



The Role of Competitive Advantage in Implementing Supply Chain Management to Support Employee Performance in Batik SMEs in Pekalongan, Indonesia

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ABSTRACT

Purpose: The purpose of this study is to explore how competitive advantage mediates the effect of supply chain management implementation on employee performance in small and medium batik businesses in Pekalongan, Indonesia.

Design/methodology/approach: Using quantitative descriptive research design and sampling technique using questionnaires for sample collection of 150 batik small and medium enterprises actors. This study evaluates the proposed hypothesis by analyzing the primary data with SmartPLS 4.

Findings: The research results found that the implementation of supply chain management has the effect of increasing competitive advantage, and competitive advantage has an impact on employee performance. Another finding is that competitive advantage plays a mediating role in the influence of supply chain management on employee performance. This paper shows how the application of supply chain management and competitive advantage can improve employee performance. There is a pseudo-mediated relationship between the implementation of supply chain management, competitive advantage and employee performance.

Research limitations/implications: This finding implies that batik small and medium entrepreneurs must implement supply chain management to improve competitive advantage. To enhance employee performance, small and medium-sized Batik entrepreneurs need to strengthen the connection between supply chain management and competitive advantage.

Originality/value: The value of this research lies in expanding the scientific discussion on the relationship between supply chain management, competitive advantage and employee performance by placing competitive advantage as a mediator. This study emphasizes the interplay between supply chain management, competitive advantage, and employee performance, with Resource Based Theory serving as the theoretical framework. This research is the first to examine the relationship between supply chain management, competitive advantage, and employee performance within the Batik sector for small and medium-sized enterprises.

Keywords: Batik, Quantitative Descriptive, Competitive advantage, Employee Performance, Mediating role, Supply chain management

I. Introduction

Pekalongan is a city whose territory is on the coast of the island of Java, Indonesia. The city of Pekalongan is well known as an icon of the batik industry in

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Indonesia. The batik industry predominantly consists of Micro, Small, and Medium Enterprises, commonly known as Batik SMEs. The main obstacles faced by Pekalongan Batik SMEs are the supply of raw materials is not smooth, distribution to consumers is slow, reduced consumer demand for batik, lack of professional assistance, and obstacles to motivation to always be consistent in entrepreneurship (Rachmawati et al., 2022). Other obstacles from a financial perspective relate to funding (internal and external) and entrepreneurial dimension constraints (Beckert & Wehinger, 2013; Trinh et al., 2021; Winton & Yerramilli, 2015). These many obstacles have caused a slowdown in the growth of the Batik SME business. This is an encouragement and challenge for researchers to conduct more in-depth studies.

Adopting supply chain management (SCM) has emerged as a highly valuable and effective strategy for enhancing organizational performance, as competition has shifted from being between individual organizations to being between entire supply chains. Therefore, only companies that have implemented SCM effectively can win their business (Costa et al., 2023). Likewise, if applied to Batik SMEs, then only SMEs that have implemented SCM will be able to improve their performance (Almanei et al., 2017; Costa et al., 2023; Sarkar et al., 2021). To ensure smooth business operations and effective distribution of products to consumers, sufficient equipment is necessary to support the production process. Supply chain management software (SCM) is software used to manage all processes related to purchasing raw materials, production, delivery and sales of products or services (Buxmann et al., 2004; Haulder et al., 2019; Hsu, 2016).

A key weakness of SMEs is their lack of competitive advantage in the products they offer. This condition causes difficulties in overcoming competitors, increasing efficiency and organizational performance (Al Badi, 2018; Anwar, 2018; Razali et al., 2018; Wongsansukcharoen & Thaweepaiboonwong, 2023). SMEs that have a competitive advantage enable cost efficiency, seize market opportunities, and avoid competitors' threats (Hanifa et al., 2023; Kalaitzi et al., 2019). In addition, companies with competitive advantages can perform

better than competitors, innovate, have products that are better value, and more useful than competitors, customers feel that their products have higher value and benefits (Ali et al., 2022; Kovalenko et al., 2021).

Research on Pekalongan Batik is still rarely done. Especially if it is related to the implementation of supply chain management and competitive advantage in the performance of Pekalongan Batik SMEs (Kasmari et al., 2020). In general, researchers are more interested in applying SCM and competitive advantage to manufacturing industrial businesses. Literature and research objects related to SCM have been carried out in developed countries and large-scale manufacturing companies (Doan, 2020). In contrast, the fact is that developing countries and small and medium industries face more real challenges related to the complexity of implementing SCM (Anwar, 2018).

This study seeks to empirically evaluate how the application of supply chain management and competitive advantage impacts employee performance in batik SMEs in Pekalongan during the Industry 4.0 era. By understanding the challenges and opportunities faced by batik SMEs, it is hoped that this research can provide appropriate recommendations and solutions to improve employee performance in batik micro, small and medium enterprises (SMEs) in a society that continues to develop (Muñoz-Pascual et al., 2021).

The novelty of this research is the effort to combine two main concepts, namely the application of supply chain management and competitive advantage, which is an innovative step. Supply chain management is a major trend in today's business world, while competitive advantage is an important factor in improving the performance of small and medium businesses (Aloqool et al., 2022; Ploenhad et al., 2019). Examining how the application of SCM and competitive advantage are interrelated and influence each other through competitive advantage itself is a step forward that can provide new insights. Therefore, research on the implementation of SCM and competitive advantage for Batik SMEs is important. This is because operational efficiency, good supply chain management can help Batik SMEs to improve their operational efficiency,

such as effective management of raw materials, production, distribution, shipping can reduce operational costs, time, and risk. Competitiveness in the Global Market, Batik SMEs can meet global quality standards and international consumer needs. By choosing the right suppliers and ensuring efficient production processes, Batik SMEs can produce high-quality products, which is one of the keys to achieving competitive advantage. Business sustainability is carried out by minimizing waste and increasing resource sustainability, as well as building a positive image in the eyes of consumers who are increasingly concerned about sustainable business practices. Competitive advantage can be design innovation, product quality, or cost efficiency obtained through an effective supply chain. Improving the performance of Batik SMEs, Batik SMEs can achieve better performance, including increasing productivity, revenue, and profitability.

II. Literature Review

Employee performance is the ability of employees to fulfil their duties in achieving the goals set by the company (Kim, 2024). Employee performance is measured based on how well employees meet the performance criteria set by the company, including for small and medium enterprises (SMEs).

Employee performance, especially for SME employees, can be understood through Resource Based Theory. This theory offers a framework for emphasizing and forecasting the impact of Supply Chain Management and competitive advantage. This aims to outline imperfect company resources that have the potential to become the main source for improving employee performance by implementing supply chain management and sustainable competitive advantage (Barney, 1991).

A. Implementation of Supply Chain Management in SMEs

Batik SMEs face intense competition in the era of globalization as they strive to survive and thrive in the market. Therefore, a strategy is needed to survive and develop. One strategy that can be applied in developing Batik SMEs is supply chain management (Kumaran & Jeyachandran, 2022; Paliwal et al., 2020). Supply chain management encompasses the entire process, beginning with the procurement of raw materials from suppliers, through company operations, and extending to the distribution of products to consumers. This concept is the key to the process of implementing supply chain management in business to carry out integration from suppliers to end users (Muysinaliyev & Aktamov, 2014; Treiblmaier et al., 2020). Meanwhile, Gonzalez-Loureiro et al. (2015) illustrate SCM as the systemic and strategic coordination of traditional business functions and tactics across these business functions within a particular company and across businesses in the supply chain. Another definition of SCM is the coordination of production, inventory, location, and transportation among participants in a supply chain to achieve the best mix of responsiveness and efficiency for the markets served to maximize customer satisfaction and to increase competitive advantage (Chileshe & Phiri, 2022; Kot et al., 2018; Naslund & Williamson, 2010; Zhang et al., 2016).

Successful implementation of SCM enables the delivery of prompt service with distinctive and high-quality products. This enhances customer retention and ultimately boosts profitability. Overall, applying supply chain management in Batik SMEs is anticipated to enhance their performance and competitiveness.

B. Competitive Advantage in SMEs

There are numerous differing views on the concept of competitive advantage. When a company can produce something that competitors do not, it can be called a competitive advantage (Rahyuda et al.,

2018). While explaining that competitive advantage is a company's ability to create value that cannot be imitated by existing competitors. In his research, competitive advantage is a company's ability to create a position that can be defended against competitors (Basar, 2015; Horng et al., 2023). Competitive advantage is an organization's ability to create a defensive position against its competitors. Companies that have implemented competitive advantages will imply the creation of systems that have unique advantages over competitors (Li et al., 2006).

Competitive advantage is the extent to which an organization is able to create a defensible position above its competitors. Based on previous literature, Azeem et al. (2021) explain a research framework for competitive capabilities and define the following five dimensions: competitive price, premium price, customer value quality, reliable delivery, and product innovation.

Competitive Advantage can be achieved through quality control. Strict control, starting from product planning, the production process, until the product reaches the customer's hands. This is done to achieve the quality expected by customers and increased quality will reduce damaged products even at the zero percent level, thereby not only increasing customer satisfaction, but also increasing sales, as well as the competitive ability of small and medium businesses (Wahyudin et al., 2022; Yaskun et al., 2023).

Two conceptual models of competitive advantage for micro, small, and medium enterprises (SMEs). The first model focuses on external factors, which include market diversity, technological advancement, market appeal, product or industry life cycle, demand, and competitive intensity. 2). Internal factors include; innovation, quality, cost and structure creation, and flexible organizational systems (Putri & Yuniawan, 2016; Treiblmaier et al., 2020). Competitive advantage is one of the drivers for increasing company performance and can be measured based on a number of dimensions, such as market share, sales, growth and costs (Narwane et al., 2022; Pahlevi & Rahab, 2022). Network interactions provide opportunities for learning, because SME actors in their operational activities create

responses to changes in their environment. The advantage of SMEs is that they have fewer communication barriers compared to the function of sharing knowledge about these activities to help operational change in a strategic direction for the development of a larger organization (Wahyudin et al., 2022; Yaskun et al., 2023). Small medium enterprises will focus on a series of innovations based on ideas from customers, competitors and suppliers of products or raw materials, as well as processes to increase their advantages. These efforts are a more effective way to compete overall (Tilley et al., 2003). SME innovation will become a competitive advantage because SMEs always innovate, in the form of product, process and market innovation. The results of this innovation can increase or improve the competitive advantage of SMEs (Ratnawati, 2019).

In principle, the application of competitive advantage strategies in Batik SMEs is grouped into four categories. First, an integration strategy is a strategy that requires the company to carry out tighter supervision of its distributors, suppliers and competitors. Second, intensive strategy, namely a strategy that requires intensive efforts to improve the company's competitive position through existing products. Third, diversification strategy, namely a strategy intended to add new products. Fourth, survival strategy, namely a strategy carried out to save the life of the company so that it avoids greater losses, or in other words as an effort to avoid company bankruptcy (Hastutik & Novitaningtyas, 2021; Hatta et al., 2019; Mustaniroh et al., 2020).

C. Growth in SMEs Performance

As explained by Pham and Ha (2024), performance evaluation behavior is essentially part of the overall range of role behaviors carried out by all members of the organization. In general, performance evaluation is measured by business growth which includes sales growth, employment growth, and other financial indicators such as profit increase, asset value increase, return on assets, return on investment, and so on (Mwenda et al., 2023; Yawar & Seuring, 2017).

Growth puts pressure on the entrepreneur's financial resources, human resources, labor management, and time. The final measurement of company growth is by measuring the growth of its own capital. The sustainability of SME businesses can be measured by the level of success of SMEs in innovating and success in managing employees. Another indicator is the ability of SMEs to generate business profits and return on initial capital (Engwa et al., 2021). In other words, SMEs have an orientation to develop, seize opportunities, and are able to innovate sustainably (Al Koliby et al., 2022; Nor-Aishah et al., 2020; Ok & Ahn, 2019).

1. The relationship between supply chain management and employee performance

As stated by Ruangtip et al. (2024) that industry 4.0 is a framework for implementing the concept of cyber-physical integration in manufacturing, supply chain, and logistics. Furthermore, supply chain capabilities have a positive impact on the company's financial performance (Ruangtip et al., 2024). This capability is called supply chain management, which includes processes such as supply chain planning, supply risk management, and supplier relationship management.

It was explained that there is a significant and positive influence between Supply Chain Management and employee performance. Related to this, it was also explained that implementing SCM in SMEs can improve employee performance. This is in line with Wolf's (2014) opinion which states that by implementing good SCM practices, companies can provide opportunities to improve their performance, both financial and operational performance. Therefore, we suggest the following first hypothesis:

H₁: Supply chain management positively impacts employee performance.

2. The relationship between SCM and competitive advantage

According to Cahyono et al. (2023) in their research concluded that effective supply chain management

has a positive and significant effect on competitive advantage. Effective supply chain management is influenced by product development, supplier relationship strategy, planning and control, production and distribution, information quality, and purchasing (Cahyono et al., 2023). Likewise, research conducted by Amizuar et al. (2017); Giudice, (2021); Mukhyi et al. (2021); Ratnawati, (2019); Tilley et al., (2003); Tukamuhabwa et al., (2023) stated that effective supply chain management has the potential to increase competitive advantage. This is proven by integrated supply chain management starting from relationships with suppliers and customers, delays and quality which can maintain and strengthen its competitiveness in winning competition in the market. Ausat and Peirisal (2021); Setyawati et al. (2014) stated that implementing good supply chain management in SMEs will be able to increase competitive advantage. According to Barata, (2022); Halassa and Al Saed, (2023); Tukamuhabwa et al. (2023), supply chain management by establishing relationships with suppliers and consumers will increase competitive advantage. From the explanation above, we propose the second hypothesis as follows:

H₂: Supply chain management has the impact of increasing competitive advantage

3. The relationship between competitive advantage and employee performance

Competitive advantage is a crucial element for a company, as it can significantly impact the enhancement of employee performance. Competitive advantage can be found from management's ability to explore the competencies of the company's functional areas, namely competencies in marketing, product development and design and production (Bari & Park-Poaps, 2020; Ikhwana & Dianti, 2022; Jamaludin, 2021). A company with competitive advantages can create higher economic value for stakeholders, customers and suppliers compared to competitors. Companies strive to maintain their competitive advantage by innovating in processes, product characteristics, and transaction methods. In essence, competitive advantage

can improve employee performance (Bari & Park-Poaps, 2020). Thus, we propose the following hypothesis:

H₃: The higher the competitive advantage, the higher the employee performance.

4. *The relationship between supply chain management and employee performance through competitive advantage*

Small and medium enterprises (SMEs) that possess a competitive edge often exhibit one or more of these advantages over their rivals: reduced prices, superior quality, greater value propositions, and faster delivery times. These capabilities have in the past improved overall organizational performance (Ausat & Peirisal, 2021; Setyawati et al., 2014). Competitive advantage can lead to high economic performance, customer satisfaction and loyalty, and relationship effectiveness (Baah & Jin, 2019). Brands with higher consumer loyalty face less competitive competition in their target segments thereby increasing sales and profitability (Kerdpitak et al., 2022; Yuliantari & Pramuki, 2022). Thus, we suggested the following hypothesis:

H₄: Supply chain management has the effect of improving employee performance through competitive advantage.

Based on the literature review outlined above, a

research framework can be developed as illustrated in Figure 1.

III. Methods

This research uses a quantitative approach using a questionnaire as a data collection tool. Quantitative research is the process of collecting and analyzing numerical data. It is useful for determining trends and averages, formulating hypotheses, examining causality, and extrapolating findings to larger groups. The research population was 2,191 Pekalongan batik SMEs assisted by the Pekalongan City Department of Trade, Cooperatives and SMEs.

A. Participants and Sampling Method

Sampling was carried out by multiplying the number of research indicators by 10. This method is a good sample size for the analysis technique used in the research (Hair et al., 2019). The number of research indicators was 15 so the number of respondents was $10 \times 15 = 150$ Batik SMEs. This

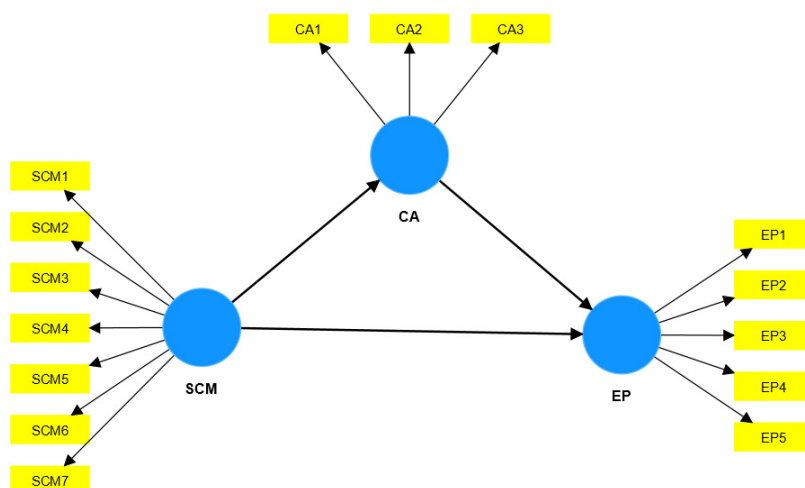


Figure 1. Empirical research model

research was conducted a survey in January 2024 to June 2024 using a sample of 150 Batik SMEs in Pekalongan, Indonesia.

All respondents are employees consisting of 10 (ten) areas of expertise in making Batik cloth. Of the 150 questionnaires distributed, only 136 were returned, so the research response rate was 90.67%. A total of 130 questionnaires are available for use in the data analysis. or 86.67% of the questionnaires returned. The sampling technique used was purposive sampling (Isaac, 2023; Thomas, 2022), with the criteria include SMEs that have been in operation for over 2 years and employ more than 5 people. Batik SMEs data has unique characteristics because it reflects a combination of traditional aspects, the local economy, and typical modernization. In data processing, partial least squares structural equation modeling (PLS-SEM) was used due to its predictive explanatory nature (Henseler, 2018) and the need for latent variable scores to run additional analyzes (Cepeda-Carrion et al., 2019; Ghasemy et al., 2020).

B. Measures and Covariates

To measure supply chain management, we use a scale developed by Morgan & Nasir (2020). Operationalizing competitive advantage using the

three-item Competitive Advantage (CA) scale by (Kamukama, 2013), and provided respondents with a 5-point Likert-type scale to rate items from both constructs. Measuring employee performance, using the theory put forward by Maltz et al. (2003). This scale consists of five items used to describe employee performance. Finally, filtering the data using IBM SPSS Statistics 24, and analyzing the main data using Smart PLS 4 (Ringle et al., 2022b). Measuring operational variables of supply chain management, competitive advantage, and employee performance as stated in Table 1.

IV. Results and Discussions

The results of the research were carried out using a two-way approach including measurement modelling of Consistency Reliability (CR), Convergent Validity (CV), as well as structural models (i.e., path coefficients, coefficients of determination and effect sizes) used (Hair et al., 2021; Ringle et al., 2022a; Ringle et al., 2022b).

Evaluation of the measurement model is carried out using reflective indicators evaluated through convergent and discriminant validity of the indicators

Table 1. Operational variables

No.	Variable	Operation definition
1. Supply Chain Management	Integrated activities along the supply chain are carried out by companies to promote effective supply chain management	1. Strategic Supplier Partnership 2. Level of Information Sharing 3. Quality of Information Sharing 4. Customer Relationship Management 5. Internal Lean Practices 6. Suspension 7. Total Quality Management
2. Competitive advantage	The ability of an organization to produce superior performance and be able to survive in the long term	1. Differentiation 2. Cost Leadership 3. Outreach Level
3. Employee performance	How to optimize business to achieve profits	1. Finance 2. Market/Customer 3. Process 4. Human Resources Development 5. Future Pasar/Pelanggan

Source: Taken from an article written by Morgan and Nasir (2020); Kamukama (2013); (Maltz et al. (2003).

forming the latent construct and composite reliability as well as Cronbach alpha for the indicator block (Hair et al., 2021; Ringle et al., 2022a).

A. Test for Validity and Reliability

The SCM variable is measured by seven indicators, but because the outer loading value is below 0.70, it is deleted so that there are only four valid indicators with an outer loading value of 0.772 - 0.823, which means that the four measurements reflect the SCM measurement. Meanwhile, the CA variable is measured by three valid indicators with an outer loading value of 0.749 - 0.842, which means that the three measurements reflect the CA measurement. Next, the EP variable was measured with 5 indicators, but because the outer loading value was below 0.70, it was removed so that only 3 valid indicators remained with an outer loading value of 0.789-0.859, which means the three measurements were capable. reflects EP measurements.

The evaluation results are presented in Table 2, the three variables prove that the construct measurement model produces acceptable internal consistency reliability and convergent validity also correlates

positively with alternative measures of the same construct (Hair et al., 2021; Ringle et al., 2022a).

B. Results of the evaluation of the Measurement Model

The results of the discriminant validity test are reflected in the diagonal values and correlations between constructs at positions outside the diagonal (0.799, 0.820, and 0.801). Meanwhile, Heterotrait-Monotrait (HTMT) is a method of testing convergent and discriminant consistency in Partial Least Square (PLS) based path analysis to test the extent to which a construct is different from other constructs. HTMT testing is carried out by calculating the ratio between correlation between constructs (heterotrait) and correlation within the same construct (monotrait) estimated from the SmartPLS 4 model. If the HTMT value between two constructs is less than 0.9, then the construct is considered to have good convergent consistency and can be differentiated from other constructs (Hair et al., 2019; Henseler, 2018).

Discriminant Validity (DV) is better assessed using HTMT. DV is used to measure how different other

Table 2. Result of model constructs

Variable	Measurement Items	Indicator	Item reliability	Convergent reliability		
			Outer Loading	Cronbach Alpha	Composite Reliability	AVE
SCM	SCM1	Strategic Supplier Partnerships	0.811	0.815	0.817	0.642
	SCM3	Quality of Information Sharing	0.772			
	SCM4	Customer Relationship Management	0.823			
	SCM7	Total Quality Management	0.797			
CA	CA1	Differentiation	0.803	0.716	0.720	0.638
	CA2	Cost Leadership	0.842			
	CA3	Outreach Level	0.749			
EP	EP1	Finance	0.859	0.756	0.762	0.672
	EP2	Market/Customer	0.789			
	EP5	Future	0.810			

Notes: All outer loading, cronbach alpha, composite reliability more than 0.70 and AVE more than 0.60; SCM, supply chain management; CA, competitive advances; EP, employee performance.

constructs are using empirical standards (Hair et al., 2021). To achieve a satisfactory DV level, Henseler, (2018) recommends an HTMT value above 0.90. This means that an HTMT value above 0.90 does not depict Discriminant Validity (DV), which indicates that the constructs are conceptually similar. The results show that all constructs have HTMT scores < 0.90 and the 97.5% bootstrap confidence interval shows all corresponding values are below 1, thus indicating that all research constructs (CA, EP and SCM) are conceptually and empirically different. different each other.

C. Structural Coefficient Modeling Path Assessment

The research results show that R^2 for the endogenous latent variable CA is 0.752. These findings show that SCM accounts for 75.20% of the variance in CA, while the remaining 24.80% is attributed to factors not explored in this study. Selain itu, EP menjelaskan 0.654 atau 65.40%. This means that CA and SCM strongly explain 65.40% of the EP variance. The remaining 0.346 or 34.60% is influenced by other factors not examined in this research. The explanation is as shown in Table 4.

The structural model reveals that SCM has the strongest influence on EP of 0.665 (p value = 0.000) followed by the SCM variable on EP with an influence of 0.438 (0.007) and finally CA has an influence on EP of 0.280 (0.041). The explanation of the structural model can be seen in Table 3.

Table 3. Discriminant validity of constructs

Variable	CA	EP	SCM
Discriminant Validity: Fornell-Larcker Criterion			
CA	0.799		
EP	0.571	0.820	
SCM	0.665	0.624	0.801
Hererotrait-Monotrait Criterion			
CA			
EP	0.771		
SCM	0.856	0.779	

Source: Processed data, 2024

This means that the hypothesized path relationship between SCM and CA shows that it is statistically significant with a p -value ($0.000 < 0.05$) as well as the hypothesized path relationship between SCM and EP with a p -value (0.007), as well as the relationship between CA and EP also has a significant p -value (0.041).

Findings compared to research in developed countries, overall, this research is consistent with Hypothesis 1 which states that Competitive advantage has a significant and influential effect on employee performance is accepted at $\hat{y} = 0.280$, $t = 2.046$ $p=0.041$. This shows that competitive advantage has a big role in improving employee performance. The explanation of the path coefficients model can be seen in Table 5.

Hypothesis 2 states that SCM has an influence in increasing competitive advantage and is accepted at $y = 0.438$, $t = 2.705$ and $p = 0.007$. This means that the role of SCM is very important in increasing companies.

Hypothesis 3: SCM significantly improves employee performance and is accepted with $y = 0.665$, $t = 11.227$ and $p = 0.000$. This hypothesis has the greatest influence compared to the others. This means that the role of SCM is very large in improving employee performance.

Table 4. R-square - overview

Variable	R-square	R-square adjusted
CA	0.752	0.749
EP	0.654	0.646

Source: Processed data, 2024

Table 5. Path coefficients -mean, STDEV, tvalue, p-value

Variable	Original Sample(0)	Sample Mean (M)	Standard Deviation (STDEV)	Tstatistic (IO/STDEV)	P value
CA->EP	0.280	0.290	0.137	2.046	0.041
SCM -> CA	0.665	0.675	0.059	11.227	0.000
SCM -> EP	0.438	0.410	0.162	2.705	0.007

Source: Processed data, 2024

Table 6. Spesific indirect effect -mean, STDEV, tvalue, p-value

Variable	Original Sample(0)	SampleMean (M)	Standard Deviation (STDEV)	Tstatistic (IO/STDEV)	P value
SCM->CA->EP	0.186	0.201	0.098	1.905	0.057

Source: Processed data, 2024

Hypothesis 4: Supply chain management can significantly improve SME's performance through competitive advantage is not accepted at $y = 0.186$ $t = 1.905$ and $p = 0.057$. This indicates that the role of SCM in improving the performance of MSME employees ignores the role of competitive advantage. This relates to hypothesis three where the role of SCM is so large in improving employee performance that the interference of competitive advantage can be ignored. The explanation of the spesific indirect effect can be seen in Table 6.

The primary goal of this study is to investigate how supply chain management and competitive advantage affect employee performance. The research was carried out at Pekalongan Batik SMEs in Central Java, Indonesia. The researchers chose this location based on their observation that it exhibits distinct characteristics compared to previous studies, which suggest that SMEs generally show similar practices in supply chain management and competitive advantage, regardless of their location. Existing literature on supply chain management and employee performance shows that there is a positive relationship between supply chain management and employee performance (Al Badi, 2018; Halassa & Al Saed, 2023; Li et al., 2006; Silitonga et al., 2023). The research findings regarding the implementation of SCM are consistent with all of these research findings (Chileshe & Phiri,

2022; Gamini & Rajapaksa, 2020). The results further reveal that the implementation of SCM is very important and is the center of attention in developing employee performance so that management is able to encourage the growth of Batik MSMEs. This is once again supported by existing literature which finds that the application of SCM can encourage employee performance opportunities to be creative (Alomari et al., 2020; Baah & Jin, 2019; Singh et al., 2010; Singh et al., 2014). Besides that, the application of SCM can also increase the competitive advantage of Batik MSMEs. In fact, research findings show that the application of SCM to competitive advantage provides the most dominant contribution. This is in line with previous research conducted by Bari & Park-Poaps, (2020); Khaddam et al. (2020); Kunides & Charoen-Rajapark, (2019); Singh et al. (2014); Vencataya et al. (2016).

By using SmartPLS 4 software, a picture of this research model can be created. The outcomes of the model measurement evaluation are illustrated in Figure 2 below.

Competitive advantage has an increasing influence on employee performance. Factors that encourage an increase in employee performance are differentiation, cost leadership, and affordability. Batik businesses require continuous design so that the motifs produced follow current fashion and are different from other regional batik businesses which have distinctive characteristics. Likewise, in terms of cost leadership,

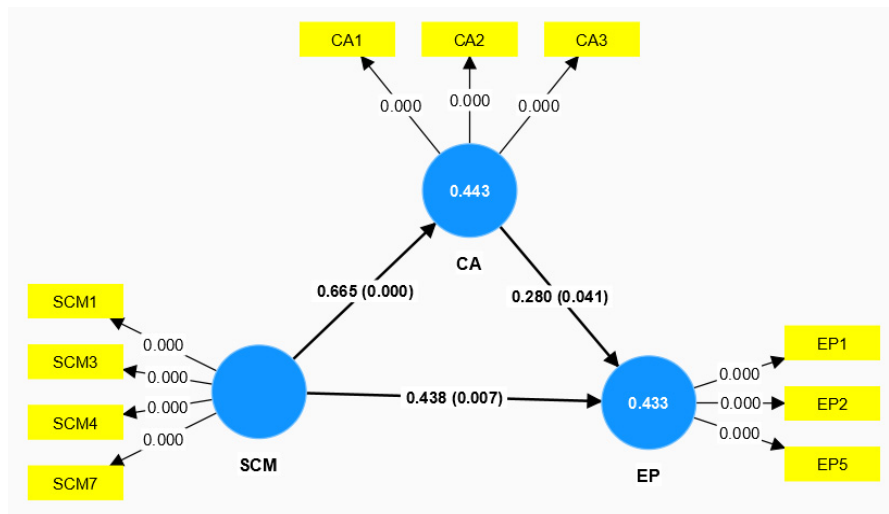


Figure 2. Measurement model evaluation results

consumers will like cheap batik prices but contemporary quality and designs. In terms of affordability, consumers want prices that are in line with their purchasing power.

The application of SCM to employee performance through competitive advantage apparently does not improve employee performance, this finding is in accordance with (Alomari et al., 2020; Khaddam et al., 2020; Kunides & Charoen-Rajapark, 2019).

V. Conclusion

This study aims to examine how competitive advantage mediates the effect of supply chain management implementation on employee performance in small and medium batik businesses in Pekalongan, Indonesia. The research findings show that supply chain management (SCM) has an influence on increasing competitive advantage and employee performance. Competitive advantage also has an impact on increasing employee performance. The influence of supply chain management on employee performance can be direct or indirect. This influence can be through or mediated by competitive advantage, so that competitive advantage also acts as a mediator

variable. This influence is relatively high, namely contributing 74.9% and 64.6%.

This study contributes to the theory by supporting the Resource Based View Theory. For batik SMEs practitioners, provides recommendations to improve operational efficiency, such as choosing the right suppliers, managing raw material stocks, organizing distribution efficiently, and identifying strategies to increase competitive advantage through product innovation, quality improvement, and better customer service. The implication of this study is that the development of batik SMEs in the industrial era 4.0 must modernize the production process, product innovation and design, digital marketing and e-commerce, sustainability and ethics, and network development and cooperation.

Although this study has contributed to the understanding and psychology of the implementation of SCM and competitive advantage on employee performance. However, the study still has limitations, namely it was only conducted on batik SMEs so that it cannot be generalized to other businesses. The impact of Industry 4.0 on batik SMEs is very significant in increasing the use of automation technology and production efficiency, digitalization of business processes, product innovation, digital marketing and sales, data analysis using big data and analytics, and improving

product quality with digital quality control and standard certification. Therefore, future research will be directed at the digitalization of batik SMEs towards the sustainability of their businesses.

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Conflicts of Interest

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References

- Al Badi, K. S. (2018). The impact of marketing mix on the competitive advantage of the SME sector in the Al Buraimi Governorate in Oman. *SAGE Open*, 8(3), 1-10.
- Al Koliby, I. S., Mohd Suki, N., & Abdullah, H. H. (2022). Linking knowledge acquisition, knowledge dissemination, and manufacturing SMEs' sustainable performance: the mediating role of knowledge application. *Bottom Line*, 35(4), 185-205.
- Ali, M., Kazi, A. A., Rizvi, S. A. A., & Ghafoor, H. (2022). How do operational disruption and resiliency impact a firm's operational efficiency and competitive advantage? Pakistan case. *Journal of Business Administration and Management Sciences (JOBAMS)*, 4(2), 56-76.
- Almanei, M., Salonitis, K., & Xu, Y. (2017). Lean implementation frameworks: The challenges for SMEs. *Procedia CIRP*, 63, 750-755.
- Alomari, K. M., Salah, A. A., Mansour, A. M. d., Alshaketheep, K. M. K. I., Altarawneh, M. I., & Jay, A. A. A. (2020). Supply chain quality and organizational performance: Moderating role of competitive advantages. *WSEAS Transactions on Business and Economics*, 17, 806-817.
- Aloqool, A., Alharafsheh, M., Abdellatif, H., Alghasawneh, L. A. S., & Al-Gasawneh, J. A. (2022). The mediating role of customer relationship management between e-supply chain management and competitive advantage. *International Journal of Data and Network Science*, 6(1), 263-272.
- Amizuar, S. H., Ratnawati, A., & Andati, T. (2017). The integration of international capital market from Indonesian investors' perspective: Do integration still give diversification benefit. *International Journal of Economics and Finance*, 9(9), 157-165.
- Anwar, M. (2018). Business model innovation and SMEs performance: Does competitive advantage mediate? *International Journal of Innovation Management*, 22(7), 1850057.
- Ausat, A. M. A., & Peirisal, T. (2021). Determinants of e-commerce adoption on business performance: A study of MSMEs in Malang city, Indonesia. *Jurnal Optimasi Sistem Industri*, 20(2), 104-114.
- Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society*, 66, 101635.
- Baah, C., & Jin, Z. (2019). Sustainable supply Chain management and organizational performance: The intermediary role of competitive advantage. *Journal of Management and Sustainability*, 9(1), 119-131.
- Barata, F. A. (2022). Information technology mediating influence supply chain management on competitive Advantage at PT. Ritelteam Sejahtera Indonesia. *Quality - Access to Success*, 23(188), 217-223.
- Bari, M. S., & Park-Poaps, H. (2020). The roles of supply-chain management on competitive advantage: An empirical study in the Bangladeshi apparel sector. *Journal of Textile and Apparel, Technology and Management*, 11(4), 1-19.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Basar, P. (2015). The diversities of the competitive advantage concepts and understanding sourced by resource-based approach to firm. *International Journal of Business and Management*, 10(5), 113-125.
- Beckert, J., & Wehinger, F. (2013). In the shadow: Illegal markets and economic sociology. *Socio-Economic Review*, 11(1), 5-30.
- Buxmann, P., Von Ahsen, A., Díaz, L. M., & Wolf, K. (2004). Usage and evaluation of supply chain management software - Results of an empirical study in the European automotive industry. *Information Systems Journal*, 14(3), 295-309.
- Cahyono, Y., Purwoko, D., Koho, I. R., Setiani, A., Supendi, Setyoko, P. I., Sosiady, M., & Wijoyo, H. (2023). The role of supply chain management practices on competitive advantage and performance of halal agroindustry SMEs.

- Uncertain Supply Chain Management*, 11(1), 153-160.
- Cepeda-Carrion, G., Cegarra-Navarro, J. G., & Cillo, V. (2019). Tips to use partial least squares structural equation modelling (PLS-SEM) in knowledge management. *Journal of Knowledge Management*, 23(1), 67-89.
- Chileshe, M. J., & Phiri, J. (2022). The impact of supply chain management practices on performance of small and medium enterprises in developing countries: A case of agro-dealers in Zambia. *Open Journal of Business and Management*, 10(02), 591-605.
- Costa, A., Crupi, A., De Marco, C. E., & Di Minin, A. (2023). SMEs and open innovation: Challenges and costs of engagement. *Technological Forecasting and Social Change*, 194(3), 1-16.
- Doan, T. T. T. (2020). Supply chain management drivers and competitive advantage in manufacturing industry. *Uncertain Supply Chain Management*, 8(3), 473-480.
- Engwa, F. E., Yakum, I. M., & Mukah, S. T. (2021). The role of banking institutional services on the sustainable growth of SMEs in Cameroon. *Journal of Economics and Management Sciences*, 4(2), 1-14.
- Gamini, L. P. S., & Rajapaksa, P. K. (2020). Impact of supply chain management practices on competitive advantage and organization performance: Evidence from the manufacturing industry in Sri Lanka. *Sri Lanka Journal of Management Studies*, 2(1), 137-158.
- Ghasemy, M., Teeroovengadam, V., Becker, J. M., & Ringle, C. M. (2020). This fast car can move faster: A review of PLS-SEM application in higher education research. *Higher Education*, 80(6), 1121-1152.
- Giudice, M. D., Cierice, R., Mazzuccelli, A., & Fiano, F. (2021). Supply chain management in the era of circular economy: The moderating effect of big data. *The International Journal of Logistics Management*, 32(2), 337-356.
- Gonzalez-Loureiro, M., Dabic, M., & Kiessling, T. (2015). Supply chain management as the key to a firm's strategy in the global marketplace: Trends and research agenda. *International Journal of Physical Distribution & Logistics Management*, 45(1/2), 159-181.
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). A primer on partial least squares structural equations modeling (PLS-SEM). *Journal of Tourism Research*, 6(2), 1-40. Sage Publications.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24. Emerald Group Publishing Ltd.
- Halassa, O., & Al Saed, R. (2023). The impact of supply chain drivers on the performance of Ministry of Health pharmacies in Jordan. *Problems and Perspectives in Management*, 21(2), 439-448.
- Hanifa, R., Adam, M., Isnurhadi, & Andriana, I. (2023). Does competitive advantage, operating efficiency and intellectual capital effect sustainable competitive advantage (SCA)? *Journal of Law and Sustainable Development*, 11(3), 1-24.
- Hastutik, T. P., & Novitaningtyas, I. (2021). Ana Batik Magelang's business development strategy based on SWOT and business model canvas. *International Journal of Marketing & Human Resource Research*, 2(4), 224-235.
- Hatta, I. H., Riskarini, D., & Ichwani, T. (2019). Business development strategy model of SMEs through SWOT and EFE-IFE Analysis. *Shirkah: Journal of Economics and Business*, 3(1), 75-94.
- Haulder, N., Kumar, A., & Shiwakoti, N. (2019). An analysis of core functions offered by software packages aimed at the supply chain management software market. *Computers and Industrial Engineering*, 138, 106116.
- Henseler, J. (2018). Partial least squares path modeling: Quo vadis? *Quality and Quantity*, 52(1), 1-8.
- Hong, J. S., Liu, C. H., Chou, S. F., Yu, T. Y., & Ng, Y. L. (2023). Modelling competitive advantage using the concepts of big data and social media to develop a sustainability strategy. *Tourism Review*, 78(3), 712-725.
- Hsu, S. (2016). Modelling the bullwhip effect under the implementation of supply chain management software. *International Journal of Management and Applied Research*, 3(3), 99-108.
- Ikhwana, A., & Dianti, S. (2022). The influence of information technology and SCM on competitive advantage to improve MSMEs performance. *International Journal of Computer and Information System (IJCIS)*, 3(1), 6-11.
- Isaac, O. E. (2023). Convenience and purposive sampling techniques: Are they the same? *Innovative Social & Science Education Research*, 11(1), 1-7.
- Jamaludin, M. (2021). The influence of supply chain management on competitive advantage and company performance. *Uncertain Supply Chain Management*, 9(3), 696-704.
- Kalaitzi, D., Matopoulos, A., Bourlakis, M., & Tate, W. (2019). Supply chains under resource pressure: Strategies for improving resource efficiency and competitive advantage. *International Journal of Operations and Production Management*, 39(12), 1323-1354.
- Kamukama, N. (2013). Intellectual capital: Company's invisible source of competitive advantage. *Emerald Group Publishing Limited*, 23(3), 260-283.
- Kasmari, Basukianto, & Indriyaningrum, K. (2020). Application of the supply chain operation reference (SCOR) method: Batik SMEs in Indonesia. *International Journal of Supply Chain Management*, 9(5), 1014-1020.
- Kerdpitak, C., Pungnirund, B., Hotrawaisaya, C., Jariyachamsit, S., Yen, W. H., & Chantranon, S. (2022). Effect of competitive advantage, digital marketing to supply chain management on tourism business performance in Thailand. *Uncertain Supply Chain Management*, 10(3), 721-728.
- Khaddam, A. A., Irtameh, H. J., & Bader, B. S. (2020). The effect of supply chain management on competitive advantage: The mediating role of information technology. *Uncertain Supply Chain Management*, 8(3), 547-562.

- Kim, N. L. T. (2024). The impact of emotional intelligence and transformational leadership on organizational culture and employee performance in the banking industry in Vietnam. *Global Business & Finance Review*, 29(4), 158-168.
- Kot, S., Goldbach, I. R., & Ślusarczyk, B. (2018). Supply chain management in SMES - Polish and Romanian approach. *Economics and Sociology*, 11(4), 142-156.
- Kovalenko, N., Kovalenko, V., Hutsol, T., Ievstafieva, Y., & Polishchuk, A. (2021). Economic efficiency and internal competitive advantages of grain production in the central region of Ukraine. *Agricultural Engineering*, 25(1), 51-62.
- Kumaran, L., A., & Jeyachandran, H. (2022). Title: Modelling e-business influencing factors for supply chain performance of Indian MSMEs: an ISM approach. *International Journal of Process Management and Benchmarking*, 12(1), 28-45.
- Kunides, N., & Charoen-Rajapark, N. (2019). Role of top & middle management support and strategic purchasing in gaining competitive advantage: Mediation of internal supply chain management. *International Journal of Supply Chain Management*, 8(4), 389-398.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, 34(2), 107-124.
- Maltz, A. C., Shenhar, A. J., & Reilly, R. R. (2003). Beyond the balanced scorecard: Refining the search for organizational success measures. *Long Range Planning*, 36(2), 187-204.
- Morgan, J., & Nasir, M. A. (2020). Financialised private equity finance and the debt gamble: The case of Toys R Us. *New Political Economy*, 26(3), 455-471.
- Mukhyi, R. A., Hwihanus, H., & Ratnawati, T. (2021). The analysis of financial performance in risk systematic and return stock for manufacturing companies listed in Indonesia Stock Shariah Index (Issi). *Jmm17*, 8(1), 13-25.
- Muñoz-Pascual, L., Galende, J., & Curado, C. (2021). Contributions to sustainability in smes: Human resources, sustainable product innovation performance and the mediating role of employee creativity. *Sustainability (Switzerland)*, 13(4), 1-20.
- Mustaniroh, S. A., Prabaningtias, N., & Citraresmi, A. D. P. (2020). Analysis of business development strategies with business model canvas approach. *IOP Conference Series: Earth and Environmental Science*, 515(1), 012075.
- Muysinaliyev, A., & Aktamov, S. (2014). Supply chain management concepts: Literature review. *IOSR Journal of Business and Management*, 15(6), 60-66.
- Mwenda, B., Israel, B., & Mahuwi, L. (2023). The influence of sustainable supply chain management practices on financial sustainability of food processing SMEs. *LBS Journal of Management & Research*, 21(2), 218-235.
- Narwane, V. S., Raut, R. D., Gardas, B. B., Narkhede, B. E., & Awasthi, A. (2022). Examining smart manufacturing challenges in the context of micro, small and medium enterprises. *International Journal of Computer Integrated Manufacturing*, 35(12), 1395-1412.
- Naslund, D., & Williamson, S. (2010). What is management in supply chain management? A critical review of definitions, frameworks and terminology. *Journal of Management Policy and Practice*, 11(4), 11-28.
- Nor-Aishah, H., Ahmad, N. H., & Thurasamy, R. (2020). Entrepreneurial leadership and sustainable performance of manufacturing SMEs in Malaysia: The contingent role of entrepreneurial bricolage. *Sustainability (Switzerland)*, 12(8), 3100.
- Ok, C., & Ahn, H. S. (2019). How does entrepreneurial orientation influence the sustainable growth of SMEs? The role of relative performance. *Sustainability (Switzerland)*, 11(19), 1-16.
- Pahlevi, A., & Rahab, R. (2022). The effect of innovation, tqm implementation and entrepreneurship orientation on competitive advantage strategies in building MSMEs performance. *Eduvest - Journal of Universal Studies*, 2(8), 1503-1513.
- Paliwal, V., Chandra, S., & Shama, S. (2020). Indian MSME's sustainable adoption of blockchain technology for supply chain management: A socio-technical perspective. In *IFIP in Advances in Information and Communication Technology*. Springer.
- Pham, M. T., & Ha, H. T. H. (2024). Factors affecting employee performance in the business recovery process at listed banks in Vietnam. *Global Business & Finance Review*, 29(4), 80-95.
- Ploenhad, J., Laoprawatchai, P., Thongrawd, C., & Jemsittiparsert, K. (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), 216-226.
- Putri, V. W., & Yuniawan, A. (2016). Organizational effectiveness: Social capital and competitive advantage approach. *Jurnal Dinamika Manajemen*, 7(1), 76-90.
- Rachmawati, R., Sawitri, S., & Prasetyaningtyas, W. (2022). Analysis of business growth of Batik MSMEs in the covid-19 pandemic. *Research Horizon*, 2(1), 270-282.
- Rahyuda, I. K., Rahyuda, A. G., Rahyuda, H., & Candradewi, M. R. (2018). The relationship between the concept of competitive advantage and the value of Catur Paramitha on SMEs in Sarbagita. *International Journal of Law and Management*, 60(6), 1522-1538.
- Ratnawati, R. (2019). Partnership strategy and competitive advantage to improve the performance of MSMEs in the creative industry. *Journal of Applied Management (JAM)*, 17(4), 668-676.
- Razali, R., Saraih, U. N., Shaari, M. S., Abd Rani, M. J., & Abashah, A. (2018). The influences of effectiveness, competitive advantages and market accessibility on SME performance in Malaysia. *MATEC Web of Conferences*, 150. doi:10.1051/mateconf/201815005023
- Ringle, C., Hult, G. T. H., & Sarstedt, M. (2022a). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage.

- Ringle, C. M., Wende, S., & Becker, J.-M. (2022b). *SmartPLS 4*. SmartPLS.
- Ruangtipa, P., Rueboonb, W., Jomkokgoudc, K., & Md Faysald. (2024). The role of trust in mediating the effect of blockchain and e-Payment on logistics 4.0 and supply chain capabilities in Thailand. *Global Business & Finance Review*, 29(7), 168-182.
- Sarkar, B., Sarkar, M., Ganguly, B., & Cárdenas-Barrón, L. E. (2021). Combined effects of carbon emission and production quality improvement for fixed lifetime products in a sustainable supply chain management. *International Journal of Production Economics*, 231, 107867.
- Setyawati, A., Kumadji, S. K., Zulkhirom, Moch., & Nimran, U. (2014). Effect of strategic decision, innovation, and information technology adoption on competitive advantages and msme performance studies at msme food and beverage industry sector in Bandung Raya. *European Journal of Business and Management*, 6(35), 25-51.
- Silitonga, R. Y. H., Setiawati, M., & Immanuella, S. E. K. (2023). The impact of supply chain management practices on competitive advantage and organizational performance. *Journal of Management Studies and Development*, 2(1), 26-36.
- Singh, R., Sandhu, H. S., Metri, B. A., & Kaur, R. (2010). Relating organised retail supply chain management practices, competitive advantage and organisational performance. *The Journal of Business Perspective*, 14(3), 173-190.
- Singh, R., Sandhu, H. S., Metri, B. A., & Kaur, R. (2014). Supply chain management practices, competitive advantage and organizational performance: A confirmatory factor model. *International Journal of Information Systems and Supply Chain Management*, 7(2), 22-46.
- Thomas, Fr. B. (2022). The role of purposive sampling technique as a tool for informal choices in a social sciences in research methods. *Just Agriculture*, 2(5), 1-8.
- Tilley, F., Hooper, P., & Walley, L. (2003). Sustainability and competitiveness: Are there mutual advantages for SMEs? In *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Treiblmaier, H., Mirkovski, K., Lowry, P. B., & Zacharia, Z. G. (2020). The physical internet as a new supply chain paradigm: A systematic literature review and a comprehensive framework. *International Journal of Logistics Management*, 31(2), 239-287.
- Trinh, H. H., Nguyen, C. P., Hao, W., & Wongchoti, U. (2021). Does stock liquidity affect bankruptcy risk? DID analysis from Vietnam. *Pacific Basin Finance Journal*, 69, 101634.
- Tukamuhabwa, B., Mutebi, H., & Kyomuhendo, R. (2023). Competitive advantage in SMEs: Effect of supply chain management practices, logistics capabilities and logistics integration in a developing country. *Journal of Business and Socio-Economic Development*, 3(4), 353-371.
- Vencataya, L., Seebaluck, A. K., & Doorga, D. (2016). Assessing the impact of supply chain management on competitive advantage and operational performance: A case of four star hotels of Mauritius. *International Review of Management and Marketing*, 6(S4), 61-69.
- Wahyudin, N., Herlissha, N., Christianingrum., & Aldiesi, D. R. (2022). The Utilization of E-commerce and QRIS as digital payment tools to improve sales performance through competitive advantage in MSME. *Journal of Consumer Sciences*, 7(2), 134-147.
- Winton, A., & Yerramilli, V. (2015). Lender moral hazard and reputation in originate-to-distribute markets. *SSRN Electronic Journal*, 1-74. doi:10.2139/ssrn.1986956
- Wolf, J. (2014). The relationship between sustainable supply chain management, stakeholder pressure and corporate sustainability performance. *Journal of Business Ethics*, 119(3), 317-328.
- Wongsansukcharoen, J., & Thaweepaiboonwong, J. (2023). Effect of innovations in human resource practices, innovation capabilities, and competitive advantage on small and medium enterprises' performance in Thailand. *European Research on Management and Business Economics*, 29(1), 1-13.
- Yaskun, M., Sudarmiati, Hermawan, A., & Rahayu, W. P. (2023). The effect of market orientation, entrepreneurial orientation, innovation and competitive advantage on business performance of Indonesian MSMEs. *International Journal of Professional Business Review*, 8(4), 1-21.
- Yawar, S. A., & Seuring, S. (2017). Management of social issues in supply chains: A literature review exploring social issues, actions and performance outcomes. *Journal of Business Ethics*, 141(3), 621-643.
- Yuliantari, N. P. Y., & Pramuki, N. M. W. A. (2022). The role of competitive advantage in mediating the relationship between digital transformation and MSME performance in Bali. *Jurnal Ekonomi & Bisnis JAGADITHA*, 9(1), 66-75.
- Zhang, M., Somerville, R. C. J., & Xie, S. (2016). The SCM concept and creation of ARM forcing data sets. *Meteorological Monographs*, 57, 24.1-24.12.