International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 08 Issue 12 December 2025
DOI: 10.47191/ijcsrr/V8-i12-68, Impact Factor: 8.048
IJCSRR @ 2025
www.ijcsrr.org

Optimizing Fast Moving Product Inventory Management Using the Economic Order Quantity (EOQ) Method: A Case Study at a Minimarket

Fajrillah[1*], Jam'an Amadi[2], Juliani[3], Ari Lestari[4]
[1,2,3] Manajemen, Universitas IBBI, Jalan Sei Deli No.18 Medan, Sumatra Utara, 20114, Indonesia.
[4] Manajemen Informatika, STMIK Logika. Medan, Sumantera Utara, Indonesia

ABSTRACT: In today's highly competitive retail industry, inventory management plays a vital role in maintaining operational stability and company profitability. Imbalances in inventory, whether it be overstocking or stockouts, can have a significant negative impact on operating costs and customer satisfaction. This study focuses on the problem at Indomaret outlets, which often reorder fast-moving products based on subjective intuition without precise mathematical calculations, thereby triggering cost inefficiencies. The purpose of this study is to analyze the level of inventory cost efficiency by applying the Economic Order Quantity (EOQ) method. This study uses a quantitative descriptive approach. Data was collected through historical documentation, including annual demand data, average ordering costs, and storage costs per unit. The analysis was conducted by comparing the Total Inventory Cost (TIC) between the conventional method currently applied by the company and the results of the EOQ method calculation. The results show that the application of the EOQ method is able to provide more optimal order quantity recommendations with more efficient frequency compared to the company's actual method. The application of EOQ has been proven to significantly minimize total inventory costs. These findings recommend the need to integrate the EOQ algorithm into the retail inventory management information system to support accurate decision-making and ensure sustainable operational efficiency.

KEYWORDS: Cost Efficiency, Economic Order Quantity, Inventory Management, Retail, Stock Optimization.

I. INTRODUCTION

In an era of increasingly fierce retail competition, inventory management plays a vital role in the continuity of a company's operations. Retail companies such as Minimarket face major challenges in managing thousands of stock keeping units (SKUs), especially in the fast-moving product category, which has a high turnover rate (Jay Heizer, Barry Render, 2020). Errors in inventory management can have fatal consequences; overstocking increases storage costs and the risk of damage to goods, while stockouts result in lost sales potential and decreased customer satisfaction (Ristono, 2019).

From an economic and management perspective, the main objective of a company is to minimize operational costs in order to maximize profits. However, the reality on the ground shows that many retail outlets still place reorders based on the subjective estimates of store managers without precise mathematical calculations (Efendi et al., 2019)(Handayani & Afrianandra, 2022)(Triagustin & Gresik, Himawan, 2022). This often results in inventory cost inefficiencies and stock data inaccuracies (LATIEF, 2015)(Turgay & Dinç, 2023)(Umari Abdurrahim Abi Anwar, Aditia Wirayudha, Sri Suwarsi & Mohamed, 2023).

From an Operational Management perspective, an inventory optimization approach can be implemented through the Economic Order Quantity (EOQ) method. EOQ is a classic yet effective inventory management method that calculates the ideal order quantity to minimize total variable costs, which consist of ordering costs and holding costs.

This study aims to apply the EOQ method to fast-moving products in minimarkets and compare its cost efficiency with the conventional method currently in use. In addition, from an information management perspective, these calculations provide a logical basis for the future development of a decision support system for the automation of goods procurement (Haryati, Intan Suryani, 2019)(Ariyani, 2022)(Ilham Fahruliansyah, 2023).

II. RESEARCH METHODOLOGY

A. Type of Research

This study uses a quantitative descriptive method. This approach was chosen to measure numerical data in the form of costs and inventory quantities in order to obtain an objective picture of cost efficiency (Sugiyono, 2019).

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 08 Issue 12 December 2025
DOI: 10.47191/ijcsrr/V8-i12-68, Impact Factor: 8.048
IJCSRR @ 2025
www.ijcsrr.org

B. Data Sources

The data used is secondary data obtained from store operational reports, including:

1. Product demand/sales data (D) per year.
2. Cost per order (Ordering Cost - S), including administrative, transportation, and telephone costs.
3. Storage costs (Holding Cost - H), including electricity, warehouse rental, and risk of damage per unit per year.

C. Data Analysis Method

The analysis was conducted by comparing the company's current policy with the EOQ method. The analysis steps refer to the principles of operational management (Heizer et al., 2020) as follows:

1) Calculating EOQ: This method is used to determine the optimal order quantity using the following formula:

$$EOQ = \sqrt{\frac{2 \text{ X D X S}}{\text{H}}}$$

Where: D = Annual demand (units), S = Ordering cost (Rp), H = Storage cost per unit/year (Rp).

2) Order Frequency (F): Calculates the intensity of orders in a period:

$$\text{F} = \frac{D}{EOQ}$$

3) Safety Stock (SS) and Reorder Point (ROP): Calculate safety stock to prevent stockouts during lead time.

4) Total Inventory Cost (TIC): Calculating total inventory costs to determine cost efficiency (Ristono, 2019):

$$\text{TIC} = (\text{F X S}) + \left(\frac{\text{EOQ}}{3} \text{ X H}\right)$$

This study will compare the company's actual TIC method with the EOQ TIC method to see the difference in cost savings.

III. RESULTS AND DISCUSSION

A. Product Data Analysis

The research focused on one fast-moving product, namely 2-liter packaged cooking oil. Based on historical data from 2024, the following data parameters were obtained:

1. Total Annual Demand (D): 4,800 units.
2. Ordering Cost (S): IDR 25,000 per order.
3. Storage Cost (H): IDR 2,000 per unit/year.
4. Actual Conditions: The company places regular weekly orders (48 times/year) with an average of 100 units per order.

B. EOQ Method Calculation

Based on the above parameters, the optimal order quantity calculation is:

$$\text{EOQ} = \sqrt{\frac{2 \text{ X } 4.800 \text{ X } 25.000}{2.000}} = \sqrt{120.000} \approx 346 \text{ unit}$$

Using the EOQ method, the recommended order quantity is 346 units per order.

C. Comparison of Order Frequency

The order frequency according to EOQ is calculated as follows:

$$\text{F} = \frac{4.800}{346} = 13{,}8 \approx 14 \text{ times a year}$$

These results show a significant difference compared to the company's actual method (48 times/year). EOQ suggests ordering less frequently but in larger quantities (consolidation) to reduce recurring ordering costs.

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 08 Issue 12 December 2025
DOI: 10.47191/ijcsrr/V8-i12-68, Impact Factor: 8.048
IJCSRR @ 2025
www.ijcsrr.org

D. Cost Efficiency Comparison (TIC)

A comparison of the total inventory costs between the conventional method and the EOQ method is presented in Table I.

Table I. Comparison Of Total Inventory Cost (TIC)

Cost Components	Conventional Method (Actual)	EOQ Method (Proposed)
Order Frequency	48 times	14 times
Order Quantity	100 units	346 units
Ordering Cost	Rp 1.200.000	Rp 350.000
Storage Cost	Rp 100.000	Rp 346.000
Total Inventory Cost (TIC)	Rp 1.300.000	Rp 696.000

Based on Table I, it can be seen that the application of the EOQ method results in cost savings of:

Difference = IDR 1,300,000 - IDR 696,000 = IDR 604,000

The application of EOQ to this one type of fast-moving product has proven to save 46.4% in inventory costs. If this method is applied to hundreds of other Stock Keeping Units (SKUs) in stores, the potential for operational efficiency will be very significant and have a positive impact on the company's profitability.

IV. CONCLUSION

The application of the Economic Order Quantity (EOQ) method to fast-moving products at Indomaret has been proven to provide significant efficiency compared to conventional methods. The results of the analysis show that the EOQ method is able to reduce excessive ordering frequency and optimize storage costs. Quantitatively, the application of EOQ to the product sample resulted in inventory cost savings of 46.4% compared to the actual method.

The managerial implication of this study is that store management is advised to change the pattern of procurement from an intuitive approach to a quantitative data-based approach. From an information technology perspective, the EOQ calculation algorithm is highly recommended for integration into the company's Point of Sales (POS) or Enterprise Resource Planning (ERP) system. This allows the calculation of the optimal order quantity (ROQ) to be done automatically (computerized), thereby minimizing human error and maintaining stock stability on an ongoing basis.

ACKNOWLEDGMENTS

The author would like to express his deepest gratitude to IBBI University and STMIK Logika for the facilities and opportunities provided in completing this research. We would also like to thank the management of the Minimarket store for granting permission and access to data for observation purposes. We would also like to express our highest appreciation to all members of the research team for their cooperation, contributions, and dedication, which enabled this scientific article to be completed successfully.

REFERENCES

1. Ariyani, L. (2022). Penerapan Metode Economic Order Quantity pada Sistem Informasi Persediaan Barang Perusahaan Otomotif. *Jurnal Informatika Universitas Pamulang*, *6*(4), 713–720.
2. Efendi, J., Hidayat, K., & Faridz, R. (2019). Analisis Pengendalian Persediaan Bahan Baku Kerupuk Mentah Potato dan Kentang Keriting Menggunakan Metode Economic Order Quantity (EOQ). *Performa: Media Ilmiah Teknik Industri*, *18*(2), 125–134. https://doi.org/10.20961/performa.18.2.35418
3. Handayani, R., & Afrianandra, C. (2022). ANALISIS PENGENDALIAN PERSEDIAAN BAHAN BAKU DENGAN MENGGUNAKAN METODE ECONOMIC ORDER QUANTITY (EOQ) DALAM MENETAPKAN PERIODIC ORDER QUANTITY (POQ) (STUDI KASUS PADA PABRIK TEMPE SOYBEAN). *Jurnal Ilmiah Mahasiswa Ekonomi Akuntansi (JIMEKA)*, *7*(2), 308–323.
4. Haryati, Intan Suryani, G. (2019). Penerapan Metode Economic Order Quantity (EOQ) untuk Sistem Informasi Persediaan Bahan Baku. *Jurnal Web Informatika Teknologi (J-WIT)*, *4*(1), 1–5. https://ejurnal-wit.ac.id/index.php/J-WIT/article/view/26

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 08 Issue 12 December 2025
DOI: 10.47191/ijcsrr/V8-i12-68, Impact Factor: 8.048
IJCSRR @ 2025
www.ijcsrr.org

5. Ilham Fahruliansyah, A. B. P. (2023). IMPLEMENTASI METODE ECONOMIC ORDER QUANTITY (EOQ) DALAM SISTEM PENGENDALIAN INVENTORY DI PT SINERGI KREASI UTAMA. *JURNAL ILMIAH M-PROGRESS*, *13*(2), 137–149. https://journal.universitassuryadarma.ac.id/index.php/ilmiahm-progress/article/view/1067
6. Jay Heizer, Barry Render, C. M. (2020). Operations Management: Sustainability and Supply Chain Management. In *Pearson Education*. Pearson Education. https://elibrary.pearson.de/book/99.150005/9781292295107
7. LATIEF, F. I. (2015). Optimasi Pengendalian Persediaan pada Gudang DistributorFast Moving Consumer Goods PD. Akur Sejahtera MenggunakanMetode Probabilistik Periodic Review (R,s,S) System untukMinimasi Total Biaya Persediaan. In *Universitas Telkom*. https://repositori.telkomuniversity.ac.id/home/catalog/id/101848/slug/optimasi-pengendalian-persediaan-pada-gudang-distributorfast-moving-consumer-goods-pd-akur-sejahtera-menggunakanmetode-probabilistik-periodic-review-r-s-s-system-untukminimasi-total-biaya-persediaan.html
8. Ristono, A. (2019). Manajemen Persediaan. In *Graha Ilmu*. https://library-bpsdm.kemendagri.go.id/index.php?p=show_detail&id=8143
9. Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. In *Alfabeta*.
10. Triagustin, A., & Gresik, Himawan, A. F. I. (2022). Analisis Pengendalian Persediaan Bahan Baku Menggunakan Metode Economic Order Quantity (EOQ). *Jurnal Ekobistek*, *11*(4), 349–354. https://doi.org/10.35134/ekobistek.v11i4.404
11. Turgay, S., & Dinç, K. F. (2023). Optimizing Inventory Allocation for Fast Moving Consumer Goods : A Stochastic Model Approach. *Industrial Engineering and Innovation Management*, *6*(10), 77–86. https://doi.org/10.23977/ieim.2023.061011
12. Umari Abdurrahim Abi Anwar, Aditia Wirayudha, Sri Suwarsi, A. A., & Mohamed, B. (2023). LOGISTICS PERFORMANCE FOR PRACTICE IN THE FMCG INDUSTRY THROUGH A SUPPLY CHAIN MANAGEMENT APPROACH. *JURNAL ILMIAH MANAJEMEN BISNIS DAN INOVASI UNIVERSITAS SAM RATULANGI (JMBI UNSRAT)*, *10*(2), 1386–1394. https://ejournal.unsrat.ac.id/v3/index.php/jmbi/article/view/49546

Cite this Article: Fajrillah, Amadi, J., Juliani, Lestari, A. (2025). Optimizing Fast Moving Product Inventory Management Using the Economic Order Quantity (EOQ) Method: A Case Study at a Minimarket. International Journal of Current Science Research and Review, 8(12), pp. 6585-6588. DOI: https://doi.org/10.47191/ijcsrr/V8-i12-68