

Impact of Capital Structure on the Operating Performance of Listed Companies in the Pharmaceutical Industry

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Abstract: The objective of this paper is to explore the correlation between the capital structure and operating performance of selected leading pharmaceutical companies listed on the stock exchange during the COVID-19 pandemic. To investigate how diverse capital structures influence corporate performance, this study collects, calculates, and compares pertinent financial data, including leverage ratios, performance indicators, and cash flow, for these firms over three years. The findings show that companies with lower debt ratios are more likely to achieve stable earnings and cash flows, as well as to achieve higher performance indicators to some extent, compared to companies with higher debt ratios. Thus, capital structure has an impact on a company's operating performance. At the same time, a reasonable capital structure optimization can enhance a company's operating performance and mitigate operational risks. It is recommended that listed companies in the pharmaceutical industry should focus on optimizing their capital structure to reduce financial risks and financing costs and to improve cash flow levels in order to achieve stable improvements in operating performance while ensuring sound operations and management. Investors should also focus on the capital structure of companies when making investment decisions and select those companies with a sound capital structure for investment. These findings and recommendations provide suggestions and directions for the pharmaceutical industry to optimize its capital structure and improve its operating performance.

Keywords: capital structure, pharmaceutical industry, operating performance, financial risk, investor

1. Introduction

1.1. Background

The outbreak of an epidemic signals the remarkable value of the pharmaceutical industry, not only in providing effective treatments and drugs but also in launching vaccines in the shortest possible time to protect against the dangers of the epidemic. In today's fast-growing and competitive pharmaceutical industry, public companies are trying to gain more market share and profit through different business strategies. One of the key strategies is capital structure management. The influence of capital structure

on business performance has emerged as a critical issue in the domain of financial research. Numerous studies have indicated that the capital structure of a public pharmaceutical company may considerably affect its operational performance. Thus, conducting an extensive exploration into the interplay between capital structure and operating performance of pharmaceutical companies listed in the stock market is vital for devising appropriate financial strategies, enhancing companies' competitiveness, and ensuring their sustainable growth.

1.2. Related Research

Huang and Song analyzed market and accounting data to investigate the capital structure features of over 1,200 Chinese companies listed on the stock exchange. The research highlights that the level of leverage among Chinese firms tends to rise with the increase in business size and fixed assets, whereas it tends to decline with enhanced profitability, non-debt tax shield, growth prospects, and managerial ownership. Furthermore, the capital structure of these firms was shown to have a considerable correlation with the industry in which they operate [1]. Guo and Sun conducted a comprehensive study of the capital structure of companies in the same industry and different industries, using the Industry Classification Guidelines for Listed Companies as the standard. The study shows that there are significant differences in the capital structure of listed companies in diversified industries, while the capital structure of listed companies in the same industry is stable with no significant differences between companies [2]. Eriotis et al. conducted a sampling study on the debt ratios of various firms, in which they examined how firm characteristics serve as determinants of capital structure. The results demonstrated that there exists a negative correlation between firms' debt ratios and their growth rate, quick ratio, as well as interest coverage ratio. Moreover, a marked discrepancy was observed in the capital structure between companies having debt ratios above and below 50% [3].

Campello conducted a study that investigated the influence of capital structure on product market outcomes using both firm- and industry-level evidence. The findings indicated that debt financing adversely affects the sales growth of companies operating in industries where their competitors are comparatively less leveraged but only during economic downturns, not during periods of expansion. These results suggest that companies that heavily depend on external financing are more susceptible to scaling back on investments in building market share in response to negative shocks to demand [4]. In a sample study of 358 firms that demonstrated underperformance over one year, Eli and Ofek assessed the correlation between capital structure and firms' responses to short-term financial distress. The research discovered that the likelihood of operational actions, including asset restructuring and employee layoffs, is higher for companies that have comparatively higher leverage before experiencing financial turmoil. Additionally, higher pre-distress leverage was found to be correlated with an increased probability of financial actions [5].

Ria investigated the role of capital structure as a mediating variable between corporate governance and firm performance by using data from 15 companies' financial statements between 2015-2017. The results show that corporate governance is significantly related to capital structure and firm performance and that the effects of capital structure and corporate governance on firm performance cannot be mediated by each other [6]. Hu chose descriptive statistics to conduct detailed data analysis on the capital structure and operating performance of GEM-listed companies. The results of the study showed that the shareholding ratio of the top five shareholders of GEM-listed companies was positively correlated with operating performance, and long-term capital indebtedness ratio was positively correlated with operating performance; while gearing ratio and current debt ratio were negatively correlated with operating performance [7]. Li selected a sample of over 700 GEM-listed companies from 2010-2012 and conducted a study on the relationship between capital structure and firm performance, concluding that capital structure and firm performance are negatively correlated with each

other. The increase in financial leverage of firms is not conducive to the improvement of business performance; the better the business performance of firms, the lower the debt financing ratio [8].

Zhang selected the financial data of 144 listed companies in the pharmaceutical manufacturing industry and conducted a regression analysis through the model. The study shows that the asset-liability ratio has a significant negative relationship with the profitability of the company and that there is a critical value of the asset-liability ratio in this industry to maximize the profitability of the company [9]. Deng et al. investigated empirical research to determine the factors that influence the capital structure of publicly listed pharmaceutical companies. Their findings indicate a strong positive correlation between growth opportunities and the ability to raise debt. Moreover, long-term capital is typically utilized for financing sales expenditures, while larger firms have a greater capacity for debt financing. The study also revealed a positive relationship between the value of collateral and the raising of long-term debt [10].

1.3. Objective

This study aims to investigate how the capital structure of several notable pharmaceutical companies in the market has affected their operational performance in the context of the COVID-19 outbreak. The impact of different capital structures on corporate operating performance is explored by collecting, calculating and comparing relevant financial data, such as leverage, performance indicators and cash flow, of these companies over the past three years. This study aims to reveal the role of capital structure optimization of listed companies in the pharmaceutical industry in enhancing and stabilizing their operating performance and to provide a valuable reference for investors in the pharmaceutical industry, as well as to provide suggestions and directions for the industry to optimize its capital structure and enhance its operating performance.

2. Research Methodology

2.1. Information Collection

In order to investigate how capital structure affects the operating performance of pharmaceutical companies listed on the stock market, it is necessary to gather and organize data on the following variables.

Annual reports and financial reports of industry-related companies: including balance sheets, income statements and cash flow statements, etc. to assess the company's financial position and profitability. The governance structure of industry-related companies: including information on the composition of the board of directors and senior management, the company's shareholding structure, internal controls, etc. to assess the efficiency and transparency of the company's decision-making, supervision and management. Industry and market trends: including information on the overall economic environment, policies and regulations, market competition, and outlook of the pharmaceutical industry to gauge potential opportunities and threats to the company's operations.

2.2. Analysis of the Capital Structure

The leverage ratio, debt ratio and equity ratio of pharmaceutical companies are calculated to assess their financial risk and financing capacity and to compare the differences between companies. For example, pharmaceutical companies usually need to invest a lot of money in R&D and production, and these activities require a certain period to realize a return. Therefore, the debt ratio is a very important indicator. A higher debt ratio indicates that a company's financing method is more oriented toward borrowing, which means that the company is more leveraged and risky. At the same time, companies with high leverage also face higher pressure on interest expenses.

2.3. Analysis of Performance Indicators

Financial indicators such as profitability and ROE of pharmaceutical companies are calculated to assess their profitability and asset utilization efficiency to judge their business performance. As an illustration, the formula for calculating return on equity (ROE) involves dividing the net income by shareholders' equity. A higher ROE is indicative of superior financial performance and more efficient utilization of capital. However, since the pharmaceutical industry has a long R&D cycle, it may require relatively more capital investment, which means that ROE may be affected.

2.4. Analysis of Cash Flows

The free cash flow and cash surplus of a pharmaceutical company are calculated to assess the balance between its capital expenditure and return on capital, and thus determine the value of the company. The cash flow statement can be used to analyze the impact of a company's capital structure through a detailed breakdown of the three main categories: operating, investing and financing. For example, if a company relies on significant borrowing to finance its operations at a time when the company's cash flow statement shows consistently negative cash flows from operating activities, this means that the company's capital structure is under pressure and may hurt operating results.

3. Analysis and Comparison

Pfizer, AstraZeneca and Merck are three well-known public companies in the pharmaceutical industry. They are all different in terms of business and product layout and have been affected differently by the COVID-19 pandemic.

The study selected data from Pfizer, Merck and AstraZeneca for three years from 2020 to 2022 for analysis, as shown in Table 1.

Table 1: Comparison of Pfizer, Merck and AstraZeneca.

Company Year	Pfizer			AstraZeneca			Merck		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Total debt/Total capital(%)	23.6	10.7	11.4	15.6	15.9	13.0	12.2	12.0	9.8
Total debt(B)	41.3	41.4	39.4	22.7	33.4	31.1	33.4	34.6	32.0
Revenue(B)	41.7	81.3	100.3	26.6	37.4	44.4	41.5	48.7	59.3
Net Income to Common Margin(%)	15.9	27.6	31.3	12.0	0.3	7.4	10.9	25.3	24.5
Levered Free Cash Flow(B)	12.2	29.9	26.0	3.8	4.9	8.7	5.8	9.7	14.7
Free Cash Flow Yield(%)	5.2	9.0	8.1	2.6	2.9	3.7	3.3	4.3	5.4
ROE(%)	14.5	31.3	36.2	20.8	0.4	8.6	27.5	41.0	34.5

Pfizer is a global pharmaceutical company with businesses in life sciences, hospitals and other areas. During the epidemic, Pfizer quickly launched the COVID-19 vaccine and accelerated the development and production of the vaccine. In addition to the COVID-19 vaccine, Pfizer also has many well-known products such as the cancer drug Ibrance and the antibiotic Zithromax. Pfizer's business is growing steadily with good revenue and net profit performance.

AstraZeneca is a global biopharmaceutical company with major products covering cardiovascular, digestive, respiratory and immunological areas. During the epidemic, AstraZeneca worked with Oxford University to develop the COVID-19 vaccine. However, problems during the testing of the vaccine delayed its release and made it less competitive in the market than companies such as Pfizer. Meanwhile, in 2022, AstraZeneca's finances show a high leverage ratio and low free cash flow yield and return on net assets, indicating a relatively weak operating position.

Merck is a life sciences, medical devices and animal health products company with a diverse portfolio of businesses. During the New Crown epidemic, Merck was involved in the development of several COVID-19 therapeutics, such as the antiviral Molnupiravir, and continued to promote other product lines. Merck's financials in 2022 show a better performance, indicating that the company responded well during the epidemic.

Net income to common margin assesses the percentage of net profit earned by a business in sales revenue and therefore reflects the profitability of the business, particularly the earnings received by ordinary shareholders. A high Net income to common margin is usually considered a positive sign, as it indicates that the business has more profits available for distribution to ordinary shareholders.

Free cash flow yield is an assessment of the free cash flow provided to shareholders as a percentage of the company's market capitalization and reflects the financial position and potential risks of the business. A high free cash flow yield means that the more free cash flow a business provides as a percentage of the company's market capitalization, which is often seen as a positive sign as it indicates that the business has more flexibility in promoting growth and allocating capital.

ROE (Return on Equity) reflects the net profit generated by a business per unit of equity and is important in measuring the profitability of a business. A high ROE is usually considered a positive sign as it indicates that the business is using the capital provided by shareholders efficiently to generate profits.

3.1. Longitudinal Comparison

As shown in Table 1, comparing the gearing of these three companies, all of them have lower gearing in 2022 than they would have had in 2020. Except for AstraZeneca, the other two companies' total debt is also decreasing year on year, and their net income to common margin in 2022 is significantly higher than in 2020, signaling that they have a higher share of net profit in sales revenue, meaning that the company has more profit available for distribution to common shareholders. This is supported by their levered free cash flow levels, free cash flow yield and ROE values. All three of these figures are higher for Pfizer and Merck in 2022 than they each will be in 2020, meaning that the greater the proportion of free cash flow provided by a company as a percentage of that company's market capitalization, this is typically regarded favorably since it suggests that the company possesses greater agility in pursuing expansion opportunities and distributing capital resources and that the company is using the capital provided by shareholders effectively to generate profits. The above figures suggest to some extent that both Pfizer and Merck, are in a better position to operate in 2022 than they were in 2020.

3.2. Cross-sectional Comparison

Comparing the three companies individually in 2022, Merck has the lowest gearing while AstraZeneca has the highest gearing. AstraZeneca has the lowest Net income to common margin, meaning that it has the lowest proportion of interest rates allocated to common shareholders of the three companies. AstraZeneca also has the lowest free cash flow yield and ROE, which means that it provides the lowest free cash flow as a percentage of market capitalization and the lowest net profit per unit of

equity of the three companies. Table 1 provides some indication that AstraZeneca is not as well positioned to operate in FY2022 as the two companies Pfizer and Merck.

4. Discussion

4.1. Impact of the Epidemic and Operations

From the above analysis, it is clear that AstraZeneca is not as good as Pfizer and Merck in adapting to the changes brought about by the epidemic, its vaccines are less competitive and it is not performing as well as the latter two in terms of operating conditions. AstraZeneca's relatively weak operating position during the epidemic may also be affected by the following factors:

The COVID-19 pandemic had a significant impact on AstraZeneca's business. As a result of the outbreak and spread of the New Coronavirus, the prioritization of healthcare resources and the procurement and supply chain of medicines around the world were severely affected, which created a great deal of uncertainty for AstraZeneca's business, resulting in a decline in the Company's performance.

AstraZeneca has had multiple negative events in the past few years. For example, the company suffered a serious breach of integrity allegation in 2017, where its cancer drug sales were allegedly fraudulent. In addition, AstraZeneca had engaged in some inappropriate promotional practices in promoting its heart drug Brilinta, which also hurt the company.

AstraZeneca's market share is not dominant in the pharmaceutical industry as a whole, but the company is still competitive in some areas. However, during the epidemic, several pharmaceutical companies around the world were actively developing and promoting related vaccines and drugs, and the market became more competitive, which also put some pressure on AstraZeneca's business.

Therefore, AstraZeneca needs to further increase innovation and launch more quality products to enhance its competitiveness, while paying attention to risk control, reducing leverage and improving financial indicators such as free cash flow yield.

4.2. Investor's Perspective

The impact of the COVID-19 pandemic on the pharmaceutical industry as a whole has been significant and there are differences in the performance of individual companies. Investors, need to take into account various factors, assess the actual business situation and risk level of each company, and make scientific and reasonable investment decisions. The capital structure determines the debt burden and risk level of a company. For investors in the pharmaceutical industry here are some suggestions.

Investors should be concerned about the level of solvency and debt of the business. Pharmaceutical companies require significant research and development costs and capital expenditure, as well as a high level of risk-taking in areas such as new drug development, so they usually have a high debt ratio on their balance sheets. However, an excessive debt ratio can increase the pressure on a company to service its debt and increase its financial risk, and investors should pay more attention to the company's solvency and financial stability.

Investors should pay attention to whether the company has sufficient free cash flow. Pharmaceutical companies often require large amounts of capital for research and development and production, and to ensure the smooth development and long-term sustainability of their business, they must have sufficient free cash flow to support activities such as operations, investments and dividends. Investors should pay more attention to the company's free cash flow yield over the past few years to get an idea of the company's cash flow position.

Investors should also focus on the equity structure of the company. The structure of a company's share capital is a critical factor that impacts both its decision-making processes and corporate gov-

ernance practices. Pharmaceutical companies often have large shareholders or significant stakeholders, for example, and these factors may also have an impact on the company's operating conditions. Investors should keep an eye on the company's shareholding structure and the intentions and background of the majority shareholder's actions.

In conclusion, to achieve more robust returns in the pharmaceutical industry, investors need to be patient in understanding industry trends, emphasize the company's financial standing and innovativeness, and carefully examine factors such as a company's capital and equity structure, debt burden and free cash flow to assess its long-term performance and level of risk.

5. Conclusion

After examining the relationship between the capital structure and operating performance of three representative public companies in the pharmaceutical industry during the COVID-19 pandemic: Pfizer, AstraZeneca and Merck, the paper draws the following conclusions:

In terms of operating performance, the calculation of financial indicators such as the gearing ratio, performance indicators and cash flow revealed that companies with lower debt ratios were more likely to achieve stable earnings and cash flow, as well as to achieve higher gearing and performance indicators to a certain extent, compared to companies with higher debt ratios. This suggests that a link exists between a company's capital structure and its operating performance. In terms of capital structure optimization, the comparison shows that a reasonable capital structure optimization can improve a company's operating performance and mitigate operational risks. By reducing debt ratios, companies can reduce financial risks and financing costs, and improve cash flow levels, thus providing a more stable foundation for future growth.

Therefore, it is suggested that listed companies in the pharmaceutical industry should focus on optimizing their capital structure, reducing financial risks and financing costs, and improving cash flow levels to achieve a stable improvement in operating performance, while ensuring sound operation and management. At the same time, investors should also focus on the capital structure of companies when making investment decisions, taking into account their operating performance, and selecting those companies with a sound capital structure for investment.

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