

JAM

Jurnal Aplikasi Manajemen
Journal of Applied Management
Volume 22 Issue 1
March 2024

22 | 1 | 2024

Received October '23
Revised October '23
Accepted November '23
January '24

**INDEXED IN**

DOAJ - Directory of Open
Access Journals
SINTA - Science and Technology
Index
Dimensions
Google Scholar
ResearchGate
Garuda
IPI - Indonesian Publication
Index
Indonesian ONEsearch

CORRESPONDING AUTHOR

Zainurrafiqi
Univeritas Madura,
Indonesia

EMAIL

zainurrafiqi@unira.ac.id

OPEN ACCESS

e ISSN 2302-6332
p ISSN 1693-5241



Copyright (c) 2024 Jurnal Aplikasi Manajemen

SUPPLY CHAIN DIGITALIZATION, GREEN SUPPLY CHAIN, SUPPLY CHAIN RESILIENCE TOWARD COMPETITIVENESS AND MSMEs PERFORMANCE

Zainurrafiqi
Gazali

Univeritas Madura, Indonesia

Abstract: MSMEs that previously only relied on human resources are now forced to keep up with the times by utilizing IT in every process, from raw material procurement, production processes to distribution processes in order to remain competitive in facing a business world full of challenges. Information Technology, which is closely related to digitalization, can help companies gain sustainable competitiveness in the supply chain by improving certain asset relationships, facilitating information exchange, and building long-term cooperative relationships as a form of implementing Supply Chain Digitalization. The ability of MSMEs to implement green supply chain management is a unique ability to improve company performance. For example, a company can reduce production costs by involving its suppliers in several green initiatives, such as material recycling, environmentally friendly packaging, and efficient use of energy. Companies with high supply chain resilience will be strong and grow significantly in the face of crises, thereby minimizing losses. Therefore, companies with good supply chain resilience will have a competitive edge so they can grow faster and win the competition from their competitors. For this reason, this study aimed to examine the effect of supply chain digitization, green supply chain, and supply chain resilience on competitiveness. This research is Explanatory Research. Data collection uses a questionnaire. The sampling technique uses purposive sampling. The total sample was 400 MSMEs Managers in Pamekasan Regency, and used data analysis, namely Structural Equation Model (SEM) with AMOS software. The results highlighted that Supply Chain Digitalization, Green Supply Chain and Supply Chain Resilience has a direct and significant influence on MSMEs Performance. Moreover, Competitiveness partially mediates the relationship between Supply Chain Digitalization, Green Supply Chain and Supply Chain Resilience and MSMEs Performance. The findings of this study suggest that managers should be made aware that Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience can be an important driver for Competitiveness which in turn would enhance MSMEs Performance.

Keywords: Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience, Competitiveness, MSMEs Performance

CITATION

Zainurrafiqi and Gazali. 2023. Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience Toward Competitiveness and MSMEs Performance. Jurnal Aplikasi Manajemen, Volume 22, Issue 1, Pages 175–192. Malang: Universitas Brawijaya. DOI: <http://dx.doi.org/10.21776/ub.jam.2024.022.01.14>.

INTRODUCTION

MSMEs that used to only rely on human resources are now forced to keep up with the times by utilizing IT in every process, from the procurement of raw materials to the production process to the distribution process, in order to remain competitive in facing a challenging business world (Abeyssekara et al., 2019). IT, closely related to digitization, can help companies gain sustainable competitiveness in the supply chain by improving certain asset relationships, facilitating the exchange of information, and building long-term cooperative relationships as a form of Supply Chain Digitization (Afraza et al., 2021). The ability of MSMEs to implement green supply chain management is a unique ability to improve company performance. For example, a company can reduce production costs by involving its suppliers in several green initiatives, such as recycling materials, environmentally friendly packaging, and efficient energy use (Agyabeng-Mensah and Ahenkorah, 2019). Companies with high supply chain resilience will be strong and grow significantly in the face of crises, thereby minimizing losses. Therefore, companies with good supply chain resilience will have a competitive edge to grow faster and win the competition from their competitors (Singh, 2017).

Information technology (IT) growth requires rapid adaptation from all parties, including MSMEs. MSMEs that used to only rely on human resources are now forced to keep up with the times by utilizing IT in every process, from the procurement of raw materials to the production process to the distribution process, in order to remain competitive in facing a challenging business world (Ganbold et al., 2020). The use of modern technology for sustainable production systems has an impact on efforts to become an environmentally friendly company (Siagian et al., 2021). IT developments have a significant impact on efforts to become an environmentally friendly company. Internet of Things (IoT) can reduce harmful gas emissions as a green supply chain (Behl, 2022). Technology-based MSMEs can improve green supply chains by reducing inventory levels and improving company performance. Bjorkdahl (2020) shows that IT contributes to providing stability for companies, especially in an environment that is not conducive. Research by (Liu and Lee 2018) shows that IT companies can integrate systems to increase supply

chain resilience. As a form of business, organizations maintain business goals by paying attention to the environment through a balance of economic, social and environmental values (Xu et al., 2022), and (Novitasari and Tarigan, 2022). Green businesses need to engage the company's suppliers and customers to maintain balance and sustainability in the supply chain. Companies can optimize green supply chain management by involving all internal companies to communicate with upstream and downstream parties (Siagian et al., 2022) (Zhen et al., 2021). MSMEs can reduce their production costs by involving their suppliers in several green initiatives, such as material recycling, green packaging and efficient energy use. Çankaya and Sezen (2019) stated that green product development and production processes can improve product quality, reduce production costs, and enhance a good image for the company. If green supply chain management goes well, companies can carry out clean technology innovation, one of the focus areas in Net Zero Industry and Innovation.

Competitive MSMEs always have the ability to understand changes in market structure and choose effective marketing strategies to improve company performance (Cagliyan et al., 2022). Corporate performance refers to how companies achieve their production, human resource, marketing and financial goals. Competitiveness refers to a company's ability to create a defensive position against its competitors (Chhabra et al., 2021). MSMEs must have competitiveness, such as lower operating costs, faster delivery times, and better customer satisfaction to improve MSME performance. Solid supply chain management gives companies a competitive edge compared to competitors. Competitiveness is a company strategy to win business competition and survive a crisis. One example of competitiveness that a company must have been the ability and flexibility to estimate and measure supply chain performance (Yu et al., 2021).

Based on a review of previous research by researchers, it was found that no studies discussed variables regarding supply chain digitization, green supply chain, supply chain resilience, competitiveness and MSMEs performance simultaneously. Previous research related to the value chain antecedent concept of competitiveness in MSMEs only focused on a few variables, such as supply chain

digitalization and supply chain resilience (Nanyang and Hong, 2023), supply chain digitalization (Chiu, 2021), and Green Supply Chain Management (Wang, 2018), this research tries to fill this gap by integrating a conceptual model that connects Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience, Competitiveness and MSMEs Performance. Apart from that, the antecedents of Supply Chain Digitalization, Green Supply Chain, and Supply Chain Resilience are rarely researched, especially in MSMEs in Indonesia.

This research will increase MSMEs actors' understanding of the vital role of supply chain digitalization, green supply chains, and supply chain resilience in strengthening competitiveness, which will have an impact on MSMEs performance. This research aims to examine and analyze the influence of supply chain digitalization on competitiveness, the influence of green supply chains on competitiveness, the influence of supply chain resilience on competitiveness, the influence of competitiveness on MSMEs performance and the influence of Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience on MSMEs Performance with Competitiveness as a mediating variable.

LITERATURE REVIEW

Supply Chain Digitalization

Legner et al. (2017) stated that digitalization refers to the processes associated with converting analog signals into digital models and the impact of such technology caused by its adoption and operation. Digitalization is starting to receive great attention from organizations worldwide, as it brings great benefits to many companies. Digitalization in the supply chain allows the maximum use of digital technology to plan and execute transactions, communications and actions (Sanders and Swink, 2020).

Green Supply Chain

Green Supply Chains can be seen as logistic structures that guarantee the production and distribution of products globally in an environmentally friendly manner (Barbosa-Póvoa, 2009). To achieve such a goal, companies must invest in the design and planning optimization of their logistic structures while accounting for the trade-off between profits and environmental impacts. Srivas-

tava (2007) reported that Green Supply Chains include green design, purchasing, production, distribution, logistics, marketing, and reverse logistics. Walker et al. (2008) stated that the green supply chain concept covers all phases of a product's life cycle, from the extraction of raw materials through the design, production and distribution phases to the use of the product by consumers and its disposal at the end of the product's life cycle. Green Supply chain practices are extremely extensive. Similar to the concept of Green Supply Chains, the boundary of Green Supply Chains depends on the researcher's goal ((Srivastava, 2007; Yildiz-Çankaya and Sezen, 2019).

Supply Chain Resilience

In the field of supply chains, Supply Chain Resilience generally refers to a company's ability to be vigilant, respond quickly and adapt to changes caused by supply chain disruptions. However, scholars often refer to "the systematic ability of a supply chain to recover in a timely manner or achieve a new and more ideal state when disruptions occur" in defining resilience (Christopher, 2004). Resilience is described as an adaptive phenomenon and seen as an emergent phenomenon. Nowadays, the definition of Supply Chain Resilience has attracted the attention of scholars (Nawawi, 2014; Pu, 2023). Most of these studies have been conducted from a capability's perspective, mainly covering the topics of flexible capabilities (Zhou et al., 2022), responsiveness, and recovery (Chowdhury, 2016). Closs (2004) was the first to propose a definition of Supply Chain Resilience, arguing that supply chains can survive and recover from damaging events. Pettit and Fiksel (2010) define resilience as a balanced state of vulnerability and capability. Chowdhury (2016) defines Supply Chain Resilience as the ability of a supply chain to prevent disruptions by increasing flexibility levels and responding quickly to and recovering from disruptions.

Competitiveness

Competitiveness refers to the capacity to achieve at a greater level than others in the same sector or market through credit and resources (Nkuda, 2016). As with Competitiveness, the organization has an edge when its value-creating strategy is not pursued by its existing or future ri-

vals (Gareche et al., 2017). As a result, an organization with a competitive edge will outperform existing or potential competitors (Kang and Na, 2020). An organization's business plan manipulates the various resources it has direct control over to gain competitiveness. Resource management and competitive strategy play a major role in creating Competitiveness (Sri, 2020). Competitive strategy is viewed by Varanavicius and Navikaite (2016) as an instrument for maximizing resources and gaining an edge in the marketplace. If one does not have control of distinctive resources, one's competitive approach may not be effective. The measures of Competitiveness used here are cost advantage, Differentiation Advantage, and technological advantage.

MSMEs Performance

Business performance is "the operational ability to satisfy the desires of the company's major shareholders", which must be assessed to measure an organization's accomplishment (Atikah, 2014). Business performance is an indicator which measures how well an organization accomplishes its objectives. Business performance considers multiple financial and nonfinancial objectives under the influence of a fuzzy and uncertain external environment involving an outside-in perspective for mobilizing diverse resources through open information flow (Singh, 2017).

HYPOTHESIS DEVELOPMENT

Supply Chain Digitization and Competitiveness

IT, closely related to digitalization, can help companies gain sustainable competitiveness in the supply chain by improving certain asset relationships, facilitating information exchange, and building long-term cooperative relationships to implement Supply Chain Digitalization (Yu et al., 2021). IT strengthens the exchange of information in buyer and supplier relationships through more efficient processes that reduce waiting times. Chhabra et al. (2021) show that companies that use the Internet to streamline supply chain processes will benefit from reduced transaction costs, smoother information flow, and more responsiveness to demand. The use of IT in supply chain management is closely related to changes that occur from old systems to new systems in the digitalization era (Tarigan et al., 2019). Digitalization in the supply chain is an

exemplary process for increasing visibility and transparency across the supply chain, as it will facilitate the rapid collection and sharing of information for all stakeholders. With good visibility and transparency, companies can integrate planning and innovation and provide better services to meet customer needs. Digitalization in the supply chain can make the level of competitiveness jump forward. Besides that, supply chain digitalization can provide opportunities for MSMEs to increase revenue or innovation rather than reduce costs through operational efficiency (Liu and Weisheng, 2021). In this regard, we propose the following hypothesis:

H1: Supply Chain Digitalization has a significant effect on competitiveness.

Green Supply Chains and Competitiveness

The ability of MSMEs to implement green supply chain management is a unique ability to improve company performance (Bjorkdahl, 2020). For example, companies can reduce production costs by involving their suppliers in several green initiatives, such as material recycling, environmentally friendly packaging, and efficient energy use (Siagian et al., 2022). In addition to production costs, green supply chain management impacts product quality because responsible environmentally friendly suppliers can help companies reduce the number of defective products and increase product reliability and consistency. Another advantage of green supply chain management is that companies are better prepared to face market uncertainty by collaborating with suppliers. Green supply chain management also influences the company's delivery performance (Wu et al., 2017). The green concept has penetrated every supply chain management process, from raw materials, production, storage, packaging, and shipping to product distribution. Green production and process innovation will increase competitiveness and provide a good image for the company.

Competitiveness also includes the quality of production processes that produce environmentally friendly products (Dinh et al., 2023). By implementing green production processes, companies can reduce costs and improve the performance of the production process and the entire supply chain process. Based on the explanation above, we propose the following hypothesis: The green concept

has penetrated every process in supply chain management, starting from raw materials, production, storage, packaging, and shipping to product distribution. Green production and process innovation will increase competitiveness and provide a good image for the company. Competitiveness also includes the quality of production processes that produce environmentally friendly products (Nguyen and Le, 2020). By implementing green production processes, companies can reduce costs and improve the performance of the production process and the entire supply chain process. The green concept has penetrated every supply chain management process, from raw materials, production, storage, packaging, and shipping to product distribution. Green production and process innovation will increase competitiveness and provide a good image for the company. Competitiveness also includes the quality of production processes that produce environmentally friendly products (Kustianti and Murwaningsari, 2023). By implementing green production processes, companies can reduce costs and improve the performance of production processes and the entire supply chain process. Based on the explanation above, we propose the following hypothesis: Competitiveness also includes the quality of production processes that produce environmentally friendly products (Dong et al., 2021). By implementing green production processes, companies can reduce costs and improve the performance of production processes and the entire supply chain process. Competitiveness also includes the quality of production processes that produce environmentally friendly products (Nguyen and Le, 2020). By implementing green production processes, companies can reduce costs and improve the performance of production processes and the entire supply chain process. Based on the explanation above, we propose the following hypothesis: **H2:** Green supply chains have a significant effect on competitiveness.

Supply Chain Resilience and Competitiveness

Several studies show that a resilient company can be seen from its growth indicators, for example, financial and company strength (Siagian et al., 2022). These various studies emphasize the importance of having a strong supply chain to measure a company's competitiveness (Siagian et al., 2021). Companies with high supply chain resilien-

ce will be strong and grow significantly in crises, thereby minimizing losses (Cagliyan et al., 2022). Furthermore, continuous innovation in business operations will help companies win competition through productivity and profits (Zhou et al., 2022). Therefore, companies with good supply chain resilience will have a competitive edge to grow faster and win the competition from their competitors. Research conducted by Behl (2022) shows that supply chain resilience affects company performance and competitiveness. Based on the explanation above, we propose the following hypothesis: **H3:** Supply chain resilience has a significant effect on competitiveness.

Competitiveness and MSMEs Performance

Competitive MSMEs always have the ability to understand changes in market structure and choose effective marketing strategies to improve company performance. Company performance refers to how companies achieve their production, human resource, marketing and financial goals (Abeysekara et al., 2019). Competitiveness refers to the ability of companies to create defensive positions against their competitors. Competitive advantage or competitiveness is the ability of a company to achieve economic benefits above the profits that competitors can achieve in the same market. Competitiveness refers to a company's results in developing attributes that enable it to outperform its competitors in a way that makes it difficult or impossible for competitors to imitate.

Meanwhile, competitiveness and firm performance are often used interchangeably (Das and Canel, 2023). Viewed as a means to an end, competitiveness is often thought to be facilitated by superior value creation, thus leading to increased performance (Afraza et al., 2021). Therefore, the competitiveness and performance of SMEs are two different constructs with seemingly complex relationships. But overall, research has shown a significant relationship between competitiveness and firm performance (Zadeh et al., 2020).

H4: Competitiveness has a significant effect on MSMEs performance.

Supply Chain Digitalization, Competitiveness and MSMEs Performance

Digitalization in the supply chain can increase the efficiency of business processes through

systems, including reduced production and transaction costs, increased inventory turnover, streamlined logistics steps, automated manufacturing, and faster completion of electronic collections and payments (Liu and Weisheng, 2021). Companies can increase the yield and quality of their production and minimize the number of defects by making production processes smarter through the use of digital technology and more and better data (Bjorkdahl, 2020). Additionally, digitalization has the potential to increase product development efficiency and speed up product design by reducing the need for physical artifacts and prototypes (Bjorkdahl, 2020). Apart from increasing internal efficiency, digital transformation is able to develop the company by providing added value for customers. Digital systems and processes facilitate the customer journey by providing transactions and delivering efficient services, which can meet customers' increasing demand for personalized products (Gorbach, 2017). This phenomenon is, for example, in the case of Scania, one of the 26 case companies in Björkdahl's (2020) study, the results of which reveal that digitalization brings new business growth opportunities. A company will most likely reduce its cash conversion cycle by increasing supply-side digitalization (Magretta, 1998), directly affecting its profitability, increasing its competitiveness and creating such (Ricardianto et al., 2023). In the existing literature, the digitalization of supply chains is believed to benefit organizations. However, academic investigations into how and why digitalization can improve performance for companies in the supply chain context are still limited (Björkdahl, 2020).

H5: Supply Chain Digitalization has a significant effect on MSMEs performance mediated by Competitiveness.

Green Supply Chain, Competitiveness and Firm Performance

Previous research shows that a company's Green Supply Chain can influence performance. However, in testing the influence of Green Supply Chain on company performance, it is necessary to consider mediating variables (Dian, 2022). In this case, first, the Green Supply Chain influences competitive advantage and second, competitive advantage influences company performance. Competitive advantage is a mediating variable because

companies need to increase their competitive advantage to compete for market share (Wu et al., 2017). Green" practices used by companies in supply chain management will create competitive advantages that can improve company performance (Lee et al., 2015). With competitive advantage, companies will gain benefits, including reduced costs by preventing pollution, stakeholder monitoring of products that competitors cannot imitate, and synergistic long-term development (Pålsson and Kovács, 2014). It will help companies improve their performance.

H6: Green Supply Chain has a significant effect on MSMEs performance mediated by Competitiveness.

Supply Chain Resilience, Competitiveness, and Firm Performance

Over time, successful events in the business world have increased the importance of supply chain management, regardless of the size of an organization. Organizations invest optimally to strengthen supply chain management. Initially, the supply chain was considered a large-scale enterprise concept, but time has proven that size does not matter in this context. Proper supply chain management is today's demand. Variations in the business environment occur when sustainable approaches or the provision of goods to customers are disrupted (Sri, 2020). The ultimate impact of various situations in countries affects the needs of companies and customers (Ploenhad, 2019). Therefore, there is a significant relationship between consumers and companies when supply chain management effectively drives the right strategy to overcome problems and helps companies achieve significant performance (Agyabeng-Mensah and Ahenkorah, 2019). Supply chain management is a global measure that came into force a few years ago. The rapid adaptation of supply chain management has enabled companies to achieve goals in a very short time (Oh and Ryu, 2019). Where communication occurs, the role of the supply chain significantly incorporates a dominant dimension for the recovery of superior performance while maintaining competitive advantage globally (Safkaur, 2019). The introduction of supply chain management is clearly stated in the literature as having a significant impact on firm performance and competitive advantage.

H7: Supply Chain Resilience a significant effect on MSMEs performance mediated by Competitiveness.

METHOD

Measurement Scale

The variables in this study were measured using a Likert scale with a range from 1 to 5, where 1 equal "Strongly Disagree" and 5 equals "Strongly Agree". The variables studied consist of exogenous variables and endogenous variables. Exogenous variables including Supply Chain Digitalization adopted from Ganbold et al. (2020), Xi et al. (2022), and Çankaya and Sezen (2019) with indicators, namely electronic application for coordination with internal stakeholders, electronic application for coordination with external stakeholders, electronic application to process administrative activities, electronic applications used in real-time, the electronic application used is accurate, and reliable electronic applications. The Green Supply Chain adapted from Zhou et al. (2022) and (Liu and Lee, 2018) with indicators namely, The company has the right system regarding green issues, The company plans to purchase green raw materials, The company implements green production processes, The company uses a green distribution system, and company and external (suppliers and customers) jointly address environmental issues and Supply Chain Resilience was adopted from Siagian et al. (2021), Abeysekara et al. (2019) and Behl (2022), with indicators namely the company has a system that can quickly warn of supply chain

disruptions, the company has a system that can quickly respond or adapt to supply chain disruptions, the company has a system that can quickly restore operational conditions to normal after a supply chain disruption, and the company has sufficient resources to handle supply chain disruptions. Meanwhile, the endogenous variable is Competitiveness, which was adopted from Tarigan et al. (2018) and Menike (2019), with indicators namely lower production costs than competitors, lower distribution costs than competitors, lower selling prices than competitors, better quality reputation than competitors, product uniqueness from the customer's perspective, loyal customers to the product compared to competitors, and better delivery accuracy than competitors. MSMEs performance adopted from Menike (2019), with indicators namely Financial Performance and Non-Financial Performance.

Population and Sample

The population in this research is MSMEs managers in Pamekasan Regency. The number of samples in this research was 400 MSMEs managers.

Method of Collecting Data

The main source of this research is primary data. Researchers used a questionnaire to obtain information by dealing directly with MSMEs Managers in Pamekasan Regency and asking in-depth questions.

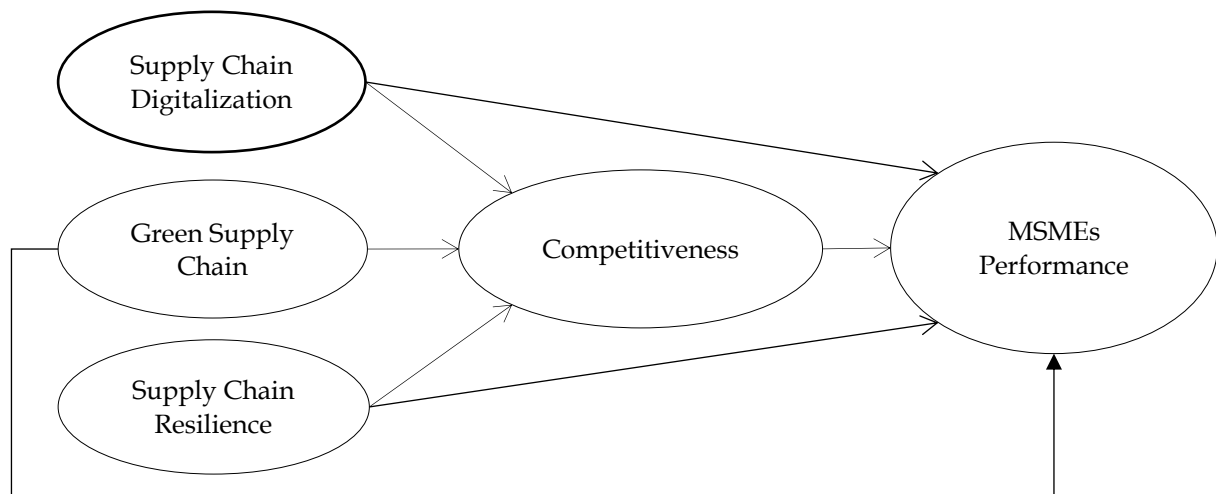


Figure 1. Research Framework

Table 1. The Measurement Model Fit Result

Index	Results
Chi-square (χ^2)	450.23
Chi-square DF	190
Chi-square (χ^2/df)	2.36
Goodness of Fit (GFI)	0.92
Adjusted Goodness of Fit (AGFI)	0.93
Root Mean Square Error of Approximation (RMSEA)	0.04
Root Mean Square of Residual (RMR)	0.05
Normed fit index (NFI)	0.95
Non-normed Fit Index (NNFI)	0.96
Comparative fit index (CFI)	0.97

Source: Processed Data (2023)

Data analysis technique

This research uses SEM (Structural Equation Modeling) analysis to investigate linear relationships between variables, hypothesis testing and causal relationships between variables using AMOS 17 software.

RESULTS

Inferential Statistical Analysis

Data analysis used AMOS software with the Structural Equation Model (SEM) method. There are two stages in the Structural Equation Model (SEM). The first stage is the Measurement Model, and the second is the Structural Model (Kaplan, 2009).

Measurement Models Goodness Fit Indices

Table 1 showed that the following results are obtained, namely χ^2/df -ratio of 2.36, which is in the 2-3 interval, which means the model has met the criteria to accept the model. Meanwhile, for the GFI, NFI, NNFI, and CFI assessment, the value obtained is greater than or close to 0.9. It means that the calculations related to GFI, NFI, NNFI, and CFI have met the model requirements criteria, so it can be concluded that the model is acceptable. As for the RMSEA calculation, a value of 0.04 is obtained, so it can be concluded that this value is still acceptable. So, the measurement as a whole meets the standardization of assessment on the measurement model fit indices.

Validity and Reliability

Reliability testing in this research has met the standardization requirements regarding varia-

ble testing. The variables in this study were tested using Standardized Loading and Composite Reliability. The Composite Reliability calculations are shown in Table 2, where values between 0.8 and 0.9 are obtained. Fornell and Larcker (1981), the composite reliability value is acceptable if greater than 0.60.

Validity testing in this study using Confirmatory Factor Analysis to measure the value of Convergent Validity. Table 2 presents the following information: the first is the t value, the second is related to the Standardized Loading value, and based on the calculations in Table 4, it can be concluded that for all variables in this study, it is significant, namely a value obtained greater than 1.96. This proves that the path coefficient in this study is significant, so it can be concluded that all indicators in this study have met the standard requirements for calculating Convergent Validity (Anderson, 1988).

Structural Models

This study uses Structural Equation Model (SEM) analysis to test the research hypothesis. Overall, the test results for the goodness fit of the structural model can be seen in Table 3. The Chi-square (χ^2) /df-ratio value is 2.31, according to Schumacker and Lomax (2004). Usually, the accepted ring values for chi-squared are 1 to 3. GFI and NNFI are still accepted because they are greater than 0.8 and close to 0.9. RMSEA is still accepted because the value equals or less than 0.1. Overall, the requirements for goodness of fit indices of structural models in the structural model have been accepted. In the structural model, RNFI

should be greater than 0.9; closer to 1 is better. RPR is to detect the structural model to the parsimony degree. Ring Value starts from 0.0 to 1.0; the bigger, the better the fit (goodness of fit). RPF

FI is very useful for choosing a model that simultaneously maximizes fit and parsimony in the structural part of the model. With higher RPF values, it is more necessary.

Table 2. Scale Composite Reliability and Convergent Validity Analysis

Construct (F) and Indicators (V)	Standardized Loading	t value	Reliability Indicators	Composite Reliability
Supply Chain Digitalization (F1)				
V1 electronic application for coordination with internal stakeholders	0.98	22.90	0.79	
V2 electronic application for coordination with external stakeholders	0.96	23.60	0.90	
V3 electronic application to process administrative activities.	0.94	26,40	0.93	0.90
V4 electronic applications used in real-time.	0.92	26.30	0.92	
V5 the electronic application used is accurate.	0.90	26,25	0.91	
V6 reliable electronic applications.	0.88	26,20	0.90	
Green Supply Chain (F2)				
V7 The company has the right system regarding green issues	0.79	18.83	0.46	
V8 The company plans to purchase green raw materials	0.77	15.23	0.51	
V9 The company implements green production processes	0.75	15.20	0.50	0.85
V10 The company uses a green distribution system	0.72	15.19	0.49	
V11 company and external (suppliers and customers) jointly address environmental issues	0.69	15.15	0.48	
Supply Chain Resilience (F3)				
V12 companies have systems that can quickly warn of supply chain disruptions	0.82	16.34	0.30	
V13 companies have systems that can quickly respond or adapt to supply chain disruptions	0.81	16.33	0.29	
V14 the company has a system that can quickly restore operational conditions to normal after a supply chain disruption	0.80	16.32	0.28	0.80
V15 the company has sufficient resources to deal with supply chain disruptions	0.79	16.31	0.27	
Competitiveness (F4)				
V16 Lower production costs than competitors	0.93	25,20	0.25	
V17 Lower distribution costs than competitors	0.87	21.00	0.67	
V18 selling price is lower than the competitors	0.84	18.25	0.50	
V19 reputation for better quality than competitors	0.89	22,29	0.79	
V20 uniqueness of the product from the customer's point of view	0.93	21.28	0.78	0.75
V21 customers are loyal to the product compared to competitors	0.92	19,27	0.77	
V22 Delivery accuracy is better than competitors	0.91	18.26	0.75	
MSMEs Performance (F5)				
V23 Financial performance	0.93	15.30	0.62	
V24 Non-Financial Performance	0.92	15,28	0.61	0.70

Source: Processed Data (2023)

Table 3. The Goodness Fit Model Indices

Combined Model										Structural Models		
Chi-square	DF	χ^2/df	GFI	AGFI	CFI	NFI	NNFI	RMR	RMSEA	RFI	RPR	RPFI
347.53	150	2,31	0.88	0.90	0.91	0.93	0.89	0.03	0.04	0.98	0.49	0.50

Source: Processed Data (2023)

Table 4. Structural Model Path Coefficient

Dependent Variable	Independent Variable	Standardized path coefficient	t value	Square Multiple Correlation (r ²)
Competitiveness	Supply Chain Digitalization	0.80	15.30*	0.85
	Green Supply Chain	0.77	14.50*	
	Supply Chain Resilience	0.73	13.90*	
MSMEs performance	Competitiveness	0.70	13.10*	0.95

Source: Processed Data (2023)

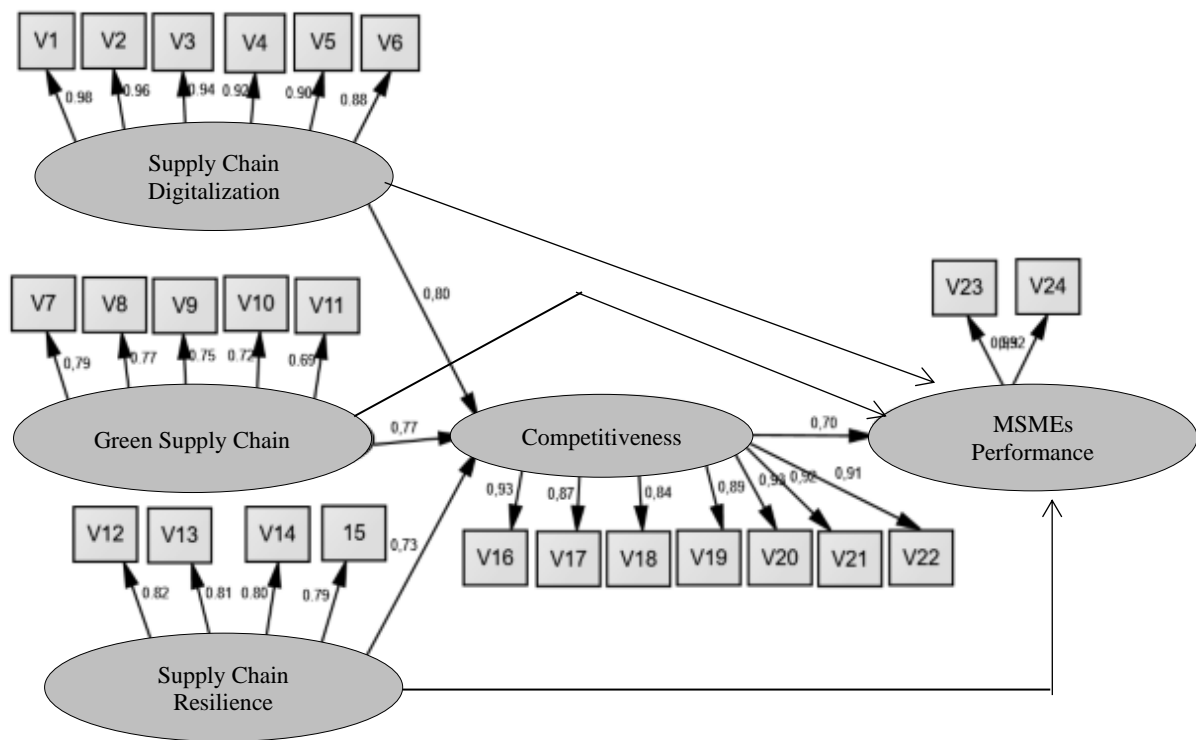


Figure 2. Standardized Path Coefficient

Hypothesis testing

Table 4 presents information related to the results of hypothesis testing, the results of the path coefficient associated with the effect of Supply Chain Digitalization → Competitiveness with a

value of 0.80; Green Supply Chain → Competitiveness with a value of 0.77; Supply Chain Resilience → Competitiveness with a value of 0.73; Competitiveness → MSMEs Performance with a value of 0.70. Furthermore, "Competitiveness", as

the dependent variable, obtained an r^2 value of 0.85, and "MSMEs Performance" had an r^2 value of 0.95. Kline (2016) stated that the r^2 influence size categories are small 0.02, medium 0.13, and large 0.26. So, it can be concluded that the Competitiveness and Performance of MSMEs have a very high contribution. The results of the path analysis can be seen in Table 4.

Sobel test

The Sobel test is carried out to test whether a variable can be an intervening variable. When there is an intervening variable, a mediating effect will usually appear with an indirect influence on the direct relationship between the two variables (Hayes, 2004). This study tests whether Competitiveness indirectly influences the relationship between Supply Chain Digitalization, Green Supply Chain, and Supply Chain Resilience on MSMEs Performance.

$$Sab = \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2}$$

The influence of Supply Chain Digitalization (X1) on MSMEs Performance (Y) through Competitiveness (Z). The Sobel test statistic value is 5.26, which means it is greater than 1.96. It can be concluded that the Competitiveness (Z) is an intervening variable between the Supply Chain Digitalization (X1) and MSMEs Performance (Y).

The influence of Green Supply Chain (X2) on MSMEs Performance (Y) through Competitiveness (Z). The Sobel test statistic value is 5.10, which means it is greater than 1.96. It can be concluded that Competitiveness (Z) is an intervening variable between the Green Supply Chain (X2) and MSMEs Performance (Y).

The influence of Supply Chain Resilience (X3) on MSMEs Performance (Y) through Competitiveness (Z). The Sobel test statistic value is 4.63, which means it is greater than 1.96. It can be concluded that the Competitiveness (Z) is an intervening variable between the Supply Chain Resilience (X3) and MSMEs Performance (Y).

DISCUSSION

Supply Chain Digitization and Competitiveness

Supply chain digitization has a positive and significant effect on competitiveness. It shows that supply chain digitization is essential to create com-

petitiveness. The results support the research by (Fahad and Nwagwu, 2023) that there is a positive relationship between Supply Chain Digitalization and Competitiveness. Based on this information, it can be concluded that there is a significant relationship between supply chain digitalization and the competitiveness of MSMEs in Pamekasan Regency. This condition shows that digitalization of the supply chain can improve a company's competitiveness. This research aligns with research that states that the digitalization of the supply chain affects competitiveness (Harsono and Kiswara, 2022; Novianti et al., 2022; Bjorkdahl, 2020).

Green Supply Chain and Competitiveness

Green supply chains have a positive and significant effect on competitiveness. It shows that a green supply chain is very important for creating competitiveness. Based on this information, it can be concluded that there is a significant influence between the Green Supply Chain and the Competitiveness of MSMEs companies in Pamekasan Regency. Therefore, the described Green Supply Chain can have an impact on the Competitiveness of the company. Furthermore, the company's competitiveness, such as having better delivery accuracy than competitors and customers who are loyal to the product compared to competitors, is a solid basis for the company to compete (Çankaya and Sezen, 2019; Chhabra et al., 2021; Novitasari and Tarigan, 2022). This condition shows that with a good Green Supply Chain system, environmental problems can be solved jointly by companies, suppliers or customers (Dong et al., 2021; Nguyen and Le, 2020; Xi et al., 2022; Gazali and Zainurrafiqi, 2023). One of them is a Green Supply Chain system, which will increase production efficiency and require less time and resources. This efficiency can also reduce production and distribution costs to make product selling prices more competitive. In addition, product delivery times will be more precise so that customers will feel happy and customer loyalty will increase. This research is in line with research which states that Green Supply Chain affects company Competitiveness (Rozudin and Mahbubah, 2021; Pellondou and Santosa, 2022; Kustianti and Murwaningsari, 2023).

The company's ability to implement green purchasing management is a unique ability to improve company performance. Therefore, green

supplier management is also possibly called green purchasing management, which has an impact on various aspects of company performance. For example, a company can reduce production costs by involving its suppliers in several green initiatives, such as material recycling, environmentally friendly packaging, and efficient energy use. In addition to production costs, green supplier management also has an impact on product quality because responsible green suppliers can help companies reduce the number of defective products and increase product reliability and consistency (Basana et al., 2022a; Basana et al., 2022b; Siagian et al., 2022).

Supply Chain Resilience and Competitiveness

Supply Chain Resilience has a positive and significant effect on Competitiveness, and this shows that Supply Chain Resilience is very important to create Competitiveness. Based on this information, it can be concluded that Supply Chain Resilience has a significant effect on the Competitiveness of companies among MSMEs in Pamekasan Regency. With a robust supply chain resilience system, companies will adapt more quickly to supply chain disruptions to prepare resources to survive immediately and return to normal conditions. It also has a good impact on the company, where product delivery will always be on time and quantity even if supply chain disruptions occur, so customer loyalty to the product and the company can increase. This research aligns with research stating that Supply Chain Resilience influences a company's Competitiveness (Behl, 2022; Cagliyan et al., 2022; Abeysekara et al., 2019; Liu and Lee, 2018). Several studies show that a resilient company can be seen from its growth indicators, for example, the company's finances and robustness. These studies emphasize the importance of a strong supply chain to measure a company's competitive advantage. Companies with high supply chain resilience will be strong and grow significantly in crises, thereby minimizing losses (Tarigan et al., 2018; Tarigan et al., 2019; Zhou et al., 2022). Next, innovation sustainability in business operations will help companies win the competition through productivity and profits. Therefore, a company with good supply chain resilience will have a competitive advantage, so it can grow faster and win the competition from its competitors. Research conducted by (Abeysekara et al., 2019 Yu et al., 2021 and Zadeh

et al., 2020) shows that supply chain resilience affects company performance and competitive advantage.

Competitiveness and MSMEs performance

Competitiveness has a positive and significant effect on MSMEs performance, and this shows that Competitiveness is very important to create MSMEs performance. The test results state that competitiveness has a significant impact on the MSME performance. The positive path coefficient means that high competitiveness can support improvement in MSMEs performance. Thus, the higher the Competitiveness of MSMEs performance, the more increasing. The findings of this research are able to prove the existence of Porter's competitive advantage theory that competition is the core of a company's success and failure, as well as determining the appropriateness of company activities that can support the company's operational performance. The findings of this research, both in terms of description and measurement model of indicators for competitiveness, are very priority in their application according to respondents' assessments and have a dominant contribution in reflecting the company's competitiveness (Ricardianto et al., 2023; Siagian et al., 2022). In addition, it supports the opinion that high-quality performance is very important for the success of operations and can influence the company's competitive advantage position.

Apart from that, the findings of this research are consistent with the opinion of (Hamel, 2002), stating that based on the competency approach, competitiveness sources come from strategy, structure, competence, and innovation, as well as tangible and intangible resources. The findings of this research strengthen the opinions expressed Heizer et al. (2020), Das and Canel (2023), and Menike (2019) that apart from various vital elements in operations, quality is the key to a company's success in carrying out its operations. In addition, it supports the opinion that high-quality performance is critical to successful operations and can influence a company's competitive advantage position (Krajewski and Ritzman, 2010; Peng and Schroeder, 2011; Afraza et al., 2021; Kim, 2006). The results of interviews with respondents stated that the flexibility of companies and business partners, especially suppliers, in meeting supply needs can incre-

ase the company's ability to serve diverse consumer demands and tastes, resulting in a reduction in costs, stockouts, and lead time. In addition, the company's operational performance can always be achieved following the targets planned by the company's management. The conclusion that can be formulated is that competitiveness benefits the improvement of MSMEs performance. The results of this study are consistent with the findings of several previous researchers Giménez and Ventura (2005), Kim (2006), Richey et al. (2009), Amar (2020), Zainurrafiqi et al. (2020a), Gazali and Zainurrafiqi (2023), Zainurrafiqi et al. (2020b), Zainurrafiqi (2018), and Zainurrafiqi and Hidayati (2021) that high competitiveness can directly improve the company's operational performance.

Mediation Role of Competitiveness

The results of the Sobel test calculation show an influence of Supply Chain Digitalization, Green Supply Chain and Supply Chain Resilience on MSMEs Performance, which is mediated by Competitiveness. These results can be concluded that Competitiveness (Z) can mediate the influence of Supply Chain Digitalization (X1), Green Supply Chain (X2) and Supply Chain Resilience (X3) on MSMEs Performance (Y). This is in line with research by Liu and Weisheng (2021), Novitasari and Tarigan (2022), and Hadi and Herianingrum (2020), which shows research results that Supply Chain Digitalization, Green Supply Chain and Supply Chain Resilience have a positive influence on MSMEs Performance with Competitiveness as a mediating variable.

IMPLICATIONS

MSMEs need to allocate a budget for developing applications and supply chain systems within the company. This is because the digitalization of the supply chain provides a solid foundation for the companies' competitive advantage. Companies must increase the resilience of their supply chains to survive the crisis and return to their original condition quickly. Finally, companies need to maintain and improve their competitive advantage because most competitors already know the importance of having a competitive advantage in running a business.

MSMEs managers can improve MSMEs

Performance by paying attention to Supply Chain Digitalization, Green Supply Chain, and Supply Chain Resilience, which will have an impact on realizing competitiveness. Applying Supply Chain Digitalization, Green Supply Chain, and Supply Chain Resilience practices can increase competitiveness and place the company more profitably in a tight competitive position. Sustainable Supply Chain Digitalization, Green Supply Chain, and Supply Chain Resilience practices will create competitiveness and improve MSMEs Performance in the long term. In creating competitiveness, the company must have efficient resources and capabilities. The competitiveness of supply chain operations is heightened and supports business. Digitalization is also helping to achieve a competitive edge by enhancing the overall performance.

RECOMMENDATIONS

This research only focuses on SME employees in Pamekasan with a sample size of 400 SME employees, so the research results cannot be generalized to other companies in other cities/regencies. Future research can expand the results by analyzing other cities and including large companies. This research aims to dig deeper into the role of Supply Chain Digitalization, Green Supply Chain, Supply Chain Resilience, Competitiveness and Performance of MSMEs over a certain period and their influence on Employee Performance. However, the effects of some variables may change over time, causing the results to change as well. Therefore, this research suggests that further research can develop research models to obtain more comprehensive results/information.

CONCLUSIONS

This research shows that Digitalization of the Supply Chain has a positive and significant effect on Competitiveness, Green Supply Chain has a positive and significant impact on Competitiveness, and Supply Chain Resilience has a positive and significant effect on Competitiveness. Competitiveness has a positive and significant effect on MSMEs Performance. Supply Chain Digitalization, Green Supply Chain and Supply Chain Resilience have positive and significant effects on MSMEs Performance, with Competitiveness as a mediating variable.

ACKNOWLEDGEMENTS

Direktorat Riset, Teknologi, dan Pengabdian kepada Masyarakat, Direktorat Jenderal Pendidikan Tinggi, Riset, dan Teknologi Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Tahun Anggaran 2023, Nomor SP DIPA- 023.17.1.690523/2023 revisi ke-4 tanggal 31 Maret 2023.

REFERENCES

- Abeyssekara, N., Wang, H., and Kurupparachchi, D. 2019. Effect of Supply Chain Resilience on Firm Performance and Competitive Advantage. A Study of the Sri Lankan Apparel Industry. *Business Process Management Journal*, 25(7), pp. 1673–1695.
- Afraz, M., Bhattia, S., Ferraris, A., and Couturier, J. 2021. The Impact of Supply Chain Innovation on Competitive Advantage in the Construction Industry: Evidence from a Moderated Multimediation Model. *Technological Forecasting and Social Change*, 120370, pp. 1–12.
- Agyabeng-Mensah, Y. and Ahenkorah, E. N. K. 2019. The Intermediary Role of Supply Chain Capability between Supply Chain Integration and Firm Performance. *Journal of Supply Chain Management Systems*, 8(2), pp. 32–39.
- Amar, Z. 2020. Effect of Innovation Capability and Blue Ocean Strategy on Competitive Advantage and Business Performance. *Journal of Islamic Economic Business FEBI Institut Dirosat Islamiyah Al-Amien Prenduan*, 2(2), pp. 73–100.
- Anderson, J. C. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-step Approach. *Psychological Bulletin*, 103, pp. 411–423.
- Atikah, Z. S. N. 2014. Business Performance for SMEs: Subjective or Objective Measures?. *Rev. Integr. Bus. Econ. Res*, 3(1), pp. 391–401.
- Barbosa-Póvoa, A. 2009. *Sustainable Supply Chains*. Computer-Aided Chemical Engineering. Brazil, Elsevier, pp. 127–132.
- Basana, S., Siagian, H., Ubud, S., and Tarigan, Z. 2022. The Effect of Top Management Commitment on Improving Operational Performance through Green Purchasing and Green Production. *Uncertain Supply Chain Management*, 10(4), pp. 1479–1492.
- Basana, S. R., Suprpto, W., Andreani, F., and Tarigan, Z. 2022. The Impact of Supply Chain Practices on Green Hotel Performance Through Internal, Upstream, and Downstream Integration. *Uncertain Supply Chain Management*, 10(1), pp. 169–180.
- Behl, A. 2022. Antecedents to Firm Performance and Competitiveness Using the Lens of Big Data Analytics: A Cross-Cultural Study. *Management Decision*, 60(2), pp. 368–398.
- Bjorkdahl, J. 2020. Strategies for Digitalization in Manufacturing Firms. *California Management Review*, 62(4), pp. 17–36.
- Cagliyan, V., Attar, M., and Abdul-Kareem, A. 2022. Assessing the Mediating Effect of Sustainable Competitive Advantage on the Relationship between Organizational Innovativeness and Firm Performance. *Competitiveness Review: An International Business Journal*, 32(4), pp. 618–639.
- Çankaya, S. Y. and Sezen, B. 2019. Effects of Green Supply Chain Management Practices on Sustainability Performance. *Journal of Manufacturing Technology Management*, 30, pp. 98–121.
- Chhabra, D., Singh, R. K., and Kumar, V. 2021. Developing IT-Enabled Performance Monitoring System for Green Logistics: A Case Study. *International Journal of Productivity and Performance Management*, 71(3), pp. 775–789.
- Chiu, K. P. L. 2021. Supply Chain 4.0: The Impact of Supply Chain Digitalization and Integration on Firm Performance. *Asian Journal of Business Ethics*, 10, pp. 371–389.
- Chowdhury, M. M. 2016. Supply Chain Readiness, Response and Recovery for Resilience. *Supply Chain Manag*, 21, pp. 709–731.
- Christopher, M. P. H. 2004. Building the Resilient Supply Chain. *Int J Logist Manag*, 15, pp. 1–14.
- Closs, D. J. 2004. Enhancing Security throughout the Supply Chain. *IBM Center for the Business of Government*.
- Das, S. and Canel, C. 2023. Linking Manufacturing and Competitive Strategies for Successful Firm Performance: A Review and Reconceptualization. *Journal of Strategy and Management*, 16(1), pp. 148–172.

- Dian, N. M. 2022. Assessing the Impact of Green Supply Chain Management, Competitive Advantage and Firm Performance in PROPER Companies in Indonesia. *Operations and Supply Chain Management*, 15(3), pp. 395–406.
- Dinh, T. N., Kuo, K. C., Lu, W. M., and Nguyen, D. T. 2023. The Effect of Quantitative Easing on Asian Construction Firms' Performance. *International Journal of Construction Management*, 23(1), pp. 38–47. DOI: <https://doi.org/10.1080/15623599.2020.1846887>.
- Dong, Z., Tan, Y., Wang, L., Zheng, J., and Hu, S. 2021. Green Supply Chain Management and Clean Technology Innovation: An Empirical Analysis of Multinational Enterprises in China. *Journal of Cleaner Production*, 310(127377), pp. 1–10.
- Fahad, Saddique and Nwagwu, Urenna. 2023. Implementation of Digitalization Supply Chain Helps in Gaining of Competitive Advantages as Mediating Role in the Supply Chain Performance in Construction Organization in Pakistan under the Creative Common Attribution Non-Commercial 4.0. *Critical Discourse Studies*, 1(1), pp. 14–27.
- Fornell, C. and Larcker, D. F. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), pp. 39. DOI: <https://doi.org/10.2307/3151312>.
- Ganbold, O., Matsui, Y., and Rotaru, K. 2020. Effect of Information Technology-Enabled Supply Chain Integration on Firm's Operational Performance. *Journal of Enterprise Information Management*, 34(3), pp. 948–989.
- Gareche, M., Hosseini, S. M., and Taheri, M. 2017. A Comprehensive Literature Review in Competitive Advantages of Businesses. *International Journal of Advanced Studies in Humanities and Social Science*, 6(4), pp. 312–329.
- Gazali, Gazali and Zainurrafiqi. 2023. The Effect of Green Entrepreneur Orientation on Network Resource Acquisition and Small and Medium Enterprises' Business Performance with Knowledge Transfer and Integration and Green Technology Dynamism as Moderator Variables. *Indonesian Interdisciplinary Journal of Sharia Economics*, 6(1), pp. 136–153.
- Giménez, Cristina and Ventura, Eva. 2005. Logistics-Production, Logistics-Marketing and External Integration: Their Impact on Performance. *International Journal of Operations and Production Management*, 25. pp. 20–38. DOI: 10.1108/01443570510572222.
- Gorbach, G. 2017. The Great Digitization of Industry. *Supply Chain Management Review*, pp. 24–29.
- Hamel, G. 2002. *Competing for the Future*. Business School Press.
- Harsono, H. and Kiswara, G. 2022. The Impact of Digital Supply Chains on Organizational Performance: An Empirical Study in the Defense Industry. *Journal of Industrial Engineering and Management Research*, 3(6), pp. 80–90.
- Hayes, K. J. P. 2004. SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models. *Behavior Research Methods, Instruments, and Computers*, 36, pp. 717–731.
- Heizer, B., Render, and C. M. 2020. *Principles of Operations Management: Sustainability and Supply Chain Management (11th Edition)*. Pearson Education.
- Kang, S. and Na, Y. N. 2020. Effects of Strategy Characteristics for Sustainable Competitive Advantage in Sharing Economy Businesses on Creating Shared Value and Performance. *Sustainability*, 12(1397), pp. 2–21.
- Kaplan, D. 2009. *Structural Equation Modeling: Foundations and Extensions (2nd ed)*. SAGE Publications, Inc.
- Kim. 2006. The Effect of Supply Chain Integration on the Alignment between Corporate Competitive Capability and Supply Chain Operational Capability. *Int. J. Opera. Prod. Manag.*, 26(10), pp. 1084–1107.
- Kline, R. 2016. *Principles and Practice of Structural Equation Modeling (Fourth Ed)*. The Guilford Press.
- Krajewski, L. J. and Ritzman, L. P. 2010. *Operations Management: Process and Supply Chains (9th ed)*. Pearson.
- Kustianti, A. R. and Murwaningsari, E. 2023. The Influence of Green Organizational Culture, Green Supply Chain Management on Com-

- pany Performance. *Journal of Financial and Business Accounting*, 16(1), pp. 20–29.
- Lee, V. H., Ooi, K. B., Chong, A. Y. L., and Lin, B. 2015. A Structural Analysis of Greening the Supplier, Environmental Performance and Competitive Advantage. *Production Planning and Control*, 26(2), pp. 116–130.
- Legner, C., Eymann, T., Hess, T., Matt, C., Böhmman, T., Drews, P., Mädche, A., Urbach, N., and Ahlemann, F. 2017. Digitalization: Opportunity and Challenge for the Business and Information Systems Engineering Community. *Business and Information Systems Engineering*, 59(4), pp. 301–308.
- Liu, C. L. and Lee, M. 2018. Integration, Supply Chain Resilience, and Service Performance in Third-Party Logistics Providers. *The International Journal of Logistics Management*, 29(1), pp. 5–21.
- Liu, K. P. and Weisheng, C. 2021. Supply Chain 4.0: The Impact of Supply Chain Digitalization and Integration on Firm Performance. *Asian Journal of Business Ethics*, 10, pp. 371–389.
- Magretta, J. 1998. The Power of Virtual Integration: An interview with Dell Computer's Michael Dell. *Harvard Business Review*, 76(2), pp. 72–84.
- Menike, L. 2019. Effect of Financial Literacy on Firm Performance of Small and Medium Enterprises in Sri Lanka. *SSRN Electronic Journal*, pp. 1–25.
- Nanyang, Zhao and Hong, Jiangtao. 2023. Impact of Supply Chain Digitalization on Supply Chain Resilience and Performance: A Multi-Mediation Model. *International Journal of Production Economics*, 259, pp. 108817.
- Nawawi, I. 2014. *Riyadhus Shalihin*. In carihadis.com. Pustaka Al-Kautsar.
- Nguyen, X. and Le, T. 2020. The Impact of Global Green Supply Chain Management Practices on Performance: The Case of Vietnam. *Uncertain Supply Chain Management*, 8(3), pp. 523–536.
- Nkuda, M. O. 2016. Strategic Agility and Competitive Advantage: Exploration of the Ontological, Epistemological and Theoretical Underpinnings. *British Journal of Economics, Management and Trade*, 16(1), pp. 1–13.
- Novianti, T., Cahyadi, I., Utami, I. D., Anggraeni, N. E., and Sunawan, W. 2022. *Supply Chain Management: Engineering Methods*. Media Nusa Creative (MNC Publishing).
- Novitasari, M. and Tarigan, Z. J. H. 2022. The Role of Green Innovation in the Effect of Corporate Social Responsibility on Firm Performance. *Economies*, 10(117).
- Oh, S. Y. U. and Ryu, H. Y. 2019. Interaction Effects between Supply Chain Capabilities and Information Technology on Firm Performance. *Information Technology and Management*, 20(2), pp. 91–106.
- Pålsson, H. and Kovács, G. 2014. Reducing Transportation Emissions: A Reaction to Stakeholder Pressure or a Strategy to Increase Competitive Advantage. *International Journal of Physical Distribution and Logistics Management*, 44(4), pp. 283–304.
- Pellondou, D. C. and Santosa, W. 2022. The Influence of Supply Chain Integration Capabilities on Sustainability Performance with Green Supply Chain Management. *Innovation*, 18(4), pp. 717–728.
- Peng, R. G. and Schroeder, R. S. 2011. Competitive Priorities, Plant Improvement and Innovation Capabilities, and Operational Performance: A Test of Two Forms of Fit. *J. Opera. Prod. Manag.*, 31(5), pp. 484–510.
- Pettit, T. J. and Fiksel, J. C. K. 2010. Ensuring Supply Chain Resilience: Development of a Conceptual Framework. *J. Bus. Logist*, 31, pp. 1–21.
- Ploenhad, J. 2019. Mediating Role of Competitive Advantage on the Relationship of Supply Chain Management and Organizational Performance on the Food Industry of Thailand. *International Journal of Supply Chain Management*, 8(4), pp. 216–226.
- Pu, Guoli. 2023. Effect of Supply Chain Resilience on Firm's Sustainable Competitive Advantage: A Dynamic Capability Perspective. *Environmental Science and Pollution Research*, 30, pp. 4881–4898.
- Ricardianto, P., Lembang, A., Tatiana, Y., Rumin-da, M., Kholdun, A., Kusuma, I., and Endri, E. 2023. Enterprise Risk Management and Business Strategy on Firm Performance: The Role of Mediating Competitive Advantage. *Uncertain Supply Chain Management*, 11(1), pp. 249–260.

- Richey, H., Chen, R., Upreti, S. E., and Fawcett, F. A. 2009. The Moderating Role of Barriers on the Relationship between Drivers to Supply Chain Integration and Firm Performance. *Int. J Phys. District. Logistics*, 39 (10), pp. 826–840.
- Rozudin, M. and Mahbubah, N. 2021. Implementation of the House of Risk Method in Green Supply Chain Risk Management for Bogie S2hd9c Products (Case Study: PT Barata Indonesia). *JISI: Journal of Industrial System Integration*, 8(11), pp. 1–11.
- Safkaur, H. L. 2019. Impact of Business Strategy on the Management Accounting: The Case of the Production of State-Owned Enterprises in Indonesia, South Sumatra. *Journal of Asian Business Strategy*, 9(1), pp. 29–39.
- Sanders, N. and Swink, M. 2020. Digital Supply Chain Transformation: Visualizing the Possibilities. *Logistics Management (2002)*, 59 (3), pp. 42–48.
- Schumacker, R. E. and Lomax, R. 2004. *A Beginner's Guide to Structural Equation Modeling (Second edition)*. Lawrence Erlbaum Associates.
- Siagian, H., Tarigan, Z. J. H., and Basana, R. 2022. The Role of Top Management Commitment in Enhancing Competitive Advantage: The Mediating Role of Green Innovation, Supplier and Customer Integration. *Uncertain Supply Chain Management*, 10(2), pp. 477–494.
- Siagian, H., Tarigan, Z. J. H., and Jie, F. 2021. Supply Chain Integration Enables Resilience, Flexibility, and Innovation to Improve Business Performance in the COVID-19 Era. *Sustainability*, 13(4669).
- Singh, A. P. S. K. J. K. D. P. A. K. 2017. Productivity, Quality and Business Performance: An Empirical Study. *International Journal of Productivity and Performance Management*, 66(1), pp. 78 – 91.
- Sri, H. N. H. 2020. The Influence of Supply-Chain Resilience on Competitive Advantage and Firm Performance. *International Journal of Supply Chain Management*, 9(4), pp. 440–446.
- Srivastava, S. K. 2007. Green Supply-Chain Management: A State-of-the-Art Literature Review. *International Journal of Management Reviews*, 9(1), pp. 53–80.
- Tarigan, Z. J. H., Basana, S. R., and Suprpto, W. 2018. Enterprise Resources Planning Project Manager Competency on Improving Organizational Performance through Process Design and Quality Performance. *ICEBT 2018: Proceedings of the 2nd International Conference on E-Education, E-Business and E-Technology*, pp. 153–157.
- Tarigan, Z. J. H., Siagian, H., Basana, S. R., and Jie, F. 2019. Effect of Key User Empowerment, Purchasing Strategy, Process Integration, Production System to Operational Performance. *E3S Web of Conferences*, 130, pp. 01042.
- Varanavicius, V. and Navikaite, A. 2016. The Link between Competitive Advantage and Environmental Sustainability. *Journal of Economics and Finance*, 7(6), pp. 2321–5925.
- Walker, H., Di Sisto, L., and McBain, D. 2008. Drivers and Barriers to Environmental Supply Chain Management Practices: Lessons from the Public and Private Sectors. *Journal of Purchasing and Supply Management*, 14(1), pp. 69-85.
- Wang, J. X. 2018. The Impact of Green Supply Chain Management Practices on Competitive Advantages and Firm Performance. *Environmental Sustainability in Asian Logistics and Supply Chains*, pp. 121–134.
- Wu, K. J., Tseng, M. L., Chiu, A. S. F., and 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, pp. 96–107.
- Xi, M., Fang, W., and Feng, T. 2022. Green Intellectual Capital and Green Supply Chain Integration: The Mediating Role of Supply Chain Transformational Leadership. *Journal of Intellectual Capital, Production Planning and Control*, 26(12), pp. 100-130.
- Xu, J., Yu, Y., Wu, Y., Zhang, J. Z., Liu, Y., Cao, Y., and Eachempati, P. 2022. Green Supply Chain Management for Operational Performance: Antecedent Impact of Corporate Social Responsibility and Moderating Effects of Relational Capital. *Journal of Enterprise Information Management, The International*

- al Journal of Logistics Management*, 29(1), pp. 22–34.
- Yildiz-Çankaya, S. and Sezen, B. 2019. Effects of Green Supply Chain Management Practices on Sustainability Performance. *Journal of Manufacturing Technology Management*, 30(1), pp. 98-121.
- Yu, Y., Huo, B., and Zhang, Z. 2021. Impact of Information Technology on Supply Chain Integration and Company Performance: Evidence from Cross-Border E-Commerce Companies in China. *Journal of Enterprise Information Management*, 34(1), pp. 460-489.
- Zadeh, A., Ramayah, T., Hanifah, H., Kurnia, S., and Mahmud, I. 2020. Supply Chain Information Integration and Its Impact on the Operational Performance of Manufacturing Firms in Malaysia. *Information and Management*, 57(8).
- Zainurrafiqi, Rachmawati, R., Putri, D. L. P., Resdiana, E., Widyastuti, E., Asy'ari, Q., and Rusdiyanto, W. H. 2020a. The Determinants and Consequents of Competitive Advantage Based on Local Wisdom at the Micro, Small, and Medium Enterprise: Evidence from Indonesia. *Solid State Technology*, 63 (6), pp. 1604–1620.
- Zainurrafiqi, Zainurrafiqi. 2018. Revisiting the Role of Antecedents of Micro, Small and Medium Enterprises (MSME) Performance and Democratic Variables Using the Variance Analysis Method. *Economics Journal of Economics*, 11(1), pp. 1-65.
- Zainurrafiqi and Hidayati, Nurul. 2021. Pengaruh Financial Literacy terhadap Financial Behavior dan Firm Performance dengan Religiosity sebagai Variabel Moderasi (Survey pada Usaha Mikro Kecil Menengah di Madura). *Public Corner*, 16(2), pp. 100–118.
- Zainurrafiqi, Z., Gazali, Nuzulul, Q., and Nurul, H. 2020b. The Effect of Organization Learning Capability and Organizational Innovation on Competitive Advantage and Business Performance. *Russian Journal of Agricultural and Socio-Economic Sciences*, 3, pp. 9-17. DOI: 10.18551/rjoas.2020-03.02.
- Zhen, J., Xie, Z., and Dong, K. 2021. Impact of IT Governance Mechanisms on Organizational Agility and the Role of Top Management Support and IT Ambidexterity. *International Journal of Accounting Information Systems*, 40, pp. 1-15. DOI: <https://doi.org/10.1016/j.accinf.2021.100501>.
- Zhou, J., Hu, L., Yu, Y., Zhang, J. Z., and Zheng, L. 2022. Impacts of IT Capability and Supply Chain Collaboration on Supply Chain Resilience: Empirical Evidence from China in the COVID-19 Pandemic. *Journal of Enterprise Information Management*, 35(4), pp. 120-138.