Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

TRINITY BUSINESS SCHOOL
Academic Year 2022/23

Individual/Group Assignment Cover Sheet

Module: BU7506 Corporate Finance
Date Due: November 7, 2022

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List of Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
Bn	Billion	i.e.	id Est (That is)
BoD	Board of Directors	No.	Number
cc.	circa	NWC	Net Working Capital
CAGR	Compound Annual Growth Rate	OECD	Organisation for Economic Cooperation and Development
CapEx	Capital expenditures	OpEx	Operating Expenses
CAPM	Capital Asset Pricing Model	pp.	Percentage Point
D&A	Depreciation & Amortisation	PP&E	Property, Plant and Equipment
DCF	Discounted Cash Flow	PV	Present Value
DIO	Days Inventory Outstanding	ROA	Return on Assets
DPO	Days Payables Outstanding	ROE	Return on Equity
DSO	Days Sales Outstanding	R&D	Research and Development
D/E	Debt-to-Equity	S&P	Standard & Poor's
EV	Enterprise Value	ST	Short Term
FED	Federal Reserve	SG&A	Selling, General and Administrative Expenses
Fig.	Figure	TV	Terminal Value
FDA	Food and Drug Administration	USD	United States Dollar
FY	Fiscal Year	Q	Quarter
GDP	Gross Domestic Product	YoY	Year-on-Year

1. Company introduction

Regeneron Pharmaceuticals (Regeneron) is not a traditional major pharmaceutical company, but it is certainly an eye-catching and creative enough company to have been named on the World's 50 Smartest Companies list and the Forbes World's Most Innovative Companies list several times. Regeneron has been hailed as "the next Amgen for the new century", as it develops, manufactures and markets drugs for eye diseases, lipid-lowering and inflammatory conditions.

Currently, Regeneron has launched six FDA (US Food and Drug Administration) approved drugs. In 2021, the ophthalmic drug Eylea is Regeneron's star product, accounting for over 36.04% of the company's total drug sales, REGEN-COV accounts for 36.26% of total drug sales, and Dupixent sales account for 20.6% of total drug sales volume and can be considered the backbone of Regeneron (2021 Regeneron Annual Report, 2022).

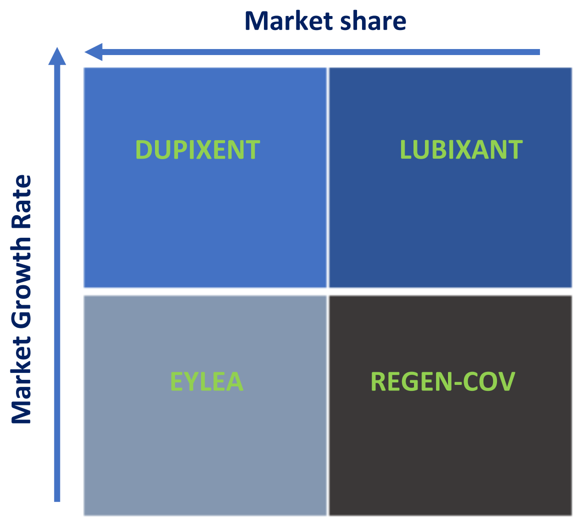


Table: BCG Matrix

In terms of R&D costs, Regeneron is arguably the lowest in the industry. According to studies , pharmaceutical companies that invent three or more drugs spend an average of $4.3 billion on R&D per drug, and this figure can be higher for pharmaceutical giants such as Merck at $5.5 billion, Pfizer at $7.8 billion and Sanofi at $10 billion. In comparison, the average R&D spend per drug for Regeneron is minimal, at around US$7 billion (2021 Regeneron Annual Report, 2022).

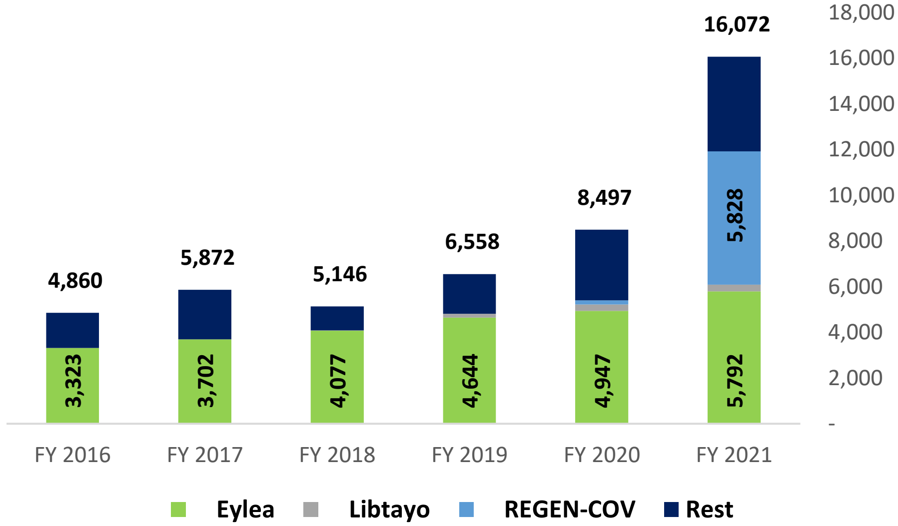
2. Products and Business overview

2.1. Pharmaceutical Sales

In 2021, Regeneron will have total revenues of $16.072 billion. Revenues from drug sales are primarily from the ophthalmic drugs Eylea and REGEN-COV of which Eylea is Regeneron's lead product and is primarily used to treat wet macular degeneration. Macular degeneration (AMD) is a common eye disease in people over the age of 65 and is the leading cause of blindness in the elderly.

In this huge market, Eylea's sales are growing so fast that it has caught up with those of the older drug Lucentis. According to a report by BioTrends Research Group, it has become the most profitable product in the regenerative metabolism sector. (Marshall, 2010)

Figure 1: Revenue composition by product (REGN 10K)



2.2. Sanofi collaboration revenue

Total revenues also include collaboration revenues of $890 million in the fourth quarter of 2021 and $3.673 billion for the full FY21, compared to $678 million in the fourth quarter and $2.373 billion for the full year 2020. Sanofi collaboration revenue increased primarily due to the Company's share of profits from commercialization of antibodies, which were $388 million and $1.363 billion in the fourth quarter and full year 2021, respectively, compared to $230 million and $785 million in the fourth quarter and full year 2020, respectively.

2.3. Leverage & Borrowing Capacity

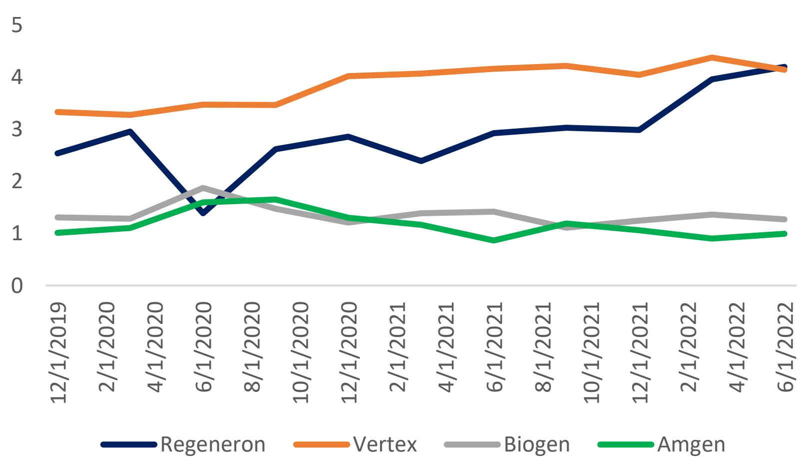
Compared to its competitors, Regeneron credit rating is below that of its peers, Amgen and Biogen which were rate Baa1 and Baa2 respectively by Moody's, even though company does not have high leverage comparing to its competitors. The reason for lower credit rating is high revenue concentration in only one drug, EYLEA, which faces biosimilar risk around 2024/2025 as well as a high exposure to the US drug pricing regulations. (Source: Yahoo Finance)

	Regeneron	Amgen	Biogen	Vertex	Median
D/E	14%	507%	70%	10%	42%
ROA	38%	10%	6%	19%	14%
Interest Coverage	156.1	6.4	11.2	45.2	2822%
Debt/EBITDA	29%	31%	191%	33%	32%

Rating Agaency	Rating
S&P	BBB+
Moody's	Baa3
Fitch	A+

In 2021, Regeneron increased its liquidity position. The main reason for higher liquidity position of Regeneron was increase in Retained Earnings of 74% YoY, which was a result of increased earnings in the same year. (Regeneron, 10K)

Figure 2: Comparison of Quick Ratio (Bloomberg)



2.4. Capital Structure

Until the beginning of 2020, Regeneron kept stable and low values of Leverage. The fact that D/E ratio was almost 0% has both advantages and disadvantages.

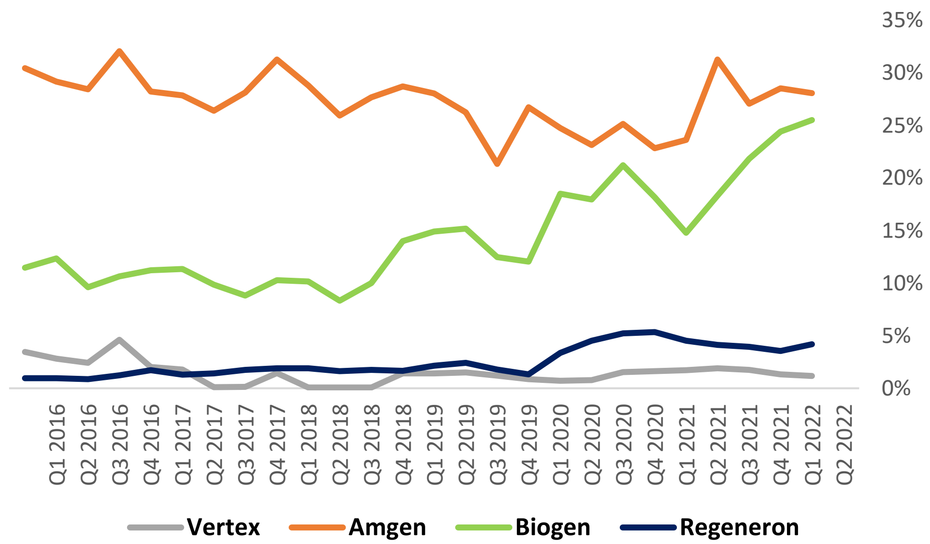
Firstly, as the firm was solely financed by equity it decreased the risk of the firm, as the company is not burdened by interest and principal payments. Also, capital could be reinvested which would increase stock price, ceteris paribus.

On the other hand, debt is beneficial for the company, especially in period 2016-2020, as it was way cheaper than debt financing, mainly due low (or even negative) base interest rates.

In the figure below, we have depicted D/E of Regeneron and its competitors. Until Q4 2019, the company's D/E ratio was low, between 1% and 3%. At the beginning of 2020, the company raised debt by issuing the bond while the use of proceeds was to finance R&D expenses related to the development of REGEN-COV and to finance operations.

Regarding Regeneron's peers, the trend of issuing debt at the end of 2019 and beginning of 2020 can be seen at the figure. Historically, the highest level of leverage has Amgen, the largest competitor by market cap. Also, while Biogen historically had D/E between 10% and 15%, at the beginning of 2020 it almost doubled it leverage. The main purpose of higher leverage throughout industry is to enable smooth financing during the period of Covid-19 pandemic.

Figure 3: Debt to Equity ratio (Bloomberg)



2.5. Maturity of Debt

Historically, Regeneron's Current Assets have exceeded its Current and Non-Current liabilities. Regeneron has mostly used long term debt in the previous couple of years which is indicated in the figure below. Apart from 2021 when the company had Short Term Lease which was later refinanced by long term debt. (Source: Regeneron, 10K).

In addition, the company has substantial amounts of cash and cash equivalents that are enough to finance debt. (At the end of FY2021, the company had 2.8 billion USD in Cash and Equivalents)

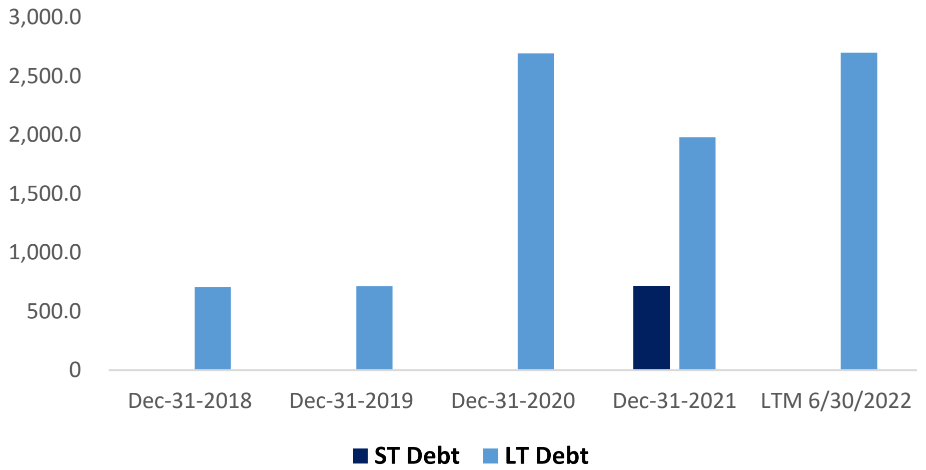


Figure 4: Long-Term and Short-Term Debt (Bloomberg)

2.6. External Governance and Control

FMR LLC, BlackRock Inc., Vanguard Group Inc. are the three largest holders of the percentage of shares in Regeneron Pharmaceuticals, Inc. The three holders own 10.08%, 8.85% and 8.00%, respectively.

In comparison with the S&P 500 and the S&P Global Market Intelligence universe, Regeneron's takeover defense rating is above average, indicating that Regeneron is not easy to suffer to a hostile takeover by another company. Regeneron is given the "Blank Check Preferred Stock", Which is used as an anti-takeover defense because the board has the right to create a new set of preferred stock that may have special voting rights or control rights that could make a takeover more difficult (Capital IQ, 2022).

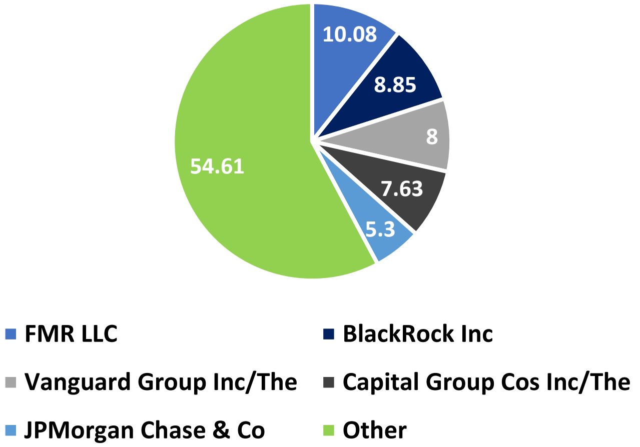


Figure 5: Ownership Structure (Bloomberg)

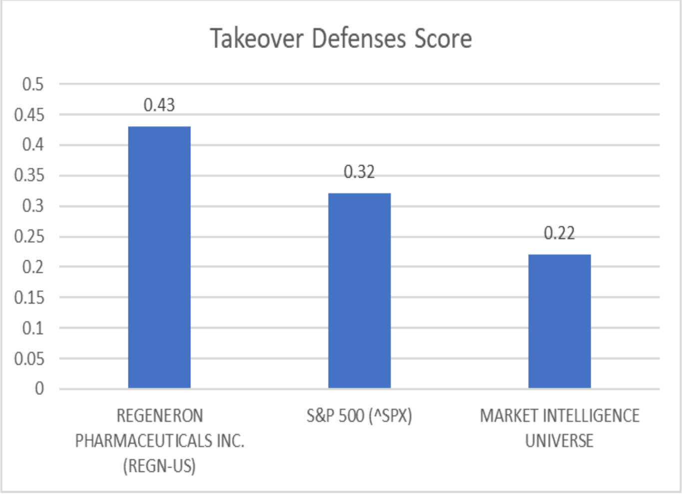


Figure 6: Takeover defense score (Yahoo Finance)

2.7. Dividends and Payout Policy

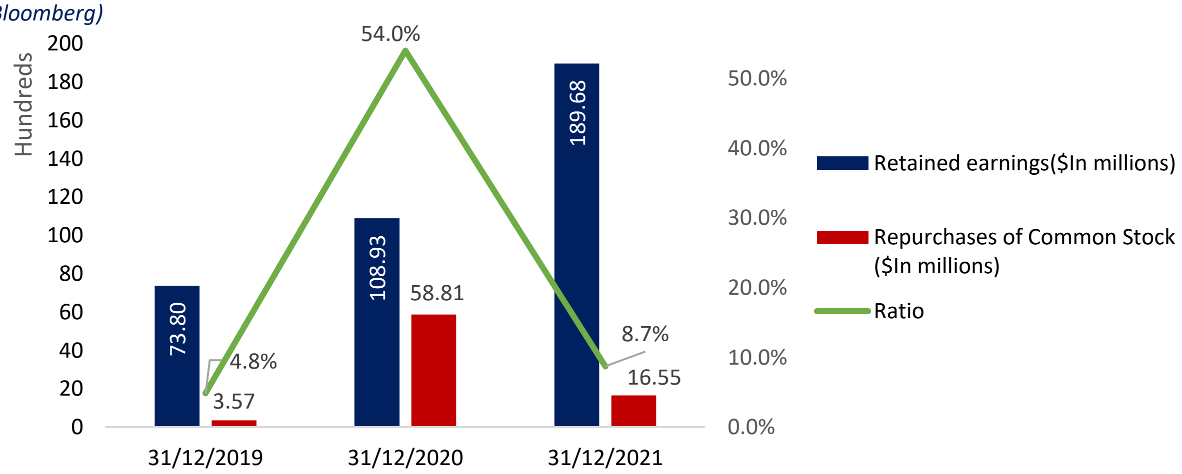
The market for Registrant's Common Equity: Regeneron's common stock has a par value of $0.001 per share and is quoted on the Nasdaq Global Select Market under the symbol "REGN." Class A shares also have a par value of $0.001 per share, but Class A shares are subject to certain restrictions on transfer and are not publicly quoted or traded. 166 common Stockholders and 15 Class A Stockholders are recorded as of January 27, 2022.

The voting rights of Regeneron: The holders of Class A Stock are entitled to ten votes per share and the holders of Common Stock are one vote per share (2021 Regeneron Annual Report, 2022). Holders of Class A shares and common shares have equal rights when their boards declare dividends from legally available funds. (PRELIMINARY PROSPECTUS SUPPLEMENT of Regeneron Pharmaceuticals, Inc., 2020).

Regeneron Pharmaceuticals, Inc. did not pay a dividend in nearly a decade, according to information reviewed by Bloomberg. Because Regeneron is subject to Sections 510 and 513 of the New York Business Corporation Law, which govern the payment of dividends. They are restricted from engaging in payment of dividends unless they maintain a capital surplus. They have never paid cash dividends and do not anticipate paying any in the foreseeable future (PRELIMINARY PROSPECTUS SUPPLEMENT of Regeneron Pharmaceuticals, Inc., 2020).

As the chart above shows, the company has repurchased stock in recent years. Although the net income of 2021 was the largest, resulting in cumulative retained earnings of nearly 19 billion, the amount of stock repurchases in 2021 only reached 8.7% of the retained earnings, far less than that in 2020. However, Regeneron announced on November 12, 2021, that its board of directors approved a share repurchase program for up to $3 billion of the company's outstanding common stock. The Company views this share repurchase program as part of a broader capital allocation strategy to maximize shareholder value over the next few years (Regeneron, 2022). The number of buybacks will go up in the next few years.

Figure 8: Retained Earnings and Stock Buy-Back (Bloomberg)



2.8. Impact of Covid-19

Net product sales of EYLEA in the United States increased in 2021, compared to 2020, due to higher sales volume (including the adverse impact of the COVID-19 pandemic on U.S. EYLEA demand during the three months ended June 30, 2020).

In November 2020, the antibody cocktail known as REGEN-COV received Emergency Use Authorization from US Food and Drug Administration (FDA). But laboratory data showed that REGEN-COV is highly unlikely to be active against the Omicron variant, which resulted in FDA's decision to exclude REGEN-COV as a method of therapy, since Omicron variant was dominant in the US in January 2022.

The degree to which future sales of their COVID-19 monoclonal antibodies will continue is highly uncertain and will depend on, among other factors, the number of new COVID-19 cases and effectiveness of our product against other variants of virus. (2021 Regeneron Annual Report, 2022)

2.9. Environmental, Social and Governance

The final ESG Risk Ratings scores are a measure of unmanaged risk on an absolute scale of 0-100, with a lower score signaling less unmanaged ESG Risk (Yahoo Finance, 2022). According to Figure: ESG Comparison, Regeneron's overall ESG risk is minimal compared to its peers, especially has the fewest environmental issues and lowest risk, which is comparable to the level of its peers, because Regeneron has made efforts in environmental aspects.

Regeneron remains committed to mitigating climate-related risks and maximizing opportunities to protect our planet. In 2020 they conducted an assessment of their climate-related risks and opportunities and conducted a scenario analysis to evaluate their potential impacts on their business. In keeping with their commitment to transparency, this report in 2021 shares the findings from this assessment and how Regeneron is taking action. Regeneron engages with a wide range of stakeholders on climate-related issues, including community partners, industry peers, suppliers and government agencies. They actively engage with the investor community to confirm their understanding of, and resilience to, potential climate-related risks to their business and their value chain.

Building on their existing mitigation strategies in their operations and value chain, they have set environmental sustainability targets for energy and GHG emissions, water and waste. They have committed to establishing global science-based targets for their Scope 1 and 2 GHG emissions by 2023 and to matching 100 percent of their electricity consumption with electricity from certified renewable energy sources by 2035. (Regeneron TCFD Report, 2021)

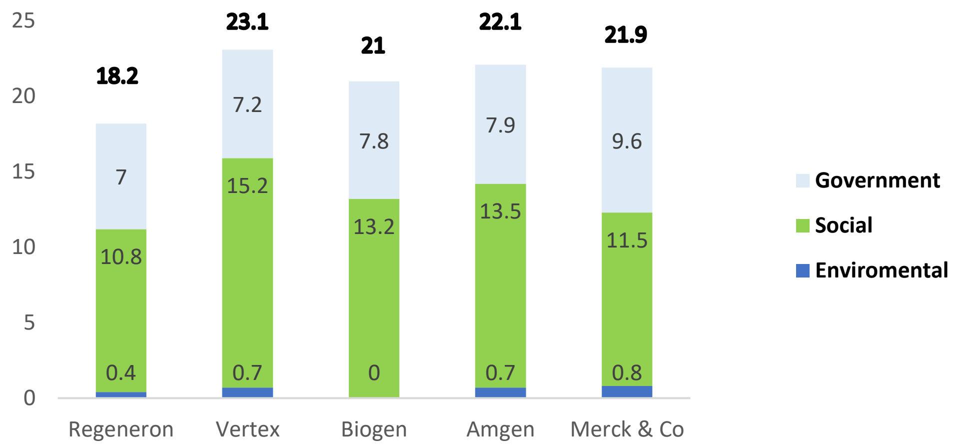


Figure 8: Comparison of ESG Scores (Yahoo Finance)

3. Market overview

3.1. Market Characteristics

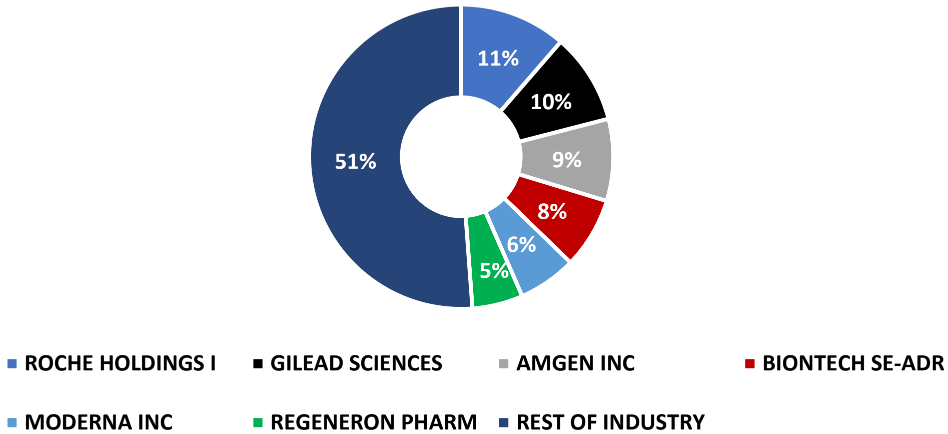
Firstly, the global biotechnology market is currently dominated by six companies that together earn almost half of the total industry revenue. The largest one among them is Roche Holding AG that earns more than 11% of Total Industry's revenue (Source: Bloomberg).

Secondly, the market has a relatively strong customer base. The recurrence of existing infectious diseases and the emergence of new ones provide the biotech market with plenty of opportunities to develop. Also, United Nations (2022) predicts that the global population will reach 8 billion by November 2022 and 9.7 billion by 2050.

Thirdly, the biotechnology market has a relatively high SG&A margin, 8.0% in 2021 (Capital IQ), compared with some conventional sectors, like the energy industry, 5.0%. In the Case of Regeneron, SG&A expenses increased by 17% CAGR over the last 5 years, and SG&A margins were 11% in 2021.

Finally, the input costs of the industry are relatively high. The high requirements for technology drive companies to invest more in R&D, recruiting high-tech talents, and configuring new equipment. Moreover, due to strict policy requirements, the project cycle, from laboratory research to clinical trials to product commercialization, will be more than nine years, which increases human and material costs (Brown et al.,2021).

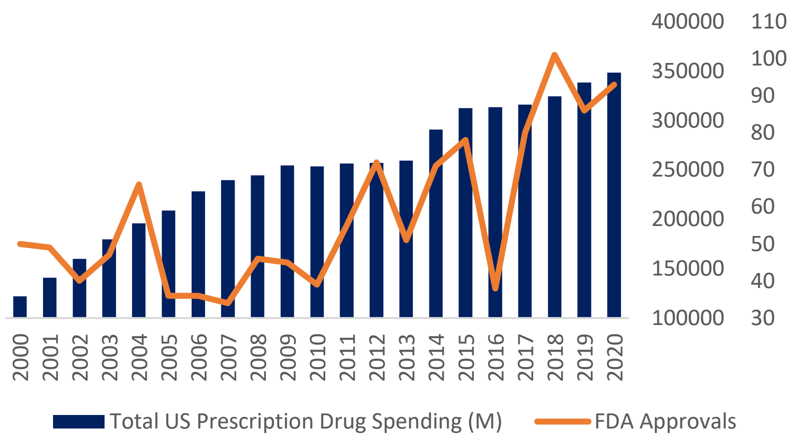
Figure 9: % of Total Biotech Industry revenue in FY21 (Bloomberg)



3.2. Forecasted Market

The market was growing in the last couple of years, and some of the key drivers were spending on prescription drugs, higher number of FDA approvals and growing R&D costs. Additionally, a relatively high mortality rate, about 18.5%, for people with chronic diseases aged between 30 and 70 (World Health Organization, 2022) is anticipated to boost demand for related clinical trials, which may stimulate market growth. Also, the emergence and spread of new diseases lead some organizations to discover new drugs and act as a positive factor in the market growth in the forecasted future. Furthermore, some countries, like China and India, which have heavy population pressure, drive the biotechnology expansion. Overall, the biotechnology market is predicted to show a growth trend in the recent future

Figure 10: Total spending on prescription drugs in the US and Number of FDA Approvals (Bloomberg)



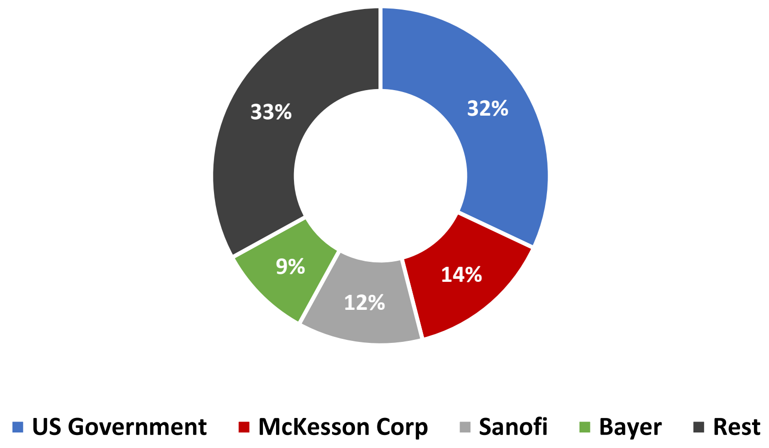
3.3. Suppliers and Consumers

Regeneron has high customer over-dependance risk. Sales to the US Government, the largest customer of the firm, will decrease after FDA pulled down the license for REGEN-COV drug. Also, Sanofi and Bayer have full right to terminate their contracts which can lead to the revenue reduction as well.

Additionally, in the past 5 years the company experienced increase in the Days Sales Outstanding (DSO), mostly due to the more flexible sales deals of EYLEA during the pandemic and higher sales to the US Government.

From the Supply side, Regeneron does not have any overdependence risk. The largest supplier of the company, Charles River Laboratories, that produces research tool and gives support during drug discovery and development, accounts for only 0.5% of R&D Costs in 2021. Therefore, no changes in Days Payable Outstanding can be expected in the future.

Figure 11: Revenue share by customer in FY21 (Bloomberg)



3.4. Competitors

Regeneron significantly outperformed the competitors listed on the ROA ratio. However, the main reason for the higher ROA is that its competitors' assets are approximately seventeen times that of Regeneron.

This means that Regeneron may lack investment in some assets such as PP&E or patents, which have significant impacts on the company's success (Regeneron, 10K).

From 2019 to 2021, the company's asset turnover rate is higher than the market average and is also at the mid-to-upper level compared with its competitors. Even in 2021, it will grow to 0.8, which is twice the market average, which shows that the company's utilization of assets is constantly optimizing.

However, Regeneron' s gross revenue is slightly lower than its competitors, suggesting that the company should focus more on controlling the cost of sold products. Similarly, its inventory turnover is also at a disadvantage compared to competitors such as AbbVie Inc., indicating that the company may have weak sales or excess inventory.

The ability of Regeneron to compete to a great extent depends on how fast the company can develop safe and effective products, complete clinical testing, and approval process, supply enough to the market.

Some of the best seller products of our company has very strong competition in the US and abroad. In example. Roche is the biggest competitor, as their product Lucentis can serve as perfect substitute for EYLEA. If Lucentis becomes more superior, or Roche succeeds to produce it more efficiently, this can have significant impact of Regeneron's profitability. In addition, since EYLEA is produced and distributed in collaboration with Bayer, any disruption in that collaboration can affect market share of EYLEA and help Roche become more dominant in that niche.

Market Product	Competitor Product	Competitor	Territory
EYLEA	Lucentis	Novartis AG and Roche	Worldwide
	Byooviz	Biogen Inc	US and EU
	Avastin	Roche	Worldwide
DUPIXENT	Xolair	Novartis AG and Roche	Worldwide
	Eucrisia	Pfizer	US and EU
Libtayo	Keytruda	Merck & Co	Worldwide
	Tecentriq	Roche	Worldwide

4. Valuation

4.1. Cost of Equity

The Cost of Equity (Re) is an indicator of the required annual return that a company's shareholders may expect to receive due to the incremental risk premium of the stock. The Cost of Equity is calculated using the CAPM model (Rosenbaum and Pearl, 2013)
For the calculation of Cost of Equity, we have used CAPM model.

$$\text{CAPM: Re} = Rf + \beta * (Rm - Rf)$$

Where:

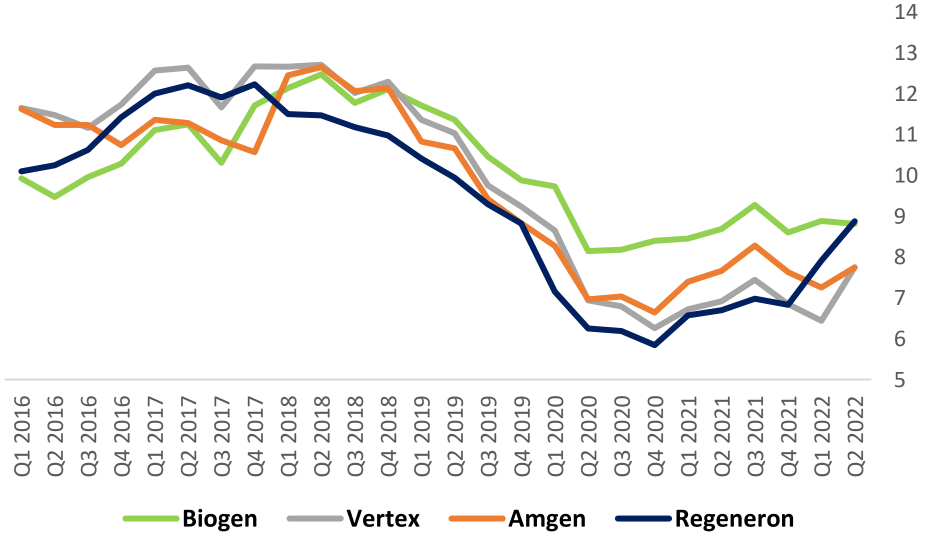
- Rf is the risk-free rate, assumed to be equal to US 5y Treasury-Bill Yield=3.96% taken on October 7, 2022 (Source: Federal Reserve)
- (Rm-Rf) is equal to the equity risk premium, taken from NYU Stern Database from May 6, 2022=2.05%
- Beta is company's Beta calculated as the ratio of covariance of weekly REGN returns and S&P 500 Index weekly returns. Furthermore, we have used Beta Smoothing method (Blume, 1975) as Beta tends to approach to 1 in the future. The formula for Beta smoothing is provided below. The adjusted Beta of Regeneron is 0.79.

$$\text{Beta Adjustment: } \beta(adj) = \frac{1}{3} + \frac{2}{3} * \beta(levered)$$

Therefore, Regenron's Cost of Equity is Equal to 8.18%.

From the Figure: Comparison of Cost of Equity we can see the variations of Cost of Equity over the last 3 years. While Risk free rate has increased for all the companies due to the rising interest rates by FED, as a measure of fighting surging inflation, Beta of Regenron has significantly higher comparing to its peers, which suggests that Regenron is more volatile than its them. Higher beta resulted in investors demanding higher returns.
From the chart below, we can see that competitors of Regeneron also experienced Cost of Equity increase in previous periods. The exception is Biogen that increased their leverage and switched to the cheaper method of financing, debt. However, with the rising interest rates, companies experienced increase in Cost of Debt and consequentially the increase in WACC.

Figure 12: Comparison of Cost of Equity (Bloomberg)



4.2. Cost of Debt

In the last couple of years, Regeneron have not had substantial amount of debt, with D/E ratio varying between 0.87% (Q3 2016) and 5.22% (Q4 2020). The majority of debt in the last couple of years is Long Term Debt, and currently LT Debt comprises 100% of Total Debt. In comparison to its peers, Regeneron's Cost of Debt is relatively inexpensive, with its minimum of cc0.5% just before start of Covid-19 pandemic. (Q1 2020). In the last 2 years, Cost of Debt has increased all over the industry, primarily because of the rise of Interest Rates in the US.

On top of that, there is a trend of new debt issuance after the Covid-19 pandemic, which further increased Cost of Debt, but had a positive impact on WACC as it is the cheaper method of financing. In chart D/E Ratio we can see that close competitor, Biogen, increased its D/E by almost 10pp from the start of 2021. Also, Amgen has increased its leverage ratio by 8pp in the same period.

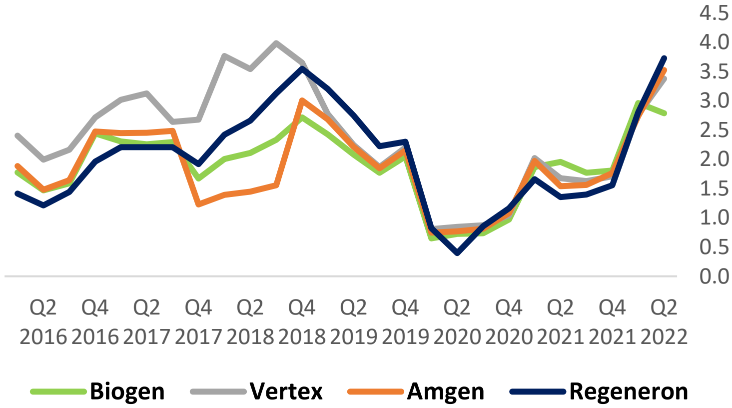


Figure 13: Cost of Debt Comparison (Bloomberg)

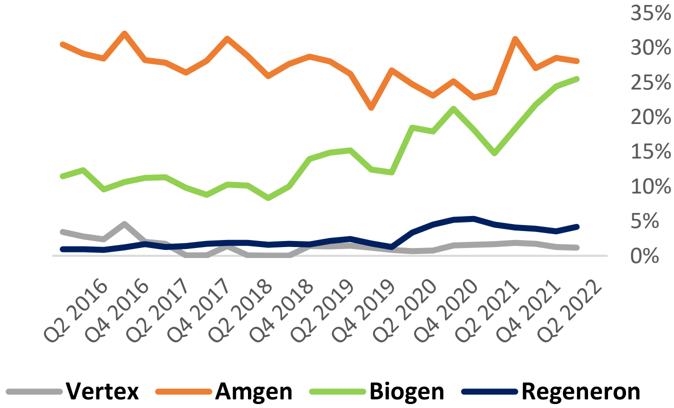


Figure 14: Leverage (D/E) comparison (Bloomberg)

4.3. WACC

The weighted average cost of capital (WACC) is a financial ratio that measures a company's financing costs. It weighs equity and debt proportionally to their percentage of the total capital structure. A company's executives use WACC in making decisions about how to fund operations or projects, and it helps investors determine the minimum rate of return they're willing to accept on their money. (Business Insider)

D/E Ratio chart shows that Regeneron has the lowest leverage comparing to the closest competitors while simultaneously it has the highest WACC.
Therefore, Regenron can create additional value for its shareholders by increasing leverage and utilize cheaper alternative, debt. However, as further increases of interest rates by FED can be expected, in order to sustain inflation and inflation expectations, it is possible that Regeneron will delay its decision to issue a new debt.
Comparing to its peers, Regenron has the highest Cost of Capital. It can be seen that all peers experienced slight increase of WACC during pandemic (Q1 2020-Q4 2021) and substantial increase of WACC since the beginning of 2022, which can be attributed to higher interest rates, inflation expectations as well as incoming energy crisis due to the war in Ukraine.

The cost of capital is computed using the formula:

$$WACC = Re * \left(\frac{E}{V}\right) + Rd * \left(\frac{D}{V}\right) * (1 - Tc)$$

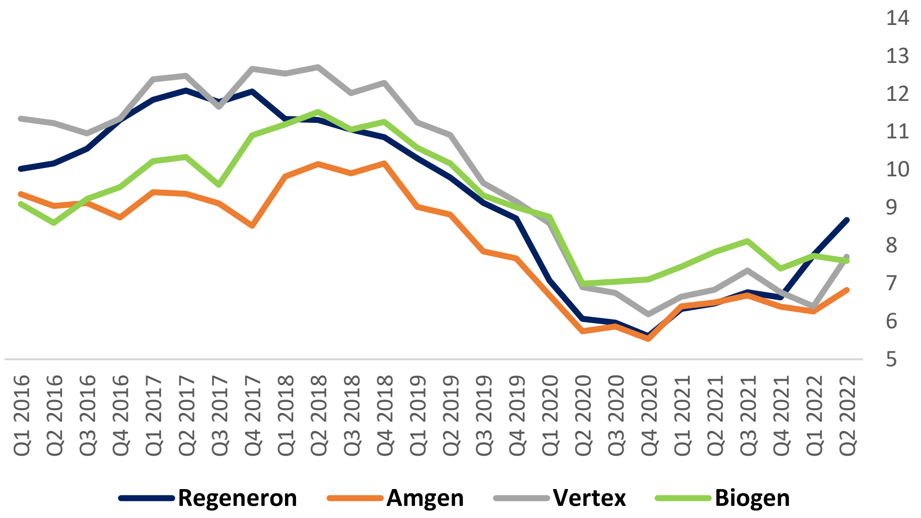
Where:

- Re=Cost of Equity
- Rd=Cost of Debt
- E=Market Value of Company's Equity
- D=Market Value of Company's Debt
- V=E+D
- Tc=Corporate Tax Rate

(Brealey at al., 2013)

Regernon's overall cost of capital is 8.01%, which is higher than the one of close competitors. Higher cost of capital means that the company cannot invest in new projects easily and it will need to generate higher returns on the projects to make them profitable.

Figure 15: Historical WACC comparison (Bloomberg)



4.4. DCF

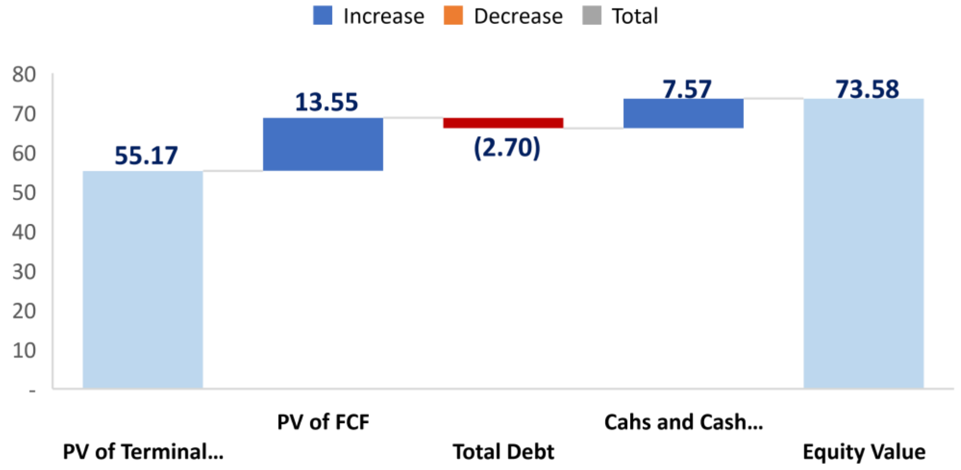
According to our DCF analysis, the intrinsic value of Regeneron's share is 711.00 USD, suggesting that the company is overvalued by cc.4%. The overvalue conclusion is mainly due to uncertainty surrounding future revenue. While revenue from REGEN-COV19 drug will decrease in 2022, the uncertainty about future types of virus in further years is the prime driver of overvalued conclusion.

The Terminal Value was calculated using peer median EV/EBIT ratio of 14x as an exit multiple. Present Value of Terminal Value comprises 81% of the total enterprise value of Regeneron which is represented in Equity Value bridge. This exit multiple yielded the implied perpetuity growth rate of 1.8% which is in line with OECD estimated for US economy until 2060.

To confirm our hypothesis that Regeneron stock is overvalued, we have performed a sensitivity analysis. We have examined the impact of different Cost of Capital and Different Exit Multiples on final DCF Price in our model.

The exit multiple was varied between first and third quantile value in our peer group while WACC was varied as 8%+-2pp. The Sensitivity analysis clearly shows the dominance of overvalued scenario.

Figure 16: Equity Value Bridge (Bloomberg)



708.79	11.00x	12.00x	13.00x	14.00x	15.00x	16.00x	17.00x
6.00%	634.75	676.21	717.67	759.12	800.58	842.04	883.50
7.00%	614.80	654.73	694.66	734.59	774.52	814.45	854.38
8.00%	595.73	634.20	672.67	711.14	749.62	788.09	826.56
9.00%	577.50	614.57	651.65	688.73	725.81	762.89	799.97
10.00%	560.05	595.80	631.55	667.30	703.05	738.80	774.55

Table: Sensitivity Analysis

4.5. Relative Valuation

In the Table below we have represented Peer Comparison and Multiples on 10/07/2022. In addition, we have depicted the relative valuation of Regeneron, comparing various multiples with its competitors.

The criteria under which Peer Group was chosen were, respectively: geographic presence, business model and profitability.

Median peer EV/Revenue multiple is 4.84x while Regenron has 5.66x EV/Revenue, which signalizes that Regenron may be overvalued.

Additionally, Regeneron's EV/EBITDA is circa 13.78x, way above median peer multiple of 11.40x. Higher EV/EBITDA ratio suggests the lower amount of earnings, suggesting that Regenron may be overvalued. In favor of this argument speaks the Conesus Revenue estimate for FY22 (source: Bloomberg) of $11.6B (-26% YoY). The decrease in revenue is primarily driven by almost no sales of REGEN-COV, Regeneron's anti-Covid drug released in 2020 in the middle of Covid-19 pandemic.

As a confirmation to this conclusion, EV/EBIT multiple that considers the impact of depreciation and amortization is 14.68x which is lower than peer median EV/EBIT multiple of 14.39x.

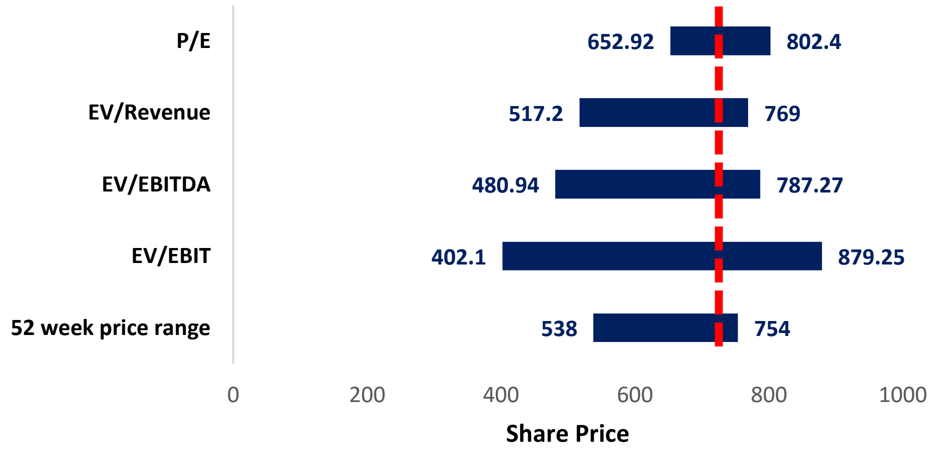
Finally, the last calculated multiple is P/E ratio which is defined as the ratio of company's share price and its earnings per share (Shiller, 2005) P/E ratio is lower than the median one of peer group, suggesting that share price of the company is too high.

Company Name	Market Cap	EV/Revenue	EV/EBITDA	EV/EBIT	P/E
Biogen Inc. (Nasdaq: BIIB)	38,054	3.73x	11.34x	13.44x	18.79x
Gilead Sciences, Inc. (Nasdaq: GILD)	81,408	3.64x	7.58x	9.02x	19.86x
Amgen Inc. (Nasdaq: AMGN)	123,530	5.79x	11.60x	15.35x	19.54x
Vertex Pharmaceuticals Incorporated (Nasdaq: VRTX)	76,599	8.17x	20.81x	21.73x	24.14x
Moderna, Inc. (Nasdaq: MRNA)	48,959	1.38x	1.99x	2.03x	3.81x
AbbVie Inc. (NYSE: ABBV)	248,047	5.43x	11.46x	16.42x	19.84x
Eli Lilly and Company (NYSE: LLY)	316,369	11.35x	31.65x	37.44x	53.10x
Bristol-Myers Squibb Company (NYSE: BMY)	149,983	3.81x	8.51x	17.01x	23.26x
Merck & Co., Inc. (NYSE: MRK)	221,512	4.25x	10.35x	12.18x	13.35x
Regenron	**78,236**	**5.66x**	**13.78x**	**14.68x**	**19.50x**
Peer Median	123,530	4.84x	11.40x	14.39x	19.85x
Peer Average	144,940	5.64x	12.81x	16.07x	21.74x

Table: Relative Valuation

We have summarized our findings in Figure: Football Field Chart. For all multiples we have used first and third quantile of observations to measure the stock price. The quantiles were used to eliminate the impact of outliers. The presented analysis clearly indicates the dominance of overvalued conclusion among all valuation models

Figure 17: Football Field Chart



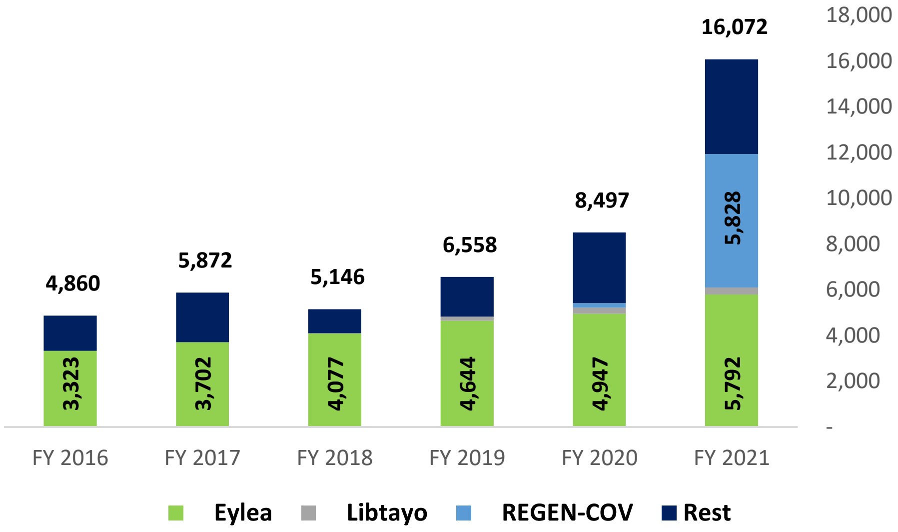
4.6. Risk Analysis

The company is subject to a number of risks that could potentially harm its operations and influence operating results and financial conditions. Here we will provide a breakdown of the most significant risks that are compered in Figure: Risk Matrix

4.6.1. Commercial Risk

The company is substantially dependent on EYLEA, the drug that comprise almost 50% of the revenue historically (except in 2021). Sales of these products are dependent on the availability of key components from suppliers as well as recently announced control of drug prices in the US (Source: Bloomberg). Moreover, the commercial success of these drugs is subject to significant competition from products of Novartis and Roche, that can be more cost effective and more superior.

Figure 18: Revenue Distribution by product (Bloomberg)



4.6.2. Risks related to Covid 19

The business of the company can be adversely affected by possible new variant of Covid-19 virus or any similar type of the pandemic. Firstly, the company earned high portion of revenue from sales of REGEN-COV antibody cocktail in 2020. It was later shown that this medicine is not effective against Omicron variant of virus, which left the company losing the license by the FDA and huge loss of revenue.

4.6.3. Intellectual property and Market Exclusivity Risk

The company may not be able to protect confidentiality of patents and to protect its intellectual property. Possible loss or limitation on patents, as well as similarity with products of competition, could reduce the market exclusivity of products, including the star products such as EYLEA and Dupixent.

4.6.4. Regulatory and Development Risks

Drug development and obtaining and maintaining regulative approval can be costly and uncertain. The lower revenue that can be expected in 2022 will cause reduction in R&D expenditures which will have prolongation of testing and application process as a consequence.

4.6.5. Third Party Reliance risk

If collaboration with Sanofi or Bayern is breached or terminated the company will lose the ability to produce some of its best-selling products. Under the terms of their agreement, Bayer can terminate the collaboration agreement at any time. The company does not have sales, marketing, or distribution capabilities for EYLEA outside the US and is completely dependent on Bayer's activities.
In addition, Sanofi and Regeneron co-commercialize Dupixent in the US. As a result, company partially relies on sales and marketing activities of Sanofi. In addition, Sanofi also funds half of R&D costs and costs of clinical development of Libtayo drug.

4.6.6. Foreign exchange risk

Large portion of company's revenue comes from outside of the US while major costs are incurred in the US. The appreciation of US Dollar against Pound Sterling, Euro, Yen or Canadian Dollar primarily can decrease revenue thus having a negative impact on margins. Conversely, it will also decrease overall expense, having positive impact on margins.

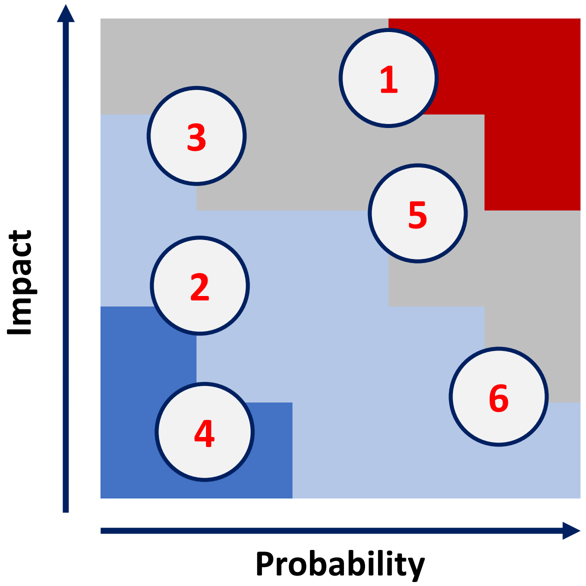


Table: Risk Matrix

5. Final Recommendations

In the previous two years, 2020 and 2021, Regeneron established itself as one of the major players in US Biotech market. The key driver to this success was development and effectiveness of REGEN-COV drug that protected millions of people from virus. However, at the end of 2021 Omicron Variant of Covid-19 showed that REGEN-COV is not effective against it, which resulted in withdrawal of license by FDA and lower revenue.

Before 2020, Regeneron was a niche player in Biotechnology market, focused primarily on development of highly specialized drugs that are used in treatment of limited number of patients. In 2019 for example, Regeneron's market share was just over 1.5% while in 2020 it was above 5% at the end of 2021.

However, the company now faces a considerable number of risks, as Covid-19 has almost passed, the large concentration of revenue belongs to EYLEA, which means that company now faces commercial, supply chain and collaboration risk. Currently, based on our analysis, Regeneron is not ready to mitigate these risks fully.

Based on the valuation approaches we have taken; Regeneron appears to be overvalued. It is also riskier than its peers, as they have more channels and revenue streams, diversified portfolio of consumers as well as wide range of products, unlike Regeneron. In addition, Regeneron operates in an industry that is driven by Research and Development. While R&D costs increased all around the world in Biotech industry, Regeneron's R&D costs were stagnant-if the firm fails to protect its patents and to provide innovations on the market it can not achieve higher return on capital, which would cause investors to disinvest and transfer their capital to companies that can.

6. Literature

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