

Report: Benchmarking Johnson & Johnson, USA against Its Competitors

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ABSTRACT: *In this report Johnson & Johnson (J&J) is benchmarked against three of its competitors namely, Roche Holding AG, Sanofi and GlaxoSmithKline to improve its sustainable competitive advantage and profitability by determining its current status. Four types of benchmarking has been carried i.e. Benchmarking of strategies, Competitive advantage, Process benchmarking and Performance bench marking to get better view of strategic position of J&J. This report also contains VRIO, STEEPLE and TOWS analyses.*

KEYWORDS: *Benchmarking, Biotechnology, Competitive advantage, Johnson & Johnson, Pharmaceutical, Strategy*

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I. INTRODUCTION

Pharmaceutical companies operate in ever changing, complex and demanding business environment. In order to survive in the pharmaceutical market, to achieve competitive edge over its peers and meet customer and stakeholder expectations, Pharmaceutical companies need a good corporate strategy. Strategy is defined as long term course of action of an organization to meet stakeholder expectations while utilizing its resources and competences [1].

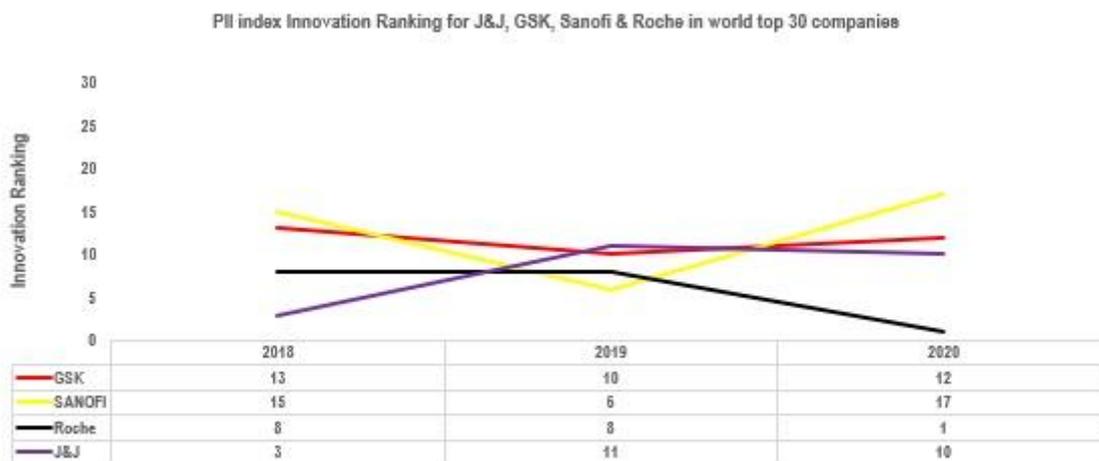
There are four types of strategies namely, corporate, Functional, Business unit and operating strategies [2]. Corporate strategy is based on fundamental approaches of planning process and provides the framework for all other subordinated strategic levels i.e. all strategies are grown from corporate strategy [2]. One of the ways companies can learn from their competitors or other companies is through process of benchmarking. It leads to enhance quality of decision making [2]. For the purpose of this assignment, strategic position of Johnson and Johnson from Pharmaceutical and Healthcare sector will be critically analysed by benchmarking its core competences against its three competitors in Pharma and Biotechnology sector. For this external or competitive bench marking Roche, GSK, and Sanofi from the pharma and biotechnology sector are chosen. These pharma companies are selected as they are quite competitive, innovative and are from same industry as Johnson & Johnson. Benchmarking with direct competitors in the same industry tend to produce highly relevant and adequate results due to high comparability whereas lowest relevant results are produced when benchmarking against companies from other industries [3].

According to Pharmaceutical Invention and Innovation indices (PII) GSK, Roche and Sanofi has been very close competitor of Johnson & Johnson in terms of innovation and invention. [4-5] Thus Johnson & Johnson will be benchmarked against their European counterparts. Generating new knowledge via benchmarking and using that newly created knowledge to improve business decision making will in turn enhance business performance which leads to greater competitive advantage.

II. METHODS

J & J is benchmarked against its competitors Roche Holding AG, Swiss, Sanofi, France and GlaxoSmithKline (GSK), UK in Pharmaceutical and Biotechnology industry. The focus is on benchmarking of strategies, competitive advantages and performance. Process benchmarking is only briefly discussed. The four types of benchmarking is used to cover most aspects of strategic management engagements. The entire benchmarking process is divided into three stages i.e. i) planning phase ii) Comparison and Analysis phase iii) Application phase as described by Prasnikar et al. [2]. However only first two phases are relevant for the purpose of this report.

The companies for benchmarking were selected on the basis of their Pharmaceutical Innovation and Invention Index from 2020-2018 and on their financial performance (Market cap, Revenue, R&D investment) as identified from secondary data sources such as company financial reports. The corporate websites of these companies were also accessed to obtain relevant information.



PII index Invention Ranking for J&J, GSK, Sanofi & Roche in world top 30 companies

Fig. 1 PII index Innovation Ranking

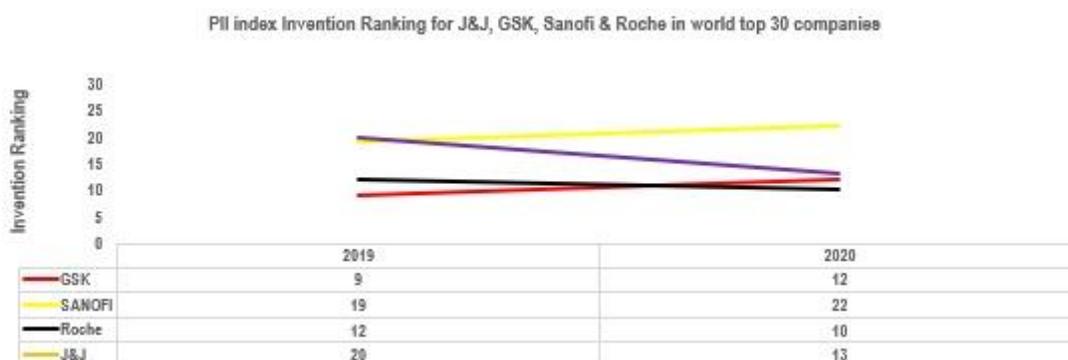


Fig. 2 PII index Invention

Note: The graphs are created by the researcher using secondary data collected from PII index.

III. BENCHMARKING PROCESS

3.1 Planning Phase

In this phase goals of the bench marking are clearly stated. These goals are listed in Table I.

Table I. Benchmarking & its Advantages

Type of Benchmarking	Goals	Advantages
Strategic Benchmarking Goals	i) Which successful strategies are utilized by competitor / peers with objectives identical to those of J&J. .	This is done to use this knowledge to enhance the efficacy of strategies that result in realization of strategic objectives in the long run. [2] It includes both positive and negative experiences i.e. strategies that produced good results and strategies that fail.
Competitive advantage benchmarking Goals	i) to improve J&J's sustainable competitive advantage. ii) To identify factors on which the competitive advantage of competitors is based	To achieve better economic profitability [2]. To find best practices. [6]
Performance Benchmarking Goals:	i) To find out if J&J is attaining at least an average level of economic performance ii) To create knowledge about performance of	in order to improve quality of planned strategic goals. [2]

	competitors in order to relatively evaluate business performance of J&J	
Process Benchmarking:	i) Which methods of planning, implementation and controlling are used by competitors to effectively implement their operational strategies which are similar to strategies of J&J.	i) This can enhance competitive position of the J&J & Improve efficient performance in the changing business environment [7]. iii) Achieve set objectives [2].

3.2 Comparison & Analysis

3.2.1 Strategic benchmarking

Sekar [6] define strategic benchmarking as follows: “This is to compare the long-term, significant decisions and actions undertaken by other organizations to achieve their objectives”. Strategic benchmarking provides response to the question of how to achieve company objectives whereas objectives are what company desires to attain. The more innovation development policies, innovation methods, decision making on innovation and innovation process development and R&D departments a company has the higher score the company achieves. Results are shown in Tables II-V.

Table. II Strategies, Planning and Policies of J&J

Johnson & Johnson	
Vision	"Be yourself, change the world" [8].
Mission	"Our mission is to make diversity & Inclusion our way of doing business" [8].
Purpose	To advance health for humanity & our performance. [9]
Goal	To advance Health care and Health Equity.[10] 2021 Resolutions: <ul style="list-style-type: none"> • Produce an efficacious COVID-19 vaccine • Protect lives by advancing Gender & Racial Health Equality • Ensuring protection of frontline workers • Redirecting to prevention, interception & cure • Reasonable delivery of Health services & Innovation • Product development using less & smarter resources • Influence positive disruption 2020 Goals: Health for Humanity Goals 2020. [11]
Strategies	Global Diversity & Inclusion strategy has 3 parts: <ul style="list-style-type: none"> • Advance culture of Inclusion & innovation • Build a diverse workforce for the future • Enhance Business results & reputation Commitment to developing Trust-based procurement relationships - "to own and shape a diverse supplier base that delivers high quality complaint and reliable products and services" Deliver Above the Market Growth "To continue to drive a robust pipeline of innovative medicines to generate near and long term, volume driven growth" [8]
Long-term priorities	Long-Term volume driven growth
Business Model	Three business segments: 1) consumer healthcare, 2) Pharmaceuticals, 3) Medical devices [9].
Capital allocation frame work	<ul style="list-style-type: none"> • Investment in innovation/growth opportunities [9, p.4] • Investment in acquisitions, mergers and licensing [9, p. 4] • Investment in giving a competitive dividend to shareholders (about \$10billion in 2019) [9,p.4] • Investment in wise ways to return values to shareholders (share repurchase programme) [9].
Social Value and Sustainability policies	J&J committed to achieving SDG3 (good Health & well-being), SDG 5 (Gender Equality), SDG 17 (Partnership). Focus areas: 5 [11] <ul style="list-style-type: none"> • Health workforce -to train health workers. • Women's & children's health • Essential surgery • Global disease challenges • Environmental health
Marketing & Distribution:	Pharmaceutical Segment market leading performance: J&J reported \$45.6bn [12, p. 37] and \$42.2bn sales by pharmaceutical sector in 2020 and in 2019 respectively making it one of the largest pharmaceutical companies in the world. Sales by region: WW =8.0%, US =7.8%, Int : 8.3% Infectious and Vaccine division under Pharmaceutical segment reported sales of \$3.574bn and \$3.413 bn in 2020 and 2019 respectively [12, p.37, 9, p. 36]. Consumer Health segment: It shows competitive market growth with \$14.1 bn sales in total. Sales by region: WW =1.1%, US =9.0%, Int =4.6%. Medical Devices Segment: Double digit growth as a result of introduction of new products. In 2020 medical devices sales decreased from \$26.0bn to \$23.0bn in 2020, a 11.6% decrease from 2019 due to negative effective of COVID-19. Sales by region: WW =11.6%, U.S. =10.9%, Int = 12.2%. J&J used 3 wholesalers to distribute products for all 3 segments in 2019 & in 2018 [9, p.34]

Table III. Strategies, Planning and Policies of Roche

Roche Holdings AG	
Vision	"We focus on our vision of fitting treatments to patients: providing the right therapy for the right patient to ensure the best response at the right time for the right value" [13, p.62].
Mission Purpose Goal	No clear mission listed on corporate website. "Doing now what patients need next" [13, p.62]. Patient is core Focus
Strategies	Manging their supply chain, Attain excellence in science, Personalised Health Care (HC), Access to HC, having sustainable business. [13, 14] "We focus on finding new medicines and diagnostics that help patients live longer, better lives and evolve the practice of medicine" [13, p.62]. Roche has following strategies as listed in Annual Report [15, p. 9] Strategies: R&D pipeline strategy & Personalised Healthcare Employee engagement & retention. Product portfolio Strategy. Patent Policies Leadership commitments. Roche is focusing on digitalization since 2018 and aims to use this technology to assess data from both clinical practice and clinical trials and market digital solutions [15, p. 20-21].
Long-term priorities Business Model	Attain long term sustainability growth and provide value to all stakeholders [16] It has 2 divisions: Pharmaceutical and Diagnostics [17]]. Pharma division is focused on growth and expansion of novel & better medicines whereas diagnostics division is changing and introducing clinical decision support systems and Apps e.g. Parkinson's monitoring App.
Capital allocation frame work Social Value and Sustainability policies	No information available in corporate annual and financial reports. Special focus on UN SDG 3: Good Health & well-being [15, p.10]. Other SDG goals where Roche has shown commitment are 5,6,7,8,9,13,16 & 17.

Table IV. Strategies, Planning and Policies of Sanofi

Sanofi	
Vision Mission Purpose Goal Strategies	No clearly stated company vision on corporate website and in integrated reports "Our mission is to empower lives and improve access to healthcare" [18, p.20]. "to do well and to do good at the same time" [18, p.20]. "Sanofi's ultimate goal is to make medicines to make people better" [19]. "Our new strategy positions us to achieve breakthroughs with our most promising medicines. I'm confident we will deliver long-term growth and value for our shareholders, while turning innovation into transformative therapies for patients" [20]. ii) Corporate Social Responsibility strategy iii) R&D Strategy to control new drug discovery platforms iv) establish strong partnerships
Long-term priorities Business Model	Four priorities: i) growth ii) pipeline of potentially transformative drugs iii) efficiency iv) reinvent [20]. Three core GBUs (Speciality care, Vaccines and General Medicine) and one standalone business unit to speed up digital transformation (Consumer Health care) [18, p. 4]
Capital allocation frame work	Sanofi intends to use cash with following order of preference [20]: • Organic Investment, Business development & M&A activities, Increasing annual dividend, & Anti-dilutive share buy backs
Social Value and Sustainability policies	Climate change issues are embedded in decision making process. Policies include: enhancing environmental profile of its products, mitigate climate change, preserve biodiversity of every facility and reduce its environmental foot print. [21-22]. 19% Reduction in water consumption and 12% reduction in CO ₂ emissions since 2015 [18, p. 11].
Marketing & Distribution	Market share/ranking: Leading Health care company in emerging markets and 7 th largest pharma company in china, 2 nd largest pharmaceutical company in France and 6 th in Germany (3.5% market share), and 1.7% market share in Japan & 3.3% market share (12 th in ranking) in USA. [23, p.33]. Channels: Range of channels e.g. digital & in person to market their products among health care professionals [23]

Table V Strategies, Planning and Policies of GSK

GlaxoSmithKline (GSK)	
Vision Mission Purpose Goal Strategies	"The opportunity to make a difference to millions of life every day" [24]. "A Science-led global healthcare company with a special purpose: to help people do more, feel better, live longer" [25] "To improve the quality of human life by helping people do more, feel better, live longer" [26]. "To become one of the world's most innovative, best-performing and trusted healthcare companies" [26, p.2] "to bring differentiated, high-quality and needed healthcare products to as many people as possible, with our three global businesses, scientific and technical know-how and talented people". [26, p.2]
Long-term priorities	Innovation We invest in scientific and technical excellence to develop and launch a pipeline of new products that meet the needs of patients, payers and consumers" [26, p. 2]. Performance: "We deliver growth-based performance by investing effectively in our business, developing our people and executing competitively" [26, p. 2]. Trust: "to address health needs, make our products affordable and available and to be a modern employer" [26, p. 2].
Business Model	Pharmaceutical, Vaccines and Consumer healthcare businesses have a wide portfolio of innovative medicines, vaccines and everyday health care brands [26, p. 3] Pharmaceutical division made highest contribution) towards turnover in 2019 and in 2020 i.e. £17.55 bn and £17 bn respectively.
Capital Allocation Social Value & Sustainability policies	Includes innovation, R&D pipeline and new products. GSK focuses primarily on UN SDG Goal 3: Good health & well-being by utilizing science and technology to address health needs, & by making their products inexpensive and available.[27]. UNSDG Goal 1, 5, 8, 9, 12, 13, 15, 16, 17 [27]. UNSDG 6: Water & sanitation – to reduce water usage by 30% by 2030 [27].
Marketing & Distribution	Vaccines Segment: GSK is world's largest vaccine company by revenue i.e. sales £7bn in 2020 and £7.15bn in 2019 [26, 28]. Sales by region: US: 52.9% vaccine sales came from US, 20.5% from Europe and 26.3% from international markets (Calculated by Author). Pharmaceutical Segment: In 2020 GSK reported £17.056bn pharmaceutical turnover. This is 50% of total sales turnover and 1.7% of global pharma sector sales. Sales by region: US=43% of pharma turnover, Europe= 24.1% of Pharma turnover Int: 32.2% of pharma turnover (Calculated by Author). Consumer Health: reported £10.033 bn turnover in 2020 and £8.995bn in 2019 [28, p. 1, 26, p.30]

3.2.1.1 Strategic Analysis & findings:

A summary of strategies is provided in Fig. 3 below.

All four companies have different missions and strategic goals. However all four companies have a common long-term priority i.e. growth. GSK has a performance based organizational culture i.e. growth based performance. This is somewhat in line with its corporate strategy. Johnson & Johnson, Roche and Sanofi share a corporate culture of inclusion and diversity. This culture of diversity and inclusion supports J&J's strategy to have a diverse supply chain and to have a culturally diverse workforce. Roche business priority also involves well-tailored solutions for individual markets. Such practice can be taken up by other companies to improve their growth and revenue.

A Culture of well-tailored business communication between management and employees can be regarded as a successful business strategy and will help in achieving strategic goals. No clear information on business communication is available on corporate websites or in annual reports of these companies. However looking at the success of these companies it is fair to assume that they all have some effective communication channels between management and employees.

Sanofi has adopted a new strategy of re-inventing and simplifying its business model to enhance adoption of digital transformation. GSK has also re-modelled its business units. Depending on the country and its culture J&J customise their products and methods of distribution in the international business [9]. This seems to be a good strategy to achieve diversity and inclusion as well as growth. J&J seem to have a focused best value (differentiation) market strategy that focuses on small segments or niches of market and provide products at best price value possible e.g. baby care products are targeted at mothers or young parents, Neutrogena skin products are targeted at adults and Clean & Clear products are targeted at teenagers. This looks a very effective strategy. Although there is always risk of generic product entries once the patents are expired. However brand quality and name still helps J&J to continue to serve that particular segment or niche of customers.

Roche seems to have a differentiation focused strategy as Excellence in science is one of their business priorities. They also seem to have product leadership as they continuously trying to innovate and come up with state of the art products and solutions to meet patients' needs. J&J, Sanofi and GSK compete in Immunology and oncology products in Pharmaceutical business.

Fig. 3 Strategic Benchmarking Findings

3.2.2 Competitive benchmarking of Johnson & Johnson against Roche, GSK and Sanofi:

Competitive advantage is influenced by internal (e.g. capabilities) and external environment. The internal environment will be assessed using a resource-based model such as VRIO whereas external environment of Johnson & Johnson and its competitors will be analysed using TWOS and STEEPLE. The competitive Advantage benchmarking model used by [2] consists of scarce resources that are difficult to find, are unique to a company and are unshared. Imitation barrier and early mover advantage include legal restrictions, market size, strategic fit, reputation and buyer switching. To read further information on competitive benchmarking model readers are directed to [2].

3.2.2.1. VRIO analysis of Internal environment for J&J: First VRIO analysis will be done to assess internal environment of J&J. The results are shown in Tables VI-X

Table VI VRIO Analysis of J&J Financial Resources

J&J Financial Resources In USD bn	V	R	I	O	Advantage	Refs
Adequate capital revenue enables to commercialize drugs (J&J \$82.5bn vs. Roche \$67.11bn, vs. GSK \$43.783bn, vs. Sanofi \$42.687bn in 2020)	Y	Y	Y	Y	Sustainable Competitive advantage	[12, 30, 28, 31]
Free cash flow (J&J \$20.49bn vs. Roche \$12.18bn vs. GSK 7.0bn vs. Sanofi \$8.4bn)	Y	Y	Y	Y	Sustainable Competitive advantage	[32, 30, p.2, 28, p. 43, 31]
Total Assets (J&J USD 174.9bn vs. Roche \$95.88bn vs. GSK \$103.27bn vs. Sanofi \$129.91 bn in 2020)	Y	Y	Y	Y	Sustainable Competitive advantage	[33, 30, p. 180, 28, p.53, 31]
Tangible Assets	Y	Y	Y	Y	Sustainable Competitive advantage	
Intangible assets	Y	Y	Y	Y	Sustainable Competitive advantage	
Market Cap (J&J USD 441.73bn vs. Roche \$282.64bn, vs. GSK \$102.08bn vs. Sanofi \$128. 44bn on 7th May 2021)	Y	Y	Y	Y	Sustainable Competitive advantage	[34-37]
Innovation activity Indicators						
R&D investment (J&J \$12.2bn vs. Roche \$13.58bn vs. GSK \$6.6bn vs. Sanofi \$6.7bn in 2020)	Y	N	Y	Y	Competitive Parity	[38, 30, 28, p. 46, 31]
R&D Intensity (Roche has highest value in 2020: J&J 14.7% vs. Roche 21% vs. GSK 15% vs. Sanofi 15.3%)	Y	N	Y	Y	Competitive Parity	[38, 30, 28, 31]

Note: Figures are obtained from finance and annual reports of all these companies plus macro trends.net and other sources. All figures are referenced in the table.

Table VII VRIO analysis of J&J Human Resources

J&J Human Resources	V	R	I	O	Advantage	Refs
Continuous improvement of knowledge & abilities of employees	Y	N	Y	Y	Competitive Parity	39
Best training programmes e.g. leadership programmes (AEL, AEO, TAP, IDP, ELD, Developing R&D leaders)	Y	N	Y	Y	Competitive Parity	39-40
Employees are empowered according to their knowledge and abilities	Y	N	Y	Y	Competitive Parity	11, 41
Cooperation & communication between employees is encouraged & they are dedicated to produce next generation of communicators	Y	N	Y	Y	Competitive Parity	42
Compensation system motivates employees to use their knowledge & abilities (e.g. generous global parental leave policy, extended volunteer leave policy, Health screening, onsite fitness centres)	Y	Y	Y	Y	Sustainable Competitive advantage	43
Large sales & marketing force	Y	N	Y	Y	Competitive Parity	
Total number of employees & Employees in R&D	Y	Y	Y	Y	Sustainable Competitive advantage	
Reputation is a good employer (e.g. Provides safe & health work place for employees, provides safety training)	Y	N	Y	Y	Competitive Parity	41
Reputation as socially responsible organization (e.g. 32% CO ₂ emissions since 2010, 30% of energy acquired from renewable sources, donated \$37m for disaster relief, good waste management, goal is to reduce 80% of carbon emission by 2050)	Y	N	Y	Y	Competitive Parity	11, 41
Relationship with suppliers (e.g. Rated no.1 & no.3 on Gartner's 2019 & 2020 Healthcare supply chain Top 25 list respectively, increased supplier diversity & inclusion, suppliers urged to reveal their environmental performance)	Y	Y	Y	Y	Sustainable Competitive advantage	41, 44

Table VIII VRIO analysis of J&J Legal Resources

J&J Legal Resources	V	R	I	O	Advantage	Refs
Intellectual property/registered Patents (indicator of innovation activity and barrier to imitation) J&J secures top position in patent strength for antivirals for coronavirus family with over 500 patents followed by GSK at no.2 with about 200 patents and Roche at no. 7 with about 150 patents and Sanofi at no. 13 with about 50 patents	Y	Y	N	Y	Temporary competitive advantage (until patent expires)	45
Johnson & Johnson Patents Asset index is 53,295 making it no.1 company in medical technology as of Dec 2018. It has a portfolio size of about 9000.	Y	Y	N	Y	Temporary competitive advantage (until patent expires)	46

Table. IX: VRIO analysis of J&J Marketing Resources

J&J Marketing Resources	V	R	I	O	Advantage	Refs
Market segmentation strategy: Targets specific age group, geographies, lifestyles psychographic segmentation, urban-rural segmentation. Direct to consumer marketing is encouraged by J&J. Innovative solutions & technologies are adopted by J&J (J& dedicated \$ 800 million to make its products sustainable) (e.g. Clean & clear products target teenagers, Neutrogena products target adults and teenagers & recommended by Dermatologists, Johnson & Johnson & Aveno baby line of products for those who like natural ingredients for their babies).	Y	N	Y	Y	Competitive parity	47, 48
Brand equity/Stakeholder equity : creating emotional connections via different marketing & promotional campaigns. Higher 2020 brand rating than its peers (AA+)	Y	Y	Y	Y	Sustainable Competitive advantage	49
Strong Brand Value and Presence: J&J was most valuable Pharma brand (USD 10.8bn) in 2020 due to antimicrobial R&D. Roche, Bayer, GSK & Sanofi got 2 nd , 3 rd , 8 th & 9 th Positions respectively. Product ads are found in digital & print media.	Y	Y	Y	Y	Sustainable Competitive Advantage	49
Access to emerging markets (e.g. in Africa, China, Asia). In China J&J Medical companies opened 1 innovation centre, 3 Medical devices, 1 Pharma, & 3 consumer healthcare manufacturing facilities.	Y	N	Y	Y	Competitive parity	50
Digital assets or Augmented reality (AR) assets (AR in Acuvue lenses).	Y	Y	Y	Y	Sustainable Competitive Advantage	51
Virtual Reality (VR) learning e.g. VR to impart orthopaedics surgical training	Y	Y	Y	Y	Sustainable Competitive Advantage	52
Strong Distribution network (>350) globally	Y	Y	Y	Y	Sustainable Competitive Advantage	53
Distribution channels- wholesalers, retailers, hospitals, e-commerce, SC	Y	N	Y	Y	Sustainable Competitive Advantage	9
Large customer base: J&J runs business in almost all countries of the world.	Y	Y	Y	Y	Sustainable Competitive Advantage	9

Note: SC= supermarket Chains

Table X VRIO Analysis of J&J Core Competencies

Core competencies	V	R	I	O	Advantage
Innovation – Heavy R&D Investment	Y	Y	Y	Y	Sustainable Competitive Advantage
Massive collaboration, Mergers & Acquisitions e.g. Acquisition of Auris Health for \$3.4 billion [9], Acquisition of Verb Surgical Inc [9]	Y	Y	Y	Y	Sustainable Competitive Advantage
Corporate culture	Y	Y	Y	Y	Sustainable Competitive Advantage
Digital Platforms and Robotics: Examples - J&J recently reveals its novel robot-assisted surgery system (Ottava) that provides co-ordination across full extent of procedures (Unique capability), Digital ecosystem, Monarch platform to give localized drug delivery to cancer cells (54)	Y	Y	Y	Y	Sustainable Competitive Advantage
Distribution channels					
Strong Distribution network (>350) globally	Y	Y	Y	Y	Sustainable Competitive Advantage
Various Distribution channels e.g. wholesalers, retailers, e-commerce, supermarket chains	Y	N	Y	Y	Sustainable Competitive Advantage

3.2.2.2. Roche VRIO Analysis: Results are shown in Table XI-XII

Table XI VRIO Analysis of Roche Financial Resources

Roche Financial Resources	V	R	I	O	Advantage	Refs
Adequate capital revenue enables to commercialize drugs (CHF 60.3 bn in 2020 or USD 67.11 bn vs. J&J USD 82.5 bn in 2020 J&J)	Y	N	Y	Y	Competitive Parity	[30]
Free cash flow (CHF 10.9bn/ USD 12.18bn in 2020, CHF16.764bn/USD 17.32bn in 2019, -26% decline from 2019)	Y	N	Y	Y	Competitive Parity	[30, p.39]
Total Assets (CHF 86.138bn / USD 95.88bn vs. J&J 174.9bn in 2020)	Y	Y	Y	Y	Sustainable Competitive Advantage	[30,p. 51]
Market Cap (as of 7 th May 2021, Roche USD 282.64 bn vs. J&J USD 441.73bn)	Y	Y	Y	Y		[35, 34]
Innovation activity Indicators:						
R&D investment (CHF=13bn/ USD 13.58bn vs. J&J USD 12.2bn in 2020)	Y	Y	Y	Y	Sustainable Competitive Advantage	[30, p. 6]
R&D Intensity (Roche has higher value than J&J i.e. 21% vs. 14.7%)	Y	Y	Y	Y	Sustainable Competitive Advantage	[38, 30]
R&D sites (Roche 17 global sites vs. J&J that has four innovation centres globally & 260 companies)	Y	Y	Y	Y	Sustainable Competitive Advantage	
Creating Sustainable value for all stakeholders:						[30]
1% increase in group sales	Y	Y	Y	Y	Sustainable Competitive Advantage	
4% in core operating profits	Y	Y	Y	Y	Sustainable Competitive Advantage	[30]
21% of sales invested in R&D in 2019 & 22.3% in 2020 vs. J&J that invested 13.8% & 14.7% in 2019 & 2020 respectively	Y	Y	Y	Y	Sustainable Competitive Advantage	[13]
Total Shareholder return 2% in 2020	Y	Y	Y	Y	Sustainable Competitive Advantage	[30]

Note: CHF converted to USD using exchange rate on 31/12/2020 i.e. 1 CHF=\$1.1131

Table XII VRIO Analysis of Roche Human Resources

Roche Human Resources	V	R	I	O	Advantage	Refs
Total number of employees & Employees in R&D (101465)	Y	Y	Y	Y	Sustainable Competitive Advantage	[55]
Reputation is a good employer	Y	N	Y	Y	Competitive Parity	
Reputation as socially responsible organization	Y	N	Y	Y	Competitive Parity	
Relationship with suppliers (pilot study in UK: converting suppliers to 100% renewable energies)	Y	Y	Y	Y	Sustainable Competitive Advantage	[13, p.97]
Creating Sustainable value for all stakeholders:						[13]
32% of key leadership roles held by women	Y	N	Y	Y	Competitive Parity	
68% employee engagement	Y	N	Y	Y	Competitive Parity	
19% reduction in energy consumption per employee since 2015	Y	Y	Y	Y	Sustainable Competitive Advantage	
26% reduction in general waste/employee since 2015	Y	Y	Y	Y	Sustainable Competitive Advantage	

3.2.2.3. STEEPLE Analysis of Macro External environment

Results of analysis are shown in the Table XIII.

Table XIII STEEPLE Analysis of J&J and Pharma Sector globally

External Factors	Analysis of External environment
Social	Aging population & Single adult homes [56], growing obesity, growing burden of chronic diseases [57, p. 4], tele working, environmental friendly product packaging, E-tagging [57] are some of the rising trends
Technological	Cyber threats [58], digitalization [59], data analytics, rise in biotechnology, rise in remote monitoring [60] According to PwC, 2021 [59] survey, 77% of UK CEO's plan to enhance their investment in digitalization and two third of UK CEO's tend to increase investment in data privacy and cyber security.
	Rise in demand of AI for health care [56], Virtual platforms & predictive bio simulation such as Virtual Vermin, Virtual man to better understand the pathophysiology of the disease and cells and to reduce the necessity to test on living creatures [61]. Roche used computer modelling while developing Pegasys to find out optimal dose in various patient populations [61].
	Lack of AI, Deep machine learning, virtual platforms expertise/skills within J&J
	Information Gap- not enough information available for executive decisions/lack of SMART data [62]
	Robotics e.g. robots with health care function. J&J has developed robotically assisted knee surgical device called Orthotaxy and general surgical robotic platform called Ottava [63]. Orthotaxy device is less expensive and compact in size and results in lower per procedure costs [64]. J&J entered robotic surgery field by acquiring Paris-based Orthotaxy and Auris and by collaborating with Google. This could be considered an expansion strategy of J&J. In 2022 J&J intends to run clinical trials to validate Ottava [65]. Ottava will compete with da Vinci from Intuitive surgical, which has dominated the robotic surgical market since 2000.
	Incorporated traceability process [56]
	Increasing use of mixed reality (AR, VR) in health care (56, p. 2)
Economical	Uncertain economic growth [58,59], value for money, demand for better customer benefits, pay for performance is on rise e.g. repayment of J&J's Velcade depends on measurable tumour shrinkage [57, p. 9], and emerging markets are rising trends in Pharma Industry. The 24th Annual UK CEO survey [59] also found that 86% of CEO are concerned with economic uncertainty with 51% of CEOs expecting moderate growth in global economy.
	More producer responsibility (transparency) is expected [56]
	Service & product Automation is in demand [56]. It will provide competitive advantage
	Necessity for skilled personnel e.g. data scientists, personnel with digital skills and soft skills are required. There is shortage of these skills in industry. Upskilling programmes and collaborations with biotechnology and AI / I.T companies can solve the skill shortage [58].
	Regulators are turning out to be more risk averse [57].
	Increasing use of E-health services and E- prescribing [56, 57]
Environmental	Lack of Green patents, UNSDGs [66]
	Increased use of renewable energy
	Creation of Products that generate less waste is desirable. Some of J&J competitors are working to reduce their carbon foot print such as Sanofi, Bayer and GSK
Political	Pandemics and Health crisis has become top concern for CEOs in 2020 followed by Cyber threat and over regulation [67].
Legal	Patents, copyrights, trademarks. Most of the patents of J&J are about to expire leaving them vulnerable to generic medicine and their competitors
Ethical	Rising drug prices, use of ethically sourced ingredients, Data privacy and security are some of the ethical issues faced by J&J, its competitors and Pharma sector.

3.2.2.4. TOWS Analysis of J&J

TOWS analysis is shown in Fig.4. TOWS analysis is carried out to assess both internal environment of J&J as well as external business environment such as overall trends and challenges reported by Pharma and biotechnology sector globally. TOWS analysis also helps in identifying and assessing Entrepreneurial opportunity for J&J to follow. TOWS Analysis was chosen over SWOT as it provides a relationship between factors (Strengths, weaknesses, opportunities and threats) to come up with planning strategies or strategies to minimize threats while taking advantages of opportunities i.e. strategies that J&J can pursue.

	Strengths	Weaknesses
	<p>Large cash reserve/strong financial base</p> <p>Largest Market Cap, Largest consumer healthcare, Enormous total assets (higher than Roche, GSK, Sanofi), High income from existing products and brands, Skills in drug discovery, medical devices and consumer health care products, Ability to expand, Advanced R&D capabilities, Good R&D investment record and capability, Huge number of international clients, Over 350 distribution centres, Significant number of patents in US and other countries.</p>	<p>Product innovation is expensive and time consuming.</p> <p>Less green patents</p> <p>Overall in pharma sector, number of patents has declined /year in EU and USA.</p> <p>Need to drive revenue growth</p> <p>Need to speed up innovation.</p> <p>Less use of AI</p> <p>Comprehensive data on customer needs not available for decision making due to lack of analytical talent.</p> <p>Insufficient Digitalization</p>
Opportunities	SO (use strength to maximize opportunities)	WO (overcoming weakness by taking advantage of opportunity)
Climate change and green products/services	Provide green products/services	J&J should progress in innovation in business models, systems, processes, supply chain and services. 13% leaders in pharm companies make business model innovation a top 3 innovation priority [68]. Collaborate with external parties e.g. biotech companies, academic institutes, even competitors to ensure revolutionary innovation e.g. GSK & Pfizer co-operating to find drug for melanoma
Collaboration, unmet needs, Emerging markets (e.g. Asian markets),	Work to get more green patents.	
Emerging technologies: Personalized Medicines & care, Use of AI and machine learning, Online services, data analytics	This will enhance company reputation	
	Will also result in getting government financial incentives	
	J&J to use digital technologies & digital transformation.	
Threats (experienced by Pharma sector globally and J&J)	ST (use strength to min threats)	WT (min weaknesses and avoid threats)
Skill Gap, Difficulty retaining best talent to ensure innovation occurs. 59% pharma CEOs say locating and retaining best talent to ensure innovation is challenging [69].	J&J to promote upskilling programmes to handle skill gap and shortage of talent. This will lead to superior innovation and better work force productivity.	Have a flexible business strategy as this will help the company in uncertain economic growth conditions.
Over regulation, Uncertain economic growth, Threat of new entrants, Cyber threats, Customers & Governments demand more value for care Pharma products/services, Increasing job automation, Diminished talent availability, Ageing talent, Changing Consumer behaviour, Policy uncertainty, Covid-19/viral infection spread, Supply chain disruptions	J&J to let staff participate in high profile innovative projects and give financial & non-financial rewards to help create innovative climate.	Mergers and collaboration with Biotech companies.
	J&J to hire talent directly from universities & educational institutions. J&J to hire staff from competitors if required. Creating a climate where failure & risks are modestly endured. Encourage senior executives to take part in innovative projects. This will help nurture innovative climate	

Fig. 4 TOWS Analysis of J&J

3.2.2.5. Global Pharma and Vaccine sector sales in 2020

Results are shown in Fig.5-6. Pharma worldwide revenue was \$1.25 Trillion in 2019 [29] . Pharma sales by J&J, GSK, Sanofi and Roche contributed 3.37%, 1.79%, 2.3% and 4% of 1.25 trillion Global Pharma revenue (Calculated by Author).

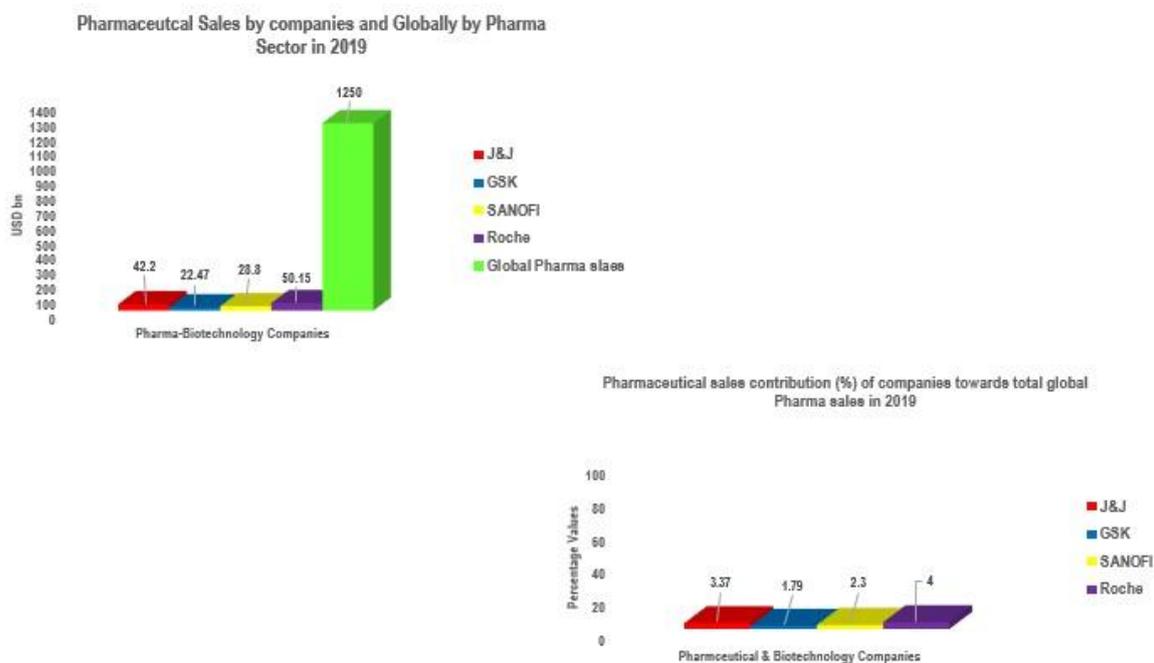


Fig. 5 Percentage contributions made by J&J, GSK, Sanofi, & Roche in 2020 towards Global Pharmaceutical sales

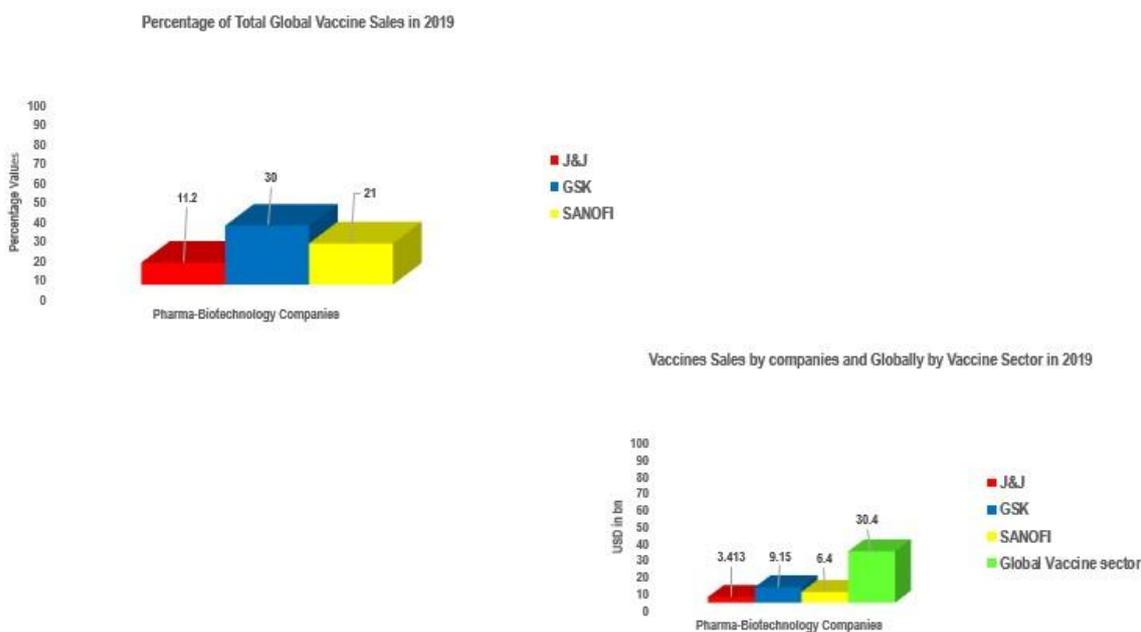


Fig.6 Percentage contribution made by J&J, GSK and Sanofi in 2020 towards global Vaccine sales

3.2.2.6. Registered Trademarks and Patents: See Fig 7-8 for details.

Box. 1. Patents & Trademarks

- J&J currently hold about 9 significant pharmaceutical patents whereas GSK and Sanofi also hold patents most of them are due to expire soon. Patents and trade marks are examples of legal restrictions and act as imitation barrier. Patents provide companies time restrained market power and therefore companies can set higher prices resulting in generation of higher revenues.
- STELARA (immunology drug) is J&J's largest product in immunology market and it generated about 7.8 % of the company's total revenue for fiscal year 2019 [9]. This means STELARA accounted for USD 6.4 bn in sales. Other prominent drugs in Immunology market include SIMPONI & SIMPONI ARIAS and Remicade [9].
- The latest projected expiry dates for patents related to STELARA are 2023 & 2024 in USA & EU respectively [9]
- The latest projected expiry dates for patents related to SIMPONI are 2024 in US and Patents on Remicade has expired [9]
- J&J also manufactures and sells speciality drugs such as ZYTIGA, ERLEADA (Prostate cancer), IMBRUVICA (B-cell lymphomas) [9]. Speciality drugs also provide manufacturers great revenues. Sanofi also manufactures oncology drugs e.g. Jevtana for metastatic castration-resistant Prostate cancer
- An article by Morgan and Colleagues [70] showed that pharmaceuticals can utilize their market power in form of patents or intellectual property rights to amplify profits. Thus it is fair to conclude that these immunology products and their associated patents give J&J competitive advantage over their competitors in the immunology market and in oncology.

Fig. 7 Box 1 Patents & Trademarks

Box. 2. Patents & Trademarks

- **Roche Group:** In US and the EU, Roche group's main primary patents for Mab/Thera/Rituxan, Herceptin and Avastin have elapsed whereas subcutaneous formulations for MabThera/Rituxan and Herceptin have secondary patent rights that will expire beyond 2025 and patent expiry for Lucentis in the US is approaching that could impact 2021 sales for this product [30, p. 23]. In 2020 biosimilar competition of these three products in the US, EU and Japan had a negative impact of CHF 5.1 billion.
- **Sanofi:** Examples of main expired patents: Cerizyme, Lantis, Lovenox, Lumizyme, Plavix and Toujeo. Some of these expired patents already had Generics / biosimilars in the US and the EU market [23]. Patents for Three main products in Immunology & Inflammatory division are still active (Dupixent, Eloctate and Alprolix). Dupixent for treatment of A-tropic dermatitis (AD) & Asthma.
- **GSK:** World leader in respiratory products for 5 decades e.g. Tielegy Ellipta for COPD [26, p. 21]. GSK is running a Ph III study of Otilimab in patients with Rheumatoid Arthritis. In 2019, vaccines turnover increased by 19% (CER) mainly due to Shingrix (for Herpes Zoster) vaccine [26].

Fig. 8 Box 2 Patents and Trademarks

3.2.3 Process Benchmarking

The process benchmarking is done in area of marketing and distribution network.

VRIO analysis earlier has shown that J&J has a very vast distribution network. GSK also has strong distribution network and in 2009 started redesigning its distribution network for marketing competitiveness by using a non-linear mix integer programming model [71]. This new process enabled GSK to make next day delivery in 86.2% of cases and delivery within two days in 97.8% of cases. It decreased total distribution costs by \$1.99 million per annum and improved on time delivery in 40.4% of cases.

Besides Using Key performance indicators, J&J also employs Key Value Indicators (KVI) with their key suppliers to enhance conformity and performance over time [72]. J&J has five KVI namely i) Quality, compliance and effectiveness, ii) Financial performance and total cost, iii) Innovation, iv) Supplier satisfaction, v) customer satisfaction [72]. These KVI provide a score that shows the status of the relationship and whether business needs are met. J&J Supplier Relationship management (SRM) program includes these KVI and focuses on Robust segmentation model, Focus on innovation and sustainability and health check to find out gaps in the relationship or strengths [72]. This has given rise to increase in productivity up to 30% per GPS (Global Pharmaceutical R&D sourcing) from 2007-2009 [72].

Roche uses sustainable procurement principles to enhance compliance, safety, innovation and create value for the supply chain [73]. Roche aims at increasing business with green suppliers who release their environmental, energy, safety and certification goals publicly [73]. Since 2020 Roche has started to promote start-up portal permitting interested start-ups to actively register their interest in working with Roche [73]. Roche also encourages supplier recognition by celebrating annual supplier day awards in areas of exceptional sustainability accomplishments, Effective and solid partnerships and for providing innovative and complete solutions [73]

3.2.4 Performance benchmarking

Performance of J&J and its competitors can be measured using a number of metrics such as net come or revenue , profitability and sales growth. Fig. 9-18 depicts how J&J is benchmarked against its peers/competitors in terms of Size, value, growth, profit and Market share. In addition to it R&D investment and growth one year was also compared. Data for benchmarking purposes was collected from J&J, Roche, GSK and Sanofi Annual Reports as well as financial reports and microtrends.net website.

3.2.4.1 **Size:** In this category Revenue, operations Income (Op. income), Total assets are benchmarked against competitors. Results are shown in Fig 9-11. All Revenue values were converted into USD for comparison purposes. Roche revenue values were obtained from Roche Finance Reports [30], [74-75]. These values in CHF were then converted to USD using exchange rates quoted on exchangerates.org.uk website [76] on 31/12/2020, 31/12/2019, 31/12/2018 and 31/12/2017. GSK revenue values were obtained from Press release Full year and Fourth Quarter 2020 [28], Annual Report 2019 [26], and Annual Report 2018 [77]. The Revenue values in Pound sterling were converted into USD using exchange rates quoted in annual reports of GSK. **See Appendix A. Sanofi Revenue values were acquired from Sanofi Q4 and FY 2020 Income statements [31], Form-20F**

2019 [23] and Form-20F 2018 [78]. Revenue values in Euros were converted into USD using exchange rates quoted on exchangerates.org.uk website [76] on 31/12/2020, 31/12/2019, 31/12/2018 and 31/12/2017. A bar chart was then created in MS Excel to show all the revenue values from all four companies. Same procedure was applied to obtain values for Operating income and total assets.

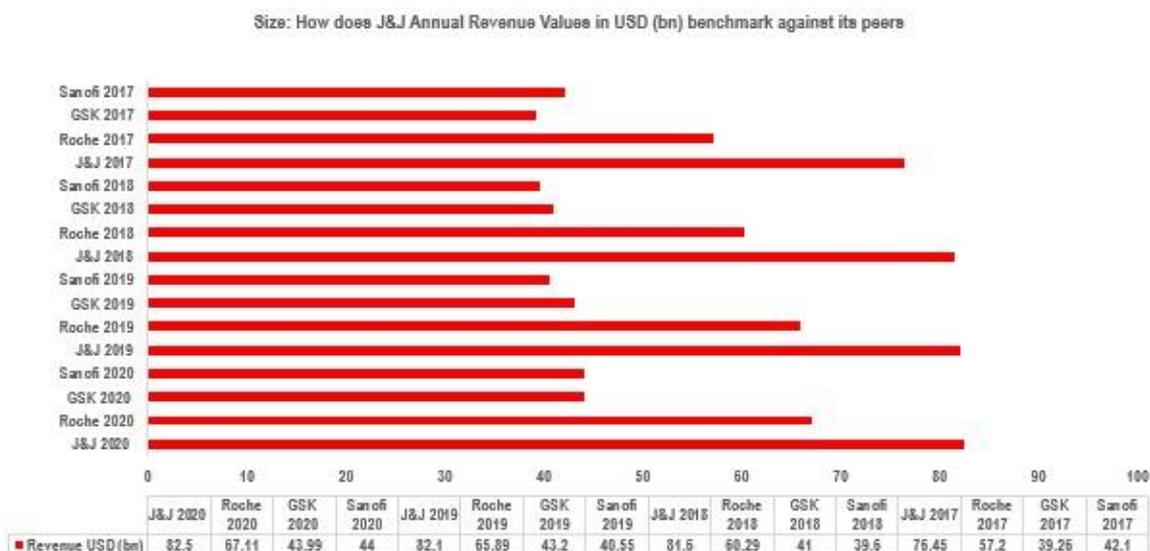


Fig.9 Annual Revenue comparison between J&J and its competitors

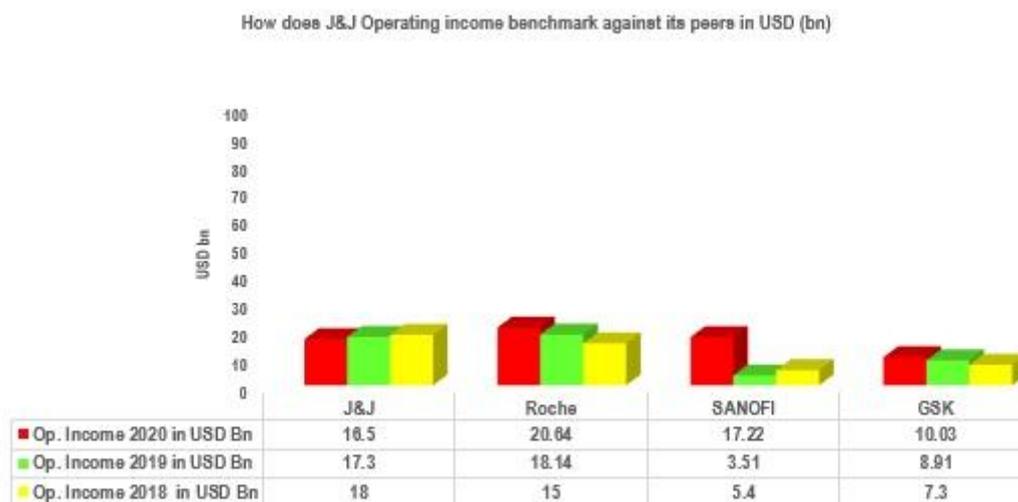


Fig. 10 Operating Income comparison between J&J and its competitors

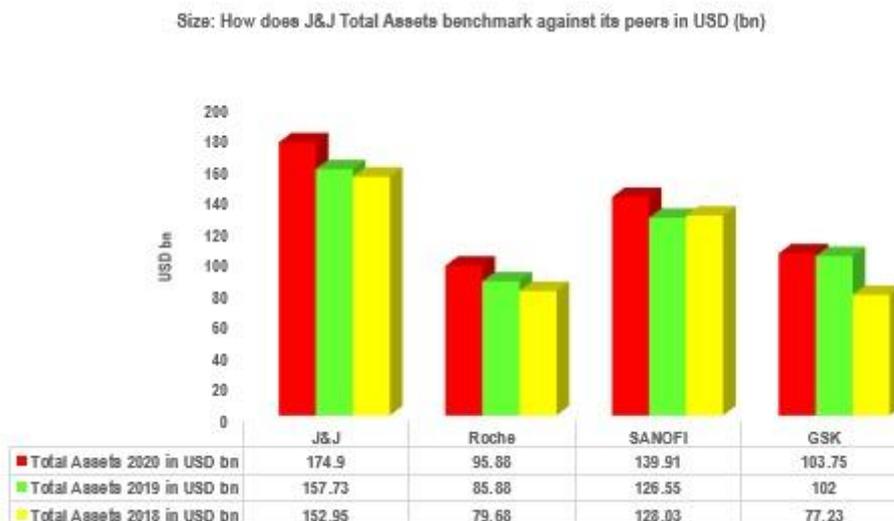


Fig. 11 Total Assets Comparison

3.2.4.2 **Growth:** In this category Revenue growth and operating Income year-on year growth are benchmarked against J&J competitors. Results are shown in Fig 12-14.

$$\text{Current Year Earnings} - \text{Last year's Earning} / \text{Last year's Earning} \times 100$$

Similarly Year-on-Year Operating Income growth (%) can be calculated using following formula:

$$\text{Current Year operating income} - \text{Last year's operating Income} / \text{Last year's Operating Income} \times 100$$

It is important to note that Y-o-Y values calculated in USD are slightly different than values calculated in Pound sterling (£), Swiss Franc (CHF) and in Euro (€). GSK revenue Y-o-Y growth values for instance calculated in USD are 1.82%, 5.36% and 4.43% whereas values calculated in Pound Sterling are 1.0%, 9.5% and 2.1% for 2020, 2019 and 2018 respectively.

The Growth £% values quoted by GSK in annual reports are 1 [28, p. 12], 10 [26, p. 8] and 2 [77, p.6] for 2020, 2019 and 2018 respectively. These values are close to our values calculated using the formula in Pound sterling.

Similarly Roche revenue Y-o-Y Growth values calculated in CHF are -5.3% or -5%, 7% and 6.7% or 7% for 2020, 2019 and 2018 respectively. The Growth £% values quoted by Roche in annual reports are -5% [30, p.6], +7% [74, p. 5] and +7% [75] and these values are same as our calculated values. Roche Revenue y-o-Y growth values in USD are 1.85%, 9.28% and 5.3% for 2020, 2019 and 2018 respectively as calculated by using the formula.

Sanofi Revenue Y-o-Y Growth values calculated in Euro are -0.2%, 4.8%, -1.7% for 2020, 2019 and 2018. Sanofi Revenue Y-o-Y Growth values calculated using formula in USD are 9%, 2.4% and -6.0%.

Roche Operating profit Y-O-Y growth values calculated in CHF are 5.7%, 19%, 13.5% whereas values calculated in USD are 13.8%, 21% and 12.3% for 2020, 2019 and 2018 respectively.

Sanofi operating Income growth Y-O-Y values calculated in Euro are 352%, -33.2% and -19.4% whereas values calculated in USD are 392%, -35% and -22.9%

GSK operating Profit growth Y-O-Y values calculated in Pound Sterling are 12%, 27%, 34% whereas values calculated in USD are 12.7%, 22.1% 36.8 or 37% for 2020, 2019, and 2018 respectively.

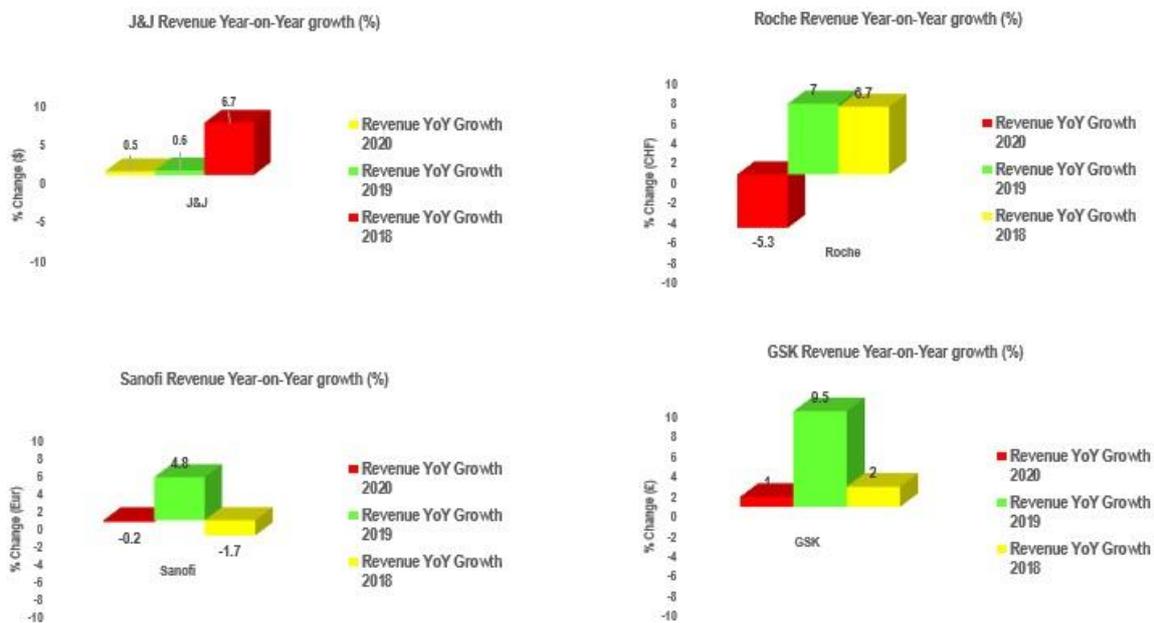


Fig. 12 Annual Revenue Y-O-Y Growth values
 Note: Values Calculated in original Currencies

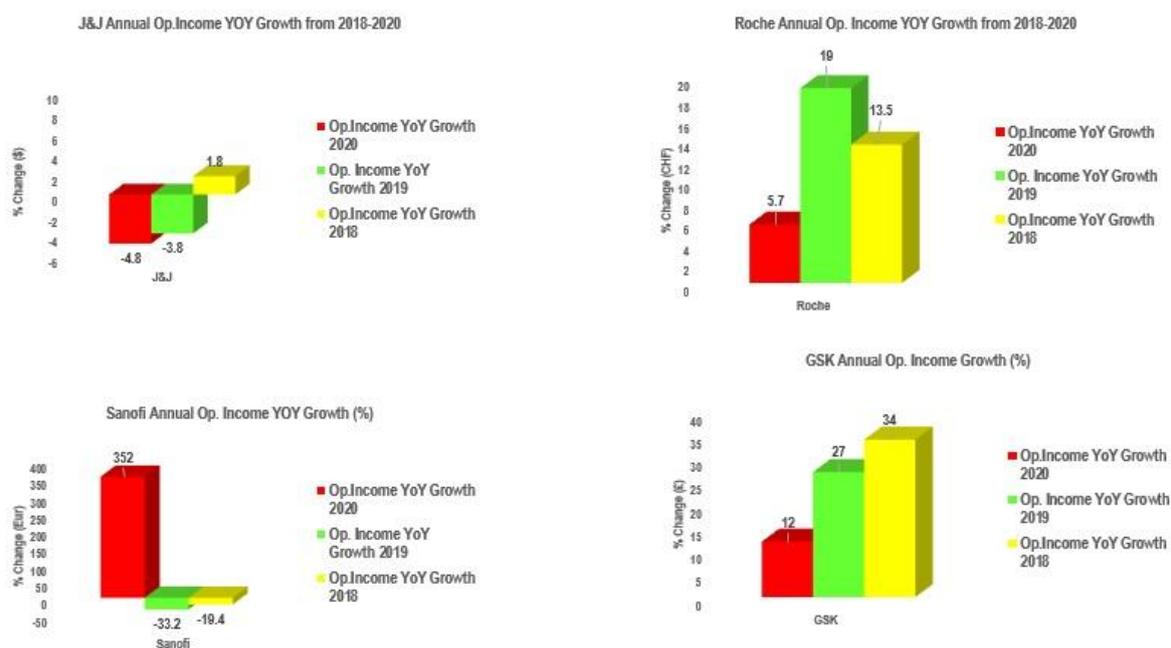


Fig.13: Operating Income Year-on-Year growth
 Note: Values Calculated in original Currencies

Annual Op.Income YOY Growth comparison from 2018-2020

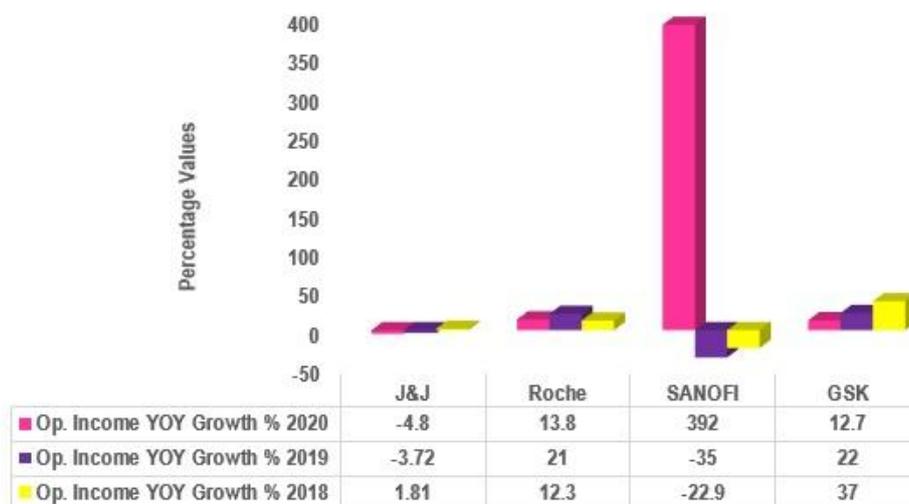


Fig. 14 Annual Operating Income Y-OY growth comparison
 Note: Values calculated in USD

3.2.4.3 **Market cap and Profit:** Results are shown in Fig. 15. Data on market cap and Return on Asset was obtained from macrtrend.net website [34-37, 79-82].

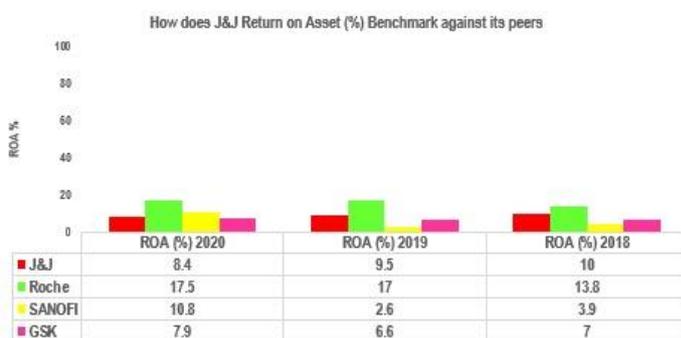


Fig.15 Profitability and Market cap comparison from 2018-2020

3.2.4.4. Value:

Results are shown in Fig. 16-17. Earnings per share (EPS) analysis shows that J&J had the highest EPS YOY growth of 101.52 % increase for Quarter ending 30th sept 2020 compared to GSK (-16.6%) and Sanofi (75.24%). In 2019 J&J only had 0.36% YOY growth from 2018. This is lower than GSK and Roche. J&J also had highest EPS YOY growth in 2018 i.e. 1093%. J&J has consistently shown positive YOY growth from 2018 – 2019 but growth declined in 2020. Data for EPS and EPS YOY growth, Shares outstanding and Share Outstanding growth was collected from Macrotrends.net website [83-90] and authors turned the data into charts/graphs.



Fig.16 Annual EPS and EPS Y-O-Y growth comparison

Outstanding Shares and Year on Year growth:



Fig.17 Outstanding shares and Outstanding shares Y-O-Y growth comparison

R&D investment and R&D Intensity (Innovation activity indicators). Results are shown in Fig.18. Data on R&D investment was obtained from [38], [9, p. 53], [28, p. 12], [26, p. 8], [31], [23, p. 70], [30, p. 6], [74, p. 43]. In the present study Authors then calculated R&D intensity using following formula:

$$\text{R\&D Intensity} = \text{R\&D expenditure} / \text{Turnover or output}$$

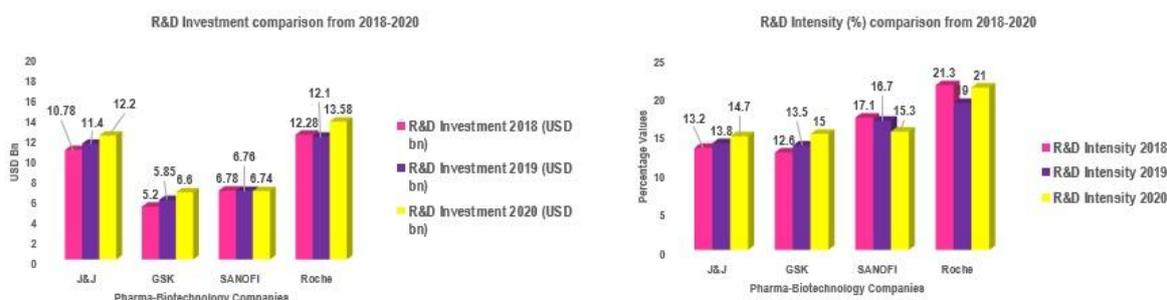


Fig. 18 R&D Investment and R&D Intensity comparison

IV. SUMMARY OF FINDINGS

The competitive advantage analysis shows the core competencies of J&J indicated by the sustainable competitive advantage. Competitive advantage allows a company to create better economic value than its competitors either by generating a greater consumer surplus than its competitor i.e. higher benefits for consumer or by generating higher producer's surplus i.e. it sells at a higher price or has a lower cost [2]. J&J creates a greater consumer surplus by producing higher perceived benefits for customers e.g. its baby products are based on natural ingredients and do not contain chemicals giving better value to customers.

The competitive benchmarking also showed that J&J has isolating mechanisms in place to delay competitors from imitating its products e.g. legal restrictions in forms of patents, trademarks and copyrights. Other isolating mechanisms include superior access to consumers i.e. J&J has vast distribution channels (over 350), market for specialized products e.g. orthopaedic surgical products including Augmented Reality based surgical training, baby products and access to emerging markets. The competitive benchmarking has shown that Roche has higher R&D investment and R&D intensity compared to J&J. J&J should increase its R&D intensity and investment. This in turn will increase its competitive advantage as it will result in more innovative products.

The process benchmarking has shown that GSK employs a marketing and distribution network process that decreased total distribution costs by \$1.99 (6%) per year while at the same time increasing on-time delivery to customers by 40.4%. J&J uses Key value and Key performance indicators with its key suppliers to enhance relationship with suppliers and increase productivity.

Market analysis has shown J&J has the highest market cap compared to its competitors.

Performance benchmarking has shown that J&J had lower annual revenue Y-O-Y growth compared to its competitors in 2020 and 2019. J&J had negative operating Income YOY growth values for 2020 and 2019 whereas Sanofi showed highest Growth % for 2020. Sanofi exhibited highest values for EPS Y-O-Y growth in 2020 whereas J&J displayed lower growth than its competitors in 2020 and in 2019. J&J also had lower outstanding shares Y-O-Y growth than its competitors in 2020.

J&J has expansion strategies such as venturing into robotic orthopaedic surgery, oncology, and use of AI and Augmented Reality. Other strategies include volume driven goal, inclusion & diversity and innovation. Roche, GSK and Sanofi also has innovation as one of their strategic priorities.

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Conflict of Interest

Author declares no conflict of Interest

- [1]. Johnson G, Scholes K, Whittington R. Exploring Corporate Strategy. Text and Cases. 7th ed. Harlow: Pearson Education Limited; 2005
- [2]. Prasnikar J, Debeljake Z, Ahcan A. Benchmarking as a Tool for Strategic Management. Total Quality Management. 2005; 16(2):257-275. Available from: doi.org/10.1080/14783360500054400
- [3]. Harrington H, Harrington J. High Performance Benchmarking: 20 Steps to Success. New York: McGraw-Hill; 1996.
- [4]. Idea Pharma. Pharmaceutical Invention and Innovation indices 2020. Cranfield: Idea Pharma; 2020. Available from: <https://www.ideapharma.com/pii/> [Accessed 01/08/2020].
- [5]. Idea Pharma. Pharmaceutical Innovation Index 2019. Cranfield: Idea Pharma; 2019. Available at: <https://www.ideapharma.com/pii/> [Accessed 01/08/2020].
- [6]. Sekhar S. Benchmarking. African Journal of Business Management. 2010; 4(6):882-885. Available from: <https://www.internationalscholarsjournals.com/articles/benchmarking.pdf> [Accessed 16/05/2021].
- [7]. Malhotra Y. Organizational learning and learning organizations: an overview [online]. 1996. Available from: <https://www.brint.com/papers/orglrng.htm> [Accessed 17/03/2021]
- [8]. Johnson & Johnson. Diversity, Equity & Inclusion [online]. 2020. Available from: <https://www.jnj.com/about-jnj/diversity> [Accessed 14/03/2021]
- [9]. Johnson & Johnson. Johnson & Johnson Annual Report 2019 [online]. New Jersey: Johnson & Johnson; 2020. 144p. Available from: https://www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_JNJ_2019.pdf [Accessed 27/02/2021].
- [10]. Johnson & Johnson. Innovation. Employee Spotlight [online]. 2021. Available from: <https://www.jnj.com/innovation/johnson-johnson-leaders-on-advancing-healthcare-in-2021> [Accessed 17/03/2021]
- [11]. Johnson & Johnson. Health for Humanity 2020 Goals. Towards a Healthier 2020 [online]. 2020. Available at: https://www.jnj.com/_document/johnson-johnson-health-for-humanity-2020-goals?id=0000015c-adde-d4cb-a5fd-efdef8110000 [Accessed 06/03/2021]
- [12]. Johnson & Johnson. Full year 2020 Results [online]. New Jersey: Johnson & Johnson; 2021. 38p. Available from: <https://johnsonandjohnson.gcs-web.com/static-files/288c1c7f-1ba6-4f92-a88f-205b176496a6> [Accessed 19/03/2021]
- [13]. Roche. Roche Annual Report 2020. A year in Review [online]. Basel: F. Hoffmann-La Roche Ltd; 2021. 178p. Available from: <https://www.roche.com/investors/annualreport20.htm> [Accessed 16/05/2021].
- [14]. Roche. Roche A Year in Brief [online]. Basel: F. Hoffmann-La Roche Ltd; 2021. 17p. Available from: <https://www.roche.com/dam/jcr:ea077b96-ee9a-42e7-b3c1-57016a9708cd/en/riib20e.pdf> [Accessed 16/05/2021]
- [15]. Roche. Annual Report 2018 [online]. Basel: F. Hoffmann-La Roche Ltd; 2019. 160p. Available from: <https://www.roche.com/investors/annualreport18.htm> [Accessed 17/03/2021]
- [16]. Roche. Our Business priorities, [online]. 2021. Available at: <https://www.roche.com/about/priorities.htm> [Accessed 16/05/2021]

- [17]. KPMG. Roche Holdings Inc. Annual Report 2019, [online]. Basel: KPMG; 2021. 102p. Available from: <https://www.roche.com/investors/annualreport19.htm> [Accessed 17/03/2021]
- [18]. Sanofi. 2019 Integrated Report Our Responsibility for the future [online]. Paris: Sanofi; 2019. 19p. Available from: https://www.sanofi.com/-/media/Project/One-Sanofi-Web/Websites/Global/Sanofi-COM/Home/en/investors/docs/2020_04_28_integrated_report_2019_v3_acc.pdf?la=en&hash=13D83CCF9BBF295C5FB73D6B443375CE [Accessed 06/08/2020]
- [19]. Sanofi. Science & Innovation Voices from the Lab [online]. 2021. Available from: <https://www.sanofi.com/en/science-and-innovation/research-and-development/voices-from-the-lab> [Accessed 17/03/2021]
- [20]. Sanofi. Press Releases. Sanofi CEO unveils new strategy to drive Innovation and growth, [online]. 2019. Available from: <https://www.sanofi.com/en/media-room/press-releases/2019/2019-12-09-22-42-41> [Accessed 17/03/2021]
- [21]. Sanofi. Corporate Social Responsibility 2019 [online]. 2019. Available from: https://www.sanofi.com/-/media/Project/One-Sanofi-Web/Websites/Global/Sanofi-COM/Home/common/docs/our-responsibility/documents-center/factsheets-pdf4-2020/Sanofi-Chapter4-EN_accessible.pdf?la=en&hash=25B33FE52F73FFF6ABD29D6D70431068 [Accessed 06/08/2021]
- [22]. Sanofi. Corporate Social Responsibility Chapter 4 of the 2018 Document de reference [online]. 2019. Available from: https://www.sanofi.com/-/media/Project/One-Sanofi-Web/Websites/Global/Sanofi-COM/Home/common/docs/download-center/Sanofi-CSR-DDRChapter4-2018-EN-PDF-e-accessible_01.pdf?la=en&hash=2CB78DF1C687CBF501038FC9A3766250
- [23]. Sanofi. Form 20-F 2019 Annual Report [online]. Paris: Sanofi; 2020. Available from: https://www.sanofi.com/-/media/Project/One-Sanofi-Web/Websites/Global/Sanofi-COM/Home/common/docs/investors/2020_03_23_Sanofi-Report-2019-20F-accessible.pdf?la=en&hash=14ACCB31D1FFF966C8EA96CA7EE5049 [Accessed 16/05/2021]
- [24]. GlaxoSmithKline. About Us. Our Vision, Mission and Strategy [online]. 2021. Available from: <https://pk-consumerhealthcare.gsk.com/en-gb/about-us/profile-of-company/> [Accessed 17/03/2021]
- [25]. GlaxoSmithKline. Responsibility. Our Approach. [online]. 2021. Available from: <https://uk.gsk.com/en-gb/responsibility/our-approach/> [Accessed 17/03/2021]
- [26]. GlaxoSmithKline. GSK Annual Report 2019 [online]. Place Unknown: GlaxoSmithKline; 2020. 76p. Available from: <https://www.gsk.com/media/5894/annual-report.pdf> [Accessed 16/05/2021].
- [27]. GlaxoSmithKline. Our Contribution to the Sustainable Development Goals, [online]. 2019. Available from: <https://www.gsk.com/media/5326/our-contribution-to-the-sdgs.pdf> [Accessed 25/03/2021]
- [28]. GlaxoSmithKline. Press release Full Year and Fourth Quarter 2020 [online]. London: GlaxoSmithKline; 2021. 65p. Available from: <https://www.gsk.com/media/6557/fy-2020-results-announcement.pdf> [Accessed 16/05/2021]
- [29]. Mikulic, M., Global Pharmaceutical Industry – Statistics & facts, Statista, [online]. 2020. Available at: <https://www.statista.com/topics/1764/global-pharmaceutical-industry/> [Accessed 19/03/2021]
- [30]. La Roche Ltd. Finance Report 2020, [online]. Basel: La Roche Ltd; 2021. 193p. Available from: <https://www.roche.com/dam/jcr:988cc95a-0813-4e70-a7c8-f61a4b902749/en/fb20e.pdf> [Accessed 27/02/2021].
- [31]. Sanofi. Q4 and FY 2020 Income statements, Cashflow statements, Balance sheet [online]. 2021. Available from: <https://www.sanofi.com/en/investors/financial-results-and-events/financial-results/Q4-results-2020> [Accessed 28/02/2021].
- [32]. Macrotrends. Johnson & Johnson free Cash Flow 2006-2020 JNJ [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/free-cash-flow> [accessed 25/03/2021]
- [33]. Macrotrends. Johnson & Johnson Total Asset 2006-2020 JNJ. [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/total-assets> [Accessed 25/03/2021].
- [34]. Macrotrends. Johnson & Johnson Market Cap 2006-2020 JNJ [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/market-cap> [Accessed 08/05/2021]
- [35]. Macrotrends. Roche Holding AG Market Cap 2006-2020 RHHBY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/RHHBY/roche-holding-ag/market-cap> [Accessed 08/05/2021]
- [36]. Macrotrends. GlaxoSmithKline Market Cap 2006-2020. GSK [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/GSK/glaxosmithkline/market-cap> [Accessed 08/05/2021]
- [37]. Macrotrends. Sanofi Market Cap 2006-2020. SNY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/SNY/sanofi/market-cap> [Accessed 08/05/2021]
- [38]. Johnson & Johnson. Condensed consolidated statement of Earnings [online]. 2020. Available from: <https://johnsonandjohnson.gcs-web.com/static-files/a440e2e2-d1c8-4d1d-a25f-1ba14c793a4d> [Accessed 27/02/2021]
- [39]. Johnson & Johnson. Position on Employee Development [online]. 2021. Available from: <https://www.jnj.com/about-jnj/policies-and-positions/our-position-on-employee-development> [Accessed 06/03/2021]
- [40]. Johnson & Johnson. Leadership Development Programs [online]. 2020. Available from: <https://www.careers.jnj.com/leadership-development-programs> [Accessed 06/03/2021]
- [41]. Johnson & Johnson. Health for Humanity Report. Progress in Sustainability, [online]. New Jersey: Johnson & Johnson; 2019. 10p. Available from: <https://healthforhumanityreport.jnj.com/responsible-business-practices/empowering-people> [Accessed 06/03/2021]
- [42]. Johnson & Johnson. Careers. Communication [online]. 2021. Available from: <https://www.careers.jnj.com/communication> [Accessed 10/04/2021]
- [43]. Johnson & Johnson. Position on Employee compensation and Benefits, [online]. 2021. Available from: <https://www.jnj.com/about-jnj/policies-and-positions/our-position-on-employee-compensation-and-benefits> [Accessed 16/05/2021]
- [44]. Johnson & Johnson. Latest News. Johnson & Johnson Earns the #3 spot on the 2020 Gartner Supply Chain Top 25 list, [online]. 2020. Available from: <https://www.jnj.com/latest-news/johnson-johnson-among-top-3-2020-gartner-supply-chain-list> [Accessed 06/03/2021]
- [45]. Lexis Nexis PatentSight Team. Patent Sight Press Centre Analysis Reveals companies with Strongest Patents Related to COVID-19 vaccines [online]. Bonn: PatentSight; 2021. Available from: <https://www.patentsight.com/patentsight-press-center/analysis-reveals-companies-with-strongest-patents-related-to-covid-19-vaccines> [Accessed 27/02/2021]
- [46]. Lubbering A. PatentSight IP Analytical Blog Insight into Medical Technology Field in light of planned GE Healthcare IPO [online]. Bonn: PatentSight; 2019. Available from: <https://www.patentsight.com/en/ip-analytics-blog/insights-into-medical-technology-field-in-light-of-planned-ge-healthcare-ipo> [Accessed 27/02/2021]
- [47]. Johnson & Johnson. Position on Ethical Sales and Marketing [online]. 2021. Available from: <https://www.jnj.com/about-jnj/policies-and-positions/our-position-on-ethical-sales-and-marketing> [Accessed 06/03/2021]
- [48]. Johnson & Johnson. Consumer Health Products [online]. 2021. Available from: <https://www.jnj.com/healthcare-products/consumer> [Accessed 10/04/2021]
- [49]. Brand Finance. Pharma 25 2020 The Annual Report on the most valuable and strongest Pharma Brands [online]. London: Brand Finance; 2020. Available from: <https://brandirectory.com/rankings/pharma/> [Accessed 06/03/2021]

- [50]. Johnson & Johnson. Johnson & Johnson Medical companies opens Innovation center in China to serve Emerging Markets, [online]. 2011. Available from: <https://www.jnj.com/media-center/press-releases/johnson-johnson-medical-companies-opens-innovation-center-in-china-to-serve-emerging-markets> [Accessed 10/04/2021]
- [51]. Bulik, B. J&J vision débuts new try-it augmented reality tech application for Acuvue lenses in China, [online]. 2020. Available from: <https://www.fiercepharma.com/marketing/j-j-vision-launches-new-try-it-augmented-reality-tech-application-for-acuvue-lenses-china> [Accessed 06/03/2021]
- [52]. Johnson & Johnson. Virtual Reality News. J&J Institute continues to Power Surgical Training with Virtual Reality, [online]. 2020. Available from: <https://jnjinstitute.com/en-us/news/jj-institute-continues-power-surgical-training-virtual-reality> [Accessed 06/03/2021]
- [53]. Leadership for a Networked World. Transforming the Supply Chain at Johnson & Johnson. An insight from the 2017 Next Generation Operations Summit, [online]. 2021. Available from: <https://lnwprogram.org/content/transforming-supply-chain-johnson-johnson> [Accessed 16/05/2021]
- [54]. Whooley S. Breaking: Johnson & Johnson finally unveils its new robot-assisted surgery system, MassDevice Medical Network [online]. 2020. Available from: <https://www.massdevice.com/breaking-johnson-johnson-finally-unveils-its-new-robot-assisted-surgery-system/> [Accessed 10/04/2021]
- [55]. Statista. Number of Roche group employees from 2007 to 2020 [online]. 2021. Available from: <https://www.statista.com/statistics/266522/roche-group-number-of-employees-since-2007/> [Accessed 27/02/2021]
- [56]. Inherit. Impactful trends in Europe Towards 2040 [online]. 2017. Available from: <https://www.scp-centre.org/publications/impactful-trends-in-europe-towards-2040/> [Accessed 10/04/2021]
- [57]. PricewaterhouseCoopers. Pharma 2020: Marketing the future. Which path will you take?, [online]. 2009. Available from: <https://www.pwc.com/gx/en/industries/pharmaceuticals-life-sciences/publications/pharma-2020/pharma-2020-marketing-the-future-which-path-will-you-take.html> [Accessed 10/04/2021]
- [58]. PricewaterhouseCoopers. 23rd Annual Global CEO Survey Navigating the rising tide of uncertainty. [online]. 2020. Available from: <https://www.pwc.com/gx/en/ceo-survey/2020/reports/pwc-23rd-global-ceo-survey.pdf> [Accessed 10/04/2021]
- [59]. PricewaterhouseCoopers. 24th Annual UK CEO Survey. UK CEOs plan a 'no regrets' recovery. [online]. 2021. Available from: <https://www.pwc.co.uk/ceo-survey/23rd-ceo-survey.html> [Accessed 10/04/2021]
- [60]. PricewaterhouseCoopers. Pharma 2020: Changing business Models. Which Path will you take? [online]. 2009. Available from: <https://www.pwc.com/gx/en/pharma-life-sciences/pdf/challenge.pdf> [Accessed 10/04/2021]
- [61]. PricewaterhouseCoopers. Pharma 2020: Virtual R&D which path will you take? [online]. 2008. Available from: https://www.pwc.com/gx/en/pharma-life-sciences/pdf/pharma2020_virtualrd_final2.pdf [Accessed 10/04/2021]
- [62]. PricewaterhouseCoopers. 22nd Annual Global CEO Survey. CEOs' curbed Confidence spells Caution [online]. 2019. Available from: <https://www.pwc.com/gx/en/ceo-survey/2019/report/pwc-22nd-annual-global-ceo-survey.pdf> [Accessed 14/04/2021]
- [63]. Johnson & Johnson. Johnson & Johnson Medical Devices Companies acquire Orthotaxy to Develop next generation Robotic Assisted Surgery Platform in Orthopaedics [online]. 2018. Available from: <https://www.jnj.com/media-center/press-releases/johnson-johnson-medical-devices-companies-acquire-orthotaxy-to-develop-next-generation-robotic-assisted-surgery-platform-in-orthopaedics> [Accessed 14/04/2021]
- [64]. Crotti N. J&J and its surgical orthopedic robot: What you need to know, Medical Design & Outsourcing [online]. 2019. Available from: <https://www.medicaldesignandoutsourcing.com/jj-and-its-surgical-orthopedic-robot-what-you-need-to-know/> [Accessed 14/04/2021]
- [65]. Evaluate Vantage. J&J tries to strike the right note with Ottava. [online]. 2020. Available from: <https://www.evaluate.com/vantage/articles/news/corporate-strategy/jj-tries-strike-right-note-ottava> [Accessed 14/04/2021]
- [66]. Hernández H, Grassano N, Tübke A, Amoroso S, Csefalvay Z, Gkotsis P. (2019) The 2019 EU Industrial R&D Investment Scoreboard; EUR 30002 EN; Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-11261-7, doi:10.2760/04570, JRC118983. [online] Available from: <https://iri.jrc.ec.europa.eu/scoreboard/2019-eu-industrial-rd-investment-scoreboard> [Accessed 06/08/2020]
- [67]. PricewaterhouseCoopers. 24th Annual Global CEO Survey. A leadership agenda to take on tomorrow. [online]. 2021. Available from: <https://www.pwc.com/gx/en/ceo-agenda/ceosurvey/2021/report.html> [Accessed 10/04/2021]
- [68]. Ringel M, Baeza R, Panandiker R, Harnoss J. In innovation, Big is back, [online]. Boston: BCG; 2020. Available from: <https://www.bcg.com/en-gb/publications/2020-most-innovative-companies/large-company-innovation-edge> [Accessed 01/08/2020].
- [69]. PricewaterhouseCoopers. Pharmaceutical industry perspectives on the Global Innovation Survey 2013. Managing innovation in Pharma [online]. 2013. Available from: <https://www.pwc.com/gx/en/pharma-life-sciences/assets/pwc-managing-innovation-pharma.pdf> [Accessed 01/08/2020]
- [70]. Morgan S, Bathula H, Moon S. Pricing of Pharmaceuticals is becoming a major challenge for health systems. BMJ. 2020; 368: 14627 [online] Available from: <https://www.bmj.com/content/bmj/368/bmj.l4627.full.pdf> [Accessed 14/04/2021]
- [71]. Shang J, Yildirim T, Tadikamalla P, Mittal V, Brown L. Distribution network redesign for marketing competitiveness. Journal of Marketing. 2009; 73(2):146-63.
- [72]. Griscti R. Supplier chain benchmarking, Contract Pharma. [online] 2011. Available from: https://www.contractpharma.com/issues/2011-01/view_features/supply-chain-benchmarking/ [Accessed 08/05/2021].
- [73]. Roche. Sustainability in Procurement practices, [online]. 2021. Available from: <https://www.roche.com/sustainability/suppliers/sustainable-procurement.htm> [Accessed 08/05/2021]
- [74]. Roche. Roche Finance Report 2019, [online]. Basel: F. Hoffmann-La Roche Ltd; 2020. 185p. Available from: <https://www.roche.com/investors/annualreport19.htm#financials> [Accessed 16/05/2021]
- [75]. Roche. Roche Finance Report 2018, [online]. Basel: F. Hoffmann-La Roche Ltd; 2019. 179p. Available from: <https://www.roche.com/dam/jcr:933329c4-4564-4b17-a29b-246ac7e617d5/en/fb18e.pdf> [Accessed 16/05/2021]
- [76]. Exchange Rates UK. Exchange Rates UK- Compare Live Foreign Currency Exchange Rate & History [online]. 2021. Available from: <https://www.exchangerates.org.uk/> [Accessed 08/05/2021]
- [77]. GlaxoSmithKline. Annual Report 2018 [online]. Brentford: GlaxoSmithKline; 2019. 276p. Available from: <https://www.gsk.com/media/5349/annual-report-2018.pdf> [Accessed 16/05/2021]
- [78]. Sanofi., (2018) Form 20-F 2018 Annual Report [online]. Paris: Sanofi; 2019. 364p. Available from: https://www.sanofi.com/-/media/Project/One-Sanofi-Web/Websites/Global/Sanofi-COM/Home/common/docs/investors/Sanofi-20-F-2018-EN-PDF-e-accessible_01.pdf?la=en&hash=6AC303E769D68FF95508C93D1CBF6F1A [Accessed 16/05/2021]
- [79]. Macrotrends.net. Johnson & Johnson Financial Ratios for Analysis 2005-2021 JNJ [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/financial-ratios> [Accessed 08/05/2021]
- [80]. Macrotrends.net. Roche Holding AG Financial Ratios for Analysis 2005-2021. RHHBY, [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/RHHBY/roche-holding-ag/financial-ratios> [Accessed 08/05/2021]

- [81]. Macrotrends.net. GlaxoSmithKline Financial Ratios for Analysis 2005-2021 GSK [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/GSK/glaxosmithkline/financial-ratios> [Accessed 08/05/2021]
- [82]. Macrotrends.net. Sanofi Ratios for Analysis 2005-2021 SNY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/SNY/sanofi/financial-ratios> [Accessed 08/05/2021]
- [83]. Macrotrends.net. Johnson & Johnson EPS-Earnings per share 2006-2021 JNJ [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/eps-earnings-per-share-diluted> [Accessed 08/05/2021]
- [84]. Macrotrends.net. GlaxoSmithKline EPS-Earnings per share 2006-2020 GSK [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/GSK/glaxosmithkline/eps-earnings-per-share-diluted> [Accessed 08/05/2021]
- [85]. Macrotrends.net. Sanofi EPS-Earnings per share 2006-2021 SNY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/SNY/sanofi/eps-earnings-per-share-diluted> [Accessed 08/05/2021]
- [86]. Macrotrends.net. Roche Holding AG EPS - Earnings per share 2006-2021 RHHBY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/RHHBY/roche-holding-ag/eps-earnings-per-share-diluted> [Accessed 08/05/2021]
- [87]. Macrotrends.net. Johnson and Johnson Shares Outstanding 2006-2021. JNJ [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/JNJ/johnson-johnson/shares-outstanding> [Accessed 08/05/2021]
- [88]. Macrotrends.net. GlaxoSmithKline Shares Outstanding 2006-2021. GSK [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/GSK/glaxosmithkline/shares-outstanding> [Accessed 08/05/2021]
- [89]. Macrotrends.net. Sanofi Shares Outstanding 2006-2021.SNY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/SNY/sanofi/shares-outstanding> [Accessed 08/05/2021]
- [90]. Macrotrends.net. Roche Holding AG Shares Outstanding 2006-2020. RHHBY [online]. 2021. Available from: <https://www.macrotrends.net/stocks/charts/RHHBY/roche-holding-ag/shares-outstanding> [Accessed 08/05/2021]

Supplementary Data: Supplementary data related to this report can be found below

Appendix A

Exchange rates for \$/£ conversion as stated in GSK annual reports

Year	Exchange rate \$/£
2020	1.29
2019	1.28
2018	1.33
2017	1.30

Taqaddas, A. "Report: Bench marking Johnson & Johnson, USA against its competitors." *International Journal of Pharmaceutical Science Invention*, vol. 10(05), 2021, pp 09-28. Journal DOI- 10.35629/6718