

FINANCIAL MANAGEMENT

by Pranjal Parthiv Trivedi

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Student name: Pranjal Parthiv Trivedi

Student ID number: 2241418

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Lecturer: prof Masud Ibrahim

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Overview of GlaxoSmithKline (GSK):

²³ GlaxoSmithKline (GSK) is a renowned global pharmaceutical company based in London, United Kingdom. It was formed in 2000 through the merger of ⁴⁹ Glaxo Wellcome and SmithKline Beecham. GSK operates in three main business segments: Pharmaceuticals, Vaccines, and Consumer Healthcare. The company's business model focuses on developing, manufacturing, and distributing prescription medicines, vaccines, and consumer healthcare products.

GSK has a strong market position, ranking among the largest pharmaceutical companies globally. The company's diversified product portfolio encompasses various therapeutic areas, including respiratory, HIV, ² oncology, immuno-inflammation, and infectious diseases. GSK's primary competitors include other major pharmaceutical companies such as Pfizer, Novartis, Johnson & Johnson, and AstraZeneca.

Major Events in the Past Five Years:

² Over the past five years, GlaxoSmithKline ² has experienced significant events that have influenced its overall financial performance and strategic direction:

- **Leadership Changes:** In 2017, Emma Walmsley became the CEO of GSK, making ² her the first female CEO of a major pharmaceutical company. This change in leadership brought a fresh perspective and focus on innovation and growth.
- **Legal Issues:** GSK faced legal challenges related to its marketing practices and drug safety. In 2018, the company was fined by the Competition and Markets Authority (CMA) in the UK for anti-competitive behavior. Legal issues can impact the company's reputation and financial standing.
- **Strategic Shifts:** GSK underwent a strategic transformation in recent years, focusing on strengthening its core business areas and divesting non-core assets. The company announced a major restructuring plan in 2018, including the creation of a new consumer healthcare joint venture with Pfizer.
- **COVID-19 Pandemic:** The global pandemic had a significant impact on the pharmaceutical industry, including GSK. The company collaborated with other organizations to develop and manufacture COVID-19 vaccines and treatments, contributing to its reputation and revenue stream.

These events, among others, have shaped GSK's financial performance and strategic outlook.

Founding Principles:

GlaxoSmithKline's founding principles revolve around improving the quality of human life by enabling people to do more, feel better, and live longer. GlaxoSmithKline (GSK) was founded with a commitment to improving the quality of human life by enabling people to do more, feel better, and live longer. These principles reflect GSK's dedication to addressing global healthcare challenges and finding innovative solutions to improve the health and well-being of individuals worldwide. GSK's core values include integrity, transparency, and a patient-centric approach, guiding its operations and decision-making processes.

Core Products:

The company's core products and services span three main business segments:

1. Pharmaceuticals:

GlaxoSmithKline (GSK) develops and markets a diverse range of prescription medicines across various therapeutic areas. Some of its core pharmaceutical products include:

- **Advair/Seretide:** A widely prescribed inhaler for the treatment of respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD). It combines a long-acting bronchodilator with an inhaled corticosteroid to help patients manage their symptoms.
- **Triumeq:** A once-daily tablet for the treatment of HIV-1 infection in adults and adolescents. Triumeq is a fixed-dose combination product that combines three different antiretroviral drugs, simplifying the treatment regimen for patients.
- **Zejula:** A targeted therapy indicated for the treatment of ovarian cancer. Zejula belongs to a class of drugs called poly (ADP-ribose) polymerase (PARP) inhibitors and is used for the maintenance treatment of adult patients with recurrent epithelial ovarian, fallopian tube, or primary peritoneal cancer.

These core pharmaceutical products highlight GSK's commitment to addressing significant medical needs and providing innovative treatments to patients.

2. Vaccines:

GSK has a strong presence in the vaccines market, offering preventive vaccines for various infectious diseases. Some of its core vaccine products include:

- **Infanrix:** A combination vaccine used to protect infants and children against diseases such as diphtheria, tetanus, pertussis (whooping cough), hepatitis B, and polio.
- **Boostrix:** A vaccine indicated for boosting immunity against diphtheria, tetanus, and pertussis in adolescents and adults.
- **Shingrix:** A vaccine developed to prevent shingles (herpes zoster) in adults aged 50 years and older. Shingrix is highly effective in reducing the risk and severity of shingles.

These core vaccine products demonstrate GSK's commitment to disease prevention and the promotion of public health.

3. Consumer Healthcare:

GSK's consumer healthcare division offers a wide range of over-the-counter (OTC) medicines, oral care products, nutritional drinks, and skincare brands. Some of its core consumer healthcare products include:

- **Sensodyne:** A leading brand of toothpaste for individuals with sensitive teeth. Sensodyne provides relief from tooth sensitivity and helps protect against dental cavities.
- **Panadol:** A popular pain relief brand that includes a range of paracetamol-based products for different types of pain, including headaches, muscular aches, and fever.
- **Voltaren:** A well-known brand of topical pain relief products containing diclofenac. Voltaren offers targeted relief for joint and muscle pain.
- **Tums:** An antacid product that provides relief from heartburn, indigestion, and acid reflux symptoms.

These core consumer healthcare products highlight GSK's focus on empowering individuals to manage their health and well-being on a day-to-day basis.

Market Niche:

GlaxoSmithKline (GSK) occupies a significant market niche as a leading global pharmaceutical company with a diverse product portfolio. The company's market niche stems from its expertise in three main business segments: Pharmaceuticals, Vaccines, and Consumer Healthcare. GSK's focus on pharmaceuticals allows it to develop and market a wide range of prescription medicines, targeting various therapeutic areas and addressing critical medical needs. In the vaccines market, GSK is recognized for its preventive vaccines, offering protection against infectious diseases and contributing to public health. Additionally, GSK's consumer healthcare division provides a broad range of over-the-counter medicines, oral care products, nutritional drinks, and skincare brands, enabling individuals to manage their health and well-being on a daily basis. This comprehensive approach to healthcare, spanning pharmaceuticals, vaccines, and consumer healthcare, positions GSK as a prominent player in the global market, catering to a wide spectrum of healthcare needs.

Part B: Critical Review of GlaxoSmithKline's Financial Performance

1. Calculation of Key Financial Ratios (2018-2022):

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a. Profitability Ratios:

Year	Gross Profit	Revenue	Operating Profit	Net Profit
2018	\$27.470 B	\$41.140 B	\$7.319 B	\$4.836 B
2019	\$27.953 B	\$43.100 B	\$8.889 B	\$5.931 B
2020	\$28.755 B	\$43.783 B	\$9.993 B	\$7.382 B
2021	\$30.955 B	\$46.910 B	\$8.527 B	\$6.030 B
2022	\$24.454 B	\$36.271 B	\$7.957 B	\$18.499 B
Total	\$139.587 B	\$211.204 B	\$42.685 B	\$42.678 B

- Gross Profit Margin = (Gross Profit / Revenue) * 100
$$= (139.587 / 211.204) * 100 = 66.091$$
- Operating Profit Margin = (Operating Profit / Revenue) * 100
$$= (42.685 / 211.204) * 100$$
$$= 20.210$$
- Net Profit Margin = (Net Profit / Revenue) * 100
$$= (42.678 / 211.204) * 100$$
$$= 20.207$$

b. Liquidity Ratios:

Year	Assets	Liabilities
2018	\$77.507 B	\$72.605 B
2019	\$101.759 B	\$78.319 B
2020	\$103.273 B	\$76.556 B
2021	\$108.775 B	\$79.427 B
2022	\$74.395 B	\$61.907 B
Total	\$465.709 B	\$368.814 B

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- Current Ratio = Current Assets / Current Liabilities
$$= 71.182 / 57.441$$
$$= 1.24$$

- ¹³ Quick Ratio = (Current Assets - Inventory) / Current Liabilities
= (71.182 - Inventory) / 57.441)

⁵⁶ c. **Gearing Ratios:**

- Debt-to-Equity Ratio = Total Debt / Total Equity
¹² The debt/equity ratio can be defined as a measure of a company's financial leverage calculated by dividing its long-term debt by stockholders' equity. GSK debt/equity for the three months ending March 31, 2023 was 1.47.
- Interest Coverage Ratio = Operating Profit / Interest Expense
= 42.685 / 1.810
= 23.582B

¹³ d. **Efficiency Ratios:**

- Asset Turnover Ratio = Revenue / Average Total Assets
= 211.204 / 93.141
= 2.268

² Now we will critically evaluate the key financial ratios calculated for GlaxoSmithKline (GSK) over the past five years (2018-2022):

1. **Profitability Ratios:**

²⁸ Profitability ratios, such as the Gross Profit Margin, Operating Profit Margin, and Net Profit Margin, provide insights into GSK's ability to generate profits from its operations. Evaluating the trend of these ratios over the five-year period is crucial. If there is a declining trend, it could indicate challenges in managing costs, pricing pressures, or changes in the product mix. Analyzing the magnitude of the ratios is also important. Comparing GSK's profitability ratios to industry peers or sector averages will help determine the company's relative performance and identify areas where improvement may be needed.

Profitability ratios provide ⁵ insights into GSK's ability to generate profits from its operations. They evaluate the company's ability to effectively manage costs, pricing strategies, and product mix to generate a satisfactory level of profitability. Let's delve further into each profitability ratio:

- ¹¹ **Gross Profit Margin:** The Gross Profit Margin measures the percentage of revenue that remains after deducting the cost of goods sold (COGS). A higher gross profit margin indicates that GSK is effectively managing its production costs and generating a higher margin on its products. However, a declining trend in the gross profit margin may suggest increasing production costs or pricing pressures, which could impact overall profitability.

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Operating Profit Margin: The Operating Profit Margin assesses the profitability of GSK's core operations by measuring the percentage of revenue left after deducting both COGS and operating expenses (such as selling, general, and administrative expenses). An increasing operating profit margin signifies improved efficiency in cost control and operational performance. Conversely, a decreasing trend may indicate rising operating expenses or declining revenue.
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Net Profit Margin: The Net Profit Margin indicates the percentage of revenue that remains as net profit after deducting all expenses, including taxes and interest. It reflects GSK's overall profitability and considers non-operational factors like interest payments and taxes. An increasing net profit margin demonstrates effective cost management and a higher level of profitability. On the other hand, a declining trend suggests challenges such as rising expenses or decreasing revenue.

Analyzing the trend of these profitability ratios over the five-year period provides valuable insights into GSK's financial performance and competitive position. It helps identify whether the company has been successful in maintaining or improving profitability. Comparing these ratios to industry peers or sector averages allows for benchmarking GSK's performance and understanding its relative position within the industry.

2. Liquidity Ratios:

60 Liquidity ratios, including the Current Ratio and Quick Ratio, assess GSK's 25 ability to meet its short-term obligations. A Current Ratio above 1 indicates that GSK has sufficient current assets to cover its current liabilities. Evaluating the trend of the Current Ratio over the five-year period is 62 important to identify stability or improvements in GSK's liquidity position. Additionally, comparing these ratios to industry benchmarks can provide insights into GSK's liquidity position relative to its 70 peers. A higher liquidity position indicates a lower risk of liquidity problems and suggests a better ability to meet short-term obligations.

8 Liquidity ratios assess GSK's ability to meet its short-term financial obligations and provide insights into the company's short-term liquidity and financial flexibility. Let's explore the two commonly used liquidity ratios:

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Current Ratio: The Current Ratio measures the company's ability to cover its short-term liabilities with its short-term assets. It is calculated by dividing current assets by current liabilities. A current ratio greater than 1 indicates that GSK has 5 sufficient current assets to cover its current liabilities. A higher current ratio suggests a healthier liquidity position, as it implies GSK has enough assets to meet its short-term obligations. However, an excessively high current ratio might indicate underutilized assets, 8 implying a potential inefficiency in managing working capital.
- Quick Ratio (also known as Acid-Test Ratio):** The Quick Ratio is 50 more stringent measure of liquidity, as it excludes inventory from current assets. It provides a 18 clearer picture of GSK's ability to meet its short-term obligations using its most liquid assets. The Quick Ratio is calculated by dividing quick assets (current assets minus inventory) by current liabilities. A quick ratio greater than 1 indicates that GSK has sufficient

highly liquid assets to cover its short-term liabilities. This ratio provides a more conservative assessment of liquidity, as it focuses on assets that can be quickly converted into cash. A higher quick ratio suggests a stronger ability to meet short-term obligations without relying heavily on inventory.

Evaluating the trend of these liquidity ratios over the five-year period is crucial to understanding GSK's ability to manage its short-term financial commitments consistently. It helps identify if the company's liquidity position is stable or improving over time. Comparing these ratios to industry benchmarks or sector averages provides additional context and helps assess GSK's liquidity relative to its peers.

3. Gearing Ratios:

Gearing ratios, such as the Debt-to-Equity Ratio and Interest Coverage Ratio, examine GSK's level of financial leverage and its ability to service its debt obligations. A higher Debt-to-Equity Ratio may indicate a higher level of financial risk and a greater dependence on borrowing. Comparing GSK's Debt-to-Equity Ratio to industry peers or sector averages can provide insights into its financial risk position. The Interest Coverage Ratio evaluates GSK's ability to cover its interest expenses with operating profits. A higher ratio indicates a better ability to service debt obligations and suggests a lower risk of default. Evaluating the trend of these ratios over time is crucial to identify any changes in GSK's financial risk position.

Let's explore two commonly used gearing ratios:

- **Debt-to-Equity Ratio:** The Debt-to-Equity Ratio measures the proportion of debt financing relative to shareholders' equity. It is calculated by dividing total debt by shareholders' equity. A higher debt-to-equity ratio indicates a higher level of financial risk and suggests that GSK relies more heavily on debt financing to support its operations and investments. It implies that a significant portion of the company's assets are financed by debt. Conversely, a lower debt-to-equity ratio suggests a more conservative capital structure with a higher proportion of equity financing.
- **Interest Coverage Ratio:** The Interest Coverage Ratio assesses GSK's ability to meet its interest payments using its operating profits. It is calculated by dividing operating profit by interest expenses. A higher interest coverage ratio indicates a greater capacity to cover interest expenses and suggests a lower risk of default. It signifies that GSK's operating profits are sufficient to service its interest obligations. Conversely, a lower interest coverage ratio suggests higher financial risk and a potential inability to meet interest payments from current operating profits alone.

Analyzing the trend of these gearing ratios over the five-year period provides valuable insights into GSK's financial risk profile and capital structure management. It helps identify whether the company's reliance on debt financing is increasing or decreasing over time. Comparing these ratios to industry benchmarks or sector averages provides additional context and helps assess GSK's leverage relative to its peers.

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It's important to note that the optimal level of debt and equity financing varies across industries and depends on factors such as the company's growth prospects, cash flow stability, and industry dynamics. While a certain level of debt can provide tax advantages and leverage potential returns, excessive debt can increase financial risk and interest burden.

4. Efficiency Ratios:

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Efficiency ratios, such as the Asset Turnover Ratio, Inventory Turnover Ratio, and Receivables Turnover Ratio, assess how effectively GSK utilizes its assets, manages inventory, and collects payments from customers. The Asset Turnover Ratio indicates how efficiently GSK generates revenue from its total assets. A higher ratio suggests better asset utilization. Analyzing the trend of this ratio over time can help identify improvements or inefficiencies in GSK's asset management. The Inventory Turnover Ratio measures how quickly GSK sells its inventory and replenishes it. A higher ratio indicates efficient inventory management. The Receivables Turnover Ratio assesses GSK's effectiveness in collecting payments from customers. A higher ratio suggests efficient credit and collection policies. Evaluating the trends and magnitudes of these ratios can help identify areas where GSK can improve its operational efficiency and optimize its asset utilization.

Let's explore three commonly used efficiency ratios:

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- **Asset Turnover Ratio:**

The Asset Turnover Ratio measures how effectively GSK utilizes its total assets to generate sales. It is calculated by dividing revenue by total assets. A higher asset turnover ratio indicates more efficient utilization of assets to generate revenue. It suggests that GSK is generating a higher level of sales relative to its asset base. A declining trend in the asset turnover ratio may indicate underutilized assets or inefficiencies in the utilization of resources.

- **Inventory Turnover Ratio:**

The Inventory Turnover Ratio assesses how efficiently GSK manages its inventory. It is calculated by dividing the cost of goods sold (COGS) by average inventory. A higher inventory turnover ratio suggests efficient management of inventory, with a faster rate of inventory turnover. It indicates that GSK is effectively converting its inventory into sales and minimizing holding costs. However, a very high inventory turnover ratio could imply inventory shortages or difficulties in meeting customer demand.

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- **Receivables Turnover Ratio:**

The Receivables Turnover Ratio measures how effectively GSK collects payments from its customers. It is calculated by dividing annual credit sales by average accounts receivable. A higher receivables turnover ratio indicates efficient credit and collection policies, with faster collection of payments from customers. It suggests that GSK is converting credit sales into cash more quickly. Conversely, a lower ratio may indicate potential difficulties in collecting payments or lenient credit terms.

Analyzing the trends of these efficiency ratios over the five-year period helps identify improvements or inefficiencies in GSK's asset utilization, inventory management, and receivables collection. Comparing these ratios to industry benchmarks or sector averages provides additional context and helps assess GSK's operational efficiency relative to its peers.

Comparison to major competitors and/or sector averages:

To provide a comprehensive analysis of GlaxoSmithKline's (GSK) financial performance, it is important to compare the calculated ratios to those of its major competitors or sector averages. By doing so, we can gain insights into GSK's relative position within the industry and identify areas of strength and areas that require improvement.

When comparing the ratios to major competitors, it is important to consider companies operating in the same industry and of similar size. For example, GSK's competitors in the pharmaceutical industry might include companies like Pfizer, Johnson & Johnson, or AstraZeneca. By comparing the ratios with these competitors, we can determine how GSK's financial performance measures up in terms of profitability, liquidity, gearing, and efficiency.

Similarly, comparing the ratios to sector averages provides ⁶⁴broader context for evaluating GSK's financial management. Sector averages reflect the performance of companies operating in the same industry and can serve as a benchmark for assessing GSK's relative performance. It helps identify whether GSK is performing above, below, or on par with the industry average in various financial aspects.

⁴⁶When conducting these comparisons, it is important to consider the specific characteristics and dynamics of the industry. Factors such as regulatory environment, market conditions, and technological advancements can impact financial performance and should be taken into account. Additionally, it is crucial to ensure the data used for comparisons is from reliable sources and is based on a similar time frame.

Recommendations to improve Financial Management:

Based on the analysis of GSK's financial performance and the comparison to competitors or sector averages, recommendations can be made to improve the company's financial management. Here are some potential recommendations:

- 1. Enhance Profitability:** If GSK's profitability ratios are lower than those of its competitors or sector averages, the company should focus on improving cost management, exploring pricing strategies, and optimizing its product mix. This may involve identifying areas of inefficiency, streamlining operations, and investing in research and development to develop innovative and high-margin products.
- 2. Strengthen Liquidity Position:** If GSK's liquidity ratios indicate room for improvement, the company could consider implementing strategies to enhance its short-term liquidity. This might involve optimizing working capital management, such as reducing inventory holding periods, improving collections from customers, and negotiating favourable payment terms with suppliers. Additionally, GSK could explore alternative sources of financing or refinancing options to improve its liquidity position.

3. **Manage gearing and Financial Risk:** If GSK's gearing ratios suggest a high level of financial risk, the company should evaluate its capital structure and debt management practices. This might involve optimizing the mix of debt and equity financing, considering debt refinancing options to reduce interest costs, and ensuring that the company's interest coverage remains strong. GSK could also focus on generating sufficient cash flows to meet debt obligations and maintaining a prudent level of leverage.
4. **Enhance Operational Efficiency:** If GSK's efficiency ratios indicate areas for improvement, the company should focus on optimizing its asset utilization, inventory management, and receivables collection processes. This may involve implementing lean manufacturing practices, adopting efficient supply chain management strategies, and utilizing technology to streamline operations. Additionally, GSK could evaluate its credit policies to ensure timely collection of receivables and minimize the risk of bad debts.

These recommendations are general in nature and should be tailored to GSK's specific circumstances, strategic objectives, and industry dynamics. It is important for GSK's management team to conduct a thorough analysis of the company's financial performance, consider market conditions, and develop a comprehensive financial management strategy to address the areas identified for improvement.

Part C: Overview of Investment Appraisal Methods of GSK in Assessing Capital Investment Decisions

When GlaxoSmithKline (GSK) evaluates capital investment decisions, various investment appraisal methods are employed to assess the potential financial returns, risks, and viability of investment projects. In this section, we will provide an overview of some commonly used investment appraisal methods, discuss their strengths and limitations, and critically analyze their effectiveness in different investment scenarios specific to GSK.

1. Net Present Value (NPV):

The Net Present Value method calculates the present value of all cash flows (both inflows and outflows) associated with an investment project by discounting them to their present value using a specified discount rate. If the NPV is positive, it indicates that the project is expected to generate more cash flows than the initial investment and is considered financially viable. The NPV method considers the time value of money, accounts for the entire project's cash flows, and provides a measure of profitability.

Strengths: The NPV method accounts for the time value of money, considers all cash flows, and provides a measure of profitability. It helps in identifying projects that create value for GSK and is widely recognized in financial analysis.

Limitations: The NPV method requires the estimation of a discount rate, which can be subjective. It may not be suitable for comparing projects with different durations or scales.

Critical Analysis: GSK can effectively use the NPV method to evaluate investment opportunities in terms of their profitability and value creation potential. By incorporating

appropriate discount rates, GSK can assess the attractiveness of projects and prioritize those with higher NPVs. However, the accuracy of the NPV calculation heavily relies on the accuracy of cash flow projections and the appropriateness of discount rates chosen.

2. Internal Rate of Return (IRR):

¹ The Internal Rate of Return method calculates the discount rate at which the NPV of an investment project becomes zero. It represents the project's expected return rate and is used to assess the project's attractiveness. If the IRR exceeds the required rate of return or cost of capital, the project is considered financially viable. However, the IRR method can result in multiple IRRs, making interpretation complex, especially when cash flows change direction more than once.

⁷ **Strengths:** The IRR method considers the time value of money, provides a measure of the project's return rate, and helps assess project attractiveness. It is useful for comparing projects against their required rates of return.

Limitations: The IRR method can result in multiple IRRs, making interpretation complex. It does not provide a direct measure of profitability and can give misleading results when cash flows change direction multiple times.

¹⁰ **Critical analysis:** GSK can utilize the IRR method as a complementary approach to the NPV method. By comparing the project's IRR with the required rate of return or cost of capital, GSK can assess the potential return on investment. However, it is important to be cautious when interpreting the IRR, particularly in cases of non-conventional cash flow patterns.

²⁶ 3. Payback Period:

The Payback Period method calculates the time required for an investment project to generate sufficient cash flows to recover the initial investment cost. It is a simple and straightforward method that focuses on the time taken to recoup the investment. However, it does not consider the time value of money and does not account for cash flows beyond the payback period, making it a limited method for long-term investments.

⁴⁵ **Strengths:** The Payback Period method provides a quick assessment of the time taken to recover the initial investment and is easy to understand. It can be useful for projects with short payback requirements or high liquidity needs.

¹⁴ **Limitations:** The Payback Period method ignores the time value of money, does not consider cash flows beyond the payback period, and fails to provide a comprehensive measure of profitability.

⁷ **Critical Analysis:** While the Payback Period method may offer a simplified assessment of the time required to recover the investment, it does not provide a comprehensive measure of profitability or consider the project's long-term value. Therefore, GSK should utilize the Payback Period as a supplementary method rather than relying solely on it for investment decision-making.

4. Sensitivity Analysis:

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Sensitivity Analysis involves assessing the impact of changes in key variables or assumptions on the financial outcomes of an investment project. It helps to identify the level of sensitivity of the project's financial metrics, such as NPV or IRR, to changes in factors like sales volume, costs, or discount rates.

Strengths: Sensitivity Analysis allows GSK to understand the project's robustness and vulnerability to different scenarios. It enhances decision-making by identifying the most critical variables and their potential impact.

Limitations: Sensitivity Analysis relies on assumptions and estimations, and it does not provide a single conclusive result. It may not capture all the potential risks or interactions between variables.

Critical Analysis: GSK can effectively use Sensitivity Analysis to evaluate the impact of key variables on investment outcomes. By considering various scenarios and analyzing the project's performance under different conditions, GSK can gain insights into the project's resilience and make informed decisions.

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5. Real Options Analysis:

Real Options Analysis extends traditional investment appraisal methods by incorporating the value of flexibility and managerial choices in investment projects. It recognizes that projects may provide additional future opportunities or the option to abandon or alter the project based on market conditions.

Strengths: Real Options Analysis captures the value of managerial flexibility and the potential upside or downside of future investment decisions. It provides a more comprehensive assessment of investment projects with embedded options.

Limitations: Real Options Analysis can be complex and requires assumptions about future events or conditions. It may involve subjective estimates, making it challenging to quantify the value of real options accurately.

Critical Analysis: Real Options Analysis can be beneficial for GSK when evaluating projects with significant strategic implications or high uncertainty. By considering the value of flexibility and future decision-making options, GSK can gain a more comprehensive understanding of the investment's potential and make decisions that align with long-term strategic goals. However, the accuracy of the analysis heavily depends on the quality of assumptions and estimates used.

GSK should employ a combination of investment appraisal methods, primarily focusing on NPV and IRR, to assess the financial viability and attractiveness of capital investment decisions. Sensitivity Analysis and Real Options Analysis can complement the evaluation process by considering risk factors, potential scenarios, and strategic considerations. GSK should carefully consider the strengths, limitations, and applicability of each method to make informed investment decisions aligned with the company's objectives and risk appetite.

Theoretical Concepts and Numerical Example:

Example-1: Net Present Value (NPV)

GSK is considering investing in a new research and development (R&D) project for a potential drug candidate. The project requires an initial investment of \$10 million and is expected to generate annual cash flows of \$3 million over the next five years. The discount rate, representing the cost of capital and the project's risk, is determined to be 10%.

Using the NPV method, we can calculate the present value of the cash flows and determine the profitability of the project.

The NPV formula is:

$$NPV = \left(\frac{CF_1}{(1+r)^1} \right) + \left(\frac{CF_2}{(1+r)^2} \right) + \dots + \left(\frac{CF_n}{(1+r)^n} \right) - \text{Initial Investment}$$

Assuming the cash flows for each year are constant, the NPV calculation would be as follows:

$$NPV = \left(\frac{\$3 \text{ million}}{(1+0.10)^1} \right) + \left(\frac{\$3 \text{ million}}{(1+0.10)^2} \right) + \left(\frac{\$3 \text{ million}}{(1+0.10)^3} \right) + \left(\frac{\$3 \text{ million}}{(1+0.10)^4} \right) + \left(\frac{\$3 \text{ million}}{(1+0.10)^5} \right) - \$10 \text{ million}$$

By calculating the NPV, GSK can determine whether the project is financially viable. If the NPV is positive, it suggests that the project's expected cash inflows exceed the initial investment, indicating potential profitability.

Example 2: Internal Rate of Return (IRR)

GSK is evaluating two different investment projects, Project A and Project B, each with different cash flow profiles. The required rate of return for GSK is determined to be 12%. The cash flows for each project are as follows:

Project A:

Initial Investment: \$5 million

Year 1 Cash Flow: \$2 million

Year 2 Cash Flow: \$2 million

Year 3 Cash Flow: \$1 million

Project B:

Initial Investment: \$8 million

Year 1 Cash Flow: \$3 million

Year 2 Cash Flow: \$2 million

Year 3 Cash Flow: \$2 million

To calculate the IRR for each project, we find ²⁹ the discount rate that makes the NPV of the cash flows equal to zero. By comparing the IRR with the required rate of return, GSK can assess the projects' attractiveness.

Using the IRR method, GSK can determine which project offers a higher return ⁷ rate and aligns with their investment objectives. Project selection would depend on whether the IRR exceeds the required rate of return and the company's risk appetite.

Example 3: Payback Period

³ GSK is considering investing in a manufacturing facility for a new pharmaceutical product ⁴³. The project requires an initial investment of \$20 million, and the expected cash inflows are as follows:

Year 1: \$5 million

Year 2: \$7 million

Year 3: \$8 million

Year 4: \$6 million

To calculate the payback period ²⁷, GSK determines the time it takes for the cumulative cash inflows to ⁵⁷ equal or exceed the initial investment. In this example, the payback period is determined as follows:

Year 1: \$5 million

Year 2: \$5 million + \$7 million = \$12 million

Year 3: \$12 million + \$8 million = \$20 million

The payback period for this investment project would be three years, as that is ⁵¹ the point at which the cumulative cash inflows equal the initial investment. GSK can use this information to assess the project's liquidity and compare it to their desired payback period requirement.

Example 4: Sensitivity Analysis GSK is evaluating an expansion project for an existing product line. The initial investment is \$15 million, and the estimated cash flows are as follows:

Best-Case Scenario:

³⁵ Year 1: \$6 million

Year 2: \$8 million

Year 3: \$10 million

Worst-Case Scenario:

Year 1: \$4 million

Year 2: \$6 million

Year 3: \$8 million

GSK performs a sensitivity analysis by varying key variables such as sales volume or cost assumptions to assess the project's sensitivity to changes. By recalculating the NPV or IRR under different scenarios, GSK can identify the project's robustness and potential risks. For example, if the project remains financially viable and attractive under the worst-case scenario, it suggests a greater resilience and lower risk.

Example 5: Real Options Analysis

GSK is considering investing in a research project to explore the development of a new breakthrough drug. The project requires an initial investment of \$50 million. However, there is uncertainty surrounding the project's success due to regulatory hurdles and market acceptance. GSK employs real options analysis to evaluate the project.

In this case, GSK recognizes that if the initial research stage yields positive results, they will have the option to proceed to the clinical trials stage, with an estimated additional investment of \$100 million. Based on the success of the clinical trials, GSK will have the option to proceed with commercialization, requiring an additional investment of \$150 million.

By analyzing the potential outcomes and assigning probabilities to each stage, GSK can assess the value of managerial flexibility and the project's overall worth. Real options analysis allows GSK to consider the value of future choices and make more informed investment decisions based on different potential scenarios.

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