HELLENIC OPEN UNIVERSITY

# School of Social Sciences

## Master in Business Administration

Postgraduate Dissertation

"The Role of Management in Biotechnology and Pharmaceuticals: Literature Review and Case Studies"

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Athens, Greece, May 2026


# "The Role of Management in Biotechnology and Pharmaceuticals: Literature Review and Case Studies"

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# Abstract

Management has a great role in business as it is the main tool that ensures that business viability and mission will be achieved. This dissertation examines the importance of management in biotechnology pharmaceutical companies as well as managerial techniques that leading companies use.

In the beginning, a definition of biotechnology pharmaceutical companies is given, and aspects of the industry are being studied. In the next part, management and managerial techniques of the leading biotechnology pharmaceutical companies are being presented. Finally, case studies of some of the leading and most well-known biotechnology pharmaceutical companies in Greece are being presented.

The purpose of the Dissertation is to investigate and analyze managerial practices that are often applied in large biotechnology pharmaceutical companies, study how innovation, quality management, compliance and sustainability are connected with business performance and to come up with some conclusions about effective management in the biotechnology pharmaceutical industry.

**Keywords**

biotechnology pharmaceutical, biotechnology management, biotechnology entrepreneurship, biotechnology pharmaceutical industry, regulatory affairs of biotechnology pharmaceutical industry

# Περίληψη

Η αποτελεσματική διοίκηση παίζει σπουδαίο ρόλο σε μια επιχείρηση καθότι διασφαλίζει την βιωσιμότητα και την επίτευξη των στόχων της. Η παρούσα διπλωματική εργασία εξετάσει την σημασία της αποτελεσματικής επιχειρησιακής διοίκησης στις εταιρείες βιοτεχνολογίας και φαρμακευτικής καθώς επίσης και τεχνικές διοίκησης που χρησιμοποιούν οι κορυφαίες εταιρείες του κλάδου.

Στην αρχή παρουσιάζεται ο ορισμός της εταιρείας βιοτεχνολογίας και φαρμακευτικής και μελετώνται επίσης διάφορα στοιχεία που αφορούν τον κλάδο. Στην συνέχεια παρουσιάζεται η επιχειρησιακή διοίκηση στις εν λόγω εταιρείες μαζί με τεχνικές που χρησιμοποιούν οι κορυφαίες εταιρείες του κλάδου. Τέλος, παρουσιάζονται μελέτες περιπτώσεων των κορυφαίων και πιο γνωστών στην Ελλάδα εταιρειών βιοτεχνολογίας και φαρμακευτικής.

Σκοπός της παρούσας εργασίας είναι η διερεύνηση διοικητικών πρακτικών που εφαρμόζονται συχνά στις μεγάλες βιοτεχνολογικές-φαρμακευτικές εταιρείες, η μελέτη του πως η καινοτομία, η διοίκηση ποιότητας, η συμμόρφωση και η βιωσιμότητα συνδέονται με την επιχειρησιακή απόδοση και η εξαγωγή συμπερασμάτων σχετικά με αποτελεσματικές διοικητικές τεχνικές που εφαρμόζονται στον βιοτεχνολογικό-φαρμακευτικό κλάδο.

**Λέξεις – Κλειδιά**

Βιοτεχνολογία φαρμακευτική, διοίκηση βιοτεχνολογίας, επιχειρηματικότητα βιοτεχνολογίας, κλάδος βιοτεχνολογίας και φαρμακευτικής, ρυθμιστικές αρχές του κλάδου βιοτεχνολογίας και φαρμακευτικής

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# 1. Introduction

## 1.1 Purpose of the Dissertation

The purpose of the Dissertation is to investigate and analyze managerial practices that are often applied in large biotechnology pharmaceutical companies, study how innovation, quality management, compliance and sustainability are connected with business performance and to come up with some conclusions about effective management in the biotechnology pharmaceutical industry.

## 1.2 Importance of the Dissertation from academic and practical aspect

From academic aspect, referring to effective managerial values and techniques can lead to further research and development to the related with management sciences such as statistics, economics, financial and accounting, in order managerial needs to be covered. This is due to the fact that management uses theories and methods from these sciences.

From a practical aspect, revealing such values and techniques implemented in the biotechnology pharmaceutical industry assists the evolution of biotechnology pharmaceutical companies.

## 1.3 Methodology and structure of the Dissertation

The dissertation follows qualitative multiple case study approach. The Dissertation is based on critical reviews of scientific literature collected from online databases. Moreover, companies and organizations official information and reports provided from websites has been used to provide supplementary information to the information provided from scientific literature.

The companies Bayer, Roche and GSK that are included in the case studies have been selected due to their international presence and intense activity in pharmaceuticals/ biopharma and due to availability of comparable public data. The analysis for each company separately is based on four dimensions: corporate governance/ management structure, innovation and R & D, quality/ compliance/ risk management, and financial performance.

The Dissertation includes five chapters. The first chapter is the introduction, the second chapter is the business sector of biotechnology and pharmaceuticals, the third chapter is management, the fourth chapter includes the case studies of biotechnology pharmaceutical companies, and the final chapter is the conclusions.

In the first chapter, an analytical abstract of the dissertation is being presented. The purpose of the dissertation is being revealed and the dissertation's contribution in academic and practical level. Furthermore, an extent reference is being made not only about the methodology and classification of the dissertation but also about the objectives of each chapter of the dissertation.

In the second chapter, the biotechnology pharmaceutical industry is being studied according to related management fields. To be more specific, the mission and products of biotechnology pharmaceutical companies are being referred and the industry's regulatory

affairs. Finaly, information is being provided about the impact of the global pharmaceutical industry.
In the third chapter, the management in biotechnology pharmaceutical companies is being studied including related managerial fields that global leader pharmaceutical companies give emphasis according to the Association of International Pharmaceutical Manufacturers. Such managerial fields are innovation management and trends in biotechnology pharmaceutical companies, quality management and trends and ethics in the biotechnology pharmaceutical industry. This chapter ends with a critical review of the role of management in efficiency and profitability of biotechnology pharmaceutical firms based on the previous information provided from this chapter.

The fourth chapter includes case studies of biotechnology pharmaceutical companies such as Bayer, Roche, and GSK. Information is being provided about organization's profile and management and organization's products. Also, financial statement analysis is being conducted to evaluate the firm's financial position.

The final chapter includes the conclusions which are the research results based on the purpose of the dissertation. The research results come from the critical review of the literature in the second and the third chapter and case studies in the fourth chapter. Moreover, the limitations of this research are being discussed and proposals for future further research regarding the dissertation topic are being made.

# 2. The business sector of biotechnology and pharmaceuticals

## 2.1 Biotechnology pharmaceutical companies: Mission, products

Biotechnology pharmaceutical companies are innovative pharmaceutical companies that use methods and principles from biology and biotechnology, such as genetic engineering, bioprocessing, cell and tissue engineering, to produce biopharmaceutical products, drug delivery systems, personalized medicine, diagnostic tools and regenerative medicine. Such firms also conduct drug research and development. Their goal is to improve patients' lives through safe, high quality, accessible and innovative medication and contribute to the improvement of existing medicines or discover new more effective.

Biopharmaceutical products include drugs, protein therapeutics, peptides, DNA or mRNA vaccines and biosimilars. Such products are made by using biological agents like microorganisms, enzymes, plant and animal cells. This is their difference from traditional medicines that are made by using chemical substances. Biopharmaceutical products are used to treat many diseases like cancer, diabetes, or autoimmune disorder. Examples include insulin and growth hormones, while vaccines are being used to create long lasting immune response to diseases. Biosimilars are safe, high quality, and low-cost generic biopharmaceutical products.

Drug delivery Systems are supplement drugs to the main treatment drugs that aim to improve therapeutic results and enhance safety. Examples are chemotherapeutic agents. (Nagarajan, Marimuthu & Sundaram, 2024).

Personalized medicine are drugs that are made according to the patients' profile and treatment needs. (Nagarajan, Marimuthu &Sundaram, 2024).

Diagnostic tools are tools that are used to detect and/or monitor disease. These tools also help to give the appropriate treatment to the patient according to the diagnosis. (Nagarajan, Marimuthu & Sundaram, 2024).

Regenerative medicine includes therapies that aim to treat, repair or replace damaged genes, organs, or tissues. Such therapies include gene therapy and stem cell therapy.

As far as drug research and development is concerned, biotechnology pharmaceutical firms, use the research and development department to conduct research either to improve

the quality or manufacturing process of existing drugs or to discover new more effective drugs.

## 2.2Regulatory affairs of biotechnology pharmaceutical industry around the world

Regulatory agencies exist on a global basis, regional basis, and national basis. Their mission is to protect public health and promote competition and innovation in the pharmaceutical industry by providing safe, efficient, and high-quality pharmaceutical goods.

The World Health Organization (WHO) and International Conference on Harmonization (ICH) are global regulatory bodies of the pharmaceutical industry including biopharmaceuticals. WHO works with governments, public and private organizations, civil society, and health workers. (WHO, 2025). WHO's mission is to ensure that everybody in the world has access to health services and medicine and to give guidelines to governments around the world about managing diseases and health crises in general. WHO is also responsible about creating the international standards of safety, efficacy and quality of medicines concerning pharmaceutical companies all over the world, conducting reports related to these issues and promote healthy habits for the civil society. (WHO, 2025). On the other hand, (ICH) is responsible for the harmonization of the safety, efficacy and quality standards of regulatory agencies around the world to simplify the process of manufacturing and licensing of pharmaceutical goods.

Health Canada, European Medicines Agency (EMA), Therapeutic Goods Administration (TGA), Pan American Health Organization (PAHO) are regional regulatory agencies in Canada, Europe, Australia and USA respectively. Their duties and responsibilities are like these in global regulatory bodies, but they are concerned on a regional basis. Regional regulatory agencies are also responsible for ensuring that drugs, biopharmaceuticals, medical devices, cosmetics and veterinary medical products adhere with the global and regional safety, efficacy and quality standards of global regulatory agencies and regional regulatory agencies regarding the country that these products are available to the public. These products are being monitored for these standards not only during the manufacturing process but also after being available to the public. Pharmaceutical manufacturers have the

ability to submit an application to these agencies for licensing their products to the countries of the whole region simultaneously.

National regulatory agencies exist also in all countries around the world besides low- or middle-income countries that lack financial or qualified human capital desired for these agencies. These countries rely on regional agencies and international standards to approve medical products and devices for human or animal use. National regulatory agencies are responsible for ensuring that drugs, biopharmaceuticals, medical devices, cosmetics and veterinary medical products adhere with the global, regional (according to the region the country belongs to) and national, safety, efficacy and quality standards. These products are being monitored for these standards not only during the manufacturing process but also after being available to the public. Pharmaceutical manufacturers have the ability to submit an application to these agencies for licensing their products to the country they want these products to be available.

Large or small pharmaceutical and biopharmaceutical companies have the regulatory affairs department (DRA). This department is responsible for embodying international, regional and national standards of safety, efficacy and quality of pharmaceutical products and medical devices to the company's manufacturing process and handling the process of these products licensing and approval from regional and/or national regulatory bodies regarding the desired regions/countries the company wants the products to be available. This department is important for these companies as it assists in making correct moves as far as the manufacturing process is concerned to save time and money that inadequate decisions and practices include.

## 2.3 The impact and future perspectives of pharmaceutical biotechnology

Pharmaceutical biotechnology is a highly growing sector with the usage of biologics to gradually extend. Pharmaceutical biotechnology has brought tremendous changes in the healthcare industry and regulations of pharmaceuticals, adding a positive social and economic impact.

Pharmaceutical biotechnology contributed to the creation of new drugs, vaccines and diagnostics. Compared with traditional medicines, biologics are safer, with fewer side effects, more efficient and with better quality. (Abass, Ahmad, Faraz & Farid, 2024).

Biosimilars, cheaper bio generics, increased patients' access to enhanced treatments, improved their health condition, and extended life average. Personalized therapies, which are drugs specially made according to patient's profile and needs offer an effective treatment option related to traditional drugs. Moreover, pharmaceutical biotechnology brought medical advancements through new mRNA vaccines, like COVID-19 vaccines. Also, pharmaceutical biotechnology introduced new cutting-edge, accurate diagnostic tools and methods that help health workers to manage more efficiently patients' condition.

The pharmaceutical biotechnology industry integrates innovative emerging technologies like artificial intelligence. This fact gave competitive advantage to such firms and changed research and development and manufacturing process of drugs and vaccines in a more efficient manner.

New pharmaceutical biotechnology products created the need to establish new laws and regulations from regulatory affairs of the pharmaceutical industry. These regulations set standards about manufacturing and product life cycle processes in order safety, efficacy and product's quality to be ensured.

The pharmaceutical biotechnology sector has a positive global economic impact. *The global sales of biotech products exceeded $ 175 billion about 19% of the $950 billion in the total prescription of product sales worldwide. The global biotechnology market size was valued at USD 752.88 billion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 15.83% from 2021 to 2028 out of which around 40% of the consumption comprises human and animal healthcare products.* (Arora, Chawla & Wakchaure, 2022). This sector also created new employment and investment opportunities. (Abass, Ahmad, Faraz & Farid, 2024).

In the future, pharmaceutical biotechnology is expected to drive changes in the biotechnology pharmaceutical industry and improve healthcare systems. The manufacturing and research and development process is expected to be cheaper, faster, more accurate, and with higher quality to meet the increased market demand of biologics. Existing treatments will be enhanced, and new treatments are expected to be launched for today's untreatable diseases. (Abass, Ahmad, Faraz & Farid, 2025).

# 3. Management

## 3.1 Definition of biotechnology entrepreneur

Biotechnology entrepreneur could be an individual or a group of scientists, like physicians and bioengineers or even a businessperson from unrelated fields that start a business, managing its resources according to business opportunities and undertake all related business risks and benefits. Most biotechnology pharmaceutical companies belong to scientists. The ideal biotechnology entrepreneur should be focused on innovation, add market value identically by meeting unmet market needs related to biotechnology pharmaceutical industry, have scientific and business knowledge by himself and qualified partners.

## 3.2 Definition of management and business culture of leading pharmaceutical companies around the world

Management is the process of planning, organizing, leading and controlling organization's resources and functions in an effective and efficient way in order to minimize costs, increase profits, and business goals and objectives to be achieved. (Lussier, 2023).

Planning is the stage in the managerial process where business strategy for attaining business mission is being formulated. In other words, is being determined what should be done in order business goals and objectives to be achieved and how should business functions and resources be coordinated in order to implement business strategy.

Organizing is the initial stage of business strategy implementation and concerns the delegation of duties and responsibilities to employees and departments according to their capabilities in order business goals to be achieved.

Leading is the following stage of strategic plan implementation and concerns guiding and motivating employees in order to perform their duties and responsibilities.

Controlling is the final stage of strategic planning implementation. In this stage, the initial strategic plan is being evaluated by measuring progress in achieving goals and if necessary, corrections to the initial plan are being made in order better results to be achieved.

According to the Association of International Pharmaceutical manufacturers with members the leading pharmaceutical and biopharmaceutical companies around the world, such companies invest on innovation and research and development that both aim to add value to patient's lives, pharmaceutical industry and healthcare system. Moreover, they have the highest standards of business ethics and scientific development and focus on the production of accessible, innovative, high-quality and safe pharmaceutical and biopharmaceutical products.

## 3.3 Departments of biotechnology pharmaceutical company

The following departments usually exist in large biotechnology pharmaceutical companies. Medium size or small biotechnology pharmaceutical companies outsource some of the following activities in order to reduce costs and increase profitability.

1. Management department: The top management department is responsible for formulating business culture, and business strategy in order firm's goals to be achieved according to its mission. This department is also responsible for monitoring all business departments in order to control results and ensure that strategic business plan is followed properly. Management department exists in all business functions that leads and monitors each department separately in according to its duties and responsibilities in order the strategic business plan of the top management department to be implemented correctly and firm's goals to be achieved.
2. Financial department: Financial department formulates and monitors business financial strategy according to the guidelines of the top managements' strategic business plan. This department is responsible for conducting financial and accounting responsibilities and assessing financial risks in order to increase firm's profitability. This department keeps accounting books and records, prepares financial statements and interprets all the above data in order financial decisions to

be taken. The financial department is also responsible for evaluating and choosing profitable business projects and taking financing decisions.

3. Human resources department: Human resources department is responsible for formulating and implementing business policies related to employee issues, according to the top managements' strategic business plan. This department is responsible for monitoring employees' performance and keeping related records, hiring new employees, and firing old ones according to business needs and employee's performance.
4. Research and Development Department: This department is responsible for conducting research and developing biopharmaceutical products according to business product portfolio and ensuring compliance of products traits with regulatory affairs regulations.
5. Legal department: This department is responsible for legal issues and ensuring that business activity is performed according to laws and regulations. This department has intellectual property executives that advice managers for intellectual property issues, laws and regulations about biopharmaceutical products, attorneys', and regulatory affairs experts that consulate managers about licensing procedures of regulatory affairs for biopharmaceutical products.
6. Quality assurance unit: This unit creates and implements business quality strategy and supervises the quality of materials and equipment used to produce biopharmaceutical products.
7. Technical support department: This department consists of technical experts that oversee and maintain facilities and manufacturing systems.
8. Supply chain department: This department is responsible for communicating with suppliers to order all necessary products and materials for business function and operations.
9. Marketing department: Marketing department creates and applies marketing plan for biopharmaceutical products produced according to the top management's strategic business plan. This unit is responsible for designing products, sale and promoting products, distributing products, and determining products price. All the above according to laws and regulations.

All the above departments of an entity don't work separately. They all cooperate with the top management department and whatever department is necessary in order to perform their duties and responsibilities in an effective and efficient way.

## 3.4 Kinds of biotechnology pharmaceutical companies

1. Start-up company: A start-up company is a business that outsources all or the most of its activities to a university with a technology transfer office and owns or leases either some or none of its activities. In the case that the company owns or leases some of its activities, then these activities are staffed with a few employees. Often universities share their equipment with start-ups for research purposes while technology transfer offices in universities have experts in entrepreneurship that assist businesses in this field and a vast network of professionals from the biotechnology pharmaceutical field than can cooperate with start-ups. A start-up company is a business model usually preferred from biotech pharmaceutical companies in their first steps in order to save money and acquire knowledge and network in entrepreneurship.
2. Fully integrated company: This company owns and performs all its activities in-house. The advantage of this company is that it has full control of its operations. Nevertheless, this is a very difficult business model to be achieved in real life because it demands a large portion of cash flows in order all the business functions and resources to be maintained. (Shimasaki, 2020).
3. Virtually integrated company: This company either moved to mergers and acquisitions with other biotechnology pharmaceutical companies or acquired license to produce biotechnology pharmaceutical products from other companies that were in a development stage. These companies have the ability to outsource some of their activities in order to save money and increase profits. This is a more feasible business model in real life. (Shimasaki, 2020).
4. Research Intensive Pharmaceutical Company: This company performs only research for biotechnology pharmaceutical products through R&D department in

order to discover new products and then licensees these products for production to interested biotechnology pharmaceutical companies. (Shimasaki, 2020).

5. The Drug Repositioning Company: This company aims to bring into industry abandoned drugs, approved or not for consumption from population that is able to receive the higher benefits from the drug with the fewer side-effects. (Shimasaki, 2020).
6. Companies that produce clinical diagnostics instruments: These companies have customers clinical and research laboratories. There are companies that produce clinical diagnostic instruments that might or might not work in competitor platforms.
7. Companies that produce diagnostic factors for clinical diagnostic instruments: These companies produce diagnostic factors that could be a chemical or a biomarker or a molecule and sale them to clinical and research laboratories to perform diagnostic tests. (Shimasaki, 2020).
8. Subscription companies: Companies with online platforms with useful information for biotechnology pharmaceutical companies that sell this information to interest companies for fees or royalties on products produced using this data. (Shimasaki, 2020).

## 3.5 Meaning and importance of intellectual property for biotechnology pharmaceutical companies

Intellectual property refers to legal tools that differ between countries, that biotechnology pharmaceutical companies that conduct or don't conduct research and development on biotechnology pharmaceutical products use under the advisory of IP experts to deter rival companies from copying the production of their biopharmaceutical products. In this way, they protect their innovative ideas and avoid losing profits from sales on biopharmaceutical products since they are the only authorized company that is allowed to produce them. Through intellectual property, the company has ownership of products, designs, product names, and trademarks. Intellectual property policy should be

determined before the foundation of the company according to business strategy and needs. (Elman & Zhang, 2020).

Intellectual property legal tools use also academic institutions that conduct research on biopharmaceutical products. In this case, if a biotech company wants to use such research results to produce products, then intellectual property rights on the products should be negotiated between the firm and the institution's technology transfer office.

## 3.6 Development process of drugs and vaccines

Biotechnology products come up either from research conducted by an academic institution that is used afterwards from biotechnology pharmaceutical companies, or they come up from research conducted by Research and Development department in biotechnology pharmaceutical companies. After a new drug or vaccine has been discovered, then an application should be submitted in the regulatory authorities of the country/countries that is intended the product to be sold, that describes the manufacturing process, distribution and promotion process. After the application is approved, the manufacturing process begins.

After the new product is produced in its final form, laboratory tests that examine how the product works in the human body according to drug absorption, drug distribution, drug metabolism, toxicity and side-effects are being conducted. These tests are being reviewed by regulatory authorities and if approved, then clinical trials begin to test in practice the safety and effectiveness of the new product.

Clinical trials include three phases. In phase 1, the new product is tested on healthy volunteers. In phase 2, a placebo of the new product is given to patients. A placebo is an inactive substance, a drug that doesn't contain the active ingredient, to see the therapeutic results of the product to patients. In phase 3, it is determined whether this placebo treated the patients. If phase 3 succeeds, then an application is submitted to regulatory affairs with the process and the results of all the above procedures in detail. The regulatory authorities review the application, inspect the facilities where the product has been developed, and decide whether the product will be approved.

If the product is approved, then it's available to patients. After that, regulatory authorities continue to monitor the safety and effectiveness of the new product.

## 3.7 Development process of medical devices

The development process of medical devices begins with designing the device. In this stage, the features of medical devices are being designed after taking into consideration patient needs and performance criteria requirements. Then the company sends an application to regulatory authorities of the country/region that the device will be launched to the market with all this information in order the device to be approved. If the regulatory authority approves the device, then the company moves to the next stage.

The next stage is the manufacturing of the device. The development of the device is done through the product engineering process, according to the design of the medical device that is referred to as the previous stage of the process. After the device is manufactured then it is tested by the company to ensure the safety, accuracy, and effectiveness of the device. All this information is being sent to the regulatory authority to approve the device.

If the device is approved, then it's licensed by the regulatory authority to be launched in the market and available for use from patients of this country or region.

## 3.8 Innovation trends in biotechnology pharmaceutical companies according to the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA)

IFPMA is an organization that is responsible for promoting innovation in the pharmaceutical industry, including biotechnology pharmaceutical companies at an international level. It cooperates with innovative companies all over the world and regulatory affairs of the pharmaceutical industry, to promote innovation through laws and regulations and throughout business training. Innovation trends promoted are invest in Research and Development with the use of intellectual property, open trade policies, cooperation between companies and environmental protection policies.

IFPMA prompts businesses to cooperate with respect to laws and regulations and IP rights and invest in R&D and gain ownership on produced products through intellectual property. IFPMA supports that such a move leads to the development of new or better products that benefit patients. Also, scientific and technological progress is achieved. As a result, competition is increasing, economies strengthen, and science is improved.

Environmental protection policies are also encouraged. IFPMA guides firms to embody environmental protection laws to their operations and respect animal rights during the pharmaceutical development of products. This fact leads to socially responsible businesses that gain customer trust.

Finally, IFPMA cooperates with regulatory affairs to promote open international trade policies with elimination of restrictions and tariffs for socioeconomic benefit at international level.

## 3.9 Quality management and biotechnology pharmaceutical quality system according to ICH Q10 guideline

ICH Q10 provides a harmonized model for pharmaceutical quality management and pharmaceutical quality system applicable to all pharmaceutical companies, including biotechnology pharmaceutical companies after considering regional Good Manufacturing Practice (GMP). The ICH Q10 model aims to complement or enhance these requirements. This model promotes business innovation and continual improvement that leads to the production of high-quality, accessible and effective products that meet patient needs, healthcare professional needs, and the requirements of regulatory authorities. (ICH guideline Q10 on pharmaceutical quality system, 2007).

The quality management department is responsible for quality management and implementation and monitoring of pharmaceutical quality system. Knowledge management in this department is responsible for managing products and procedures throughout the entire product lifecycle, while quality risk management is responsible for the identification and evaluation of quality risks related to products or pharmaceutical quality system and propose solutions to eliminate risks. Knowledge managers and quality

risk managers cooperate to take decisions about quality management and pharmaceutical quality system.

Quality management is the process of planning, organizing, leading and controlling business functions and resources to attain quality objectives. Planning involves decisions about quality policy according to the company's size and activities, goals, and objectives. A quality strategic plan is also determined during this stage. It involves decisions about using and coordinating resources and functions necessary for the implementation of the plan. Quality policy and quality strategic plan should be simple and easily understood. Organizing and leading involves delegating duties and responsibilities to departments and employees and give incentives for a company-wide commitment to quality for the performance of the pharmaceutical quality system. Training related to the performance of the pharmaceutical quality system is also included in this stage. Controlling involves conducting management reviews to adjust product quality and pharmaceutical quality system if the company hasn't achieved quality objectives or business goals and objectives. In this case, the whole process of quality management begins again.

The ICH Q10 Pharmaceutical Quality System aims to ensure product quality in every product lifecycle according to model goals referred to the first paragraph through the utilization of pharmaceutical quality system elements applied according to circumstances under which one is used, relative information and goals of each product lifecycle stage.

The product lifecycle consists of pharmaceutical development, technology transfer, commercial manufacturing, and product discontinuation. In the stage of pharmaceutical development investigational products take their final form in lab while the method of product development through manufacturing process has been determined. The goal is to design a product and its manufacturing process according to patient and healthcare professional needs and regulatory authorities' requirements. During technology transfer, begins the manufacturing process for commercialization of products according to the guidelines of pharmaceutical development. At this stage, it is aimed to transfer the knowledge of the manufacturing process determined in pharmaceutical development in a proper way. During commercial manufacturing ends, the manufacturing process of products while distribution to the market begins. The quality of products produced is examined, packaging, labeling and storage of products takes place while distribution of products begins. The target is to ensure quality of produced products while monitoring the

quality of products available in the market and customer satisfaction and if necessary, adjustments to be made. The last stage of the product lifecycle is product discontinuation. In this stage, the product is moved from the market while a sample of the product and relevant document is retained. Companies should also inform regulatory affairs. The goal is all these procedures to be done in an effective and efficient way. (ICH guideline Q10 on pharmaceutical quality system, 2007).

In the following information, pharmaceutical quality system elements are introduced including their purpose and application from companies according to the product lifecycle.

The Process Performance & Product Quality Monitoring System is an element that is used by companies to evaluate the quality of product and processes performance to make corrections if needed.

Quality risk management should evaluate relative information to identify deviations from quality by using tools for measurement and analysis like data management and statistic tools. Feedback from internal and external resources like customer complaints, audits, and regulatory inspections for process performance and product quality should also be used to identify deviations. Then, a new strategy should be developed with a new quality control strategy for process performance and product quality. (ICH guideline Q10 on pharmaceutical quality system, 2007).

**Table 3.1: The Process Performance & Product Quality Monitoring System in product lifecycles**

| Pharmaceutical Development | Technology Transfer | Commercial Manufacturing | Product Discontinuation |
|---|---|---|---|
| A quality control strategy is established for manufacturing according to the product development process generated from this stage. | The manufacturing process is evaluated to adjust the quality control strategy developed in pharmaceutical development. | Quality monitoring system for assessing quality of products available in the market for detecting improvement areas. | Product discontinuation activities should be implemented according to regulations while still available products should follow regulations. |

(ICH guideline Q10 on pharmaceutical quality system, 2007).

The Corrective Action/ Preventing Action (CAPA) System is used by companies to make corrective actions in the product lifecycle for preventing reasons or after receiving

complaints from customers, product rejections, deviations from quality related to products or processes or inspection findings. The corrective actions should be made according to the complaint or deviation. (ICH guideline Q10 on pharmaceutical quality system, 2007).

**Table 3.2: The Corrective Action/ Preventing Action (CAPA) System in product lifecycles**

| Pharmaceutical Development | Technology Transfer | Commercial Manufacturing | Product Discontinuation |
|---|---|---|---|
| Corrective actions should be made in the design and development process of products. | Manufacturing processes should be improved according to the corrective actions that took place in pharmaceutical development. | Product quality and performance should be improved for customer satisfaction. | The impact of discontinued product remaining in the market should be studied as well as the impact of still available products that might be affected. |

(ICH guideline Q10 on pharmaceutical quality system, 2007).

The Change Management System refers to the evaluation, approval, and implementation of managerial changes after mergers and acquisitions or changes in product ownership. It is also referred to managerial changes after implementing the corrective action/preventing action (CAPA) system. Proposed changes should be evaluated from quality risk management according to business goals and laws and regulations. After implementing a change, results should be evaluated.

**Table 3.3: The Change Management System in product lifecycles**

| Pharmaceutical Development | Technology Transfer | Commercial Manufacturing | Product Discontinuation |
|---|---|---|---|
| Managerial changes in the product development process should be documented and implemented according to the stage of pharmaceutical development. | Changes in management of technology transfer activities should be documented. | The quality unit should provide a change management system to assess and implement changes according to product quality. | After product discontinuation, changes should be evaluated by a change management system. |

(ICH guideline Q10 on pharmaceutical quality system, 2007).

The Management review of process performance and product quality is conducted to ensure process performance and product quality during the product lifecycle and take corrective actions if necessary. It can be conducted in all product lifecycle and related departments.

During this process, the results of regulatory or audit inspections should be taken into consideration and periodic quality reviews of customer satisfaction, process performance, and product quality. The achievement of quality objectives should also be measured. Changes in the business environment and goals should also be taken into account as well as managerial changes. (ICH guideline Q10 on pharmaceutical quality system, 2007).

**Table 3.4: The Management Review of process performance and product quality in product lifecycle**

| Pharmaceutical Development | Technology Transfer | Commercial Manufacturing | Product Discontinuation |
|---|---|---|---|
| Management reviews are made to ensure product quality during pharmaceutical development. | Management reviews are made to ensure that product development agrees with pharmaceutical development. | Management reviews are made to ensure product quality and customer satisfaction. | Management review should include product and quality complaints. |

(ICH guideline Q10 on pharmaceutical quality system, 2007).

## 3.10 Ethics in biotechnology pharmaceutical companies according to the Association of International Pharmaceutical Manufacturers

The Association of International Pharmaceutical Manufacturers brings together and trains international leading pharmaceutical companies, including biotechnology pharmaceutical companies, to improve science and healthcare system. This organization supports that business ethical behavior should be in accordance with socioeconomic welfare, including pharmaceutical industry welfare.

This organization supports that pharmaceutical companies should act according to their social responsibility. Social responsibility refers to obligations to patients, healthcare system, and regulatory affairs. This implies that companies should be honest by providing

accurate and real information so mutual trust can be built. Their activities should also follow legislation. Products should be patient centered. They should be produced according to patient needs, with the highest standards of safety and quality.

Finally, fair competition is promoted between companies. Fair competition refers to acting and trading using fair methods and appropriate conduct and to refrain from unfair competition and inappropriate conduct that harms the image, position, or economic status of competitors.

## 3.11 The role of management in efficiency and profitability of biotechnology pharmaceutical companies

Management helps biotechnology pharmaceutical companies to coordinate business resources and functions in an effective and efficient way in order goals and objectives to be achieved, increase profitability, and gain competitive advantage over rivals. Management help business to build a business culture dedicated to quality, innovation and ethical behavior with all interest parties working inside or outside the firm to achieve the production of safe, high-quality products that meet patient and healthcare system needs and gain customer loyalty and reliability.

# 4. Case studies of biotechnology pharmaceutical companies

## 4.1 The case study of Bayer

### 4.1.1 Short company profile

Bayer AG is one of the world's leading biotechnology pharmaceutical companies with the headquarters located in Germany. Bayer is an international company with presence in 80 countries besides Germany in regions like Asia, Europe, Middle East, Africa, U.S.A, Canada and Latin America.

Bayer produces healthcare and agricultural products. The company focuses on producing high-quality, safe, and accessible medical products that improve patients' lives and enhance people's access to quality nutrition. Through its business activity, the company aims to add value to society, economy, and environmental protection.

Healthcare products include prescription drugs for women's healthcare and drugs for cardiology, oncology, hematology and ophthalmology. In the field of radiology, the company produces diagnostics and the necessary contrast agents. Moreover, the company produces non-prescription drugs like dermatological products, nutritional, analgesics, and products for cough and cold, digestive health and allergies.

Agricultural products are focused on regenerative agriculture. Through regenerative agriculture, the company creates biological, high-quality, nutritious and resistant to environmental conditions seeds available for farmers. The company also creates biological pest management solutions. Digital tools are also created to help farmers manage their farms and sell or purchase agricultural products. Through these solutions, the company aims to help farmers optimize their productivity and reduce their environmental impact.

### 4.1.2 Governance and management structure

Bayer is a company with flatter hierarchies. This means that the company has a few managerial and employee positions all focused on consumer needs and product quality. Bayer's personnel constitute by self-managed teams with employees being responsible for carrying their own work and cooperating with others. As a result, the company is more productive and delivers faster solutions to its customers and interest parties. (Discover Dynamic Shared Ownership, 2026).

Bayer finances its operations and activities by using mainly its own capital and aims at lowering debt levels. Besides, the company retains its credibility through good assessments from international agencies like Moody's and Fitch to using debt with low interest rates. Accounting books and financial statements are done according to International Accounting Standards and International Financial Reporting Standards respectively with respect to laws and regulations.

Bayer's management structure includes independent external governance parties and internal governance parties.

Independent external governance parties include Bayer Sustainability Council, Bayer's Bioethics Council and external auditors presented as follows:

1. Bayer Sustainability Council: The Council consulates Bayer about sustainability matters and promotes cooperation between the company and related organizations. Such matters can be initiatives that the company can take to promote social, economic, and environmental welfare.

2. The Bayer Bioethics Council: The council advice Bayer on issues related to its business activity and operations and promotes acting under legal and ethical manner.

3. External auditors: The auditors provide independent and fair audits about the company's financial activities and financial statements.

Bayer's AG internal governance parties include the Board of Management, the Supervisory Board, Committees and Division Leadership, presented as follows:

1. Board of Management: It defines the business code of conduct, business strategy and performs financial management. Related to financial management activities are getting access to financial resources, allocating budgets to financial activities, and publishing financial statements. The Board of Management also informs the Supervisory Board about all the above related matters. (The Bayer AG Board of Management, 2026).

2. Supervisory Board: It forms business strategy in cooperation with the Board of Management. It also advises and oversees the Board of Management about decisions taking on matters related to their duties. (The Supervisory Board of Bayer AG, 2026).

3. Committees: They are set by the Supervisory Board. They include the Mediation Committee, the Audit Committee, the Human Resources and Compensation Committee, the Nomination Committee, the Legal Risk Committee, and the ESG Committee.

The Mediation Committee organizes and makes proposals about the Supervisory Board's meetings. Also, the Supervisory Board may delegate authorities in decision

making to the Mediation Committee about related issues in their field. (Mediation Committee / Presidial Committee, 2025).

The Audit Committee performs financial auditing to business activities, assesses the performance and effectiveness of related financial management systems, cooperates with the Supervisory Board on financial decisions and cooperates with the external auditors. (Audit Committee, 2025).

The Human Resources and Compensation Committee is responsible for compensation issues of the Board of Management and takes decisions about the Supervisory Board's and personnels compensation on behalf of the Supervisory Board. These decisions are being monitored and approved by the Supervisory Board. It also advises the Board of Management about business strategy issues. (Human Resources and Compensation Committee, 2025).

The Nomination Committee organizes the election of stockholder representatives for the Supervisory Board. It also suggests suitable candidates for the Supervisory Board according to their criteria. (Nomination Committee, 2025).

The Legal Risk Committee ensures that the Supervisory Board's and entity's activities are performed according to laws and regulations. (Legal Risk Committee, 2025).

Finally, the ESG Committee is responsible for integrating into business activity sustainability actions related to social and environmental welfare. It advises the Supervisory Board for relative decisions. (ESG Committee, 2025).

4. Division Leadership: The company has management teams in its business activities related to the agricultural and medical products that are produced.

### 4.1.3 Innovation and R & D management

The company invests on developing its in-house Research and Development focused on unmet medical needs while collaborating with other biotechnology pharmaceutical companies that invest on innovation and share the same values to increase its social impact and exchange knowledge that leads to breakthroughs. Bayer uses Intellectual Property on its R&D efforts and medical products.

The company invests also in regenerative agriculture by providing farmers with high quality, safe agricultural products that respect the environment.

Finaly, the company integrates artificial intelligence to its operations as an assisting tool of employees to perform their duties. AI ensures faster product development in compliance with business practices, laws, and regulations.

### 4.1.4 Quality, compliance and risk management

Business strategy is continuously monitored and adapted to business macroenvironment and industry environment. The company acts according to laws and regulations and according to its culture.

The company integrates to all its activities a risk and compliance management system. This system helps managers to identify and consider corresponding risks in decision making while ensuring that all decisions and operations comply with laws and regulations.

The company integrates ICH's international quality standards of products as well as Good Manufacturing Practice and Good Distribution practice. The company implements the ICH Q10 quality management system for its medical products that was referred to in the previous chapter to ensure product safety, efficacy, and quality. Good Manufacturing Practice ensures that employees are well trained to manufacture medical products while facilities are in good hygiene conditions and well equipped. This practice ensures also that products meet regulatory affairs demands. On the other hand, good distribution practice ensures that products are stored in conditions that ensure their quality, safety, and efficacy without the risk of contamination and are distributed within the scheduled time periods. For agricultural products, the company follows the Crop Science Integrated Management System that ensures that agricultural products are safe while respecting and protecting the environment.

### 4.1.5 Sustainability and ethics

The company's management is focused on promoting innovation and sustainability with the entire operating model to stay focused on the business mission.

To increase its impact on global sustainability, the company cooperates with organizations that promote sustainability like the United Nations. This helps the company to embrace its strategy of sustainability goals of such organizations.

The company acts in an ethical manner to all interest parties. The company offers employees a fair and safe working environment where all employees have equal opportunities and are assessed and given more responsibilities if necessary, according to their performance without discrimination. Moreover, harassment and retaliation are not tolerated. Bayer expects its employees to act with integrity and take decisions according to the company's best interest without taking into account personal interests. Bayer promotes regular, transparent and detailed communication with all interest parties including employees, stakeholders, customers and business partners to business related issues. Bayer fights corruption. Gifts or bribery are not accepted to influence decisions. Furthermore, the company fights against illegal trade of agricultural and medical products through cooperation with authorities, investigating and reporting such events while educating consumers on how they can avoid such products. Also, the company uses security features for its products so they can be easily distinguished from counterfeit products. The company acts with fair competition respecting rules and regulation of international and insider trading. Bayer respects data privacy and uses technical measures to protect data while training employees for related issues. Employees should keep their passwords secret and prevent damage, theft or loss of their devices. If this happens, it must be reported that the company can take protective measures to ensure data privacy. Data is being processed according to laws and regulations and only for business purposes. Such purposes can be handling issues related to product quality, managing customer complaints, and/or answering inquiries, delivering products, and improving services through customers' feedback or call recording. When relative information is published, personal information is removed.

Finally, the company respects and protects the environment according to laws and regulations. The company integrates in its operations systems that aim to reduce Greenhouse gas emissions and minimize water usage while managing disposals according to environmental laws. Also, the company uses recycling materials and protects biodiversity through responsible use of natural resources.

### 4.1.6 SWOT analysis

SWOT analysis evaluates business for its internal strengths and weaknesses, and opportunities and threats from business external environment.

Bayer's strengths rely on its successful brand name and its investment in innovation. Through its entire year of operation, the company has gained consumer trust through its high-quality and safe product that meets unmet medical needs. Moreover, through sustainability that is in core of its business activity, the firm has a positive socioeconomic impact globally that makes it a trustworthy brand and a reliable partner that adds value to all interest parties.

The company's weaknesses rely on high costs of investments in Research and Development. Also, the technology used for data privacy and equipment used for environmental protection purposes may imply high costs too.

Opportunities for the company arise from its product portfolio. Entrepreneurial and social turnover to eco-friendly solutions and healthy eating gives perspectives for increased demand in the company's agricultural products, a fact that boosts firm's profitability in the future. Also, the extent of people's life average will increase further in the future aging population that will have medical needs. A fact that ensures increased demand for the company's medical products.

Threats in business external environment are detected in competition, legal and technological environment. Biotechnology pharmaceutical is an industry with positive future perspectives, and new competitors are expected to enter the market in the future. This may lead to aggressive marketing and pricing strategies that may impact a firm's financial position. Also, the firm will have to invest more on R&D to bring to the market more breakthroughs superior from competitor's products to fight competition and remain one of the leading biotechnology pharmaceutical companies. A fact that will increase costs too. Moreover, it is anticipated that regulatory changes will become more stringent. This might result in the fact that in the future some of the business products might be out of the market due to legal restrictions which may impact negatively the firm's financial position. Also, technological advances in a firm's operations might be complicated and difficult to follow. Also, they might have a higher cost.

In conclusion firm's weaknesses and threats are not strong enough to alter firm's market position as one of the leading pharmaceutical companies due to the fact that the company has a powerful know-how, qualified employees and good financial management that are sufficient to use its opportunities and combat threats and weaknesses.

### 4.1.7 Analysis of Consolidated Financial Statements of Bayer AG and its subsidiaries (Bayer Group)

The financial statements were prepared according to the IFRS Accounting Standards. (Bayer Annual Report, 2025).

"*Except where otherwise indicated, amounts are stated in millions of euros (€ million) and rounded to the nearest million. Adding the individual figures may therefore not always result in the exact total given."* (Bayer Annual Report, 2025, pp. 271).

1. Income Statement: The Income Statement presents income using the accrual basis, which means that it contains non-cash expenses like depreciation, and revenues and expenses not yet collected and paid respectively. The income statement doesn't give a clear picture of actual cash flows and therefore doesn't present the real business income based on actual cash flows like the Statement of Cash Flows.

Selling expenses, research and development expenses, and general administration expenses are referred to the main business activity, which is the production of health care and agricultural products.

Other operating income/expenses are referred to income, expenses, gains, and losses that come from business secondary activities. These activities might be assets disposals, changes in firm's intangible assets, and changes in financial assets.

EBIT refers to operating income. It's negative and indicates a loss.

Financial Result comes from financial income and expenses related to financial activities. These activities might concern Bayer AG and subsidiaries or investments related to business partners (Equity-method income).

Income taxes are referred to the total amount of taxes that Bayer AG and Bayer Group (subsidiaries) paid to the countries in which they operate.

Income after income taxes is negative which means that there's a loss but not due to cash inflows and outflows but due to non-cash expenses like depreciation, and revenues and expenses not yet collected and paid respectively. As we move forward, we will see that in the Statement of Cash Flows Bayer and its subsidiaries have profit due to actual cash inflows and outflows, which is the actual picture of its income.

Net income attributable to Bayer AG stockholders is negative. A fact that indicates that the loss of income after income taxes is attributable to them. Income after income taxes of which attributable to noncontrolling interest is referred to the amount paid to subsidiaries.

Earnings per share are negative and indicate a loss due to a loss in income after income taxes.

2. Statement of Financial Position: Noncurrent assets are referred to as assets held for long term use. From the information above, these are tangible and intangible assets, financial assets, and transactions related to these assets.

Current assets are business assets expected to convert into cash during the accounting cycle. These can be revenues related to business primary activity, revenues from firm's financial assets (other financial assets) revenues from assets sale within the accounting cycle, and income tax refunds.

Equity refers to capital earnings from business activities.

Noncurrent liabilities are long-term liabilities expected to be settled after the time period of an accounting cycle. These can be financial obligations related to employees (provisions for pensions and other post-employment benefits), financial obligations related to environmental protection (other provisions), contract and refund liabilities related to firm's primary activities, financial obligations and tax obligations.

Current liabilities are short-term liabilities expected to be settled during the accounting cycle. These are firm's obligations similar to noncurrent liabilities.

3. Statement of Changes in Equity: After taking into consideration the Statement of Financial Position and comparing Equity data with the data in the Statement of Changes in Equity, we observe that the accounting value (Par Value) of entity's stocks (Capital Stock) available for sale to investors remains constant between years 2024 and 2025 at € million 2,515. Moreover, the capital generated from financial transactions concerning noncurrent assets (Capital reserves) which is held for financing long-term obligations remains constant between 2024 and 2025. Which means that no related financial transactions took place during this period. A fact that is due to a loss in net cash from investing activities that concern noncurrent assets as it is presented in the Statement of Cash Flows.

In the statement of financial position there's a decrease in other reserves from € million 11,132 in 2024 to 5,171 in 2025. After taking into consideration the Statement of Changes in Equity, it is concluded that this is due to a decrease in Retained Earnings from 9,876 in 2024 to 6,726 in 2025. This means that the amount of operational profit held for reinvest in short-term liabilities and outstanding long-term liabilities is less in 2025. Also, this is due to losses from exchange differences occurred from translation of foreign currencies in transactions to the firm's currency. There's also a decrease in the market value of shares (Fair-value measurement of equity instruments) from 16 in 2024 to 6 in 2025. All the above are the reasons why total Equity decreased from 2024 € million 32,045 to € million 26,063 in 2025.

Finaly, we observe that the company has good hedging management due to an increase in cash flow hedges from € million 8 in 2024 to € million 73 in 2025. This means that the company closes good pricing deals in derivative contracts for assets purchases and is well protected from unexpected future costs that would lower equity value.

4. Statement of Cash Flows: The Cash Flow Statement shows the real amount of cash inflows and outflows not calculated on an accrual basis like the Income Statement. The Cash Flow Statement shows cash inflows and outflows from operating activities, investing activities, and financing activities. Operating activities include Net income as in Income Statement, depreciation, gains (losses) on disposal of noncurrent assets, and cash inflows and outflows from current assets and short-term liabilities. Investing activities represent

cash inflows and outflows from acquisition and disposal of long-term assets. Finally, Financing activities include cash inflows and outflows from activities that alter the equity capital and the firm's borrowing structure, like long-term debt, short-term debt, common and preferred stock.

Net cash from operating activities reduced in 2025 from € million 7,368 in 2024 to 5,930 in 2025. This is mainly due to an increase in loss in income after income taxes, cash outflows due to income taxes paid, increase in trade accounts receivable, and cash outflows from accounts payable.

Net cash from investing activities reduced in 2025 to € million – 1,270 from € million 164 that were in 2024. This is mainly due to cash outflows for additions in long-term assets, financial expenses for noncurrent financial assets, and expenses related to acquisition of long-term assets.

The loss in Net cash from financing activities reduced in 2025 to -€ million 3,884 from -€million 7,178 in 2024. This is mainly due to a decrease in dividend payments, and reduced financial expenses related to swaps.

The Change in cash and cash equivalents due to business activities represents the increase in net cash flows from all the activities for the years 2024 and 2025. Net cash flows for 2025 have been increased related to 2024. This is due to the decrease in loss in net cash from financing activities.

### 4.1.8 Ratio analysis of the Consolidated Financial Statements of Bayer AG and its subsidiaries (Bayer Group)

The ratio analysis is based on liquidity ratios, financial structure and viability ratios, activity ratios, and profitability ratios.

1. Liquidity Ratios: These ratios indicate whether the firm can manage its short-term liabilities by using its cash inflows from current assets.

*Current Ratio = Current Assets / Short-term liabilities* = 32.911.000 / 32.585.000 = 1,0100046 ≈ 1,01 > 1

The above result indicates that the firm can pay out its short-term liabilities by using cash inflows from current assets.

*Acid-test Ratio = (Current assets – Inventory) / Short-term liabilities =*

= (32.911.000 - 12.378.000) / 32.585.000 = 20.533.000 / 32.585.000 = 0,6301365 ≈ 0,63

The above result shows that the firm can't pay its short-term liabilities by using current assets that can be quickly liquidated. After taking into consideration the Current Ratio result, it is concluded that the firm can pay its short-term liabilities by using cash flows generated from its current assets but in a not immediate way since its current assets that can be easily liquidated are not sufficient to cover its short-term liabilities.

*Net Working Capital = Current Assets – Current Liabilities* = 32.911.000 - 32.585.000 =

= 326.000. This indicates that current assets with such value are financed by long term creditors. To be more specific, the percentage of current assets financed by long-term creditors equals with:

*Percentage of current assets financed by long-term creditors= Net Working Capital / Current Assets* = (326.000 / 32.911.000) × 100 = 0,0099055 × 100 = 0,99055 % ≈ 0,99 %. It is a small percentage that indicates that the firm doesn't depend too much on long-term debt to finance its current assets.

*Cash Ratio = Cash / Short-term Liabilities* = 6.671.000 / 32.585.000 = 0,204726101 ≈ 0,20 indicates that cash is insufficient to cover short-term liabilities.

2. Financial structure and viability ratios: These ratios indicate whether a firm can manage its long-term liabilities. They are also used to assess the firm's credibility, which refers to the firm's capacity to take long-term loans in favorable terms.

*Debt to Owner's Equity Ratio = Total liabilities / Owner's equity* =
= (45.893.000 + 32.585.000) / 25.947.000 = 78.478.000 / 25.947.000 = 3,024550044 ≈ 3,02
The above result indicates that the owner's equity isn't sufficient to cover long-term liabilities. As a result, the firm relies on long-term debt to pay its long-term liabilities.

*Owner's Equity to Total Assets = Owner's equity / Total assets* = 25.947.000 / 104.541.000 = 0,248199271 ≈ 0,25
The result indicates that the firm finances its operations mainly with borrowed funds. Only 25% of its operations are financed with equity.

*Fixed Assets to long-term Liabilities Ratio = Non-current Assets / Long-term Liabilities =*

= 71.630.000 / 45.893.000 = 1,5608044 ≈ 1,56
The result indicates that the firm doesn't depend too much on long-term creditors to finance fixed assets.

*Times Interest Earned = Operating profit / Interest and related expenses* =
= -1.077.000 / 2.559.000 = -0,420867526 indicates that the firm isn't credible and also that the firm is unable to cover its financial costs through operating profit.

3. Activity Ratios: These ratios indicate how fast current assets are cycled through sales and turned into cash inflows and how fast the firm pays for its short-term liabilities. It also measures the firm's effectiveness in optimizing its assets.

*Inventory Turnover Ratio = Cost of Goods Sold / Average Inventory* =
= 18.797.000 / [(12.378.000 + 13.467.000) / 2] = 18.797.000 / 12.922.500 = 1,454594699 ≈ 1,45. The results show that inventories are produced and sold fast during the accounting period. Inventories don't stay for a long time in the warehouse.

The days that inventories stay in the warehouse during the accounting cycle equal with:
*Days of stock in inventory = 365 / Inventory Turnover Ratio* = 365 / 1,454594699 =250,9290046 ≈ 250 days.

*Receivables Turnover Ratio = Sales / Average Receivables* = 45.575.000 / [(9.077.000 + 8.966.000) / 2] = 45.575.000 / 9.021.500 = 5,051820651≈ 5,05. It shows that accounts receivable is fast turned into cash during the accounting period.

The days required are equal to: Days Sales Outstanding = 365 / Receivables Turnover Ratio = 365 / 5,051820651 = 72,25117937 ≈ 72 days.

*Accounts Payable Turnover Ratio = Cost of Goods Sold / Short-term liabilities* =
= 18.797.000 / 32.585.000 = 0,576860519 ≈ 0,58. It indicates that the firm faces difficulties in paying off suppliers within the accounting cycle.

The days required are equal to: *Days ST Payables Outstanding = 365 / Short-term Liabilities Turnover Ratio* = 365 / 0,576860519 = 632,7352765 ≈ 632 days.

*Assets Turnover Ratio = Sales / Average Assets* = 45.575.000 / [(104.541.000 + 110.850.000) / 2] = 45.575.000 / 107.695.500 = 0,423183884 ≈ 0,42. The result indicates that the firm doesn't manage effectively its assets to achieve profits.

*Cash Conversion Cycle = Days Inventory Outstanding + Days Sales Outstanding – Days Payables Outstanding* = 250,9290046 + 72,25117937 – 632,7352765 = -309,5550916 indicates that the firm has a short Cash Conversion Cycle which means that quickly converts into cash resources from sales.

4. Profitability Ratios: Profitability Ratios include Gross Profit Margin, Net Profit Margin, Return on Assets, and Return on Equity. They are indicators of the firm's profitability and overall management efficiency. Due to a loss in net income after income taxes, Net Profit

Margin, Return on Assets and Return on Equity are negative. A fact that shows a loss and no return of Net income to assets and equity capital.

*Gross Profit Margin = 100 × (Gross Profit / Sales)* = 100 × (26.778.000 / 45.575.000) = 100 × 0,587558969 = 58,75 %, is businesses' gross profit from sales.

5. Investment Ratios: They indicate the firm's performance within the stock market.

According to Bayer Group Consolidated Income Statement, Earnings Per Share are negative due to a loss in net income attributable to Bayer AG stockholders. This fact leads in general to negative Investment Ratios which means bad performance in the stock market. It also shows that the firm has a bad reputation for investors as it is considered non-profitable.

### 4.1.9 Bayer's financial performance summary

According to the Statement of Cash Flows that shows actual cash movement, it is concluded that Bayer is a profitable company with increased profitability from 2024 to 2025 of € million 6,191 to € million 6,671 respectively, although it has loss in income after income taxes in the Income Statement. This is because in Income Statement income is presented by using the accrual basis, which means that it contains non-cash expenses like depreciation, and revenues and expenses not yet collected and paid respectively.

The ratio analysis shows that the firm can settle its short-term liabilities by using cash inflows from current assets and doesn't depend too much on long-term debt to finance its current assets. All the above indicate good financial management of current assets and short-term liabilities.

The firm lacks on financial management related to operations and long-term liabilities according to Owner's Equity to Total Assets Ratio and Debt to Owner's Equity Ratio since it depends too much on using long-term debt for financing rather than using own capital.

According to Activity Ratios, the firm has good sales management according to Inventory Turnover Ratio and Receivables Turnover Ratio. But the firm has difficulties in paying off suppliers according to Accounts Payable Turnover Ratio and doesn't utilize its assets related to production activities in an efficient way to achieve profits according to Assets Turnover Ratio.

Finally, according to investment ratios it comes up that the firm has a bad performance in the stock market and a bad reputation for investors.

### 4.1.10 Key management insights

The entire business model of Bayer is focused on sustainability that means adding value to society, economy and environmental protection through business activity, integrity, and the production of high-quality, innovative, safe and accessible healthcare and agricultural products.

Business strategy is continuously monitored and adapted to business macroenvironment and industry environment, after taking into consideration related risks and opportunities assessed by the risk management department. The company has also a separate managerial department for agricultural products. Also, the company has a compliance management department to ensure its operations comply with laws and regulations. AI is integrated to all operations as an assisting tool for employees for effective and faster job performance. The firm also integrates in its operations eco- friendly environmental management resources systems.

Company's management structure is based on flatter hierarchies. This means that the company has a few managerial and employee positions all focused on consumer needs and product quality. Bayer's personnel constitute by self-managed teams with employees being responsible for carrying their own work and cooperating with others.

The firm is subjected to international laws and regulations like ICH guidelines. ICH Q10 quality management guideline, Good Manufacturing Practice, and Good Distribution Practice are some of the regulations applied in biopharmaceutical products. Bayer finances its operations and activities by using mainly its own capital and aims at lowering debt levels. Besides, the company retains its credibility through assessments from international agencies like Moody's and Fitch to using debt with low interest rates. Accounting books and financial statements are prepared according to IAS and IFRS respectively.

The company invests on its in-house R & D development for biopharmaceutical products. It also collaborates with other biotechnology pharmaceutical companies that share the same values to exchange knowledge, meet unmet medical needs and optimize results.

Finaly the company acts with integrity among all interest parties. The company has external independent governance parties that consulate managers on issues related to bioethics and sustainability. External independent auditors are also included. The company does not tolerate bribery or gifts to affect decisions in the wrong way. Data are also used only for business purposes and personal information is being protected and not given to public. Bayer also provides to employees with an equal-opportunity and safe working environment where harassment and discrimination has no place.

## 4.2 The case study of Roche

### 4.2.1 Short company profile

Roche is a Swiss company with presence in more than 70 countries located in U.S.A, Europe, Africa, Asia, Australia and Middle East.

Roche focuses on producing healthcare products and diagnostics. The company focuses on producing high-quality, safe, and accessible medical products that improve patients' lives. Through its diagnostic solutions, the company aims to produce high-quality and innovative diagnostics that provide results in a highly efficient manner that help patients and doctors make correct decisions. Through its business activity, the company aims to add value to society, economy, and environmental protection.

The company produces a wide range of medical products for various diseases like anemia, cancer, dermatological problems, infectious diseases, inflammatory and autoimmune diseases, neurological disorders, ophthalmology, respiratory disorders and transplantation. (Roche Pharma solutions, 2026).

The company produces also diagnostic solutions for laboratories, doctors and patients. These diagnostic solutions involve In-vitro test (diagnostic agents) and instruments used by laboratories and doctors. Most of the company's in-vitro tests have been manufactured to work only with the company's instruments. Roche develops the above products either by itself or in cooperation with external partners. Instruments are fully automatic, a fact that reduces error potential and gives the ability to deliver high-quality results that help doctors make correct decisions about patients. Digital diagnostic solutions are also produced to be used by patients to monitor their health condition and take decisions. (Diagnostic solutions, 2026).

### 4.2.2 Governance and management structure

The company's management team consists of the Board of Directors, the Board of Committees and the Corporate's Executive Committee. All meet on an annual basis to make decisions about matters related to the company's issue

The Board of Directors are business owners (shareholders). Most of them, above 50%, are independent members of the company, a fact that means that they do not have other professional relationships with the company and they do not have also any familiar relationship with other company members. Their performance is assessed by themselves or by third parties via electronic survey 2-3 times a year. The Board of Directors is responsible for overall business management, including short-term and long-term decisions. Short-term and medium-term decisions are taken in cooperation with the Corporate Executive Committee that deals only with such decisions. The Corporate Executive Committee is appointed and monitored by the Board of Directors. The Corporate Executive Committee deals with global product development issues related to diagnostics and pharmaceuticals, corporate strategy and sustainability issues, financial decisions, and decisions related to human resources management. Assistants in decision making of the Board of Directors are the Board Committees. The Board of Committees consists of the Nomination Committee of the Board of Directors, the Remuneration Committee, the Corporate Governance and Sustainability Committee, and the Audit Committee. The Nomination Committee of the Board of Directors helps the Board of Directors in decision making and monitors implementation of decisions. It is also responsible for the replacement and evaluation of candidates for the overall managerial team. It also makes proposals about suitable candidates for the managerial team to the Board of Directors. The Remuneration Committee is responsible for the compensation of the overall management team and the rest of the employees. The Corporate Governance and Sustainability Committee is responsible for decision making and reporting issues related to sustainability policy. Such matters concern business strategy and actions that add value to society, economy, and environmental protection. It is also responsible for risk management for specific issues delegated by the Board of Directors. Finally, the Audit Committee is responsible for the supervision and approval of financial decisions and accounting systems. It is also responsible for risk management in related fields.

### 4.2.3 Innovation and R & D management

The company invests in R&D to promote scientific research that assists in scientific evolution through new useful findings. The company invests on developing its in-house Research and Development focused on unmet medical needs while collaborating with other biotechnology pharmaceutical companies that invest on innovation and share the same values to increase its social impact and exchange knowledge that leads to breakthroughs. Roche utilizes Intellectual Property to safeguard its valuable assets like R&D results and products from inappropriate use of competitors. In this way, it also retains its profitability from product sales.

Finaly, the company integrates artificial intelligence to its operations as an assisting tool of employees to perform their duties. AI ensures faster product development in compliance with business practices, laws, and regulations.

### 4.2.4 Quality, compliance and risk management

The production of drugs and diagnostics is based on international standards like ICH guidelines. Such guidelines refer to Good Clinical Practice (GCP), and Good Manufacturing Practice (GMP). Good Clinical Practice is referred to the implementation process of clinical trials on humans. This process has been described on the previous chapter on the part that refers to the development process of drugs and vaccines. Besides this information, ICH also refers that clinical trials should be conducted under ethical principles that would ensure the safety of volunteers and the quality of results. The process of clinical trials and quality management should be clearly documented before implemented, and records of the results of clinical trials should be kept. Good Manufacturing Practice ensures that employees are well trained to manufacture medical products while facilities are in good hygiene conditions and well equipped. This practice ensures also that products meet regulatory affairs demands. On the other hand, good distribution practice ensures that products are stored in conditions that ensure their quality, safety, and efficacy without the risk of contamination and are distributed within the scheduled time periods. Products are also being monitored after launched in the market as far as their safety and efficacy is concerned with adverse events and product complaints to be reported followed the ICH Q10 quality management process. Training to healthcare professionals is being provided as far as products are concerned. They are also informed about the company's R&D results.

Roche evaluates data privacy. The company uses data only for operating reasons and regulatory obligations according to laws and regulations related to data privacy. Employees that either work or have stopped working for Roche should keep the company's data private and not reveal information to competitors. If an employee starts working for Roche, he is not permitted to reveal private information about the company that was working previously. The company also takes technical measures to protect data. Electronic tools used for communication should be assessed and authorized by the company before they are used. Each employee is also responsible for data safety by keeping secret passwords and protecting devices from loss. If this happens, it must be immediately reported to take measures for data protection.

The company also has a comprehensive and compliance management department where deviations from the already values are being referred for corrective actions to be taken. This department has also a consultant role in related issues and guides employees to act according to the business code of conduct.

### 4.2.5 Sustainability and ethics

Retaining the firm's good reputation and acting in a sustainable manner are core elements of Roches' business strategy. This means creating a business strategy and acting to create value for all interest parties. Managers and employees are trained constantly in related issues, and all operations act in accordance with these elements.

Retaining a good reputation means acting with high ethical standards and integrity according to international standards and local regulations for business activity and international trade (support fair competition). Integrity also means no toleration in bribery and improper advantages that will affect business decisions in a wrong way and taking decisions based on Roche's interest and not based on personal interests. It is also necessary to create value for patients and healthcare system and build a relationship of mutual trust based on transparent and consistent communication with all interest parties including patients, physicians, regulatory authorities, and stockholders. Roche is focused on the production of high-quality, safe, accessible drugs and diagnostics that meet patients' unmet

needs. Over all the years of its operation, the firm is consistent in acting like this and has gained trust from the market. This is how firms' good reputation has been built over the years.

The company sustainability strategy is focused on creating value for patients, the healthcare system, stockholders, economy, and environmental protection. Besides its high-quality and accessible products, the company follows laws related to tax payment and pays its taxes on time. Also, the company follows laws and regulations related to accounting and reporting issues and informs in a timely manner stockholders and debt investors about its financial position by providing true and accurate data. Furthermore, the company acts with respect to laws related to environmental protection and integrates in its operations systems that reduce resources consumption, limit gas emissions, and manage waste in an eco-friendly way that avoids pollution.

Roche expects employees and business partners to share the same values related to business activity and conduct. Roche is a company where discrimination and harassment are not tolerated. Employees and business partners are evaluated according to their performance. The company also has a secure working environment that protects the safety of employees.

### 4.2.6 SWOT analysis

SWOT analysis evaluates business for its internal strengths and weaknesses, and opportunities and threats from business external environment.

Roche's strengths rely on its successful brand name and its investment in innovation and Research and Development. Through its entire year of operation, the company has gained consumer trust through its high-quality and safe product that meets unmet medical needs. Moreover, through sustainability that is in core of its business activity, the firm has a positive socioeconomic impact globally that makes it a trustworthy brand and a reliable partner that adds value to all interest parties.

The company's weaknesses rely on high costs of investments in Research and Development. Also, facilities for environmental protection purposes may imply high costs too.

Opportunities for the company arise from its product portfolio. Its high quality and effective diagnostic solutions with in-vitro tests that work only with the company's instruments give the ability to create constant clientele. Also, the extent of people's life average will increase further in the future aging population that will have medical needs. A fact that ensures increased demand for the company's medical products.

Threats in business external environment are detected in competition, legal and technological environment. Biotechnology pharmaceutical is an industry with positive future perspectives, and new competitors are expected to enter the market in the future. This may lead to aggressive marketing and pricing strategies that may impact a firm's financial position. Also, the firm will have to invest more on R&D to bring to the market more breakthroughs superior from competitor's products to fight competition and remain one of the leading biotechnology pharmaceutical companies. A fact that will increase costs too. Moreover, it is anticipated that regulatory changes will become more stringent. This might result in the fact that in the future some of the business products might be out of the market due to legal restrictions which may impact negatively the firm's financial position. Also, technological advances in a firm's operations might be complicated and difficult to follow. Also, they might have a higher cost.

In conclusion firm's weaknesses and threats are not strong enough to alter firm's market position as one of the leading pharmaceutical companies due to the fact that the company has a powerful know-how, qualified employees and good financial management that are sufficient to use its opportunities and combat threats and weaknesses.

### 4.2.7 Analysis of Consolidated Financial Statements of Roche and its subsidiaries (Roche Group)

Roche's Group Consolidated Financial Statements have been made using the International Financial Reporting Standards (IFRS). (Finance Report 2025).

1. Roche Group Income Statement: The firm's revenue comes from its sales on pharmaceuticals and diagnostics that the firm produces (Sales) and revenue from leasing agreements with other companies or royalty revenues that come from the sale of technology to other companies (Other revenue). According to the Finance Report 2025, for 2025 for the pharmaceuticals division sales were CHF millions 47.669 and other revenue was CHF million 1.782. For the same year, for the diagnostics division, sales were CHF million 13.847 and other revenue was CHF million 58. For 2024 for the pharmaceuticals division sales were CHF million 46.171 and other revenue was CHF million 1.871. For diagnostics, sales were CHF million 14.324 and other revenue CHF million 29. Increased revenues are observed in the department of pharmaceuticals while in the diagnostics department there's a decrease only in other revenue. This income doesn't represent actual cash inflows. Instead, it is calculated on an accrual basis for each year. As it is for all the other income presented in the income statement.

Operating profit represents income after taking into consideration operating expenses from the firm's primary activity (sales, other revenue for pharmaceuticals and diagnostics) and operating income and expenses from secondary activities. This is presented as other operating income (expense) while operating expenses from the firm's primary activity are research and development costs and selling, general and administrative expenses.

Financing costs refer to expenses derived from firm's primary and secondary operating activity. Income taxes represent the total amount of taxes paid by the group in all countries where the firm operates. Net income attributable to Roche shareholders is referred to the amount of profit attributed to the shareholders of Roche Holding Ltd (mother company), while net income attributable to non-controlling interests is referred to the amount of profit attributed to subsidiaries. Also, there is an increase in EPS from 2024 to 2025 which means that the company's profits of shares have increased.

2. Roche Group Balance Sheet: The balance sheet represents the value of non-current assets, current assets, non-current liabilities, current liabilities, and equity. Non-current assets represent fixed assets used for operations, including tangible assets and intangible assets. These assets are held for long term use. Current assets include financial assets and in general assets expected to be converted into cash within one accounting cycle such as inventories, accounts receivable related to production and sales of pharmaceuticals and diagnostics. Non-current liabilities are expected to be settled in a time that exceeds one accounting cycle. Such liabilities can be long-term debt, lease, employee, and legal provisions. On the contrary, current liabilities are expected to be settled within one accounting cycle. They are also referred as short-term liabilities. These can be income tax liabilities, short-term debt, etc. Equity is referred to as the total equity capital attributed to the parent company (Roche shareholders) and to subsidiaries (non-controlling interest).

3. Roche Group Statement of Changes in Equity: There's an increase in total equity attributable to the parent company from 2024 to 2025 from CHF million 36.161 to CHF million 37.880 respectively while there's a slight decrease in equity attributable to subsidiaries (non-controlling interests). We observe that the accounting value (Par Value) of entity stocks (Share capital) available for sale to investors remains constant between years 2024 and 2025 at CHF million 107. The amount of operational profit held for reinvest in short-term liabilities and outstanding long-term liabilities (Retained earnings has increased from 2024 to 2025 from CHF million 43.842 to CHF million 48.837. This might imply a higher profit from operations. There's a loss in the value of the firm's financial assets from 2024 to 2025 from CHF million –28 to CHF million – 187. Also, the company has a bad hedging management due to a loss in hedging reserves from CHF million -41 in 2024 to CHF million -131 in 2025. This means that the company doesn't close good pricing deals in derivative contracts for assets purchases. Losses from exchange rates (translation reserves) have also increased in 2025.

4. Roche Group Statement of Cash Flows: The Cash Flow Statement shows the real amount of cash inflows and outflows not calculated on an accrual basis like the Income Statement. The Cash Flow Statement shows cash inflows and outflows from operating activities, investing activities, and financing activities. Operating activities include Net income as in Income Statement, depreciation, gains (losses) on disposal of noncurrent assets, and cash inflows and outflows from current assets and short-term liabilities. Investing activities represent cash inflows and outflows from acquisition and disposal of long-term assets. Finally, Financing activities include cash inflows and outflows from activities that alter the equity capital and the firm's borrowing structure, like long-term debt, short-term debt, common and preferred stock.

Cash flows from operating activities in the above statement include cash flows from primary (cash generated from operations) and secondary business activities (other operating cash flows), income taxes paid, legal, employee and restructing provisions, pensions and post-employment benefit plans, and assets financed by long-term creditors and shareholders (net working capital). There's a decrease in total income from operating activities from 2024 to 2025. This is mainly due to the increase in net working capital and utilization of provisions.

Cash flows from investing activities in the above statement besides cash inflows from acquisition and disposal of long-term assets also include the value of acquisition and disposal of intangible assets, the value of mergers and acquisitions (Business combinations), divestment of subsidiaries, and cash inflows and outflows of financial assets like interest income, debt securities etc. There's a minimization in the total cash flows (loss) from investing activities from 2024 to 2025. This is mainly due to business combinations, minimization of disposal of products, minimization of divestment of net assets previously held for sale, and minimization of income from financial assets.

Cash flows from financing activities besides of cash inflows and outflows from activities that alter the equity capital and the firm's borrowing structure, like long-term debt, and issue of bonds include also hedging arrangements, interest, lease and dividends paid. There's an increase in loss of total cash flows from financing activities from 2024 to 2025. This is mainly due to an increase in the loss of repurchase of bonds and notes, hedging and collateral arrangements, interest paid, and dividends paid.

After taking into consideration cash in the beginning of each year of 2024 and 2025 and the annual cash flows from all the above activities (Increase (decrease) in cash and cash equivalents) and after deductions due to loss in exchange rates (net effect of currency

translation on cash and cash equivalents) there's a decrease in the total amount of cash flows from 2024 to 2025 (Cash and cash equivalents at 31 December).

### 4.2.8 Ratio analysis of Roche Group

1. Liquidity Ratios: They assess whether a firm can meet its short-term liabilities.

*Current Ratio = Current assets / Short-term liabilities* = 38.729.000 / 28.001.000 = = 1,2831291 ≈ 1,28 indicates that in general the group can pay off its short-term liabilities through income from its current assets.

*Net Working Capital = Current assets – Current liabilities* = 38.729.000 - 28.001.000 = = 10.728.000 indicates the amount of current assets financed by shareholders and long-term creditors. Not financed by short-term creditors.

*Percentage of Net Working Capital = (Net Working Capital / Current assets) × 100* = = (10.728.000 / 38.729.000) × 100 = 0,2770017 × 100 ≈ 27,7%

*Acid-test Ratio = (Current assets – Inventory) / Short-term liabilities* = (38.729.000 - 7.479.000) / 28.001.000 = 31.250.000 / 28.001.000 = 1,1160315 ≈ 1,12 indicates that the firm can immediately pay of its short-term liabilities through current assets that can be easily liquidated.

*Cash Ratio = Cash / Short-term Liabilities* = 5.582.000 / 28.001.000 = 0,199350023 ≈ 0,20 indicates that cash is insufficient to settle its short-term liabilities

2. Financial Structure and Viability Ratios: Indicate whether the firm can meet its long-term liabilities. They also assess the firm's credibility.

*Debt to Owner's Equity Ratio = Total liabilities / Owner's Equity* = 62.823.000 / 33.802.000 = 1,858558665 ≈ 1,86 indicates that the firm depends on debt capital to finance its total liabilities (short-term and long-term).

*Owner's Equity to Total Assets Ratio = Owner's Equity / Total Assets* = 33.802.000 / 100.703.000 = 0,335660308 ≈ 0,34 indicates that the firm uses external funds to finance operations.

*Fixed Assets to LT Liabilities Ratio = Non-current Assets / Long-term Liabilities* = = 61.974.000 / 34.822.000 = 1,7797369 ≈ 1,78 indicates that the firm doesn't use debt capital to finance its fixed assets.

*Times Interest Earned = Operating profit / Interest and related expenses* = = 18.476.000 / 1.503.000 = 12,29274783 ≈ 12,29 indicates that the firm enjoys high protection by creditors while also being able to cover its financial costs through operating profit.

3. Activity Ratios: They are indicators of sales and production effective management. They also indicate whether the firm can pay off its suppliers.

*Inventory Turnover Ratio = Cost of Goods Sold / Average Inventory* =
= 16.645.000 / [(7.479.000 + 7.606.000) / 2] = 16.645.000 / 7.542.500 = 2,2068279 ≈ 2.21
Indicates that the stock doesn't remain for a long time in the warehouse. It is sold quickly.

*Days of stock in inventory = 365 / Inventory Turnover Ratio* = 365 / 2,2068279 = 165,39577 indicates that the stock remains in the warehouse for about 165 days.

*Receivables Turnover Ratio = Sales / Average Receivables* = 61.516.000 / [(11.506.000 + 11.297.000) /2] = 61.516.000 / 11.401.500 = 5,3954304 ≈ 5,39 indicates that accounts receivable is quickly turned into cash inflows for the business.

*Days Sales Outstanding = 365 / Receivables Turnover Ratio* = 365 / 5,3954304 = 67,649839 indicates that accounts receivable is converted into cash inflows at about 67 days.

*Accounts Payable Turnover Ratio = Cost of Goods Sold / Short-term liabilities* =
= 16.645.000 / 28.001.000 = 0,594443 indicates that the company faces difficulty in paying off its suppliers within an accounting cycle.

*Days (ST) Payables Outstanding = 365 / Accounts Payable Turnover Ratio* = 365 / 0,594443 = 614,02018 indicates that about 614 days are required for the firm to settle its liabilities to suppliers.

*Cash Conversion Cycle = Days Inventory Outstanding + Days Sales Outstanding – Days Payables Outstanding* = 165,39577 + 67,649839 - 614,02018 = -300,97745710. It's a short cycle that indicates that the company Fastly converts into cash sales resources.

*Assets Turnover Ratio = Sales / Average Assets* = 61.516.000 / [(100.703.000 + 101.801.000) / 2] = 61.516.000 / 101.252.000 = 0,607553431 ≈ 0,61 indicates inefficient use of assets to achieve profits.

4.Profitability Ratios: They are indicators of the firm's profitability and overall efficiency of its management.

*Gross Profit Margin = 100 × (Gross Profit / Sales)* = 100 × (44.871.000 / 61.516.000) =
= 100 × 0,7294199 = 72,94199 % ≈ 72,94% is the percentage of gross profit achieved by sales.

*Net Profit Margin = 100 × (Net Profit / Sales)* = 100 × (13.799.000 / 61.516.000) =
=100 × 0,2243156 = 22,43156% ≈ 22,43% is the percentage of net profit achieved by sales.

*Return on Assets = 100 × (Net Profit / Total Assets)* = 100 × (13.799.000 / 100.703.000) = 100 × 0,137026702 = 13,70267022% ≈ 13,70% indicates difficulty in assets management to achieve profits.

*Return on Equity = 100 × (Net Profit / Owner's Equity)* = 100 × (13.799.000 / 33.802.000) = 100 × 0,408230282 = 40,82302822% ≈ 40,82% is the return of net profit on invested capital.

5. Investment Ratios: They assess the firm's performance within the stock market.

According to the Finance Report 2025, Earnings Per Share (EPS) for the year 2025 were CHF 16,18 while for the year 2024 were CHF 10,39. In other words, there's an increase in (EPS) from 2024 to 2025 that indicates an increase in firm profitability based on its stock.

The Dividends per share for the year 2025 were CHF 9,80 while for the year 2024 were CHF 9,70. A fact that indicates a positive impact on stockholders' welfare. (Finance Report 2025).

Also, the Report states that stock price on 31/12/2025 was CHF 335,20.

*Price to earnings ratio = Stock Price / Earnings per share* = 335,20 / 16,18 = 20,71693448 ≈ 20,72 indicates that investors are willing to pay a high price to acquire the firm's stock because they expect increased firm's profitability in the future.

### 4.2.9 Financial performance summary of Roche Group

The Ratio analysis of Roche Group indicates that the firm has good liquidity ratios, which means that it doesn't face difficulty paying off its short-term liabilities by utilizing cash flows from its current assets. Also, the firm doesn't depend much on the long-term dept to finance its current assets, according to the Net Working Capital.

According to Financial Structure and Viability Ratios, the firm uses long-term debt to finance its operations and total liabilities.

Activity Ratios indicates that the group has good production and sales management. Stock is quickly sold and accounts receivable fast convert into cash. Activity ratios also indicate difficulty in paying off suppliers.

The group has medium to low profitability ratios of profit achieved by sales while the return of net profit to invested capital (Return on Equity) is at a good level. Still, better management of assets needs to be done in order for these ratios to become even better.

The group's investment ratios are at a good level, a fact that indicates good performance in the stock market. Shareholders' welfare increases while investors have a good opinion about the firm's profitability expecting increased profits in the future.

In conclusion, Roche Group is a profitable company with good management in general. Still, utilization of assets in order for profits to be achieved needs to be better.

### 4.2.10 Key management insights

All of the company's governance structure include internal parties. Most important are the Comprehensive and Compliance Management department, the Sustainability Committee and the Audit Committee. The role of the first department is to advice managers and employees about matters related on the business code of conduct, ensure compliance and take corrective actions where needed. The Sustainability Committee advices managers on issues related to the integration of sustainability (adding value to society, economy and environmental protection) to business activity and operations. Finally, the Audit committee monitors business financial activities, accounting books and financial statements to ensure compliance with laws and regulations.

The company is subject to international laws and regulations like ICH guidelines. Commonly used guidelines include ICH Q10 quality management process, Good Clinical Practice and Good Manufacturing practice.

The company focuses on producing high-quality, innovative, safe and accessible medical products and diagnostics. Roche uses IP rights to safeguard its valuable assets (R &D results and products) from inappropriate use by competitors. Products are developed by the use of its in-house R & D while collaborations with other similar firms also occur to enhance results, meet unmet medical needs and exchange knowledge. To the entire business operations AI is also used as an assisting tools for employees to perform their duties, develop products faster and ensure compliance with laws.

The entire business model is focused on sustainability and integrity. The company supports fair competition, does not tolerate bribery that will affect decisions in the wrong way and has on a regular basis transparent communication with all interested parties for issues related to its activity. Furthermore, data are used only for business purposes, according to laws and regulations with respect and protection of personal information. Finally, the company is an equal opportunity and safe working environment where discrimination and harassment has no place.

## 4.3 The case study of GSK

### 4.3.1 Short company profile

GSK is a global biopharma company with its headquarters located in the UK. The company has also presence in Europe, Middle East, U.S.A and Latin America and Asia.

GSK focuses on producing medicines and vaccines. The company focuses on producing high-quality, safe, and accessible medical products that improve patients' lives. Through its business activity, the company aims to add value to society, economy, and environmental protection.

The company produces prescribed medicines and vaccines. Such medicines are used to treat diseases in various therapeutic areas such as respiratory, immunology and inflammation, cancer, HIV, and infectious diseases like childhood diseases and seasonal infections. The company has also one of the broadest vaccine's portfolio in the industry that covers diseases from birth to adulthood. (Purpose, strategy and culture, 2021-2026).

### 4.3.2 Governance and management structure

The company is managed by the Chief Executive Officer (CEO) and the Chief Financial Officer (CFO). The CEO is responsible for the development and implementation of the business strategy and risk management related to its activities. The CFO is responsible for the development and implementation of financial risk management as well as monitoring and managing the firm's financial performance. The Board of Directors as well as the Committees assist CEO and CFO to perform their job. In addition, the Board of Directors is assisted by Committees to take decisions according to each Committees area of business. The CEO, the CFO, and the Board of Directors meet regularly with stakeholders to provide information about the firm's overall performance and financial events.

The Board of Directors assist the CEO and the CFO to develop the firm's strategic plan. The Chair is the top manager of the Board of Directors that guides all members of the Board to perform their duties. The Company's secretary handles the schedules of the Board's meetings, which take place at least six times per year where relevant matters are

being discussed. The Company's secretary also advises the Board of Directors on matters related to corporate governance.

The Board Committees consist of the Audit and Risk Committee, the Remuneration Committee, the Nominations and Corporate Governance Committee, the Corporate Responsibility Committee, the Science Committee, and the Chairs' Committee. (Committees, 2021-2026).

The Audit and Risk Committee is responsible for monitoring the firm's financial performance and validating the integrity of the firm's financial statements according to laws, regulations, and the business code of conduct. Another responsibility that this Committee has is to select and monitor the work of the firm's external independent auditor as well as deciding its compensation. (Our Board Committees, 2021-2026).

The Remuneration Committee is responsible for deciding and monitoring the firm's remuneration policy. The goal is to ensure that the remuneration policy is relevant to business culture, strategy, and business financial position. (Our Board Committees, 2021-2026).

The Nominations and Corporate Governance Committee is responsible for selecting and appointing members of the Board of Directors as well as corporate officers. It also investigates areas of conflicts of interest between the Board and the Committees and advises the Board of Directors about issues related to corporate governance. (Our Board Committees, 2021-2026).

The Corporate Responsibility Committee is responsible for evaluating, advising, and monitoring issues related to transparency and sustainability related to business activity. (Our Board Committees, 2021-2026).

The Science Committee is responsible for monitoring the company's R&D strategy as well as related risks (Risk management). (Our Board Committees, 2021-2026).

The Chairs' Committee acts on behalf of the Board of Directors in meetings about urgent issues delegated by the Board of Directors. (Our Board Committees, 2021-2026).

Other Committees have an audit role in the overall firm's activity. Such Committees are the Corporate Administration and Transactions Committee, the Risk Oversight and Compliance Council, and the Disclosure Committee. The Corporate Administration and Transactions Committee oversees and reviews firm transactions. The Risk Oversight and Compliance Council assists the Audit and Risk Committee on risks related to sustainability and financial issues. Finally, the Disclosure Committee is responsible for handling issues related to the Stock Market. (Other Committees, 2021-2026).

### 4.3.3 Innovation and R & D management

The company invests in Intellectual Property (IP), R&D, and partnerships. The company uses IP rights to secure its research results, medicines and vaccines to protect its R&D and profitability. When cooperating with other companies, GSK respects their own IP rights. Its R&D investigates the function of the immune system and disease mechanisms and use these findings to develop medicines and vaccines. Also, the company collaborates with other companies in the industry and universities to exchange clinical data and scientific information in order for better outcomes to be achieved. Besides, these partners help the company on the process of clinical trials on medicines and vaccines.

GSK supports R&D in Africa and provides additional education to scientists that reside there. For that reason, the firm created the Africa Open Lab. In this Lab scientists from Africa work by conducting research as an initiative for fostering the country's scientific development and narrowing the existing gap in this field with the rest of the world. (Africa Open Lab, 2021-2026).

The manufacturing department uses AI and robotics in order the manufacturing process of medicines and vaccines to be done automatically, the potential of mistakes to be eliminated and the capacity of production to be increased. Still, employees at the manufacturing department use these tools as an assistant to perform their job. The whole process is not completely left for AI and robotics.

### 4.3.4 Quality, compliance and risk management

The overall business activity is monitored in order compliance with laws, regulations and code of conduct to be ensured and if deviations detected to take corrective actions. The Compliance function oversees and reviews business activities to ensure their accordance with laws, regulations and code and conduct. If deviations are detected, corrective moves are being taken.

The company has a risk management department. This department is responsible for detecting and evaluating risks in order business strategy to be formulated properly in order for goals and objectives to be achieved.

In order the high-quality and safety of products to be ensured, the company implements a Quality Management System according to ICH Q10 that was referred in the previous chapter. Also, all employees are being trained and informed about related issues, and each is responsible for ensuring product quality and safety. The company also participates in independent monitoring and review of its activities as well as in regulatory inspections. (Product governance, 2021-2026).

### 4.3.5 Sustainability and ethics

GSK's management is focused on providing patients with high-quality and safe medicines and vaccines and act with transparency among shareholders and stakeholders. The company is also focused on acting in a responsible and sustainable manner among shareholders, stakeholders, and the environment. The Corporate Responsibility Committee oversees and reviews all the above activities.

Act with transparency means acting with integrity among business activities and interest parties. In this place, the company provides stakeholders and shareholders with truth information on a regular basis about business activities and financial data. This information is provided through reports, external conferences and presentations, and the annual general meeting with shareholders. Besides the CEO and CFO that participate in these activities, the company has also an Investors Relations Department responsible for handling these issues. The company also keeps accurate records related to legal issues and business activities.

Responsibility means acting with integrity and in a responsible manner among business activities. The company prompts employees and all interest parties to inform managers or report via phone or e-mail or contact forms any event related to the business that is against laws, regulations and business culture. Adverse events related to medicines and vaccines are also desired to be reported. The company supports fair competition with respect to national and international laws and regulations. The company also fights corruption and counterfeit products in cooperation with regular authorities. The company does not accept bribery or gifts given to affect decisions in the wrong way. Furthermore, the company promotes responsible use of AI in its operations and acts for responsible and safe use of data. In addition, AI is used in a legal and ethical manner as an assisting tool to perform business activities in a faster and efficient way. Data are also used according to laws and regulations, only for business-related purposes. Technical measures in computerized systems are also taken to ensure data safety. All employees are being trained in related

issues. Finally, the company respects animal rights and welfare by using as few animals as possible for research studies in a way that minimizes their pain and distress. Besides, the company tries to avoid, when possible, the use of animals instead of using in-vitro technologies and computer simulation to conduct research studies. The company also cooperates with authorities in order to be informed and promote such activities in the industry.

Sustainability focuses on creating value for shareholders, stakeholders, and the environment. The company expects its partners to share the same values. The company cooperates with other companies in the industry and regulators to provide patients with accessible medicines even in lower-income countries. Also, the company cooperates with organizations related to health issues such as the World Health Organization (WHO), to address needs in medicines and vaccines and produce relative products.

The company provides employees with a safe and equal opportunity working environment. The company recruits qualified employees that act with integrity. Their career opportunities within the company are decided according to their qualifications and performance, and discrimination and harassment have no place. Training is also provided.

The company acts for protecting the environment through cooperation with regulatory affairs and other related scientists to address environmental threats and find solutions that will create environmentally friendly activity. For that reason, the company has integrated into its operations systems that reduce greenhouse gas emissions and water management systems that purify water and help to save water consumption in operations. Other initiatives include responsible and sustainable use of natural resources and proper waste management to avoid land or ocean contamination. (Environment, 2021-2026).

The company also provides medical education, monetary, or equipment donations to partners and organizations in the industry that share the same values with GSK. These can be business partners, universities, trade associations, hospitals, etc. (Grants and donations, 2021-2026).

### 4.3.6 SWOT analysis

SWOT analysis evaluates business for its internal strengths and weaknesses, and opportunities and threats from business external environment.

GSK's strengths rely on its successful brand name and its investment in innovation. Through its entire year of operation, the company has gained consumer trust through its high-quality and safe product that meets unmet medical needs. Moreover, through sustainability that is in core of its business activity, the firm has a positive socioeconomic impact globally that makes it a trustworthy brand and a reliable partner that adds value to all interest parties.

The company's weaknesses rely on high costs of investments in Research and Development. Also, the technology used for data privacy and equipment used for environmental protection purposes may imply high costs too.

Opportunities for the company arise from its product portfolio. The extent of people's life average will increase further in the future aging population that will have medical needs. A fact that ensures increased demand for the company's medical products.

Threats in business external environment are detected in competition, legal and technological environment. Biotechnology pharmaceutical is an industry with positive future perspectives, and new competitors are expected to enter the market in the future. This may lead to aggressive marketing and pricing strategies that may impact a firm's financial position. Also, the firm will have to invest more on R&D to bring to the market

more breakthroughs superior from competitor's products to fight competition and remain one of the leading biotechnology pharmaceutical companies. A fact that will increase costs too. Moreover, it is anticipated that regulatory changes will become more stringent. This might result in the fact that in the future some of the business products might be out of the market due to legal restrictions which may impact negatively the firm's financial position. Also, technological advances in a firm's operations might be complicated and difficult to follow. Also, they might have a higher cost.

In conclusion firm's weaknesses and threats are not strong enough to alter firm's market position as one of the leading pharmaceutical companies due to the fact that the company has a powerful know-how, qualified employees and good financial management that are sufficient to use its opportunities and combat threats and weaknesses.

### 4.3.7 Analysis of Consolidated financial statements of GSK group

1. Consolidated income statement: The income statement presents GSK's income on an accrual basis. There's an increase in GSK's turnover from sales of specialty medicines, vaccines, and general medicines. According to GSK Annual Report 2025, for the year 2024 the turnover was in millions £ 11.810 for specialty medicines, 9.138 for vaccines and 10.428 for general medicines. For the year 2025 there's a total increase of the turnover in all aspects, with the turnover for specialty medicines to be in millions £13.474, 9.157 for vaccines, and 10.036 for general medicines.

The income statement presents the business income from primary and secondary business activity, as well as financial expenses and taxation. It also presents the profit attributable to subsidiaries (non-controlling interests) and the profit attributable to the parent company (shareholders). There's also information about EPS.

There's an increase in profits from the year 2024 to the year 2025 from millions £ 2.951 to
millions £ 6.289. This is due to an increase in Gross profit and operating income and due to a decrease in financial expenses.

2. Consolidated balance sheet: The balance sheet presents the value of the firm's assets, liabilities, and equity. The firm's assets are non-current(fixed) assets that are tangible and intangible assets for long-term use for the firm's operations and current assets that include assets related to the business sales primary activity expected to be converted into cash usually within one year or one accounting cycle. Liabilities include short-term liabilities (current liabilities) expected to be settled within one year or within an accounting cycle, and long-term liabilities (non-current liabilities) expected to be settled in a longer period. Equity is the capital held from reinvestment.

In the above balance sheet non-current assets include the firm's fixed assets and intangible assets, associated investments, taxes and derivative financial instruments related to non-current assets used to protect the firm's profitability from unexpected costs.

Current assets include inventories of specialty medicines, vaccines, and general medicines, taxes and investments related to these products, and derivative financial instruments used for the acquisition of current assets.

Current liabilities include short-term debt, taxes, and other liabilities expected to be settled within an accounting cycle, while long-term liabilities include long-term debt, taxes and other liabilities expected to be settled in a longer time compared to current liabilities.

There's an increase in the value of the firm's non-current assets due to an increase in the value of the firm's tangible and intangible assets. Current assets have also been increased

from 2024 to 2025 due to an increase in receivables, inventories, derivative financial instruments, and tangible and intangible assets held for sale. The firm's current liabilities have decreased due to the settlement of taxes, provisions, and derivative financial instruments. The firm's long-term liabilities have also decreased due to the settlement of taxes, pensions and post-employment benefits, contingent consideration liabilities and other non-current liabilities. Finally, the firm's equity has increased from 2024 to 2025 due to an increase in share capital, share premium, retained earnings, and other reserves.

3. Consolidated statement of changes in equity: Statement of changes in equity presents changes in equity between 2024 and 2025. Share capital represents the accounting value of shares available for sale. There's an increase from 2024 to 2025 due to an increase in shares issued.

Share premium represents the value of shares issued above their nominal value. There's also an increase from 2024 to 2025 due to shares issued.

Retained earnings are referred to as the amount of operational profit held for reinvestment in short-term and outstanding long-term liabilities. There's a decrease from 2024 to 2025 due to losses on shares and equity investments.

Other reserves are referred to reserves different that the above categories. There's an increase from 2024 to 2025 due to gains on equity investments and shares.

Shareholders equity (equity of the parent company) has decreased from 2024 to 2025 due to a decrease in retained earnings while the equity of subsidiaries (non-controlling interests) has also decreased due to losses on distributions to non-controlling interests.

4. Consolidated cash flow statement: The Cash Flow Statement shows the real amount of cash inflows and outflows not calculated on an accrual basis like the Income Statement. The Cash Flow Statement shows cash inflows and outflows from operating activities, investing activities, and financing activities. Investing activities represent cash inflows and outflows from acquisition and disposal of long-term assets. Finally, Financing activities include cash inflows and outflows from activities that alter the equity capital and the firm's borrowing structure, like long-term debt, short-term debt, common and preferred stock.

There's an increase in cash inflows from operations from 2024 to 2025 due to a minimization in taxes paid. There's an increase in loss from investing activities from 2024 to 2025 mainly due to increases in loss in purchase of intangible and tangible assets. Also, there's a loss minimization in the loss from financing activities mainly due to payments of long-term and short-term loans as well as lease liabilities, loss in dividends payments and loss in purchase of shares.

There's a decrease in total cash flows from all the above activities from 2024 to 2025 mainly due to a loss in total cash flows for the year 2025.

### 4.3.8 Ratio analysis of GSK group

1. Liquidity Ratios: They assess whether a firm can meet its short-term liabilities.

*Current Ratio = Current Assets / Short-term Liabilities* = 17.510.000 / 21.391.000 = 0,818568557 ≈ 0,82 indicates that there's a difficulty in paying off short-term liabilities via current assets.

*Net Working Capital (NWC) = Current Assets – Current Liabilities* = =17.510.000 - 21.391.000 = -3.881.000 indicates that the firm depends on short-term creditors to finance its current assets.

*Acid-test Ratio = (Current Assets – Inventories) / Short-term Liabilities* = (17.510.000 - 5.924.000) / 21.391.000 = 0,541629657 ≈ 0,54 indicates that the firm has a difficulty in paying off its short- term liabilities by using current assets that can be easily liquidated.

*Cash Ratio = Cash / Short-term Liabilities* = 3.397.000 / 21.391.000 = 0,158805105 ≈ 0,16
Indicates that cash is insufficient to settle short-term liabilities.

2. Financial Structure and Viability Ratios: Indicate whether the firm can meet its long-term liabilities. They also assess the firm's credibility.

*Debt to Owner's Equity Ratio = Total Liabilities / Owner's Equity* =
= 45.162.000 / 16.377.000 = 2,757647921 ≈ 2,76 indicates that GSK group depends on debt capital to finance its total liabilities.

*Owner's Equity to Total Assets Ratio = Owner's Equity / Total Assets* =
= 16.377.000 / 61.118.000 = 0,267957067 ≈ 0,27 indicates that the firm depends on external funds to finance its total assets.

*Fixes Assets to LT Liabilities Ratio = Non-current Assets / Long-term Liabilities* =
= 43.608.000 / 23.771.000 = 1,834504228 ≈ 1,83 indicates that the firm doesn't depend on long-term debt to finance its non-current assets.

*Times Interest Earned = Operating profit / Interest and related expenses* =
= 7.932.000 / 701.000 = 11,31526390 ≈ 11,31 indicates that the firm enjoys high protection by creditors. It also indicates the firm's ability to settle its financial expenses through operating profit.

3. Activity Ratios: They are indicators of sales and production effective management. They also indicate whether the firm can pay off its suppliers.

*Inventory Turnover Ratio = Cost of Goods Sold / Average Inventory* =
= 9.017.000 / [(5.924.000 + 5.669.000) / 2] = 9.017.000 / 5.796.500 = 1,555593893 ≈ 1,56 indicates that the stock doesn't remain for a long time in the warehouse. It is produced and sold quickly.

The days where inventory stays in the warehouse are equal with:
*Days of stock in inventory = 365 / Inventory Turnover Ratio* = 365 / 1,555593893 = 234,6370743, about 234 days.

*Receivables Turnover Ratio = Sales / Average Receivables* =
= 32.667.000 / [(7.471.000 + 6.836.000) / 2] = 32.667.000 / 7.153.500 = 4,566575802 ≈4,57
Indicates that accounts receivables are quickly turned into cash.

The days that it takes so accounts receivables are turned into cash are equal with:
*Days Sales Outstanding = 365 / Receivables Turnover Ratio* = 365 / 4,566575802 =
= 79,62859766, about 79 days.

*Accounts Payable Turnover Ratio = Cost of Goods Sold / Average Short-term liabilities* =
= 9.017.000 / [21.391.000 + 21.697.000) / 2] = 9.017.000 / 21.544.000 = 0,418538804
≈0,42 indicates that the firm has difficulty in paying off its suppliers.

The days required to settle short-term liabilities are equal with:
*Days ST Payables Outstanding = 365 / Short-term Liabilities Turnover Ratio* =
=365 / 0,418538804 = 872.0816242, about 872 days.

*Cash Conversion Cycle = Days Inventory Outstanding + Days Sales Outstanding + Days Payables Outstanding* = 234,6370743 + 79,62859766 + 872.0816242 = 1.186,347296 are the days required to convert into cash inventory and other resources from sales. It is considered a big cash conversion cycle.

*Assets Turnover Ratio = Sales / Average Assets* =
= 32.667.000 / [(61.118.000 + 59.463.000) / 2] = 32.667.000 / 60.290.500 = 0,541826656
≈ 0,54 shows that the firm doesn't use effectively its assets to achieve profit.

4.Profitability Ratios: They are indicators of the firm's profitability and overall efficiency of its management.

*Gross Profit Margin = 100 × (Gross profit / Sales)* = 100 × (23.650.000 / 32.667.000)
= 100× 0,723972204 = 72,39722043% ≈ 72,40% is the percentage of profit at which a business sells.

*Net Profit Margin = 100 × (Net Profit / Sales)* = 100 × (6.289.000 / 32.667.000) =
= 100 × 0,192518444 = 19,25184436% ≈ 19,25% is the percentage of profit achieved by sales.

*Return on Assets = 100 × (Net profit / Total Assets)* = 100 × (6.289.000 / 61.118.000) =
= 100 × 0,102899310 = 10,28993095% ≈ 10,29% is the ability of the firm to achieve profits using assets. It is a low ratio that indicates the need for better assets management to achieve profits.

*Return on Equity = 100 × (Net profit attributable to shareholders / Owner's Equity)* =
100 × (5.716.000 / 16.377.000) = 100 ×0,349026073 = 34,9026073 % ≈ 34,90% is the ratio of profit return in invested capital.

5. Investment Ratios: They assess the firm's performance within the stock market.

According to GSK Annual Report 2025, share price on December 31, 2025, is equal to £ 18,26. Also:

Earnings Per Share (EPS) for the year 2025 is equal to £ 1,411 or 141,1 pence as it is referred to the consolidated income statement. It reflects the firm's profitability based on its stock. There's an increase in EPS compared with the EPS for the year 2024 that was £ 0,632 or 63,2 pence according to the consolidated income statement.

Dividends Per Share for the year 2025 = £ 0,66 or 66.00 pence as it is referred to in GSK's Annual Report 2025. There's also an increase in Dividends Per Share for the year 2025 compared to Dividends Per Share for the year 2024 that were £ 0,61 or 61,00 pence.

*Price to earnings ratio = Stock Price / EPS* = £ 18,26 / £ 1,411 = 12,94117647 indicates that investors are willing to pay high to acquire the firm's stock due to their expectation for future increase profitability of the firm.

### 4.3.9 Financial performance summary of GSK Group

The firm doesn't have sufficient financial independence because it depends too much on long-term debt while facing difficulties settling its short-term liabilities. It would be more desirable to be able to use its own capital to finance its activity. The ratio analysis of the GSK group shows that the firm has difficulty settling its short-term liabilities. The firm depends on short-term debt to finance its current assets. The firm uses long-term debt to finance its total liabilities and non-current assets. Operating profit is sufficient to settle its financial expenses.

Through inventory turnover ratio and receivables turnover ratio comes up that the firm has good sales management. Products are sold quickly, and accounts receivables are quickly turned into cash. Though, there is difficulty paying off its suppliers.

The firm's profitability ratios as far as sales are concerned are at a good level but still there's a need for better assets management to increase its profitability. This might also affect retained earnings in a way that there might be a higher ratio of profit return in investment capital that would help the company to have better financial independence.

Through investment ratios comes up that the firm's performance in the stock market is at a good level. Also, the firm has a good reputation and is considered by investors to be profitable. There's a high demand for the firm's stock.

### 4.3.10 Key management insights

GSK's governance structure includes internal and external parties. The company has an external independent auditor that deals with issues of firm's financial activity and ensures compliance with laws and regulations. The most important internal parties include the Compliance Department, the Corporate Responsibility Committee, the Science Committee and the Disclosure Committee. The Compliance Department ensures the compliance of business activity with laws and regulations. The Corporate Responsibility Committee deals with issues of transparency and sustainability. The Science Committee deals with issues related to R & D strategy and related risks and the Disclosure Committee deals with issues related to the Stock Market.

The company is subject to international laws. ICH guidelines are commonly used such as ICH Q10 quality management system for products.

The entire business model is focused on providing people with high-quality, innovative and safe medicines and vaccines while also focus on integrating sustainability and integrity into business operations and activities. The company invests on IP, R&D and partnerships as far as product development is concerned. The manufacturing department

uses AI and robotics in order the manufacturing process of medicines and vaccines to be done automatically, the potential mistakes to be eliminated and the capacity of production to be increased. Still, employees at the manufacturing department use these tools as an assistant to perform their job. The whole process is not completely left for AI and robotics. Acting with integrity means that the firm has a transparent communication with all interest parties for issues related to the business activity. The company also fights corruption and counterfeit products in cooperation with authorities. The company does not accept bribery that will affect decisions in the wrong way. Moreover, data are used according to laws and regulations with respect to data privacy of personal info. The company respects animal rights and welfare and offers an equal opportunity and safe working environment.

### 4.4 Comparative analysis of Bayer, Roche and GSK as far as short company profile, governance and management structure, innovation and R &D management, sustainability and ethics, financial performance and key management insights

| | **Bayer** | **Roche** | **GSK** |
|---|---|---|---|
| **1. Short company profile** | • Presence in 80 countries (Germany, Asia, Europe, Middle East, Africa, U.S.A, Canada, Latin America).<br>• Healthcare products (prescription, non-prescription), agricultural products. | • Presence in more than 70 countries ( U.S.A, Europe, Africa, Asia, Australia, Middle East)<br>• Healthcare products, diagnostics. | • Presence in Europe, Middle East, U.S.A, Latin America<br>• Medicines, vaccines |
| **2. Governance and management structure** | • Flatter hierarchies, self-managed teams.<br>• Independent external parties (Sustainability Council, Bioethics Council, Auditors)<br>• Internal parties (Board of Management, Supervisory Board, Committees, Division Leadership). | • Internal governance parties (Board of Directors, Committees, Corporate Executive Committee). | • Internal parties: CEO, CFO assisted by the Board of Directors and Committees<br>• External parties: External independent auditor |
| **3. Innovation and R &D management** | • In house R & D<br>• Cooperation with similar companies<br>• IP right on medical products<br>• AI in operations<br>• Regenerative agriculture | • In house R & D<br>• IP rights on products<br>• AI in operations | • IP rights on products<br>• Invest in R & D<br>• Cooperation with similar companies, universities<br>• Manufacturing department: AI, robotics |

| | | | |
|---|---|---|---|
| **4. Quality, compliance and risk management** | • ICH guidelines (GDP, GMP, ICH Q10 quality management system)<br>• Crop Science Integrated System | • ICH guidelines (GDP, GMP, ICH Q10 quality management process)<br>• Data used for business purposes, data privacy<br>• Comprehensive and Compliance management department | • Compliance management department<br>• ICH Q10 quality management system<br>• Participation in regulatory inspections |
| **5. Sustainability and ethics** | • Sustainability in the entire business model<br>• Equal opportunity, safe working environment<br>• Fights bribery<br>• Transparent communication with interest parties<br>• Fair competition<br>• Data used for business purposes, data privacy<br>• Environmental protection systems in operations | • Focus on sustainability<br>• Integrity<br>• Equal opportunity, safe working environment | • Focus on sustainability<br>• Corporate Responsibility Committee<br>• Integrity<br>• Data used only for business purposes, data privacy<br>• Respect of animal rights<br>• Equal opportunity, safe working environment<br>• Environmental management resources systems in operations |
| **6. Financial performance** | • Cash flows: increased profits<br>• Able to settle short-term liabilities<br>• Do not use debt for financing current assets<br>• Excess use of long-term debt to finance operations and long-term liabilities<br>• Good sales management but bad utilization of assets.<br>• Bad performance, reputation in the Stock Market. | • Ability to settle short-term liabilities<br>• Doesn't use much debt to finance current assets<br>• Excessive use of long-term debt to finance operations and liabilities.<br>• Medium profitability ratios<br>• Good production, sales management<br>• Good performance in the Stock Market | • Dependance on short-term debt to finance short-term liabilities, current assets<br>• Dependance on long-term debt to finance total liabilities and operations<br>• Lack of financial independence<br>• Good sales management<br>• Lack in assets management |

| | | | |
|---|---|---|---|
| | | | • Good profitability ratios<br>• Good performance in the Stock Market |
| **7. Key management insights** | • Sustainability<br>• High-quality, innovative, safe, accessible products<br>• Business strategy regularly adapted<br>• Separate management department for agricultural products<br>• Compliance management department<br>• Environmental resources management systems in operations<br>• Flatter hierarchies<br>• International laws and regulation ( ICH, IAS, IFRS)<br>• In-house R & D<br>• Integrity | • Comprehensive and Compliance Management Department, Sustainability Committee, Audit Committee<br>• Follows international laws and regulations (ICH guidelines)<br>• High-quality, innovative, safe products secured with IP rights<br>• In-house R & D<br>• Collaboration with similar companies<br>• AI in operations<br>• Sustainability<br>• Integrity | • Most important governance parties: Compliance department, Corporate Responsibility Committee, Science Committee, Disclosure Committee<br>• Follows international laws and regulations (ICH guidelines)<br>• High-quality, safe innovative products secured with IP rights<br>• AI and robotics integrated in manufacturing department<br>• Integrity<br>• Respect of animal rights<br>• Equal opportunity, safe working environment |

From the above information is concluded that Bayer, Roche and GSK differ as far as their presence in regions and product portfolio.

Governance and management structure also differs. Bayer and GSK have internal and external-independent governance parties, while Roche has only internal governance to all levels.

Innovation and R & D management is similar for these firms. The only difference is that Bayer and Roche integrate AI in all operations, while GSK integrates AI and robotics only in the manufacturing department.

Quality and compliance management system has also differences between these firms. While all firms are subject to international laws and regulations and have a Compliance

Management department, Bayer has a different management department for agricultural products while GSK participates also in regulatory inspections.

Sustainability and ethics are common to these firms.

The financial performance also differs. Roche is in better financial position between the other two firms. Then follows Bayer and the last position has GSK. Strong points in Roche's financial performance include the profitability ratios, the good performance in the Stock Market and its capacity to finance by its own capital current assets and short-term liabilities. Production and sales management are also strong points. The only weak point is that the firm depends too much on long-term debt to finance operations and liabilities, but this is common for companies in the biotechnology pharmaceutical industry. Bayer is also a profitable company able to finance with its own capital its current assets and short-term liabilities. The company has also good sales management. Weak points in Bayer's financial performance are the lack in assets management, the excessive use of long-term debt to finance operations and liabilities and the bad performance in the Stock Market. Finally, GSK isn't in very good financial position due to excessive use of debt that leads to lack of financial independence. There's also lack in assets management. Still, the company has good sales management, good profitability ratios and good performance in the Stock Market.

# 5. Conclusions

Managerial practices that are often applied by large biotechnology pharmaceutical companies have to do with the way that such companies manage their functions and resources to achieve goals, mission and profits.

As far as their managerial function is concerned, managerial departments that often exist in such companies include the Compliance Management department, the Risk Management department, the Sustainability Committee/ Council as well as internal or external Auditors. The role of the Compliance Management department is to ensure that laws and regulations are applied properly during operations and business activity. The Risk Management department assesses risks and takes them into consideration in decision making. The Sustainability Committee/ Council is responsible for issues related to integrating sustainability into business activities and operations. Finally, Auditors monitor business financial activity to ensure the compliance with laws and regulations.

Large biotechnology pharmaceutical companies are subject to international laws and regulations like ICH guidelines and IAS/IFRS. Most commonly used ICH guidelines include ICH Q10 quality management process that deals with managing product quality to the entire product lifecycle, Good Manufacturing Practice that sets the rules of manufacturing process of biotechnology pharmaceutical products, Good Clinical Practice that sets the rules of clinical trials of vaccines and Good Distribution Practice that sets the rules of product distribution. IAS/IFRS are referred to international accounting standards based on which accounting books should be kept while IFRS are referred to international rules that should be followed during the preparation of financial statements.

The entire business model of such companies is focused on producing high-quality, innovative, safe and accessible products. It is also focused on sustainability and integrity. Sustainability aims on adding value to patients, the society, the economy and environmental protection. Integrity for such companies mean acting with the highest ethical standards among all interest parties.

Large biotechnology pharmaceutical companies usually invest on innovation. They develop in-house R & D , secure products and R & D results with IP rights, cooperate with companies that share the same values to exchange knowledge and enhance results and integrate AI in operations to maximize efficiency and minimize mistakes.

Innovation has a crucial role in the creation of scientific breakthroughs that lead to the creation of products that meet unmet patient's needs. This fact gives to biotechnology pharmaceutical firms the opportunity to gain competitive advantage over rivals that with the combination of the use of IP rights that secure these products and R & D results firm's profitability is secured and even increased. The integration of AI into firm's operations as an assisting tool to employees minimizes the potential of mistakes, ensures compliance with laws and regulations and increases production capacity. As a result products are delivered faster to patients, and the services quality is enhanced. A fact that helps firms to maintain good reputation and optimizes financial performance.

Quality management for products ensures product safety and quality through products lifecycle. Compliance management ensures that laws and regulations are properly applied during operations and business activity. All these lead to maintain firm's good reputation, be a reliable partner and optimize financial performance.

Sustainability also makes firms to be a reliable partner and maintain their good reputation. Also, innovation, quality management, compliance and sustainability can positively affect firms credibility.

Effective management in biotechnology pharmaceutical industry relies on effective compliance, risk and sustainability management, adherence to international laws and regulations, integrity, and invest in innovation and quality management system for products.

Limitations of this research include the exclusion of large biotech pharmaceutical companies' with international presence and intense activity in pharmaceuticals/biopharma that could be used as case studies to reveal even more managerial practices. In future research, an overall presentation of case studies of these companies could be used to reveal more effective managerial practices.

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# Appendix A: Consolidated Financial Statements of Bayer AG and its subsidiaries (Bayer Group)

## Income Statement

| € million | 2024 | 2025 |
|---|---|---|
| **Net sales** | **46,606** | **45,575** |
| Cost of goods sold | (21,270) | (18,797) |
| **Gross profit** | **25,336** | **26,778** |
| Selling expenses | (13,364) | (12,549) |
| Research and development expenses | (6,209) | (5,769) |
| General administration expenses | (2,574) | (2,160) |
| Other operating income | 1,779 | 1,802 |
| Other operating expenses | (5,039) | (9,179) |
| **EBIT** | (71) | (1,077) |
| Equity-method income (loss) | (132) | (44) |
| Financial income | 545 | 507 |
| Financial expenses | (2,676) | (2,515) |
| **Financial result** | **(2,263)** | **(2,052)** |
| **Income before income taxes** | **(2,334)** | **(3,129)** |
| Income taxes | (212) | (466) |
| **Income after income taxes** | **(2,546)** | **(3,595)** |
| Of which attributable to noncontrolling interest | 6 | 25 |
| **Of which attributable to Bayer AG stockholders (net income)** | **(2,552)** | **(3,620)** |
| € | | |
| **Earnings per share** | | |
| Basic | (2.60) | (3.68) |
| Diluted | (2.60) | (3.68) |

Source: Bayer Annual Report 2025

## Statement of Financial Position

| € million | Dec. 31, 2024 | Dec. 31, 2025 |
|---|---|---|
| **Noncurrent assets** | | |
| Goodwill | 30,016 | 28,061 |
| Other intangible assets | 22,112 | 20,622 |
| Property, plant and equipment | 13,456 | 12,649 |
| Investments accounted for using the equity method | 820 | 546 |
| Other financial assets | 2,260 | 2,265 |
| Other receivables | 1,578 | 1,742 |
| Deferred taxes | 6,164 | 5,745 |
| | **76,406** | **71,630** |
| **Current assets** | | |
| Inventories | 13,467 | 12,378 |
| Trade accounts receivable | 8,966 | 9,077 |

| | | |
|---|---|---|
| Other financial assets | 2,266 | 1,391 |
| Other receivables | 2,052 | 1,867 |
| Claims for income tax refunds | 1,480 | 1,504 |
| Cash and cash equivalents | 6,191 | 6.671 |
| Assets held for sale | 22 | 23 |
| | **34,444** | **32,911** |
| **Total assets** | **110,850** | **104,541** |
| | | |
| **Equity** | | |
| Capital stock | 2,515 | 2,515 |
| Capital reserves | 18,261 | 18,261 |
| Other reserves | 11,132 | 5,171 |
| **Equity attributable to Bayer AG stockholders** | **31,908** | **25,947** |
| Equity attributable to noncontrolling interest | 137 | 116 |
| | **32,045** | **26,063** |
| **Noncurrent liabilities** | | |
| Provisions for pensions and other post-employment benefits | 3,312 | 2,090 |
| Other provisions | 7,396 | 8,976 |
| Refund liabilities | 9 | 7 |
| Contract liabilities | 303 | 169 |
| Financial liabilities | 35,498 | 31,833 |
| Income tax liabilities | 1,346 | 1,054 |
| Other liabilities | 1,124 | 995 |
| Deferred taxes | 865 | 769 |
| | **49,853** | **45,893** |
| | | |
| **Current liabilities** | | |
| Other provisions | 3,808 | 6,816 |
| Refund liabilities | 5,905 | 5,641 |
| Contract liabilities | 3,652 | 3,733 |
| Financial liabilities | 5,313 | 5,746 |
| Trade accounts payable | 7,518 | 7,081 |
| Income tax liabilities | 547 | 678 |
| Other liabilities | 2,209 | 2,890 |
| | **28,952** | **32,585** |
| **Total equity and liabilities** | **110,850** | **104,541** |

Source: Bayer Annual Report 2025

## Statement of Changes in Equity

| € million | **Capital stock** | **Capital reserves** | **Retained earnings incl. Net income** | **Exchange differences** | **Fair-value measurement of equity instruments** | **Cash flow hedges** | **Equity attributable to Bayer AG stockholders** | **Equity attributable to noncontrolling interest** | **Equity** |
|---|---|---|---|---|---|---|---|---|---|
| **Jan.1, 2024** | **2,515** | **18,261** | **12,175** | **(128)** | **81** | **23** | **32,927** | **151** | **33,078** |
| Total comprehensive income | | | | | | | | | (2,546) |
| Income after income taxes | | | (2,552) | | | | (2,552) | 6 | 1,597 |
| Other comprehensive income | | | 370 | 1,385 | (75) | (86) | 1,594 | 3 | |
| Miscellaneous other changes | | | (65) | | (10) | 55 | | | |
| Equity transactions with owners | | | | | | | | | |
| Dividend payments | | | (108) | | | | (108) | (23) | (131) |
| Other changes | | | 47 | | | | 47 | | 47 |
| **Dec. 31, 2024** | **2,515** | **18,261** | **9,867** | **1,257** | **16** | **8** | **31,908** | **137** | **32,045** |
| Total comprehensive income | | | | | | | | | |
| Income after income taxes | | | (3,620) | | | | (3,620) | 25 | (3,595) |
| Other comprehensive income | | | 595 | (2,879) | (27) | 19 | (2,292) | (27) | (2,319) |
| Miscellaneous other changes | | | (67) | | 5 | 62 | | | |
| Equity transaction | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| s with owners | | | | | | | | | |
| Dividend payments | | | (108) | | | | (108) | (19) | (127) |
| Other changes | | | 59 | | | | 59 | | 59 |
| **Dec. 31, 2025** | **2,515** | **18,261** | **6,726** | **(1,622)** | **(6)** | **73** | **25,947** | **116** | **26,063** |

Source: Bayer Annual Report 2025

## Statement of Cash Flows

| € million | **2024** | **2025** |
|---|---|---|
| Income after income taxes | (2,546) | (3,595) |
| Income taxes | 212 | 466 |
| Financial result | 2,263 | 2,052 |
| Income taxes paid | (1,222) | (1,243) |
| Depreciation, amortization and impairment losses (loss reversals) | 8,783 | 2,785 |
| Change in pension provisions | (494) | (217) |
| (Gains) losses on retirements of noncurrent assets | (207) | (469) |
| Decrease (increase) in inventories | 521 | 475 |
| Decrease (increase) in trade accounts receivable | 197 | (852) |
| Decrease (increase) in trade accounts payable | (120) | (176) |
| Changes in other working capital, other noncash items | (19) | 6,704 |
| **Net cash provided by (used in) operating activities** | **7,368** | **5,930** |
| Cash outflows for additions to property, plant, equipment and intangible assets | (2,778) | (2,487) |
| Cash inflows from sales of property, plant, equipment and other assets | 295 | 415 |
| Cash inflows from (outflows for) divestments less divested cash | 17 | (2) |
| Cash inflows from noncurrent financial assets | 18 | 144 |
| Cash outflows from noncurrent financial assets | (251) | (179) |
| Cash outflows for acquisitions less acquired cash | (184) | (196) |
| Interest and dividends received | 489 | 339 |
| Cash inflows from (outflows for) current financial assets | 2,558 | 696 |
| **Net cash provided by (used in) investing activities** | **164** | **(1,270)** |
| Cash outflows to acquire Bayer AG shares (BayShare) | (16) | (14) |
| Dividend payments | (131) | (127) |
| Issuances of debt | 5,815 | 6,282 |
| Retirements of debt | (10,833) | (8,327) |
| Interest paid including interest-rate swaps | (1,977) | (1,698) |
| Interest received from interest-rate swaps | 5 | - |
| Cash outflows for the purchase of additional interests in subsidiaries | (41) | - |
| **Net cash provided by (used in) financing activities** | **(7,178)** | **(3,884)** |

| | | |
|---|---|---|
| **Change in cash and cash equivalents due to business activities** | **354** | **776** |
| **Cash and cash equivalents at beginning of year** | **5,907** | **6,191** |
| Change in cash and cash equivalents due to changes in scope of consolidation | (2) | - |
| Change in cash and cash equivalents due to hyperinflation of cash flows | (58) | (5) |
| Change in cash and cash equivalents due to exchange rate movements | (10) | (291) |
| **Cash and cash equivalents at end of year** | **6,191** | **6,671** |

Source: Bayer Annual Report 2025

# Appendix B: Consolidated Financial Statements of Roche and its subsidiaries (Roche Group)

## Roche Group Income Statement

| In millions of CHF | **2025** | **2024** |
|---|---|---|
| Sales | 61.516 | 60.495 |
| Other revenue | 1.840 | 1.900 |
| **Revenue** | **63.356** | **62.395** |
| Cost of sales | (16.645) | (16.283) |
| Research and development | (13.352) | (15.304) |
| Selling, general and administration | (15.161) | (14.896) |
| Other operating income (expense) | 278 | (2.495) |
| **Operating profit** | **18.476** | **13.417** |
| Financing costs | (1.349) | (1.412) |
| Other financial income (expense) | (154) | (212) |
| **Profit before taxes** | **16.973** | **11.793** |
| Income taxes | (3.174) | (2.606) |
| **Net income** | **13.799** | **9.187** |
| Attributable to | | |
| -Roche shareholders | 12.880 | 8.277 |
| -Non-controlling interests | 919 | 910 |
| Earnings per share and non-voting equity security | | |
| Basic (CHF) | 16,18 | 10,39 |
| Diluted (CHF) | 16,04 | 10,31 |

Source: Finance Report 2025

## Roche Group Balance Sheet

| In millions of CHF | **31 December 2025** | **31 December 2024** |
|---|---|---|
| **Non-current assets** | | |
| Property, plant and equipment | 21.949 | 22.557 |
| Right-of-use assets | 985 | 1.183 |
| Goodwill | 7.492 | 7.876 |
| Intangible assets | 19.321 | 17.303 |
| Deferred tax assets | 8.411 | 8.569 |
| Defined benefit plan assets | 1.791 | 2.256 |
| Other non-current assets | 2.025 | 2.021 |
| **Total non-current assets** | **61.974** | **61.765** |
| **Current assets** | | |
| Inventories | 7.479 | 7.606 |
| Accounts receivable | 11.506 | 11.297 |

| | | |
|---|---|---|
| Current income tax assets | 393 | 415 |
| Other current assets | 3.875 | 3.401 |
| Marketable securities | 9.894 | 10.342 |
| Cash and cash equivalents | 5.582 | 6.975 |
| **Total current assets** | **38.729** | **40.036** |
| | | |
| **Total assets** | **100.703** | **101.801** |
| **Non-current liabilities** | | |
| Long-term debt | (27.430) | (30.722) |
| Deferred tax liabilities | (884) | (832) |
| Defined benefit plan liabilities | (3.950) | (4.381) |
| Provisions | (1.055) | (1.079) |
| Other non-current liabilities | (1.503) | (1.603) |
| **Total non-current liabilities** | **(34.822)** | **(38.617)** |
| **Current liabilities** | | |
| Short-term debt | (4.206) | (3.932) |
| Current income tax liabilities | (2.867) | (2.923) |
| Provisions | (1.743) | (1.726) |
| Accounts payable | (5.779) | (4.894) |
| Other current liabilities | (13.406) | (13.548) |
| **Total current liabilities** | **(28.001)** | **(27.023)** |
| | | |
| **Total liabilities** | **(62.823)** | **(65.640)** |
| | | |
| **Total net assets** | **37.880** | **36.161** |
| **Equity** | | |
| Capital and reserves attributable to Roche shareholders | 33.802 | 31.767 |
| Equity attributable to non-controlling interests | 4.078 | 4.394 |
| **Total equity** | **37.880** | **36.161** |

Source: Finance Report 2025

## Roche Group Statement of Changes in Equity

| In millions of CHF | Share capital | Retained earnings | Fair value reserves | Hedging reserves | Translation reserves | Total | Non-controlling interests | Total equity |
|---|---|---|---|---|---|---|---|---|
| **Year ended December 2024** | | | | | | | | |
| At January 2024 | 107 | 42.347 | (97) | (90) | (12.952) | 29.315 | 3.948 | 33.263 |
| Net income recognised in income statement | - | 8.277 | - | - | - | 8.277 | 910 | 9.187 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Net change in fair value-financial assets at fair value through OCI | - | 8 | 69 | - | - | 77 | (1) | 76 |
| Cash flow hedges | - | - | - | 48 | - | 48 | 29 | 77 |
| Currency translation of foreign operations | - | - | 0 | 1 | 839 | 840 | (143) | 697 |
| Remeasurements of defined benefit plans | - | 1.129 | - | - | - | 1.129 | 9 | 1.138 |
| **Total comprehensive income** | **-** | **9.414** | **69** | **49** | **839** | **10.371** | **804** | **11.175** |
| Dividends | - | (7.650) | - | - | - | (7.650) | (360) | (8.010) |
| Equity compensation plans, net of transactions in own equity | - | (269) | - | - | - | (269) | 2 | (267) |
| **At 31 December 2024** | **107** | **43.842** | **(28)** | **(41)** | **(12.113)** | **31.767** | **4.394** | **36.161** |
| **Year ended December 2025** | | | | | | | | |
| At 1 January 2025 | 107 | 43.842 | (28) | (41) | (12.113) | 31.767 | 4.394 | 36.161 |
| Net income recognised in income statement | - | 12.880 | - | - | - | 12.880 | 919 | 13.799 |
| Net change in fair value-financial assets at fair value through OCI | - | 0 | (159) | - | - | (159) | 0 | (159) |
| Cash flow hedges | - | - | - | (100) | - | (100) | (64) | (164) |
| Currency translation of foreign operations | - | - | 0 | 10 | (2.711) | (2.701) | (537) | (3.238) |
| Remeasurements of defined benefit plans | - | (287) | - | - | - | (287) | 19 | (268) |
| **Total comprehensive income** | **-** | **12.539** | **(159)** | **(90)** | **(2.711)** | **9.633** | **337** | **9.970** |
| Dividends | - | (7.731) | - | - | - | (7.731) | (655) | (8.386) |
| Equity compensation plans, net of | - | 134 | - | - | - | 134 | 1 | 135 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| transactions in own equity | | | | | | | | |
| Changes in non-controlling interests | - | (1) | - | - | - | (1) | 1 | - |
| **At 31 December 2025** | **107** | **48.837** | **(187)** | **(131)** | **(14.824)** | **33.802** | **4.078** | **37.880** |

Source: Finance Report 2025

## Roche Group Statement of Cash Flows

| In millions of CHF | **2025** | **2024** |
|---|---|---|
| **Cash flows from operating activities** | | |
| Cash generated from operations | 25.524 | 24.332 |
| (Increase) decrease in net working capital | (1.657) | 1.161 |
| Payments made for defined benefit plans | (654) | (661) |
| Utilization of provisions | (1.222) | (1.012) |
| Other operating cash flows | 0 | 1 |
| Income taxes paid | (3.139) | (3.727) |
| **Total cash flows from operating activities** | **18.852** | **20.094** |
| **Cash flows from investing activities** | | |
| Purchase of property, plant and equipment | (3.748) | (3.529) |
| Purchase of intangible assets | (2.031) | (1.480) |
| Disposal of property, plant and equipment | 139 | 61 |
| Disposal of intangible assets | 2 | 0 |
| Disposal of products | 43 | 376 |
| Divestment of net assets previously held for sale | 0 | 1.049 |
| Business combinations | (911) | (2.836) |
| Asset acquisitions | (2.167) | (283) |
| Divestment of subsidiaries | 16 | 1 |
| Interest received (paid) and dividends received on marketable securities and other investments | 167 | 232 |
| Sales of equity securities and debt securities | 241 | 198 |
| Purchases of equity securities and debt securities | (263) | (112) |
| Sales (purchases) of money market instruments and time accounts over three months, net | 54 | (5.084) |
| Other investing cash flows | (85) | 14 |
| **Total cash flows from investing activities** | **(8.543)** | **(11.393)** |
| **Cash flows from financing activities** | | |
| Proceeds from issue of bonds and notes | 2.299 | 7.915 |
| Redemption and repurchase of bonds and notes | (3.386) | (3.095) |
| Increase (decrease) in commercial paper | 656 | (709) |
| Increase (decrease) in other debt | 276 | (292) |
| Hedging and collateral arrangements | (288) | 30 |
| Interest paid | (1.189) | (1.145) |
| Principal portion of lease liabilities paid | (364) | (350) |

| | | |
|---|---|---|
| Dividends paid | (8.385) | (8.043) |
| Equity-settled equity compensation plans, net of transactions in own equity | (987) | (1.130) |
| **Total cash flows from financing activities** | **(11.368)** | **(6.819)** |
| Net effect of currency translation on cash and cash equivalents | (334) | (283) |
| **Increase (decrease) in cash and cash equivalents** | **(1.393)** | **1.599** |
| Cash and cash equivalents at 1 January | 6.975 | 5.376 |
| **Cash and cash equivalents at 31 December** | **5.582** | **6.975** |

Source: Finance Report 2025

# Appendix C: Consolidated financial statements of GSK group

## Consolidated Income Statement

| | **2025 £ m** | **2024 £ m** |
|---|---|---|
| Turnover | 32.667 | 31.376 |
| Cost of sales | (9.017) | (9.048) |
| Gross profit | 23.650 | 22.328 |
| Selling, general and administration | (9.088) | (11.015) |
| Research and development | (7.525) | (6.401) |
| Royalty income | 879 | 639 |
| Other operating income/(expense) | 16 | (1.530) |
| **Operating profit** | **7.932** | **4.021** |
| Finance income | 169 | 122 |
| Finance expense | (701) | (669) |
| Share of after tax profit/(loss) of associates and joint ventures | 1 | (3) |
| Profit/(loss) on disposal of interests in associates and joint ventures | - | 6 |
| **Profit before taxation** | **7.401** | **3.477** |
| Taxation | (1.112) | (526) |
| **Profit after taxation** | **6.289** | **2.951** |
| Profit attributable to non-controlling interests | 573 | 376 |
| Profit attributable to shareholders | 5.716 | 2.575 |
| Basic earnings per share (pence) | 141,1 | 63,2 |
| Diluted earnings per share (pence) | 138,8 | 62,2 |

Source: GSK Annual Report 2025

## Consolidated Balance Sheet

| | **2025 £ m** | **2024 £ m** |
|---|---|---|
| **Assets** | | |
| **Non-current assets** | | |
| Property, plant and equipment | 9.322 | 9.227 |
| Right of use assets | 726 | 846 |
| Goodwill | 7.018 | 6.982 |
| Other intangible assets | 16.748 | 15.515 |
| Investments in associates and joint ventures | 89 | 96 |
| Other investments | 1.037 | 1.100 |
| Deferred tax assets | 6.520 | 6.757 |
| Derivative financial instruments | - | 1 |
| Other non-current assets | 2.148 | 1.942 |
| Total non-current assets | 43.608 | 42.466 |
| **Current assets** | | |
| Inventories | 5.924 | 5.669 |

| | | |
|---|---|---|
| Current tax recoverable | 288 | 489 |
| Trade and other receivables | 7.471 | 6.836 |
| Derivative financial instruments | 121 | 109 |
| Liquid investments | 9 | 21 |
| Cash and cash equivalents | 3.397 | 3.870 |
| Assets held for sale | 300 | 3 |
| Total current assets | 17.510 | 16.997 |
| Total assets | 61.118 | 59.463 |
| **Liabilities** | | |
| **Current liabilities** | | |
| Short-term borrowings | (3.012) | (2.349) |
| Contingent consideration liabilities | (1.348) | (1.172) |
| Trade and other payables | (15.381) | (15.335) |
| Derivative financial instruments | (75) | (192) |
| Current tax payable | (498) | (703) |
| Short-term provisions | (938) | (1.946) |
| Liabilities relating to assets held for sale | (139) | - |
| Total current liabilities | (21.391) | (21.697) |
| **Non-current assets** | | |
| Long-term borrowings | (14.708) | (14.637) |
| Deferred tax liabilities | (291) | (382) |
| Pensions and other post-employment benefits | (1.687) | (1.864) |
| Derivative financial instruments | (67) | - |
| Other provisions | (610) | (589) |
| Contingent consideration liabilities | (5.385) | (6.108) |
| Other non-current liabilities | (1.023) | (1.100) |
| Total non-current liabilities | (23.771) | (24.680) |
| Total liabilities | (45.162) | (46.377) |
| Net assets | 15.956 | 13.086 |
| **Equity** | | |
| Share capital | 1.349 | 1.348 |
| Share premium | 3.498 | 3.473 |
| Retained earnings | 10.209 | 7.796 |
| Other reserves | 1.321 | 1.054 |
| Shareholder's equity | 16.377 | 13.671 |
| Non-controlling interests | (421) | (585) |
| Total equity | 15.956 | 13.086 |

Source: GSK Annual Report 2025

## Consolidated Statement of Changes in Equity

| | Share capital £ m | Share premium £ m | Retained earnings £ m | Other reserves £ m | Total £ m | Non-controlling interests £ m | Total equity £ m |
|---|---|---|---|---|---|---|---|
| **At 31 December 2024** | **1.348** | **3.473** | **13.835** | **1.242** | **19.898** | **(30)** | **19.868** |
| Distributions to non-controlling interests | - | - | - | - | - | (391) | (391) |
| Dividends to shareholders | - | - | (2.564) | - | (2.564) | - | (2.564) |
| Realised after tax gains/(losses) on disposal or liquidation of equity investments | - | - | (66) | 66 | - | - | - |
| Share of associates and joint ventures realised gains/(loss) on disposal of equity investments | - | - | 58 | (58) | - | - | - |
| Shares issued | 1 | 14 | - | - | 15 | - | 15 |
| Purchase of treasury shares | - | - | (1.377) | - | (1.377) | - | (1377) |
| Write-down on shares held by ESOP Trusts | - | - | (467) | 467 | - | - | - |
| Shares acquired by ESOP Trusts | - | 11 | 385 | (369) | - | - | - |
| Share-based incentive plans | - | - | 374 | - | 374 | - | 374 |
| Tax on share-based incentive plans | - | - | 31 | - | 31 | - | 31 |
| **At 31 December 2025** | **1.349** | **3.489** | **10.209** | **1.321** | **16.377** | **(421)** | **15.956** |

Source: GSK Annual Report 2025

## Consolidated Cash Flow Statement

| | 2025 £ m | 2024 £ m |
|---|---|---|
| **Cash flow from operating activities** | | |
| Profit after tax | 6.289 | 2.951 |
| Adjustments reconciling profit after tax to operating cash flows | 2.654 | 4.910 |
| Cash generated from operations | 8.943 | 7.861 |
| Taxation paid | (1.202) | (1.307) |
| **Total net cash inflow/(outflow) from operating activities** | **7.741** | **6.554** |
| **Cash flow from investing activities** | | |
| Purchase of property, plant and equipment | (1.348) | (1.399) |
| Proceeds from sale of property, plant and equipment | 24 | 65 |
| Purchase of intangible assets | (1.637) | (1.583) |
| Proceeds from sale of intangible assets | 115 | 131 |
| Purchase of equity investments | (92) | (103) |
| Proceeds from sale of equity investments | 189 | 2.356 |
| Share transactions with non-controlling interests | - | (1) |
| Purchase of businesses, net of cash acquired | (1.692) | (805) |
| Investments in associates and joint ventures | - | (43) |
| Proceeds from disposal of associates and joint ventures | - | - |
| Contingent consideration paid | (17) | (19) |
| Disposal of businesses | (27) | (18) |
| Interest received | 154 | 138 |
| (Increase)/decrease in liquid investments | 11 | 21 |
| Dividends from joint ventures and associates | 67 | 15 |
| Dividend and distributions from investments | 20 | 16 |
| **Total net cash inflow/(outflow) from investing activities** | **(4.233)** | **(1.229)** |
| **Cash flow from financing activities** | | |
| Issue of share capital | 15 | 20 |
| Repayment of long-term loans | (1.400) | (1.615) |
| Issue of long-term notes | 1.979 | 1.075 |
| Net increase/(decrease) in short-term loans | 1.085 | (811) |
| Increase in other short-term loans | 130 | 266 |
| Repayment of other short-term loans | (288) | (81) |
| Repayment of lease liabilities | (241) | (226) |
| Interest paid | (679) | (632) |
| Dividends paid to shareholders | (2.564) | (2.444) |
| Purchase of treasury shares | (1.377) | - |
| Distribution to non-controlling interests | (391) | (416) |
| Contributions from non-controlling interests | - | 9 |

| | | |
|---|---|---|
| Other financing items | 46 | 129 |
| **Total net cash inflow/(outflow) from financing activities** | **(3.685)** | **(4.726)** |
| **Increase/(decrease) in cash and bank overdrafts in the year** | **(177)** | **599** |
| Cash and bank overdrafts at the beginning of the year | 3.403 | 2.858 |
| Exchange adjustments | (19) | (54) |
| Increase/(decrease) in cash and bank overdrafts in the year | (177) | 599 |
| **Cash and bank overdrafts at the end of the year** | **3.207** | **3.403** |

Source: GSK Annual Report 2025

Author's Statement:

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