACC has a negative relationship with share price and has higher sensitivity than the

terminal growth rate. For instance, a 10% change in WACC leads to a 13% change but a 10% change in terminal growth rate leads to only a 3%-4% change in share price. This negative relationship and high sensitivity suggest a potential undervaluation if the market overestimates the cost of capital. In other words, the investors who bought Pfizer's share at the latest share price of \$29.68 are potentially expecting a rate of return of over 10% while the estimated WACC is only 7.22%. This means that the latest price of Pfizer's share is undervalued.

4.4 Valuation Recommendation

Our DCF analysis points to an implied share price for Pfizer that suggests the stock is currently undervalued, signaling a potential buying opportunity. This assessment is supported by Wall Street analysts who forecast an upward trajectory for Pfizer's stock over the next year (Figure 4.5). Specifically, Terence Flynn from Morgan Stanley projects a 39% increase in Pfizer stock over the next 12 months, as of November 27, 2023 (Levin, 2023).

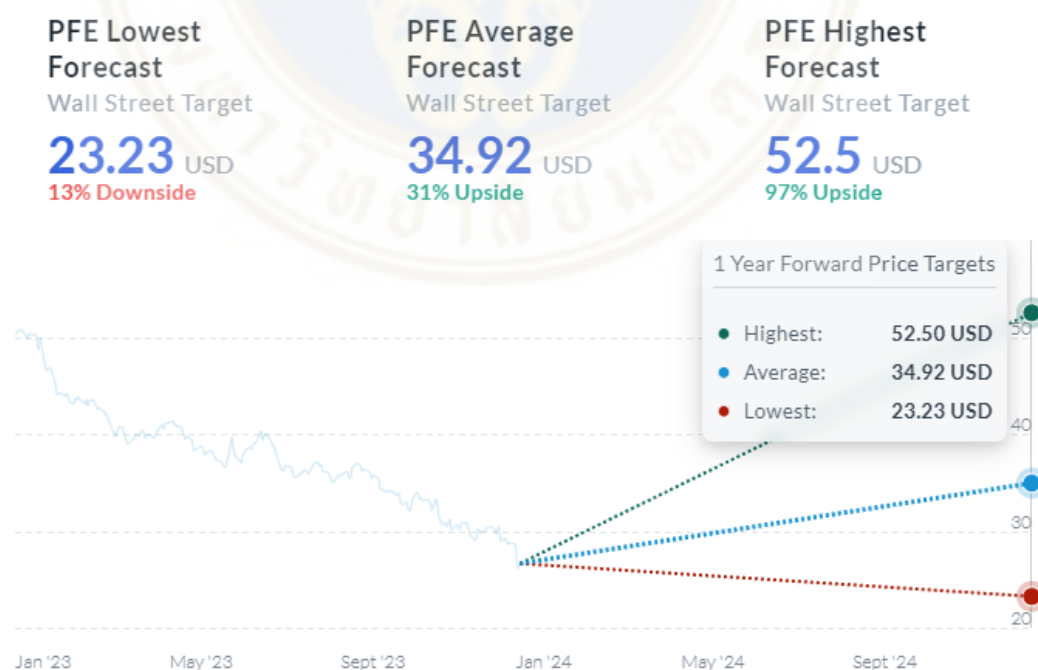


Figure 4.5 Wall Street Analyst Estimation on Pfizer's Share Price

Source: From Alpha Spread, "PFE Price Targets Summary", 2023 (www.alphaspread.com)

The consensus among analysts complements my DCF findings and underscores confidence in Pfizer's growth potential. The intrinsic value of a stock is a forward-looking estimate that also includes assumptions about the company's future. In the pharmaceutical industry, we believe that Pfizer's operational strengths, coupled with strategic investments in R&D, are likely to maintain its financial growth over the next five years.

The current market price of Pfizer shares presents a compelling case for investment, when compared with these analysts' projections. The company's strong dividend yield and plans for growth in the evolving healthcare landscape make it an attractive option for investors.

Balancing these insights, we recommend buying Pfizer shares. This recommendation reflects a combination of detailed financial analysis, external expert opinions, and the company's promising outlook, making it an attractive proposition for investors focused on long-term growth and stability.

CHAPTER V

INVESTMENT RISKS

This chapter will explore the risks Pfizer may encounter due to a combination of internal and external factors. Understanding these risks is crucial for investors, as the pharmaceutical industry is laden with uncertainties. Table 5.1 lays out the risk matrix considering two factors: Probability and Severity. Risks for Pfizer can be categorized into business, market, geographical, and financial segments.

Risk Matrix		Severity		
		Acceptable	Moderate	Intolerable
Probability	Unlikely			Cybersecurity Risk
	Possible	Interest rate risk	Outbreak Risk Political Risk Regulatory Risk	
	Probable	Competitor Risk Counterfeit Risk	R&D risk Foreign Exchange risk	Patent Risk

Figure 5.1 Risk Matrix

Source: Own Elaboration

5.1 Business Risk

5.1.1 R&D Risk

Research and development are the lifeblood of pharmaceutical companies, demanding significant investment. Despite increasing R&D spending, there's no guaranteed correlation with productivity boosts. Pfizer has seen a recent upswing in R&D returns due to COVID-19 vaccines, but there's the looming challenge of post-pandemic revenue declines against consistent R&D expenses.

5.1.2 Patent Risk

Patents are a cornerstone of value for pharmaceutical giants, providing exclusive production rights. However, patent expirations can significantly affect revenues, and Pfizer is bracing for such impacts soon.

5.1.3 Cybersecurity Risk

With substantial intellectual property at stake, pharmaceutical companies are prime targets for cyber threats. Any data breaches can tarnish public trust and affect Pfizer's performance.

5.2 Market Risk.

5.2.1 Outbreak Risks

Global health crises demand swift action from pharmaceutical companies, both in terms of R&D and supply chain management. Pfizer's role in the COVID-19 pandemic illustrates the potential for both opportunity and risk during such events.

5.2.2 Competitor and Counterfeit Risk

Pfizer faces relentless competition from generic brands and global rivals, leading to aggressive marketing expenditures. The industry's competitive dynamics often pivot on pricing, demanding continual marketing to maintain brand dominance. Pfizer's brand strength and product pipeline also attract counterfeit risks, endangering patient safety and the company's financial standing.

5.3 Geographical & Regulatory Risk

Political climates across the various markets in which Pfizer operates can significantly influence profitability. Also, changes in healthcare laws, intellectual property regulations, and trade policies can pose risks to Pfizer's operations, as can legal and compliance challenges.

5.4 Financial Risk

5.4.1 Foreign Exchange Risk

With a significant surge in revenue growth outside the U.S. in recent years (Figure 1.2), where approximately 60% of the total revenue is generated from international markets, it becomes crucial for the company to pay close attention to foreign exchange matters. Managing volatile foreign exchange rates remains a pivotal risk for the firm.

5.4.2 Interest Rate Risk

Pfizer faces risks related to its interest-bearing obligations. Historically, about 50% of their capital structure is made up of debt. This imposes a certain level of risk related to interest, and the company needs to handle this carefully, particularly in the current situation where sales are declining, and investor confidence has weakened following the impact of COVID-19 downsizing. Additionally, the company is susceptible to changes in government monetary policy and potential interest rate hikes influenced by various factors.

CHAPTER VI CONCLUSIONS

In this chapter, we would like to integrate the two aspects mentioned above: risks and valuation.

Currently, Pfizer faces the risks mentioned earlier, with the most pressing being the patent risk as a Loss of Exclusivity is anticipated in the coming years, potentially resulting in a loss of 17 billion USD (Figure 6.1). Additionally, sales have stabilized following the decline in COVID cases, and the sales of the COVID vaccine has slowed down. Investors have noted these factors have already been incorporated, which led to a decrease in the stock price from approximately 50 USD at the beginning of the year to the current value of around 30 USD per share.

Key Products Included in the Expected ~\$17 Billion in LOE Revenue Declines from 2025-2030

Product	2021 WW Revenues (\$ millions)	2021 U.S. Revenues (\$ millions)	2021 Dev. EU Revenues (\$ millions)	Year of Expected U.S. LOE	Year of Expected EU LOE
Eliquis ¹	\$5,970	\$3,160	\$1,520	2026*	2026
Inlyta	\$1,002	\$599	\$181	2025	2025
Ibrance	\$5,437	\$3,418	\$1,044	2027	2028
Xeljanz	\$2,455	\$1,647	\$308	2025	2028
Xtandi ²	\$1,185	\$1,185	N/A	2027	N/A
Vyndaqel family ³	\$2,015	\$909	\$572	2024 (2028 pending PTE)	2026

* Date is based on the composition of matter patent. See Pfizer's 2021 Annual Report on Form 10-K filed with the U.S. Securities and Exchange Commission for more information about potential scenarios that could affect the timing of generic entry in the U.S.

¹ Eliquis alliance revenues & direct sales.

² Xtandi alliance revenues.

³ Vyndaqel family includes global revenues from Vyndaqel, as well as revenues for Vyndamax in the U.S. and Vynmac in Japan.
PTE=Patent Term Extension LOE=Loss of Exclusivity



Fourth Quarter 2022 Earnings

Figure 6.1 Expected 17 billion in Loss of Exclusivity Revenue Decline

Source: From “Fourth Quarter 2022 Earnings”, Pfizer, 2023, p.36

Nevertheless, the following is our target price analysis of Pfizer based on our valuation method.

PFE Analyst Price Target i

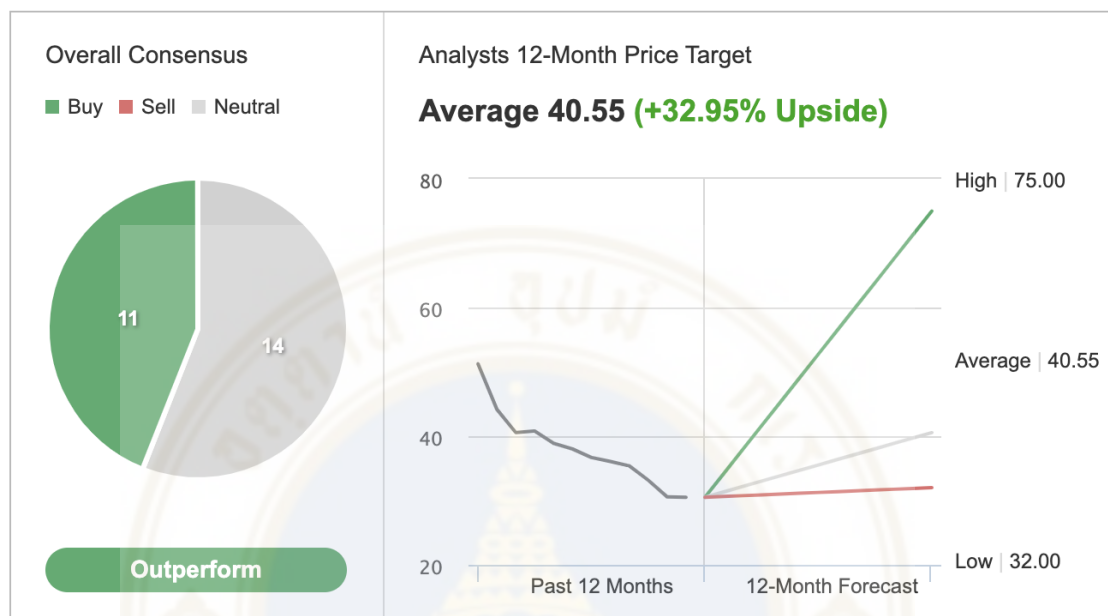


Figure 6.2 Pfizer's Target Price by Analysts

Source: From Investing.com, PFE Analyst Price Target, 2023 (www.investing.com)

Implied Share Price	\$	48.94
Current Share Price (10/11/2023)	\$	29.68
39% Undervalued		

Figure 6.3 Implied Share Price from DCF Valuation

Source: Own Calculation

According to analyst ratings, Pfizer's stock price is anticipated to go above the current value of \$29.68 per share (Figure 6.3). Our target price is also determined by the discounted cash flow method using the forecast figures based on historical financial data and growth trends. As a result, our target price is around 48.94 USD per share. With the current price of around 30 USD per share, we expect a potential upside of 60.65%.

While Pfizer is not entirely risk-free, particularly given its performance during the COVID-19 pandemic, our valuation analysis suggests that the current price is still undervalued. This implies an opportunity for an upward movement towards 48.94 USD per share, when we expect the price to consolidate.

Therefore, we recommend a BUY position for Pfizer for short-term and medium-term outlooks. For the long-term outlook, further assessment is necessary to see how Pfizer will manage reduced sales and how they will handle the upcoming patent expiries while staying competitive.



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