A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

Equity Research: GlaxoSmithKline
Strategy and Forecast

ZIRUI WEI & 41118

A Project carried out on the Master in Finance Program, under the supervision of:

Professor Rosário André

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Abstract

As we are living in a Covid-19 spreading environment, people can never feel more important and vulnerable the health itself is. Naturally, we feel interested to do an equity research on a healthcare company. Coincidently, the news that an HPV nine-valent vaccine was finally available in mainland China and the exporter —— GSK arose our interest. Thus, we did a brief investigation into it and found this company is appropriate to be our research target.

Our work industry and company overview, macroeconomics environment, past analysis, forecast and valuation. It is based on the corporate valuation, financial statement analysis and financial report knowledge that we learned at Novasbe.

We started from analyzing the company and its macro environment, we did a forecast on its revenue, income statement, balance sheet and cash flow statement. Note that instead of choosing GDP and population as drivers, we decided to not apply any drives because it's more reasonable to forecast its revenue based on its products and patent. Then, A APV model has been applied to deal with the valuation.

We got a brief conclusion that GSK's stock is undervalued and it's worth to buy GSK stocks with an expected return of 23.0%

After completing this study, we could know better not only our target company GSK but also other pharma companies. Our equity research can serve as a good guideline for investors who want to know about healthcare stocks.

Keywords: Healthcare, Equity Research, GSK

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This report is part of the GSK report (annexed) and should be read has an integral part of it.

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Investment and Strategy

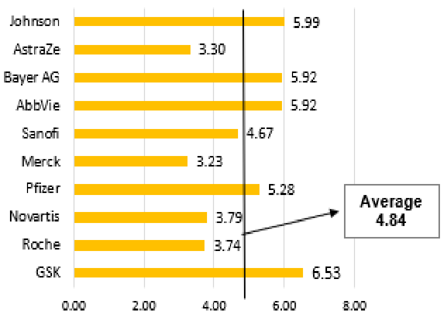
Figure 11 - Number of Medicines in pipeline	
Abbvie	60
AstraZe	86
GSK	39
Merck	29
Novartis	46
Pfizer	80
Roche	72
Sanofi	71

Source: Annual Reports

To strengthen GSK's business, it increased investment in **R&D** and in 2019, it had 39 medicines and 15 vaccines in the pipeline, also three major approvals, eight regulatory submissions, six positive read-outs from pivotal studies. Moreover, it progressed four new assets into pivotal studies[1]. However, in comparison with its peers, GSK has the lowest number of medicines in the pipeline. GSK's late-stage pipeline is still thin versus some of its peers, for instance, Novartis is holding 20 medicine in third phase versus GSK's 13 product (including vaccines). Among interesting prospects in GSK's pipeline is *Zejula*, which was approved as first-line monotherapy in April by FDA and have the potential to reach blockbuster (1 billion) status. Other prospects that have been submitted for FDA approval include respiratory syncytial virus and Chronic Obstructive Pulmonary Disease (COPD) vaccines, oncology asset *Belantamab Mafodotin*, HIV drug *Cabotegravir,* and *Bintrafusp Alpha* (developed under alliance with Merck KGaA). We expect GSK will continue looking for deals that could further strengthen its pipeline. (See below Forecast section for more information).

To understand better GSK's **R&D investment**, we run an analysis of a ten-year RORC[2] among GSK and its competitors (Appendix 1). In 2019, the GSK's RORC (with a lag of 3 year) is 6,53 which means, for each pound invested in R&D, after 3 year, the company earned £6.53 in gross profit. GSK's RORC climbed gradually over the last ten years, in which it exceeded the average RORC (around 5) among pharma companies since 2017. It reflects that GSK's R&D investment is relatively effective among its peers. The high value of RORC of 6.53 in 2019 indicates that GSK has spent wisely in terms of research and development and is obtained the rewards from its efforts. It's interesting to note that Bayer, Pfizer and Johnson & Johnson, similar to GSK, who develop not only pharmaceuticals but also own Consumer Healthcare unit, have a high RORC compared to its sole pharma peers. This is in accordance with the fact that drugs cost more R&D expenditure than Consumer Healthcare products.

Figure 12 - RORC, in 2019 3y Lag



Source: Analyst Graph

Two new companies to set competitive and a different cost base.

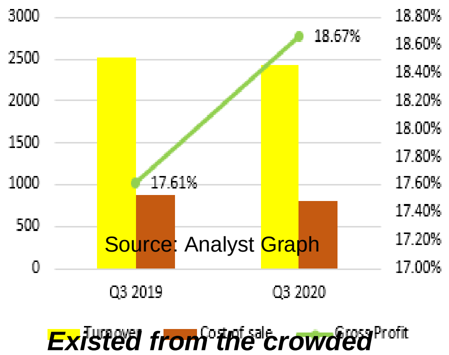
In Q1 2020, GSK initiated a **two-year program**[3] to prepare for the separation of the company into two entities: **New GSK**[4], a biopharma focusing on science related to the immune system, application of genetics and advanced technologies development; and a **New Consumer Healthcare** company which will be aimed at

[1] A pivotal study is a clinical study that intends to provide the ultimate evidence and data that the FDA uses to decide whether or not to approve a potential new medicine.
[2] RORC = Gross Profit (t)/ R&D cost (t-n), n = years of lag
[3] This program initiated in 2020 and it is expected to be finished in the end of 2021.
[4] This company will focus on pharmaceutical and vaccines products.

consumer healthcare products. The program targets cost savings through organization improvement and deleverage the whole group through IPO of New Consumer Healthcare company. (Please refer to Alternative Scenario regarding this saving program).

The Joint Venture with Pfizer Consumer Healthcare business was completed on 31 July 2019, which GSK holds a 68% stake and has a full operational control and management. According to Pfizer publishment, this investment makes the joint venture to occupy the first position in the US market and second position in China – the two biggest OTC markets in the world. In order to analyze the JV's impact on the profit, we made following assumption: the cost of sale of each unit would be equal to the percentage of its contribution to the revenue. With this assumption, it was calculated that the gross profit margin in Q3 2019 is 17.61% comparing to 18.67% in Q3 2020. The gross profit margin of Consumer Healthcare unit has gone up by 1%, verifying a slight margin improvement in the first year after JV formation.

Figure 13 - Consumer Healthcare Margin Analysis, Q3 2019 and Q3 2020



Source: Analyst Graph

Existed from the crowded "first generation" market and entered the potential immune-oncology market

Acquisition of Tesaro to return to the battle against cancer.

The global oncology drugs market was $97bn in 2017 and is estimated to reach at $176bn by 2025, with a CAGR of 7.6% from 2018 to 2025. The high growth potential in developing countries, increasing number of pipeline products, and rise in demand for personalized medicines are main drivers for the market players[5]. To strengthen the pharmaceutical pipeline, especially in oncology sector, GSK began to **acquire 100% of Tesaro Inc** for $5.1bn in cash from the end of 2018 and it was completed during 2019. Tesaro is acquired by $75 a share, a 110% premium to Tesaro's 30-day volume-weighted average price. According to a report of Bloomberg the key product *Zejula* would not bring much profit to GSK, since its main competitor *Lynparza* has generated formidable data in recent clinical trials. However, in April of 2020, the FDA green-lighted *Zejula* as a first-line maintenance therapy for all women, regardless of BRCA mutation status.[6] In our point of view, Tesaro acquisition is a good deal for GSK, although in the short term, only revenue generated by *Zejula* was consolidated in the total revenue (1% of total revenue in 2019), in the long term, Tesaro brings 15 new medicines in the pipelines, enabling GSK to rebuild its oncology commercial infrastructure and developing its own immune-oncology combination therapies internally, reducing its dependence with external partners. Tesaro has the most advanced pipeline product which is in the same immune-boosting class as *Keytruda*, arguably the only group of cancer drugs more competitive than PARPs[7]. Moreover, we believe the acquisition of Tesaro is rational as GSK once sold its oncology sector in 2014 to Novartis but returned to cancer sector two years later with absorption of small cancer drugs to

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[5] Market Analysis - (2019) Volume 7

[6] FiercePharma platform: https://www.fiercepharma.com/pharma/glaxosmithkline-s-zejula-jumps-ahead-lynparza-all-comers-ovarian-cancer-nod

[7] Poly (ADP-ribose) Polymerase is a family of proteins involved in a number of cellular processes such as DNA repair, genomic stability, and programmed cell death.

its portfolio. According to Citigroup, GSK tried to get rid of its "last generation" products and focus on "Transformational" cancer drugs that are either **first-in-class or highly differentiated from rivals.**

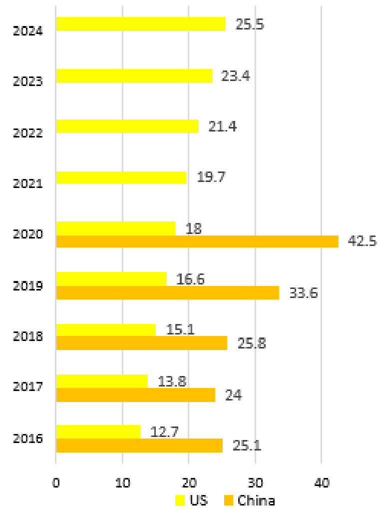
Five year of collaboration with Lyell to enhance its cell therapies

Due to the lack of technologies to counter T cell "exhaustion" and to enhance the activity and specificity of cell therapies in solid tumor cancer, the firm announced a five-year collaboration (2020-2024) with Lyell Immunopharma, a cellular therapy company. These investments show a positive expectation by GSK regarding oncology sector, however, $5bn of debt to support the acquisition of Tesaro and investments to further develop its asset as well as investment in the oncology commercial infrastructure would lead to a contradiction in GSK's operating margin in Pharmaceutical Unit – in addition of the continued lower revenue from *Advair* in total revenue.

The divestment of the Indian Horlicks business for the debt payment

GSK divested its Horlicks[8] business to Hindustan Unilever Limited (HUL), in return of 5.7% equity stake in HUL and approximately £0.4bn in cash on 1 April of 2020. During May 2020, with the appreciation of the shares value of HUL, GSK sold its 5.7% equity stake for approximately £2.8bn. This price is in line with GSK's expectation (approximately £3.1bn) since they received £0.4bn in cash previously. According to the Q3-20 report, this profit was allocated for debt repayment[9].

Figure 14 - China and US Vaccines Market, in billion (¥ , $)



Source: Statista

To maintain its global vaccines market, GSK puts its two key assets: *Shingrix* and *Bexsero* focusing on the US and China, two largest vaccines markets in the world. During the last four years, there are huge increases in vaccines' sales in these two markets. For instance, the total sales of vaccines in China has increased from ¥24bn in 2016 to ¥42.5bn in 2019 and the US has climbed to $16.6bn in 2019 from $12.7bn in 2016. In 2019, GSK received regulatory approval for *Shingrix* in China where the firm planned to have a phased launch to ensure its continuity of supply. On the other hand, to further grow *Bexsero*, which already had a 70% share of the global meningitis B vaccines market in 2019, the firm will focus on EU and US market. As the competitors in EU only offer adolescent protection, GSK can be benefitted in offering infant products. Furthermore, the firm is developing an MMR (Measles, Mumps and Rubella) vaccine and a PCV-free (Porcine Circovirus) formulation rotavirus vaccine specifically for the US market.

In the end GSK is also working on vaccine for the Covid-19. The firm collaborated with Sanofi to support the COVAX Facility to make their vaccine adjuvant technology (AS03) available for the development of an effective vaccine and global response to the coronavirus epidemic. However, due to the unsuccessful development of vaccines in immune response in older adults, they announced to

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[8] Horlicks is a nutrition drinks product that was in the Healthcare division of GSK.
[9] £3.3 billion decreased in net debt which including shares revenue in the Horlicks Unilever of £2.7 billion and £0.6 billion of other assets.

delay its vaccines supply to the end of 2021. During November 2020, GSK and Medicago, another biopharmaceutical firm, announced their positive result of adjuvanted Covid19 vaccines in phase I and started the phase II/III clinical trials. Nevertheless, even with the success of vaccines' development by GSK and Medicago, there are already 2 vaccines in the market (Pfizer and Moderna). According to the Eikon platform, when there is announcement of success of Covid-19 vaccines, Pfizer's share price has increased by 16% and Moderna increased by 46%. However, after 1 week, their price dropped back to their former level (Pfizer with $37.84 and Moderna with $111.40). In the beginning of December, Johnson&Johnson also announced its vaccines' success in the third phase. Its share price increased by 7% to $154.51. Therefore, in our point of view, even with the success of Covid-19 vaccines by GSK, its impact on GSK share price would be diminutive (1% to 5% of increase), since it would only be available in the end of 2021.

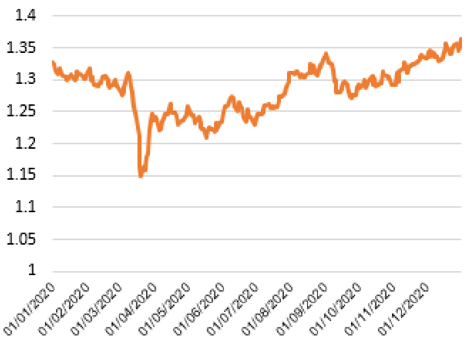
Macroeconomic Environment

Brexit: The consequence of Brexit is still an uncertainty for the firm. It affected its supply chain and the product quality, however, GSK believed that **Brexit would not have a material impact on its business**. For instance, GSK has been engaging with Governments in both the UK and EU27, as well as Brussels institutions, to discuss their preparations and their ambitions for the new UK/EU relationship (Including the taxes issues and regulations). Furthermore, GSK has prepared currently a new post Brexit operating model. The firm planned the retesting and certification of medicines and consumer products in Europe where required and they have completed relevant marketing authorization transfers, updated packaging and secured additional warehousing for products.

No material impact of Brexit for Pharma Business

In the end of December 2020, the deal is completed. There is no huge change in trade policies. The agreement establishes zero tariffs or quotas on trade between UK and the EU. Regarding Pharmaceutical products, There is annex which aims to facilitate availability of medicines, promote public health and protect high levels of consumer and environmental protection in respect of medicinal products. It provides mutual recognition of Good Manufacturing Practice (GMP) inspections and certificates, Thus, manufacturing facilities **do not need to undergo separate UK and EU inspections**, as well as ongoing co-operation.

Figure 22 - GPB to US exchange rate



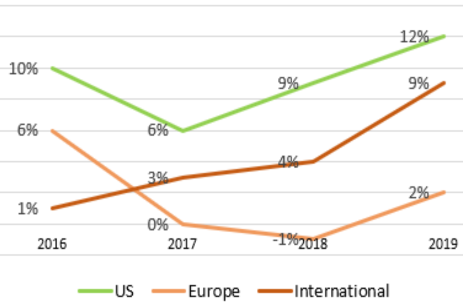
Source: Yahoo finance

Exchange rate: According to the Yahoo finance platform, the lowest exchange rate of GBP to USD during the last 5 years was 1.16 in the beginning of Covid-19 pandemic. However, after the announcement of completion of the Brexit, GBP to USD has exceeded 1.35, reaching 1.36, the highest value in 2020. This also happened to several currencies, for example, GBP to CNY has climbed to 8.87.

Since GSK has strong presence internationally, the exchange rate is one of the most important factors to affect its total revenue. For instance, there would be a growth in Consumer Healthcare Unit's turnover if eliminating the impact of exchange rate (-1% AER, 2% CER in 2018). In order to reduce the impact of foreign currency rate fluctuation on GSK's total revenue, it has bought several financial derivatives, such as forward and swaps. Moreover, GSK seeks to denominate borrowings in the currencies of its principal assets and cash flows, that is USD, Sterling and EUR. Borrowings can be changed to other currencies as required.

Forecast

Figure 23 - CER for each Region



Source: Company Data

The main market of the GSK is in the US. The US segment has increased its contribution during the last 5 years. It accounted for 34% of the total revenue in 2015 and climbed to 41% in 2019. Although the US market is the largest revenue origin of the firm, GSK has been seeking for opportunities in the worldwide, especially in the economies with high potential such as China, Japan and India. During last five years, it is notable that, GSK's European segment CER[10] growth rate has decreased constantly, reaching a negative point of -1% in 2018 while the international market (excluding USA and EU) has increased continuously from 1% to 6% (2016-2019) and strengthened its contribution to the total revenue. It reflects that **GSK's Europe market has been saturated while emerging markets such as Asia-Pacific still represent opportunities to explore**.

Covid-19 impacted GSK, particularly, in the Vaccines unit since the pandemic suspended regular immunization programs organized by The United Nations Children's Fund (UNIFCEF), World Health Organization (WHO) and Pan American Health Organization (PAHO). In the meantime, the subdivision Established Pharmaceuticals of Pharmaceutical unit has also suffered in 2020 as most of their product's patents expired and experienced fierce competition with its generic drugs substitution. Nevertheless, the Consumer Healthcare unit actually recorded very positive CER growth rate in first half year of 2020 comparing same period of 2019 (Q1 2020: 46%; Q2 2020: 25%) although the growth rate plummeted to 2% in the Q3. The reason behind is that the joint-venture between GSK and Pfizer was completed in Q3 2019. Thus, FY19 Q3 Consumer Healthcare revenue had been a record (+ 25% CER), which set a high standard for FY20 Q3 to compare with. To be noted that the total revenue for first nine months of 2020 increased by 2%, reflecting that **GSK remain resistant against Covid-19.**

In general, our revenue forecast model is based on historical income generated by each product. Each medicine or vaccine is forecasted, taking its past growth rate,

[10] The percentage that sales grew if exchange rates had been constant in the period.

Figure 24

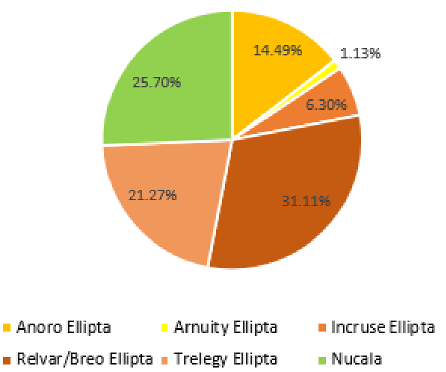
£m - Sales from new Pharma& Vaccines	FY18	FY19	% Growth Actual
Respiratory			
Relvar/Breo Ellipta	1090	971	-10.9
Anoro Ellipta	476	514	8
Nucala	563	768	36.4
Trelegy Ellipta	156	518	>100
Others	327	310	-5.2
HIV			
Trivicay	1639	1662	1.4
Triumeq	2648	2546	-3.9
Juluca	133	366	>100
Others	302	280	-7.3
Oncology			
Zejula	0	229	>100
Immuno-Inflammation			
Benylsta	473	613	29.6
Pharmaceuticals	**7807**	**8777**	**12.4**
Bexsero	584	678	16.1
Fluarix	523	541	3.4
Shingrix	784	1810	>100
Others	297	339	14.1
Vaccines	**2188**	**3368**	**53.9**
Total	**9995**	**12145**	**21.5**

Source: Company Data

the patent expiration date and its competitors patent expiration date (after the patents expiration, we assume the growth would be negative) into account. Our model is bult on following assumptions: Firstly, the total revenue from each medicine in 2020 is calculated by the average income of the first three quarters, multiplied by four[11]. Secondly, the patent expiration date for international market (excluding EU and USA) are the average of the expiration date of US and EU. Thirdly, after the patent expiration, the growth would be -10% in the first year, -20% in the second year due to the fact that generic substitution drugs usually come out at second year of expiration, then, it will keep decreasing by -10% in the following years. These percentages (10%, 20%, 10%) are set to simulate the historical evolution of previous expired drugs. For instance, the *Advair* first experienced 12% decrease (around 10%) and 19% decrease (around 20%) in the second year after expiration and 16% for the third year. Another example could be Avodart which experienced a decreasing growth rate of 6%, 19% and 13%. Finally, if competitor drug's patent expires before GSK's corresponding drug, the sale of GSK' drug will be negatively impacted as well since the genericization of its substitute will drag the price down. However, the indirect impact from generics of its competitor will be less than the direct impact of its own patent expiration. Thus, the growth rate is only assumed to decrease 10% every year.

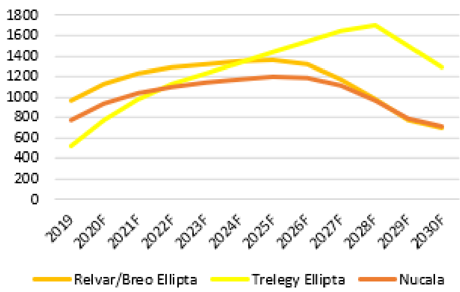
Pharmaceuticals

Figure 25 - Respiratory segmentation, 2020



Source: Analyst Graph

Figure 26 - Relvar, Trelegy and Nucala Sales 2019-2030



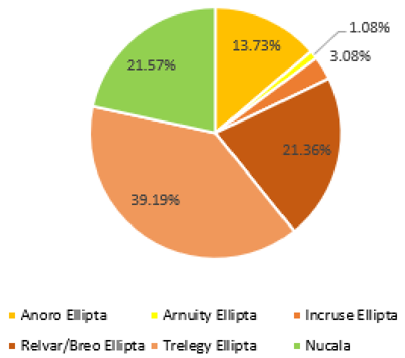
Source: Analyst Graph

Respiratory: GSK has been a global leader in respiratory for five decades, with the development of modern, innovative medicines for asthma and chronic obstructive pulmonary diseases. In the first nine months of 2020, respiratory sales were up 25% (CER growth rate of 26%) with significant growth from main drugs: *Trelegy* (accounts for 21% of total respiratory revenue), *Relvar/Breo* (31%) and *Nucala* (26%) in all regions. In US, based on the third quarter result, apart from continued growth of *Trelegy* (20% AER) and *Nucala* (25% AER). *Relvar/Breo*'s registered a growth of 64%, which is mainly resulted by the effect of a prior period RAR[12] adjustment and a stronger US ICS/LABA[13] market in the COVID-19 pandemic environment. Moreover, the US FDA approved *Trelegy Ellipta* for asthma, becoming the first once-daily single inhaler triple therapy for the treatment of both asthma and COPD in the US. Furthermore, in 2019, *Trelegy Ellipta* was available in over 40 markets, including Japan and China, the two biggest economies in the Asia.

In respiratory segment, as we mentioned previously, the **three main products are *Relvar/Breo Ellipta, Trelegy Ellipta* and *Nucala***, whose patent expiration years

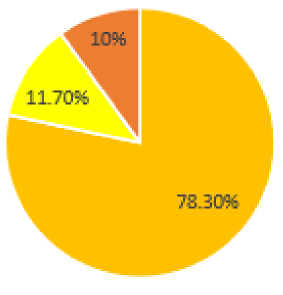
[11] 4 refers to four quarters in a year.
[12] Returns and Rebate
[13] Inhaled corticosteroid and a long acting β2-agonist – maintenance treatment for asthma

Figure 27 - Respiratory segmentation, 2030



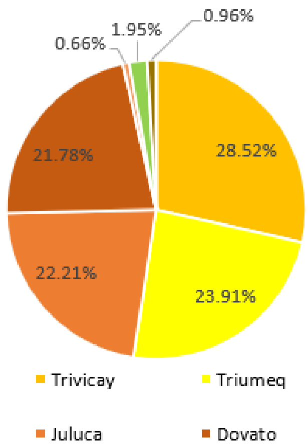
Source: Analyst Graph

Figure 28 - ViiV Healthcare Shareholdes Composition



Source: Company Data

Figure 29 - HIV Revenue Segmentation, 2030



Source: Analyst Graph

are 2025/2026[14], 2027/2028 and 2027/2026 respectively. According to historical data, when GSK release a new drug, there would be a huge increase in revenue during the first two or three years, afterwards, it would drop dramatically until reaching a growth below 5% before expiration date. Taking the products competitors' patent expiration date[15] and the historical trend of a drug into consideration, it is assumed that these three products' growth rate would decrease by 50% after 2020 until expiration year.

In our forecast period, after 10 years, the main products did not change, *Trelegy* still has the highest sales in the respiratory segment in 2030, accounting for 39% of total revenue, even with the patent expiration. However, there are new drugs in developing, one of which has been in the third phase that is against COPD (the same indication as *Advair*). In our point of view, taking the continuously decrease of *Advair* into the consideration, this new medicine would substitute *Advair* to become a new "star" product in the respiratory segment.

HIV: The HIV business is managed through ViiV Healthcare, a sole global specialist HIV pharmaceutical company, which is mostly owned by GSK (78% of equity) as we mentioned previously. There are 15 antiretroviral medicines in GSK's portfolio and 12 products in the development pipeline. Apart from that, the EMAs Committee for Medicinal Products for Human Use published a positive opinion to recommend approval of *Vocabria* (*cabotegravir* injection) used in combination with Johnson & Johnson's *Rekambys* (*rilpivirine* injection) for treatment of HIV.

The total sales were £3.6bn, 0% AER, 1% CER during the first nine months of 2020. The declines in *Trivicay* and *Triumeq* (the main products in HIV segment) were totally offset by the high growth of *Juluca* and *Dovato* (40% and >100% AER respectively). The decline of *Triumeq* is essentially resulted by the intensive competition of other successful HIV products (*Descovy*, *Genvoya* and *Odefsey* from Gilead[16]) and transition of the business to a new portfolio.

***Trivicay* and *Triumeq* accounts for 86% of the HIV's total revenue** in 2019, while *Juluca* and *Dovato* only represent 9%. To forecast *Trivicay* and *Triumeq*'s future revenue, we maintain its growth of 2019 in the following years until their patent expiration date (both in 2027 US and in 2029 EU). *Juluca* is forecasted by the average growths of 2019 and 2020. *Dovato*, since it is a new drug, it is assumed 100% of increase in 2021, then the growth would decrease by 50% per year util 2027 in US and 2029 in EU. It is worth noting that, *Juluca* and *Triumeq* face same competitors. *Juluca* could increase its revenue during the last three years, while

[14] There are two patent expiration date, the first one refers the expiration date in US and second one refers in EU.
[15] *Relvar*'s main competitor: *Symbicort* (Patent expiration:2023); *Trelegy: Trimbow* (2030) and *Nucala: Cinqair* (2032), *Dupixent* (2034)
[16] The patent expiration for Descovy, Genvoya and Odefsey were 2022, 2029 and 2025, respectively.

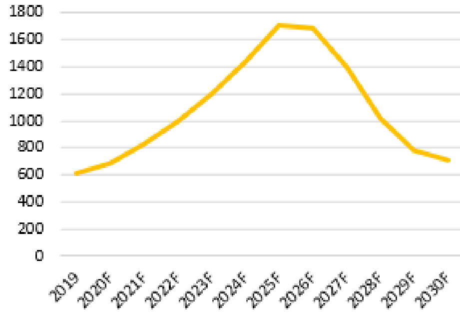
triumeq's sales declined.

In this segment, due to the intensive competition face by Triumeq and same patent expiration date (2029) of its competitors, in the end of 2030, Trivicay has exceed Triumeq, to become the product with the highest sales. It represents 28% of HIV's total revenue while Triumeq accounts for 24%. In our forecast model, the four medicines (*Trivicay, Triumeq, Juluca* and *Dovato*) that we mentioned previously would exceed £1bn of sales after 2023.

Immuno-inflammation: Immuno-inflammation represents the medicines that are developed for immune-mediated diseases such as lupus and rheumatoid arthritis (RA). In nine months of 2020, it registered a sale of £521 million, with 18% growth rate (19% CER), while the main product - *Benlysta*, a first biologic therapy, registered a sale of £514 million. In 2019, *Benlysta* was approved in China and became the first biologic treatment to be approved in the US, EU and Japan.

In US market, during last 5 years, *Benlysta* grows at 22% per year on average. However, in 2020, the growth, based on the average of the quarters, went to 9%. Since this medicine has no competitors[17], it is assumed that it would increase at 17% (average of the past growth rates including 2020) until its patent expiries (2025), afterwards, it would decrease by 10% in the first year, 20% in the second year and 30% in the third year. In EU market, the increase is bigger than US market (on average, 32% of increase per year before 2020). When including 2020 on the average, the growth falls to 27%. Moreover, in this market, the patent expiration begins in 2026. In international market, there are positive results from the pivotal BLISS-LN[18] and the new product *Duvroq* launched in Japan in Q3 2020. Therefore, *Benlysta* is forecasted to grow with same pattern as in EU and US market, while *Duvroq*, since it is a new drug, we assumed that its first three years growths would be 100% then its growth rate would decrease by 50% in the following years.

Figure 30 - Benlysta Revenue Forecast



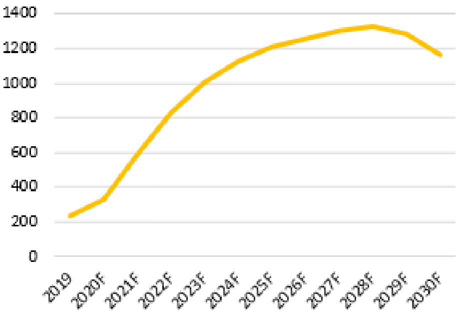
Before 2020, Benlysta is the only product in immuno-inflammation segment. Since it has no competitors, its growth rates are stable during the last 4 years. **Benlysta would become blockbuster (Sales>£1bn) in 2023**. In this segment, there are 6 products in pipeline, three of which are in the third phase. Therefore, we expect that GSK will increase its products in Immuno-inflammation segment and gain more market share.

Oncology: Oncology registered sales £257 million during the first nine months 2020, with a growth rate of 57% (57% CER). Currently, GSK increases its investment in oncology assets such as *Blenrep* and ICOS, which reflecting the progression of GSK's several key programs.

[17] *Benlysta* is the only biologic approved specifically for lupus and has moved slowly but surely toward blockbuster sales in the indication.

[18] Efficacy and Safety of Belimumab in Patients with Active Lupus Nephritis

Figure 31 - Zejula Revenue Forecast



Source: Analyst Graph

In US market, based on our first assumption, *Zejula* would increase by 51% in 2020. We believe that 2021 will be a year recovering from Covid-19 but still suffering an afterpain. To balance the impact of Covid-19 on *Zejula,* its growth rate of 2021 would be the average of Q1 and Q2 2020 growths. The main reason is that Q1 2020 growth rate had not been impacted by Covid-19 while in Q2, it was highly affected. The growth rate would decrease by 50% until 2025 when its main competitor *Lynparza*'s (Astrazeneca PLC's drug) patent expired. Afterwards, it decreases by 10% since *Zejula*'s patent only expired in 2030. *Blenrep* is a new drug in the oncology portfolio, therefore, it is assumed that its growths for the first 4 years (2021-2024) are 100%, then decreased by 50%. The same pattern is applied in EU market. However, in this market, *Zejula's* patent expiration year is in 2028 and its competitor in 2029. Looking to International market, *Zejula* is introduced in 2020, which is also considered as a new drug in that market, therefore, it is assumed that its growth rate would be 100% until 2025 then decreased by 50% until 2027 when the *Lynparza* expired (2024 in China and 2029 in Japan, average equal to 2027). Afterwards, it would decrease by 10% until 2029, when its patent expired.

Figure 32 - the sale growth in Established Pharmaceuticals

%	2019	2020
Seretide/Advair	-29%	-9%
Imigran/Imitrex	-2%	-12%
Flixotide/Flovent	6%	-30%
Avodart	0%	-14%
Ventolin	27%	-18%
Dermatology	2%	-5%
Avamys/Veramyst	8%	-7%
Valtrex	-13%	-4%
Other Respiratory	6%	-15%
Larnictal	-8%	-6%
Seroxal/Paxil	-6%	-8%

Source: Company Data, Analyst Graph

Established Pharmaceuticals: Established Pharmaceuticals segment includes the products without patent protection thus, it is highly impacted by generic competition. For instance, the generic albuterol substitutes on *Ventolin* and price pressure on *Florent* in US, the declining of *Advair/Seretide* sales and a lower sale of *Viread* in international market contribute to the decrease of sales for Established Pharmaceutical segment in a whole. Additionally, the government in some countries such as France and China promoted the use of generics. During the first nine months of 2020, sales were £5572 million, -16% AER, -14% CER.

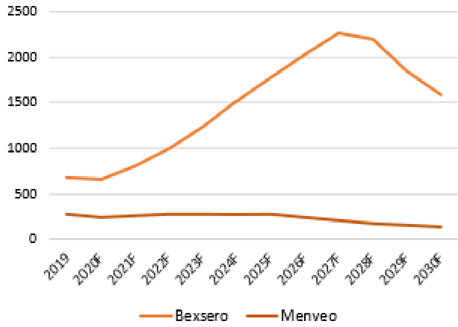
Majority of its products registers a negative growth rate, even in 2019 when there is no effect of Covid19 pandemic. To forecast this segment, we only rely on the growths of the last three years as the future growth of their revenues in US and EU markets. To be noted, in US market, the average of last three years of *Ventolin* is still positive (7%), however, taking *Advair*'s historical trend into the consideration, it is assumed its growth rate would decrease by 50% and it would be -10% after reaches 0%, and -20% in the following years. In international market, we maintain *Ventolin*'s growth rate (-10%) of 2020 to the following years. The main reason for keeping its growth is the positive results in the previous years (the growth rates are positives).

Vaccines

Vaccines business is highly impacted by the Covid-19 pandemic during the first nine months of 2020, registered sales of £4970 million, -8% AER, -7% CER. The Covid-19 results in the limited visits to healthcare practitioners and points of vaccination, also the government stay-at-home directives directly affects the demand for vaccinees.

There are two additional vaccines that GSK is developing: Respiratory Syncytial Virus (RSV) and Chronic Obstructive Pulmonary Diseases (COPD). These vaccines make GSK focus on therapeutic and antimicrobial resistance vaccines, which put GSK in a strong competitive position in the era of therapeutic vaccines. Currently, there is positive data from the Phase I/II for RSV vaccines.

Figure 33 - Bexsero and Menveo Revenue forecast



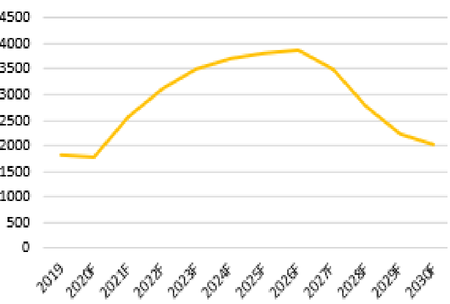
Source: Analyst Graph

Meningitis: Meningitis segment develops vaccines for inflammation of the fluid and membranes surrounding the human brain and spinal cord. *Bexsero,* which already had a 70% share of the global meningitis B vaccines market in 2019, sales amounted to £755 million in the first nine months in 2020, with 7% AER, 5% CER. Due to the stable increase of *Bexsero* during the last 4 years, it is applied the average growth rates of these years as future growth rate until its patent expiration date (2027 in US and 2028 in EU). With these growths, it would exceed £1bn of sales in 2023. Another vaccine, *Menveo*, with a sale of 182 million, 9% AER and 8% CER, expanded its market share in US market during the first nine months of 2020. Taking this into consideration, and in order to exclude the effect of Covid19 in this vaccine, FY19 growth rate is estimated as its future growth rate before the patent expiration (2025). In EU and international market, the growth rate would be the average 2019 and 2020.

Influenza: The main product in the Influenza segment is *Fluarix*, this vaccine is highly welcome in US and International market (22% and 23% of increase in 2020, respectively). In the first nine months of 2020, it registered a sale of £481 million, with 19% growth rate (21% CER).

In US and International markets, we maintain its growth rate of 2020 in the next year and a 50% of decrease in its future growth rate evolution after 2021 until 2026, when its patent expired. Note that in EU market, in order to include the effect of Covid-19, the growth for 2021 would be the average of the previous two years growths (2019 and 2020).

Figure 34 - Shingrix Revenue Forecast



Source: Analyst Graph

Shingles: During the first nine months of 2020, the main product, *Shingrix* grew 5% (6% CER) with a sale of £1344 million. This product contributes to 25% of the total Vaccine segment' revenue in 2019. The main drivers for that increase are its strong performance in European market, especially in Germany, and the introduction of *Shingrix* in China. The negative growths in Q2 and Q3 2020 are resulted by the lower wellness visits and vaccination rates. Regarding forecast, with the appearance of new variant of the SARS-CoV-2 virus in UK, it is believed the impact of disease will continuously affect the economy in 2021. Therefore, in US market, if there is no impact of Covid-19, the growth would be 83% (Q1 2020), with impact of Covid19, the actual growth of 2020 is -8%. To forecast the growth in 2021, a year still affected by Covid-19 but not as serious as 2020, 50% influence is applied in our model. That is, we combined these two situations and resulted 38% (average method). Then the growth rate would decrease by 50% until 2026 when the patent expires. To be noted that its main competitor *Zostavax*'s patent will be expired after 2030. Additionally, the U.S. Center for Disease Control has recommended *Shingrix* better than *Zostavax* since it is considered to be safer and more effective. In EU market, due to the huge increase of this vaccine in 2020 (189%), the following years' growth would decrease by 50% until its patent expiration year (2026). The same applies to international market.

Figure 35 - the sale growth in Established Vaccines

%	2019	2020
Infanrix	8%	-17%
Boostrix	13%	-20%
Hepatitis	8%	-33%
Rotarix	7%	-2%
Synflorix	10%	-12%
Priorix	-24%	5%
Cervarix	-64%	153%
Other	-8%	-32%

Source: Company Data, Analyst Graph

Established Vaccines: In this segment, due to lower demand and lower vaccination rate across all regions, most of established vaccines represents a negative growth rate except *Priorix*[19] in the EU market and *Cervarix*[20] in the international market. *Infanrix, Boostrix* and *Hepatitis* are the three main vaccines accounting for the largest revenue origin (52%) of Established Vaccine segments' total revenue and registering a total sale of £1.24bn. These three vaccines are forecasted by the average of the FY18 and FY19 growth rates. The positive growth of *Priorix* is largely driven by the improvement of its supply in Europe market. Due to the patent expiration of this vaccine and the impact of Covid-19 in beginning of 2021, in EU market, we use the average growth rates of 2019 and 2020 as the growth rate of 2021, then -50% on the growth rate in the following years. The *Cervarix's* 2019 revenue has been highly impacted by the lower demand and competitive pressure in China. However, in 2020, there is huge increase in the international market (-75% in 2019 vs 272% in 2020), which is contradictory with its main competitor *Gardasil* (the patent expiration years are 2028 in US, 2021 in EU and 2017 in Japan), which is negatively impacted by Covid-19 (-26% AER, -24% CER in 2020)[21]. This vaccine would be forecasted with same growth pattern as *Priorix*. While *Priorix* patent has been expired, *Cervarix* patent only expires in 2028 in US and 2022 in EU.

Figure 36

Consumer Healcare	Growth rate Q3 2020
Oral Health	3%
Pain Relief	31%
Vit. Mine and Sup.	100%
Respiratory heal.	14%
Digestive health	19%
Brand Divested	-45%
Total	**19%**

Source: Company Data

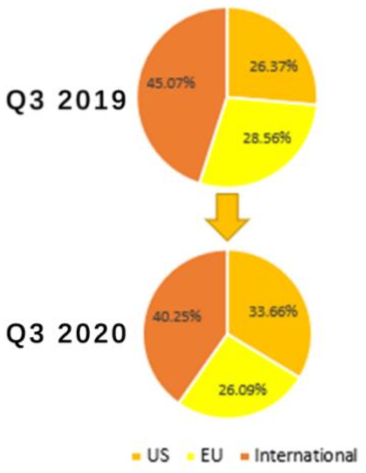
Consumer Healthcare

Consumer Healthcare Unit had a sale growth of 19% AER, 23% CER, largely driven by the inclusion of Pfizer portfolio. In this unit, the past growth rates are always positive, except 2018 (-1%). Although it decreased 1% AER in 2018, it grew 2% CER. The decrease is mainly resulted by increased competitive pressure in Europe and the divestment of some smaller brands, such as Horlicks and MaxiNutrition in UK. In the late stage, it also happens in India.

[19] Vaccine for the MMR (measles, mumps and rubella).
[20] Vaccine for human papilloma virus.
[21] Source: Quarterly report 2020 of Merck & Co, Inc. (Q2)

There are several drugs and medicines benefited from COVID-19 pandemic, for instance, *Panadol* in Pain relief area (31% growth rate, 34% CER) and *Theraflu* in Respiratory health area (14% growth rate, 16% CER). Furthermore, the increase of the awareness on the health and wellness by consumers also contributed to the sale growth of some Vitamins, minerals and supplements. In order to forecast the future revenue of this unit, it is used the average of the last 4 years' growth. Afterwards, it would decrease by 50%. It is interesting to note that even in healthcare unit, EU market is reducing its contribution to the total revenue. For instance, in Q3 2019, EU market registered a sale of £1.8bn, £1.6bn of sales in US and the international market accounted for the largest revenue share (45%). In Q3 2020, US climbed to £2.5bn (52% of increase) while EU market's revenue is £2bn (9% of increase).

Figure 37 - C&H Unit Geographic Segmentation



Source: Company Data, Analyt Graph

The inclusion of Pfizer's portfolio increased the profit margin of Consumer Healthcare (C&H) Unit, however, in our point of view, with the increase of e-commerce and entry of small and medium brand of C&H products in this market, there would not be huge growth in the future revenue.

New Drugs

We noticed that aside Advair, there will be very limited patents expired until 2027, while after that, GSK will face negative impact of expiration. Taking USA expiration date into consideration, by 2027, there will be 8 out of 19 patents expire. However, the new drug release, half of which is to be launched in 2026, will compensate the patent expiration issue.

Figure 38

Patents Expiration Year in US	
2021	3
2022	2
2023	0
2024	0
2025	3
2026	1
2027	8
2028	1
2029	0
2030	1
Total	19

Source: Company Data

According to a research published by Informa, Amplion and the Biotechnology Innovation Organization (BIO)[22], it takes 1 year from phase I to phase II with successful rate of 70%; 2 years from phase II to phase III and the success rate dropped to 33% and after 3 years clinical test of phase III with a success rate of 58.1%, it still needs 2 years from submission to final approval. Additionally, we believed that some R&D resources were used to develop vaccines for Covid-19, therefore their planned R&D activities for existing pipelines were delayed for half year. In 2026, if the drugs are developed as we expect, GSK will have 11 out of 16 medicines and vaccines to be lunched, offsetting the negative impact of original patent expiration challenge. It is estimated that there will be 4, 7, 4, 1 new products coming out respectively in 2023, 2026, 2028 and 2029. To simplify the complicated process of forecasting the probability for the new products, we choose a reference product for each segment with same indication to simulate their revenues and growth rates in the following years (For example: Oncology – *Zejula* – Cancer).

[22] Clinical Development Success Rates, David W. Thomas, Justin Burns, John Audette, Adam Carroll, Corey Dow-Hygelund, Michael Hay