



Analysis of Cost Control in the Value Chain of a Logistics Company under the "Dual Carbon" Background

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Abstract. Centered on the study of cost control management in logistics companies under the "dual carbon" background, this paper primarily employs case analysis and both horizontal and vertical comparative research methods to explore cost control in logistics companies. Utilizing a value chain perspective, this article matches the main costs generated by the company with the internal value chain segments of logistics enterprises, analyzes the problems in cost control at various stages of the enterprise value chain, and provides optimized corresponding strategies to aid companies in achieving carbon reduction targets and cost control, while maintaining sustainable economic growth.

Keywords: Dual Carbon Background; Value Chain; Cost Control

1 INTRODUCTION

In recent years, due to the rapid development of the market economy and online trade, the express delivery industry has become a major growth point in China's economy. Currently, the express delivery industry is at a critical transition period, integrating the internet with logistics, optimizing customer experience, reducing resource consumption in logistics, and pursuing green development. In October 2021, the CCP Central Committee and the State Council issued the "Opinions on Fully, Accurately, and Comprehensively Implementing the New Development Philosophy to Achieve Carbon Peaking and Carbon Neutrality," incorporating carbon peaking and neutrality into the overall socio-economic development plan, striving to achieve carbon neutrality by 2060. This poses new challenges to logistics enterprises primarily reliant on traditional fuel transport, including energy structure adjustment, cost and investment structure optimization, and innovation in operational methods.

Based on this, under the "dual carbon" targets, logistics enterprises need to integrate green development concepts into every link of their internal value chains, merging them with these value chain segments, to promote low-cost, high-efficiency matching of supply and demand. This integration helps effectively control costs and enhance performance in the process of achieving green development, thus facilitating high-quality development of enterprises under the "dual carbon" framework.

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2 THEORETICAL BASIS

Value chain theory emphasizes that a company is an organism composed of core activities such as production, sales, and service, supplemented by activities like human resources and technological development, creating value in the process of selling products or services to consumers [1].Based on this theory, some scholars have further proposed a value chain model for the logistics industry, suggesting that the value of enterprises can be enhanced by optimizing and integrating key operational segments such as receiving, sorting, transporting, and storing [2] [3].

The value chain cost control theory posits that, in a competitive market environment, companies seeking to maintain cost advantages and add value must manage costs using value chain theory. Companies allocate substantial costs to value chain segments such as receiving, sorting, transporting, and storing, creating value through value-added activities in these fundamental operations, thereby generating revenue[4].

Since costs incurred in basic operations are inevitable, companies should take measures to reduce resource wastage and eliminate non-value-adding activities, thus achieving efficient cost control under the value chain[5].Under the evolving premise of traditional value chain theory, many scholars have conducted optimization studies on the value chain system processes based on sustainable development strategies, establishing green value concepts, and incorporating green processing and waste recycling into the value chain system.Consequently[6], based on the research of various scholars, this paper divides the basic activity value chain of logistics enterprises into a six-step progressive value chain, as shown in Figure 1.

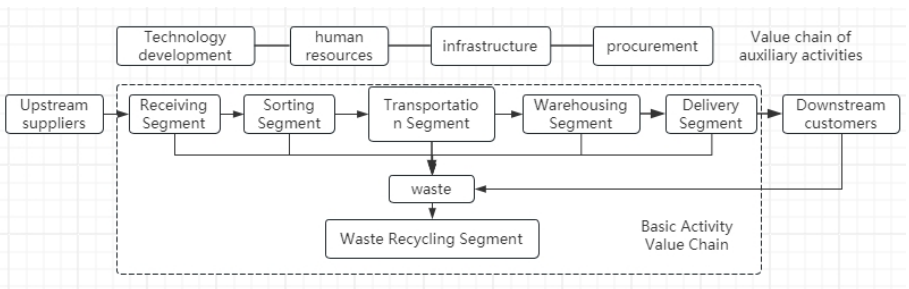


Fig. 1. Value chain of logistics enterprises

3 ANALYSIS OF COST CONTROL IN THE VALUE CHAIN OF A LOGISTICS COMPANY

3.1 Introduction to A Logistics Company

A Logistics Company was established in 1993 and successfully listed in 2017, with total assets reaching 231 billion RMB. By the end of 2021, as the largest cargo owner in domestic express logistics, it operates 86 cargo planes, owns 776 warehouses, and runs 95,000 self-operated and outsourced dry branch line trucks. The company's

business covers a wide range, including time-sensitive express, economy express, fast transport, cold chain logistics, pharmaceuticals, same-city rush delivery, supply chain management, international and other non-logistics services. After years of business expansion and operations, it has become the leading private enterprise in China's comprehensive express logistics services.

3.2 Cost Composition of the Value Chain in A Logistics Company

In its production and operations, the company engages in value activities that consume corresponding resources and incur costs, as outlined in the structural framework shown in Table 1.

Table 1. Cost Composition of the Value Chain

Corporate Chain	Value	Value Activities	Resource Consumption	Main Cost Items
Primary Activities Value Chain		Receiving Segment	Material Resource Consumption (Depreciation of Fixed Assets, Other Material Costs, etc.)	Transportation Costs
		Sorting Segment		
		Transportation Segment	Energy Resource Consumption (Fuel and Power Costs, etc.)	Warehousing Costs
		Warehousing Segment	Human Resource Consumption (Direct Labor Costs and Indirect Labor Costs)	Outsourcing Costs
		Delivery Segment		
	Waste Recycling Segment	Technology Resource Consumption (Design System Costs, etc.)	R&D Costs	

3.3 Main Cost Analysis of A Logistics Company

Vertical Cost Comparison Analysis of the Company. Through analysis, the main costs incurred in the value chain segments of A Logistics Company include outsourcing costs, transportation costs, warehousing costs, and R&D costs, as shown in Table 2.

The expenditure on outsourcing costs, primarily supporting transportation, warehousing, and delivery segments within the value chain, began to decline from 34.82% to 9.96% since 2021. Despite rapid business growth, this cost segment did not increase proportionally, reflecting enhanced control over labor outsourcing and transport capacity outsourcing, optimization of outsourcing route procurement and settlement models, and rational control of unit outsourcing prices. Additionally, with environmental protection and sustainable development becoming integral to business, outsourcing vendors often lack sufficient awareness in this area. Therefore, increasing reliance on outsourcing services could contradict the company's long-term development goals, forcing the company to not only consider cost and efficiency but also the

environmental philosophy and practices of potential partners to ensure the sustainability of outsourcing collaborations.

The company's expenditure on transportation costs, mainly supporting the transportation and delivery segments of the value chain, has steadily increased from 9.26% in 2020 to 25.66% in 2022. This rise has largely been influenced by domestic fuel price increases. Despite strategic goals towards green logistics, the prevalence of new energy and clean energy vehicles remains insufficient, and reliance on traditional fuel vehicles is still significant. This not only hinders the low-carbon transformation in transportation but also significantly increases transportation costs, posing a major bottleneck to the company's development.

The company's spending on warehousing costs primarily supports the warehousing segment of the value chain. While the proportion of warehousing costs has decreased from 13% to about 8%, the absolute value of these costs still grew by 7.39% in 2022 compared to 2021. Despite achieving phased results through a digitalized warehousing system, supporting rapid income growth with relatively low warehousing cost input, the company's warehousing costs remain high compared to other logistics companies in the industry, with still low capacity utilization rates in warehousing.

The company's spending on R&D costs supports packaging, warehousing, and waste recycling within the value chain. The proportion of these costs to main business income has been decreasing annually since 2019, from 2.13% to 1.32%, although absolute R&D spending is still growing. The company's R&D focuses on developing recyclable packaging, constructing green warehousing, and planning green transportation routes, aiming to reduce costs and increase efficiency across the supply chain, which also leads to increased investment in intelligent technology R&D.

Table 2. Cost Indicators of A Logistics Company

Main Cost Items Analysis Indicators(%)		2019	2020	2021	2022
Transportation Costs	Proportion of Operating Income	48.56	52.5	51.12	43.38
	Growth Rate	36.12	48.37	34.82	9.96
Warehousing Costs	Proportion of Operating Income	9.27	9.26	16.84	25.66
	Growth Rate	10.54	12.27	144.54	96.74
Outsourcing Costs	Proportion of Operating Income	13.97	11.84	10.24	8.52
	Growth Rate	20.54	16.32	16.45	7.39
R&D Costs	Proportion of Operating Income	2.13	1.95	1.76	1.32
	Growth Rate	6.79	13.47	21.69	-3.38

Horizontal Comparative Analysis with Industry Peers. Analyzing financial indicators with other companies in the industry can help A Company identify controllable cost management points in terms of profitability, operations, and solvency, leading to more reasonable and effective cost control.

In terms of profitability, the main business cost rate measures the proportion of main business costs in operating income. The higher this rate, the lower the income's profit contribution capacity. A Company's difference with Company C is about 10%, resulting in a lower cost profit rate of only 3.92%, meaning the company needs to invest more capital than others to achieve the same revenue. The marginal contribution rate is low, with a net profit margin of only 1.89%, which is also at a low level in the industry. Overall, the company's profitability is weak, and cost control needs improvement.

Operationally, A Company has long inventory turnover days and slow accounts receivable turnover, resulting in high warehousing costs and opportunity costs, showing inadequate operational efficiency.

In terms of solvency, the company's current ratio is relatively appropriate, but the high inventory turnover days in the industry will increase the company's stored goods, potentially inflating the current ratio and increasing operational risks.

Overall, A Company has inventory backlog issues and is relatively weak in cost control. Specific data are shown in Table 3.

Table 3. Comparison of Financial Indicators between A Logistics Company and Industry Peers

Classification	Financial Indicators	A Corporate rate	B Corporate	C Corporate	D Corporate
Profitability	Main Business Cost Rate (%)	87.62	87.34	78.32	90.95
	Net Profit Margin (%)	3.92	6.68	24.09	4.91
Operational Efficiency	Inventory Turnover Days (Days)	1.89	4.84	15.47	2.99
	Accounts Receivable Turnover Days (Days)	2.51	0.54	1.25	1.48
Solvency	Current Ratio (%)	41.09	11.90	19.44	9.42

4 COST CONTROL MEASURES IN THE VALUE CHAIN OF A LOGISTICS COMPANY

4.1 Optimization of Transportation and Distribution

To achieve green and low-carbon transformation in the company's logistics processes and control transportation costs during the transformation, the company can actively promote the use of new energy vehicles on roads and reduce the consumption of traditional energy. Additionally, the company can monitor fuel vehicles through platforms, improve existing transport routes using technology to minimize the total distance traveled by each vehicle across all nodes, thus promoting energy conservation and emissions reduction in transportation, and strengthening cost control.

4.2 Accelerating Green Warehousing Construction

The company should further accelerate the green transformation of basic warehousing facilities, transitioning from traditional to new energy sources. Although this increases short-term investments, it reduces long-term dependence on externally purchased resources, thereby lowering warehousing costs. Accelerating the construction of automated sorting and transmission systems can reduce labor costs and enhance efficiency from the ground up. Finally, for new warehousing facilities, select locations judiciously, choosing areas with low rent but high potential returns to cover as many distribution points as possible, maximizing the logistics network coverage.

4.3 Accelerating Green Warehousing Construction

In controlling outsourcing costs, the company can analyze the revenue within the regional scope of its outsourcing operations to identify areas that contribute significantly to the company's profitability and manage these areas autonomously. This approach can eliminate cost increases due to malicious price hikes or inefficiencies by contractors. Moreover, achieving a low-carbon transformation in outsourcing also requires the company to consider the environmental and low-carbon credentials of service providers, thereby controlling outsourcing costs while achieving transformation and upgrading.

5 CONCLUSION

The conclusions of this paper are as follows: The company's costs in outsourcing, transportation, and warehousing have significantly reduced its gross margin, leading to a narrower profit margin. When compared to industry peers, its various indicators are also lower than those of other companies. This paper proposes improvement suggestions for reducing various costs, such as eliminating non-value-adding activities, optimizing the collaboration of value chain segments, and encouraging the company to actively engage in the rational planning of transportation routes, reasonable control of outsourcing costs, and technological enhancement of warehousing costs.

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