



CATÓLICA  
LISBON  
BUSINESS & ECONOMICS

EQUITY VALUATION -  
AMGEN INC.

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Dissertation submitted for partial fulfilment of the requirements for the degree of "Master in Finance" (Mestrado em Finanças) at Universidade Católica Portuguesa.

October of 2024

Dissertation written under the supervision of Professor José Carlos Tudela Martins.

## **Abstract**

The main purpose of this dissertation is to determine the target share-price for Amgen Inc., a biopharmaceutical company based in United States of America and listed on New York Stock Exchange (NYSE). For the valuation, an analysis was conducted on the company's structure, their business model, the primary sources of revenues, the risks associated and the dynamics of the market and competitors. This research offered a clearer insight into the possible future cash flows of the company and through the Discounted Cash Flow method we were able to determine the target valuation for each share of Amgen. In addition, the Relative Valuation was used to compare the target share price.

Our research recommends a Hold investment, with a target share price of 323.10 USD, 13.64% above the share price at 28<sup>th</sup> of March 2024.

## **Resumo**

O principal objetivo desta dissertação passa por identificar o preço-alvo de cada ação da Amgen Inc., uma empresa farmacêutica focada em produtos biofarmacêuticos sediada nos Estados Unidos da América e cotada no *New York Stock Exchange* (NYSE). Para o efeito, foi analisada a estrutura da empresa, o seu modelo de negócio, as principais fontes de receita, os riscos subjacentes e a evolução do mercado e competidores. Esse estudo permitiu perceber melhor quais os possíveis futuros *cash flows* da empresa e através do método de *Discounted Cash Flow Valuation* (DCF) chegar ao valor alvo de cada ação da companhia. Adicionalmente, foi utilizado o método de avaliação relativa para comparar com o valor obtido através da técnica de avaliação mencionada anteriormente.

Em conclusão, a nossa recomendação passa pela manutenção da ação com um preço-alvo de 323.10 dólares, 13.64% acima do preço de cada ação no dia 28 de março de 2024.

## **Acknowledgments**

After a long journey started with MIF, and with the CFA level I in between, this master thesis represents the end of my journey in Catolica Lisbon School of Business and Economics. This was a fantastic learning experience, demanding and sometimes tough for someone from such a different background.

At the end, is important to express my gratitude to professor Tudela Martins for all his support and for the organization of the preparation classes for this dissertation.

In the end, I owe a big thank you to my family and girlfriend for their support and patience over the years.

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## List of Abbreviations

AZ – Astra Zeneca

CAGR – Compounded Annual Growth Rate

CAPEX – Capital Expenditures

CAPM – Capital Asset Pricing Model

COGS – Cost of goods sold

D/E – Debt over equity

DCF – Discounted Cash-Flow Model

DDM – Dividend Discount Model

DMV – Debt Market Value

EBIT – Earnings before interest and taxes

EBITDA – Earnings before interest, taxes, depreciation and amortization

EMA – European Medicines Agency

EMV – Equity Market Value

EPS – Earnings per share

EV – Enterprise Value

FCFF – Free Cash Flow to the Firm

FDA – U.S. Food and Drug Administration

GAAP – Generally Accepted Accounting Practices

GDP – Gross Domestic Product

IFRS – International Financial Reporting Standards

IRA – Inflation Reduction Act

K<sub>d</sub> – Cost of debt

K<sub>e</sub> – Cost of equity

LOE – Loss of Exclusivity

M&A – Mergers and Acquisitions

MRP – Market Risk Premium

NASDAQ – National Association of Securities Dealers Automated Quotations

NYSE – New York Stock Exchange

O-US – Outside US

OECD – Organization for Economic Cooperation and Development

P/E – Price over earnings

PPE – Plant, Property and Equipment

R&D – Research and Development

Rf – Risk-Free Rate

RV – Residual Value

S&P 500 – Standard & Poor's 500 Index

SG&A – Selling, General, and Administrative Expenses

TV – Terminal Value

US – United States

WACC – Weighted Average Cost of Capital

WC – Working Capital

WHO – World Health Organization

# 1. Introduction

## 1.1 General Context

The economy has undergone major changes in recent years due to various factors such as the COVID pandemic and the conflicts in the Middle East and Eastern Europe. The central banks used quantitative easing to combat the pandemic initially, creating a situation of high inflation and high interest rates that put pressure on businesses worldwide (International Monetary Fund 2024). The geopolitical conflicts worsened the scenario and led to an energy crisis that creates shortages and severe supply disruptions.

The pharmaceutical industries, and in specific Amgen, were not isolated from the impacts and consequences of these events. For example, a supply chain disruption could represent a potential loss of 25 percent of EBITDA margin (Dukart and Laurie Lanoue 2022).

To comprehend the connection between the macroeconomic events and the pharma dynamics, a variety of factors are essential to analyze. Besides the supply events, the reimbursement strategies that exist between the governments and the pharmaceuticals must also be noted. It is a clear conclusion on how a recession, rising inflation environments or higher unemployment rates could represent delays in co-payments from governments putting more burden on patients and pose challenges to set higher prices for medicines in different countries (Berndt and Newhouse 2010). Pharmaceutical industries have played a vital role globally in the past decades. The rise in the aging population increased the pool of patients for many chronic diseases such as hypertension or diabetes, which was translated in a significant market growth during the previous years. By 2030, 1 in 6 people in the world will be aged 60 years or over and 20 years later, by 2050, the percentage will increase to 21.6% (WHO 2022).

In conclusion, promoting good health quality is essential since premature deaths, disabilities or short-term illnesses reduce the labor force participation undermining the economic prosperity. Some studies indicate a potential impact of around 10% in US GDP (Goldman Sachs 2024).

With all those challenges in mind, our purpose in this dissertation is to achieve the target share price of one of the biggest pharmaceutical companies in the world, Amgen, that played a fundamental role in the development and improvement of biopharmaceutical drugs.

## 1.2 Concepts of Valuation - Literature Review

### 1.2.1 Discounted Cash-Flow (DCF)

Discounted cash flow method is a valuation approach based on the estimation of a company's future cash flows to assess its intrinsic value.

$$DCF = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + (\dots) + \frac{FCF_n}{(1+r)^n} = \sum_{t=1}^{t=n} \frac{FCF_t}{(1+r)^t}$$

where FCF represents the Free Cash Flow at a specific year, r represents the discount rate applied and n the number of periods considered for the generation of cash flows.

DCF has an important feature since it relies on forward-looking data. The calculation of the company's value is based on the present value of future free-cash flows. The cash flows calculated are based on a set of assumptions, specific for the industry, the historical and future perspectives of the company and the market.

It is possible to estimate the value of all future free cash-flows once the firm is assumed to have reached the steady state by using a growing perpetuity formula (terminal value). The terminal growth rate is the constant rate after the forecasted period at which is expected that free cash flows are assumed to grow in perpetuity (Rosenbaum and Pearl 2009).

$$Terminal\ Value = \frac{FCF_n(1+g)}{(r-g)}$$
$$DCF = \sum_{t=1}^n \frac{FCF_t}{(1+r)^t} + \frac{Terminal\ Value}{(1+r)^t}$$

where g represents the growth rate of Expected Cash Flow after the firm reaches its steady state.

The FCFF represents the total cash flows available to all stakeholders of the firm, including stockholders and debt holders. It retrieves the Enterprise Value of the company that can be transformed in Equity Value after the deduction of items from other investors.

If we want to calculate directly the Equity Value of the Firm we can use FCFE as the input for DCF model. The discount rate used should be the cost of equity and FCFE represent the cash flows available to the company's common equity holders after interest and principal payments have been made.

<b>Earning before Interests and Taxes (EBIT)</b>
(-) Taxes
<b>Net Operating Profit after Taxes (NOPAT)</b>
(+ ) Depreciations and Amortizations
(+ ) Other non-cash changes
(-) Capital Expenditures
(-) Investments in Net Working Capital (NWC)
<b>Free Cash Flow to the Firm (FCFF)</b>
(+ ) New Debt Issued
(-) Debt Repayments
(-) Interest Expense x (1-t)
<b>Free Cash Flow to the Equity (FCFE)</b>

**Table 1** – Calculation of Free Cash Flow to the Firm (FCFF) and Free Cash Flow to the Equity (FCFE).

### 1.2.1.1 Discount Rate

For DCF valuation is mandatory to find an appropriate discount rate to discount the future cash flows forecasted. The discount rate applied should reflect the investor's opportunity cost, offering a suitable return for the risk involved (Michael J. Mauboussin 2023).

By far, the most used discount rate is WACC, Weighted-Average Cost of Capital, that is divided in different parts as shown in the formula below.

$$WACC = \frac{E}{D + E} Ke + \frac{D}{D + E} Kd(1 - t)$$

where E represents the Equity Market Value, D is Debt Market Value, Ke the Cost of Equity, Kd the Cost of Debt and t the effective tax rate.

Starting with Cost of Equity ( $K_e$ ), this is the expected rate of return of the company's stock. Unlike the cost of debt, which can be directly observed, estimating the cost of equity is more complex. There are different models to evaluate the expected returns, like the capital asset pricing model (CAPM) or the Fama-French models. In our dissertation we will use CAPM, since all the features included in the model are well developed for American markets, where Amgen bases most of their business. The CAPM suggests that the expected rate of return of a security equals the risk-free rate plus the security's beta multiplied by the market risk premium.

$$CAPM = R_f + \beta_e (MRP)$$

where  $R_f$  is the risk-free rate,  $\beta_e$  is the equity beta of the firm and MRP - Market Risk Premium is the expected return from a market portfolio.

The risk-free rate is the return available from government default-free bonds. To value a firm or long-term project, the return from a long-term treasury bill is usually considered appropriate, as the short-term rate cannot properly measure the opportunity cost of investment for longer term projects. In the case of our project, we are valuing an US company with most of the business based in US, therefore we will consider 10-year US treasury bonds, since is a good proxy due to the low default risk and equal currency (Michael J. Mauboussin 2023).

The market risk premium (MRP) is similar to a credit spread and reflects the premium required by investors in the market relative to a risk-free asset like U.S. Treasury bonds. This calculation seems straightforward, but some decisions needed to be made, like if we should use arithmetic or geometric means of returns or how to include the country risk in our calculations (Zenner, et al. 2008).

*Kaserer* in a research work published in 2022 mentioned that “geometric means underperformed versus arithmetic means”, and this helped in our choice to rely on arithmetic means of returns (Kaserer 2022). In addition, historical data is not the perfect scenario for a valuation, but in the case of MRP and for the US market with all the data available it provides a reliable scenario.

From a macroeconomic perspective, the MRP reflects the broader outlook on the whole economy. Factors like economic growth, consumer demand, inflation, interest rates, and geopolitical risks

are important to be balanced in our calculations, therefore we will consider the adjusted country risk premiums provided by Damodaran to adjust our calculations for MRP (Damodaran 2024).

Equity Beta ( $\beta_e$ ) represents the systematic variation present in the market and for its calculation there are different possibilities. Probably the most common is the comparison of historical returns of the assets versus the historical returns of the market. Liquid equity market indexes, such as S&P500, are used as market portfolios.

The frequency of data is another sensible topic, and according to our research, monthly returns over a period of 60 months are a reliable estimator. This strategy is backward-looking however we can adjust our beta into a forward-looking beta based on the assumption that betas tend toward 1.0 over time (Michael J. Mauboussin 2023).

$$\beta_e = \frac{2}{3} \text{ Estimated Beta} + \frac{1}{3}$$

Alternatively, the beta can be estimated indirectly based on an industry beta. First, we need to identify a comparable set of companies, and gather their levered betas. Then, the betas should be unlevered, reflecting only the systematic risk of the peer's industry as shown in the formula below.

$$\beta_u = \frac{\beta_L}{1 + (1 - t) \times \frac{D}{E}}$$

where  $\beta_L$  represents the levered beta of the peer group,  $\beta_u$  represents the unlevered beta of the peer group,  $t$  the corporate tax rate and  $\frac{D}{E}$  the Debt-to-Equity value.

Finally, the beta should be re-levered to capture the current Debt and Equity market values of the target company.

$$\beta_L = \beta_u \times \left(1 + (1 - t) \times \frac{D}{E}\right)$$

where  $t$  – effective tax rate,  $\beta_L$  represents the levered beta of the company and  $\beta_u$  represents the unlevered beta of the peer group.

In terms of the calculation of cost of debt ( $K_d$ ) our approach will be based on traded debt and the respective yield-to-maturity (YTM) of each bond. According to Mauboussin et al., “YTM is a good estimate for the pre-tax cost of debt for a company with securities that are rated as investment grade” as is the case in this dissertation (Michael J. Mauboussin 2023).

Furthermore, is of major importance to analyze consistently what is the percentage of public and private debt to further compute Debt Market Value. For private debt, like loans, to calculate their specific rate we relied on the yield-to-maturity of bonds with the same rating and maturity.

Tax rate is other fundamental item to be calculated, either for cost of debt or cash flows. There are two different tax rates that can be considered – the effective tax rate and the marginal one. The effective tax rate is simply the taxes due in income statement over the taxable income. Alternatively, it is possible to use the marginal tax-rate, which is the statutory tax-rate of a country’s jurisdiction. According to *Fernandez* in his paper addressing the common errors in valuation, “the tax rate used in the calculation of WACC should be the effective tax rate” and therefore our choice will follow his guidance (Fernández 2004).

### **1.2.2 Relative Valuation**

Relative valuation is by far the most common strategy in equity research since it is a simple way to determine the valuation of a company (Jerald E. Pinto 2019). The fundamental concept of relative valuation is to consider comparable assets to value another similar asset by a multiple. However, the assumptions considered in the computations should be scrutinized to avoid errors that are commonly made in this type of valuations.

In our research we use relative valuation based in comparable companies to compare and support our projections from the discounted cash flow approach.

Our calculations will be based on Enterprise Value/EBITDA (EV/EBITDA). P/E was the traditional multiple used historically and it captures the changes in market expectations since it deals with the changes in stock prices. Nevertheless, is highly affected by accounting standards and the adoption of IFRS or US GAAP affects substantially the results achieved. In this work, we will rely solely on EV/EBITDA since it is now the most used multiple in practice. It retrieves the enterprise value therefore should be adjusted for excess cash and non-operating items before we determine the equity value. Since this multiple considers EBITDA, thus before Depreciations and Amortizations, it is less susceptible to accounting choices (Goedhart, Koller and Wessels 2005).

## 2. Pharma Overview

The pharmaceutical sector has several distinctive conditions. The larger investments in Research and Development (R&D), the specific agreements with governments for reimbursements, or the pricing pressures faced by the companies are examples of characteristics that differentiate pharma industries from companies in other sectors.

Furthermore, the regulatory oversight is challenging, and the products sold in pharma sector are protected by patents that give them a limited time of exclusivity. After expiration, companies face tough competition from generics or biosimilars that intensifies the pricing pressures.

In the next chapter, we will address the risks and specificities of pharma market.

### 2.1 Pricing Pressures

In recent years, governments around the world have been spending large amounts of money on co-payments for pharmaceuticals, becoming a significant customer for pharma companies. With these significant investments, which can be a large part of national GDP, countries are increasing their efforts to negotiate lower prices for pharmaceuticals to ease the burden of healthcare on national budgets. (OECD 2023).

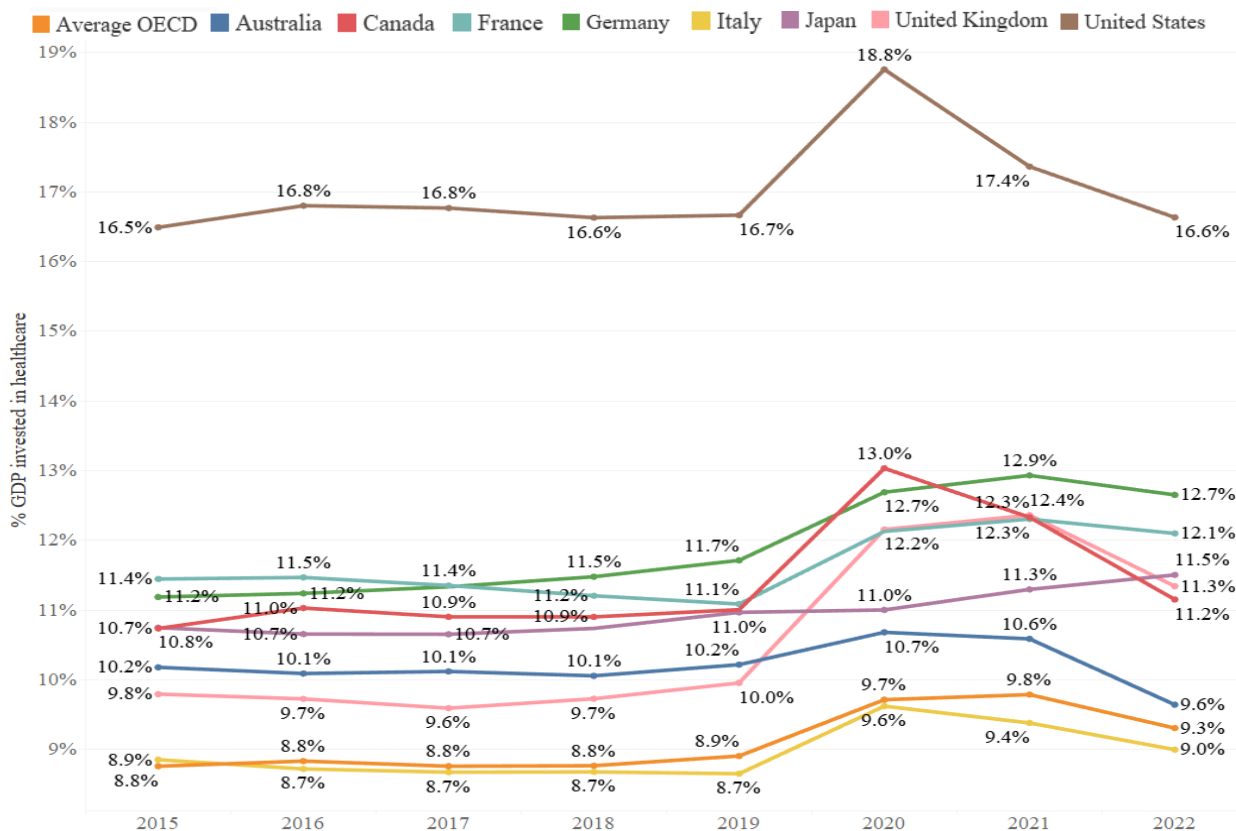
According to figure 1, which shows the percentage of GDP invested in healthcare in OECD<sup>1</sup> countries, the health expenditure to GDP ratio in 2022 was fixed in 9.3%. US is by far the country with a largest percentage of GDP invested in healthcare, followed by Germany and France. Moreover, US is a country recognized to pay more for identical branded drugs than any other country in the world and constitutes about 40 percent of the world pharmaceutical market, making them a central country for all the business made in pharma world (Berndt and Newhouse 2010).

Certainly, those reasons presented explain why 64.4% of sales of new medicines launched during the period between 2016-2021 were on US market, compared with only 16.8% on European market (EFPIA 2022).

However, the Inflation Reduction Act (IRA) could bring relevant changes for the pricing strategy in US.

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<sup>1</sup> OECD countries – Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.



**Figure 1** – Percentage of GDP invested in healthcare in OECD countries (OECD 2023).

The drug pricing negotiations in US are something new considering the past behavior of US market. Historically, it was the perfect market for pharma companies to launch their new products due to the possibility to negotiate prices flexibly. Nevertheless, pressures from different sides, aiming to control inflation and public spending, led to the elaboration of Inflation Reduction Act (IRA). This plan will introduce price caps, limiting price increases to the rate of inflation, not only for Medicare, the federal health insurance, but also to private health insurers.

The paradigm in US would resemble the European approach, where the drug prices faced strict regulation protecting the governments and consequently reduced their spending on reimbursements.

This set of measures will not impact all the products, but will impact gradually at least ten products in 2026, fifteen more for 2027 and 2028, twenty for 2029 and twenty each year thereafter (Lieneck, et al. 2023). The products that will be affected are mostly the ones that have been in the market for over nine years, in case of the regular pharmaceutical products, or for over 13 years in case of biological drugs. This legislation brings an important advantage for biological drugs, which are

exempt from price caps and harsh price negotiations for the first 13 years after approval. This fact might direct the R&D efforts towards biologicals, creating more and stronger competition for this type of products, which could be relevant in Amgen's case.

Latest years demonstrated that in a sector that is very susceptible to price pressures, where prices in most regions, such as Europe, are largely restricted and fixed, inflationary environments could threaten profitability due to the rising costs in labor, raw materials or transportation (Lieneck, et al. 2023).

## **2.2 Regulatory overview**

Pharma industries must comply with rigorous regulations, across different dimensions. Pharmaceutical products must go through a complex and challenging approval process to comply with the demanding requirements of regulatory agencies like the European Medicines Agency (EMA) or the U.S Food and Drug Administration (FDA).

After the approval, a patent is granted, and the product has market exclusivity for a period of typically 20 years. During this period of market exclusivity, manufacturers can set prices and establish a sort of monopoly due to the absence of competition.

Consequently, companies need to use the exclusivity period to maximize their revenues, and to build trust among patients and physicians about the product's effectiveness, so that they can prevent a big decline in revenues and volumes after the loss of exclusivity (LOE).

When the exclusivity ends, the pricing pressure becomes much stronger driven mainly by two different factors. If the product which patent expired captures interest to produce, due to the potential revenues or a large patient base, more companies will be interested in manufacturing those products increasing the product's supply. In addition, the costs of production will decrease significantly, since expenditures in R&D are much smaller compared with the originator decreasing the final price of the product.

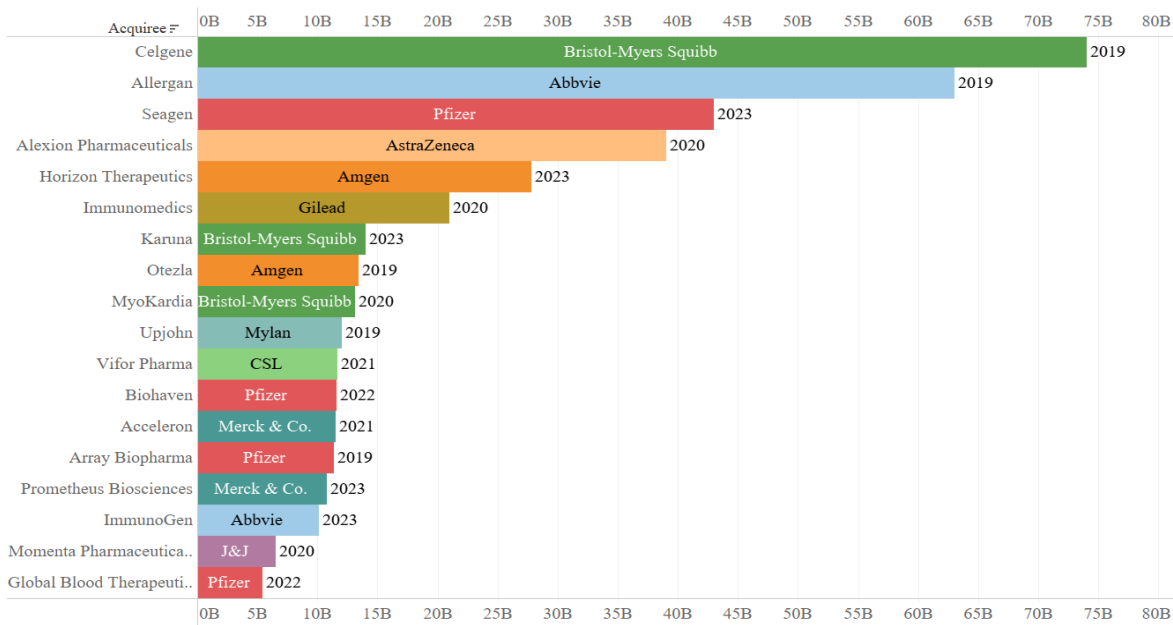
## **2.3 Current and Past Trends of Pharma Business**

The R&D component is a classical and vital feature of pharmaceutical industries. R&D processes often have low efficiency, with only about 12 percent of drugs that enter clinical drugs getting FDA approval. (Congressional Budget Office 2021).

The average expected cost to develop a new drug in Big Pharma, including expenditures on drugs that fail to reach the market, has been estimated to range around \$6 billion per new drug. On

average pharmaceutical companies spent about one-quarter of their revenues on R&D which is nearly the double of the proportion allocated in 2000s (Schumacher, et al. 2023).

An interesting feature is that a significant percentage of companies need to compensate for their negative R&D productivity through Mergers and Acquisitions (M&A) (Schumacher, et al. 2023). M&A deals are a common strategy of pharma business, similar to R&D expenditures. Pharma companies often use this strategy to buy other companies or specific products. In the past years, there were cycles with more acquisitions than others depending on market conditions. Figure 2 shows the bigger M&A between 2019-2023.



**Figure 2** – Relevant M&A deals between 2019 and 2023. *Source: Statista.*

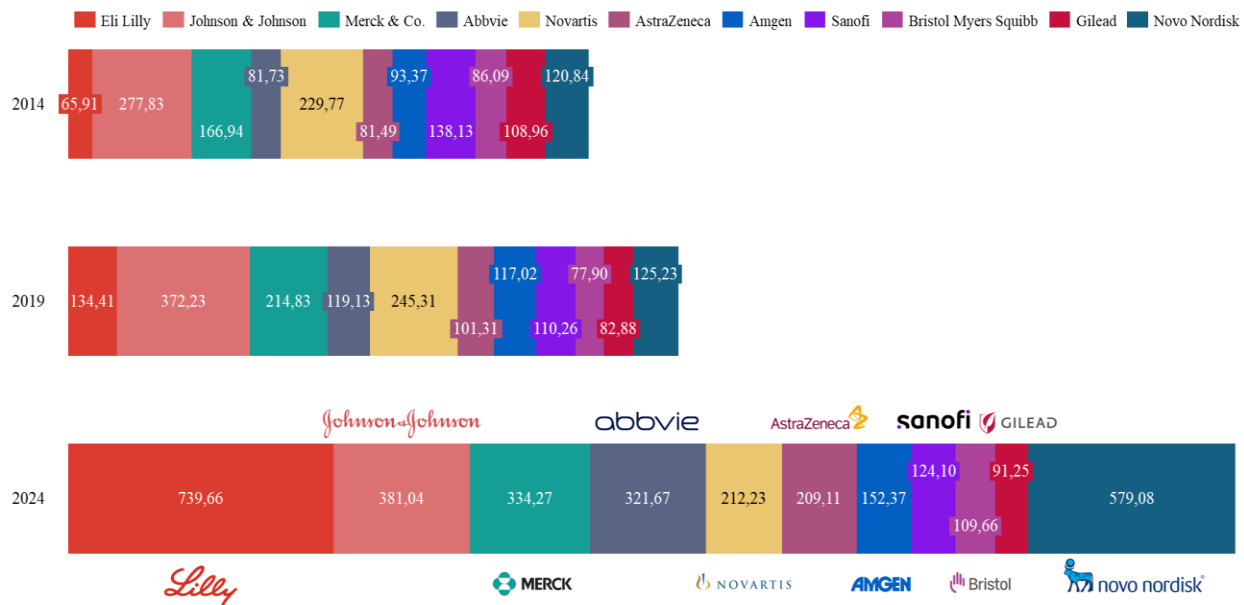
The chart presented above shows the global impact of M&A and the large sums involved in the transactions made between 2019 and 2023. Amgen is also positioned in a relevant place regarding the recent deals with the acquisition of Horizon in 2023 and Otezla in 2019.

Oncological, immunology and rare diseases are fields explored by pharma companies in the past years and the competition to buy companies that operate in those fields was intense. Typically, some of the illnesses in those areas affect small portions of the population, but the expertise gained by the acquired companies is valuable for the acquirer’s future.

However, market trends have changed recently, since weight loss drugs became more relevant and Goldman Sachs predicts that this market could grow to \$100 billion by 2030 (Goldman Sachs 2024). The potential for future blockbusters related with obesity market is real since it is estimated

that more than 650 million people worldwide live with obesity and it is the fifth most relevant cause of death according to World Health Organization (Lobstein, et al. 2023). Those factors will accelerate the reimbursements from governments, since obesity is not only a health problem but also an economic burden (Stierman, et al. 2021).

Even the evolution of market capitalization throughout the past 10 years reflects the changes in pharma trends. A decade ago, traditional companies like Pfizer or Johnson & Johnson were leading but now companies like Eli Lilly or Novo Nordisk have taken the top spots. These companies are experienced in developing the most reputable weight loss products.



**Figure 3** – Evolution of Market Capitalization between 2014 and 2024. Market cap values are in USD billions and extracted on 31<sup>st</sup> of March of each year. *Source: Refinitiv Eikon*

Share price of pharma traded companies is positively influenced by the launch of blockbuster drugs with positive clinical data and usually by mergers and acquisitions. On the other hand, safety issues concerning clinical trials can have the opposite effect.

### 3. Amgen Overview

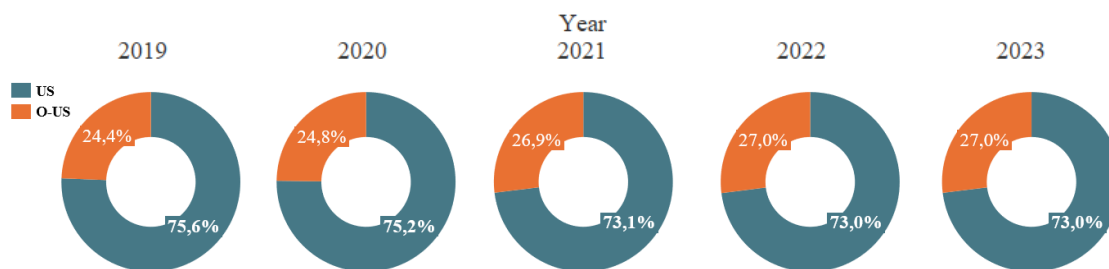
#### 3.1 Company Overview

Applied Molecular Genetics Inc., Amgen, is a biopharmaceutical company founded in Thousand Oaks, California, on April 8, 1980. The breakthrough discovery for Amgen was the replication of

erythropoietin gene, that gave the possibility to create one of the most successful drugs in biotech history - EPOGEN® (epoetin alfa), which got patent approval in 1988.

Amgen is present in more than 100 countries worldwide and is known for their capacity to produce biologicals in different therapeutic areas, like oncology, inflammation, or hematology. The company quickly became successful and are seen as the pioneers of the biotechnology industry (Amgen 2024).

Even though the company is operating in more than 100 countries, their revenues are concentrated mainly in US. This fact makes them more exposed to changes in the US market, like the previously mentioned Inflation Reduction Act. Figure 4 presents the dispersion of Amgen revenues between US and other countries (O-US).



**Figure 4** – Distribution of revenues between US and O-US markets. *Source: Amgen Annual Report.*

Nevertheless, Amgen is trying to differentiate their sources of revenues in terms of regional distribution. The changes are smooth, but in the last 5 years the percentage of revenues from O-US is increasing.

Biotechnological business face different challenges compared with the conventional chemical molecules. Biologicals are more complex compared with conventional drugs, therefore manufacturing costs and related expenses such as distribution costs are higher. On the other hand, it also brings a sense of protection to the portfolio since due to the complexity of biologicals it is difficult to establish bioequivalence and to produce biosimilars.

Historically, the extent of normal generic drugs approved after the loss of patent is much higher than biological molecules and so the degree of price competition following loss of patent could be lower in biologicals safeguarding the portfolio (Berndt and Newhouse 2010).

### 3.2 Portfolio and Business areas

Amgen's portfolio is divided in 4 main categories, General Medicine (GenMed), Oncology, Inflammation and Rare diseases. Table 2 shows the products that are considered in each category.

Original medicines continue to be the largest portion of Amgen’s portfolio, however biosimilars are gaining territory becoming an important part of the business.

General Medicine	Oncology	Inflammation	Rare Diseases
Repatha	Blincyto	Tezspire	Tepezza
Prolia	Vectibix	Otezla	Krystexxa
Evenity	Kyprolis	Enbrel	Uplizna
Aimovig	Lumykras	Amgevita	Tavneos
Evenity	Xgeva	Avsola	Procysbi
Sensipar	Nplate	Riabni	Ravicti
	Kanjinti		
	Mvasi		

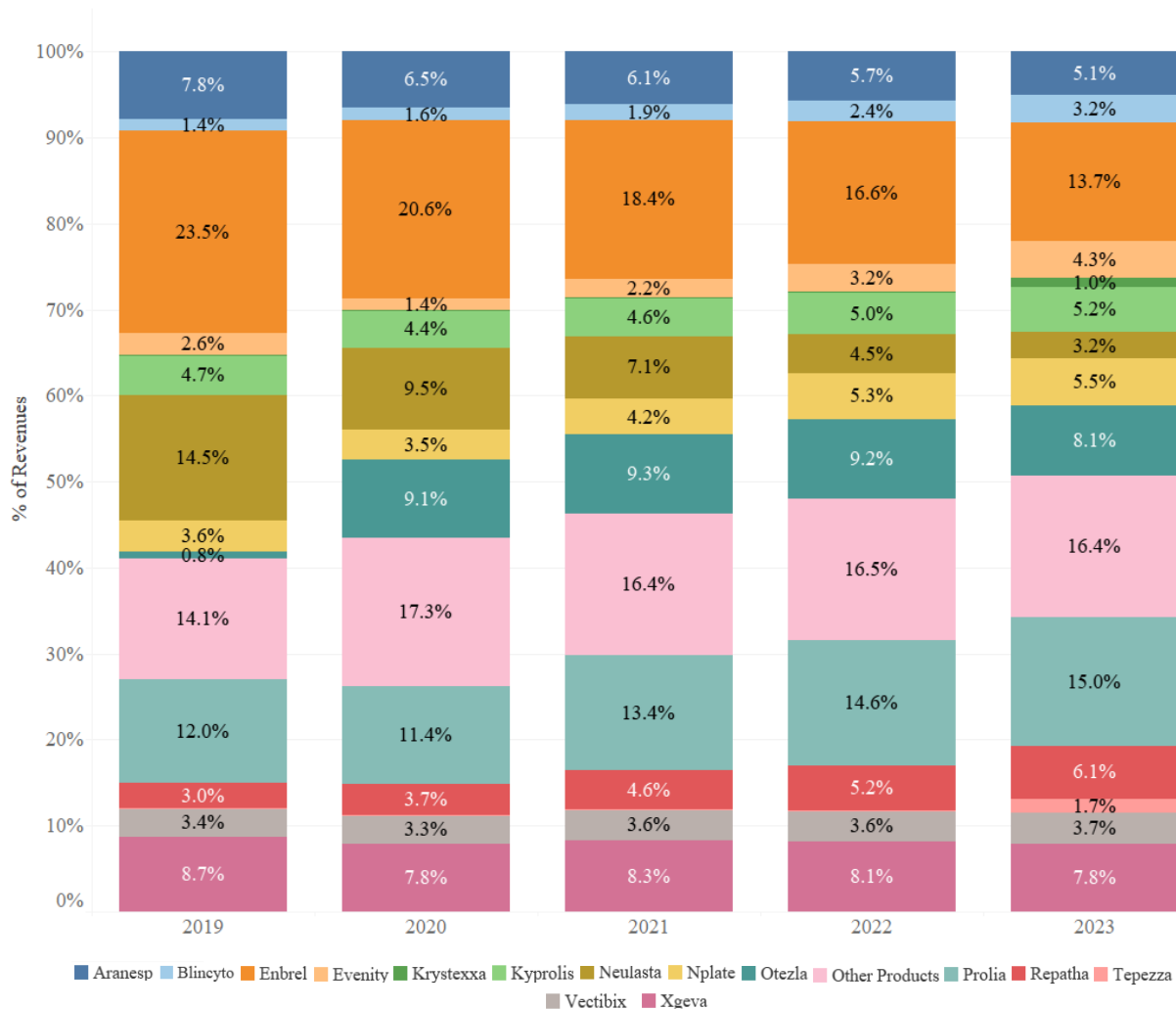
**Table 2** – Amgen’s product portfolio distributed by therapeutic area. *Source: Amgen Annual Report.*

For a company that relies on its product portfolio as the core of its business, it is essential to assess the evolution of revenues, the strengths and weaknesses and how the portfolio handles with patent expiry in key brands. There are critical points in the current structure of Amgen’s portfolio and figure 5 shows the revenue dispersion by product in the last 5 years (Amgen Inc. 2024).

In terms of critical points, there are patent expiries expected in important products soon. Xgeva and Prolia, two products with the same active ingredient – denosumab, will lose their patent in 2025. Other products like Otezla in 2028, Enbrel in 2029 and Repatha in 2030.

Looking at the revenue profile from 2023, the products that will expire their patent by 2030 account for 50.8% of revenues now. It is true that the loss of exclusivity might not mean a complete loss of revenues, but the probability is higher due to the price shift. This highlights the relevance of developing new products or acquiring other companies, since the revenues are not permanent and stable in pharmaceutical industries.

On the other hand, Amgen portfolio shows important strengths namely the current balanced revenue distribution and the adaptation to patent expirations. Figure 5 shows that in 2023 none of the products account for more than 15% of revenues, which shields the portfolio against fluctuations in specific markets and therapeutic areas. Furthermore, after LOEs, the portfolio is resilient, as we can see in the case of Neulasta, which went from almost 15% of revenues in 2019, before the patent expiry, to 3.2% of revenues now.



**Figure 5** – Dispersion of revenues per product between 2019 and 2023. *Source: Amgen Annual Report.*

To prepare the portfolio for future challenges is important to improve his diversity, therefore the products in the pipeline could be important for Amgen’s future. There are promising products, like MariTide, which in phase 2 of clinical trials showed encouraging results in long-lasting weight loss. Olpasiran also demonstrated positive outcomes in 2022 in lowering “bad” cholesterol that is inherited genetically. In the oncological field, Tarlatamab advanced significantly in treating small lung cancer in patients who did not respond to two or more previous treatments (Amgen Inc. 2024).

### 3.3 Acquisitions and strategy behind

Amgen has often used acquisitions as a strategic approach, as it acquired two of its blockbuster drugs, Otezla and Enbrel, as well as other companies such as FivePrime, Teneobio or

ChemoCentryx. However, the biggest acquisition ever made was the acquisition of Horizon completed in October 2023 for 27.8 bn USD, which meant \$116.50 paid per share.

The acquisition of Horizon was the result of a fierce bid among major pharma players like Janssen, Amgen and Sanofi. Horizon adds their unique business in rare diseases, enhancing Amgen's inflammatory portfolio, in an area with less competition. In addition, Horizon's products are patent protected, difficult to replicate and consequently being fairly protected from biosimilars threat.

Horizon portfolio is composed by several products like Uplizna, Ravicti, Krystexxa or Tepezza. The former two represented already more than 10% of Amgen's revenues in 4Q of 2023 (Amgen Inc. 2024). Some products are in a very early stage of their life cycles and could be leveraged by the extensive global presence of Amgen, their capability to make biological drugs and their expertise in inflammation.

These efforts would be essential to access more patients around the world, something crucial in rare diseases business. For example, Krystexxa a product used for uncontrolled gout has a patient pool of about 100 000 patients out of the 9.5 million with gout in the US (1.05%). For Ravicti, there are only 1 000 patients who have been diagnosed, which clearly reflects the challenge to identify new patients (Horizon Therapeutics PLC 2023).

Additionally, as these products address a small group of population, they can get the status of orphan drugs which brings an advantage in terms of marketability. Orphan drugs are defined by FDA "as medicines designated to treat a condition affecting fewer than 200 000 people in US and that have no prior approved treatment for such disease" (U.S. Food & Drug Administration 2024). Tepezza and Uplizna are examples of orphan drugs in Horizon's portfolio.

Amgen faces a big challenge and opportunity with Horizon's acquisition, which is vital for its future success. In 2020, AstraZeneca (AZ) acquired Alexion Pharmaceuticals, also a company focused on rare diseases, for nearly 40bn USD. The goals of the acquisition were similar to Horizon's deal, namely the diversification into rare diseases, globalization of Alexion's portfolio and use AZ's manufacturing capacity to improve the profitability of Alexion products.

### **3.4 Past Performance**

#### **3.4.1 Activity and Profitability**

In the previous years, Amgen had a solid performance increasing their revenues consistently despite the loss of exclusivity for some products. 2023 was a challenging year due to Horizon

acquisition, and the incorporation of the company represented a change in activity indicators like inventories.

	2019	$\Delta_{(y0/y-1)}$	2020	$\Delta_{(y0/y-1)}$	2021	$\Delta_{(y0/y-1)}$	2022	$\Delta_{(y0/y-1)}$	2023	$\Delta_{(y0/y-1)}$
Revenues	23,362	-1.62%	25,424	8.83%	25,979	2.18%	26,323	1.32%	28,190	7.09%
Gross Profit	19,006	-3.26%	19,265	1.36%	19,525	1.35%	19,917	2.01%	19,775	-0.71%
% of Revenues	81.4%		75.8%		75.2%		75.7%		70.1%	
SG&A	5,150	-6.4%	5,730	11.26%	5,368	-6.32%	5,414	0.86%	6,166	13.89%
% of Revenues	22.0%		22.5%		20.7%		20.6%		21.9%	
R&D	4,116	10.1%	4,207	2.21%	4,819	14.55%	4,434	-7.99%	4,784	7.89%
% of Revenues	17.6%		16.5%		18.5%		16.8%		17.0%	
EBITDA	11,465	-3.33%	12,558	9.8%	9,986	-20.7%	12,667	26.8%	11,752	-7.2%
% of Revenues	49.1%		49.5%		38.40%		48.1%		41.7%	

**Table 3** – Evolution of revenues, gross profit, EBITDA and operating expenses between 2019 and 2023 (Numbers in millions USD). *Source: Amgen Annual Report*

From the table above is important to mention the consistency and predictability of Amgen's operating ratios, namely SG&A and R&D, which have stable percentages out of revenues. R&D follows the tendency of pharma business, representing almost one fifth of revenues. In addition, the company achieves interesting levels of profitability, that are negatively affected by Horizon acquisition during 2023. The ratios also indicate that Amgen revenues rose considerably in 2023, but the profitability did not follow the same pattern, meaning that there might be some challenges to integrate Horizon's structure efficiently.

Regarding activity parameters our attention will be focused in three fundamental items: inventories, receivables and payables.

	2019	$\Delta_{(y0/y-1)}$	2020	$\Delta_{(y0/y-1)}$	2021	$\Delta_{(y0/y-1)}$	2022	$\Delta_{(y0/y-1)}$	2023	$\Delta_{(y0/y-1)}$
<b>Inventories</b>	3,584	21.9%	3,893	8.6%	4,086	5.0%	4,930	20.7%	9,518	93.1%
Inv. Turnover	1.34		1.65		1.62		1.42		1.16	
Days of Inventory on Hand	269.59		218.52		222.53		253.34		309.05	
<b>Receivables</b>	4,057	13.3%	5,324	31.2%	5,839	9.7%	6,392	9.5%	7,942	24.2%
Rec. Turnover	6.12		5.92		5.52		5.03		4.39	
Days of Sales Outstanding	58.84		60.76		65.27		71.51		81.93	
<b>Payables</b>	1,371	13.6%	1,421	3.6%	1,366	-3.9%	1,572	15.1%	1,590	1.1%

	2019	$\Delta_{(Y0/Y-1)}$	2020	$\Delta_{(Y0/Y-1)}$	2021	$\Delta_{(Y0/Y-1)}$	2022	$\Delta_{(Y0/Y-1)}$	2023	$\Delta_{(Y0/Y-1)}$
Pay. Turnover	3.88		4.63		4.77		4.94		8.22	
Number of Days of Payables	92.81		77.70		75.47		72.94		43.77	

**Table 4** – Evolution of inventories, receivables and payables between 2019 and 2023 (Numbers in millions USD) and their respective ratios. *Source: Amgen Annual Report.*

Horizon’s merger explains the increase in inventories observed in 2023 as the result of considering the fair value of acquired inventory. The days of inventory on hand in 2023 would not reflect the normal operations since the last year was strongly influenced by Horizon deal.

Higher levels of receivables comprise a normal situation in pharmaceutical companies due to the business dynamics. Reimbursements and co-payments from governments are often delayed because they are made during or after the treatments. In Amgen’s annual report is mentioned that the total allowance for doubtful accounts is insignificant, which might suggest that the company is confident in collecting the majority of receivables amount.

This is in line with the ratio of days of sales outstanding which is less than the 120 days limit that Amgen usually allows for payment delay, meaning that Amgen is on average collecting their payments earlier than the maximum established.

In terms of payables, the ratios in 2023 are influenced by Horizon incorporation, but looking retrospectively the values are stable and the period of Amgen payment is regular.

### 3.4.2 Liquidity

Looking for liquidity performance of Amgen, the ratios throughout the period analyzed show a consistent performance by the company. The critical factor for cash variations is the purchase of other companies. Table 5 shows the evolution of liquidity ratios between 2019 and 2023.

	2019	$\Delta_{(Y0/Y-1)}$	2020	$\Delta_{(Y0/Y-1)}$	2021	$\Delta_{(Y0/Y-1)}$	2022	$\Delta_{(Y0/Y-1)}$	2023	$\Delta_{(Y0/Y-1)}$
<b>Current Ratio</b>	1.44		1.81		1.59		1.41		1.65	
<b>Quick Ratio</b>	1.01		1.37		1.14		1.00		1.03	
<b>Cash Ratio</b>	0.69		0.91		0.66		0.59		0.60	
<b>Cash Conversion</b>	235		201		212		252		347	

**Table 5** – Evolution of liquidity ratios between 2019 and 2023. *Source: Amgen Annual Report*

Operating activities, as expected, are the main source of cash inflows for the company and acquisitions are the biggest responsible for cash outflows. In terms of capital expenditures, there was a slightly increase in the last years but nothing relevant. The cash conversion cycle measured as the days of inventory on hand plus the days of sales outstanding minus the number of days of payables clearly demonstrates the effect of the previously mentioned rise in inventories in 2023.

### 3.4.3 Solvency

The macroeconomic context and the higher interest rates created pressure in many businesses. In the case of Amgen, the book values of debt increased significantly in 2023 due to the acquisition of Horizon, however as we will discuss later in terms of debt market values the riskiness of the company did not increase significantly. The growth in outstanding debt explains the total increase in interests paid.

	2019	$\Delta_{(y0/y-1)}$	2020	$\Delta_{(y0/y-1)}$	2021	$\Delta_{(y0/y-1)}$	2022	$\Delta_{(y0/y-1)}$	2023	$\Delta_{(y0/y-1)}$
<b>Interests</b>	536	-32.8%	1,006	87.7%	1,197	19.0%	1,406	17.5%	2,637	87.6%
Interest Coverage	18.05		9.08		6.38		6.86		3.02	
% Interests / Debt	1.79%		3.05%		3.59%		3.61%		4.08%	
<b>Total Debt</b>	29,903	-11.9%	32,986	10.3%	33,309	1.0%	38,945	16.9%	64,613	65.9%
Short Term Debt	0	-%	0	-%	0	-%	0	-%	0	-%
Long Term Debt	26,950	-8.7%	32,895	22.1%	33,222	1.0%	37,354	12.4%	63,170	69.1%
Current Port of LT Debt	2,953	-33.2%	91	-96.9%	87	-4.4%	1,591	1728.7%	1,443	-9.3%
Financial Leverage	0.43		0.46		0.44		0.34		0.46	
Debt-to-assets	0.50		0.52		0.54		0.60		0.67	

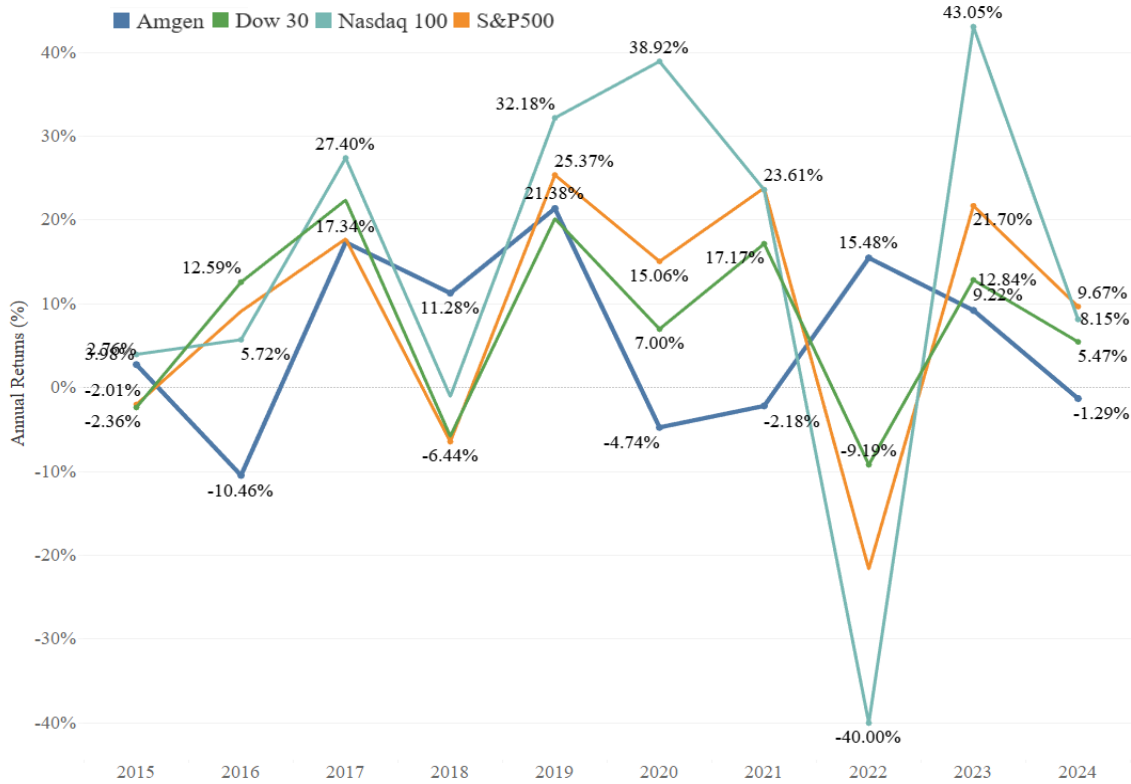
**Table 6** – Evolution of interest and debt between 2019 and 2023 (Numbers in millions USD) and their respective ratios. *Source: Amgen Annual Report*

Despite the period of rising inflation faced during the last 2 years (2022-2023) the percentage of interests paid over the total debt did not suffer a huge variation. This might be explained by the significant percentage of debt with fixed interest rates.

Motivated by the increase in the total amount of debt, the evolution of ratings for long term debt suffered a little degradation. For example, considering the Standard & Poor classification, Amgen's rating for long term debt was downgraded from A- to BBB+.

### 3.4.4. Share price and returns evolution

Amgen is listed in New York Stock Exchange (NYSE) and belongs to some of the worlds’ major indexes, such as S&P500, Nasdaq 100 or DOW 30. Figure 6 compares the performance of Amgen with the indexes abovementioned.



**Figure 6** – Comparison of annual returns (%) between Amgen, Dow 30, Nasdaq 100 and S&P 500 in the period comprising 2015 and 2024 (until March). Source: *Refinitiv Eikon Datastream*

Figure 6 shows that in most of the years the company is underperforming the indexes. Nevertheless, those indexes include a large share of technology companies, which had significant returns in the period considered (2015-2024), and often have large market caps that inflate their influence on weighted averaged indexes like the three presented.

Interestingly, the company outperformed the indexes in their unfavorable years, like 2018 and 2022. This suggests that pharma companies could remain in positive territory during tough market periods.

Comparing the volatility of returns vs the indexes, Amgen stock has a higher volatility which means a higher dispersion of returns for the period considered (2015-2024) and thus a higher

unpredictability in terms of the forecasted share price. The volatility was measured as the standard deviation of monthly returns and table 7 presents the summarized results.

**Annual returns**

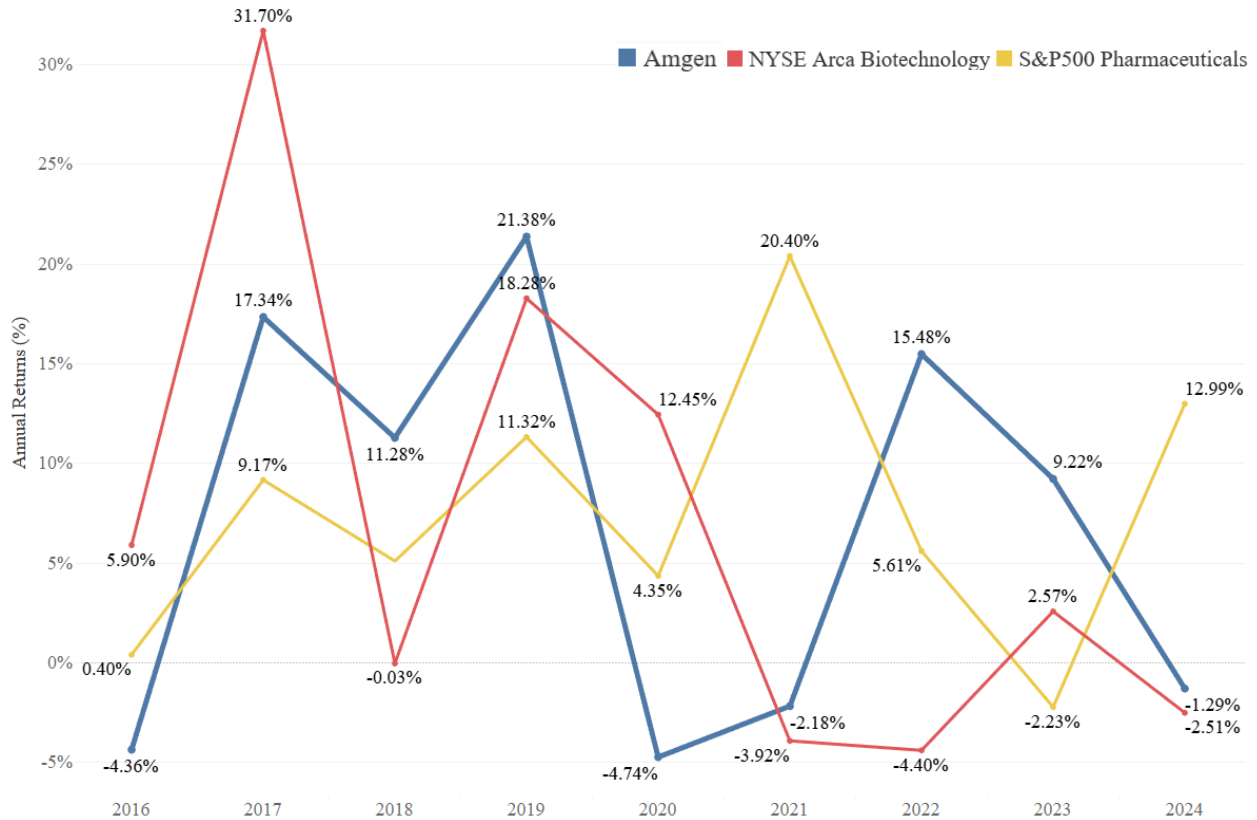
	<b>Arithmetic mean of returns</b>	<b>Geometric mean of returns</b>	<b>Volatility</b>
<b>Amgen</b>	6.81%	4.19%	24.60%
<b>S&amp;P 500</b>	10.36%	9.12%	15.74%
<b>Dow 30</b>	9.00%	7.78%	15.66%
<b>Nasdaq 100</b>	15.98%	14.19%	18.95%

**Table 7** – Comparison of arithmetic and geometric mean of annual returns as well as annualized volatility of Amgen, Nasdaq 100, Dow 30 and S&P 500 between 2015 and 2024 (until March). *Source: Refinitiv Eikon Datastream*

The comparison with large, unspecific but relevant indexes is important to provide a broad overview of Amgen returns. However, is also important to benchmark the returns with specific indexes related with pharma and biotech companies. For this purpose, the indexes selected were the following: S&P 500 Pharmaceuticals and NYSE Arca Biotechnology Index.

Amgen returns are similar to the returns achieved by the specific indexes, showing that the company achieved a performance in accordance with their peers. Amgen had an average return of 7.61% from 2016 to 2024, which was slightly above the Biotechnological index – 7.35% and slightly below the Pharma index – 8.22%.

The returns calculated did not account for dividends, but about the latter is important to mention that Amgen is increasing consistently the dividends paid. For example, the quarterly dividends paid in 2024 are 47% higher than the dividends paid in 2019 and this is an important signal from the administration to their shareholders.



**Figure 7** – Comparison of annual returns (%) between Amgen, NYSE Arca Biotechnology, S&P 500 Pharmaceuticals in the period comprising 2016 and 2024 (until March). *Source: Refinitiv Eikon Datastream*

## 4. Equity Valuation

### 4.1 Discounted Cash Flow Valuation

The main valuation technique considered in this dissertation is the Discounted Cash Flow Valuation. Additionally, our analysis considers an explicit period ranging from 2024 to 2030. This timeframe gives time for Amgen to integrate Horizon’s portfolio and to stabilize their working capital needs and expenditures following the acquisition.

#### 4.1.1 Revenue

Amgen revenues can be separated in two categories. The main one consists in product sales, which accounts for 95% of the revenues. On the other hand, the remaining 5% are concentrated in different sources like royalty income and corporate partner revenues.

To calculate the future product revenues there were two fundamental inputs considered in the computations. Firstly, is important to consider the year of patent expiration, which usually leads to a big drop in revenues, due to the sharp decrease in price. Finally, as expected, is important to consider the impact of Horizon acquisition and the incorporation of their portfolio. For this purpose, our calculations were based in the past performance of Horizon’s products and we looked for a comparable acquisition, namely the purchase of Alexion Pharmaceuticals by AstraZeneca in 2020.

In terms of loss of exclusivity, an important impact is expected in 2025 with the patent expiration of denosumab molecule, which is the main compound of Prolia and Xgeva. In the past, there were examples of products that did not experience a sudden decrease in sales after losing patent protection, like Nplate or Aranesp. However, other products suffered the exact opposite effect, such as Neulasta, which saw its sales decline at a rate of 28.37% per year (CAGR) over a period of 4 years.

We expect denosumab to face the same challenges from biosimilars, since the competition seems that is going to be aggressive. There are already two biosimilars approved in Europe and in US from Sandoz, a reference competitor in the market of biosimilar and generic drugs (U.S. Food & Drug Administration 2024).

Table 8 shows the product sales for the period between 2021-2023 and the forecasted product sales for the period comprised between 2024-2030.

Product	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Prolia</b>	<b>3.248</b>	<b>3.628</b>	<b>4.048</b>	4.491	3.854	2.761	1.977	1.416	1.015	0.727
<b>Δ (%)</b>	<b>17.6</b>	<b>11.7</b>	<b>11.6</b>	10.9	-14.2	-28.4	-28.4	-28.4	-28.4	-28.4
<b>Enbrel</b>	<b>4.465</b>	<b>4.117</b>	<b>3.697</b>	3.391	3.109	1.828	1.677	1.538	1.320	0.950
<b>Δ (%)</b>	<b>-10.6</b>	<b>-7.8</b>	<b>-10.2</b>	-8.3	-8.3	-41.2	-8.3	-8.3	-14.2	-28.4
<b>Otezla</b>	<b>2.249</b>	<b>2.288</b>	<b>2.188</b>	2.186	2.183	2.181	2.179	1.870	1.339	0.959
<b>Δ (%)</b>	<b>2.5</b>	<b>1.7</b>	<b>-4.4</b>	-0.1	-0.1	-0.1	-0.1	-14.2	-28.4	-28.4
<b>Xgeva</b>	<b>2.018</b>	<b>2.014</b>	<b>2.112</b>	2.159	1.853	1.327	0.951	0.681	0.488	0.349
<b>Δ (%)</b>	<b>6.3</b>	<b>-0.2</b>	<b>4.9</b>	2.2	-14.2	-28.4	-28.4	-28.4	-28.4	-28.4
<b>Repatha</b>	<b>1.117</b>	<b>1.296</b>	<b>1.635</b>	2.050	2.571	3.225	4.044	4.487	4.978	4.272
<b>Δ (%)</b>	<b>25.9</b>	<b>16.0</b>	<b>26.2</b>	25.4	25.4	25.4	25.4	10.9	10.9	-14.2
<b>Nplate</b>	<b>1.027</b>	<b>1.307</b>	<b>1.477</b>	1.724	2.013	2.350	2.744	3.204	3.740	4.367
<b>Δ (%)</b>	<b>20.8</b>	<b>27.3</b>	<b>13.0</b>	16.8	16.8	16.8	16.8	16.8	16.8	16.8
<b>Kyprolis</b>	<b>1.108</b>	<b>1.247</b>	<b>1.403</b>	1.511	1.626	1.751	1.885	2.030	2.186	2.353

Product	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Δ (%)	4.0	12.6	12.5	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Aranesp	1.480	1.421	1.362	1.283	1.209	1.139	1.073	1.011	0.952	0.897
Δ (%)	-5.6	-4.0	-4.2	-5.8	-5.8	-5.8	-5.8	-5.8	-5.8	-5.8
Neulasta	1.734	1.126	0.848	0.607	0.435	0.312	0.223	0.160	0.115	0.082
Δ (%)	-24.4	-35.1	-24.7	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4	-28.4
Evenity	0.530	0.787	1.160	1.387	1.659	1.984	2.373	2.838	3.394	4.060
Δ (%)	51.4	48.5	47.4	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Vectibix	0.873	0.893	0.984	1.055	1.132	1.214	1.301	1.396	1.497	1.605
Δ (%)	7.6	2.3	10.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Blinicyto	0.472	0.583	0.861	1.110	1.430	1.843	2.037	2.250	2.486	2.746
Δ (%)	24.5	23.5	47.7	28.9	28.9	28.9	10.5	10.5	10.5	10.5
Other products - Amgen	3.976	4.094	4.415	4.815	5.252	5.728	6.248	6.814	7.432	8.106
Δ (%)	-5.0	3.0	7.8	9.1	9.1	9.1	9.1	9.1	9.1	9.1
Tepezza	1.661	1.966	0.448*	2.172	2.399	2.651	2.928	3.235	3.326	3.415
Δ (%)		18.3			10.5	10.5	10.5	10.5	2.82	2.66
Krystexxa	0.565	0.716	0.272*	0.791	0.874	0.966	1.067	1.179	1.212	1.244
Δ (%)		26.7			10.5	10.5	10.5	10.5	2.82	2.66
Ravicti	0.292	0.326	0*	0.360	0.397	0.439	0.485	0.536	0.551	0.566
Δ (%)		11.6			10.5	10.5	10.5	10.5	2.82	2.66
Other products - Horizon	0.708	0.622	0*	0.687	0.759	0.838	0.926	1.023	1.052	1.080
Δ (%)		-12.2			10.5	10.5	10.5	10.5	2.82	2.66
<b>Total</b>	<b>24.30</b>	<b>24.80</b>	<b>26.91</b>	31.80	32.76	32.54	34.12	35.67	37.08	37.78
Δ (%)	0.2	2.1	8.5	18.1	3.1	-0.67	4.86	4.54	3.97	1.88

**Table 8** – Summary of revenues for Amgen products between 2021-2023 (historical data) and for the forecasted period 2024-2030. Sales numbers are in billions USD and the growth rates are presented in percentage YoY. *Source: Amgen Annual Report and Horizon Annual Report.*

(\*) - Transition year from Horizon to Amgen

Besides the patent's expiry for Prolia and Xgeva, we need to consider also the loss of exclusivity for Otezla (2028), Enbrel (2029) and Repatha (2030) during the explicit period. We followed the same strategy as we did for Prolia and Xgeva, considering an annual growth rate based on how Neulasta performed after the loss of exclusivity (CAGR of -28.37%).

Nonetheless, the rate used for the first year after the patent expired was lower, 14.2%. This rate is half of the annual rate calculated, because the impact is usually smaller in the first year. Delays in

the agreements with the governments and supply constraints are common reasons that affect the launch of the biosimilars in the market.

Regarding the remaining Amgen products, the strategy was to apply a growth rate during the forecasted period similar to the CAGR calculated for the previous four years (Appendix 7). In our view, this is a good strategy to capture the market effect and the trends that products are following. The two exceptions, for which we didn't applied the CAGR on the whole explicit period were for Blincyto and Repatha. Concerning Blincyto, this is an orphan drug to treat a small number of patients and the current CAGR does not seems reasonable in the future. Therefore, we applied the same growth rate as for Horizon products from 2026 onwards.

In the case of Repatha, we applied the CAGR until 2027, and closer to the patent expiration date we applied the growth rate of Prolia (10.94%). Similar to Blincyto, the current growth rate seems unsustainable.

The group of products that we predict an increase in revenues, are mostly products that are in the oncological field (Vectibix, Nplate, Kyprolis and Blincyto), which is an area that according to the latest reports still has a lot of potential to grow (IQVIA 2024). Moreover, for these specific products the competition is well established and no major challenges are expected.

The other product which we predict a significant growth within Amgen's current portfolio is Repatha. This is a product used to treat higher levels of bad cholesterol and consequently with a large patient pool. In this case, the competitive pressure might be intensified in the future due to the high potential of this therapeutic area, nevertheless, since the target population is large there is room for the product to keep expanding.

#### **4.1.1.1 Impact of Inflation Reduction Act in Revenues**

For the period comprised between 2026 and 2030 we should not consider the same approach for revenue evolution as we did for the previous period. And the reason for this fact is the implementation of Inflation Reduction Act (IRA) that will affect Amgen from 2026 onwards.

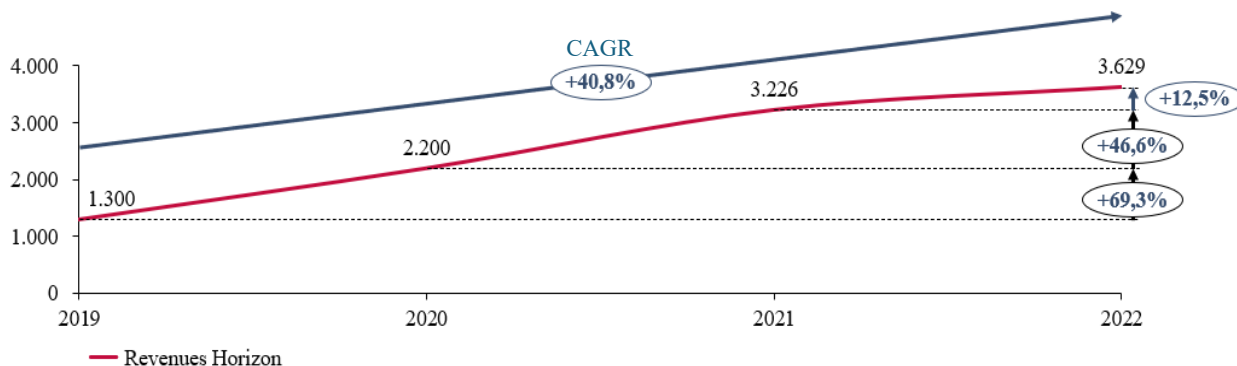
As mentioned in chapter 2.1, IRA will impact the first ten products in 2026 and Enbrel is one of the products on the US government's preliminary list (Enbrel is sold almost exclusively in US) (KPMG 2022). In addition, Enbrel has a feature that might enhance the effect of IRA, since it is one of the products that pose a large reimbursement cost for Medicare.

The exact impact of IRA is unclear, since the discussions of price negotiations have not begun yet, but some sources anticipate discounts around 70% (Kfoury, et al. 2022). Appendix 5 shows the

calculation for the average product discounts applied between 2021 and 2023, and for the calculation of Enbrel’s revenues between 2026 and 2030 we applied a discount rate from gross to net sales of 70%.

#### 4.1.1.2 Impact of Horizon incorporation

Finally, the last piece of revenues forecasting was the incorporation of Horizon portfolio. To begin the discussion about Horizon, let’s look for figure 8 that illustrates the evolution of Horizon revenues between 2019 and 2022, prior to Amgen’s acquisition.



**Figure 8** – Evolution of Horizon revenues before the acquisition, the CAGR for the period considered and the evolution YoY. The revenues numbers are in billion USD. *Source: Annual Report Horizon.*

Horizon business was growing significantly prior to the acquisition reinforcing the potential of rare diseases treatments. The compounded average growth for the period between 2019-2022 is 40.8%, however the growth rate is decreasing gradually.

While the synergies with Amgen could significantly enhance product revenue, the patient pool is limited and treatments for rare diseases are typically expensive and thus difficult to get reimbursement in some markets.

In conclusion, it appears unrealistic that the growth rate achieved in the period between 2019 and 2022 persists, especially considering that initial growth rates are typically higher.

Therefore, we looked for the acquisition of Alexion Pharmaceuticals by AstraZeneca (AZ) to establish a comparison with Horizon purchase. Alexion had a portfolio focused also on rare diseases with two products, Soliris and Ultomiris, that at the time of the acquisition already represented a significant amount of revenues – 3.95 billion USD and were established in the market.

After AZ acquisition in 2020, the revenues of Alexion portfolio grew 10.48% on an annual basis reaching 7.43B USD in 2023. Currently, the rare disease business already represents 17.8% of AZ

revenues (AstraZeneca PLC 2024). Table 9 presents the evolution of Alexion portfolio before acquisition (2019) and after the acquisition (Alexion Pharmaceuticals 2020).

	<b>Soliris</b>	<b>Ultomiris</b>	<b>Strensiq</b>	<b>Kanuma</b>	<b>Total</b>	<b>CAGR (%)</b>
<b>2019</b>	3.946	0.339	0.593	0.112	4.990	
<b>2023</b>	3.145	2.965	1.152	0.171	7.433	10.48%

**Table 9** – Evolution of revenues for Alexion Pharmaceuticals portfolio before and after AstraZeneca acquisition. Sales numbers are in billions USD. *Source: AstraZeneca annual report and Alexion Pharmaceuticals Annual Report.*

The total portfolio of Alexion prior to the acquisition totaled 4.99B USD compared to the 3.63B of Horizon. In our view, the CAGR achieved by Alexion portfolio after AZ acquisition is a good estimate to predict the future effect of Horizon. Furthermore, a higher growth rate would be difficult to achieve and thus we applied this growth rate for the whole Horizon portfolio for the period between 2024-2028.

After 5 years of a robust growth rate, for 2029 and 2030 the growth rate applied on Horizon’s products was aligned to the rest of Amgen’s portfolio. This gives total revenues for Horizon products by 2030 of 6.30B USD and the rare disease business will represent 16.7% of total product revenues of Amgen.

According to the recent news there are no new launches expected for the explicit period, therefore Horizon products will be the main driver for Amgen growth. Our calculations estimate a total product revenue growth from 2023 to 2030 of 4.97%, with only 2.66% coming from the existing Amgen products and 8.90% from Horizon products.

In conclusion, for the other sources of revenue we considered 5% of total revenues since there are no major changes expected and it will follow the historical pattern. Table 10 summarizes the overview of revenues between 2021 and 2030.

	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2023</b>
<b>Product Sales</b>	<b>24.30</b>	<b>24.80</b>	<b>26.91</b>	31.78	32.76	32.54	34.12	35.67	37.08	37.78
<b>% Revenues</b>	<b>93.5</b>	<b>94.2</b>	<b>95.5</b>	95.0	95.0	95.0	95.0	95.0	95.0	95.0
<b>Other Revenue</b>	<b>1.68</b>	<b>1.52</b>	<b>1.28</b>	1.67	1.72	1.71	1.80	1.88	1.95	1.99
<b>% Revenues</b>	<b>6.5</b>	<b>5.8</b>	<b>4.5</b>	5.0	5.0	5.0	5.0	5.0	5.0	5.0

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2023
<b>Total Revenues</b>	<b>25.98</b>	<b>26.32</b>	<b>28.19</b>	33.45	34.48	34.25	35.91	37.54	39.03	39.77

**Table 10** – Summary of Amgen Revenues (Billion USD) divided by product sales and other sources of revenues.

#### 4.1.2 Gross Margin

In terms of gross margin, the historical data shows that Amgen has an interesting profitability, an average of 75.6% between 2019 and 2022. However, in 2023 it experienced a decline that resulted in a final margin of 70.1% driven mainly by higher amortization expenses from Horizon integration, as per Amgen Annual Report.

Table 11 illustrates the gross margin evolution of Horizon between 2019-2022 and the information presented demonstrates that the profitability levels were comparable to Amgen.

	2019	2020	2021	2022
<b>Revenues</b>	1.300	2.200	3.226	3.629
<b>Gross Margin</b>	0.938	1.668	2.432	2.709
<b>% Revenues</b>	72.1%	75.8%	75.4%	74.6%

**Table 11** – Summary of Horizon Gross Margin (Billion USD) and the respective percentage of revenues.  
*Source: Horizon Annual Report*

However, due to the impact of Horizon’s acquisition is expected a continuation of amortization expenses. Those numbers were clearly presented in Amgen’s annual report – \$4.8B in 2024, \$4.5B in 2025, \$3.9B in 2026, \$3.9B in 2027 and \$2.9B in 2028.

As such, that impact was reflected in Amgen’s cost of sales, as suggested in annual report.

The loss of patents is also an important topic. We examined the impact of Humira’s loss of exclusivity (LOE), a blockbuster biological drug from AbbVie. In that case, there was a drop of 1% in gross margin due to the LOE, which we applied similarly in Amgen’s products (AbbVie 2024).

The change in product mix, the optimization of supply chain and the re-dimension of all production structure explain the small percentual decrease in gross margin after LOE.

By the end of explicit period, the gross margin is less impacted by amortization expenses, returning to levels close to pre-acquisition.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Revenues</b>	<b>25.98</b>	<b>26.32</b>	<b>28.19</b>	33.45	34.48	34.25	35.91	37.54	39.03	39.77
<b>Gross Margin</b>	<b>19.53</b>	<b>19.92</b>	<b>19.78</b>	21.98	22.88	23.11	24.63	26.53	28.20	28.77
<b>% Revenues</b>	<b>75.2%</b>	<b>75.7%</b>	<b>70.1%</b>	65.7%	66.4%	67.5%	68.6%	70.7%	72.3%	72.3%

**Table 12** – Summary of Amgen gross margin evolution between 2021 and 2030 (Numbers in Billions USD).

#### 4.1.3 SG&A

SG&A is expected to remain similar to the past since even after Horizon’s acquisition the ratio of SG&A to revenues did not increase significantly compared to previous periods.

In addition, as usual after mergers and acquisitions, Amgen will probably try to incorporate Horizon staff and structure to minimize the costs associated with it. It is expected a small increase in the investment in advertising and marketing therefore we considered a percentage of 22.5% over the explicit period for SG&A, in line with the historical data.

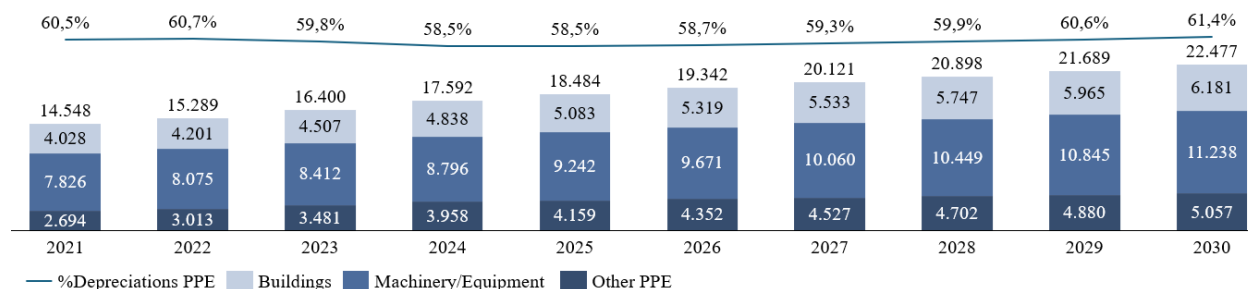
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Revenues</b>	<b>25.98</b>	<b>26.32</b>	<b>28.19</b>	33.45	34.48	34.25	35.91	37.54	39.03	39.77
<b>SG&amp;A</b>	<b>5.37</b>	<b>5.41</b>	<b>6.17</b>	7.53	7.76	7.71	8.08	8.45	8.78	8.95
<b>% Revenues</b>	<b>20.7%</b>	<b>20.6%</b>	<b>21.9%</b>	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%

**Table 13** – Summary of SG&A evolution between 2021 and 2030 (Numbers in Billions USD).

#### 4.1.4 CAPEX, Depreciations and Amortizations

Regarding capital expenditures, we conducted a historical analysis of the changes in Plant, Property and Equipment (PPE) and related depreciations. From 2019 to 2023, the average PPE turnover rate was 1.74 with a CAGR of 4.50%. Since our forecast predicts a significant increase in revenues in 2024, we have applied an annual growth for 2024 similar to 2023. In the coming years, the growth in PPE will follow the historical growth rate.

It is important to note that there are no relevant investments planned by the company in infrastructures apart from the usual ones. The percentage of depreciations from total Gross PPE remains consistent over the timeline considered converging to the historical trend. Figure 9 presents the split of PPE over the period of 2021 and 2030 and the respective percentage of depreciations over the gross PPE.



**Figure 9** – Evolution of PPE over the considered period and related depreciations. Depreciations are presented as % of total Gross PPE. PPE figures in billions USD.

Table 14 shows the investment in PPE per year, as well as the variation of depreciations.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Δ PPE</b>	<b>0.27</b>	<b>0.74</b>	<b>1.11</b>	1.19	0.89	0.86	0.78	0.78	0.79	0.79
<b>Δ Depreciations</b>	<b>0.18</b>	<b>-0.49</b>	<b>-0.53</b>	-0.49	-0.52	-0.54	-0.57	-0.60	-0.63	-0.66
<b>Δ PPE/Δ Depreciations</b>	<b>-1.53</b>	<b>1.53</b>	<b>2.12</b>	2.43	1.73	1.59	1.37	1.30	1.26	1.20
<b>PPE Turnover</b>	<b>1.79</b>	<b>1.72</b>	<b>1.72</b>	1.90	1.87	1.77	1.78	1.80	1.80	1.77

**Table 14** – Investment in PPE per year and the respective depreciations. Numbers in USD billions.

When the company reaches a steady state, CAPEX will align with Depreciation, as investments will primarily be for asset replacement rather than growth.

Another important piece for the forecasting of future cash flows is the calculation of amortizations. For the period between 2024 and 2028 the total amortization of finite-lived intangible assets was presented in Amgen’s annual report and as expected the percentage of amortizations is increasing. For 2029 and 2030, the amortizations were calculated based on a straight-line basis for ChemoCentryx, Teneobio and Horizon according to Amgen’s annual report.

For the explicit period no new acquisitions are planned since the company needs to leverage Horizon acquisition.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Intangibles</b>	<b>33.17</b>	<b>36.61</b>	<b>56.48</b>	57.01	57.58	58.16	58.74	59.91	61.41	62.95
<b>Amortizations</b>	<b>17.99</b>	<b>20.53</b>	<b>23.81</b>	28.61	33.11	37.01	40.91	43.81	46.21	48.61
<b>%Amortizations</b>	<b>54.2%</b>	<b>56.1%</b>	<b>42.2%</b>	50.2%	57.5%	63.6%	69.6%	73.1%	75.2%	77.2%
<b>Net Intangibles</b>	<b>15.18</b>	<b>16.08</b>	<b>32.64</b>	28.41	24.48	21.15	17.83	16.11	15.21	14.34

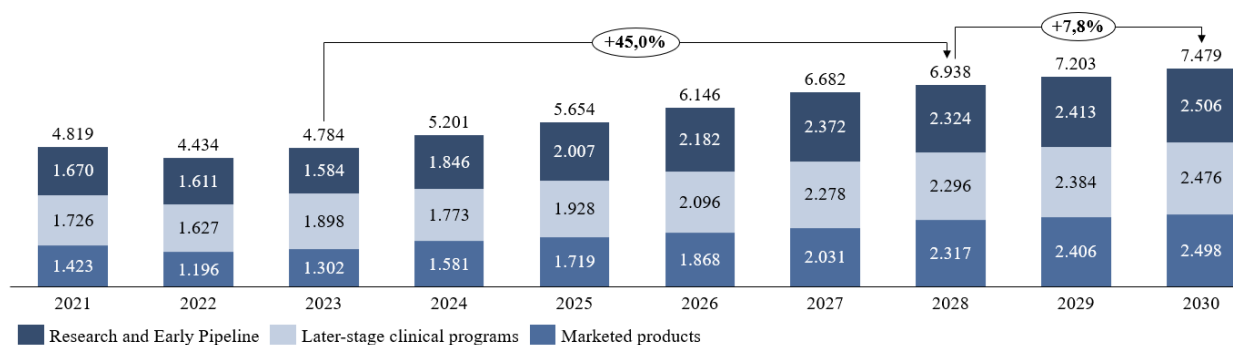
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
$\Delta$ Amortizations	-2.53	-2.54	-3.28	-4.80	-4.50	-3.90	-3.90	-2.90	-2.40	-2.40

**Table 15** – Evolution of Intangible Assets and respective amortizations over the period between 2021 and 2030. Numbers in USD billions.

#### 4.1.5 R&D

R&D evolution deserves a special chapter in our cash flows calculations. Over the past 5 years, it accounted, on average, for 17.3% of the company’s total revenues. Amgen classifies its R&D expenses into three main categories: the research and early pipeline, later-stage clinical programs and marketed products.

In all those areas we are anticipating an increase in the investment for different reasons, namely the critical necessity to invest in marketed products like the new Horizon portfolio and the ongoing research in pipeline products to overcome the LOEs coming soon.



**Figure 10** – Evolution of Amgen’s R&D expense over the period between 2021-2030. Numbers in billions USD.

As mentioned previously, MariTide a product focused on obesity treatment, is probably the biggest bet in pipeline development that Amgen made. Consequently, we examined the leading players in obesity sector, Eli Lilly and Novo Nordisk, to understand the future behavior of R&D based on companies with the expertise in this field.

Starting with Novo Nordisk, between 2019 and 2023 the R&D expenses experienced a CAGR of 20.5%, nevertheless, R&D only represents 11.7% of the revenues. Comparing this reality with Amgen is unreasonable, therefore Novo Nordisk was excluded from the analysis.

On the other hand, R&D expenses averaged 26.4% of Eli Lilly’s revenues, which is a more consistent behavior compared with Amgen. The CAGR for the same period is 13.59%, outpacing Amgen’s 3.83%.

As mentioned in Annual Report the company wants to continue the investment in R&D, particularly in obesity products leading us to use an average growth rate of 8.71% between 2024 and 2028. This figure reflects the average CAGR of Amgen and Eli Lilly from 2019 to 2023.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>R&amp;D</b>	<b>4.82</b>	<b>4.43</b>	<b>4.78</b>	5.20	5.65	6.15	6.68	6.94	7.20	7.48
<b>% Revenues</b>	<b>18.5%</b>	<b>16.8%</b>	<b>17.0%</b>	15.5%	16.4%	17.9%	18.6%	18.5%	18.5%	18.8%

**Table 16** – Summary of R&D evolution between 2021 and 2030 (Numbers in Billions USD).

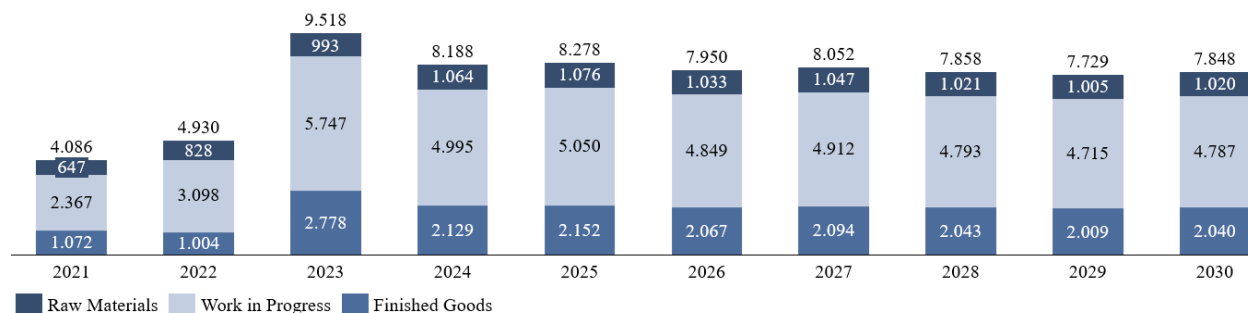
The launch date for MariTide remains uncertain, but projections are centered on 2028 (CNBC 2024). Given this target, we anticipated a decline in the growth rate of R&D starting from 2028. Consequently, from that year onward, we projected a growth rate resembling historical trends, with a greater emphasis on investment in marketed product rather than research areas.

#### **4.1.6 Working Capital**

Working capital is the difference between non-cash current assets, like inventories and accounts receivable, and non-debt current liabilities, such as accounts payable.

Starting with inventories, the increase in 2023 was essentially in the subcategories of work in progress and finished goods while the amount of raw materials followed the evolution of previous years. This is a clear indication of the incorporation of the estimated fair value of Horizon inventory, which will be sold and shipped in the upcoming periods.

Therefore, the impact of inventory increase will be diluted over subsequent years. To calculate the expected inventories in the explicit period we considered the historical average inventory turnover between 2021 and 2023 to minimize the impact of 2023.



**Figure 11** – Evolution of Amgen’s inventories over the period between 2021-2030. Numbers in billions USD.

Regarding receivables and payables, we adopted the same strategy as with inventories. The average turnover of the previous years (2021-2023) was the base to determine future estimations. For the other items the historical turnovers were considered to calculate the future impact.

Table 17 shows the evolution of the items abovementioned.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Receivables</b>	<b>5.84</b>	<b>6.39</b>	<b>7.94</b>	6.72	6.92	6.88	7.21	7.54	7.84	7.98
<b>Payables</b>	<b>1.37</b>	<b>1.57</b>	<b>1.59</b>	2.26	2.61	2.41	2.54	2.41	2.39	2.48
<b>Prepaid Expenses</b>	<b>1.22</b>	<b>1.20</b>	<b>1.65</b>	1.59	1.64	1.63	1.71	1.79	1.86	1.89
<b>Other Curr. Asset.</b>	<b>0.20</b>	<b>0.36</b>	<b>0.28</b>	0.40	0.41	0.39	0.40	0.39	0.38	0.39
<b>Accrued Expenses</b>	<b>8.95</b>	<b>10.19</b>	<b>12.49</b>	11.15	11.49	11.42	11.97	12.52	13.01	13.26
<b>Other Curr. Liab.</b>	<b>1.78</b>	<b>2.33</b>	<b>2.87</b>	2.37	2.49	2.44	2.56	2.63	2.72	2.78

**Table 17** – Evolution of receivables, payables and other current assets and liabilities between 2021-2030. Numbers in billions USD.

The evolution of working capital shows an increased relevance of current liabilities, except for 2023, mainly caused by the acquisition of Horizon’s inventories. Our projections indicate that working capital variations are expected to stabilize in the final years of the explicit period.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Working Capital</b>	<b>-0.75</b>	<b>-1.22</b>	<b>2.44</b>	1.12	0.66	0.58	0.30	0.01	-0.31	-0.40
<b>Δ WC</b>	<b>0.32</b>	<b>-0.47</b>	<b>3.65</b>	-1.32	-0.46	-0.08	-0.28	-0.29	-0.32	-0.09

**Table 18** – Evolution of Working Capital and the respective change per year between 2021 and 2030. (Numbers in Billions USD).

#### 4.1.7 Other items

For the other items, it is difficult to forecast the amount considered since these items usually are linked with unexpected impairments. On average, it represents 3% of COGS in historical data and that was the percentage applied in the forecasted period.

#### 4.1.8 Tax Rate

For the calculation of tax rate our assumption will be based on the calculation of effective tax rate, that is the result of the provision for income taxes presented in income statement and the taxable income. There were some variations in the previous years and the changes in 2023 are related with changes in Puerto Rico law tax scheme, where Amgen has some manufacturing structures. Therefore, and as this change should be kept in the future, the effective tax rate considered for the explicit period will be 14.5%.

	2019	2020	2021	2022	2023
<b>Taxable Income</b>	9.14	8.13	6.70	7.35	7.86
<b>Provision for Income Taxes</b>	1.30	0.87	0.81	0.79	1.14
<b>Effective Tax Rate</b>	14.2%	10.7%	12.1%	10.8%	14.5%

**Table 19** – Demonstration of effective tax rate calculation for the period between 2019 and 2023.  
*Source: Amgen Annual Report*

#### 4.1.9 Terminal Growth Rate

For the terminal growth rate there were two different dimensions considered, the economic evolution and the company evolution. Starting with the economic perspectives, the World Economic Outlook provided by the International Monetary Fund (IMF) projects a growth rate in advanced economies at 1.7% (real projections), The inflation rate is projected to be at 2.1% (International Monetary Fund 2024).

Our calculations for the evolution of Amgen's revenues showed an increase in the explicit period of 4.97%, considering all the portfolio and leveraged by Horizon acquisition. Amgen's standard portfolio experienced a growth rate of 2.66%. This former growth rate presents a solid number to consider in our calculations because it mirrors the normal behavior of the portfolio, taking into account ongoing patent expirations.

In addition, the cash flow considered for Terminal Value (2030) already reflects the impact of the future challenges in terms of pricing.

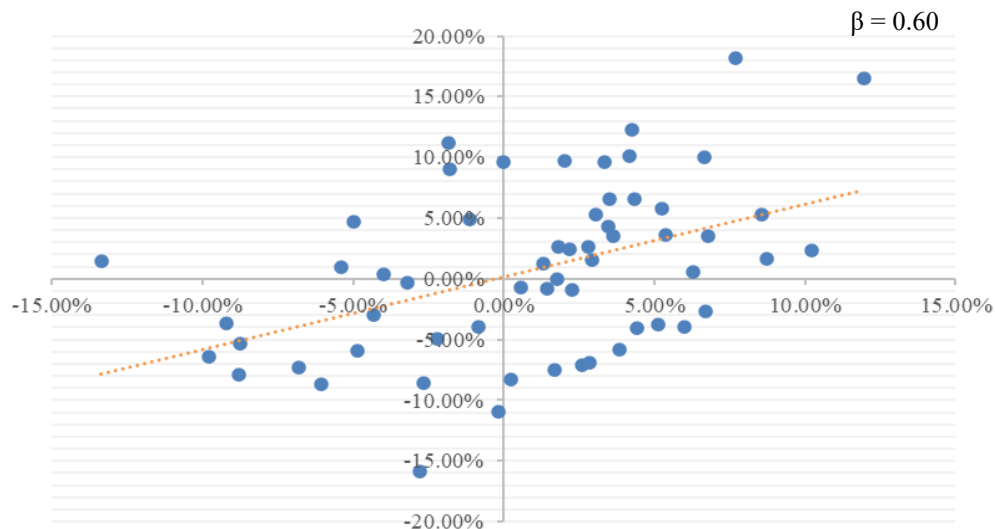
## 4.2 Discount Rate – Weighted-Average Cost of Capital

### 4.2.1 Cost of Equity (Ke)

For Cost of Equity as determined in literature review CAPM will be the model used in our computations. Therefore, is important to explain the numbers and our decision-making process. Starting with the risk-free rate, we based our decision on the yield of 10-year US treasury bonds, which we considered as 4.20% according to the yield as of 31<sup>st</sup> of March.

Subsequently, the market risk premium was calculated comparing the historically arithmetic monthly returns of SP500 against the returns of a risk-free asset (US 10-years treasury bonds). This calculation retrieved a value of 5.48% for a historical period of 20 years (March 2005 to March 2024). For country risk premium according to Damodaran databases the default spread for US is 0.0%. (Damodaran 2024).

The final component of cost of equity calculation was the beta estimation where we followed two different approaches, a regression of Amgen monthly returns versus the returns of the market as dependent variable and a calculation based on peers' information. The regression yielded a beta of 0.60, which was adjusted to 0.73 considering the adjustment from the formula -  $\frac{2}{3} Adjusted Beta + \frac{1}{3}$ .



**Figure 12** – Regression of Amgen’s monthly returns vs the returns of the market (SP500). Beta calculated – 0.60. *Source: Refinitiv Eikon*

To compare with the first approach, we also did the comparison versus a set of peers. For this, we took into consideration the levered betas of each of the companies extracted from Refinitiv Eikon,

and afterwards the betas were unlevered. As the last step, the financial structure of Amgen was applied resulting in a beta of 0.52.

Our final decision was to consider the beta as 0.73, since it was forward-looking adjusted and better reflects the future behavior of the company.

Company Name	EMV	DMV	D/E	Levered Beta	Unlevered Beta
AbbVie Inc	321.67	85.86	28.2%	0.59	0.48
Gilead Sciences Inc	91.25	19.82	21.7%	0.23	0.20
AstraZeneca	208.94	37.21	17.8%	0.36	0.32
Amgen	152.37	65.72	43.1%	0.52	

**Table 20** – Parameters to calculate the Beta from peers’ information. Numbers in USD Billions. *Source: Refinitiv Eikon*

In conclusion, the cost of equity considered for the WACC calculation was 8.20%, which is close to the 9.05% calculated by Damodaran for US biotechnological pharma companies (Damodaran 2024).

#### 4.2.2 Cost of Debt (Kd)

For cost of debt calculation our strategy was based on the analysis of traded debt along with the existing private loans. Nearly 88% of debt outstanding consists of traded debt, allowing us to calculate the current impact of debt. Furthermore, most of the bonds are issued in US dollars aligning with the currency considered throughout this work. The exception are three Eurobonds issued in Euro and British Pounds.

Each bond was weighted according to the amount outstanding and the individual yield to maturity was calculated. Regarding the foreign currency debt, the risk-free rate of the original currency was deducted and US risk-free rate corresponding to each bond was added back according to the respective maturity. For the bond issued in Euro the original risk-free rate considered was based on German Government Bonds.

Original Yield	Original Currency	Original Risk-Free Rate	Maturity	US Risk-Free Rate	Yield USD
3.60	Euro	2.54	2 years	3.86	4.93
4.92	British Pound	4.11	2 years	3.86	4.67
4.85	British Pound	3.91	5 years	3.64	4.57

**Table 21** – Conversion of foreign currency yields to USD yields. The risk-free rates were chosen according to the maturity of each bond.

The weighted yield was computed to reach a cost of debt for the traded debt of 5.40%, before taxes, and a respective Debt Market Value of 57.70B USD. For the bonds issued in Euro and British Pounds, the amount outstanding was converted to USD according to the exchange rate at 29<sup>th</sup> of March 2024.

The next challenge was related with the non-traded debt. In this chapter we need to consider two loans from Horizon that currently are part of Amgen’s debt outstanding, and a term loan issued by Amgen. To determine the market value of non-traded debt we considered the yield calculated in Refinitiv Eikon for Horizon loans and the amount outstanding was included and weighted according to the overall debt. For the term loan of Amgen, the yield considered was similar to a bond with the same rating and maturity – 5.68%.

A revolver line of 4B USD was also included in the total debt outstanding. In the consolidated balance sheet only 2.5B USD are used, however historically the full amount of revolver is committed.

Therefore, the final cost of debt after taxes was 4.68%, considering the previously calculated effective tax rate of 14.5%. The final DMV was 65.72B USD and the average maturity of debt was 13.1 years. Again, the cost of debt is aligned with Damodaran databases for US biotechnological pharma companies, which considers an after-tax cost of debt of 4.01% (Damodaran 2024).

### 4.2.3 WACC

Concerning the WACC calculation, for the target capital structure and since this is the discount rate to apply on future cash flows, we considered an average D/E based on peers’ information. The debt and equity market values were calculated following the same procedure as we did for Amgen in the previous chapters. The peers selected were AstraZeneca, Gilead and Abbvie, the same used in relative valuation and aligned to Amgen context.

The target D/E was 22.6%, which reflects the anticipated trajectory of Amgen’s performance since the levels of debt are expected to decrease, given the absence of acquisitions in the near future.

<b>Risk-Free Rate</b>	4.20%
<b><math>\beta_e</math></b>	0.73
<b>Market Risk Premium</b>	5.48%
<b>Cost of Debt after taxes</b>	4.68%
<b>Cost of Equity</b>	8.20%
<b>Target D/E</b>	22.6%
<b>Tax Rate (Effective)</b>	14.5%
<b>WACC</b>	7.55%

**Table 22** – Summary of Weighted-Average Cost of Capital inputs.

### 4.3 Free Cash Flow to the Firm (FCFF)

After the calculations presented in chapter 4.1, we achieved the cash flow for the explicit period (2024-2030). Those cash flows were discounted according to the WACC calculated in the previous chapter – 7.55%.

<b>In USDb</b>	<b>2022</b>	<b>2023</b>	<b>2024E</b>	<b>2025E</b>	<b>2026E</b>	<b>2027E</b>	<b>2028E</b>	<b>2029E</b>	<b>2030E</b>
<b>Revenues</b>	26,323	28,190	33,451	34,481	34,249	35,914	37,544	39,033	39,765
<b>COGS</b>	6,406	8,415	11,474	11,600	11,139	11,283	11,010	10,830	10,997
<b>Gross Profit</b>	19,917	19,775	21,978	22,881	23,110	24,632	26,534	28,204	28,769
<b>SGA</b>	5,414	6,166	7,527	7,758	7,706	8,081	8,447	8,782	8,947
<b>EBITDA</b>	12,667	11,752	14,197	14,136	13,364	13,999	14,314	14,918	15,069
<b>% revenues</b>	48.1%	41.7%	42.4%	41.0%	39.0%	39.0%	38.1%	38.2%	37.9%
<b>(-) Depr. / Amort.</b>	3,023	3,806	5,290	5,015	4,441	4,468	3,496	3,025	3,057
<b>EBIT</b>	9,644	7,946	8,906	9,121	8,924	9,531	10,818	11,893	12,012
<b>(-) Taxes</b>	794	1,138	924	976	974	1,078	1,303	1,475	1,516
<b>Tax Rate (%)</b>	10.8%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%
<b>NOPAT</b>	8,602	6,795	7,616	7,800	7,631	8,150	9,251	10,170	10,272
<b>(+) Depr. / Amort.</b>	3,023	3,806	5,290	5,015	4,441	4,468	3,496	3,025	3,057

In USDb	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E	2030E
<b>(-) Capital Expenditures</b>	(741)	(1,111)	(1,192)	(893)	(858)	(779)	(777)	(791)	(788)
<b>Δ NWC</b>	466	(3,654)	1,321	459	81	283	289	319	89
<b>FCFF</b>	11,350	5,836	13,036	12,381	11,294	12,122	12,259	12,723	12,630
<b>Discount Rate (WACC)</b>			7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%
<b>Present Value of Cash Flows</b>			12,121	10,704	9,079	9,060	8,519	8,221	7,588

**Table 23** – Calculation of Free Cash-Flow to the Firm (FCFF). Numbers is Millions USD.

#### 4.4 Enterprise Value and Equity Value

The desired outcome of discounted cash flow valuation is the target share price of the company. Before that, we calculated the terminal value applying a terminal growth rate of 2.66%, as previously explained, and considering the cash flow of 2030 as terminal cash flow. This calculation provided the enterprise value, that was adjusted by deducting the Net Debt. Derivatives were added according to the fair value calculated in the Consolidated Balance Sheet of the company, similarly to leases that were considered as the present value indicated in Amgen’s statements.

Finally, it was incorporated the equity investments of Amgen in BeiGene and Neumora reflecting the ownership stake acquired and with a fair value of \$4.0B recorded in 2023 Balance Sheet.

\$494 million in other equity securities were also included according to the numbers presented in Amgen’s annual report.

Table 24 details the calculations and the target share price achieved.

<b>Terminal Value</b>	265,082
<b>Present Value of Terminal Value</b>	159,249
% Terminal Value of Enterprise Value	70.9%
<b>Present Value FCFF</b>	65,290
<b>Enterprise Value</b>	224,539
<b>(+) Cash</b>	10,944
<b>(-) Debt Market Value + Revolver line</b>	65,721
<b>Net Debt</b>	54,777
<b>(+) Derivatives - Assets</b>	145

<b>(-) Derivatives - Liabilities</b>	1,092
<b>(+) Equity Securities</b>	4,497
<b>(-) Leases</b>	159
<b>Equity Value</b>	173,153
<b>Number Shares Outstanding (31<sup>st</sup> March 2024)</b>	536
<b>Share Price</b>	323.10

**Table 24** – Computation of Enterprise Value (EV) and Equity Value. Numbers in Millions USD.

### 4.5 Relative Valuation

A sensible step before the application of multiples is the choice of a suitable peer group for comparison. The strategy followed in this work was a bottom-up approach with several checkpoints to narrow down the number of companies considered in the peer group.

The first exclusion criteria considered was the industry type. Our goal was to identify a group of companies in the pharmaceutical and biotechnology field with similar business models and revenue structure of Amgen. After the first exclusion step, we were left with 14 companies that needed further examination on other drivers.

Therefore, several aspects were studied namely the historical profitability, the current D/E, the perspectives for long-term growth and pharma-specific features like the R&D proportion in total revenues.

Starting with the historical profitability, we looked for the EBITDA margin. Those values were calculated based on information extracted from Refinitiv Eikon, the same source used to extract the data for the other dimensions studied.

Regarding the current D/E ratio, the equity market value (EMV) for each company was calculated with the latest data point considered on 31<sup>st</sup> of March 2024. In addition, the same method used in chapter 4.2.2 to estimate Amgen’s debt market value was applied to each of the other companies analyzed.

Finally, the long-term growth estimates were based on analysts’ reports from Refinitiv Eikon. Table 25 summarizes the information for each company considered.

Company	Revenues 23'	EBITDA Margin	D/E	LT Growth	R&D	EMV
<b>Amgen Inc</b>	28,190	41.70%	43.1%	5.57%	16.87%	152,372
<b>Regeneron Pharmaceuticals Inc</b>	13,117	35.48%	1.4%	3.56%	33.84%	103,895
<b>Eli Lilly and Co</b>	34,124	34.73%	3.0%	52.03%	27.29%	739,658
<b>AbbVie Inc</b>	54,318	46.73%	28.2%	3.28%	12.96%	321,675
<b>Johnson &amp; Johnson</b>	85,159	37.17%	6.6%	4.70%	17.71%	381,043
<b>Sanofi SA</b>	51,255	28.60%	11.8%	6.17%	14.48%	124,102
<b>Novartis AG</b>	46,660	38.21%	7.7%	8.82%	18.43%	212,226
<b>Biogen Inc</b>	9,836	25.87%	17.4%	4.60%	25.01%	31,344
<b>Gilead Sciences Inc</b>	27,116	44.36%	21.7%	5.13%	21.01%	91,253
<b>Vertex Pharmaceuticals Inc</b>	9,869	40.53%	0.0%	12.97%	37.39%	107,975
<b>BioNTech SE</b>	18,526	6.52%	0.0%	-56.36%	10.62%	21,930
<b>AstraZeneca PLC</b>	45,811	30.23%	17.8%	10.71%	22.42%	208,937
<b>Bristol-Myers Squibb Co</b>	45,006	45.75%	43.3%	-3.40%	20.46%	109,664
<b>Merck &amp; Co Inc</b>	60,115	16.69%	8.9%	67.41%	49.49%	334,182
<b>Daiichi-Sankyo</b>	10,585	16.93%	0.0%	25.40%	22.80%	61,526
<b>Mean</b>	<b>35,979</b>	<b>32.6%</b>	<b>14.1%</b>	<b>10.0%</b>	<b>23.4%</b>	<b>200,119</b>
<b>1st quartile (25th percentile)</b>	<b>15,822</b>	<b>27.2%</b>	<b>2.2%</b>	<b>4.1%</b>	<b>17.3%</b>	<b>97,574</b>
<b>Median</b>	<b>34,124</b>	<b>35.5%</b>	<b>8.9%</b>	<b>5.6%</b>	<b>21.0%</b>	<b>124,102</b>
<b>3rd quartile (75th percentile)</b>	<b>48,958</b>	<b>41.1%</b>	<b>19.8%</b>	<b>11.8%</b>	<b>26.1%</b>	<b>266,950</b>

**Table 25** – Analysis of profitability ratios, current D/E, long-term growth and R&D expenditures of the the group of pharma and biopharma companies. Absolute numbers (revenues and EMV are in millions USD). The ratios, except D/E, are percentages of total revenues.

Starting our analysis by the expected long-term growth, we can rule out companies like Merck & Co. or Eli Lilly, which have completely different projections compared with Amgen. On the other hand, when we compare D/E among the selected companies, we can figure out that Amgen has one of the highest values, above the 75<sup>th</sup> percentile in this parameter.

The profitability ratios are in favor of Amgen, which has one of the best values in this set of companies.

Following the detailed explanation of the criteria we used to select the peer group, we decided on three companies, AbbVie, Gilead Sciences and AstraZeneca. The first two companies are quite similar to Amgen in terms of long-term growth expectations and both have EBITDA margins above the 75<sup>th</sup> percentile. In addition, the Debt ratios follow the same line, being two of the companies with higher percentages of debt.

AstraZeneca was the other company selected, which met the criteria for the D/E and for LT growth and EBITDA margin is close to the mean. Additionally, it recently acquired a company similar to Horizon, a factor shared by all the companies selected which made significant acquisitions in the last years.

As mentioned in literature review our analysis will be based in EV/EBITDA multiples and we will rely on forward-looking multiples since we are doing a future valuation. Table 26 presents the EV/EBITDA for our peer group considering the historical information - last twelve months (LTM) and the forward-looking multiples (FY1).

Company	EV/EBITDA (LTM)	EV/EBITDA (FY1)
AbbVie Inc	12.63	13.49
Gilead Sciences Inc	10.20	13.67
AstraZeneca PLC	18.57	15.93
<b>Mean</b>	<b>13.80</b>	<b>14.36</b>
<b>1st quartile (25th percentile)</b>	<b>11.41</b>	<b>13.58</b>
<b>Median</b>	<b>12.63</b>	<b>13.67</b>
<b>3rd quartile (75th percentile)</b>	<b>15.60</b>	<b>14.80</b>

**Table 26** – EV/EBITDA for AbbVie, Gilead Sciences and AstraZeneca. *Source: Refinitiv Eikon Datastream.*

For EV/EBITDA, the mean of forward-looking multiple, 14.36, was applied in the calculations. Net Debt, equity securities, derivatives and leases were discounted to the enterprise value to reach to the target share price.

EV/EBITDA	FY1
<b>EV/EBITDA Multiple - Mean</b>	14.36
<b>EBITDA</b>	14,197
<b>EV</b>	203,935
<b>Net Debt</b>	54,777
<b>Derivatives</b>	947
<b>Equity Securities</b>	4,497
<b>Leases</b>	159
<b>Equity Value</b>	152,548
<b>Shares Outstanding - 31/03/2024</b>	536
<b>Share Price</b>	284.65

**Table 27** – Relative valuation based on EV/EBITDA multiple.

The target share price achieved through Relative Valuation is close to the valuation achieved through DCF method. However, the target price from DCF is more ambitious than the Relative Valuation. The former is closer to the current share price in 28<sup>th</sup> of March 2024 (\$284.32), the data point considered for our analysis.

The differences between valuation strategies can arise from the assumptions considered, therefore in the next chapter we will stress out our DCF model.

## 5. Sensitivity Analysis

After the completion of our base case it is important to stress test our model to changes in the assumptions considered. The two dimensions we want to test are linked with each other and were two nuclear points in our model, namely the impact of the Inflation Reduction Act (IRA) and the growth rate in perpetuity.

The scenario we will test is the change of  $\pm 50$  p.p. in the perpetual growth, which means a growth rate of 2.16% as the lower bound and 3.16% as the upper bound. The pessimistic scenario could resemble a severe impact of IRA after the explicit period, with more products impacted by the legal caps imposed by the government.

On the other hand, the optimistic scenario could be similar to a scenario without the impact of IRA which is a possible scenario considering the political uncertainty in the US. Table 28 shows the variation in the valuation stress testing our model for the scenario presented.

	Reference Share Price – 31 <sup>st</sup> Mar 24	Perpetual Growth	Target Share Price	$\Delta$ vs Reference Share Price
Pessimistic Scenario	284.32	2.16%	294.24	3.49%
Base Case Scenario		2.66%	323.10	13.64%
Optimistic Scenario		3.16%	358.56	26.11%

**Table 28** – Comparison of scenarios after the stress test for perpetual growth rate.

The scenario analysis conducted showed the impact of changes in perpetual growth rate. This is expected since the terminal value accounts for 70.9% of the enterprise value. The share price after the test ranges from \$294.24 to \$358.56, which is a significant variation. Our model and the respective growth rate are linked with the revenue growth from the normal portfolio of Amgen and changes, for example, in the assumptions of Inflation Reduction Act could change dramatically our valuation.

## 6. Analysts' Recommendations and Target Price

It is important to contextualize the perspective of different banking analysts. To this end, we relied on two different sources to compare our valuation. First, we relied on an Equity Research Report from Zachs. Additionally, we used Refinitiv platform which aggregates diverse recommendations and target prices from analysts at investment banks like Wells Fargo, UBS or HSBC.

Zachs Investment Research issued a Neutral recommendation for Amgen stock, out of 3 different levels of recommendation (Outperform, Neutral and Underperform). The price target in the next 6 to 12 months is \$354.00, which is in line with the hold recommendation we suggested in this dissertation, as this report compares it to a target share price after March 2024.

Table 29 shows the evolution of analysts' recommendations from Refinitiv platform. The target share price is also climbing from 259.15 USD in September 2023 to 307.59 USD by March 2024.

	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
<b>1 - StrongBuy</b>	15%	19%	17%	17%	21%	17%	17%
<b>2 - Buy</b>	30%	30%	30%	31%	38%	38%	38%
<b>3 - Hold</b>	41%	41%	43%	41%	31%	34%	34%
<b>4 - Sell</b>	11%	7%	7%	7%	7%	7%	7%
<b>5 - StrongSell</b>	4%	4%	3%	3%	3%	3%	3%
<b>Price Target Mean</b>	<b>\$259.15</b>	<b>\$271.80</b>	<b>\$277.83</b>	<b>\$277.83</b>	<b>\$287.91</b>	<b>\$305.18</b>	<b>\$307.59</b>

**Table 29** – Percentage of analysts' by each level of recommendation and the evolution of the mean target share price. Source: *Refinitiv Eikon*

The conclusions presented by analysts are not too far from our target prices and recommendations, reinforcing our projections and the growing trend of Amgen's share price. This is also expected, since after Mergers and Acquisitions there is usually an upward trend in the stock price of the companies.

## **7. Conclusion**

After the calculations with the Discounted Cash Flow (DCF) model and Relative Valuation, Amgen's projected Share Price ranges from \$284.65 to \$323.10.

As highlighted in sensitivity analysis section, the changes in assumptions may influence the target price of our valuation, however we believe that our choices in DCF are reasonable and possible to achieve. Moreover, as presented in the chapter 3.4.4 the volatility of returns for Amgen stock is higher when compared with indexes which certainly will explain the variations that the stock price will face in the future. As such, our recommendation is a Hold investment in Amgen stock.

Nevertheless, is important to monitor the company's future development. The Horizon acquisition and its future incorporation is a sensible detail for the success. The portfolio will experience a notable impact after the losses of exclusivity in the coming years, putting more pressure in Horizon's portfolio and in the patent protected products. Finally, it is interesting to keep an eye in the current pipeline and in the outcomes of Research and Development efforts.

The historical performance showed levels of profitability above the industry average for Amgen and this study projects the same pattern in the future. The cash generation is also a fundamental item to monitor given the demanding debt repayments needed after Horizon acquisition.

Additionally, the political and macroeconomic outputs can represent a huge influence in the target share price of the company, as it was highlighted with the potential effects of Inflation Reduction Act.

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## Appendix 1 - Debt Summary

Market Debt - Amgen Outstanding Bonds as 31<sup>st</sup> of March 2024 and Non-Traded Debt

Maturity Date	Amount Outstanding	Coupon	Country of Issue	Currency	Issue Date	Yield	Last Price
22-May-2024	1,400,000,000	3.625	United States	US Dollar	22-May-2014	5.73	99.6229
21-Feb-2025	500,000,000	1.9	United States	US Dollar	21-Feb-2020	5.55	96.7576
02-Mar-2025	2,000,000,000	5.25	United States	US Dollar	02-Mar-2023	5.51	99.7583
01-May-2025	1,000,000,000	3.125	United States	US Dollar	01-May-2015	5.58	97.3775
25-Feb-2026	816,525,000	2	Eurobond	Euro	25-Feb-2016	4.93	97.06
02-Mar-2026	1,500,000,000	5.507	United States	US Dollar	02-Mar-2023	5.68	99.6823
19-Aug-2026	1,250,000,000	2.6	United States	US Dollar	19-Aug-2016	5.16	94.2416
07-Dec-2026	605,102,500	5.5	Eurobond	British Pound	05-Dec-2011	4.70	101.275
21-Feb-2027	1,723,575,000	2.2	United States	US Dollar	21-Feb-2020	5.14	92.1046
02-Nov-2027	1,000,000,000	3.2	United States	US Dollar	02-Nov-2017	5.08	93.8409
02-Mar-2028	3,750,000,000	5.15	United States	US Dollar	02-Mar-2023	5.25	99.6528
15-Aug-2028	1,234,091,000	1.65	United States	US Dollar	09-Aug-2021	5.05	86.7064
22-Feb-2029	750,000,000	3	United States	US Dollar	22-Feb-2022	4.89	91.8266
18-Aug-2029	1,250,000,000	4.05	United States	US Dollar	18-Aug-2022	5.04	95.3366
13-Sep-2029	891,730,000	4	Eurobond	British Pound	13-Sep-2012	4.57	95.714
21-Feb-2030	1,250,000,000	2.45	United States	US Dollar	21-Feb-2020	4.99	87.0928
02-Mar-2030	2,750,000,000	5.25	United States	US Dollar	02-Mar-2023	5.08	100.84
25-Feb-2031	1,250,000,000	2.3	United States	US Dollar	06-May-2020	5.07	83.9547
15-Jan-2032	1,001,064,000	2	United States	US Dollar	09-Aug-2021	5.12	80.1045
22-Feb-2032	1,000,000,000	3.35	United States	US Dollar	22-Feb-2022	5.17	88.3013
01-Mar-2033	750,000,000	4.2	United States	US Dollar	18-Aug-2022	5.25	92.5511
02-Mar-2033	4,250,000,000	5.25	United States	US Dollar	02-Mar-2023	5.28	99.7814
01-Jun-2037	478,879,000	6.375	United States	US Dollar	19-Feb-2008	5.61	107.0163
01-Jun-2038	253,281,000	6.9	United States	US Dollar	23-May-2008	5.65	112.0394
01-Feb-2039	333,010,000	6.4	United States	US Dollar	16-Jan-2009	5.59	108.0481
21-Feb-2040	1,802,693,000	3.15	United States	US Dollar	21-Feb-2020	5.46	75.6307
15-Mar-2040	373,098,000	5.75	United States	US Dollar	12-Mar-2010	5.60	101.5493
15-Aug-2041	1,091,336,000	2.8	United States	US Dollar	09-Aug-2021	5.39	71.0177
01-Oct-2041	600,000,000	4.95	United States	US Dollar	16-Sep-2010	5.53	93.545
15-Nov-2041	728,887,000	5.15	United States	US Dollar	10-Nov-2011	5.57	95.2836
15-Jun-2042	415,418,000	5.65	United States	US Dollar	30-Jun-2011	5.61	100.4804
02-Mar-2043	2,750,000,000	5.6	United States	US Dollar	02-Mar-2023	5.55	100.6085
15-May-2043	184,878,000	5.375	United States	US Dollar	15-May-2012	5.98	93.158
01-May-2045	2,250,000,000	4.4	United States	US Dollar	01-May-2015	5.58	85.429
15-Jun-2048	250,000	4.563	United States	US Dollar	14-Jun-2016	5.62	86.2806
15-Jun-2048	1,415,205,000	4.563	United States	US Dollar	10-Jan-2017	5.61	86.2624
15-Jun-2048	250,000	4.563	Eurobond	US Dollar	14-Jun-2016	5.60	86.4765
21-Feb-2050	2,131,500,000	3.375	United States	US Dollar	21-Feb-2020	5.46	71.3109
15-Jun-2051	57,000	4.663	Eurobond	US Dollar	14-Jun-2016	5.60	86.9442
15-Jun-2051	57,000	4.663	United States	US Dollar	14-Jun-2016	5.61	86.8552
15-Jun-2051	3,541,381,000	4.663	United States	US Dollar	10-Jan-2017	5.61	86.8552
15-Jan-2052	1,199,084,000	3	United States	US Dollar	09-Aug-2021	5.35	66.1516
22-Feb-2052	950,000,000	4.2	United States	US Dollar	22-Feb-2022	5.57	80.6862
01-Mar-2053	1,000,000,000	4.875	United States	US Dollar	18-Aug-2022	5.61	89.5672
02-Mar-2053	4,250,000,000	5.65	United States	US Dollar	02-Mar-2023	5.62	100.4355

<b>Maturity Date</b>	<b>Amount Outstanding</b>	<b>Coupon</b>	<b>Country of Issue</b>	<b>Currency</b>	<b>Issue Date</b>	<b>Yield</b>	<b>Last Price</b>
<b>01-Sep-2053</b>	81,000	2.77	United States	US Dollar	17-Aug-2020	5.45	60.884
<b>01-Sep-2053</b>	939,919,000	2.77	United States	US Dollar	17-May-2021	5.45	60.884
<b>01-Sep-2053</b>	81,000	2.77	Eurobond	US Dollar	17-Aug-2020	5.44	61.046
<b>22-Feb-2062</b>	1,200,000,000	4.4	United States	US Dollar	22-Feb-2022	5.68	80.1857
<b>02-Mar-2063</b>	2,750,000,000	5.75	United States	US Dollar	02-Mar-2023	5.72	100.4999
<b>01-Apr-2097</b>	100,000,000	8.125	United States	US Dollar	08-Apr-1997	6.16	131.5656

## Loans

<b>Facility Type</b>	<b>Maturity Date</b>	<b>Facility Amount</b>	<b>Country</b>	<b>Currency</b>	<b>Base Rate/Spd</b>	<b>Yield (%)</b>	<b>Title</b>
<b>Term Loan B</b>	29-May-2026	418,026,000	United States	USD	LIBOR+225	7.97	18-Dec-2019 Horizon Pharma Plc
<b>Term Loan B</b>	15-Mar-2028	1,600,000,000	United States	USD	LIBOR+200	7.70	15-Mar-2021 Horizon Pharma Plc
<b>Delaw Draw Term Loan</b>	22-Dec-2025	2,000,000,000	United States	USD	-	5.68	-
<b>Revolver/Line &gt;= 1 Yr.</b>	09-Mar-2028	4,000,000,000	United States	USD	-	-	-

## Appendix 2 - Historical Balance Sheet

Years ended December 31 – Millions USD

<b>Assets</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Current Assets</b>					
Cash and Short-Term Investments	8,911	10,647	8,037	9,305	10,944
Accounts Receivable	4,057	5,324	5,839	6,392	7,942
Inventories	3,584	3,893	4,086	4,930	9,518
Prepaid Expenses	-	1,156	1,223	1,204	1,647
Other Current Assets	1,888	124	200	355	281
<b>Total Current Assets</b>	<b>18,440</b>	<b>21,144</b>	<b>19,385</b>	<b>22,186</b>	<b>30,332</b>
Property/Plant/Equipment	13,754	14,274	14,548	15,289	16,400
Accumulated Depreciation	(8,357)	(8,977)	(8,798)	(9,283)	(9,808)
Goodwill	14,703	14,689	14,890	15,529	18,629
Intangibles, Net	19,413	16,587	15,182	16,080	32,641
Intangibles, Gross	32,045	32,048	33,169	36,605	56,447
Accumulated Intangible Amortization	(12,632)	(15,461)	(17,987)	(20,525)	(23,806)
Other Long-Term Assets	1,754	4,055	5,385	5,071	8,709
<b>Total Assets</b>	<b>59,707</b>	<b>62,948</b>	<b>61,165</b>	<b>65,121</b>	<b>97,154</b>
<b>Liabilities</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Current Liabilities</b>					
Accounts Payable	1,371	1,421	1,366	1,572	1,590
Accrued Expenses	7,565	8,295	8,947	10,192	12,490
Current Portion of Long-Term Debt	2,953	91	87	1,591	1,443
Other Current Liabilities	946	1,846	1,784	2,332	2,869
<b>Total Current Liabilities</b>	<b>12,835</b>	<b>11,653</b>	<b>12,184</b>	<b>15,687</b>	<b>18,392</b>
Total Long-Term Debt	26,950	32,895	33,222	37,354	63,170
Deferred Income Tax	2,354	-	-	-	606
Other Liabilities - Total	9,643	8,991	9,059	8,419	7,006
<b>Total Liabilities</b>	<b>50,034</b>	<b>53,539</b>	<b>54,465</b>	<b>61,460</b>	<b>90,922</b>

## Appendix 3 - Forecasted Balance Sheet

Years ended December 31 - Millions USD

<b>Assets</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Current Assets</b>							
Cash and Short-Term Investments	4,863	4,252	2,220	4,880	1,256	5,392	4,252
Accounts Receivable	6,715	6,922	6,876	7,210	7,537	7,836	7,983
Inventories	8,188	8,278	7,950	8,052	7,858	7,729	7,848
Prepaid Expenses	1,593	1,642	1,631	1,710	1,788	1,859	1,894
Other Current Assets	402	406	390	395	385	379	385
<b>Total Current Assets</b>	<b>21,761</b>	<b>21,500</b>	<b>19,067</b>	<b>22,247</b>	<b>18,824</b>	<b>23,195</b>	<b>22,362</b>
Property/Plant/Equipment	17,592	18,484	19,342	20,121	20,898	21,689	22,477
Accumulated Depreciation	(10,298)	(10,813)	(11,354)	(11,922)	(12,518)	(13,144)	(13,801)
Goodwill	18,815	19,003	19,193	19,385	19,773	20,267	20,774
Intangibles, Net	28,405	24,476	21,151	17,833	16,108	15,206	14,342
Intangibles, Gross	57,011	57,582	58,157	58,739	59,914	61,412	62,947
Accumulated Intangible Amortization	(28,606)	(33,106)	(37,006)	(40,906)	(43,806)	(46,206)	(48,605)
Other Long-Term Assets	8,709	8,709	8,709	8,709	8,709	8,709	8,709
<b>Total Assets</b>	<b>84,984</b>	<b>81,359</b>	<b>76,108</b>	<b>76,373</b>	<b>71,794</b>	<b>75,922</b>	<b>74,863</b>
<b>Liabilities</b>							
<b>Current Liabilities</b>							
Accounts Payable	2,263	2,608	2,412	2,540	2,413	2,387	2,480
Accrued Expenses	11,150	11,494	11,416	11,971	12,515	13,011	13,255
Current Portion of Long-Term Debt	3,500	4,590	2,724	6,584	2,892	4,000	1,250
Other Current Liabilities	2,367	2,489	2,440	2,561	2,634	2,717	2,777
<b>Total Current Liabilities</b>	<b>19,280</b>	<b>21,181</b>	<b>18,992</b>	<b>23,656</b>	<b>20,454</b>	<b>22,115</b>	<b>19,762</b>
Total Long-Term Debt	59,779	55,190	52,466	45,882	42,990	38,990	37,740
Deferred Income Tax	-	-	-	-	-	-	-
Other Liabilities - Total	7,006	7,006	7,006	7,006	7,006	7,006	7,006
<b>Total Liabilities</b>	<b>86,065</b>	<b>83,377</b>	<b>78,464</b>	<b>76,544</b>	<b>70,450</b>	<b>68,111</b>	<b>64,508</b>

## Appendix 4 – Historical and Forecasted Income Statement

Years ended December 31 – Millions USD

### Historical Income Statement

	2019	2020	2021	2022	2023
<b>Revenue</b>	<b>23,362</b>	<b>25,424</b>	<b>25,979</b>	<b>26,323</b>	<b>28,190</b>
Product Revenue	22,204	24,240	24,297	24,801	26,910
Other Revenue	1,158	1,184	1,682	1,522	1,280
Cost of Revenue	4,356	6,159	6,454	6,406	8,415
<b>Gross Profit</b>	<b>19,006</b>	<b>19,265</b>	<b>19,525</b>	<b>19,917</b>	<b>19,775</b>
Selling/General/Admin. Expenses	5,150	5,730	5,368	5,414	6,166
Research & Development	4,116	4,207	4,819	4,434	4,755
Unusual Expense	47	-	1,505	489	189
Other Operating Expenses	19	189	194	(64)	690
<b>EBITDA</b>	<b>11,465</b>	<b>12,588</b>	<b>9,986</b>	<b>12,667</b>	<b>11,752</b>
Depreciation/Amortization	(1,791)	(3,449)	(2,347)	(3,023)	(3,806)
<b>EBIT</b>	<b>9,674</b>	<b>9,139</b>	<b>7,639</b>	<b>9,644</b>	<b>7,946</b>
Interest Expense	(536)	(1,006)	(1,197)	(1,406)	(2,637)
Other Non-Operating Income	-	-	259	(892)	2,517
<b>Net Income Before Taxes</b>	<b>9,138</b>	<b>8,133</b>	<b>6,701</b>	<b>7,346</b>	<b>7,855</b>
Provision for Income Taxes	1,296	869	808	794	1,138
<b>Net Income</b>	<b>7,842</b>	<b>7,264</b>	<b>5,893</b>	<b>6,552</b>	<b>6,717</b>

### Forecasted Income Statement

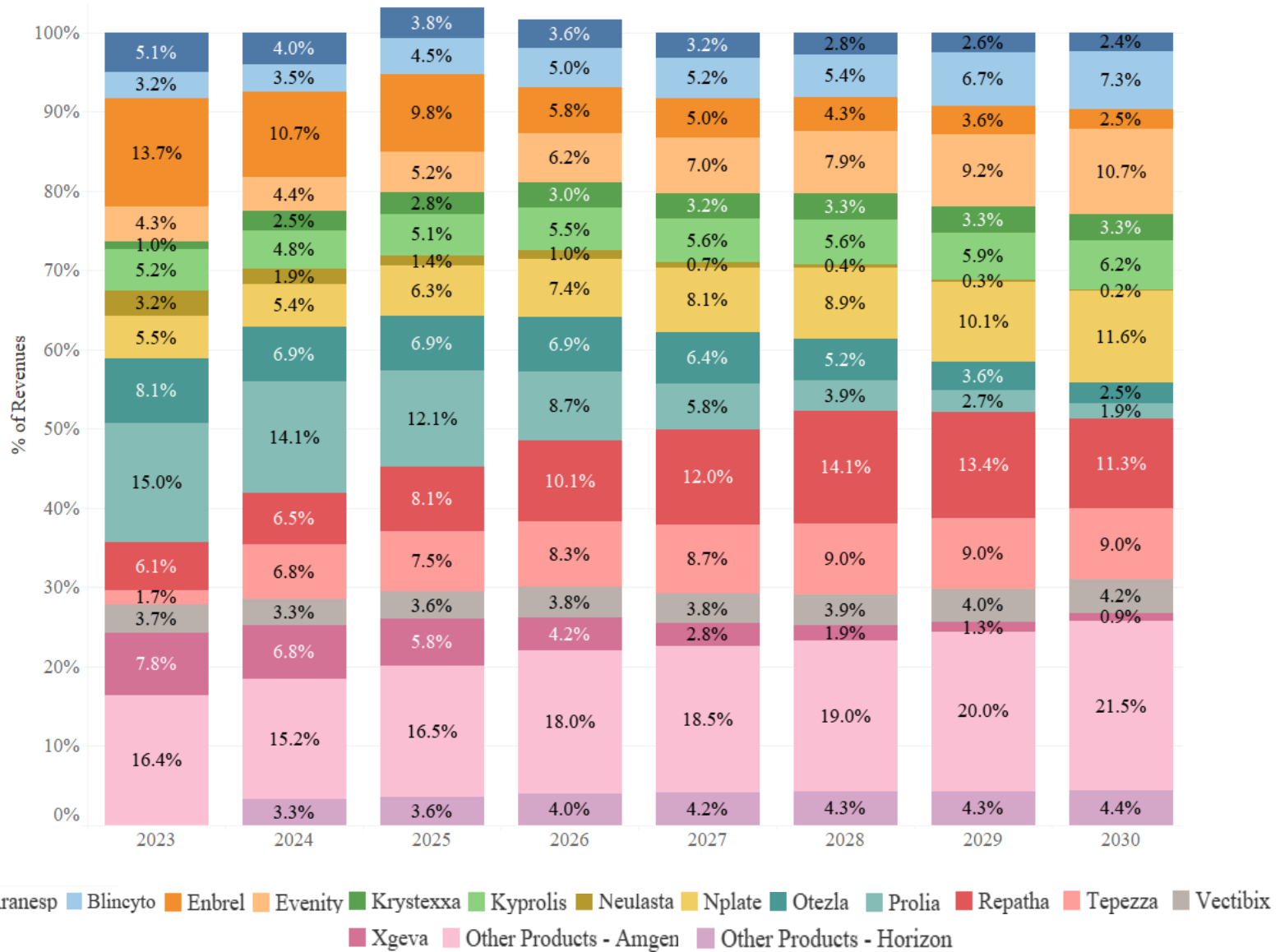
	2024	2025	2026	2027	2028	2029	2030
<b>Revenue</b>	<b>33,451</b>	<b>34,481</b>	<b>34,249</b>	<b>35,914</b>	<b>37,544</b>	<b>39,033</b>	<b>39,765</b>
Product Revenue	31,779	32,757	32,537	34,118	35,667	37,082	37,777
Other Revenue	1,673	1,724	1,712	1,796	1,877	1,952	1,988
Cost of Revenue	11,474	11,600	11,139	11,283	11,010	10,830	10,997
<b>Gross Profit</b>	<b>21,978</b>	<b>22,881</b>	<b>23,110</b>	<b>24,632</b>	<b>26,534</b>	<b>28,204</b>	<b>28,769</b>
Selling/General/Admin. Expenses	7,527	7,758	7,706	8,081	8,447	8,782	8,947
Research & Development	5,201	5,654	6,146	6,682	6,938	7,203	7,479
Unusual Expense	-	-	-	-	-	-	-
Other Operating Expenses	344	348	334	338	330	325	330
<b>EBITDA</b>	<b>14,197</b>	<b>14,136</b>	<b>13,364</b>	<b>13,999</b>	<b>14,314</b>	<b>14,918</b>	<b>15,069</b>
Depreciation/Amortization	(1,192)	(893)	(858)	(779)	(777)	(791)	(788)
<b>EBIT</b>	<b>8,906</b>	<b>9,121</b>	<b>8,924</b>	<b>9,531</b>	<b>10,818</b>	<b>11,893</b>	<b>12,012</b>
Interest Expense	(2,531)	(2,391)	(2,208)	(2,099)	(1,835)	(1,720)	(1,560)
Other Non-Operating Income	-	-	-	-	-	-	-
<b>Net Income Before Taxes</b>	<b>6,375</b>	<b>6,730</b>	<b>6,716</b>	<b>7,432</b>	<b>8,983</b>	<b>10,173</b>	<b>10,452</b>
Provision for Income Taxes	924	976	974	1,078	1,303	1,475	1,516
<b>Net Income</b>	<b>5,451</b>	<b>5,754</b>	<b>5,742</b>	<b>6,354</b>	<b>7,681</b>	<b>8,698</b>	<b>8,937</b>

## Appendix 5 - Gross Product Sales and Gross to Net Sales reconciliation

	2021	2022	2023
<b>Total Product - Gross Sales</b>	<b>45.92</b>	<b>50.08</b>	<b>57.51</b>
<b>Distribution by wholesalers</b>			
<b>McKesson (1)</b>	<b>15.19</b>	<b>17.31</b>	<b>19.04</b>
<b>Cencora (2)</b>	<b>14.78</b>	<b>15.44</b>	<b>16.63</b>
<b>Cardinal (3)</b>	<b>7.68</b>	<b>8.32</b>	<b>9.78</b>
<b>Total % Gross Sales for (1) + (2) + (3)</b>	<b>82%</b>	<b>82%</b>	<b>79%</b>
<b>Total Product - Net Sales</b>	<b>24.30</b>	<b>24.80</b>	<b>26.91</b>
<b>% Net Sales out of Gross</b>	<b>52.9%</b>	<b>49.5%</b>	<b>46.8%</b>
<b>Average product discount</b>	<b>47.1%</b>	<b>50.5%</b>	<b>53.2%</b>

All the numbers presented are in billion USD.

## Appendix 6 – Distribution of product revenues – Evolution 2023 to 2030



## Appendix 7 – Calculation of CAGR (2019-2023) for product revenue forecast

Revenues in Billions USD

Product	2019	2020	2021	2022	2023	CAGR
<b>Prolia</b>	2.672	2.763	3.248	3.628	4.048	
<i>Growth Rate (%)</i>	16.6	3.4	17.6	11.7	11.6	10.94
<b>Enbrel</b>	5.226	4.996	4.465	4.117	3.697	
<i>Growth Rate (%)</i>	4.2	-4.4	-10.6	-7.8	-10.2	-8.29
<b>Otezla</b>	0.178	2.195	2.249	2.288	2.188	
<i>Growth Rate (%)</i>		1133	2.5	1.7	-4.4	-0.11
<b>Xgeva</b>	1.935	1.899	2.018	2.014	2.112	
<i>Growth Rate (%)</i>	8.3	-1.9	6.3	-0.2	4.9	2.21
<b>Repatha</b>	0.661	0.887	1.117	1.296	1.635	
<i>Growth Rate (%)</i>	20.2	34.2	25.9	16.0	26.2	25.41
<b>Nplate</b>	0.795	0.850	1.027	1.307	1.477	
<i>Growth Rate (%)</i>	10.9	6.9	20.8	27.3	13.0	16.75
<b>Kyprolis</b>	1.044	1.065	1.108	1.247	1.403	
<i>Growth Rate (%)</i>	7.9	2.0	4.0	12.6	12.5	7.67
<b>Aranesp</b>	1.729	1.568	1.480	1.421	1.362	
<i>Growth Rate (%)</i>	-7.9	-9.3	-5.6	-4.0	-4.2	-5.79
<b>Neulasta</b>	3.221	2.293	1.734	1.126	0.848	
<i>Growth Rate (%)</i>	-28.0	-28.8	-24.4	-35.1	-24.7	-28.37
<b>Evenity</b>	0.567	0.350	0.530	0.787	1.160	
<i>Growth Rate (%)</i>		-38.3	51.4	48.5	47.4	19.60
<b>Vectibix</b>	0.744	0.811	0.873	0.893	0.984	
<i>Growth Rate (%)</i>	7.7	9.0	7.6	2.3	10.2	7.24
<b>Blinicyto</b>	0.312	0.379	0.472	0.583	0.861	
<i>Growth Rate (%)</i>	35.7	21.5	24.5	23.5	47.7	28.89
<b>Other products - Amgen</b>	3.120	4.184	3.976	4.094	4.415	
<i>Growth Rate (%)</i>	-20.7	34.1	-5.0	3.0	7.8	9.07
<b>Total</b>	22.20	24.24	24.30	24.80	26.91	
<i>Growth Rate (%)</i>	-1.5	9.2	0.2	2.1	8.5	

## Appendix 8 – Evolution of Amgen’s Ratios between 2019 and 2030

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	<b>Activity</b>											
<b>Inventory Turnover</b>	1.34	1.65	1.62	1.42	1.16	1.30	1.41	1.37	1.41	1.38	1.39	1.41
<b>Days Inventory on Hand</b>	270	219	223	253	309	278	256	262	255	260	259	255
<b>Receivables Turnover</b>	6.12	5.92	5.52	5.03	4.39	4.56	5.06	4.96	5.10	5.09	5.08	5.03
<b>Days of Sales Outstanding</b>	59	61	65	71	81	79	71	73	71	71	71	72
<b>Payables Turnover</b>	3.88	4.63	4.77	4.94	8.22	5.27	4.80	4.31	4.60	4.37	4.46	4.57
<b>Number of days of Payables</b>	93	78	76	73	44	68	75	84	78	82	80	79
<b>Total Asset Turnover</b>	37%	42%	42%	42%	35%	37%	41%	43%	47%	51%	53%	53%
	<b>Liquidity</b>											
<b>Current Ratio</b>	1.44	1.81	1.59	1.41	1.65	1.13	1.03	1.02	0.94	0.94	1.06	1.15
<b>Quick Ratio</b>	1.01	1.37	1.14	1.00	1.03	0.60	0.53	0.48	0.51	0.43	0.60	0.62
<b>Cash Conversion Cycle</b>	236	202	212	252	347	288	251	251	248	248	249	248
	<b>Solvency</b>											
<b>Debt-to-Assets</b>	0.50	0.52	0.54	0.60	0.67	0.74	0.73	0.72	0.69	0.64	0.57	0.52
<b>Debt-to-EBITDA</b>	2.52	2.59	3.02	2.98	5.36	4.47	4.19	4.05	3.71	3.08	2.77	2.49
<b>Interest Coverage</b>	18.05	9.08	6.38	6.86	3.02	3.52	3.89	4.19	4.61	6.21	7.28	8.09
	<b>Profitability</b>											
<b>ROA</b>	13%	12%	10%	10%	7%	6%	7%	7%	8%	10%	12%	12%