

MODERN MODELS FOR EVALUATING COMPANY PERFORMANCE THROUGH LOGISTICS CHAINS

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Abstract

The purpose of this paper is to analyze the impact of globalization on the logistics chain in order to be able to deliver globally and record good financial performance in order to be competitive. As a result of rapid technological development, the competitiveness of a company is no longer limited to a city, a county, a country, but is in direct competition globally with other companies that offer the same products or services and can be accessed just a click away. In this context, the established objectives focus on: evaluating the direct influence of the company's earnings, its development and its market share. The research methodology is based on the analysis of the financial statements regarding the turnover of the company ARGUS S.A. during the period 2021 - 2023, and the results obtained materialize in the proposal of objective solutions to reduce logistics costs.

Key words: turnover; logistics chains; market share; performance.

JEL Classification: F63

INTRODUCTION

The entirety of the procedures and actions involved in managing the flow of products, data, and services from a place of origin to the customer could be used to define logistics. Planning, transportation management, product storage, and the control of associated information flows are some of these procedures and operations. An efficient and well-run logistics system guarantees high-quality services by delivering items on schedule, cutting expenses, and—above all—maintaining high levels of customer satisfaction. In the current period, logistics plays an essential role in the competitiveness of companies by optimizing production and supply chains, forecasting inputs and outputs of stocks, goods, and finished products to minimize expenses and significantly increase revenues. Moreover, the integration of artificial intelligence into the decision-making process enhances these functions by enabling advanced predictive analytics, real-time tracking, and automated optimization, further improving efficiency and responsiveness in logistics operations (Dragomir & Alexandrescu, 2017).

Logistics has always been an essential activity for humanity. Even so, it has not always been perceived at its true value in all fields of activity. The importance of logistics has grown with people's needs, being influenced by the development of humanity over the centuries. Logistics has its origins in the military field. The term comes from the Greek word "logistikos", which means "skilled in calculation", and was first used to describe the art of moving, supplying and maintaining armies. In antiquity, the Persian, Roman and Byzantine empires developed sophisticated logistics systems to support military campaigns (Ballou, 2004). Logistics continued to be essential in wars, with an emphasis on supplying troops and managing supplies. The Industrial Revolution brought major changes, and logistics began to be applied in the commercial field as well. The development of railways and maritime navigation allowed for a better distribution of goods. The First and Second World Wars accelerated logistics innovations. In the 1950s, logistics began to be recognized as a separate management discipline in business. The concept of "just-in-time" (JIT) was introduced in the 1980s, emphasizing inventory minimization and improving efficiency. Globalization and technological advances, such as automation and the use of big data, have revolutionized logistics, transforming it into a complex and interconnected field (Bowersox et al., 2013; Grosu et al., 2024).

The distribution of goods, or logistics, is a critical component of economic activity and has become a key organizational function. Furthermore, the integration of recommendation systems and the modeling of abusive clauses in e-commerce enhances logistics by promoting fair practices, improving customer trust, and optimizing distribution strategies (Dragomir et al., 2021). Specialists in the field and not only can concretize that logistics is indispensable to the daily life of each of us. From an individual perspective, each of us has ordered products by phone or via the Internet and they were delivered to the locations offered by us. Only by looking objectively can we observe a sequence of events that arise from placing orders to receiving them, all of which are due to logistics. If companies deliver to individuals, they can offer benefits, they can focus on a market segment to satisfy the needs of buyers. The same is true of the logistics chain applied between companies. Speed, offers, forecasting provides

a real competitive advantage of companies in the market and a key component of companies. Without a well-established logistics system, a company can decline to the point of bankruptcy because the goods produced cannot be delivered on time or safely, and now in the age of speed, any small advantage can make the difference between growing and going bankrupt (Christopher, 2016).

The mission of the logistician is to bring goods and services to the right place and time, under the required conditions, as well as to ensure contributions to the company's profit. We can deduce that in the century of speed, in which we live, the logistician must have an overview and the necessary knowledge to efficiently schedule future activities. The objective of all organizations is to identify and control expenses as well as improve relevant performances for each activity that creates added value, in order to implement the necessary improvements and increase the company's profit (Lambert et al., 1998; Cosmulese & Hlaciuc, 2019).

The concept of logistics is not limited to the field of manufacturing enterprises but extends to all companies and individuals because, regardless of the field of activity, the transport of goods is necessary. The configuration of a logistics system in wholesale distribution is different compared to one used for retail because for wholesale the volume of products delivered to manufacturing enterprises is larger and dedicated to the specifics of production, while retail requires more preparation to streamline and increase the level of income (Grosu et al., 2024). These specific logistics operations, in turn, create significant value for customers. In this way, the relevance of the logistics concept remains constant, regardless of the type, nature and volume of goods offered, they will satisfy the needs of industrial customers, small businesses or individuals.

I. LITERATURE REVIEW

Over time, we have all become familiar with notions with a similar meaning, which suggest aspects of securing production, securing jobs, and providing the company with materials to carry out its production function: supply, acquisition, material assurance, resource management, workplace supply, materials management, company logistics, etc. (Udrescu & Cuturela, 2013; Dragomir, 2017). The concept of "logistics" - first appeared in the military field and was known to a limited circle of people. Military leaders were the first to apply logistics as a component of war, thus considering it as a practical application of troop movement strategies. If the strategy established the place of action, then logistics was the one that brought the troops to that place (Negoiță, 2021).

The notion of logistics encompasses all activities that aim to achieve a harmonization of time and space with goods and people, through their appropriate grouping. Thus, logistics is defined by the integrated planning, organization and control of all flows of goods and materials, together with the flows of information related to them, starting from suppliers, to the delivery of products to customers, including recycling and waste disposal (Rusu & Colesnicenco, 2017a). Digital transformations in the accounting and auditing profession offer significant opportunities for integrating modern models for assessing the performance of companies through supply chains and for identifying and quantifying the influence of determinants on the performance of credit institutions through econometric research, thereby strengthening the ability of statutory auditors to analyze and interpret complex data in a dynamic economy (Bores, 2023a)

Nowadays, logistics can no longer be considered just an unimportant point within a company, as it has become a pillar for development, which is why the university environment is improving its methods and techniques to train new generations of specialists in the field. The logistics department is found in the activity of any company; therefore, it is imperative that logistics be studied and constantly improved. In the era in which we live, it is impossible to imagine any flow of goods without logistics. The completion of teaching activities also requires an overview of everything that has been studied, in terms of their usefulness for the future profession. The solid preparation of a commerce graduate requires the approach of more practical disciplines on the one hand and, on the other hand, the elimination or discouragement of actions or attempts to monopolize knowledge within disciplines to which students do not have access.

In today's globalized economy, logistics plays a key role in determining a company's competitiveness in the international market. The ability to efficiently manage the flow of goods, services and information is very important for the success of companies operating globally. Logistics not only facilitates international trade transactions, but also contributes significantly to optimizing costs, improving customer satisfaction and increasing agility and flexibility in the supply chain. The logistics system is composed of a set of activities that are closely interdependent, all of which must contribute to the achievement of marketing policy. In other words, logistics management is the sum of the management of material activities carried out before the production process, to which are added the actual distribution activities at the end of production (Guțan, 2022).

In the contemporary society, where technical and scientific progress tends to replace the human-producer with the machine-producer, it becomes very important and significant to study the purchasing process for maintaining the consumption function. This is especially important since the scarce resources with alternative uses

that human society has at its disposal require the production of only those goods and services that satisfy needs in the necessary quantities. For this reason, knowing and explaining the consumption and purchasing process has become a pressing necessity since ignoring its manifestation produces serious imbalances (Bulat, 2020). Logistics is the backbone of international trade, ensuring the transport and delivery of products from producers to end consumers, regardless of distances and borders. A well-developed logistics system allows companies to access new markets, respond quickly to changing customer requirements, and maintain a constant flow of goods. Efficient logistics also helps reduce trade barriers, such as high transportation costs and long delivery times, thus facilitating international trade (Lamber et al., 1998).

Today's companies adopt the view of a complete value supply network, this value supply network being made up of the company, suppliers and distributors, and ultimately, customers who enter into "partnership" with each other to improve the performance of the entire system (Aurica, 2011). One of the main competitive advantages offered by well-organized logistics is cost reduction. Companies can save considerable amounts by optimizing transport routes, using modern technologies for inventory management and improving warehousing processes. Lower transport and storage costs are reflected in more competitive prices for products and services, which can be a decisive factor in international markets (Cosmulese, 2023). Customer satisfaction is an essential factor for international success. Efficient logistics ensures fast and accurate deliveries, minimizing delays and errors. By offering a high-quality service, companies can build solid and long-lasting relationships with their customers. In addition, a well-managed logistics system allows companies to respond quickly to customer requirements and offer them personalized solutions, thus increasing their loyalty and satisfaction. Each company, due to its past, the range of products it sells or its competitive position, requires the development of specific logistics solutions (Rusu & Colesnicenco, 2017b).

In a global business environment, change is inevitable. Logistics flexibility allows companies to quickly adapt to new market conditions, shifts in consumer demand, and supply chain disruptions. Flexible and agile logistics can make the difference between success and failure in international competition. For example, during an economic crisis or pandemic, companies with well-managed logistics can react more quickly and efficiently, thus maintaining their competitiveness. Technology plays a very important role in modernizing and streamlining logistics. The use of transportation management systems (TMS), warehouse management software (WMS), and real-time tracking solutions (such as RFID and GPS) allows companies to optimize their logistics processes and improve visibility throughout the supply chain. Investments in logistics technology and innovation can provide a significant competitive advantage in international markets, allowing companies to operate more efficiently and provide superior service (Murphy & Knemeyer, 2018). As environmental and sustainability concerns become increasingly important, companies that adopt green logistics practices can gain a competitive advantage internationally. Reducing carbon emissions, using recyclable packaging, and implementing sustainable transportation strategies not only improve a company's public image, but also contribute to reducing costs in the long run.

Today, logistics departments are present in almost all organizational charts of companies around the world. However, despite the apparent increase in the importance of logistics in the organizational structure, many executives still perceive the role of logistics simplistically, considering that this activity consists only of product delivery. Regardless of its field of activity, any organization must fulfill the role of material rotation (Rotari, 2022). International customers are increasingly sensitive to environmental issues, and companies that demonstrate social responsibility and sustainability can attract and maintain a loyal customer base. Reviewing the definition of the concept of logistics, the evolution of specific structures and actions, as well as highlighting its components are elements that help us to correctly understand the place and role occupied by logistics, but also to use it as an efficient means in the operational development of activities within companies (Carp, 2021).

Logistics plays a key role in international competitiveness. By optimizing costs, improving customer satisfaction, increasing flexibility and adopting innovative technologies, companies can gain a significant advantage in global markets. In addition, adopting sustainable practices can improve the company's reputation and attract environmentally conscious customers. In a globalized and dynamic world, international success largely depends on logistics efficiency and adaptability. The level of logistics services largely depends on these established elements: promptness, consistency, competence, adaptability and flexibility of services, at the customer's request. The main arguments for choosing a logistics partner are the price-quality ratio and the experience of the service provider (Miricescu & Moser, 2015).

II. RESEARCH METHODOLOGY

Measuring and managing supply chain performance is an essential aspect for ensuring the efficiency and competitiveness of an organization. This process involves identifying and monitoring key performance indicators (KPIs), such as logistics costs, delivery times, inventory levels and customer satisfaction rates. By using these KPIs, managers can evaluate the effectiveness of various logistics processes and identify areas that require improvement. Implementing performance management systems, such as Balanced Scorecard or Six Sigma, allows for a structured approach to optimizing logistics activities. Continuous analysis and adjustment of strategies based on collected data contributes to reducing costs, improving services and increasing flexibility in the face of market changes. Also, the use of advanced technologies, such as transportation management systems (TMS) and warehouse management systems (WMS), supports real-time monitoring and informed decision-making. In conclusion, measuring and managing supply chain performance is essential for the success and sustainability of a business in today's competitive environment (Șerbănescu & Drăgoi, 2019).

Measuring logistics performance is fundamental to ensuring the effectiveness, efficiency and speed of operations in a supply chain. A well-designed performance model helps to monitor and optimize logistics processes, thus contributing to improving the company's competitiveness. In this section, we will explore the essential elements of a logistics performance model, including key performance indicators (KPIs), evaluation methodology and benchmarking techniques. According to a classic approach, we can observe a generic performance model structured on five dimensions (Vasiliiu et al., 2008).

The five most important dimensions on which the performance of the supply chain is based and which will be used as a benchmark in the interpretation and analysis of economic and financial indicators are:

Performance criteria refer to operational results and are provided by the general management. This level is the level of effectiveness, for example the level of quality compliance represents operational objectives (see Table 1).

Table 1. Key Aspects of Performance Models in Logistics Chains

Aspect	Description	Focus Area
Performance Models	Strategies and operational decisions influencing all levels of the logistics chain. Causal links exist between processes, decisions, and logistics outcomes.	Efficiency register
Optimal Use of Resources	Utilization of human, material, and financial resources, including ERP and APS systems. Balances productivity (e.g., order processing costs) with efficiency to avoid increased expenses.	Productivity and efficiency
Standard of the Situation	Challenges in comparing situations across enterprises or historical, market, competitive, or environmental contexts.	Contextual variability and adaptability
Standard of Comparison	Setting realistic and motivating target objectives for operational performance.	Performance objectives and benchmarking

Source: Adapted from Vasiliiu et al., 2018

Depending on the size of the company, reporting will be done differently. In the case of a multinational company, reporting to higher management structures will focus on performance indicators, while for local management, all indicators will be used to make decisions. However, it is important to emphasize that any indicator must meet the following characteristics: to be relevant to the object being measured (whether it is an operational objective or an action variable), to be quantifiable in the company's accounting or extra-accounting system, to be stable over time, to be accepted without reservations by users, to be sensitive enough to reflect the evolution with the desired level of detail, and to be selected in such a way as to avoid any possibility of misinterpretation.

Key performance indicators are quantifiable measures used to assess an organization's success in achieving strategic and operational objectives. In logistics, KPIs are essential for monitoring the efficiency and effectiveness of operations. Some of the most common KPIs in logistics include (Jenkins, 2023):

- *Lead Time* measures the total time it takes for a product to be delivered from its origin to its final destination. Reducing lead time can improve customer satisfaction and operational efficiency.
- *On-Time Delivery Rate* measures the percentage of on-time deliveries out of total deliveries. This indicator reflects the ability of logistics to meet delivery deadlines agreed upon with customers.
- *Inventory Levels* monitor the amount of inventory available in warehouses. An optimal inventory level prevents both overstocking and product shortages, contributing to cost efficiency.
- *Return Rate* is the percentage of products returned out of the total number of products shipped. A high return rate may indicate problems with product quality or customer satisfaction.

- *Total Logistics Cost* includes all costs associated with logistics operations, such as transportation, warehousing, handling, and packaging. Reducing logistics costs can improve a company's profitability.

Logistics performance assessment also involves the use of a structured methodology that allows for the collection, analysis and interpretation of relevant data. This methodology can be divided into the following stages:

- *Goal setting* is the establishment of clear and measurable objectives for logistics operations. These objectives should be aligned with the overall company strategy.
- *Data collection* is the gathering of relevant data from different points in the supply chain. This can include data on transportation, warehousing, orders and deliveries.
- *Data analysis* is the use of analytical tools to interpret the collected data. This process can include statistical analysis, predictive modelling and scenario simulation (Alexandru & Radu, 2017).
- *Performance comparison* is the comparison of current performance with established objectives and industry standards. Benchmarking techniques are often used for this purpose.
- *Continuous improvement* is the identification and implementation of measures to improve logistics performance. This process involves continuous feedback and periodic adjustments to strategies and operations.

A well-defined logistics performance model is essential for monitoring and optimizing logistics operations. The use of key performance indicators, a structured evaluation methodology, and benchmarking techniques can help organizations improve their logistics efficiency and effectiveness, thereby contributing to increased competitiveness in the market (Alexandru & Radu, 2017).

III. RESULTS AND DISCUSSION

Costs and revenues are two fundamental aspects of a company's business and are essential for assessing its performance and financial health. In this paper, we will analyze the importance and interaction between costs and revenues, illustrating each concept with concrete examples. Costs are the expenses incurred by a company to produce or provide its goods and services. These can be divided into several categories, including fixed costs and variable costs. Fixed costs for a manufacturing company might include rent for production facilities and salaries for administrative employees, which do not vary with production volume.

Revenue is the financial receipts from the sale of a company's goods or services. It can come from a number of sources, including direct sales, investment income, or service contracts. A software company's revenue can come from the sale of software licenses, monthly subscriptions for online services, or consulting and implementation revenue. Cost-revenue analysis is essential for assessing a company's profitability and identifying areas for improving operational efficiency. By comparing costs to revenues, a company can identify profit margins for each product or service it offers and make strategic decisions about adjusting prices or optimizing costs (Vasiliu et al., 2008; Bores, 2023b).

Expenses represent all economic operations that affect the company's assets by decreasing assets or increasing liabilities. According to the legislation in force, expenses are defined as decreases in the economic benefits recorded by the company during a period in the form of outflows or reductions in equity. Their recognition in the profit and loss account is made only when they are reliably measured and lead to a decrease in an asset or an increase in a liability. The decisions made by a company can have a significant impact on its costs and revenues. For example, investments in technology or staff training can lead to increased operational efficiency and, implicitly, to reduced costs or increased revenues. A company that decides to outsource certain logistics processes can reduce operational costs, benefiting from economies of scale or the specialized expertise of external suppliers (Hlaciuc, 2023). In the following, we will analyze the data of the company ARGUS S.A. regarding revenues and expenses for the years 2021 - 2023, listed on the Bucharest Stock Exchange. To analyze this data, we will use a tabular method and for forecasting, we will use specialized computer programs.

Furthermore, in Figure 1 we can see that the histogram and the Plot diagram show a strong peak in 2022 as can be seen from the tables, which is not normal and predictable with the company's evolution until that year. Most likely this increase in turnover and profit is due to the geopolitical situation in 2022, which determined the increase in population consumption to make provisions. The ends of the histogram show the real evolution of the company, which determines that, except for 2022, the company is on an increasing trend. Also, we can better visualize the ends of the histogram, which denotes the direction of the company, which, except for 2022, is in constant growth.

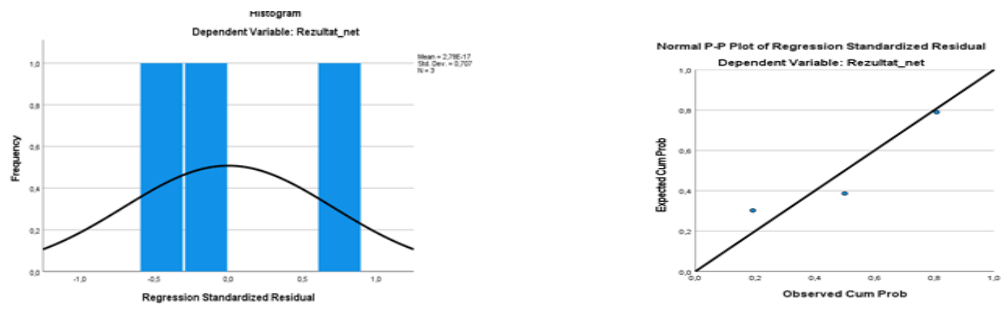


Figure 1. Histogram and Plot diagram regarding the turnover trend during 2021 – 2023

Logistics Cost Analysis

Logistics includes the complete management of goods and information flows from procurement to shipment of finished products, including waste management and possibly returns. This process involves the use of means of transport, stocks and warehouses, as well as the human resources necessary for the movement of materials. All these logistics operations have certain costs. These costs are essential for company management because cost efficiency means increased profit. Reducing costs involves detailed knowledge and analysis of them, as well as understanding the impact of each logistics activity on total costs. It is estimated that approximately 10-15% of turnover is represented by logistics costs, depending on the specifics of the company's activity. Theoretically, transportation costs represent approximately half of total logistics costs, while storage constitutes around a quarter of them. Recently, logistics costs have increased, driven by the expansion of global deliveries and the increase in fuel prices.

The Table 2 summarizes the percentage changes in logistics costs for warehousing, handling, and overhead over the period 2021–2023, highlighting significant fluctuations and efficiency improvements.

Cost Category	2022 vs. 2021 (%)	2023 vs. 2022 (%)	Key Insights
Warehousing	+93.63%	- 32.00%	Significant increase in 2022 followed by a notable efficiency-driven cost reduction in 2023.
Handling	+102.81%	- 40.42%	Substantial rise in 2022, with a marked reduction in service costs in 2023
Overhead	+4.87%	- 46.90%	Moderate increase in 2022, with a sharp decline in 2023 reflecting significant cost containment

Source: Company data under study

For the company under our study, we found an increase in warehousing costs by 93.63% in 2022 compared to 2021, indicating an increase in warehousing expenses. In 2023, these costs decreased by 32.00% in 2023 compared to 2022, suggesting an increase in inventory management efficiency; Handling costs increased by 102.81% in 2022 compared to 2021, indicating a significant increase in service expenses. In 2023, these costs decreased by 40.42% from 2022, showing a significant reduction in spending in this area; Overhead increased slightly by 4.87% in 2022 from 2021, suggesting a moderate increase in overhead. However, in 2023, these expenditures decreased by 46.90% from 2022, reflecting a significant reduction in overhead (see Figure 2).

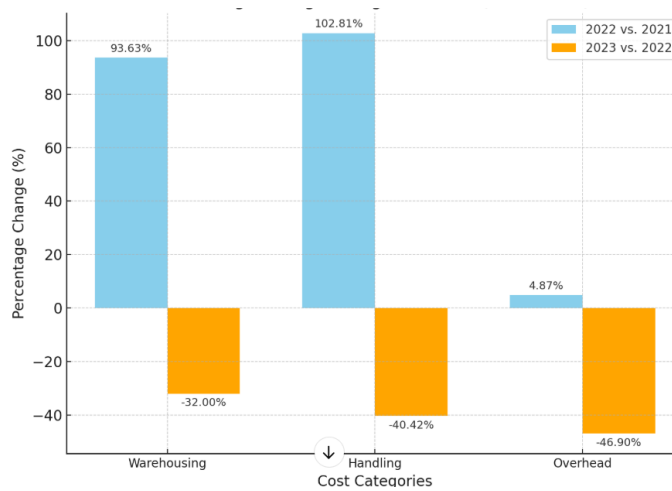


Figure 2. Percentage changes in logistics costs over 2021–2023 for warehousing, handling, and overhead categories

Another example of cost reduction can be the implementation of an inventory management computer system for inventory alerts and just-in-time orders. This computer system scans raw materials entering and leaving the warehouse and alerts managers when a minimum threshold regarding existing stocks is reached. According to a study conducted by Gartner, the implementation of this program increases costs in the first phase by approximately 10-15% but in the long run leads to cost efficiency and reduction of raw material losses or line shutdowns due to their lack. At the same time, this system reduces the work of managers and the number of personnel dedicated to checking and managing goods. It is expected that the implementation of such a computer

system can lead to long-term cost reductions of between 15 and 25%. Another method of cost reduction can be the automation of handling, which involves automated storage spaces with shelves and elevators. The implementation of such a method is expensive but the reduction in labor costs can decrease by between 20 and 30%.

On the basis of these studies, we made a comparison on the reduction of warehouse operating expenses during the period analyzed in the above-mentioned account, and we observed a reduction of overhead expenses by 30% which indicates an increased efficiency of the applied methods. Each major category of expenses (storage, handling, overheads) benefited from similar reductions, suggesting a coherent and efficient approach in optimizing logistics costs.

The implementation of efficiency methods led to significant reductions in all expense categories. The fact that all reductions are approximately 30% suggests a strategy that is efficient and applied uniformly across all analyzed segments. This emphasizes the importance of effective planning and management for reducing costs and optimizing logistics operations, as well as the application of modern inventory management methods and efficient handling within the warehouse.

IV. CONCLUSIONS

This research aimed to explore how logistics contributes to increasing the company's competitiveness, analyzing this aspect theoretically and practically through the lens of the company ARGUS SA.

The practical analysis carried out on the company ARGUS SA highlighted the significant impact of logistics management on the company's performance and competitiveness. The study showed that by optimizing logistics costs and implementing effective logistics chain management strategies, ARGUS SA can significantly improve its operational performance and competitive position in the market. Recommendations for ARGUS SA include the adoption of advanced transportation management (TMS) and warehouse management (WMS) technologies, for better monitoring and improving logistics performance. These measures can reduce costs and improve the efficiency of logistics processes.

The conclusions of this research are relevant not only for ARGUS SA, but also for other companies in the logistics sector, providing a solid basis for improving logistics strategies and increasing competitiveness. However, the research has limitations, such as data restrictions and the specificity of the context of the analyzed company. For the future, it is recommended that research explores other aspects of logistics in depth and includes comparative studies between different companies and industries to validate and extend the conclusions obtained.

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