



Investigating the Effect of the Theory of Constraints on Reducing Normal and Abnormal Spoilage in Rubber Manufacturing Companies

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Abstract

The theory of constraints is an effective management philosophy that focuses on identifying and overcoming the limitations of production systems. This theory, by providing a coherent framework for optimizing processes, helps rubber companies reduce waste and increase productivity. The purpose of the present study is to investigate the effect of the theory of constraints on reducing normal and abnormal waste in rubber companies. This study is applied in terms of purpose and descriptive and survey in terms of data collection. The statistical population of this study includes management accountants, production managers of rubber companies and university faculty members. The statistical sample size was 115 people and the questionnaire was distributed among the statistical sample. The validity of the questionnaire was confirmed through interviews with professors and experts in the field. Cronbach's alpha was also used to test the reliability of the questionnaire. The Kolmogorov-Smirnov test was used to measure the normality of the data, and SPSS software and T-test were used to analyze the data. The results of the study showed that the theory of constraints reduces normal and abnormal waste in rubber manufacturing companies. Removing unnecessary constraints can improve workflow and reduce waste. When production bottlenecks are optimized, efficiency increases and the likelihood of waste decreases.

Keywords: Theory of Constraints, Management Accounting, Normal Spoilage, Abnormal Spoilage, Rubber Manufacturing Companies.

JEL Classification: D24, D2, R3, P42, E23

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INTRODUCTION

The rubber industry, as a vital part of the transportation and manufacturing supply chain, faces numerous challenges in waste management. Normal and abnormal waste in rubber manufacturing processes not only impose additional costs but also affect the sustainability and social responsibility of companies. The theory of constraints highlights the essence of adopting sustainability practices, including green management, lean management, and top management commitment to address production constraints and achieve production performance ([Opoko and Lee, 2025](#)). The theory of constraints believes that every production system is controlled by one or more constraints. These constraints can include various factors such as machinery capacity, employee skills, or raw material availability. Also, the main goal of the theory of constraints is to ensure the smooth flow of materials throughout the production process. This includes optimizing the sequence of operations, inventory management, and production scheduling to reduce waste and improve productivity. The theory emphasizes the importance of matching demand and production capacity. By accurately forecasting demand and adjusting capacity based on constraints, companies can avoid over- or under-production of products. The theory of constraints emphasizes the flexibility of manufacturing systems to adapt to market changes, demand fluctuations, or unexpected disruptions. The theory of constraints is used in core manufacturing processes and supports both core and ancillary activities of the organization ([Souza and Excerpt, 2025](#)). Given the complexity of defect patterns in the rubber industry, a systematic approach is needed to identify, analyze, and address the root causes of these defects ([Setiawan, 2025](#)). The theory of constraints is a powerful management philosophy that focuses on identifying and overcoming the constraints of manufacturing systems. By providing a coherent framework for optimizing processes, the theory helps rubber companies reduce waste and increase productivity. The importance of this cannot be overstated in today's world, where sustainability and efficiency are the keys to success. In the modern manufacturing world, process optimization and waste reduction are the keys to success and competitive advantage for companies. The rubber industry, as one of the key industries in the transportation sector, has always faced the challenge of waste management. Normal and abnormal waste in this industry not only increases production costs, but also has negative impacts on the environment. In this article, we examine the role of the Theory of Constraints as a revolutionary management approach that can help rubber companies reduce waste and improve efficiency. The Theory of Constraints is a systematic method for optimizing processes and identifying the limiting factors in a manufacturing system. The theory is based on the principle that every manufacturing system is controlled by one or more constraints that determine the total output capacity. By identifying and managing these constraints, companies can improve production flow and minimize waste. In the rubber industry, waste can be caused by various factors such as manufacturing errors, unsuitable raw materials, or inefficient processes.

METHODOLOGY

This research is applied in terms of purpose and descriptive and survey in terms of data collection; also, the research data collection method is library. In this research, a researcher-made questionnaire was used and the components of the question were determined by obtaining the opinions of various professors and experts. The statistical population of this research includes management accountants, production managers of rubber manufacturing companies and university faculty members. Due to the uncertainty of the statistical

population, a statistical sample of 115 people was selected and the questionnaire was distributed among the statistical sample. The validity of the questionnaire was confirmed through interviews with professors and experts in the field. Cronbach's alpha was also used to test the reliability of the questionnaire. The Kolmogorov-Smirnov test was used to measure the normality of the data, and SPSS software and T-test were used to analyze the data.

RESULTS

In this study, a single-sample t-test was used to determine the level of agreement of the statistical sample with the research question. This test will determine whether the level of agreement of the statistical sample with the proposed research questions is higher than the average Likert scale or lower than this level. The questionnaire used a rating scale of 1 to 5, with an average score of 3 and above being the criterion for assessing and accepting the research questions. According to the information in Table 4, the average statistic for the research question is higher than 3; thus, the above question was approved. Based on the results of the t-test, it can be concluded that at a confidence level of 95 percent, the research question is approved by the statistical population. Therefore, the theory of constraints reduces normal and abnormal waste in rubber manufacturing companies.

CONCLUSION

The purpose of the research was to answer the following question: Does the theory of constraints reduce normal and abnormal waste in rubber manufacturing companies? To answer the above question, 115 questionnaires were distributed to a statistical sample consisting of management accountants and production managers of rubber manufacturing companies and university faculty members. The results of the research showed that the theory of constraints reduces normal and abnormal waste in rubber manufacturing companies. Removing unnecessary constraints can improve workflow and reduce waste. When production bottlenecks are optimized, efficiency increases and the likelihood of waste decreases. Optimizing processes can ensure that resources are used more effectively, waiting times are reduced, and as a result, waste is reduced. Understanding and properly managing constraints and bottlenecks can help balance the workload and prevent excessive pressure on the system, which ultimately leads to waste reduction. Improving production capacity can help better manage demand and prevent conditions that lead to waste. Cost-cutting measures often involve optimizing processes and eliminating unnecessary activities, which can also help reduce waste. Eliminating unnecessary steps or activities that do not add significant value can save time and resources, thereby reducing waste. This approach focuses directly on reducing waste and involves identifying and fixing problems in processes. Increasing production efficiency and improving quality are both directly related to reducing waste. Higher efficiency means better use of resources, and better quality means fewer defective products. Following standards and best practices can lead to more consistent, higher-quality processes, which ultimately reduce waste. Ensuring the proper allocation of resources, including materials, labor, and time, can help prevent waste and waste. Overall, optimizing

production processes, improving efficiency, and eliminating unnecessary activities can help reduce both normal and abnormal waste in tire companies.

Contribution of Authors

This study was conducted individually.

Ethical Approval

Written informed consent was obtained from individuals for the publication of their anonymous information in this study.

Sponsor

This study had no financial sponsor.

Conflict of Interest

No conflict of interest was declared by the authors.

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References

- Abbasi, A. (2025). Explanation and ranking of quality costing components and indicators in manufacturing companies. *Strategic Management Accounting*, 1(1), 65-82. [in persian]
<https://doi.org/10.22034/smajournal.2025.514935.1006>
- Bakshesh Taniani, H. , Piri, H. and Sotodeh, R. (2024). Providing an Effectiveness Model for Healthcare and Hospital Services Using Strategic Management Accounting with an Interpretive Structural Modeling Approach. *Dynamic Management and Business Analysis*, 3(4), 176-197. [in persian]
https://www.dmbaj.com/article_719452.html?lang=en
- Esmaili, M., Sotodeh, R., piri, H., & haghparast, A. (2024). Explanation and ranking of quality components in the port and maritime organization of the country. *Journal of Maritime Management Science Studies*, 5(1), 47-74. [in persian]
<https://doi.org/10.22034/mmr.2024.316717.1138>
- Javadpour, M. , Hamidian, M. and Akhondi, N. (2019). Application of ABC and TOC models in product pricing (Case study: Hamvatan dairy products company). *Journal of Management Accounting and Auditing Knowledge*, 8(29), 119-134. [in persian]
https://www.jmaak.ir/article_13839.html?lang=en
- Karimi, F. , Haghghat Monfared, J. and Keramati, M. (2024). Evaluating the Resilience and Sustainability of the Supply Chain with the Integrated Approach of the Theory of Constraints, Process Approach and Multi-Criteria Decision Making (Case of Study: Offshore Sector of the Oil Industry). *Journal of Industrial Management Perspective*, 14(2), 34-65. [in persian] <https://doi.org/10.48308/jimp.14.2.34>
- khezripour, M. , khan mohammadi, M. H. , ahmadi, F. and Kordlouie, H. (2020). Explain the Application of the Theory of Constraint(s) Model to Evaluate the Capital Adequacy Ratio in Banks. *Journal of Management Accounting and Auditing Knowledge*, 9(36), 77-85. [in persian]
https://www.jmaak.ir/article_16931.html?lang=en
- Namifard Tehran, F. , Sotodeh, R. , Haghparast, A. and hirad, A. (2025). Presenting the structural model of the efficiency indicators and components of blockchain technology in the accounting and auditing unit. *Journal of Management Accounting and Auditing Knowledge*, 14(56), 395-410. [in persian]
https://www.jmaak.ir/article_23869.html?lang=en
- Opoku, R. K., & Li, X. (2025). Sustainable management practices, operational and sustainable performance in manufacturing contexts: empirical evidence from a developing economy. *Journal of Responsible Production and Consumption*, 2(1), 48-82. <http://dx.doi.org/10.1108/JRPC-07-2024-0035>
- Piri, H., & Sotodeh, T. (2025). Designing an advanced product life cycle approach in manufacturing companies. *Strategic Management Accounting*, 1(1), 1-17. [in persian]
<https://doi.org/10.22034/smajournal.2025.513375.1002>

- Setiawan, S. A. (2025). Implementation of Six Sigma Methodology to Reduce High Defect Rate in Rubber Processing Industry. *European Journal of Business and Management Research*, 10(1), 118–126.
<https://doi.org/10.24018/ejbmr.2025.10.1.2538>
- sotudeh, R. , Haghparast, A. and Hirad, A. (2025). Management Accounting and Resilience Economics Model for Sustainable Development of Manufacturing Companies. *Strategic Management Accounting*, 1(1), 41-66. [in persian]
<https://doi.org/10.22034/smajournal.2025.511901.1003>
- Sotudeh, R. and Abasyan, R. (2024). Explaining the accounting model of strategic management to reduce the costs of manufacturing companies in the country. *Modern Research in Performance Evaluation*, 2(4), 253-262. [in persian]
<https://doi.org/10.22105/mrpe.2024.450062.1093>
- Sotudeh, R. , Hirad, A. and Sarhadi, E. (2024). Explaining the pattern of monitoring and evaluating the organizational performance of commercial companies in the country. *Modern Research in Performance Evaluation*, 3(1), 11-22. [in persian]
<https://doi.org/10.22105/mrpe.2024.447861.1092>
- Souza, F. B. D., & Ikeziri, L. M. (2025). Demand management: the essence of the theory of constraints?. *International Journal of Logistics Systems and Management*, 50(2), 233-265. <https://doi.org/10.1504/IJLSM.2025.144436>
- tanhaie, F. (2024). Determining the product mix in environments with multiple constraints, considering the priority of constraints. *Sharif Journal of Industrial Engineering & Management*, Articles in Press, Corrected Proof Available Online from 24 June 2024. [in persian] <https://doi.org/10.24200/j65.2024.63366.2377>