



**EFFECT OF SUPPLY CHAIN AGILITY ON PERFORMANCE OF MANUFACTURING FIRMS IN MOMBASA COUNTY, KENYA**

**Ali, William Wambua**

---

**EFFECT OF SUPPLY CHAIN AGILITY ON PERFORMANCE OF MANUFACTURING FIRMS IN MOMBASA COUNTY, KENYA**

**Ali, William Wambua**

Student, Master of Science in Procurement and Supply Chain Management, School of Business, Department of Management Science, Technical University of Mombasa, Kenya

**Accepted: June 10, 2024**

---

**DOI: <http://dx.doi.org/10.61426/sjbcm.v11i2.2998>**

---

**ABSTRACT**

*Efficient supply chain management constitutes a crucial element within the operational framework of contemporary business models, impacting both efficacy and profitability. Given the unpredictable fluctuations prevalent across various business sectors, the imperative of supply chain agility has emerged. Companies must harness agility within their supply chain domain to enhance organizational performance and meet the dynamic demands of the market. This research, conducted within the manufacturing sector of Mombasa County, ascertained the effect of supply chain agility on organizational performance. The theoretical frameworks underpinning this study encompass the Dynamic capabilities view theory and Fugate logistics theory. The research design employed is descriptive, and the population under consideration was the manufacturing companies within Mombasa County, with a focus on senior personnel engaged in the supply chain systems. The study's population is 100 manufacturing companies, and a census approach was adopted, involving 100 supply chain managers as the targeted audience. Challenges encountered during the research process include reluctance among respondents to participate due to concerns about the potential exposure of confidential data to competitors, time constraints faced by respondents, and a cautious approach when interacting with the broader public. The study's descriptive findings demonstrate that a large proportion of the participants strongly concurred that manufacturing adaptability decreases manufacturing lead times. In addition, most of the respondents stated that the manufacturing adaptability improves delivery reliability compared to those who disagreed. Moreover, respondents strongly agreed that manufacturing adaptability improves responsiveness to changing market needs, while also improving level of customer service. The descriptive results show that logistics adaptability improves the capacity to add/delete delivery segments, while majority of respondents strongly agreed that logistics adaptability improves the capacity to add/delete delivery types. In light of the findings, the study recommends that procurement firms within supply chain networks focus on developing manufacturing adaptability and logistic adaptability. This strategic emphasis aims to enhance the performance of manufacturing firms, fostering collaboration in product creation, capacity enhancement, reduction in order processing cycle time, and coaching and empowerment. Furthermore, the adoption of such measures is essential for ensuring on-time shipment of goods and aiding manufacturing enterprises in effective risk management by identifying, preventing, and remedying potential risks.*

**Keywords:** Supply Chain Management, Supply Chain Agility, Organizational Performance, Manufacturing Adaptability, Logistic Adaptability, Manufacturing Firms

---

**CITATION:** Ali, W. W. (2024). Effect of supply chain agility on performance of manufacturing firms in Mombasa County, Kenya. *The Strategic Journal of Business & Change Management*, 11 (2), 1535 – 1545. <http://dx.doi.org/10.61426/sjbcm.v11i2.2998>

---

## BACKGROUND

The capacity of a company to achieve agility is pivotal for thriving in volatile environments. In today's globalized world, the manufacturing industry must develop strategies to respond swiftly to daily developments (Mali & Shrimali, 2019). Responding quickly and flexibly to changes in demand is referred to as supply chain agility, and businesses must explore this concept to be complete successfully in an ever-changing supply chain landscape. It is important to view agile supply chains as a tool for gaining control within the organization, alongside other necessary measures (Osman, Sarip & Arif, 2017).

According to Chan & Moon (2017), supply chain agility in Europe possesses a wide range of properties, with flexibility as a viable starting point for companies to embark on their agility journey. Procurement, manufacturing, and logistics flexibility in the value chain favor the development of value-adding systems to meet rapidly changing market expectations. Hence, supply chain agility is crucial for addressing responsiveness issues in fast-changing environments, particularly those with a high degree of customization (Newaz, Rahman & Taha., 2020).

Organizations must proactively respond to external developments and challenges to meet evolving customer needs, making standard approaches no longer sufficient, especially when the advantages of cost and distinctiveness have diminished (Meyer, Niemann & Peckover., 2017). Businesses need to offer more than just cost savings and differentiation. While leanness and agility may seem incompatible, they can be managed to realize the benefits of both concepts, with internal value chain adjustments as a starting point for providing a proactive response (Meyer, Niemann & Peckover, 2017).

### Statement of the Problem

The future of all businesses hinges on agile supply chains. A company's ability to cultivate agility is imperative for its survival in turbulent environments. Nevertheless, many corporations grapple with supply crises as they struggle to

address unexpected market fluctuations in relation to demand. This is often due to a lack of complete understanding of the concept of supply chain agility (Notteboom, Pallis & Rodrigue, 2021). Agility within a supply chain is of paramount importance for addressing responsiveness challenges and enhancing corporate performance, especially in environments marked by a high degree of customization (Dickson, 2018).

As per studies conducted by Patel & Sambasivan (2021), agility fundamentally differs from lean, which is primarily associated with cost efficiency, mainly due to its emphasis on client effectiveness. Yet, there exists a significant knowledge gap that calls for further investigation into the influence of agile supply chains on organizational success (Dubey, Bryde, Dwivedi, Graham, & Foropon, 2021). It is recommended that organizations adopt agile practices, especially when operating in highly uncertain contexts (McMackin & Heffernan, 2021). Agility is inherently intertwined with the success of strategic supply chain management (Jamjumrus & Sritragool, 2019). According to Blome, Papadopoulos, and Childe (2018), Although distribution network agility and adaptability possess distinctive attributes, not much has been established regarding their performance and the context in which they function.

A particular knowledge gap that remains unaddressed is the lack of empirical data regarding how supply chain agility influences corporate performance. An essential area in which research is lacking involves the interpersonal and interactive precursors of supply chain agility (Ayoub & Abdallah, 2019). Meyer, Niemann, Peckover, and Karlheinz (2017) have observed that the lean approach, whether in conflict or harmony with agility, does not seem to be practically viable, especially in volatile situations.

### Objective of the Study

The general objective of this study was to examine the effect of supply chain agility on the performance of manufacturing firms in Mombasa County, Kenya.

The study was guided by the following specific objectives;

- To examine the effect of manufacturing adaptability on performance of manufacturing firms.
- To determine the effect of logistic adaptability on performance of manufacturing firms.

The study's hypothesis were;

- **H<sub>01</sub>** Manufacturing adaptability has no significant effect on performance of manufacturing firms.
- **H<sub>02</sub>** Logistic adaptability has no significant effect on performance of manufacturing firms.

### LITERATURE REVIEW

This study is lodged on Dynamic capabilities view theory and Fugate logistics theory. Agility is an operational strategy focused on enhancing velocity and flexibility in the SC. It is the system involved in the creation and sale of a product, from the delivery of source materials; dealer to the producer, through to its subsequent delivery to the end user. All organizations have supply chains of varying degrees, depending upon the size of the organization and the type of product manufactured. The concept of dynamic capacity in view of manufacturing

adaptability refers to a procedure that emphasizes the idea of improving corporate performance (Shukla & Sharma, 2019). Manufacturing adaptability transforms the way enterprise operate currently which is critical across all enterprises, small and large. Many businesses have begun a significant transformational shift by heavily integrating digital technologies into their operations. This added value can only be realized by implementing technologies that are strategically aligned with the company's vision (Gyemang & Emeagwali, 2020).

In the study by Fugate *et al.*, (2019) realized a link between logistics and organizational performance, indicating that logistic adaptability is a function of goals and outcomes in manufacturing logistics capabilities. In view of Fugate Logistic Performance Theory, ability to cope with logistic adaptability strategies can provide a competitive advantage when used as a management tools. According to Khan *et al.*, (2019), there is a positive association between logistical performance and organizational success, within the industrial sector which, according to Fugate logistic performance view, is crucial for supply chain and logistic adaptability success.

### Conceptual Framework

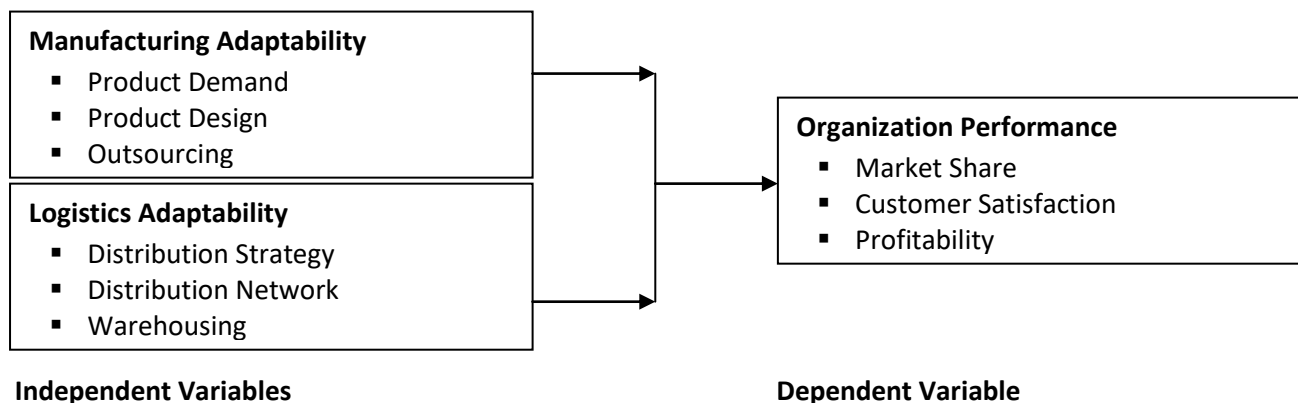


Figure 1: Conceptual Framework

## Empirical Review

Empirically, Manufacturers use resources in manufacturing adaptability to determine the strategy that best exploits internal resources and competencies regarding external opportunities (Alnuaimi *et al.*, 2021). Manufacturing adaptability is described as the availability of an assortment as well as the flexibility to use the production process more efficiently to increase customer service, product breadth, improved quality, rapid response, and dramatically decreased time to market for new product launches. Manufacturing is undergoing a paradigm change toward more flexibility in order to react rapidly and efficiently to continuously altering client demands, technological advances, and expanding product diversity (Kamil, 2017). It necessitates the capacity of providing the necessary goods and services in light of fluctuating demand, thereby supporting the growth and enhancement of a firms' distribution channel agility.

Longer lead times necessitate additional inventory as well as transportation stock. Elongated lead periods further limit the distribution network capacity to adjust to fluctuating demand, variability or even uncertainty (Katsaliaki, Galetsi & Kumar., 2021). Additionally, extended lead periods make delivery more uncertain, forcing firms to arrange orders significantly based on demand estimates.

Meyer *et al.*, (2017), in their study defined logistic adaptability as the capacity to adjust present procedures in an efficient and effective way. Profitable organizations employ logistics adaptability to minimize costs, increase competitiveness while improving efficiency. Logistics in current business conditions manages and combines the flow of goods and commodities under physical, organizational and information technology aspects (Siedlecki, 2020). The atmosphere created by logistics adaptability contributes to the creation of a beneficial aspect for the organization, which in turn stands out and contributes to customer and overall performance. Hence, logistics is known as the supply chain's blueprint (Sergiy, Ierkovska & Bugayko., 2022). As a

result, logistics adaptability is a key aspect in the performance of the agile supply chains in the manufacturing industry. Additionally, logistics is a crucial component of supply chain management (Ramos, Patrucco & Chavez., 2023).

## METHODOLOGY

A descriptive research design was used to assess whether agility in the distribution channels affects performance of the organisation. Descriptive design was utilized to explain the nature and influence of agility in supply chain performance on organisations, using the manufacturing industry case study. A descriptive study, according to Johnson & Froehlich (2018), is a design method for determining the current condition of a phenomenon and how much it links to factors or circumstances in a scenario. The study's target audience was 100 manufacturing firms supply chain/procurement managers, who work on the supply chain system for manufacturing organizations in Mombasa County.

In the study, the census approach was utilized to count every item in the population. A census is a description of a population with random variances (Kitheka, 2018). Each firm's supply chain or procurement manager was given a questionnaire, for a total of 100. The fact that supply chain managers form a component of the senior management team responsible for making critical decisions that define business strategy and relationships with partners and customers influenced their choice. Because of their position, they are judged competent enough, and their comments may be depended on in this study. Multiple linear regression was used to evaluate the coded data in the statistical program for social sciences (SPSS version 26). Qualitative data was examined for recurring themes and presented narratively. The linear regression technique was used to illustrate the relationships between the variables. The model of regression is stated as follows:

$$Y = \beta_0 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y = Organization Performance; Where  $\beta_3$  and  $\beta_4$  are multiple regression coefficients of the independent variables,

$\beta_0$  = Constant  $X_3$  = Manufacturing Adaptability  $X_4$  = Logistic Adaptability

$\epsilon$  is the error term normally distributed about a mean of zero.

## RESULTS

### Descriptive and Correlational Analysis

Manufacturing adaptability in agile supply chains has an influence on organization performance, an observation that proved the importance of manufacturing adaptability which influences organisation performance. Regression and correlation analysis revealed that manufacturing adaptability was significantly and positively related to organization performance. As a result, the null hypothesis was rejected. These results are similar to those of Blome, Papadopoulos, and Childe (2018), who assessed distribution network agility, flexibility, and alignment using empirical data from the Indian auto components sector, and they contribute by emphasizing manufacturing performance challenges. From the correlation analysis, it was found that there exists a strong correlation between

organization performance and manufacturing adaptability as  $r=0.629$ . The findings showed that manufacturing adaptability lowers manufacturing lead times by a mean of 3.9. The overall mean score for manufacturing adaptability was 3.87, suggesting that the vast majority of respondents saw enhancing manufacturing adaptability as crucial to boosting manufacturing business performance.

Logistic adaptability in agile supply chains has moderate influence on organisation performance. These observations proved the importance of Logistic adaptability in agile supply chains which influences organisation performance. From the correlation analysis, the least or weakest correlation strength was found between organizational effectiveness and logistical adaptability. Overall, the mean score for logistic adaptability was 4.32, suggesting that the majority of respondents felt that their companies were adopting logistic adaptability to enhance procurement success. 72% of the participants concurred that logistics adaptability enhances ability to fill orders from alternate global facilities. 82% of respondents also agreed that the logistics adaptability enhances ability to change delivery capacity and logistics adaptability enhance ability to change total storage capacity.

**Table 1: Pearson correlation analysis**

*Showing Pearson Correlation analysis on Procurement Range, Sourcing Adaptability, Manufacturing Adaptability and Logistic Adaptability towards Organization Performance*

	Organization Performance	Procurement Range	Sourcing Adaptability	Manufacturing Adaptability	Logistic Adaptability
Organization Performance	1				
Procurement Range	0.521	1			
Sourcing Adaptability	0.715*	.601	1		
Manufacturing Performance	0.629	.539	.320	1	
Logistic Adaptability	0.327	.164	.117	.327*	1

### Diagnostic Tests

In order to ensure robustness of the results we conducted tests of multicollinearity, Stationarity Tests, heteroscedasticity, autocorrelation and the Hausman test to test for the appropriate model to estimate between a fixed and random effects model. In testing for multicollinearity, we adopted the variance inflation factor (VIF) tests where we established that VIF were less than 5 and in the spirit of Montgomery (2001) and Gujarati (2003) who indicated that VIF values should not as a rule of thumb be more than either 5 or 10 respectively, we conclude that the model did not suffer from multicollinearity. The test for unit root was undertaken using the Im-Persaran-Shin (IPS) test which allows for heterogeneous coefficients. The results of the Im-Persaran-Shin (IPS) test indicated that the variables were non-stationarity at level, but stationary at level and thus the model incorporated variables at first difference. In testing the spherical disturbances assumption, we adopted the Breusch-Pagan LM test of independence whose null hypothesis states that the spherical disturbances are homoscedastic or tests the null of poolability (Gujarati, 2003; Wooldridge, 2003).

The Breusch-Pagan LM test with a (10) = 8.004 is statistically insignificant (p-value = 0.6285) at all levels of significance and thus in line with Gujarati (2003) and Wooldridge (2003), we conclude that the spherical disturbance assumption has been met as the Breusch-Pagan LM test, affirming that the cross-firm residuals are not correlated. In addition, using the Wooldridge (2002) test for serial correlation which is a F-test under the null hypothesis of no

first-order autocorrelation. At the 0.05 threshold of significance, the F Critical was 4.109, however the F calculated was 11.351, indicating that the F calculated was more than the F critical. As a result, the overall model proved significant in depicting the link between the dependent and independent variables. In choosing between the fixed and random effects model we employ the Hausman test which yielded a 1.36 with a p-value = 0.84 which was more than 0.05, thus this study applies the random effects regression model.

### Regression on the effect of procurement range & sourcing adaptability

The relationship between the dependent and independent variables was tested for significance at the 0.01 level, and the R-Square (coefficient of determination) was used to measure the proportion of changes in organizational performance explained by the independent variables. The regression model's significance was determined using Analysis of Variance (ANOVA). The significance value was p=0.012, demonstrating the model was significantly accurate for forecasting organizational performance using the variables chosen, namely manufacturing adaptability and logistic adaptability. At the 0.05 threshold of significance, the F Critical was 4.109, however the F calculated was 11.351, indicating that the F calculated was more than the F critical. As a result, the overall model proved significant in depicting the link between the dependent and independent variables.

**Table 2: Regression Coefficients**  
**Coefficients<sup>a</sup>**

Model	Standardized Coefficients		Unstandardized Coefficients	T	Sig.
	B	Std. Error Beta			
<b>1 (Constant)</b>	.5	.501		0.5	.001
Manufacturing Adaptability	.456	.191	.781	.437	.002
Logistic adaptability	.175	.095	.475	.345	.004

a. **Dependent Variable: Organization Performance**

The coefficients shown in Table above provide an answer to the model of regression that links both independent and dependent variables. The degree of relevance of the coefficients is determined at the 0.01 level of significance. Table shows that the significance value for each variable was less than 0.05, suggesting that the results were significant. Furthermore, each factor in the table had a positive coefficient, showing that the dependent and independent variables had a positive connection. Based on these coefficients, the regression model is as follows:

Organisation Performance (OP):  $0.5 \beta_0 + 0.456 MA_3 + 0.175 LA_4 + \epsilon$ .

$\beta_0$ : Constant

$MA_3$ : Manufacturing Adaptability

$LA_4$ : Logistic Adaptability

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

The research concluded that manufacturing adaptability decreases product development cycle times while increasing frequency of new product introductions. Manufacturing adaptability also improves delivery reliability. However, to maintain competitiveness, manufacturing companies should employ a policy of regular product customization in manufacturing adaptability to meet changing requirements of the customer on performance of manufacturing firms. Through manufacturing adaptability, there will be availability of an assortment as well as the flexible usage of production process and more efficient increased customer service, product breadth, improved quality, rapid response, and dramatically decreased time to market for new product launches in agile supply chains on manufacturing firm's success in Kenya.

### **REFERENCES**

Abdelilah, B., & Balambo, M. (2018). Flexibility and Agility: Evolution and Relationship. *Journal of Manufacturing Technology Management*.

Adapting logistics flexibility improves the ability to adjust scheduled delivery times by increasing the capacity to fulfill orders from other worldwide facilities, hence changing total storage capacity. The descriptive results show that logistics adaptability improves the capacity to add/delete delivery segments, as majority of respondents strongly agreed that logistics adaptability improves the capacity to add/delete delivery types. Adapting logistical flexibility on a regular basis in order to be completely responsive to consumer requests, such as by implementing electronic data exchange to connect fluidly with customers was highly recommended. Additionally, enterprises could invest in extra equipment and machinery in manufacturing or processing to enable versatility in handling any order at any time, so improving distribution network agility and the performance of Mombasa County industrial enterprise.

### **Limitations and Future Aspects**

A number of participants expressed concern that the information might reach the rivals during the research, making sharing of certain critical information problematic. The responders' busy schedules also posed a barrier, as did their desire to protect the organization's reputation owing to lawful and moral responsibilities when engaging with the wider public. Future research may focus on supply chain agility and success across various sectors. Furthermore, this study concentrated on two supply chain agility solutions namely; manufacturing adaptability and logistic adaptability, which constituted 73% of the variance in the dependent variable. Future research might look into various techniques for determining the remaining 27%. Thus, future research can take into account additional moderators such as information, communication, and technology, as well as the legal environment and government control.



- Abdelilah, B., & Balambo, M. (2021). Agility as a Combination of Lean and Supply Chain Integration: How to Achieve a Better Performance. *International Journal of Logistics Research and Applications*, 1-29.
- Assensoh-Kodua, A. (2019). The Resource-based View: A Tool of Key Competency for Competitive Advantage. *Problems and Perspectives in Management*, 17(3), 143.
- Bandyopadhyay, P. K., & Kim, B. (2021). A framework for Supply Chain Coordination Strategy in Indian engineering manufacturing and automobile sectors. *Benchmarking: An International Journal*.
- Blome, C., Papadopoulos, T., & Childe, S. J. (2018). Supply Chain Agility, Adaptability and Alignment: empirical evidence from the Indian Auto Components Industry. *International Journal of Operations & Production Management*.
- Brewer, B., & Arnette, A. N. (2017). Design for Procurement: What Procurement Driven Design Initiatives Result in Environmental and Economic Performance Improvement. *Journal of Purchasing and Supply Management*, 23(1), 28-39.
- Chan, T., & Moon, K. (2017). The Effects of Strategic and Manufacturing Flexibilities and Supply Chain Agility on Firm Performance in the Fashion Industry. *European Journal of Operational Research*, 259(2), 486-499.
- Chiu, A. S., & Lim, M. K. (2017). Achieving Competitive Advantage through Supply Chain Agility under Uncertainty: A Novel Multi-Criteria Decision-making Structure. *International Journal of Production Economics*, 190, 96-107.
- Ciccullo, F., Pero, M., Caridi, M., Gosling, J., & Purvis, L. (2018). Integrating The Environmental and Social Sustainability Pillars into The Lean and Agile Supply Chain Management Paradigms: A Literature Review and Future Research Directions. *Journal of Cleaner Production*, 172, 2336–2350.
- Cooper, C., Pereira, V., Vrontis, D., & Liu, Y. (2023). Extending the resource and knowledge based view: Insights from new contexts of analysis. *Journal of Business Research*, 156, 113523.
- Dabić, M., Obradović, T., Vlačić, B., Sahasranamam, S., & Paul, J. (2022). Frugal innovations: A multidisciplinary review & agenda for future research. *Journal of Business Research*, 142, 914-929.
- Dubey, R., Bryde, D. J., Foropon, C., Tiwari, M., Dwivedi, Y., & Schiffing, S. (2021). An Investigation of Information Alignment and Collaboration as Complements to Supply Chain Agility in Humanitarian Supply Chain. *International Journal of Production Research*, 59(5), 1586–1605.
- Engelmann, A., Kessler, A., & Schweiger, C. (2019). Toward A Dynamic Capabilities Scale: Measuring Organizational Sensing, Seizing, and Transforming Capacities. *Industrial and Corporate Change*, 28(5), 1149-1172.
- Foli, S., Durst, S., & Temel, S. (2022). The Link Between Supply Chain Risk Management and Innovation Performance in SMEs in Turbulent Times. *Journal of Entrepreneurship in Emerging Economies*, ahead-of-print.
- Furnival, J., Boaden, R., & Walshe, K. (2019). A Dynamic Capabilities View of Improvement Capability. *Journal of Health Organization and Management*.
- Gichuki, C. M. (2017). *Effect of Agile Supply Chain Strategy on Competitive Advantage of Firms in the Fast-Moving Consumer Goods Industry: A Case of Unilever Kenya* (Doctoral dissertation, United States International University-Africa).
- Gyemang, M., & Emeagwali, O. (2020). The Roles of Dynamic Capabilities, Innovation, Organizational Agility and Knowledge Management On Competitive Performance in Telecommunication Industry. *Management Science Letters*, 10(7), 1533-1542.

- Habibullah, K., & Joel, D. W. (2019). Supply Chain Integration, Learning, and Agility: Effects on Performance. *Operations and Supply Chain Management*, pp. (14 – 23), 1979-3561.
- Hong, J., Zhang, Y., & Ding, M. (2018). Sustainable Supply Chain Management Practices, Supply Chain Dynamic Capabilities, and Enterprise Performance. *Journal of cleaner production*, 172, 3508-3519.
- Huang, Y., & Macbeth, D. K. (2020). The Complexity of Collaboration in Supply Chain Networks. *Supply Chain Management: An International Journal*.
- Jakhar, S. K., Mangla, S. K., & Rai, D. P. (2020). A Framework to Overcome Sustainable Supply Chain Challenges Through Solution Measures of Industry 4.0 And Circular Economy: An Automotive case. *Journal of Cleaner Production*, 254, 120112.
- Jamjumrus, T., & Sritragool, N. (2019). Investigating the Impact of Supply Chain Agility, Government Regulations and Supply Chain Efficiency on Business Performance: Mediating Role of Cost Leadership. *Int. J Sup. Chain. Mgt Vol*, 8(4), 399.
- Johnson, R. B., & Froehlich, D. E. (2018). Combining Multiple Purposes of Mixing Within A Mixed Methods Research Design. *International Journal of Multiple Research Approaches*, 10(1), 271-282.
- Jauhar, S. K., Jani, S. M., Kamble, S. S., Pratap, S., Belhadi, A., & Gupta, S. (2023). How to Use No-code Artificial Intelligence to Predict and Minimize the Inventory Distortions for Resilient Supply Chains? *International Journal of Production Research*, 1-25.
- Karacuka, M., & Haucap, J. (2020). Digitalization and Economic Growth: A Comparative Analysis of Sub-Saharan Africa and OECD Economies. *Telecommunications Policy*, 44(2), 101856.
- Karman, A. (2019). The Role of Human Resource Flexibility and Agility in Achieving Sustainable Competitiveness. *International Journal of Sustainable Economy*, 11(4), 324-346.
- Kennedy, C., & Willer, M. (2022). Familiarity inferences, subjective attitudes and counterstance contingency: Towards a pragmatic theory of subjective meaning. *Linguistics and Philosophy*, 1–51.
- Kretschmann, T., & Emmitt, S. (2021). A Circular Construction Evaluation Framework to Promote Designing for Disassembly and Adaptability. *Journal of Cleaner Production*, 316, 128122.
- Kitheka, S. S. (2018). *Influence of Sourcing Ethics on Procurement Performance of State Corporations in Kenya* (Doctoral dissertation).
- Kuria, C. (2018). *Market Entry Strategies and Organizational Culture of Global Logistics Firms in Nairobi Kenya* (Doctoral dissertation, University of Nairobi).
- Lawrence, J. M., Hossain, N. U., Jaradat, R., & Hamilton, M. (2020). Leveraging a Bayesian Network Approach to Model and Analyze Supplier Vulnerability to Severe Weather Risk: A case study of the US pharmaceutical supply chain following Hurricane Maria. *International Journal of Disaster Risk Reduction*, 49, 101607.
- Lichtenthaler, U. (2020). Agile Innovation: The complementarity of Design Thinking and Lean Startup. *International Journal of Service Science, Management, Engineering, and Technology (IJSSMET)*, 11(1), 157-167.
- Lopes, J. M., Gomes, S., & Mané, L. (2022). Developing Knowledge of Supply Chain Resilience in Less-developed Countries in the Pandemic Age. *Logistics*, 6(1), 3.
- Mali, C., & Shrimali, P. (2019). Influence of Information and Communication Technology on Telecommunication Industries. In *Computing and Network Sustainability* (pp. 477-483). Springer, Singapore.

- Mandal, S., & Saravanan, D. (2019). Exploring the Influence of Strategic Orientations on Tourism Supply Chain Agility and Resilience: An Empirical Investigation. *Tourism Planning & Development*, 16(6), 612–636.
- Manzoor, U., Baig, S. A., Hashim, M., Sami, A., Rehman, H. U., & Sajjad, I. (2021). The Effect of Supply Chain Agility and Lean Practices on Operational Performance: A Resource-based View and Dynamic Capabilities Perspective. *The TQM Journal*.
- Marancik, D., Collins, J., Afema, J., & Lawrence, C. (2020). Exploring the Advantages and Limitations of Sampling Methods Commonly used in Research Facilities for Zebrafish Health Inspections. *Laboratory animals*, 54(4), 373-385.
- Mate, N. R. (2022). Transformation of supply chain management to agile supply chain management: Creating competitive advantage for the organizations.
- Meyer, A., Niemann, W., & Peckover, K. (2017). *Supply Chain Agility: A Conceptual Framework Towards Leagility*.
- Miller, D. (2019). The Resource-based View of the Firm. In *Oxford Research Encyclopedia of Business and Management*.
- Minashkina, D., & Happonen, A. (2020). Decarbonizing Warehousing Activities through Digitalization and Automatization with WMS Integration for Sustainability Supporting Operations. In *E3S Web of Conferences* (Vol. 158, p. 03002). EDP Sciences.
- Mishra, A. N., & Pani, A. K. (2020). Business Value Appropriation Roadmap for Artificial Intelligence. *VINE Journal of Information and Knowledge Management Systems*.
- Mothobi, O., & Grzybowski, L. (2017). Infrastructure Deficiencies and Adoption of Mobile Money in Sub-Saharan Africa. *Information Economics and Policy*, 40, 71-79.
- Mugunda, M., Kinyua, G., & Kahuthia, J. (2020). Effect of Strategic Intent on Firm Performance in the Context of Safaricom Limited in Kenya. *International Academic Journal of Human Resource and Business Administration*, 3(8), 194–206.
- Newaz, S., Rahman, K., & Taha, Z. (2020). Supply Chain Integration and its Impact on Supply Chain Agility and Organizational Flexibility in Manufacturing Firms. *International Journal of Emerging Markets*.
- Notteboom, T., Pallis, T., & Rodrigue, J. P. (2021). Disruptions and Resilience in Global Container Shipping and Ports: The COVID-19 Pandemic Versus the 2008–2009 Financial Crisis. *Maritime Economics & Logistics*, 23(2), 179–210.
- Nurmilaakso, R. (2018). A Review of Dynamic Capabilities, Innovation Capabilities, Entrepreneurial Capabilities and their Consequences. *The Journal of Asian Finance, Economics, and Business*, 7(8), 485-494.
- Ombati, O. T. (2018). Stakeholder Exposure and Sustainable Supply Chain Management Practices in Safaricom, Kenya. *American Journal of Industrial and Business Management*, 8(5), 1139-1156.
- Osman, O. H., Sarip, A., & Arif, L. S. M. (2017). What Role Does Continuance Commitment Play in The Relationship Between Affective Commitment and Organizational Citizenship Behaviour? Case Study Somali Telecommunication Industry Players. *Sains Humanika*, 9(1-3).
- Patel, B. S., & Sambasivan, M. (2021). A Systematic Review of the Literature on Supply Chain Agility. *Management Research Review*.
- Patrucco, A. S., Ronchi, S., & Luzzini, D. (2019). Organizational Choices in Public Procurement: What Can Public Management Learn from the Private Sector. *Local Government Studies*, 45(6), 977-1000.

- Pournader, M., Kach, A., & Talluri, S. (2020). A Review of the Existing and Emerging Topics in the Supply Chain Risk Management Literature. *Decision Sciences*, 51(4), 867-919.
- Popli, S., Jha, R. K., & Jain, S. (2018). A Survey on Energy Efficient Narrowband Internet of Things (NBloT): Architecture, Application and Challenges. *IEEE Access*, 7, 16739–16776.
- Pullman, M., Longoni, A., & Luzzini, D. (2018). Emerging Discourse Incubator: The Roles of Institutional Complexity and Hybridity in Social Impact Supply Chain Management. *Journal of Supply Chain Management*, 54(2), 3-20.
- Rahimi, A., & Alemtabriz, A. (2022). Providing a Model of Leagile Hybrid Paradigm Practices and its Impact on Supply Chain Performance. *International Journal of Lean Six Sigma*.
- Ramos, E., Patrucco, A. S., & Chavez, M. (2023). Dynamic capabilities in the “new normal”: a study of organizational flexibility, integration and agility in the Peruvian coffee supply chain. *Supply Chain Management: An International Journal*, 28(1), 55-73.
- Reddy, C. (2018). Optimization of Tensile Strength in TIG Welding Using the Taguchi Method and Analysis of Variance (ANOVA). *Thermal Science and Engineering Progress*, 8, 327-339.
- Saa'da, R. J., Al-Nsour, M., Altarawneh, A. M., Suifan, T. S., Sweis, R., Akhorshaideh, A. H. O., & Al-Lozi, K. S. (2022). The Impact of Supply Chain Management Practices on Supply Chain Agility-Empirical Study in Medical Sector. *Academy of Strategic Management Journal*, 21(1), 1-15.
- Siedlecki, S. L. (2020). Understanding Descriptive Research Designs and Methods. *Clinical Nurse Specialist*, 34(1), 8-12.
- Singh, T., Tripathi, S., Dwivedi, A., & Acevedo-Duque, Á. (2022). Post-COVID green supply chain management of used products: A study towards awareness for vaccination. *Environmental Science and Pollution Research*, 1–15.
- Sileyew, K. J. (2019). Research Design and Methodology. In *Cyberspace* (pp. 1-12). Rijeka: IntechOpen.
- Souza, F. D., Gupta, M. C., & Camargo Fiorini, P. (2019). Theory of Constraints: Review and Bibliometric Analysis. *International Journal of Production Research*, 57(15-16), 5068-5102.
- Teece, D. J. (2018). Dynamic Capabilities as (Workable) Management Systems Theory. *Journal of Management & Organization*, 24(3), 359-368.
- Torres, R., Sidorova, A., & Jones, M. C. (2018). Enabling Firm Performance Through Business Intelligence And Analytics: A Dynamic Capabilities Perspective. *Information & Management*, 55(7), 822-839.
- Wasike, C. L. (2020). *Big Data Analytics and Supply Chain Performance of Network Facilities Providers in Kenya* (Doctoral dissertation, University of Nairobi).
- Um, J. (2017). The Impact of Supply Chain Agility on Business Performance in a High-level Customization Environment. *Operations management research*, 10(1-2), 10-19.
- Yang, Y., & Jiang, Y. (2023). Buyer-supplier CSR alignment and firm performance: A contingency theory perspective. *Journal of Business Research*, 154, 113340.
- Zokaee, S., & Sadjadi, S. J. (2017). Robust Supply Chain Network Design: An Optimization Model with Real World Application. *Annals of Operations Research*, 257(1), 15-44.