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A Study on Optimization of Pharmaceutical Supply Chain Management: A Comparative Study on Select Pharma Industries

Swarnima Upadhyay, Jay Krishan, Dr. Radhakrishna M

MBA (PH &POM) Student, NIMS University, Jaipur, Rajasthan, India

MBA (LM &POM) Student, NIMS University, Jaipur, Rajasthan, India

Associate Professor, NIMS University, Jaipur, Rajasthan, India

ABSTRACT: Optimizing supply chain management in the pharmaceutical industry involves a comprehensive approach that addresses various aspects from sourcing raw materials to delivering finished products to customers while ensuring compliance with regulatory standards, maintaining product quality, and managing costs effectively. This study focusses on importance of pharma supply chain optimization and ways to improve its efficiency. The secondary is collected for the research from industry reports, research papers and other works relevant to the topic. The analysis of the vital factors like carriage forward, cost of consumption of materials, company's revenue is analyzed. The key findings of the work are the pharma industries optimized their supply chain by innovation and learning, cost reduction and logistics and planning.

KEYWORD: *S*upply chain management, Optimization, Pharma logistics, Product quality,

I. INTRODUCTION

Supply chain management is a way to connect the various stages of manufacturing and production with the customers. Pharma supply chain deals with providing one of the most essential categories of service that is the medical products to its consumers and customers. The availability or shortage of this may lead to chaos and also harmful for the humans. An efficient and effective way of supply must be adopted to mitigate the risks. The optimization of the supply chain in the pharmaceutical industries is essential to contribute to better patient outcome, improve the inventory of pharma industries and also to avoid the disruptions caused due to demand fluctuations.

II. BACKGROUND

Indian pharmaceutical industries have large market in domestic and international level because of its effective and efficient manufacturing and it is expanding at a noticeable rate (Gupta & Bansal, 2013). With growing expansion, it is also necessary to improve the supply chain involved in the business. The top priority in any heath sector business is the availability, affordability and accessibility of the products. The on- time delivery of the medicines to the right customers, at right time is an essential and foremost important factor (Kapoor D. et al., 2018). The optimization of the pharma supply chain is one of the biggest challenges industries are facing as the companies know to survive in the market and to hold competitive advantage, improving the supply chain is a must thing to do as it ultimately leads to improved patient outcome and gaining customer's loyalty (Chandrasekaran N, Kumar SM 2003). The challenges and risks in supply chain of pharmaceutical industries is relentless as this sector faces an immense fluctuation in demand and that effects the supply of the product (Mahendran H. et al.,2011). To optimize the supply chain, the first and foremost step is to have a planning with proper analytical study of the manufacturing by industries. The other factor which affects in supply chain is to know the customers demand in both medical and service area. The strategic approaches must be implemented for improvisation of pharma supply, it requires the participation of different stakeholders such as pharmaceutical manufacturers, wholesalers, distributors, customers, information service providers and regulatory agencies. Some other approaches involve improving the inventory management and evaluating the vendors for the supply.

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III. METHODOLOGY

The research methodology includes the selection of 3 pharma companies-Dr. Reddy's Laboratories, Cipla Pharmaceuticals and Zydus Lifesciences. The secondary data of financial year 2018-19 to 2022-23 is collected and the factors considered are revenue generated, carriage forward cost, cost of material consumption and export benefits.

- **SECONDARY DATA**

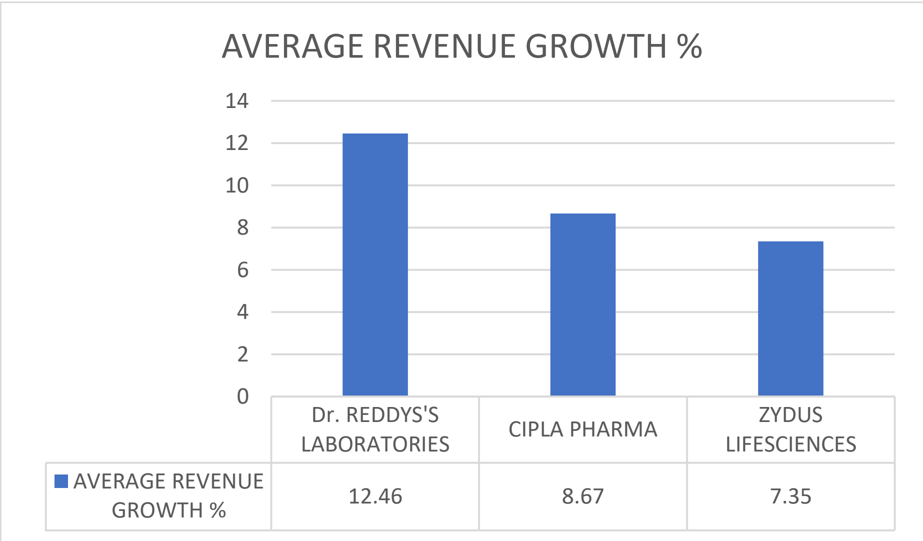
1. **Academic Databases:** Utilized academic databases like PubMed, Scopus, or Google Scholar. Use keywords such as "supply chain management," "optimization," and "pharmaceutical industry" to for precise search.
2. **Industry Publications:** Analysed industry-specific publications or journals related to pharmaceuticals. They often feature articles on supply chain management and optimization within the context of the pharmaceutical industry.
3. **Company Websites:** Some pharmaceutical companies publish white papers or articles on their websites discussing their supply chain optimization efforts. Read the financial reports of the company of year-to-year basis.
4. **LinkedIn and ResearchGate:** Networking platforms like LinkedIn and ResearchGate can be useful for connecting with professionals in the field and accessing articles they've published or shared.

TOOLS ANALYSIS

1. **Supplier Relationship Management (SRM) Tools:** SRM tools help pharmaceutical companies manage supplier relationships, track supplier performance, and ensure timely delivery of raw materials and components. They are crucial for building collaborative partnerships and reducing supply chain risks.
2. **Financial Data Analysis:** Analysing financial data related to supply chain(import-export), vehicle and transportation cost, inventories, revenue and sales.

IV. DATA ANALYSIS AND INTERPRETATION

REVENUE GENERATED



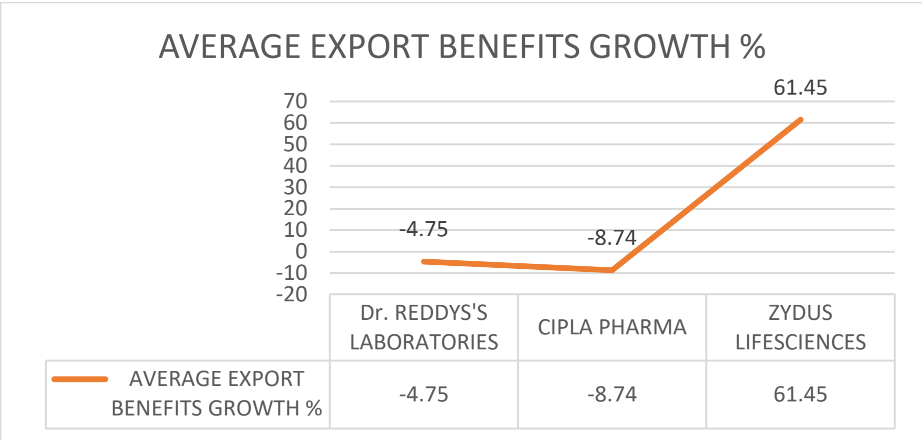
1. Dr. Reddy's Laboratories (Average Revenue Growth: 12.46%):

- Dr. Reddy's Laboratories has demonstrated a robust average revenue growth rate of 12.46% over the specified period. This indicates consistent expansion in their top-line revenue, which is a positive indicator for the company's performance.
- Possible reasons for this growth could include successful product launches, expansion into new markets, increased market share in existing segments, or strategic partnerships or acquisitions.
- Investors and stakeholders may view this growth favorably, as it reflects the company's ability to generate increasing revenue over time, which can lead to higher profits and shareholder value.

2. Cipla Pharma (Average Revenue Growth: 8.67%):
- Cipla Pharma has achieved an average revenue growth rate of 8.67%, which although slightly lower than Dr. Reddy's, still signifies healthy growth in revenue.
- This growth rate suggests that Cipla Pharma has been successful in driving sales across its product portfolio or business segments.
- Factors contributing to this growth could include the launch of new drugs, expansion into international markets, or adoption of innovative marketing strategies.
- The stakeholders may assess Cipla Pharma's performance relative to industry benchmarks and its own historical performance to gauge its competitiveness and sustainability in the market.

3. Zydus Lifesciences (Average Revenue Growth: 7.35%):
- It indicates steady but comparatively slower growth compared to the other two companies. Stakeholders may seek further insights into the drivers behind this growth and assess company's market positioning and competitive strategy.
- Factors such as product portfolio diversification, market penetration efforts, research and development initiatives, or operational efficiencies may have contributed to this growth.

EXPORT BENEFITS



1. Dr. Reddy's Laboratories (Average Export Benefits Growth: -4.75%):
- Dr. Reddy's Laboratories has experienced a negative average growth rate in export benefits, indicating a decline in the benefits derived from exporting activities over the specified period.
- This negative growth rate suggests challenges or difficulties faced by the company in its export operations, such as increased competition, regulatory hurdles, or changes in market dynamics.
- Stakeholders may need to investigate the underlying factors contributing to this decline and assess the company's export strategy and execution to identify areas for improvement.

2. Cipla Pharma (Average Export Benefits Growth: -8.74%):
- Cipla Pharma has also experienced a negative average growth rate in export benefits, indicating a more pronounced decline compared to Dr. Reddy's Laboratories.
- Similar to Dr. Reddy's, this negative growth rate raises concerns about the effectiveness of Cipla Pharma's export strategy and its ability to capitalize on international market opportunities.
- Stakeholders may need to closely examine the company's export operations, including market penetration efforts, distribution channels, and competitive positioning, to identify corrective actions and turnaround strategies.

3. Zydus Lifesciences (Average Export Benefits Growth: 61.45%):
- In contrast to the other two companies, Zydus Lifesciences has experienced a substantial average growth rate in export benefits, indicating significant positive momentum in its export activities.
- This high growth rate suggests that organisation has been successful in leveraging export opportunities and expanding its presence in international markets.

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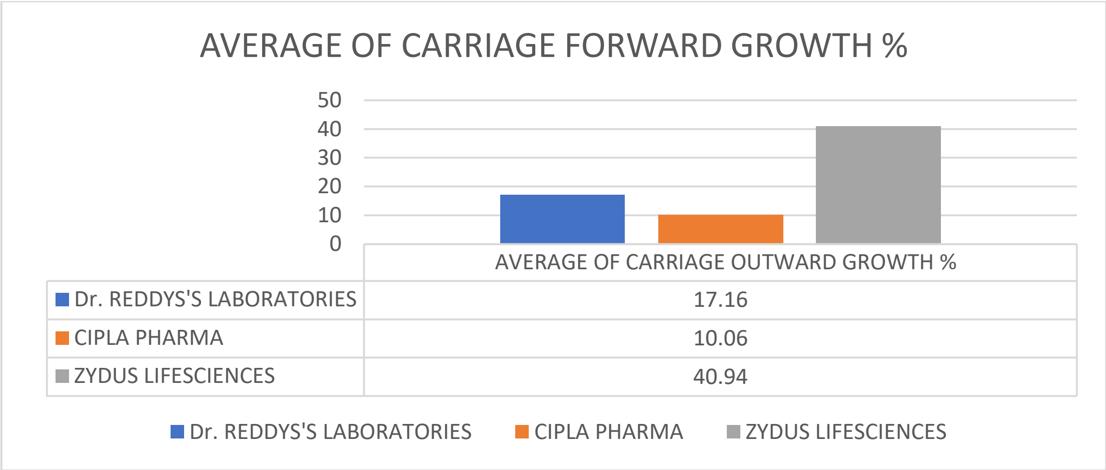
- Factors contributing to this growth may include successful market entry strategies, product differentiation, strong distribution networks, or favorable regulatory environments in target export markets.

CARRIAGE FORWARD COST



1. Dr. Reddy's Laboratories (Average Carriage Outward Growth: 17.16%):
- A substantial average growth rate in carriage outward, indicates an increase in the transportation of goods from the company's facilities to external destinations.
- This growth rate suggests heightened outbound logistics activity, which could be attributed to factors such as expanding market reach, increased production volumes, or enhanced distribution networks.
- Stakeholders may view this growth positively as it reflects the company's ability to efficiently manage and scale its outbound logistics operations to meet growing demand and serve customers effectively.

2. Cipla Pharma (Average Carriage Outward Growth: 10.06%):
- Cipla Pharma has also experienced a positive average growth rate in carriage outward, albeit at a slightly lower level compared to Dr. Reddy's Laboratories.
- This growth rate indicates ongoing investments and efforts by Cipla Pharma to expand its distribution and delivery capabilities to support its business growth objectives.Factors contributing to this growth may include the launch of new products, geographical expansion, or optimization of supply chain processes to enhance outbound transportation efficiency.
- Stakeholders may assess Cipla Pharma's performance in managing outbound logistics and its implications for the company's competitiveness and ability to meet customer demand.

3. Zydus Lifesciences (Average Carriage Outward Growth: 40.94%):
- Zydus Lifesciences has achieved a remarkably high average growth rate in carriage outward, indicating significant expansion in its outbound logistics activities.
- This substantial growth suggests rapid scaling of distribution networks, increased shipments to domestic and international markets, or strategic initiatives to improve supply chain efficiency.
- Stakeholders may perceive this growth as a positive indicator of Zydus Lifesciences' ability to capitalize on market opportunities and effectively deliver products to customers in a timely and cost-efficient manner. However, such high growth rates may also raise questions about the company's capacity to sustain this level of expansion and the associated operational challenges and risks.

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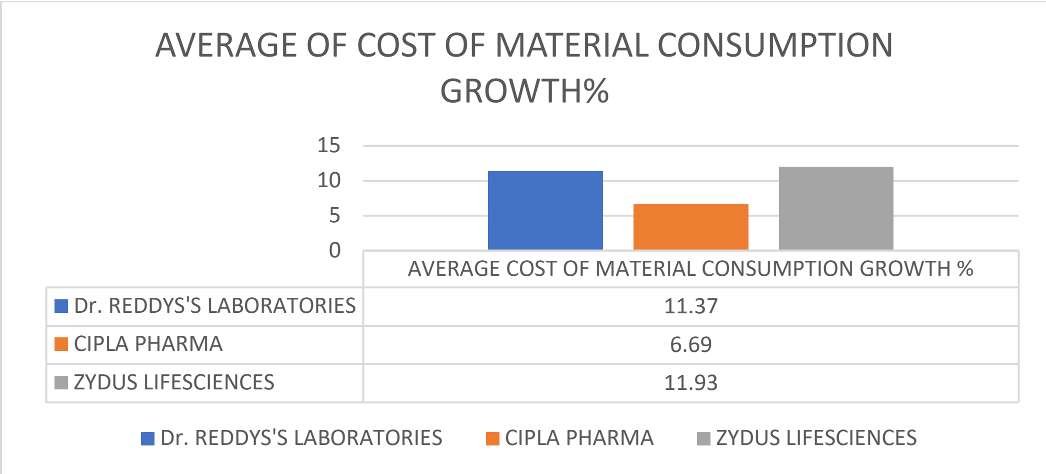
COST OF MATERIAL CONSUMPTION



1. Dr. Reddy's Laboratories (Average Cost of Material Consumption Growth: 11.37%):

- Dr. Reddy's Laboratories has experienced a significant average growth rate in the cost of material consumption, indicating an increase in the expenses related to raw materials, ingredients, or components used in its manufacturing processes.
- This growth rate suggests rising input costs, which could be driven by factors such as inflation, changes in supplier pricing, or increased demand for specific materials.

2. Cipla Pharma (Average Cost of Material Consumption Growth: 6.69%):

- Cipla Pharma has experienced a moderate average growth rate in the cost of material consumption, indicating a comparatively slower increase in material-related expenses.
- This growth rate suggests that Cipla Pharma may be implementing cost-control measures, negotiating favorable supplier contracts, or optimizing its procurement processes to mitigate the impact of rising material costs.
- Stakeholders may evaluate Cipla Pharma's ability to balance cost containment efforts with the need to ensure a reliable supply of high-quality materials to support its manufacturing operations and product portfolio.

3. Zydus Lifesciences (Average Cost of Material Consumption Growth: 11.93%):

- Zydus Lifesciences has experienced a significant average growth rate in the cost of material consumption, similar to Dr. Reddy's Laboratories.
- This growth rate suggests that Zydus Lifesciences is also facing upward pressure on material costs, which may require strategic adjustments in procurement, inventory management, or product pricing.
- Stakeholders may scrutinize cost management strategies and supply chain resilience to assess its ability to navigate volatile material markets and maintain profitability amidst cost pressures.

V. CONCLUSIONS

DR. REDDY'S LABORATORIES

1. **Average Revenue Growth (12.46%):** Possible reasons for this growth could include successful product launches, expansion into new markets, increased market share in existing segments, or strategic partnerships or acquisitions.
2. **Average Export Benefits Growth (-4.75%):** This negative growth rate suggests challenges or difficulties faced by the company in its export operations, such as increased competition, regulatory hurdles, or changes in market dynamics.
3. **Average Carriage Outward Growth (17.16%):** This growth rate suggests heightened outbound logistics activity, which could be attributed to factors such as expanding market reach, increased production volumes, or enhanced distribution networks.
4. **Average Cost of Material Consumption Growth (11.37%):** This growth rate suggests rising input costs, which could be driven by factors such as inflation, changes in supplier pricing, or increased demand for specific materials.

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CIPLA PHARMACEUTICALS

1. **Average Revenue Growth (8.67%):** This growth rate suggests that Cipla Pharma has been successful in driving sales across its product portfolio or business segments
2. **Average Export Benefits Growth (-8.74%):** This negative growth rate raises concerns about the effectiveness of Cipla Pharma's export strategy and its ability to capitalize on international market opportunities.
3. **Average Carriage Outward Growth (10.06%):** Cipla Pharma has also experienced a positive average growth rate in carriage outward, albeit at a slightly lower level compared to Dr. Reddy's Laboratories. This growth rate indicates ongoing investments and efforts by Cipla Pharma to expand its distribution and delivery capabilities to support its business growth objectives.
4. **Average Cost of Material Consumption Growth (6.69%):** This growth rate suggests that Cipla Pharma may be implementing cost-control measures, negotiating favorable supplier contracts, or optimizing its procurement processes to mitigate the impact of rising material costs.

ZYDUS LIFESCIENCES

1. **Average Revenue Growth (7.35%):** Zydus Lifesciences has achieved an average revenue growth rate of 7.35%, indicating steady but comparatively slower growth compared to the other two companies.
2. **Average Export Benefits Growth (61.45%):** This high growth rate suggests that company has been successful in leveraging export opportunities and expanding its presence in international markets.
3. **Average Carriage Forward Growth (40.94%):** Organisation has achieved a remarkably high average growth rate in carriage outward, indicating significant expansion in its outbound logistics activities.
4. **Average Cost of Material Consumption Growth (11.93%):** This growth rate suggests that Zydus Lifesciences is also facing upward pressure on material costs, which may require strategic adjustments in procurement, inventory management, or product pricing.

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