A Study on Inventory Management and Its Impact on Financial Performance- Kubhera Cable Private Limited, Puducherry

Mr. Dhanakrishnan.K[1], Dr.Pougajendy.S[2]

[1]MBA Student, Department of Management Studies, Sri Manakula Vinayagar Engineering College (Autonomous), Madagadipet, Puducherry.
[2]Professor, Department of Management Studies, Sri Manakula Vinayagar Engineering College (Autonomous), Madagadipet, Puducherry.

ABSTRACT

This study examines the effectiveness of inventory management practices in enhancing operational efficiency and financial performance. It aims to analyze existing inventory processes, identify inefficiencies such as overstocking and stockouts, and suggest methods for cost optimization. Key inventory control techniques, including ABC analysis, Economic Order Quantity (EOQ), and Just-In-Time (JIT), were applied to evaluate material management efficiency. The findings indicate that maintaining optimal inventory levels minimizes holding costs, prevents production delays, and improves profitability. The study highlights that a systematic and data-driven approach to inventory management supports better decision-making and strengthens the overall financial stability of the organization. The research contributes valuable insights into effective inventory control mechanisms within the automotive radiator manufacturing sector.

Keywords: Inventory management, financial performance, working capital, small enterprises, stock control

1 INTRODUCTION

Inventory refers to the stock of raw materials, work-in-progress (WIP), and finished goods that a company holds at any given time to meet customer demand. However, carrying too much inventory increases the holding cost, risk of obsolescence, and capital blockage, whereas maintaining insufficient inventory may lead to stockouts, production halts, or lost sales. Inventory management involves a series of decisions and activities aimed at ordering, storing, tracking, and controlling inventory in a way that minimizes costs while ensuring product availability. (Kumar & Suresh, 2015)

These decisions include determining reorder levels, safety stock, economic order quantity (EOQ), and selecting appropriate inventory control systems like FIFO (First-In, First-Out), LIFO (Last-In, First-Out), and Just-In-Time (JIT). Poor inventory management can lead to higher holding costs, increased risk of obsolescence, wastage, and cash flow problems. Conversely, efficient inventory management can reduce unnecessary expenditures, optimize working capital, and improve profitability. Thus, financial performance is not only a result of sales and market activity but also of how well internal resources, especially inventory, are managed. Maintaining optimal inventory levels reduces the cost of possible interruptions in operations or loss of business due to scarcity of products while reducing supply costs and protects against price fluctuations. (Abu Bakar, Sulaiman, & Mohd Yusof, 2018) (Raut, Gardas, & Narkhede, 2020)

1.1 OBJECTIVES

- To analyze the inventory management for cost minimization.
- To evaluate the impact of financial performance with various inventory levels.

2 REVIEW OF LITERATURE

Kumar & Suresh (2015) examined the role of Reorder Level in balancing inventory costs and service levels. They argued that setting an appropriate ROL based on demand patterns and lead time variability helps reduce both stockouts and excessive holding costs.

Abu Bakar, Sulaiman & Mohd Yusof (2018) focused on SMEs and integrated ROL with demand forecasting models. They demonstrated that using historical sales data and statistical forecasting methods alongside ROL settings reduced urgent orders by 22%, while maintaining customer satisfaction.

Raut, Gardas & Narkhede (2020) developed a dynamic ROL model that accounted for supplier lead time fluctuations and seasonal demand patterns in the automotive components sector. Their results revealed that adjusting ROL based on real-time lead time changes saved 15% in inventory holding costs without impacting delivery schedules.

Fernandez-Carames, Blanco-Novoa, Froiz-Miguez & Fraga-Lamas (2022) introduced an IoT-enabled inventory system for real-time ROL monitoring. By using automated sensors to track stock levels and trigger replenishment, they minimized manual errors and reduced order delays by 18%, highlighting the technological shift in inventory control methods.

Sahu & Mahapatra (2024) investigated the integration of safety stock levels with ROL policies in volatile demand environments. Their findings indicated that an optimally calculated safety stock directly enhances the precision of ROL settings, ensuring higher resilience against supply chain disruptions.

3 RESEARCH METHODOLOGY

Research methodology constitutes a systematic and scientific framework designed to collect, analyze, and interpret relevant data for addressing specific research objectives and testing hypotheses. It functions as a comprehensive plan that directs the overall research process, ensuring clarity of purpose, methodological rigor, and alignment with the defined scope of the study. In the context of this research on inventory management and its impact on financial performance, the chosen methodology provides a structured approach for obtaining reliable data and deriving meaningful analytical insights to support evidence-based conclusions. (Fernandez-Carames, Blanco-Novoa, Froiz-Miguez, & Fraga-Lamas, 2022)

3.1 Research Design

Research design represents the plan or structured strategy that directs the researcher in systematically addressing the research problem and achieving the study's objectives. The selection of an appropriate research design is critical, as it significantly affects the validity, reliability, and overall quality of the research outcomes. For this study on inventory management and its impact on financial performance, the research design provides a clear framework for data collection, analysis, and interpretation. It ensures that the investigation remains focused, methodologically sound, and capable of generating meaningful insights that contribute to both academic understanding and practical applications in business settings.

3.2 Data Collection Method

Data collection refers to the systematic process of gathering and analyzing information from various sources to address research questions, solve problems, evaluate results, and predict future trends. It is a crucial stage in every type of research, analysis, and decision-making process—whether in the field of business.

3.3 Data Analysis Techniques

To interpret the collected data, financial ratio analysis was employed. The following financial tools were used:

- Economic Order Quantity (EOQ)
- Safety Stock Level

The results were graphically presented using bar charts for visual interpretation.

FORMULA

1. Economic Order Quantity (EOQ)

EOQ = $\sqrt{[2\boldsymbol{DS}/\boldsymbol{H}]}$.

2. Safety Stock Level

Safety Stock =(Max Daily Usage × Max Lead Time in Days) − (Average Daily Usage ×Average Lead Time in Days).

3.4 Scope of the Study

The study emphasizes examining how inventory policies, stock control methods, and inventory turnover rates affect financial indicators such as profitability and return on assets and to explore how a company's practices in managing its inventory, such as storage, handling, and tracking, affect key financial metrics. The scope of a study with various aspects of how inventory is handled and its effects on a company's profitability and efficiency and to study the insights for management to make informed decisions that enhance both operational efficiency and financial outcomes.

3.5 Limitations

- The study may be constrained to specific industries or geographic locations, reducing the generalizability to other sectors.
- The variations in technological adoption among companies, such as the use of automated inventory systems, could impact inventory efficiency and financial outcomes, making cross-company comparisons less uniform.

4 DATA ANALYSIS AND INTERPRETATION

4.1 ECONOMIC ORDER QUANTITY (EOQ):

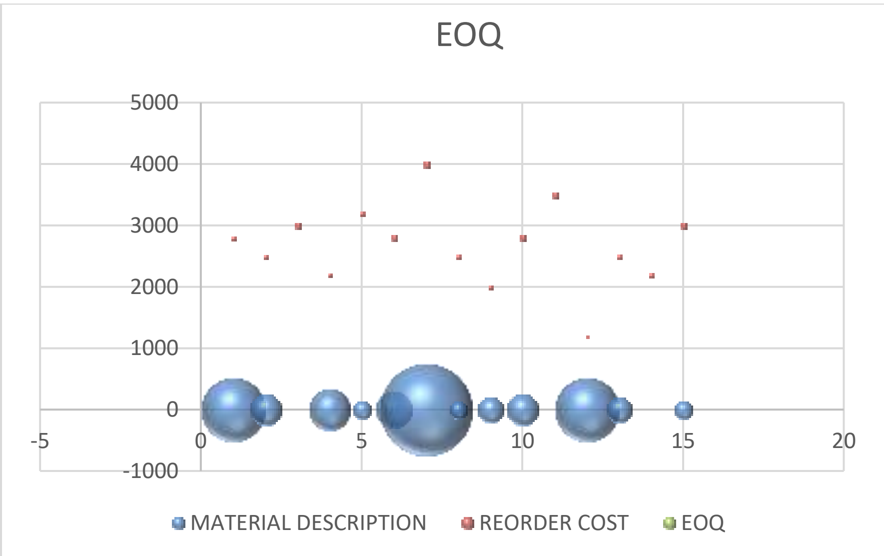
Economic Order Quantity is a mathematical formula used in inventory management to determine the ideal order size for a given product. It is a fundamental inventory management technique that determines the optimal order size for a company to minimize total inventory cost and aims to find the balance between ordering costs and holding costs.

TABLE 4.1 ECONOMIC ORDER QUANTITY (EOQ):

S. No	Material Description	Demand (per year)	Reorder Cost	Carrying Cost	EOQ
1	Copper tubes	15600	2800	120	763.5

2	Brass fittings	3900	2500	120	402.6
3	Aluminium sheets	2600	3000	200	197.9
4	Rubber seals	6500	2200	100	534.08
5	Plastic tanks	1300	3200	150	187.94
6	Steel brackets	5200	2800	180	379.47
7	Cooling fins	32500	4000	250	811.8
8	Radiator cores	1300	2500	150	186.06
9	Silicone hoses	2600	2000	120	329.08
10	Zinc coatings	3900	2800	200	333.07
11	Heat exchanger plates	6500	3500	220	455.47
12	Hose clamps	15600	1200	75	577.35
13	Welding rods	2600	2500	140	272.5
14	Gasket materials	7800	2200	150	512.9
15	Radiator caps	1300	3000	200	197.9

4.1 FIGURE SHOWING ECONOMIC ORDER QUANTITY (EOQ)



INTERPRETATION

Cooling Fins have the highest EOQ (811.88 units), indicating their high demand and cost- effectiveness when ordered in bulk. Copper Tubes also have a high EOQ (763.51 units), reflecting their significant usage in radiator production. Plastic Tanks and Radiator Cores have the lowest EOQs (187.94 and 186.07 units), suggesting lower demand or higher carrying costs. Materials like Hose Clamps (577.35 units) and Rubber Seals (534.08 units) also show substantial EOQs due to consistent usage. The distribution highlights the varying material requirements based on their role in manufacturing and associated costs.

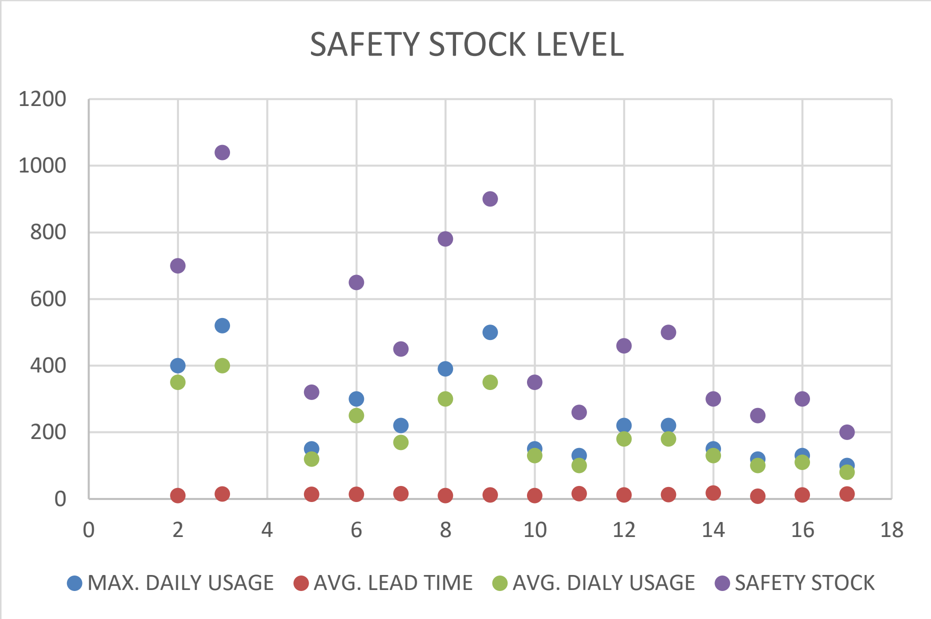
4.1 Safety Stock Level

Safety stock is a buffer inventory maintained to protect against fluctuations in demand and lead times. It helps businesses avoid stockouts and ensure uninterrupted operations by absorbing unexpected variations.

TABLE 4.2 SAFETY STOCK LEVEL

S. No	Material Description	Max.lead time	Max.daily usage	Avg.lead time	Avg.daily usage	Safety stock
1	Copper tubes	12	400	10	350	700
2	Brass fittings	20	520	15	400	1040
3	Aluminum sheets	18	150	14	120	320
4	Rubber seals	18	300	14	250	650
5	Plastic tanks	22	220	16	170	450
6	Steel brackets	15	390	10	300	780
7	Cooling fins	18	500	12	350	900
8	Radiator cores	12	150	10	130	350
9	Silicone hoses	20	130	16	100	260
10	Zinc coatings	14	220	12	180	460
11	Heat Exchanger plates	15	220	13	180	500
12	Hose clamps	25	150	18	130	300
13	Welding rods	10	120	8	100	250
14	Gasket materials	15	130	12	110	300
15	Radiator caps	20	100	15	80	200

4.2 FIGURE SHOWING SAFETY STOCK LEVEL



INTERPRETATION

The safety stock level fluctuates throughout the period analyzed. In general, the maximum lead time and maximum daily usage scenario require the highest safety stock, followed by the maximum lead time and average daily usage scenario. The average lead time and average daily usage scenario consistently require the lowest safety stock level. This suggests that the company needs to carefully consider both lead time and daily usage when determining the appropriate safety stock level for copper.

5 FINDINGS, SUGGESTIONS & CONCLUSION

5.1 FINDINGS

- Materials such as copper tubes and hose clamps have high EOQs because they are used regularly in manufacturing.
- Cooling fins have the highest EOQ among both radiator types, showing they are in high demand and cost-effective when bought in large orders.
- Items like plastic tanks and radiator cores have low EOQs, which could be because they are not needed as much or because keeping them in stock is more expensive.
- Copper tubes have the most safety stock (1,040 units) because they are used a lot every day (520 units) and it takes a long time to get them, so having extra stock helps keep production going without stopping.

5.2 SUGGESTIONS

- Implement EOQ and Safety Stock models consistently to balance holding costs and avoid overstocking, use ABC analysis to prioritize high-value items (e.g., cooling fins, copper tubes). Integrate ERP systems for real-time monitoring of stock.
- Use EOQ models regularly to cut down on ordering and holding costs. Order in bulk for high-demand items like cooling fins and copper tubes. (Kumar & Suresh, 2015)
- Work on reducing extra safety stock for parts like aluminium sheets (5,100 units) and hose clamps (3,400 units) by improving the supply chain. This will help lower lead times and the cost of keeping too much inventory. (Raut et al., 2020)

5.3 CONCLUSION

This study on inventory management shows how important it is to manage stock efficiently for smooth operations and cost savings. From this study, the conclusion of better inventory management can help solve problems like overstocking, understocking, and slow turnover. By using more accurate demand predictions, managing stock levels better, and improving how the supply chain works, the company can cut down on delays and costs. A better inventory system will also help meet production deadlines, cut waste, and boost profit, leading to long-term success for the business. (Abu Bakar et al., 2018; Sahu & Mahapatra, 2024)

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