

Impact of Supply Chain Management Strategy on Performance Operations in Micro, Small and Medium Enterprises

Nurul Aziz Pratiwi

Universitas Indonesia Maju

*nurulazizpratiwi@gmail.com

***Corresponding Author**

ABSTRACT

The Indonesian economy is significantly influenced by Micro, Small, and Medium Enterprises (MSMEs), which are the main support for the country's economy.. Therefore, the aim of this research is to identify the impact of supply chain management strategies on the operational performance of MSMEs. Data was collected by questionnaires distributed to 151 respondents, and testing was carried out using the Structural Equation Method (SEM). The findings of the study reveal that the operational performance of MSMEs is not impacted by all implemented supply chain management strategies. Out of the five supply chain management strategies, not all exhibit a significant effect. employed, one of them is not demonstrated to have a significant impact on the operational performance of a business.

Keywords : *Operational Performance, Supply chain management strategy, small micro and medium enterprises*

Introduction

In actively contributing to the overall Indonesian economy, a significant role is played by Micro, Small, and Medium Enterprises (MSMEs), which have indirectly become the main pillars in the country's economy. According to the data presented by the Ministry of Cooperatives and MSMEs (Ministry of Cooperatives and SMEs) in March 2021, Indonesia had 64.2 million MSMEs, making a contribution of 61.07 percent to the Gross Domestic Product (GDP), equivalent to IDR 8,573.89 trillion. In the same year, 97 percent of the total workforce was absorbed by MSMEs, and they amassed up to 60.42 percent of the total investment in Indonesia (Ministry of Finance of the Republic of Indonesia, 2021).

Currently, enhancements are being made to supply chain management strategies by various sectors and types of businesses to boost company performance, a trend also observed among MSMEs. According to the study conducted by Zhou et al. (2014), companies refine their supply chain management strategies to improve the competitiveness and sustainability of their businesses in this fiercely competitive market.

Implementation of various supply chain management strategies, including Vendor-managed Inventory (VMI), Enterprise Resource Planning (ERP), Collaborative Planning, Forecasting, and Replenishment (CPFR), Warehouse Management System (WMS), and Outsourcing, is feasible. Therefore, six variables will be discussed in this research, comprising five independent variables related to Supply Chain Management Strategy (including VMI, ERP, CPFR, WMS, and Outsourcing) and one dependent variable, Company Operational Performance. Given the substantial number of MSMEs in Indonesia and their crucial role in the economy, further research on factors influencing MSME sustainability, especially in the context of the impact of supply chain management strategies on MSMEs implementing these strategies in their production processes, is considered essential.

This research aims to provide valuable insights for future researchers regarding the influence of Management Strategies of Supply Chain on the Company's Performance of MSMEs. The findings from this study can also serve as a reference and input for MSME players involved in the implementation of Supply Chain Management Strategy and Company

Performance, enabling them to enhance their competitive advantage and successfully compete in the market.

The research problem formulation consists of five questions, namely:

- (1) How does Vendor-managed Inventory (VMI) influence the Company's Performance?
- (2) How is Company Operational Performance influenced by Enterprise Resource Planning (ERP)?
- (3) How is Company Operational Performance impacted by Collaborative Planning, Forecasting, and Replenishment (CPFR)?
- (4) How does the WMS (Warehouse Management System) influence the Company's Operational Performance?
- (5) How is the company's performance affected by outsourcing?

The objective of this study is to recognize the influence of company's performance in MSMEs by management strategies of supply chain.

Literature Review

Ten decisions are made by operations managers, playing a crucial role in coordinating all activities within the supply chain, from raw materials to contented customers. The supply chain encompasses all participating parties in meeting customer demand, including manufacturers, suppliers, carriers, warehouses, retailers, and even the customers themselves. In every organization, functions such as new product development, marketing, operations, distribution, finance, and customer service are included in the supply chain (Chopra, Meindl, & Kalra, 2017).

The supply chain is organized with the objective of maximizing competitive advantage and benefits for end consumers (Heizer, Render, & Munson, 2017). Suitable strategies are essential in the execution of the production process and operational activities of the company to attain production efficiency, enhance income, and improve company performance. One of the factors influencing production efficiency is the selection of a suitable supply chain management strategy. These strategies encompass Vendor-managed Inventory (VMI), Enterprise Resource Planning (ERP), Collaborative Planning, Forecasting, and Replenishment (CPFR), Warehouse Management System (WMS), and Outsourcing (Heizer et al., 2017).

Production and distribution issues, especially in the face of the bullwhip effect, become critical challenges in supply chain management. Vendor-managed Inventory (VMI) emerged as a solution by enabling suppliers to maintain inventory for manufacturers or retailers. VMI strategies can produce various benefits, including reduced delivery times, efficiency in the supply process, and savings in storage costs (Yosefa, Sitompul, & Alfian, 2015).

Enterprise resource planning (ERP) systems are becoming the largest information technology investment for some companies. ERP is designed to integrate business processes and functions, enable data sharing, business process automation, and generate and access information in real-time (Jagoda & Samaranayake, 2017).

Collaborative Planning, Forecasting, and Replenishment (CPFR) are becoming a popular strategy to overcome the bullwhip effect in supply chains. CPFR involves collaboration between retailers and suppliers in planning and fulfilling customer demand, with the aim of increasing forecasting accuracy, reducing stock-out costs, and increasing stock turnover (Rosihan, Paduloh, & Sulaeman, 2021).

Warehousing, as an important component in the supply chain, can make a significant contribution to product costs. Warehouse Management System (WMS) helps improve warehouse operational efficiency by facilitating storage, receiving, picking, and delivery of goods/cargo (Abdul Rahman et al., 2021).

Sourcing, namely the decision to purchase goods and services, can be done internally or through outsourcing. This decision must consider factors such as increasing supply chain

surplus, efficiency, and risk. Outsourcing can be an effective strategy if third parties can provide higher surpluses or have lower costs (Chopra et al., 2017).

In this context, five hypotheses covering the influence of each supply chain management strategy (VMI, ERP, CPFR, WMS, and Outsourcing) on the company's performance are proposed by the research.

Research Methods

In this research, the samples taken came from the population of MSMEs in the manufacturing sector located in Bogor City. This research uses a non-probability sampling method and applies a purposive sampling technique. Purposive sampling is a method that selects respondents based on certain criteria, and if the respondent meets these criteria, then they can be selected as respondents to achieve research objectives (Sekaran & Bougie, 2016). The criteria set in this research are the owners and employees of MSMEs in Bogor City.

According to Hair (2017), if the sample taken is too large and makes it difficult to obtain a suitable model, it is recommended to take a sample of between 100-200 respondents to be able to use interpretive estimates with SEM method or Structural Equation Model.

This research refers to the statement (Hair, 2017), Stipulating that the respondent sample size should be at least 5 times the number of items in the questionnaire according to the research questionnaire (indicators), and it is better if the sample size reaches 10 times the items in the questionnaire (indicators). With this calculation, the number of respondents required is between 144 and 240. Therefore, this research took a sample of 151 respondents who are related to MSMEs in the manufacturing sector and are located in Bogor.

Results and Discussions

Uji Goodness-of-Fit

Hypothesis testing in this research was carried out using Structural equation modeling (SEM) with AMOS version 24 software. Testing the model used is essential prior to hypothesis testing, specifically by conducting a goodness-of-fit model test. According to Hair (2017). This examination is conducted to assess the appropriateness of the model employed in a research endeavor. According to Widarjono (2010), analysis for suitability tests has many criteria and from many criteria, a study does not have to use all of these criteria to see the suitability of the research model, but it would be better if there was more than one suitability test that met the criteria (Simanjuntak & Hamimi, 2019). The following is a table of suitability test results in this research:

Table 1 Goodness-of-Fit Test Results

Measure ment Type	Measurement	Value	Recommen ded limits	Result
	P-value	0	< 0.05	good
Absolute Fit Measures	The Root Mean Square Error of Approximation (RMSEA)	0.124	< 0.10	Marginal
Parasimonious Fit Measures	CMIN/df	3.319	$\geq 1 - \leq 5$	good

Source: Output, AMOS, 2023

Referring to the table above, the test results indicate a p-value of 0.000, which is less than 0.05, confirming a good fit. Although the RMSEA value of 0.124 slightly exceeds 0.10, it can still be deemed marginally fitting. The normed chi-square value of 3.319 suggests a good fit. In summary, the research model is considered appropriate.

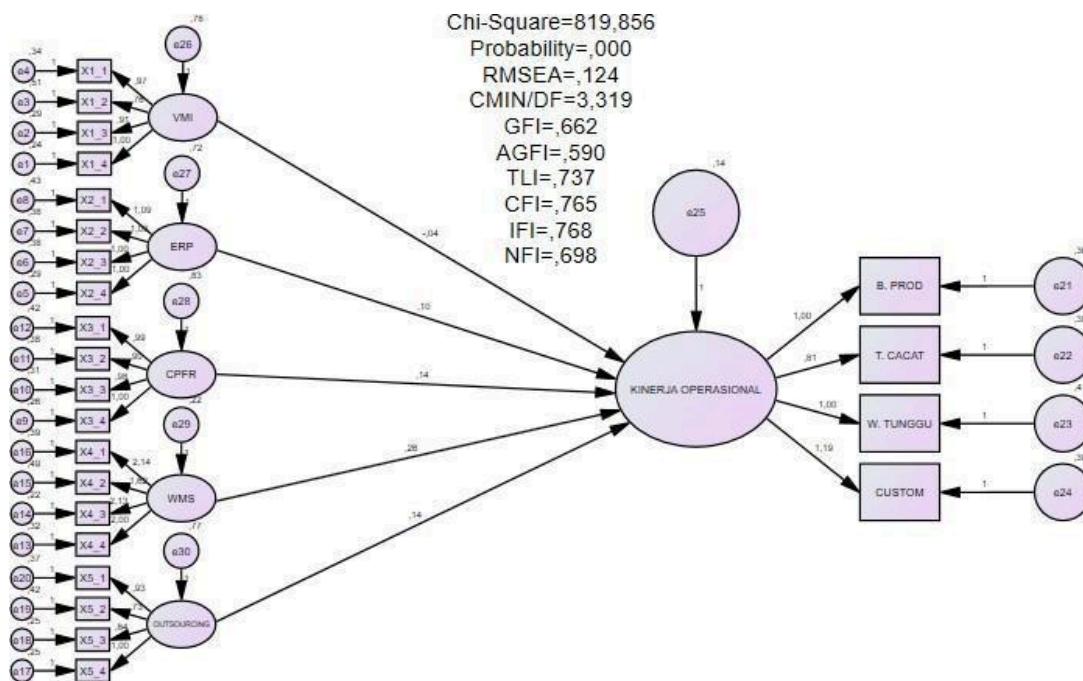


Figure 1
Research Structural Output

In this research, the hypothesis was tested using the Structural Equation Method (SEM). The decision to test this hypothesis is taken by comparing the p value with a significance level of 0.05 or 5%, and a confidence level of 0.95 or 95%. The basis for hypothetical decision making is enforced by the following provisions:

If the p value <0.05, then, H_0 is rejected, H_a is accepted.

If the p value ≥ 0.05 , then, H_0 is accepted, H_a is rejected.

Following the confirmation of the fulfillment of all criteria for the model in this study (validity test, reliability test, and model suitability test), the subsequent phase in the analysis involves ascertaining the degree of connection and the significance or meaningfulness of the relationship between the variables in this investigation. The outcomes of the examination utilizing the AMOS software present a structural equation model delineating the connection between the independent and dependent variables in this study.

Subsequent to elaborating on the depiction of the relationship between the variables in this research, the ensuing section will provide a depiction of the results of hypothesis testing.

Table 2
Hypothesis testing

Variable Relationships	Coefficient	P-value	Result
Vendor-Managed Inventory -> Company's Performance	-0.044	0.368	Hypothesis Rejected
Enterprise Resource Planning -> Company's Performance	0.103	0.049	Hypothesis Accepted
Collaborative Planning, Forecasting, and Replenishment -> Company's Performance	0.144	0.004	Hypothesis Accepted
Warehouse Management System -> Company's Performance	0.261	0.007	Hypothesis Accepted
Outsourcing -> Company's Performance	0.140	0.007	Hypothesis Accepted

Source: Output, AMOS, 2023

The conclusion drawn from the testing of hypothesis 1 is that there is no impact of Vendor-Managed Inventory (VMI) on Company Operational Performance. This suggests that the VMI strategy, when implemented by Micro, Small, and Medium Enterprises, has not demonstrated a significant effect on the Company's Operational Performance. Several factors may contribute to this, such as insufficient infrastructure within the observed MSMEs, preventing the optimization of Operational Performance aspects, including reducing defective product levels and shortening waiting times.

The outcome of hypothesis 2 testing reveals that there is an impact of Enterprise Resource Planning (ERP) on Company Operational Performance. This indicates that the adoption of ERP strategies by Micro, Small, and Medium Enterprises has proven effective in enhancing the Company's Operational Performance. This success is attributed to the presence of infrastructure within MSMEs, allowing ERP strategies to optimize aspects of Operational Performance, such as lowering production costs and increasing flexibility in product design.

Hypothesis 3 testing results conclude that Collaborative Planning, Forecasting, and Replenishment (CPFR) influence Company Operational Performance. This suggests that the implementation of the CPFR strategy by Micro, Small, and Medium Enterprises has effectively improved the Company's Operational Performance. The observed success is linked to the available infrastructure in MSMEs, enabling the CPFR strategy to optimize Operational Performance aspects, including reducing production costs and enhancing flexibility in product design.

Testing hypothesis 4 indicates that there is an impact of Warehouse Management System (WMS) on Company Operational Performance. This highlights that the implementation of the WMS strategy by Micro, Small, and Medium Enterprises has successfully improved the Company's Operational Performance. Owners, managers, leaders, and employees in MSMEs

have maximized the WMS strategy by preparing necessary infrastructure, optimizing warehousing costs, and reducing product defect rates.

The outcome of hypothesis 5 testing concludes that there is an impact of outsourcing on the company's operational performance. This suggests that the implementation of the Outsourcing strategy by Micro, Small, and Medium Enterprises has effectively improved the Company's Operational Performance. Owners, managers, leaders, and employees in MSMEs have optimized outsourcing strategies by preparing the necessary infrastructure, optimizing product procurement costs, and reducing product defect rates.

In summary, the VMI strategy, as examined in the first hypothesis, has not enhanced work efficiency in the studied MSMEs and has not provided an optimal contribution to company performance. Conversely, the ERP strategy, as tested in the second hypothesis, has increased company productivity and operational performance. Similar positive impacts on work efficiency and company operational performance were found with the successful implementation of CPFR, WMS, and outsourcing strategies, as observed in the third, fourth, and fifth hypotheses. Given this analysis, Micro, Small, and Medium Enterprises' owners, managers, leaders, and employees are encouraged to consider implementing ERP, CPFR, WMS, and Outsourcing strategies to enhance operational performance. Additionally, there is a need to assess and improve the implementation of the VMI strategy for a more effective contribution to work efficiency and company performance.

Conclusion

The results of this investigation reveal that the impact of the Company's Operational Performance is impacted by the four strategies in Supply Chain Management, although one variable has not been substantiated to affect the Company's Operational Performance. This deduction was derived from research carried out on MSMEs in Bogor City. The following are the conclusions derived from this research: (1) The Company's Operational Performance is not affected by the Vendor-Managed Inventory (VMI) strategy. This indicates that the implementation of the VMI strategy by Micro, Small, and Medium Enterprises has not achieved a satisfactory level of effectiveness in enhancing the Company's Operational Performance. (2) The Company's Operational Performance is influenced by the Enterprise Resource Planning (ERP) strategy.

This signifies that the ERP strategy executed by Micro, Small, and Medium Enterprises has effectively improved the Company's Performance. (3) A positive impact on the Company's Operational Performance has been observed due to the implementation of the Collaborative Planning, Forecasting, and Replenishment (CPFR) strategy. This implies that the CPFR strategy adopted by Micro, Small, and Medium Enterprises has successfully enhanced the Company's Operational Performance, (4) The Company's Operational Performance is influenced by the Warehouse Management System (WMS) strategy. This suggests that the WMS strategy employed by Micro, Small, and Medium Enterprises has effectively elevated the Company's Performance, (5) The Company's Performance experiences a positive impact due to the implementation of the Outsourcing Strategy. This indicates that the execution of the Outsourcing strategy by Micro, Small, and Medium Enterprises has triumphantly boosted the Company's Operational Performance.

References (Daftar Pustaka)

Abdul Rahman, N. S. F., Karim, N. H., Md Hanafiah, R., Abdul Hamid, S., & Mohammed, A. (2021). Decision analysis of warehouse productivity performance indicators to enhance logistics operational efficiency. *International Journal of Productivity and Performance Management*. <https://doi.org/10.1108/IJPPM-06-2021-0373>

Althonayan, M., & Althonayan, A. (2017). E-government system evaluation: The case of users' performance using ERP systems in higher education. *Transforming Government: People, Process and Policy*, 11(3), 306–342. <https://doi.org/10.1108/TG-11-2015-0045>

Bambang Purwoko, M. B. A., & Ec Hartati Kanti Astuti, M. M. (2017). 1. Pengaruh KEPUSAN DAN KEPERCAYAAN terhadap komitmen relasional dan loyalitas NASABAH BANK MANDIRI SURABAYA. *Economics and Sustainable Development*, 2(2), 1-1.

Baruffaldi, G., Accorsi, R., & Manzini, R. (2019). Warehouse management system customization and information availability in 3pl companies: A decision-support tool. *Industrial Management and Data Systems*, 119(2), 251–273. <https://doi.org/10.1108/IMDS-01-2018-0033>

Chopra, S., Meindl, P., & Kalra, D. V. (2017). *Supply Chain Management: Strategy, Planning, and Operation. Paper Knowledge . Toward a Media History of Documents* (6th ed.). Pearson.

Dekkers, R. (2011). Impact of strategic decision making for outsourcing on managing manufacturing. *International Journal of Operations and Production Management*, 31(9), 935–965. <https://doi.org/10.1108/01443571111165839>

Fu, H. P. (2016). Comparing the factors that influence the adoption of CPFR by retailers and suppliers. *International Journal of Logistics Management*, 27(3), 931–946. <https://doi.org/10.1108/IJLM-10-2014-0168>

Gamal, A., & Bambang Purwoko, M. B. A. (2017). 3. PENGARUH MANAJERIAL DAN PENDANAAN TERHADAP PROFITABILITAS PADA PERUSAHAN MANUFAKTUR YANG TERDAFTAR DI BURSA EFEK INDONESIA TAHUN 2012-2015. *Economics and Sustainable Development*, 2(2), 25-25.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage. Sage.

Heizer, J., Render, B., & Munson, C. (2017). *Operations Management: Sustainability and Supply Chain Management* (12th ed.). Pearson.

Hollmann, R. L., Scavarda, L. F., & Thomé, A. M. T. (2015). Collaborative planning, forecasting and replenishment: a literature review. *International Journal of Productivity and Performance Management*, 64(7), 971–993. <https://doi.org/10.1108/IJPPM-03-2014-0039>

Jagoda, K., & Samaranayake, P. (2017). An integrated framework for ERP system implementation. *International Journal of Accounting and Information Management*, 25(1), 91–109. <https://doi.org/10.1108/IJAIM-04-2016-0038>

Kementerian Keuangan RI. (2021). Pemerintah Terus Perkuat UMKM Melalui Berbagai Bentuk Bantuan No Title. Retrieved from <https://www.kemenkeu.go.id/publikasi/berita/pemerintah-terus-perkuat-umkm-melalui-berbagai-bentuk-bantuan/>

Lee, R. (2021). The effect of supply chain management strategy on operational and financial performance. *Sustainability (Switzerland)*, 13(9). <https://doi.org/10.3390/su13095138>

Machado Guimarães, C., Crespo de Carvalho, J., & Maia, A. (2013). Vendor managed inventory (VMI): evidences from lean deployment in healthcare. *Strategic Outsourcing: An International Journal*, 6(1), 8–24. <https://doi.org/10.1108/17538291311316045>

Niknamfar, A. H. (2015). Multi-objective productiondistribution planning based on vendor-managed inventory strategy in a supply chain. *Industrial Management and Data Systems*, 115(6), 1086–1112. <https://doi.org/10.1108/IMDS-03-2015-0073>

Purwoko, B. (2015). Influence of service quality and customer satisfaction and loyalty trust foreign tourists visit the attractions in East Java Indonesia. *European Journal of Business and Management*. ISSN, 2222-1905.

Purwoko, B. (2021). Analysis Of The Effect Of Inflation On Exports Of Non-Oil And Gas Commodities Through The Port Of Tanjung Perak Surabaya. *Eduvest-Journal of Universal Studies*, 1(7), 577-584.

Rosihan, R. I., Paduloh, P., & Sulaeman, D. (2021). Penerapan Collaborative Planning, Forecasting And Replenishment (CPFR) Guna Mengurangi Bullwhip Effect di PT. XYZ. *Prosiding Seminar Nasional Aplikasi Sains & Teknologi (SNAST) 2021*.

Sekaran, U., & Bougie, R. (2016). *Research Methods for Business*. Wiley. https://doi.org/10.1007/978-94-007-0753-5_102084

Suasridewi, D. G., Prihartanti, W., Purwoko, B., & Rahmanto, A. (2023). Peran Efektivitas Penerimaan PAD Via Online Dalam Meningkatkan Pendapatan Asli Daerah Kota Surabaya. *Madani: Jurnal Ilmiah Multidisiplin*, 1(10).

Simanjuntak, M., & Hamimi, U. K. (2019). Abstrak Complaints Handling and Word- of-Mouth Communication Abstract. *Jurnal Ilmu Kel Uarga Dan Konsumen*, 12(1), 75–86.

Wang, Z., & Wang, Z. (2018). The working capital management based on vendor relationship – “icing on the cake” or “timely help.” *Nankai Business Review International*, 9(2), 199–224. <https://doi.org/10.1108/NBRI-07-2017-0034>

Yosefa, ~, Sitompul, C., & Alfian, ~. (2015). Perancangan Model VMI (Vendor Managed Inventory) dengan Satu Pemasok dan Banyak Retailer yang Meminimasi Ongkos Total Rantai Pasok. *Jurnal Rekayasa Sistem Industri*, 4(2), 88. <https://doi.org/10.26593/jrsi.v4i2.1630.88-96>

Zhou, H., Shou, Y., Zhai, X., Li, L., Wood, C., & Wu, X. (2014). Supply chain practice and information quality: A supply chain strategy study. *International Journal of Production Economics*, 147(PART C), 624–633. <https://doi.org/10.1016/j.ijpe.2013.08.025>