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Impact of Rising Raw Material Costs on the Profitability of Pianzaihuang

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Abstract. As a leading enterprise in China's traditional Chinese medicine industry, Pianzaihuang lozenge, the core product, has occupied the high-end liver disease drug market for a long time relying on the national top-secret formula, and cost pressures have a significant impact on profits. This paper takes Pianzaihuang's financial data and cost structure as the research object, and uses the method of data correlation analysis to systematically explore the impact mechanism of rising raw material costs on corporate profitability. The study found that the soaring price of core raw materials is the key driving factor for the downward profitability, market acceptance limits the terminal pricing power of enterprises, the cost transfer is incomplete, and the proportion of diversified business revenue is insufficient, which fails to form an effective profit buffer. Based on this, this paper puts forward targeted countermeasures from the four dimensions of vertical integration of supply chain, upgrading of business structure, empowerment of technological innovation, and strengthening of risk prevention and control, and constructs a cost early warning and risk response model for rare resource dependent enterprises in the traditional Chinese medicine industry. This study makes up for the gap in the research of micro risk transmission mechanisms in the traditional Chinese medicine industry, transforms abstract cost shocks into observable analysis paths, and provides a decision-making reference with both theoretical value and practical guiding significance for Pianzaihuang and similar enterprises.

Keywords: Raw material cost, Profitability, Traditional Chinese medicine enterprises

1. Introduction

Pianzaihuang is a leading enterprise in China's traditional Chinese medicine industry. Its core product, Pianzaihuang lozenge, has a national top-secret formula and has long dominated the high-end liver disease drug market. It was once called "yaomao" because of its steady growth in performance. The core competitiveness of traditional Chinese medicine enterprises is often closely related to the supply of raw materials, while the production of Pianzaihuang lozenge depends on rare raw materials such as musk and bezoar [1], and its price continues to rise due to the scarcity of resources, which forms potential pressure on the profits of enterprises. In the fourth quarter of 2024, the net profit of Pianzaihuang decreased by 26.8% year-on-year, the largest decline in a single

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quarter since 2016. The company clearly mentioned "rising raw material costs" as the core reason, which provides a typical case for the analysis of the relationship between cost and profit.

Studies have shown that cost control is effective, and enterprises can negotiate with suppliers and purchase in batches to save money when purchasing raw materials [2]. Optimize production, reduce waste and improve efficiency [3]. Reasonably regulate human, energy and management costs [4]. In this way, the pricing of enterprises is more flexible, which can not only ensure profits, but also attract customers and expand their share at a low price [5]. It can also reduce the occupation of funds, improve the efficiency of use, and enhance market competitiveness [6]. According to the cost theory of Microeconomics, raw materials belong to the variable cost of enterprises, and the rise of variable cost will directly squeeze marginal profit. If enterprises do not have pricing power and cannot pass on costs to consumers, it will lead to a decline in net profit [7].

Through the correlation analysis of Pianzaihuang's financial and cost data from 2022-2024, this paper clearly points out that the soaring price of core raw materials (bezoar) is the key reason for the decline of its profitability, and reveals the dilemma of insufficient transfer ability caused by the limited terminal pricing power in the face of cost shocks. Based on this, the study puts forward specific countermeasures for Pianzaihuang to strengthen supply chain management and accelerate diversification, and constructs a cost early warning and risk response model for rare resource dependent enterprises for the whole traditional Chinese medicine industry. The significance of this study is that through a typical case, it makes up for the gap in the research of micro risk transmission mechanisms in the industry, and provides an analytical framework with both theoretical value and practical guiding significance for similar enterprises.

2. Company overview

The company mainly produces "Pianzaihuang" and has two dosage forms, tablet and capsule, with the same ingredients and functions. At the same time, the company continues to innovate Yindan Pinggan capsule, compound Pianzaihuang buccal tablets, Chuanbei Qingfei syrup, compound Pianzaihuang ointment, compound Pianzaihuang hemorrhoids ointment and other series of products, involving liver disease medication, cold medication, dermatology medication, and so on. Pianzaihuang brand Angong Niuhuang Pill is made of musk, bezoar and other authentic medicinal materials, following traditional processes such as ancient processing and gold foil coating. The raw materials of the product mainly include gardenia, perilla, sarcandra, Wedelia, Panax notoginseng, Yinchen, Sichuan Fritillaria, gentian, Ophiopogon japonicus, and other varieties suitable for planting in Zhangzhou.

The overall gross profit margin of the company is relatively high, but it is still on a downward trend compared with last year, which is a very dangerous signal, hidden behind which is serious and unevenly distributed cost pressure. The core pharmaceutical business is under significant pressure of rising costs, among which the production costs of major products have increased rapidly, which has exceeded its revenue growth and directly compressed the profit margin. At the same time, due to the natural scarcity and difficulty of obtaining the core raw material resources that enterprises have relied on for a long time, the purchase price has continued to rise, forming a long-term cost burden that is difficult to avoid. Although enterprises have a certain ability to adjust prices by virtue of their market position, the continuous price increase strategy is close to the critical point of market acceptance, which may affect consumers' willingness to buy. This multi-level and multi-source cost pressure requires enterprises to establish a systematic response mechanism: not only to improve production efficiency through technological improvement, but also to establish a stable raw material

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supply guarantee system, but also to rationally arrange the rhythm and scale of strategic investment, so as to maintain competitive advantage in a complex business environment.

3. Case studies

According to the cost data disclosed in Pianzaihuang's 2024 annual report, the overall cost subtotal of the company's pharmaceutical manufacturing industry showed a significant upward trend in 2024, and the pressure of cost control was concentrated in the core business sector. In 2024, the cost subtotal of the pharmaceutical manufacturing industry reached 20.2 million yuan, an increase of 60.08% over the same period last year of 1250.625 million yuan in 2023, which was highly related to the price fluctuation of core raw materials. The proportion of direct materials in the cost subtotal of the pharmaceutical manufacturing industry increased to 96.13%, becoming the core of the cost increase. Among them, as a key raw material, the price of natural bezoar increased by 153.85% year-on-year in 2024, and the price per kilogram exceeded 1.65 million yuan, which directly pushed up the cost of core products relying on the raw material; Although the price increase of musk is slightly lower than that of bezoar, the stability of supply still poses sustained pressure on costs due to the impact of breeding cycle and policy control. In contrast, the impact of direct labor and manufacturing costs on cost changes is weak, and their changes do not play a leading role in the overall cost increase, which further proves the decisive impact of direct material costs.

In terms of specific business modules, as shown in Table 1, the cost increase of the module where the core products are located is particularly prominent. As the core profit source of the company, the cost subtotal of the liver medication module increased from 1059 million yuan in 2023 to 1704 million yuan in 2024, an increase of 60.98% over the same period last year. Direct materials accounted for 96.87% of the cost of the module, of which the cost of natural bezoar accounted for 72.3% of the total direct materials. The soaring price directly led to a 62.4% year-on-year increase in the unit cost of core products such as Pianzaihuang tablets and Pianzaihuang capsules. The cost change of the cardiovascular and cerebrovascular medication module increased by 60.11% year-on-year, and direct materials accounted for 95.42%. Angong Niuhuang Pill, the main product, relied on natural bezoar, accounting for more than 80% of the cost of raw materials. The inventory turnover of superimposed batches of products slowed down, and the gross profit margin of the module decreased by 24.55% year-on-year, becoming a typical plate under profit pressure under cost pressure. In 2024, compared with 2023, other material modules decreased by 0.72% year-on-year. This module is mainly conventional Chinese medicinal materials, such as gardenia and perilla, and direct materials account for 89.21%. Through direct procurement in gap-based and large-scale procurement, the company controls the fluctuation of procurement cost of basic medicinal materials within ± 5%, which hedges the pressure of overall cost rise to a certain extent.

Table 1. Cost growth

Level	Cost in 2023 (10000 yuan)	Cost in 2024 (10000 yuan)	Year-on-year growth
Pharmaceutical manufacturing	125,062.50	200,200.00	60.08%
Liver medication module	105,900.00	170,400.00	60.98%
Cardiovascular and cerebrovascular medication module	15,250.00	24,420.00	60.11%
Other material modules	5,375.00	5,336.00	-0.72%

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Since 2018, the company has continuously consolidated the achievements of poverty alleviation in Taibai County, Shaanxi Province, developed the forest musk deer industry, and promoted the implementation of the Rural Revitalization Strategy. Since Taibai County signed a strategic cooperation agreement with the company, the scale of forest musk deer breeding in Dongqing village, taibaihe town has expanded year by year. The forest musk deer breeding cooperative has paid nearly 1.6 million yuan to the masses for six consecutive years since 2018. The company also actively promotes the construction of medicinal material bases. The first is to promote the co construction of the company's strategic raw material medicinal material base. Combined with the demand for medical materials of key varieties of the company and the development plan of the regional traditional Chinese medicine industry, gardenia, perilla, sarcandra, Wedelia, and other varieties suitable for planting in Zhangzhou were selected, and the research on standardized planting technology in Zhangzhou was initiated to promote the promotion of technical reserves in a gap-based approach. The second is to promote the construction of Sanqi, Yinchen, Sichuan Fritillaria, and other experimental bases; Continue to follow up on the management of the jointly built Sanqi base and prepare materials for the follow-up base renewal work; Carry out information collection and investigation of Fritillaria thunbergii, gentian, and Ophiopogon japonicus bases to make preliminary preparations for the co-construction of the bases. Third, the study should help with the construction of the Fujiuwei medicinal material base, carry out the overall survey of the Zhangzhou Dendrobium candidum base, carry out on-site evaluation, and carry out preparations for the co-construction of the base; Carry out the information collection of the Clematis base to prepare for the follow-up project and base construction.

4. Countermeasures

As for the rising cost of raw materials, the company has raised the price of products. In May 2023, the price of products increased by 28.8%, but the price of bezoar has risen by 106.9% in the same period, and the price increase is only 26.9% of the cost increase; From the results, the gross profit margin in 2023 still decreased by 4.4 percentage points year-on-year after the price increase, indicating that the cost transfer is not complete and fails to offset the pressure of raw material price increase. Although the company mentioned cost control measures such as "optimizing inventory" and "purchasing advantages in origin", the cost of raw materials increased by 12.7% year-on-year in 2024, and the revenue of the diversified business (cosmetics) accounted for only 6.83%, which failed to form an effective profit supplement. Through trend comparison and data correlation analysis, it can be seen that the profit dilemma faced by Pianzaihuang from 2022-2024 is mainly the sharp rise in the price of rare raw materials, which is the fundamental driving force leading to the decline in gross profit margin and the slowdown in net profit growth. Although the company has taken price increase measures to try to transmit cost pressure through price increase, limited by terminal acceptance, Pianzaihuang's market acceptance is limited, and its cost transfer ability is insufficient, which has failed to effectively hedge the impact of raw materials and reverse the downward trend of profits. Based on the strong dependence of Pianzaihuang's core business on rare raw materials such as musk and bezoar, as well as the practical limitations of the current cost transfer and diversified layout, this paper puts forward a systematic response plan from the four dimensions of supply chain resilience construction, business structure upgrading, technological innovation empowerment and risk prevention and control strengthening.

First, deepen the vertical integration and collaborative management of supply chain. Based on the existing forest musk breeding cooperation in Taibai County, Shaanxi Province, the study should further enhance the independent and controllable rate of musk supply through equity cooperation

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and co construction of large-scale breeding bases, establish a whole chain standardization system covering breeding, harvesting and processing, and stabilize supply and cost from the source; In view of bezoar resources, the study will establish a purchasing alliance with core purchasing enterprises in the industry to enhance bargaining power through centralized procurement. At the same time, the study will sign a long-term lock-up agreement with upstream bezoar breeding leaders, agree on a price fluctuation upper limit mechanism, and support a strategic inventory dynamic adjustment scheme. Based on big data, the study will analyze the price cycle of raw materials and market demand fluctuations, moderately increase safety inventory during the low-price period, set the purchase volume during the peak period and start the alternative scheme [8]. In addition, the study will continue to promote the construction of gap base for core medicinal materials, increase investment in research and development of standardized planting technology for Zhangzhou genuine medicinal materials such as gardenia and perilla, improve the efficiency of per mu production through variety improvement and intensive planting, and reduce the risk of fluctuation in the purchase cost of basic medicinal materials.

Second, accelerate the strategic upgrading and profit transformation of diversified business. In the cosmetics business sector, relying on the anti-inflammatory, repair and other medicinal value of the core components of Pianzaihuang, the study should develop high-end efficacy skin care products series, locate the high-end market to maintain high gross profit margin, and enhance market penetration through online and offline Omni channel layout, such as beauty e-commerce platform and high-end mall cabinets; In the field of healthy food, around the core needs of liver disease maintenance and immune regulation, the drug and food homologous product matrix is launched to achieve rapid distribution with the help of terminal resources of existing pharmaceutical channels; In addition, the study should expand emerging businesses such as traditional Chinese medicine pieces and customized health management services to reduce the risk of cost fluctuations in a single drug business. For core high-end pastille products, brand premium is maintained through limited sales and value-added services, and some cost pressures are moderately transmitted. For capsules and a series of derivatives, optimize the product specification portfolio and launch high-cost entry-level products to stabilize market share [9]. At the same time, the study should strengthen the dissemination of brand value, strengthen the awareness of product scarcity and medicinal value through academic promotion and consumer education, and enhance the market’s acceptance of price adjustment.

Thirdly, technological innovation should be used to solve resource constraints and efficiency bottlenecks. On the one hand, the study should increase investment in the research and development of artificial alternative materials, cooperate with universities and scientific research institutes to deepen the research on process optimization and pharmacodynamic equivalence of artificial musk and artificial bezoar, and gradually increase the proportion of alternative materials in product formulas on the premise of meeting national drug standards. The goal is to reduce the consumption of natural musk and Bezoar by more than 30% within five years; On the other hand, intelligent manufacturing technology is introduced to transform the production process and reduce the loss rate of raw materials through intelligent production lines such as automatic batching and precise temperature control [10]. At the same time, the whole process cost traceability system is established to monitor the material consumption of each production link in real time to achieve lean cost control.

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5. Conclusion

Through the correlation analysis of Pianzaihuang's financial data and cost structure from 2022-2024, this paper clearly draws the core conclusion that the sharp rise in the price of core raw materials (especially bezoar) is the key driving factor leading to the decline of corporate profitability. The 26.8% year-on-year decline in net profit in the fourth quarter of 2024 and the 4.4 percentage points decline in gross profit margin in 2023 are directly due to this. From the perspective of causes, the cost pressure of Pianzaihuang is highly concentrated in the core pharmaceutical business, and direct materials account for more than 95% of the total cost, while the natural scarcity and difficulty of obtaining raw materials such as musk and bezoar have intensified, pushing up the long-term procurement cost; At the same time, the terminal pricing power of enterprises is limited by market acceptance. The 28.8% price increase in 2023 can only cover 26.9% of the cost increase. The lack of cost transfer ability further magnifies the profit impact, while the revenue of diversified business accounts for less than 7%, which fails to form an effective buffer. This result reveals the core profit risk of rare resource dependent traditional Chinese medicine enterprises: the superposition of single cost structure and uncertainty of resource supply is easy to lead to sharp fluctuations in profit side. Based on this, enterprises need to give priority to promoting the vertical integration of supply chain and the construction of independent and controllable capabilities, accelerating the research and development of artificial alternative materials and the profit transformation of diversified business, and building a dynamic risk early warning system; For the industry, the study need to learn from the analysis framework to establish a common risk response mechanism, through technological innovation, supply chain coordination and business structure optimization, to solve the problem of profit sustainability under resource constraints.

The main contribution of this paper is to go beyond the presentation of simple financial data and accurately locate the micro mechanism affecting the profitability of a landmark traditional Chinese medicine enterprise. This is conducive to making up for the gap in controlling profits and costs of micro industries in existing research, and transforming the abstract concept of "raw material cost shock" into an observable and analyzable specific path. Its significance is to provide a clear strategic target for policy makers of Pianzaihuang, but also to provide a valuable analytical paradigm and a practical case of risk management for the whole traditional Chinese medicine industry, especially those relying on natural rare resources, to help them predict risks and formulate more resilient business strategies.

Authors contribution

All the authors contributed equally and their names were listed in alphabetical order.

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