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Financial Analysis of the Pharmaceutical Industry Based on Dupont Analysis: Taking Guangzhou Baiyunshan Pharmaceutical Group as an Example

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Abstract: As an "infrastructure industry", the pharmaceutical industry is related to people's livelihood and social stability and is one of the pillar industries of society. With the in-depth advancement of various medical policy reforms since 2021, the scale of China's pharmaceutical market has continued to rise, and the revenue and profit of the pharmaceutical industry have maintained steady growth, so the industry still has outstanding growth advantages. Based on the pharmaceutical industry, this paper selects Guangzhou Baiyunshan Pharmaceutical Group as the research object, takes the company's financial data from 2018 to 2022 as the basis, conducts a comprehensive study on the company's operating conditions based on DuPont analysis, and finds that Guangzhou Baiyunshan has problems such as high financial risk, low turnover of receivables and low profitability during its development. The paper puts forward the corresponding suggestions of saving expenditure, increasing income and focusing on sustainable development in solvency; improving enterprise credit policy and strengthening accounts receivable management in operational capacity; and optimizing pharmaceutical R&D investment and management in profitability.

Keywords: pharmaceutical industry, Guangzhou Baiyunshan, DuPont analysis, financial analysis, return on net assets

1. Introduction

Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd. is a listed company held by Guangzhou Pharmaceutical Group Co., Ltd. Its predecessor, Baiyunshan Pharmaceutical General Factory, was founded in 1973 and has a long history of development. Guangzhou Baiyunshan is one of the largest pharmaceutical enterprise groups in China, and after years of capital investment and careful layout, it has formed four major business segments, namely Greater Southern Medicine, Greater Health, Greater Commerce, and Greater Medical, which basically constitute a complete industry chain. In 2023, Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd. was listed on the "2022 Forbes Top 50 China Sustainable Industrial Enterprises" list. Previous research on Guangzhou Baiyunshan Pharmaceutical Group mainly used financial ratios, the Harvard analytical framework or financial strategy matrix, and other research methods, and the main research content includes the analysis and evaluation of the enterprise's asset quality, capital structure analysis, capital structure optimisation research from the perspective of capital, financial statement analysis, financial strategy research, as

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well as the study of the enterprise's internal control, accounting information disclosure research, and so on. For example, in the study of asset quality analysis and evaluation of Guangzhou Baiyunshan Pharmaceutical Group Co., Ltd., Liu Ruijie utilises the relevant financial ratios to study the asset quality of this enterprise in terms of the effectiveness, income, realizability, and profitability of assets [1]. The results show that Guangzhou Baiyunshan's asset quality indicators are generally better, but there is a decline in profitability and liquidity. Guangzhou Baiyunshan Pharmaceutical Group conducted financial strategy research on the enterprise's asset size, financial strategy, and other aspects of the analysis and put forward recommendations about inventory management, equity incentive plans, and other optimisation recommendations [2]. This thesis is innovative with DuPont analysis centred around the return on shareholders' equity and utilises relevant financial ratios to briefly analyse the overall financial status of Guangzhou Baiyunshan Pharmaceutical Group. This paper is mainly based on the financial data of 2018–2022, to find out the advantages and shortcomings of the enterprise in its development and put forward countermeasure suggestions.

2. Overview of DuPont Analysis and Baiyunshan's Main Businesses

The DuPont analysis method was firstly proposed by DuPont in the U.S., which mainly takes the return on equity as the core analysis index, and uses the intrinsic connection between various financial ratios to comprehensively evaluate the financial position and operating results of the enterprise, which is conducive to the analysis of factors.

Return On Equity= Net Profit Ratio* Total Assets Turnover * Equity multiplier.

The return on equity index reflects the rate of return on shareholders' investment in a certain period of time, reflecting the results of business operations; the Net Profit Ratio, i.e., the net interest rate on operating income, reflects the ability of the enterprise to create profits; the total asset turnover rate reflects the efficiency of the enterprise's asset operation; and the equity multiplier is the scale of total assets leveraged by shareholders' inputs, reflecting the enterprise's ability to repay its debts in the long term.

There are relatively few foreign literature that study the DuPont analysis system in a more complete way, among which the most notable characteristics are the innovative proposal of Samuel Jebaraj Benjamin et al. to utilise the total asset turnover and net profit ratio in the DuPont analysis method to analyse dividend policy so that managers realise the importance of the relevant indicators when making relevant decisions [3]. Asher Curtis et al. attempted to investigate whether the historical cost measure as an indicator affects the accuracy of the DuPont analysis method. The results of the study showed that historical cost measures further affect the accuracy of DuPont's analytical method by affecting the total asset turnover ratio [4]. The research system of the domestic DuPont analysis method is gradually perfected, and it is applied to various industries in conjunction with other methods. The research content mainly centres on profitability and financial performance. For example, Yu He introduces external and internal influences to analyse the problems found in the study to make the findings more comprehensive [5]. Wen Chen applied both factor analysis and DuPont analysis to evaluate the financial performance of enterprises in the study of financial performance, which made the analysis results more targeted [6]. This paper examines the return on equity while emphasising the return on total asset turnover and the net profit cash flow ratio, taking into account each relevant influencing factor as comprehensively as possible.

As shown by the data on the main business by industry of Guangzhou Baiyunshan Pharmaceutical Group published in the annual financial report for the year 2022, the revenue from the main business of the Greater Southern Medicine segment (pharmaceutical manufacturing business) amounted to approximately RMB10,462,000, with a gross profit margin of 47.95%; The Greater Health segment's main business into revenue was approximately RMB 10,473,000, with a gross profit margin of 43.52%, which was close to the gross profit margin of the Greater Southern Medicine segment; The revenue from main business of Greater Commerce segment was RMB 49, 131,000, while the gross profit margin was only 7.03%; the revenue from the other was RMB 484,000, and the gross profit margin was 14.06% [7].

3. Financial Analysis Based on DuPont Analysis Method

3.1. Data Sources

Table 1 is a partial data presentation, listing the main data indicators of Guangzhou Baiyunshan Pharmaceutical Group from 2014 to 2022. Through the relevant indicators in Table 1 to form Table 2, Guangzhou Baiyunshan's financial status.

Table 1: Key Data Indicators of Guangzhou Baiyunshan Pharmaceutical Group [8].

Profitability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	.
ROE (weighted)	12.97	13.46	11.55	13.87	16.93	11.34	.
ROA (weighted)	6.04	6.31	5.30	6.35	8.86	7.82	.
Net profit margin (%)	6.01	5.75	5.01	5.30	8.37	10.11	.
Financial risk index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	.
Asset-liability ratio	54.95	52.62	52.80	54.32	55.05	31.97	.
Equity multiplier	2.220	2.111	2.119	2.189	2.224	1.470	.
Operational capability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	. .
Total assets turnover rate	1.006	1.097	1.057	1.199	1.059	0.773	.
Accounts receivable	4.716	5.008	4.468	4.684	5.129	7.579	.

Table 2: Guangzhou Baiyunshan Financials.

Year	ROE (%)	Net Profit Ratio (%)	Total Assets Turnover(%)	Equity Multiplier
2018	16.93	8.37	1.06	2.22
2019	13.87	5.30	1.20	2.19
2020	11.55	5.01	1.06	2.12
2021	13.46	5.75	1.10	2.11
2022	12.97	6.01	1.01	2.22

Table 2 shows the data for the last 5 years and contains 4 main data indicators, namely ROE (%), Ret Profit Ratio (%), Total Assets Turnover (%) and Equity Multiplier.

Table 3 shows part of the data display, listing the main data indicators of China Resources Sanjiu from 2014 to 2022. The author extracts relevant indicators to form Table 4 of China Resources 39 Finance.

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Table 3: China Resources Sanjiu Key Data Indicators [8].

Profitability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
ROE (weighted)	15.15	14.14	12.09	17.89	13.83	14.06	...
Financial risk index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
Asset-liability ratio	35.36	35.72	36.12	38.89	38.06	37.48	...
Operational capability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
Total assets turnover rate	0.700	0.668	0.628	0.750	0.785	0.748	...

Table 4: China Resources Sanjiu Financials.

Year	ROE (%)	Net Profit Ratio (%)	Total Assets Turnover(%)	Equity Multiplier
2018	13.83	10.98	0.78	1.61
2019	17.89	14.37	0.75	1.64
2020	12.09	11.86	0.63	1.57
2021	14.14	13.50	0.67	1.56
2022	15.15	13.81	0.70	1.55

Table 4: China Resources Sanjiu Financials shows the data for the last 5 years from 2018 to 2022, which mainly contains 4 key data indicators, namely ROE (%), Ret Profit Ratio (%), Total Assets Turnover (%) and Equity Multiplier.

Table 5 shows part of the data display, listing the main data indicators of Tongrentang from 2014 to 2022. The relevant indicators form Table 6 Tongrentang financials.

Table 5: Tongrentang Key Data Indicators [8].

Profitability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
ROE (weighted)	12.71	11.99	10.82	10.34	12.83	12.55	...
Financial risk index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
Asset-liability ratio	31.75	33.50	28.81	29.93	29.05	29.61	...
Operational capability index	22-12-31	21-12-31	20-12-31	19-12-31	18-12-31	17-12-31	...
Total assets turnover rate	0.590	0.623	0.600	0.641	0.725	0.748	...

Table 6: Tongrentang Financials.

Year	ROE (%)	Net Profit Ratio (%)	Total Assets Turnover(%)	Equity Multiplier
2018	12.83	12.83	0.73	1.41
2019	10.34	11.76	0.64	1.43
2020	10.82	12.60	0.60	1.40
2021	11.99	12.95	0.62	1.5
2022	12.71	14.31	0.59	1.47

Table 6 : Tongrentang Financials shows the data for the last 5 years from 2018 to 2022 and contains 4 main data indicators, namely ROE (%), Ret Profit Ratio (%), Total Assets Turnover (%) and Equity Multiplier.

3.2. Overall Trend Analysis

The return on equity refers to the rate of return that investors in a company receive based on the amount invested over a certain period of time, reflecting the ability of own capital to generate net profit. The indicator is jointly influenced by the net profit ratio, the total assets turnover and the equity multiplier, and can be used to comprehensively evaluate the financial position and operating results of the enterprise.

The return on equity (ROE) = net profit/shareholders' equity, Return on Assets (ROA) = Net Profit/Total Assets = Net Profit/(Shareholders' Equity + Liabilities).

Therefore, the net profit data used in the calculation of ROE is consistent with all the net profit data used in the calculation of ROA. In other words, the numerator figure for ROE does not deduct the net profit generated with the help of debt leverage, while the denominator figure deducts the debt. In order to avoid increasing the return on equity at the cost of increasing leverage, it is necessary to observe whether the return on investment is reasonable while studying the return on investment [9]. By analysing the financial statements of Guangzhou Baiyunshan Pharmaceutical Group from 2018 to 2022 in Table 1, it can be seen that the return on equity (ROE) is reduced by 3% after 2018 and remains around 12% for the next four years. Observing the data in Table 1, Table 3, and Table 5, it can be found that the ROE of Baiyunshan is very similar to that of China Resources Sanjiu and Tongrentang, but the return on assets (ROA) of China Resources Sanjiu is roughly maintained at around 9%, and the ROA of Tongrentang is maintained at around 8%, whereas that of Baiyunshan is only maintained at around 6%. Therefore, Baiyunshan's earnings generated from liabilities are more than or equal to the earnings generated from shareholders' equity, and the risk of higher financial leverage is higher.

In order to avoid distortion of net profit due to adjustment of data on financial statements, it is important to observe the net profit cash flow ratio along with ROE. Net profit cash flow ratio = operating cash flow / net profit, if the ratio is less than 1 indicates that there are unrealised profits in the net profit for the period, which can easily lead to a shortage of funds or even bankruptcy. In 2020, the net cash flow from operating activities decreased significantly due to the delay of the Chinese New Year resulting in the deferral of the advance receipts from the sale of Wanglaoji to the following year, and as a result, the net profit cash flow ratio was only 0.19. Guangzhou Baiyunshan has maintained this rate at around 1.4 overall over the last 5 years except for 2020, which is more reasonable [8].

In Guangzhou Baiyunshan's past five years, ROE has first declined and then fluctuated to remain at about 12% in general, with peer companies China Resources Sanjiu and Tongrentang remaining in the same echelon, which reflects the fact that the firm is generating more reasonable returns from shareholder investment in the industry and has a reasonable net cash flow ratio. However, the ROA is significantly lower than that of its peers, indicating that the firm's financial leverage is too high.

3.3. Single-Factor Indicator Analysis

(1) Solvency

The equity multiplier is one of the indicators of the long-term solvency of enterprises; the higher the indicator, the greater the proportion of liabilities and the weaker the ability to repay long-term debts.

In the overall trend analysis Guangzhou Baiyunshan is known to have higher financial leverage; analysing the financial report reveals that the equity multiplier for companies in the same industry between 2018 and 2022 is mostly around 1.5, while Guangzhou Baiyunshan is mostly around 2.1. Guangzhou Baiyunshan Pharmaceutical Group's equity multiplier started to increase significantly in 2018 (it was only 1.47 in 2017) due to the use of debt to acquire Wanglaoji and Guangzhou

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Pharmaceuticals, and the significant spike in interest-bearing debt also led to high finance costs and a corresponding increase in post-acquisition overheads and selling expenses. A high equity multiplier reflects a high level of business confidence and to some extent improves the profitability of the firm [10]. However, a high equity multiplier can also lead to excessive financial risk, which is not conducive to meeting the capital needs of long-term growth strategies, so it is important to pay more attention to the proportion of liabilities and properly control the financial risk of the enterprise.

(2) Operating capacity

Total assets turnover can directly reflect the ability and efficiency of enterprise asset management; total assets turnover = operating income / average total assets; the higher the index indicates that the company's operating capacity is stronger, the more conducive it is to maximising the efficiency of enterprise funds [11].

Through the study of Table 2, it was found that Guangzhou Baiyunshan's total asset turnover ratio fluctuation in the past five years has been very small, about to maintain at 1.06% or so, while the same period of the industry enterprises is mostly about 0.6%, so the Guangzhou Baiyunshan's operating capacity is significantly stronger than the same industry enterprises. From the financial report, it can be learned that Guangzhou Baiyunshan's operating revenue increased from RMB 42.23 billion in 2018 to RMB 64.95 billion in 2019.The rapid growth in operating income in 2019 was attributable to the fact that after the acquisition of Wanglaoji in 2019, the major health segment centred on Wanglaoji achieved revenue of RMB10.479 billion, representing a year-on-year growth of 10.45%, and the sales of Jingo (sildenafil citrate tablets) increased by 29.35% in 2019 as compared with that of 2018. The overall operating income after 2020 remains relatively stable with a slow increasing trend. From only $61.67 billion in 2020 and $69.01 billion in 2021, the operating income increases to $70.79 billion in 2022. Baiyunshan's modern pharmaceutical logistics centre is the largest and most functional pharmaceutical business logistics centre in South China with the highest degree of mechanisation and intelligence, laying a solid foundation for high sales efficiency and increased operating income.

(3) Profitability

Profitability reflects the ability of the enterprise to create profits. Profits are the source of power for the long-term sustainable development of the enterprise, but they are also a source of funds to repay debts and invest dividends, so net profit from sales as one of the indicators of profitability is very important. From Table 2, it can be seen that the net profit ratio of sales fell from 8.37% in 2018 to 5.30% in 2019 because the net profit ratio of sales in 2018 was inflated, causing the normal figure for 2019 to appear low. The reason for the inflated figure is that the acquisition of Wanglaoji Pharmaceuticals resulted in an increase in profit from the item of gain or loss on change in fair value. And by 2020, the net profit ratio on sales had dropped to 5.01% due to the impact of the epidemic, leading to a significant decline in operating income and rising operating costs. The Greater Southern Medicine business segment and the Great Health business segment had higher net margins but accounted for a relatively small portion of the company's total revenue. The Greater Commerce business segment, which accounts for the largest share of the total revenue, has the lowest net profit ratio, and due to the fact that the net profit ratio of Guangzhou Baiyunshan's sales after 2021 and up to now has only increased from 5.75% to 6.01% in 2022, Overall, the business is weak in terms of profitability and needs to be improved.

4. Problems in Development and Suggestions for Solutions

1. Weak solvency and high financial risk

The equity multiplier, one of the indicators of long-term solvency, is higher than that of enterprises in the same industry, reflecting that Guangzhou Baiyunshan has used limited funds to pry up a larger scope of operation, but the high gearing ratio also leads to the company's higher financing costs in the future, which further leads to an increase in financial risk and a weakening of the solvency. Under the premise of weak solvency, guaranteeing a stable and sufficient source of profit for each business segment of the enterprise and effective cost control are the only ways to maintain the stable survival and development of the enterprise. However, Guangzhou Baiyunshan's lower profitability and weaker cost control ability are not conducive to the stable development of the enterprise.

Suggestion: Increasing revenues while saving costs and focusing on sustainability in the context of solvency issues

Increasing revenue should not only be based on Guangzhou Baiyunshan's four major business segments, but also focus on analysing and grasping the new developments in e-commerce, capital finance and medical devices. Taking the strengthening of healthcare awareness of the population as an entry point, combined with the background of the more refined classification of user consumption behaviour in the information age, the enterprise has to continuously deepen the vertical cultivation of the segmentation of various businesses. By reaching as many consumers as possible, they can gain more market share and increase revenue. At the same time, managers need to explore more financing channels or relevant policy support and also optimise the capital structure of the enterprise to improve its own risk resistance and solvency.

Managers should conduct in-depth research on whether the extended interaction of the supporting industry chain in each business segment is reasonable. When a product is finally delivered to the consumer, it has to go through at least four stages, i.e., purchasing, production, distribution and sales, and there are various kinds of costs consumed in and between each of these stages. Strengthening of internal control activities, streamlining of redundant processes and cost savings can therefore also be effective in alleviating debt servicing pressures to a certain extent.

High total assets turnover, low accounts receivable turnover

Guangzhou Baiyunshan's bargaining power for downstream customers is weakened in the company's annual financial report. In the past five years, Guangzhou Baiyunshan's accounts receivable turnover rate was about 4.5 times, while China Resources Sanjiu's was about 4.8 times and Tongrentang's was between 6.1 times and 10.1 times. Low accounts receivable turnover means that funds from sales revenue cannot be returned in time for business reproduction. In other words, the cash can not return to the enterprise to supply blood for the enterprise in a timely manner, which will weaken the operating efficiency of the enterprise in the long run and make the enterprise fall into a passive situation. In addition, the enterprise has weak solvency, low profitability, market share fluctuations and other disadvantages, and it faces heavy obstacles on the road to long-term stable development.

Suggestion: Improving the credit policy and strengthen the management of accounts receivable on the issue of operating capacity

Managers need to strengthen the company's internal management system, implement the relevant responsibility system for each position, ensure that the formation of each receivable has its corresponding counterparts with real-time follow-up and timely processing, and establish complete accounts receivable information files. In daily business activities, the relevant departments need to pay attention to timely updating the credit information of the credit buyer, understand the basic industrial and commercial information, and also pay attention to the query of the customer unit's litigation record, real estate mortgages, movable property pledges, and equity changes in order to track the credit buyer's solvency. Through the credit buyer's solvency for its credit rating assessment, the relevant departments for the accounts receivable are not yet due to pay attention to timely collection. The due accounts receivable should be called in advance to try to ensure the recovery of the receivables, and the expiration of the accounts receivable should be bad debt treatment in a timely manner.

Low profitability and wide gap in gross profit margin of business segments

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In the profitability analysis, summarising the overall trend of development from 2018 to 2022, the net profit margin of Guangzhou Baiyunshan remained at around 6%, while the net profit margin of comparable enterprise China Resources 39 remained at 10.98%–13.81% during the same period. The net profit margin of Tongrentang's sales was also mainly maintained at around 12% and even reached 14.31% in 2022. It can be seen that the profitability of Baiyunshan in Guangzhou is significantly lower than that of its peers. Studying the 2022 financial report of Guangzhou Baiyunshan Pharmaceutical Group, it was found that there are four major business sectors in Baiyunshan, namely Da Nan Yao, Da Health, Da Commercial, and others, with significant differences in their respective gross profit margins. By observing the proportion of operating revenue in various sectors of Baiyunshan, Guangzhou, in recent years, this article shows that the company has shifted its focus from the Greater South Pharmaceutical and Greater Health sectors to the Greater Commercial sector. Therefore, even if the operating revenue is high, the resulting net profit margin is lower than that of companies in the same industry, even for those that achieve extremely low profits.

Suggestion: Optimising pharmaceutical R&D investment and management on profitability issues

In order to ensure the long-term stability and development of enterprises, profit as the cornerstone of their development should be focused on. Guangzhou Baiyun's low net profit ratio is mainly due to the low gross profit ratio of the Greater Commerce segment. Enterprises need to save on the cost of various distribution links and increase the gross profit margin of the Greater Commerce business segment. However, the profitability of this segment is affected by the characteristics of the distribution industry of the business itself, which determines that there is little room to improve its gross profit margin. Therefore, the focus should be shifted to the Greater Southern Medicine business segment and the Greater Health business segment, which have a large room for growth in gross profit margin, and pay attention to the investment in innovation, research, and development. Enterprises need to continue to improve the level of production technology, research, and development of more high-value-added drugs. Other segments of the business also need to continue to transform and upgrade.

5. Conclusion

The financial analysis of Guangzhou Baiyunshan Pharmaceutical Group through DuPont analysis found that the enterprise had weak debt capacity, high financial risk, high total asset turnover, low accounts receivable turnover, low profitability, a large gap between the gross profit margins of the business segments, and other issues. This paper proposes corresponding solutions to the problems, including expanding revenues and saving costs, focusing on sustainable development, improving enterprise credit policy, strengthening accounts receivable management, and optimising pharmaceutical R&D investment and management. The current research mainly focuses on the operating results and financial status of the enterprise itself, but less on the relevant influencing factors outside the enterprise. In the future, strategic analysis will be introduced to study the pharmaceutical industry and the competitive environment in which the enterprise is located.

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