

Financial and Strategic Analysis of Ili Chuanning Biotechnology Co., Ltd. Using the Harvard Analytical Framework

Jiayi Yang ^{1,*}

¹ Department of Economics and Management, Beijing City University, Beijing 100083, China

*** Correspondence:**

Jiayi Yang

2084693376@qq.com

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Abstract

This study takes Ili Chuanning Biotechnology Co., Ltd. as the research object. Based on its financial reports from 2023 to the first half of 2025 and related public information, a comprehensive analysis is conducted using the Harvard Analytical Framework from four dimensions: strategy, accounting, finance, and prospects. The research indicates that the company maintains a leading position in the antibiotic intermediate sector by leveraging Xinjiang's resource cost advantages and large-scale fermentation capacity, achieving steady growth in operating revenue and net profit in 2023–2024. However, performance experienced a phased decline in the first half of 2025, influenced by factors such as price fluctuations of traditional products, a drop in capacity utilization, and slow progress in its synthetic biology new business. Financial analysis shows that the company's debt repayment capacity continues to improve and its profitability foundation remains solid, but asset operation efficiency has significantly declined, and cash flow quality is under pressure. In terms of prospects, the company is actively advancing its "biotechnology fermentation + synthetic biology" dual-engine strategy, yet faces multiple challenges including industry cyclical fluctuations, a sharp increase in R&D investment, and policy uncertainties. Finally, this paper proposes targeted recommendations focusing on stabilizing traditional business, accelerating new business development, enhancing operational efficiency, and optimizing capital structure, aiming to provide references for the company's sustainable growth and investor decision-making.

Keywords: Chuanning Biotechnology; Financial Analysis; Harvard Analysis Framework; Synthetic Biology; Transformation Strategy

1. Introduction

Against the dual backdrop of ongoing restructuring in the global pharmaceutical manufacturing supply chain and the rapid advancement of biotechnology, China's bio-fermentation industry is at a critical stage of scaling up and undergoing structural upgrading. As a core link connecting chemical raw materials and downstream pharmaceutical production, the antibiotic intermediates

sector faces severe challenges in transforming its growth model and reshaping its value chain. These challenges arise from tightening environmental policies, the normalization of volume-based procurement, and the impact of emerging technologies such as synthetic biology. As a leading enterprise in China's antibiotic intermediates field, Ili Chuanning Biotechnology Co., Ltd. (hereinafter "Chuanning Biotech") has established a significant competitive edge in its traditional business by leveraging the cost advantages of its Xinjiang location and its large-scale fermentation capacity. At the same time, the company is actively expanding into high-value-added sectors like synthetic biology, promoting the implementation of its "dual-engine" strategy. However, under multiple pressures—including industry cyclical fluctuations, a sharp increase in R&D investment, and slower-than-expected commercialization of new products—its financial performance and operational efficiency have shown periodic volatility. In this context, conducting a systematic financial and strategic analysis of the company will not only help uncover the drivers behind its short-term performance fluctuations but also provide a practical reference for understanding the financial characteristics and risk responses of similar enterprises during their transformation phases. (Narayan & Phan, 2019)

This study takes Chuanning Biotech as a case, focusing on its operational and financial performance from 2023 to the first half of 2025. Using the Harvard Analytical Framework, a systematic analysis is conducted across four dimensions: strategy, accounting, finance, and prospects. At the strategic level, the study emphasizes examining the implementation path and resource allocation logic of the company's "biotechnology fermentation + synthetic biology" dual-engine strategy. At the accounting and financial levels, it comprehensively evaluates the company's debt repayment capability, operational efficiency, profitability, and growth momentum based on its balance sheets, income statements, and cash flow statements during the period. At the prospects level, the study assesses the future development opportunities and risks of the company by integrating industry policies, market competition, and technological iteration trends. Through diachronic comparisons and structural interpretations, this research aims to construct an analytical system that integrates corporate business strategies and financial performance, providing both theoretical foundations and practical references for sustainable corporate growth (Palepu et al., 2023).

This study possesses both theoretical value and practical guidance significance. At the theoretical level, by applying the Harvard Analytical Framework to a representative enterprise within the transforming bio-fermentation industry, it not only validates the applicability of this framework under complex business structures but also expands its analytical dimensions for research on the strategic pivots of technology-intensive traditional enterprises, providing an industry-specific perspective to the field of corporate financial analysis. At the practical level, the in-depth analysis of Chuanning Biotech assists the company itself in identifying financial risks, optimizing resource allocation, and balancing short-term profitability with long-term investment, thereby offering a decision-making foundation for management in formulating subsequent strategies. Furthermore, it provides a referenceable pathway for peer companies in responding to industry fluctuations and advancing technological transformation. Additionally, for investors, this study helps reveal the underlying logic behind fluctuations in corporate value, enhancing the rational basis for investment

judgments. For policymakers, it can provide empirical evidence to support the upgrading of the bio-manufacturing industry and the optimization of industry regulatory policies.

2. Company Overview

2.1. Company Profile

Ili Chuanning Biotechnology Co., Ltd. (301301.SZ) is a subsidiary of Kelun Pharmaceutical established in Horgos in 2010. It listed on the ChiNext in 2022 and is a leading enterprise in biotechnology fermentation and synthetic biology. Its core products include antibiotic intermediates such as erythromycin thiocyanate and cephalosporins. In 2023, it ranked first in sales of cephalosporin intermediates domestically and second in erythromycin and penicillin intermediates, with over 90% of its revenue coming from antibiotics. Leveraging Xinjiang's climate and large-scale fermentation tank technology to control costs, it achieved a revenue of 5.758 billion yuan and a net profit of 1.4 billion yuan in 2024. The company is also expanding into synthetic biology products to build a dual growth curve (Cusumano et al., 2021).

2.2. Industry Characteristics and Competitive Company Features

(1) Industry Characteristics

Chuan Ning Biotech belongs to the bio-fermentation segment of the pharmaceutical manufacturing industry, focusing on pharmaceutical intermediates and serving as a crucial link between chemical raw materials and end pharmaceuticals. This industry is highly technology-intensive and subject to stringent compliance requirements. In 2023, the domestic market size exceeded 128 billion yuan, with an average annual growth rate of 13.5%, and is expected to reach 165 billion yuan by 2025. Policy support for green manufacturing and the push for environmental upgrades, combined with the global shift of active pharmaceutical ingredients (APIs) to China and the demand driven by innovative drugs, have led to continuous industry expansion. The sector is dominated by leading enterprises, and companies with scale and technological advantages are gradually gaining more influence (Joynal, 2021).

(2) Characteristics of Competing Companies

As a leading enterprise in the industry, Chuanning Biotech boasts four key competitive advantages: 1) Resource cost advantage: Leveraging Xinjiang's climate, low energy/labor costs, and "five exemptions and five reductions" tax incentives to reduce costs; 2) Scale advantage: Operating the world's largest antibiotic intermediate fermentation tank (500m³) with an annual production capacity of 16,000 tons, and ranking first in China for cephalosporin intermediate sales in 2023; 3) Technological advantage: AI-powered strain optimization and fermentation control, with 8 products developed through synthetic biology and 61 patents; 4) Environmental and circular advantage: Achieving over 95% exhaust/VOCs removal rates, recycling harmless microbial residues, and establishing a closed-loop system of "production-planting-materials," solidifying competitiveness through the dual drivers of "biological fermentation + synthetic biology."

2.3. Company Strategy and Major Challenges

2.3.1. Corporate Strategy

Chuanning Biotech is steadfastly implementing its "dual-engine" strategy: on one hand, it reinforces its leadership in bioprocessing through precision management and synthetic biology technologies; on the other hand, it leverages the Shanghai Research Institute as an innovation powerhouse to establish a synthetic biology CDMO platform. The strategic roadmap revolves around the principles of "maximizing production capacity, reducing costs, driving innovation, engaging all employees in marketing, and pioneering new frontiers," with a focus on four key areas:

(1) Synthetic biology modification of traditional antibiotic intermediates to improve potency and reduce cost (Cameron, 2020).

(2) Highly bioavailable C1/C2 resources for feed protein and bulk chemicals development.

(3) High value-added sectors such as health product ingredients, bio-pesticides, and premium cosmetic raw materials.

(4) AI Empowers Fermentation Process, Building Virtual Engineer Platform to Boost Efficiency by 3-5%.

2.3.2. Facing Problems

(1) Growth Bottleneck

The antibiotic market is approaching saturation, with centralized procurement policies intensifying competition and traditional business growth remaining sluggish (Liu & Zhang, 2022).

(2) Transitional Pain

Synthetic biology requires significant investment and has a long development cycle. By 2024, its revenue will account for less than 10% of the total, making it difficult to bridge the gap in traditional business operations in the short term.

(3) Cost Pressure

R&D expenditures surged by 140.34% year-on-year in Q1 2025, while the ratio of period expenses to net profit declined, and the quality of earnings deteriorated (the operating cash flow to net profit ratio dropped from 2.65 to 0.86).

(4) Project Delay

The postponement of key projects like Jiangning Bio's Phase II has affected both production capacity expansion and market expectations.

(5) Policy Risk

Development is constrained by the improvement of environmental standards, uncertainties in the approval of new food ingredients (such as ergothioneine), and changes in export policies (Pisano, 2019).

3. Company Financial Overview

This section analyzes Chuanning Biotech's financial performance from 2023 to H1 2025, moving beyond descriptive reporting to synthesize trends and link them to strategic execution and industry context. The core financial narrative reveals a company transitioning from profitable, leverage-fueled growth in its traditional business to a period of strategic adjustment and investment, characterized by revenue contraction, declining asset efficiency, and sustained R&D expenditure.

3.1. Balance Sheet Analysis: Strategic Financing and Asset Deployment

The balance sheet evolution reflects a conscious strategic shift from debt-driven expansion to equity-supported investment and deleveraging, with asset composition hinting at transitional challenges.

3.1.1. Balance Sheet Trend Analysis

(1) Assets Trend

Total assets exhibited a ‘rise-and-fall’ pattern: 10.139 billion yuan at end-2023, rising to 10.554 billion yuan in 2024, then declining to 10.159 billion yuan in H1 2025. Current assets fluctuate in tandem, with monetary funds showing significant volatility. Net accounts receivable kept growing steadily, while inventory followed a cyclical pattern of ‘rise-fall-rise’. Non-current assets grew from 2023 to 2024 but declined in H1 2025. Construction in progress surged to 538 million yuan in 2023 due to project development, then gradually decreased.

(2) Liability Trend

Total liabilities steadily decreased (3.165 bn yuan in 2023 → 2.637 bn in 2024 → 2.372 bn in H1 2025), reflecting a deleveraging trend. The decline in current liabilities was driven by a steep drop in short-term borrowings (from 851 mn to 210 mn), substantially easing short-term debt repayment pressure. Non-current liabilities decreased amid fluctuations, with long-term loans shrinking to zero by H1 2025.

(3) Equity Trend

Owner's equity showed sustained growth (6.973 bn → 7.916 bn → 7.787 bn), serving as the core driver of asset expansion, primarily fueled by accumulation of undistributed profits (1.314 bn → 2.061 bn). This reflects continuous improvement in profitability, demonstrating a robust equity structure (Damodaran, 2020).

Table 1. Trend Analysis of the Balance Sheet of Chuan Ning Biology from 2023 to the First Half of 2025

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numerical value	on year-on-year basis	numerical value	on year-on-year basis	numerical value	on year-on-year basis
Total assets	101.39	-2.42%	105.54	4.09%	101.59	-4.15%

Total current assets	39.56	-12.62%	41.44	4.75%	39.16	-4.01%
monetary resources	7.61	-53.37%	10.88	43.03%	8.08	-12.98%
net account receivable	7.48	-14.76%	9.39	25.56%	10.28	9.65%
receivables financing	6.55	21.48%	6.33	-3.42%	7.97	-29.35%
net advance payment	0.45	-47.17%	0.89	98.46%	1.08	3.44%
net other receivables	0.01	-75.64%	0.01	- 15.82%	0.01	-10.98%
net inventory	16.76	21.16%	13.42	- 19.95%	11	19.46%
other current assets	0.7	1020.40 %	0.52	- 25.89%	0.73	25.75%
Total non-current assets	61.82	5.45%	64.09	3.67%	62.43	-4.24%
net long term equity investment	0.07	-2.10%	0.16	132.98 %	0.37	125.16%
investment in other equity instruments	-	-	0.25	-	0.25	-0.47%
Other non-current financial assets	-	-	0.3	-	0.3	-
net fixed assets	51.41	-5.96%	52.74	2.60%	50.42	2.44%
net value of construction in progress	5.38	794.48%	2.85	- 46.95%	3.29	-56.30%
net intangible assets	2.58	-8.86%	2.36	-8.59%	2.39	-2.66%
development expenditure	-	-	-	-	0.01	-
net goodwill	0.01	0.00%	0.01	0.00%	0.01	0.00%
long term prepaid expenses	0.02	-29.02%	0.02	- 36.36%	0.01	-44.44%
deferred income tax assets	0.22	90.99%	0.21	-3.47%	0.24	-11.53%
assets of right of use	1.92	1582.76 %	4.86	153.75 %	4.78	-4.89%
Other non-current assets	0.22	20.45%	0.33	53.65%	0.35	48.52%
total liabilities	31.65	-24.27%	26.37	- 16.69%	23.72	-28.73%

Total current liabilities	25.36	-6.34%	19.48	- 23.20%	18.11	-14.65%
money borrowed for short time	8.51	-13.09%	2.1	- 75.30%	2.1	-72.00%
notes payable	2.93	166.79%	1.5	- 48.89%	-	-
debit balance in suppliers' account	7.17	13.71%	7.45	3.97%	6.64	-15.36%
contract liability	0.29	-23.84%	0.67	130.86 %	0.47	153.20%
employee pay payable	0.3	13.04%	0.37	23.52%	0.28	5.05%
tax payable	0.38	-26.34%	1.03	168.02 %	0.88	-25.32%
accounts payable-others	0.32	82.85%	0.13	- 60.39%	0.32	-43.84%
non current liability due within one year	5.42	-36.15%	6.17	13.81%	7.38	101.56%
Other current liabilities	0.03	-30.31%	0.06	61.20%	0.06	200.27%
Total non-current liabilities	6.3	-57.25%	6.9	9.54%	5.61	-53.49%
money borrowed for long term	3.57	-74.98%	1.46	- 59.14%	-	-
Total long-term liabilities	5.45	-62.07%	5.97	9.47%	4.6	-58.51%
anticipation liabilities	0	-	-	-	0.03	-6.71%
deferred tax liability	0	268.49%	-	-	0	-8.81%
deferred income-non current liability	0.84	144.56%	0.93	10.47%	0.98	3.71%
lease obligation	1.88	1743.84 %	4.51	139.81 %	4.6	0.34%
total owner's equity	69.73	12.28%	79.16	13.52%	77.87	7.10%
paid-in capital	22.23	0.00%	22.27	0.20%	22.3	0.13%
capital reserve	32.52	0.69%	32.84	1.00%	32.99	0.62%
surplus public accumulation	1.72	132.85%	3.25	88.79%	3.25	88.79%
undistributed profit	13.14	93.71%	20.61	56.88%	19.14	21.18%

other comprehensive income	-	-	0	-	0	-
total of owners' equity attributable to parent company	69.6	12.18%	78.98	13.46%	77.68	7.04%
minority equity	0.13	114.47%	0.19	46.28%	0.19	43.82%
total liabilities and owner's equity	101.39	-2.42%	105.54	4.09%	101.59	-4.15%

3.1.2. Analysis of Asset and Liability Structure

(1) Asset Structure

The company's assets are predominantly non-current (60–61%), reflecting an asset-heavy operational model. Fixed assets account for over half (50.71% → 49.63%), demonstrating scale of production capacity investment. Current assets account for ~38–39%, with dynamic structural adjustments: inventory ratio decreased from 16.53% to 10.83% (significant inventory reduction), while accounts receivable net rose from 7.38% to 10.12%, reflecting changes in revenue collection patterns.

(2) Liability Composition

The debt-to-asset ratio steadily declined from 31.22% to 23.35%, demonstrating a clear deleveraging trend. Short-term borrowing proportion dropped sharply (8.39% → 2.07%), significantly easing short-term debt repayment pressure. Accounts payable remained stable at 6.5–7.1%. Lease liabilities rose from 1.85% to 4.53%, reflecting a shift toward longer-term and more diversified debt maturity structures.

(3) Equity Structure

Owner's equity proportion increased steadily (68.77% → 76.65%), serving as the core driver of asset growth. Undistributed profits rose from 12.96% to 18.84%, while surplus reserves increased from 1.70% to 3.20%, demonstrating the role of profit accumulation in enhancing equity.

Table 2. Analysis of the Balance Sheet Structure of Chuan Ning Biology from 2023 to the First Half of 2025

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numeric value	proportion	numeric value	proportion	numeric value	proportion
Total assets	101.39	100.00%	105.54	100.00%	101.59	100.00%
Total current assets	39.56	39.02%	41.44	39.26%	39.16	38.55%
monetary resources	7.61	7.51%	10.88	10.31%	8.08	7.95%

net account receivable	7.48	7.38%	9.39	8.90%	10.28	10.12%
receivables financing	6.55	6.46%	6.33	6.00%	7.97	7.85%
net advance payment	0.45	0.44%	0.89	0.84%	1.08	1.06%
net other receivables	0.01	0.01%	0.01	0.01%	0.01	0.01%
net inventory	16.76	16.53%	13.42	12.72%	11	10.83%
other current assets	0.7	0.69%	0.52	0.49%	0.73	0.72%
Total non-current assets	61.82	60.97%	64.09	60.73%	62.43	61.45%
net long term equity investment	0.07	0.07%	0.16	0.15%	0.37	0.36%
investment in other equity instruments	-	-	0.25	-	0.25	0.25%
Other non-current financial assets	-	-	0.3	-	0.3	-
net fixed assets	51.41	50.71%	52.74	49.97%	50.42	49.63%
net value of construction in progress	5.38	5.31%	2.85	2.70%	3.29	3.24%
net intangible assets	2.58	2.54%	2.36	2.24%	2.39	2.35%
development expenditure	-	-	-	-	0.01	-
net goodwill	0.01	0.01%	0.01	0.01%	0.01	0.01%
long term prepaid expenses	0.02	0.02%	0.02	0.02%	0.01	0.01%
deferred income tax assets	0.22	0.22%	0.21	0.20%	0.24	0.24%
assets of right of use	1.92	1.89%	4.86	4.60%	4.78	4.71%
Other non-current assets	0.22	0.22%	0.33	0.31%	0.35	0.34%
total liabilities	31.65	31.22%	26.37	24.99%	23.72	23.35%
Total current liabilities	25.36	25.01%	19.48	18.46%	18.11	17.83%
money borrowed for short time	8.51	8.39%	2.1	1.99%	2.1	2.07%
notes payable	2.93	2.89%	1.5	1.42%	-	-
debit balance in suppliers' account	7.17	7.07%	7.45	7.06%	6.64	6.54%
contract liability	0.29	0.29%	0.67	0.63%	0.47	0.46%
employee pay payable	0.3	0.30%	0.37	0.35%	0.28	0.28%

tax payable	0.38	0.37%	1.03	0.98%	0.88	0.87%
accounts payable-others	0.32	0.32%	0.13	0.12%	0.32	0.31%
non current liability due within one year	5.42	5.35%	6.17	5.85%	7.38	7.26%
Other current liabilities	0.03	0.03%	0.06	0.06%	0.06	0.06%
Total non-current liabilities	6.3	6.21%	6.9	6.54%	5.61	5.52%
money borrowed for long term	3.57	3.52%	1.46	1.38%	-	-
Total long-term liabilities	5.45	5.38%	5.97	5.66%	4.6	4.53%
anticipation liabilities	0	-	-	-	0.03	0.03%
deferred tax liability	0	0.00%	-	-	0	0.00%
deferred income-non current liability	0.84	0.83%	0.93	0.88%	0.98	0.96%
lease obligation	1.88	1.85%	4.51	4.27%	4.6	4.53%
total owner's equity	69.73	68.77%	79.16	75.00%	77.87	76.65%
paid-in capital	22.23	21.93%	22.27	21.10%	22.3	21.95%
capital reserve	32.52	32.07%	32.84	31.12%	32.99	32.47%
surplus public accumulation	1.72	1.70%	3.25	3.08%	3.25	3.20%
undistributed profit	13.14	12.96%	20.61	19.53%	19.14	18.84%
other comprehensive income	-	-	0	-	0	-
total of owners' equity attributable to parent company	69.6	68.65%	78.98	74.83%	77.68	76.46%
minority equity	0.13	0.13%	0.19	0.18%	0.19	0.19%
total liabilities and owner's equity	101.39	100.00%	105.54	100.00%	101.59	100.00%

3.2. Income Statement Analysis

3.2.1. Trend Analysis of Income Statement

(1) Income Trend

Operating revenue exhibited “two-year growth followed by a mid-year dip”. In 2023, it reached 4.823 bn yuan (+26.24% YoY), in 2024 5.758 bn (+19.38% YoY), but in H1 2025 declined to 2.349 bn (-26.50% YoY) due to business cycle fluctuations and market conditions.

(2) Cost and Expense Trends

Total operating costs fluctuated in tandem with revenue. R&D investments significantly increased: 55 mn in 2023 (+56.18% YoY), 78 mn in 2024 (+40.67%), and 68 mn in H1 2025 (+135.00% YoY), reflecting strong commitment to innovation in synthetic biology. Financial expenses consistently declined due to debt structure optimization, from 61 mn to 16 mn, aligning with the deleveraging strategy.

(3) Profit Trend

The profit metrics, closely tied to revenue and costs, exhibit a "post-high-growth phase adjustment" pattern. Operating profit reached 1.121 billion yuan in 2023 (+105.72% YoY), 1.688 billion yuan in 2024 (+50.51% YoY), and 575 million yuan in H12025 (-37.43% YoY). Net profit surged to 941 million yuan in 2023 (+128.56% YoY), 1.4 billion yuan in 2024 (+48.88% YoY), and 455 million yuan in H12025 (-40.68% YoY). The 2023-2024 profit surge resulted from revenue expansion and cost-efficient management, while the H12025 decline was primarily driven by year-on-year revenue contraction.

Table 3. Trend Analysis of Profit Statement of Chuan Ning Biology from 2023 to the First Half of 2025

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numeric value	on year-on-year basis	numeric value	on year-on-year basis	numeric value	on year-on-year basis
gross revenue	48.23	26.24%	57.58	19.38%	23.49	-26.50%
operating receipt	48.23	26.24%	57.58	19.38%	23.49	-26.50%
total operating cost	36.49	12.55%	40.6	11.26%	17.53	-22.57%
cost in business	33	14.87%	36.63	10.99%	15.06	-27.13%
tax and surcharge	0.67	21.31%	0.8	19.59%	0.4	-14.64%
selling expenses	0.23	96.96%	0.26	13.16%	0.14	16.59%
general expenses	1.43	-0.66%	1.65	15.52%	1.1	33.51%
research and development expenditure	0.55	56.18%	0.78	40.67%	0.68	135.00%
cost of financing	0.61	-50.55%	0.48	-20.51%	0.16	-42.84%
Interest expense	0.88	-38.33%	0.62	-29.47%	0.21	-16.24%
Interest income	0.16	210.78%	0.07	-54.38%	0.03	-22.74%
miscellaneous incomes	0.09	49.45%	0.09	-7.24%	0.09	210.14%

yield	-0.14	-52.22%	-0.09	32.14%	-0.01	88.87%
loss on impairment of assets	-0.43	-157.62%	-0.17	59.97%	-0.23	-173.62%
credit impairment loss	-0.07	54.41%	0.07	202.82%	-0.06	-2459.15%
operating profit	11.21	105.72%	16.88	50.51%	5.75	-37.43%
Add: Non-operating income	0.02	5650.76%	0.01	-44.30%	0	151.86%
Excess: Non-operating expenses	0.06	-90.15%	0.14	142.99%	0.16	52.00%
total profit	11.18	129.21%	16.75	49.87%	5.6	-38.46%
Deduct: Income tax expense	1.77	132.74%	2.75	55.09%	1.05	-26.54%
net margin	9.41	128.56%	14	48.88%	4.55	-40.68%

3.3. Analysis of the Structure of the Income Statement

(1) Incomes Structure

The company's revenue structure is highly concentrated in its core business, with both total operating revenue and operating income accounting for 100% of the total. This reflects its focus on key areas such as antibiotic intermediates and active pharmaceutical ingredients (APIs), featuring a single and stable revenue stream without diversification. Its business strategy prioritizes deepening the core business.

(2) Cost Structure

Operating cost share decreased from 68.42% to 63.62% then rose slightly to 64.11%. R&D expenditure proportion consistently increased (1.14% → 2.89%). Financial expenses steadily declined (1.26% → 0.68%).

(3) Profit Structure

The profit margin exhibits a "optimization-decline" pattern in correlation with cost control and revenue scale. The operating profit margin rose from 23.24% in 2023 to 29.32% in 2024, but fell to 24.48% in the first half of 2025. The net profit margin increased from 19.51% in 2023 to 24.31% in 2024, then declined to 19.37% in the first half of 2025. The significant profit margin growth in 2024 resulted directly from the simultaneous reduction in operating costs and financial expenses, demonstrating how cost control drives profitability. The profit margin decline in the first half of 2025 was primarily attributed to year-on-year revenue contraction and a temporary cost ratio rebound.

Table 4. Analysis of the Profit and Loss Statement Structure of Chuan Ning Biology from 2023 to the First Half of 2025

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numeric value	proportion	numeric value	proportion	numeric value	proportion
gross revenue	48.23	100.00%	57.58	100.00%	23.49	100.00%
operating receipt	48.23	100.00%	57.58	100.00%	23.49	100.00%
total operating cost	36.49	75.66%	40.6	70.51%	17.53	74.63%
cost in business	33	68.42%	36.63	63.62%	15.06	64.11%
tax and surcharge	0.67	1.39%	0.8	1.39%	0.4	1.70%
selling expenses	0.23	0.48%	0.26	0.45%	0.14	0.60%
general expenses	1.43	2.96%	1.65	2.87%	1.1	4.68%
research and development expenditure	0.55	1.14%	0.78	1.35%	0.68	2.89%
cost of financing	0.61	1.26%	0.48	0.83%	0.16	0.68%
Interest expense	0.88	1.82%	0.62	1.08%	0.21	0.89%
Interest income	0.16	0.33%	0.07	0.12%	0.03	0.13%
miscellaneous incomes	0.09	0.19%	0.09	0.16%	0.09	0.38%
yield	-0.14	-0.29%	-0.09	-0.16%	-0.01	-0.04%
loss on impairment of assets	-0.43	-0.89%	-0.17	-0.30%	-0.23	-0.98%
credit impairment loss	-0.07	-0.15%	0.07	0.12%	-0.06	-0.26%
operating profit	11.21	23.24%	16.88	29.32%	5.75	24.48%
Add: Non-operating income	0.02	0.04%	0.01	0.02%	0	0.00%
Excess: Non-operating expenses	0.06	0.12%	0.14	0.24%	0.16	0.68%
total profit	11.18	23.18%	16.75	29.09%	5.6	23.84%
Deduct: Income tax expense	1.77	3.67%	2.75	4.78%	1.05	4.47%
net margin	9.41	19.51%	14	24.31%	4.55	19.37%

3.4. Cash Flow Statement Analysis

3.4.1. Cash Flow Trend Analysis

(1) Cash Flow From Operating Activities

Net cash flow: 1.292 bn (2023, +86.86%), 1.791 bn (2024, +38.59%), 391 mn (H1 2025, -49.32%). Cash inflow from sales aligned with revenue growth but dropped in H1 2025 due to temporary revenue decline.

(2) Cash Flow From Investing Activities

Net cash flow showed a narrowing decline: -353 mn, -106 mn, -45 mn. In H1 2025, ‘cash received from investment recovery’ surged to 960 mn, reflecting phased recovery of external investments. ‘Cash paid for investments’ increased significantly, reflecting new strategic moves in industrial layout.

(3) Cash Flow From Financing Activities

Consistently negative (-1.808 bn, -1.361 bn, -627 mn), reflecting a ‘deleveraging and dividend increase’ trend. ‘Cash paid for debt repayment’ decreased, while ‘cash paid for dividends, profits, or interest’ increased from 290 mn to 614 mn.

Table 5. Trend Analysis of Cash Flow Statement for the First Half of 2023 to 2025 of Chuan Ning Biology

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numeric value	on year-on-year basis	numeric value	on year-on-year basis	numeric value	on year-on-year basis
net cash flow from operating activities	12.92	86.86%	17.91	38.59%	3.91	-49.32%
subtotal of cash inflow from operating activities	41.86	43.57%	47.83	14.26%	16.53	-25.26%
cash received from sales of goods and services	39.88	37.58%	46.53	16.69%	16.17	-25.44%
tax rebate	0.09	3426.83%	0.21	133.35%	-	-
other cash received from operating activities	1.9	1016.04%	1.09	-42.51%	0.36	-13.87%
subtotal of cash outflow from operating activities	28.94	30.10%	29.92	3.39%	12.61	-12.35%
cash for goods and services	18	16.28%	16.89	-6.20%	6.24	-24.33%
cash paid to and for employees	4.17	19.42%	4.87	16.84%	2.67	5.78%

taxes paid	5.38	89.45%	6.69	24.40%	3.47	-1.89%
cash for other activities	1.39	222.70%	1.47	6.00%	0.24	157.29%
net cash flow from investing activities	-3.53	-551.96%	-1.06	69.94%	-0.45	35.87%
subtotal of cash inflow from investing activities	2.02	-	2.06	2.13%	9.62	390462%
cash received from investment recovery	2	-	2.06	2.75%	9.6	-
subtotal of cash outflow from investing activities	5.55	924.43%	3.12	-43.74%	10.07	1329.54%
cash paid for the acquisition of fixed assets, intangible assets, and other long-term assets	3.45	631.17%	0.43	-87.66%	0.24	-32.04%
cash paid for investment	2	2757.14%	2.7	34.90%	9.82	2722.88%
net cash flow from financing activities	-18.08	-479.99%	-13.61	24.74%	-6.27	-14.68%
subtotal of cash inflow from financing activities	8.59	-61.23%	8.06	-6.11%	0.13	-96.20%
cash received from investment absorption	0.07	-99.35%	0.26	281.31%	0.13	-36.16%
cash received from equity investment	0.07	-99.35%	0.26	281.31%	0.13	-36.16%
including cash received from minority shareholders' investments in subsidiaries	0.07	-	0.06	-13.66%	-	-
cash received on loan	8.52	-26.84%	7.8	-8.43%	-	-
subtotal of cash outflow from financing activities	26.67	53.41%	21.67	-18.74%	6.4	-27.86%
cash for debt service	23.57	49.19%	15.61	-33.76%	0.25	-91.55%
cash for dividend, profit or interest	2.9	103.13%	5.45	87.88%	6.14	16.67%
payment of other cash related to financing activities	0.2	25.40%	0.61	206.20%	0.01	-99.05%

3.4.2. Cash Flow Structure Analysis

(1) Cash Flow Structure

Operating activities accounted for 79.78% → 82.54% → 62.90%. The decline in H1 2025 was linked to temporary revenue slowdown. Investment inflows surged to 36.61% in H1 2025 due to investment recovery. Financing inflows declined from 16.37% to 0.49%, reflecting a strategic shift toward internal profit accumulation.

(2) Cash Outflow Structure

Operating outflows: 47.32% → 54.69% → 43.36%. Investment outflows rose to 34.63% in H1 2025 due to increased external investment. Financing outflows decreased from 43.61% to 22.01%, with debt service dropping from 38.54% to 0.86%, while dividend payments rose to 21.11%. (Lee & Park, 2021)

Table 6. Structural Analysis of Cash Flow Statement for Chuan Ning Biology from 2023 to the First Half of 2025

Project Name (in billions of yuan)	2023-12-31		2024-12-31		2025-06-30	
	numeric value	proportion	numeric value	proportion	numeric value	proportion
aggregate cash inflows	52.47	100.00%	57.95	100.00%	26.28	100.00%
subtotal of cash inflow from operating activities	41.86	79.78%	47.83	82.54%	16.53	62.90%
cash received from sales of goods and services	39.88	76.01%	46.53	80.29%	16.17	61.53%
tax rebate	0.09	0.17%	0.21	0.36%	-	#VALUE!
other cash received from operating activities	1.9	3.62%	1.09	1.88%	0.36	1.37%
subtotal of cash inflow from investing activities	2.02	3.85%	2.06	3.55%	9.62	36.61%
cash received from investment recovery	2	3.81%	2.06	3.55%	9.6	36.53%
subtotal of cash inflow from financing activities	8.59	16.37%	8.06	13.91%	0.13	0.49%
cash received from investment absorption	0.07	0.13%	0.26	0.45%	0.13	0.49%

cash received from equity investment	0.07	0.13%	0.26	0.45%	0.13	0.49%
including cash received from minority shareholders' investments in subsidiaries	0.07	0.13%	0.06	0.10%	-	-
cash received on loan	8.52	16.24%	7.8	13.46%	-	-
aggregate cash outflows	61.16	100.00%	54.71	100.00%	29.08	100.00%
subtotal of cash outflow from operating activities	28.94	47.32%	29.92	54.69%	12.61	43.36%
cash for goods and services	18	29.43%	16.89	30.87%	6.24	21.46%
cash paid to and for employees	4.17	6.82%	4.87	8.90%	2.67	9.18%
taxes paid	5.38	8.80%	6.69	12.23%	3.47	11.93%
cash for other activities	1.39	2.27%	1.47	2.69%	0.24	0.83%
subtotal of cash outflow from investing activities	5.55	9.07%	3.12	5.70%	10.07	34.63%
cash paid for acquisition of fixed assets, intangible assets and other long-term assets	3.45	5.64%	0.43	0.79%	0.24	0.83%
cash paid for investment	2	3.27%	2.7	4.94%	9.82	33.77%
subtotal of cash outflow from financing activities	26.67	43.61%	21.67	39.61%	6.4	22.01%
cash for debt service	23.57	38.54%	15.61	28.53%	0.25	0.86%

4. Value Analysis of Company

4.1. Short Term Solvency Analysis

4.1.1. Analysis of Solvency

(1) Current Ratio

Steady upward trend: 1.56 (2023) → 2.13 (2024) → 2.16 (H1 2025).

(2) Quick Ratio

Rose from 0.90 → 1.44 → 1.56, consistently exceeding 1 since 2024, indicating significant enhancement in short-term debt repayment capacity.



Figure 1. Trend of Solvency Indicators of Chuan Ning Biology from 2023 to the First Half of 2025

4.1.2. Long Term Solvency Analysis

(1) Analysis of the Company's Operational Capacity

The asset-liability ratio steadily declined: 31.22% → 24.99% → 23.35%, reflecting decreasing long-term debt repayment pressure and improved financial leverage stability (Altman & Hotchkiss, 2019).

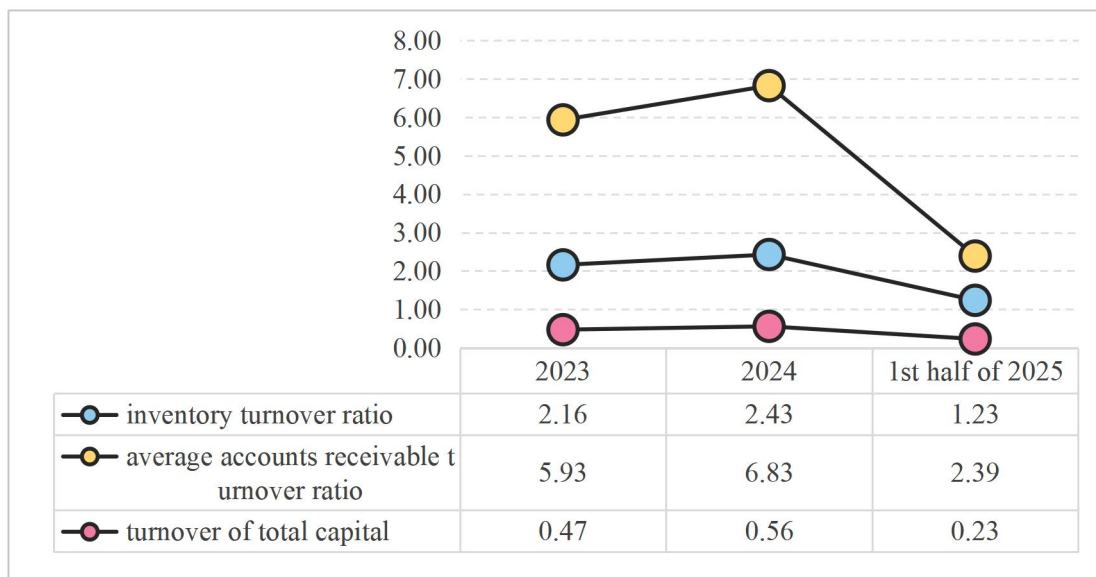


Figure 2. Trend of operational capacity indicators of Chuan Ning Biology from 2023 to the first half of 2025

4.1.3. Inventory Turnover Ratio

(1) Inventory turnover ratio – 2.16 (2023) → 2.43 (2024) → 1.23 (H1 2025). The 2024 improvement reflects better inventory management; the H1 2025 drop is a short-term fluctuation due to seasonal business cycles.

(2) Average accounts receivable turnover ratio – 5.93 → 6.83 → 2.39. The H1 2025 decline is attributable to annualization of interim data and structural changes in revenue composition.

(3) Turnover of total capital – 0.47 → 0.56 → 0.23. The sharp decline in H1 2025 is the core weakness behind ROE deterioration.

4.1.4. Average Accounts Receivable Turnover Ratio

The trend of the key indicator mirrors the inventory turnover rate, which stood at 5.93 by the end of 2023 and rose to 6.83 by the end of 2024, reflecting accelerated revenue collection and improved accounts receivable management efficiency in 2024. However, it dropped to 2.39 in the first half of 2025—a short-term decline attributable to the annualized nature of interim data and structural changes in revenue composition.

4.1.5. Turnover of Total Capital

The ratio rose from 0.47 in late 2023 to 0.56 in late 2024, reflecting a significant improvement in asset management efficiency in 2024. However, it dropped to 0.23 in the first half of 2025, which was a short-term fluctuation due to the temporary mismatch between asset scale and revenue during this period.

The data reveals that during 2023-2024, the company demonstrated consistent growth in inventory turnover, accounts receivable turnover, and overall asset management efficiency, reflecting an overall improvement in operational capacity. The temporary dip in key metrics during the first half of 2025 was a short-term fluctuation within the typical business cycle. From a long-term perspective, the company maintains strong alignment between asset allocation and revenue generation, establishing a competitive edge in operational efficiency within the industry.

4.2. Analysis of the Company's Profitability

Return on Equity (ROE): 14.27% (2023) → 18.81% (2024) → 5.79% (H1 2025). Net operating margin: 19.50% → 24.32% → 19.36%. The 2024 improvement resulted from cost control and product premiumization; the H1 2025 decline reflects temporary revenue contraction but strong earnings resilience.

The trend of key indicators follows a pattern of "initial growth followed by phased decline". The figure stood at 19.50% by the end of 2023, rising to 24.32% by the end of 2024, representing a year-on-year increase of 4.82 percentage points. This reflects the company's progress in cost control and product premiumization, with a marked improvement in core business profitability. In the first half of 2025, the figure dropped to 19.36%, directly linked to a temporary revenue decline during the same period. However, its net profit margin remained near 2023 levels, demonstrating strong earnings resilience.

In summary, the company's profitability demonstrated sustained growth during 2023-2024, with both operating net profit margin and return on equity (ROE) rising, reflecting significant improvements in earnings quality and shareholder returns. The interim adjustments to metrics in the first half of 2025 represent short-term fluctuations within the business cycle. The company

maintains a solid profit foundation for its core operations and demonstrates exceptional cost control capabilities, with overall profitability remaining at a competitive level within the industry.

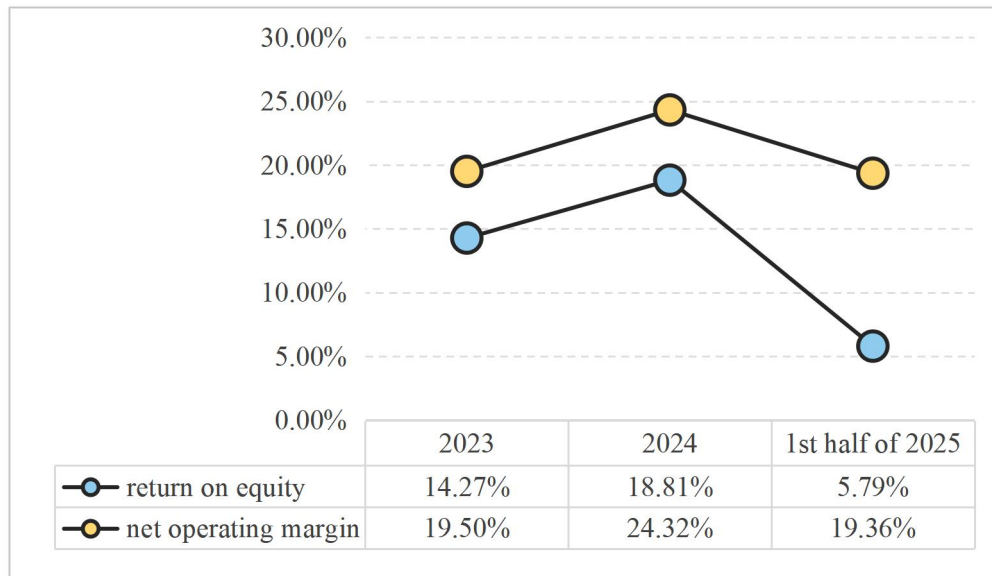


Figure 3. Profitability Index Trend Chart of Chuan Ning Biology from 2023 to the First Half of 2025

4.3. Analysis Of The Company's Growth Potential

(1) Total assets growth rate: -2.42% (2023) → +4.09% (2024) → -4.15% (H1 2025).

(2) Increase rate of business revenue: The revenue growth trajectory shows 26.24% in 2023 (high-speed growth), 19.38% in 2024 (growth with slowing pace), and a 26.50% year-on-year decline in the first half of 2025. The consecutive double-digit growth from 2023 to 2024 reflects the expansion momentum of core business operations, while the revenue decline in the first half of 2025 represents a temporary fluctuation.

(3) Net profit growth rate: +128.56% → +48.88% → -40.68%. The 2023–2024 period showed strong growth momentum; the H1 2025 decline is a temporary adjustment. Persistent declines would warrant vigilance.

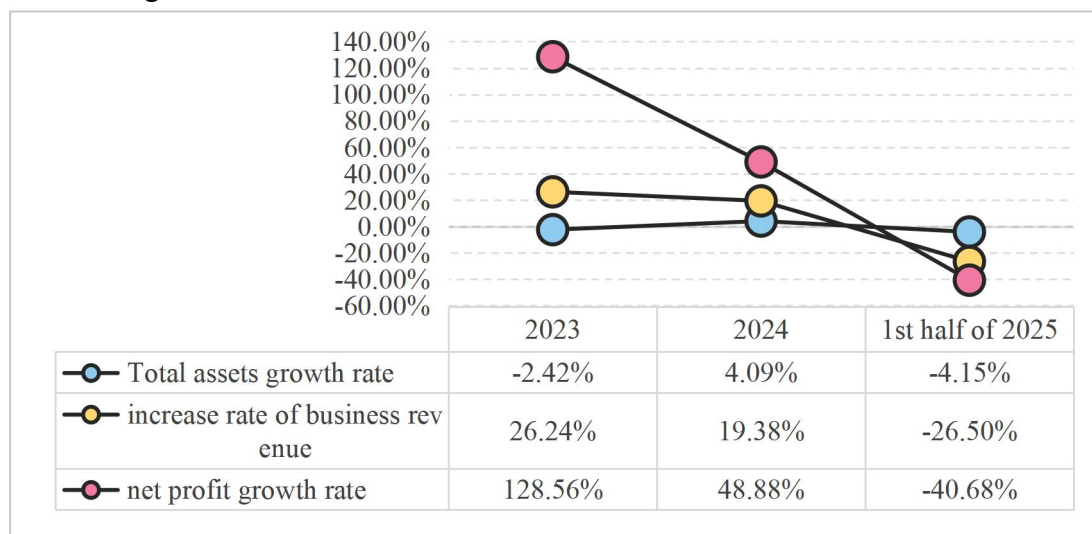


Figure 4. Growth capability index trend chart of Chuan Ning Biology from 2023 to the first half of 2025

4.4. Comprehensive Value Analysis

The DuPont analysis framework is based on the formula: "Return on Equity (ROE) = Operating Net Profit Margin × Total Asset Turnover × Equity Multiplier." Chuan Ning Biotech's ROE exhibited significant fluctuations between 2023 and the first half of 2025 (Hawawini, 2015).

$$2023: 19.50\% \times 0.47 \times 1.56 = 14.27\%$$

$$2024: 24.32\% \times 0.56 \times 1.39 = 18.81\%$$

$$H1\ 2025: 19.36\% \times 0.23 \times 1.32 = 5.79\%$$

The steep decline in total asset turnover (by 58.9% year-on-year) was the primary factor behind ROE deterioration, highlighting asset management efficiency as the core weakness (Penman & Penman, 2020).

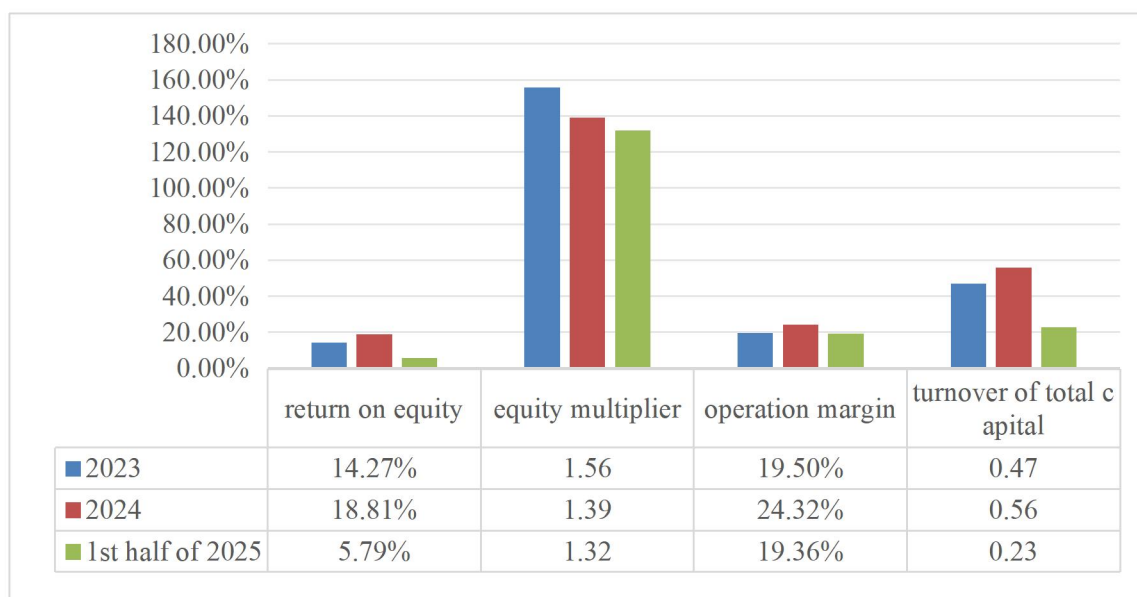


Figure 5. DuPont Analysis Method Indicator Trend Chart of Chuaning Bio from 2023 to the First Half of 2025

4.5. Identify The Key Issues Within The Company

(1) Asset operation efficiency has deteriorated significantly

In the first half of 2025, the total asset turnover rate nearly halved, likely due to underutilized production capacity, inventory overstock, and shrinking revenue scale, which significantly slowed down asset turnover.

(2) Unstable profitability

The operating net profit margin in the first half of 2025 has declined to 2023 levels, indicating weakened cost control and pricing power, making it difficult to sustain high profitability.

(3) The capital structure is conservative.

The declining equity multiplier reduces the financial risk, but limits the amplification effect of capital leverage on profits, and the efficiency of capital use needs to be improved.

4.6. The Measures the Company Should Take

(1) Improving the efficiency of asset operations

Optimize production capacity allocation, revitalize idle assets, enhance inventory turnover management, and simultaneously expand market channels to scale up revenue, thereby driving the recovery of total asset turnover ratio.

(2) Consolidate profitability

Enhance cost control with precision, focusing on high-margin synthetic biology products to boost value-added and stabilize operating net profit margins.

(3) Optimizing capital structure

Under the premise of controllable risk, we should moderately increase the financial leverage, reasonably increase the debt financing, balance the capital cost and the profit amplification effect, and improve the efficiency of capital use.

5. Company Analysis Conclusion

5.1. Risks and Problems of the Company

(1) Traditional business cycle volatility risk

Core product 6-APA price plummeted 35% YoY to 81,000 yuan/ton; capacity utilization dropped from 92% to 65%; H1 2025 revenue -26.5% YoY, net profit -40.68%.

(2) Risks associated with delays in launching new business initiatives

Synthetic biology utilization below 30%; ergothioneine approval still under notice.

(3) Risk of deterioration in operational efficiency

The inventory turnover ratio dropped from 2.43 times in 2024 to 1.23 times in the first half of 2025, while the total asset turnover ratio fell to 0.23 times. This reflects the prominent issues of inventory overstock and idle assets in traditional businesses, along with a significant decline in resource allocation efficiency.

(4) Cash flow and cost control risks

Operating cash flow to net profit ratio dropped to 0.86; period expense ratio surged 43.42%; R&D expenditures skyrocketed by 135% (Christensen et al., 2018).

5.2. The Measures the Company Should Take

(1) Traditional businesses are maintaining their stability.

Stabilize traditional business – Lock in one-year contracts, optimize fermentation parameters via AI to reduce unit cost by 5%.

(2) The new business is accelerating its scaling.

Expedite ergothioneine approval, start 100-ton pilot production, increase carvone capacity utilization to 85%.

(3) Optimizing operations and cash flow

Implement “production based on sales” mechanism, shorten payment terms to 25 days, target operating cash flow to net profit ratio >1.5.

(4) Balance capital and policy dividend

Issue low-cost short-term financing bonds ($\leq 3\%$), secure environmental subsidies (120 mn yuan).

5.3. Conclusions from the Company Value Analysis

In the short term, Chuanning Biotech is undergoing a painful transition phase. The 2025 earnings decline has pushed its valuation to a relatively low level, with risks now fully priced in. However, its long-term value remains strongly supported by: (1) Xinjiang's low energy/employment costs and tax incentives forming a sustained cost barrier; (2) synthetic biology platform commercial breakthroughs (e.g., myricetin, ergothioneine); (3) technological accumulations in AI fermentation control and microbial residue recycling. Currently in a value bottoming phase, the company's performance is expected to enter a recovery trajectory post-2026 if new businesses scale up as planned (Gompers & Lerner, 2021).

6. Conclusion

This study employs the Harvard Analytical Framework to conduct a comprehensive financial and strategic evaluation of Ili Chuanning Biotechnology Co., Ltd. from 2023 to the first half of 2025. The analysis reveals that the company has established a solid market position in the antibiotic intermediates sector through its cost advantages rooted in Xinjiang's resources and its large-scale fermentation capabilities, achieving steady growth in revenue and net profit during 2023–2024. However, the first half of 2025 witnessed a phased downturn in performance, driven by cyclical fluctuations in traditional product prices, lower capacity utilization, and slower-than-expected progress in synthetic biology initiatives.

Financially, the company has demonstrated improving solvency and a robust profitability foundation, yet it faces significant challenges in asset operation efficiency and cash flow quality. Strategically, while the “biotechnology fermentation + synthetic biology” dual-engine model offers long-term growth potential, the company must navigate industry cycles, substantial R&D investments, and policy uncertainties during its transition.

Looking ahead, Chuanning Biotech's value hinges on its ability to stabilize traditional operations, accelerate the commercialization of new synthetic biology products, optimize operational efficiency, and prudently manage its capital structure. If the company can effectively execute its transformation strategy and enhance resource allocation, it is well-positioned to overcome short-term headwinds and unlock sustainable, high-quality growth in the evolving biomanufacturing landscape.

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