

## The effects of sustainable supply chain management and organizational learning abilities on the performance of the manufacturing companies

Mohammad Hafid<sup>a\*</sup>, Ujjianto<sup>b</sup> and Tri Andjarwati<sup>b</sup>

<sup>a</sup>Doctoral Study Program of Economic Science, Universitas 17 Agustus 1945 Surabaya, Indonesia

<sup>b</sup>Faculty of Economic and Business, Universitas 17 Agustus 1945 Surabaya, Indonesia

### ABSTRACT

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This study aims to analyze the effect of supply chain management sustainability and organizational learning ability on company performance which is also measured by intervening variables of product design innovation and competitive advantage and moderated by environmental uncertainty. This study used a sample of 383 companies from a population of 5,495 in East Java Province, Indonesia. This study also uses a quantitative approach with more emphasis on social aspects with a deductive model. Some of the findings in this study are that there is no significant effect on company performance and organizational learning ability if mediated by product design innovation, even though this is very important for the company's progress in the future and proves that many companies in this province. have not fully implemented design innovation as a measure of the quality of the goods produced. And the second is that all the components of the variables analyzed produce significant values for all dependent variables so that the adjustment to the impact of the pandemic gets a good response from the industry that is working.

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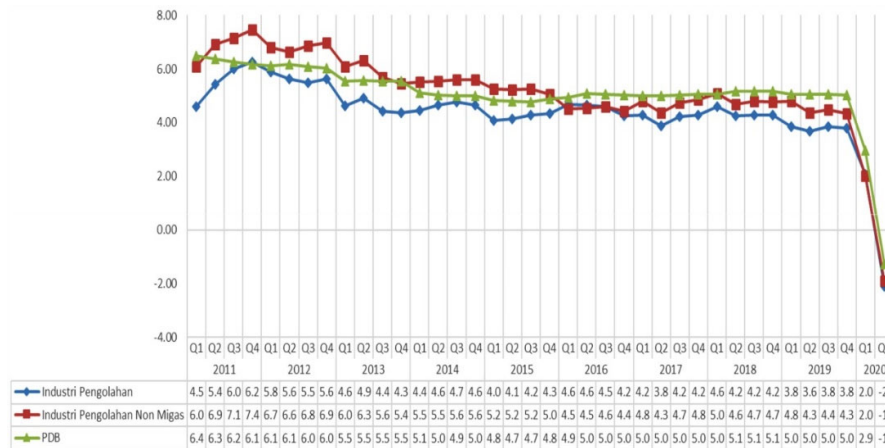
### 1. Introduction

The Covid-19 pandemic that has hit various countries has caused restrictions on mobility, social distancing, and the closure of various business activities, disrupting the supply of goods and services. On the demand side, the loss of income and layoffs due to quarantine, morbidity, unemployment, and reduced corporate investment and household consumption have further exacerbated global economic conditions (Vitenu-Sackey & Barfi, 2021). Euromonitor International observes that Global GDP growth declined by 200%, from 3.0% to negative 3.1% in the first quarter of 2020 (Damilola et al., 2020). The COVID-19 pandemic caused the global economy to contract by 3% in 2020, much worse than the global financial crisis in 2008. Several developed countries experienced economic contraction, namely Spain (8.0%), Italy (9.1 %), France (7.2%), Germany (7.0%), UK (6.5%), Japan (5.4%), and United States (5.9%) (Vitenu-Sackey & Barfi, 2021). Bank Indonesia has also revised its economic growth projection from 5% to 2.5% (Susilawati et al., 2020). This is inseparable from the decline in GDP in the second quarter of 2020 by 5.3% compared to the same quarter in 2019. However, the decline in Indonesia's GDP is still relatively low compared to neighboring countries. For example, Malaysia, the Philippines, Singapore, and Thailand experienced double-digit contractions in the second quarter of 2020. The manufacturing or processing industry was one of the sectors that experienced a significant decline during the Covid-19 pandemic (Sparrow et al., 2020). Fig. 1 shows the growth of the manufacturing, non-oil, and gas processing industries and relatively fluctuating GDP until the fourth quarter of 2019. Then in 2020, it can be seen that the overall GDP and manufacturing industry experienced a significant decline, even harmful in the second quarter of 2019. 2020. This decline was mainly due to the Covid-19 pandemic, which caused all sectors of economic activity to slump. The Covid-19 pandemic has caused changes in the business environment due to various economic policies issued by governments worldwide to deal with the Covid-19 pandemic. The Covid-19 pandemic creates uncertainty so that such conditions can disrupt the company's survival and impact bankruptcy. Companies that face bankruptcy cannot adapt quickly to changes that occur in the business environment. Adaptation to the business environment conditions during the Covid-19 pandemic can be made by reformulating the company's strategic management. This needs to

\* Corresponding author

E-mail address [mohammadhafid96@gmail.com](mailto:mohammadhafid96@gmail.com) (M. Hafid)

be done to find new opportunities, experiment, and develop competitive advantages. According to Hesterly and Barney (2008), strategic management involves a series of sequential analyses and strategy choices that increase the company's possibility of choosing the best strategy to generate a competitive advantage to improve company performance. Donthu and Gustafsson (2020) explained that the Covid-19 pandemic caused company performance to decline and even caused bankruptcy for the company. This is due to a decline in sales and production, unstable raw material prices, and delays in the distribution of raw materials and finished goods due to the policy of Large-Scale Social Restrictions (Sulistiyani, 2020).



**Fig. 1.** Cumulative Growth of the Processing Industry and Non-Oil and Gas Processing Industry 2010 – 2020 (%), Ministry of Industry (2020)

High creativity in creating unique product design innovations can encourage increased business performance. This is evidenced by previous research (Expósito & Sanchis-Llopis, 2019; Kijkasiwat & Phuensane, 2020; Saunila, 2020). Different findings are found in the research (Anning-Dorson, 2018), which shows that it does not affect company performance. Previous studies have shown that competitive advantage influences company performance (Riyadi et al., 2021; Setiawan et al., 2021). While different results were shown by the research of (Kamboj et al., 2015) that competitive advantage does not affect company performance. Due to the Covid-19 pandemic, most companies are currently facing supply chain risks in the future. This provides a common thread that maintaining the stability of industrial supply chain management during the Covid-19 pandemic is very important. The Covid-19 pandemic has caused disruptions to business operations, including supply chain activities, causing a significant decline in productivity and company performance (Farooq et al., 2021). In the early days of Covid-19 that occurred in China, the impact of disruption to supply chain activities had already occurred at the global level. Approximately 95% of Fortune 1000 companies have global supply chain operations in China and experience direct product and inventory flow disruptions (Esper, 2021). Supply chain activities have an essential role in the manufacturing industry because they can increase the competitiveness of companies in providing fast service with high product variations and low costs so that companies can survive in competition (Palandeng et al., 2018). Therefore, supply chain management must be as integrated as possible so that the business can survive in the long term because it has been able to align its resources with the market it wants to work on and its environmental conditions. In addition, companies can also compete to provide more value to consumers (stakeholders) (Pono et al., 2020). Production activities in the manufacturing industry have the impact of creating waste and pollution and can threaten the existence of life. This creates challenges and pressures that seriously encourage companies to consider environmental impacts in their business activities. Therefore, in the process, system, and technology, doing business and the resulting product can represent environmentally friendly. The manufacturing sector is an industrial sector that consumes many resources because manufacturing activities utilize a large amount of energy and natural resources (Linke et al., 2013). The International Energy Agency states that 36% of worldwide carbon dioxide (CO<sub>2</sub>) emissions are caused by the manufacturing sector (ARIF et al., 2020).

Organizational learning capability is creating, storing, conveying, and imparting modern or new organizational knowledge that significantly influences behavior/performance (Rehman et al., 2019). Organizational learning capability is one of the most important ways to create a competitive advantage to improve organizational performance (Shurafa & Mohamed, 2016). Each company will make every effort to improve efficiency, provide fast, easy service, and continue to create innovations to stay ahead and survive in the market. This is because the products being marketed must be attractive and creative to be widely demanded by consumers in both domestic and global markets. During the current Covid-19 pandemic, people have unconsciously experienced a lifestyle shift and are required to adapt to new habits.

Innovation can be interpreted as the company's ability to predict what consumers need and predict consumer tastes and desires. The added value they want to create can produce what consumers want (Sadalia et al., 2020). Amid the current Covid-19 pandemic, people have unconsciously experienced a lifestyle shift and are required to adapt to new habits. This is, of

course, a big challenge for industrial product designers because the current product design needs are in addition to carrying sustainable aspects that pay attention to economic, social, and environmental aspects, they must also prioritize health aspects by implementing health protocols in dealing with the Covid-19 pandemic situation. Companies need innovation to compete because innovation can provide added value to the products or services produced, and innovation can provide better solutions for solving consumer problems. High creativity in creating unique and more attractive product design innovations will be in demand by consumers compared to competing products, which can improve business performance. Product design innovation needs the company's immediate attention, considering that product design innovation is related to the problem of customer satisfaction, which is the goal of marketing activities carried out by the company. Every company must create innovations that will help the business improve or maintain the product's position in its market. Innovation is the primary tool for achieving competitive advantage (Herman et al., 2018). Next is to fully implement a differentiation strategy in response to new situations under uncertain market conditions (Eker & Eker, 2019). The business environment consists of the internal and external environment. The internal environment is the organization's personnel or staff, functional units, working conditions, and others. In contrast, the external environment consists of customers, suppliers, competitors, and socio-political and technological (Ganbold & Matsui, 2017). The company's close relationship with other economic actors who maintain access to resources and the instability inherent in this relationship shows the importance of environmental uncertainty in the company's strategic management because it can reduce the company's competitive advantage so that later it will have implications for company performance (Mujanah et al., 2022).

Based on the description presented above, a more in-depth study will be conducted on the influence of sustainable supply chain management and organizational learning capabilities on company performance in manufacturing companies—the survey used product design innovation and competitive advantage as intervening variables and environmental uncertainty as moderating variables. The novelty of the current research is the study of strategic management in the limited conditions of the Covid-19 pandemic. Several studies have been conducted on the topic of strategic management (Sharma et al., 2021; Harris et al., 2020; Farroq et al., 2021; Esper, 2020; Donthu & Gustafsson, 2020; Damilola, 2020), but in terms of the research, model have nothing in common with current research. This study also uses the environmental uncertainty variable as a moderating variable to explain the company's performance. Several previous studies related to environmental uncertainty as a moderating variable include the investigations of (Wong & Boon-Itt, 2008; Bstieler, 2005; Ting et al., 2012; Iriani et al., 2021). However, the four previous studies did not explain the role of the environmental uncertainty variable as a moderator for the effect of product design innovation and competitive advantage on company performance as the current study does. Technological uncertainty, changes in customer demand, and competition explain companies' environmental uncertainty (Eker & Eker, 2019). Thus, environmental uncertainty is a variable that works as an external in achieving higher company performance. This study uses environmental uncertainty because it cannot open from the uncertainty of the external environment along with the Covid-19 pandemic. The Covid-19 pandemic has created uncertainty in the health sector (Riyadi et al., 2021) and the financial industry because it causes uncertainty in customer demand and supply of raw materials, which has implications for business continuity. Such conditions lead to decreased turnover, reduction of employees, to bankruptcy (Zorn et al., 2017). The Covid-19 pandemic has created unpredictable social and economic conditions that say companies have difficulty in adopting the best practices that companies must assume. The current research has a broader scope: examining manufacturing companies in East Java Province.

## **2. Literature Review**

### *2.1 Sustainable Supply Chain Management*

According to Heizer (2020), sustainable supply chain management is a set of practices that integrates an organization's internal business processes with its suppliers and customers to improve organizational performance by considering the environmental impact of these processes and procedures. Patterns occur from the input of raw materials and energy to the disposal of end-of-life products. Grant et al. (2017) explained that sustainable supply chain management means ensuring that every logistics and supply chain activity is environmentally friendly, not wasteful, and focuses on reducing carbon emissions throughout the supply chain. Collective responsibility for 'greening' supply chains lies with three groups: logistics and transportation service providers, shippers and buyers as recipients of these services, and policymakers, both government and non-government. According to (Belvedere & Grando, 2017), sustainable supply chain management is a strategic and transparent integration in achieving organizational goals related to social, environmental, and economic aspects through the systemic coordination of business processes, including the supply chain. In general, sustainable supply chain management is managing a company's business activities by considering environmental, economic, and social issues to improve the long-term financial goals of the organization and its supply chain. Therefore, business activities have moved not only to pursue economic benefits but also to be sustainable in their operations. The need for achieving sustainability and improving supply chain performance within organizations have encouraged the development of sustainable supply chain management due to economic, social, and environmental considerations.

### *2.2 Organizational Learning*

According to Wheelen and Hunger (2018), organizational learning capability is creating, acquiring, and transferring knowledge and modifying its behavior to reflect new knowledge and insights. Organizational ability in learning is an essential component of competitiveness in a dynamic environment because it can create innovation and new product development.

Another definition of organizational learning capability by (Argote, 2013) emphasizes changes in knowledge in organizations that are obtained from experience. Knowledge is essential in organizations operating in dynamic environments, where knowledge acts as a critical resource. Organizations that emphasize learning can optimize expertise as a competitive advantage. According to Goh (2003), organizational learning capability is a process that involves transforming information into knowledge and knowledge into action, which is then reflected in cognitive and behavioral changes. Organizational learning helps organizations create, transfer, and integrate knowledge, experience, and continuous learning.

### *2.3 Environmental Uncertainty*

According to Darvishmotevali et al. (2020), Environmental uncertainty refers to the perceived lack of information about the business environment so that it cannot predict changes in that environment. This opinion shows that the rapidly changing business environment is challenging for companies. Meanwhile, another understanding is mentioned by Filar & Haurie (2010) that environmental uncertainty is an uncertain condition in the business environment that can impact company performance. The knowledge of environmental uncertainty put forward by Grote (2009) emphasizes the lack of information owned by companies regarding external environmental conditions such as suppliers, markets, and technology. So, in general, environmental uncertainty is the lack of data the company holds so that it cannot predict the impacts that occur due to environmental changes. Environmental uncertainty can make the demands and actions of competitors challenging to predict. This uncertainty is also influenced by the threatened market position due to new competitors and substitute products, thus making environmental uncertainty very high.

### *2.4 Product Design Innovation*

Singh et al. (2018) define product design innovation as the development of new products related to changes in product design or the use of new materials or components in product manufacture. According to Mafimisebi et al. (2020) Product design innovation is the introduction and development of new types of goods or services that are different from the previous ones and complement the shortcomings of earlier findings by placing more emphasis on design aspects. Companies in carrying out product design innovations must pay attention to market needs because knowledge of market needs is the key to the success of product innovation that will be produced. Product design innovation is a process of realizing new ideas that impact product design changes so that the product has aesthetic characteristics and functions and can solve consumer problems. Design is a process of transforming ideas into products that can be used by end-users (Saleh et al., 2021).

### *2.5 Competitive Advantage*

Ford (2020) explains that a company has a competitive advantage when it can create more economic value than competitors. Economic value is the difference between the costs incurred by customers for the company's products or services and the total costs of producing those products or services. David and David (2016) argue that competitive advantage is any activity the company does well compared to the activities carried out by competing companies or any company resources desired by competing companies. So that there are various actions by companies in the industry and market to create economic value or gain an advantage over competitors by offering more value to consumers than the value provided by competitors. A company is said to have a competitive advantage when its profitability exceeds the average profitability and profit growth of other companies competing for the same customer group (Maury, 2018).

Sustainable supply chain management is demonstrated by the company's ability to reduce the use of materials, energy, or water and find more efficient solutions by improving its supply chain management (Chiappetta-Jabbour & Jabbour, 2015). Implementing sustainable supply chain management means companies must have economical and innovative solutions through waste reduction and developing environmentally friendly technologies to support the organization's strategic goals and objectives. The supply chain must reduce energy consumption and CO<sub>2</sub> emissions (Tebaldi et al., 2021). Therefore, companies must adapt to a dynamic environment by considering environmental aspects in product development (Onikoyi, 2017).

**H<sub>1</sub>:** *Sustainable supply chain management significantly affects product design innovation.*

Creating a sustainable supply chain is an effective strategy to achieve competitive advantage and corporate interests in the future (Das & Hassan, 2021). Along with environmental damage resulting from the company's activities, it becomes a challenge for every company to gain a competitive advantage that stems from a series of capabilities to minimize waste, product design, and environmentally friendly technology. Previous studies conducted by Ghorbanpour and Azimi (2022) and Baah and Jin (2019) prove that sustainable supply chain management significantly affects competitive advantage. Based on the explanation, the following hypothesis is formulated:

**H<sub>2</sub>:** *Sustainable supply chain management has a significant effect on competitive advantage.*

Das and Hassan (2021) confirmed that the company's sustainable supply chain management activities positively relate to company performance from a financial perspective. Applying sustainable supply chain management practices allows companies to maintain a leading position in the market, increase market share, and increase profits (Yoo & Cho, 2021).

Previous research conducted by (Baah & Jin, 2019) prove that sustainable supply chain management has a significant effect on company performance. Following the description stated, it can be formulated as follows:

**H<sub>3</sub>:** *Sustainable supply chain management has a significant effect on company performance.*

Companies with organizational learning abilities have acquired the ability to adapt to changing environments. Therefore, organizational learning is important for companies to develop innovation capabilities. Previous studies have shown that organizational learning capability affects innovation (Kiziloglu, 2015) and competitive advantage (Makabila et al., 2017). Various researchers have studied the importance of organizational learning because it helps determine the company's overall performance (Kim et al., 2017). So that in this study, the hypothesis can be formulated:

**H<sub>4</sub>:** *Organizational learning capability has a significant effect on product design innovation.*

**H<sub>5</sub>:** *Organizational learning capability has a significant effect on competitive advantage.*

**H<sub>6</sub>:** *Organizational learning capability has a significant effect on company performance.*

Types of innovation consist of process innovation, product innovation, business model innovation, and distribution innovation. Innovation will lead to more efficient, forward-thinking ways and generate greater profits. Companies engaged in research and development to enhance innovation and increase competitiveness (Oladimeji et al., 2019). Innovation contributes to achieving a competitive advantage in different aspects. Innovations carried out by organizations are closely related to all efforts, including updating organizational systems and product design to improve organizational performance (Rajapathirana & Hui, 2018). Based on the explanation, the following hypothesis is formulated.

**H<sub>7</sub>:** *Product design innovation has a significant effect on competitive advantage.*

**H<sub>8</sub>:** *Product design innovation has a significant effect on company performance.*

If a company has something it wants from competing companies or can do something that competing companies cannot do, this can represent a competitive advantage (Mujanah et al., 2022). Competitive advantage refers to the results or activities of the organization so that it has an advantage over its competitors. Competitive advantage will create superior value, leading to increased work (Ferreira et al., 2021). Based on the description put forward, the proposed hypothesis is:

**H<sub>9</sub>:** *Competitive advantage has a significant effect on company performance.*

The Covid-19 pandemic has caused environmental uncertainty, a situation where companies are constrained to predict the surrounding conditions, so they will try to do something to deal with environmental uncertainty (Iriani et al., 2021). Delay is a challenge for businesspeople who can improve product and service innovation strategies (Utomo & Susanta, 2021). Uncertainty, complexity, and ambiguity in technological, economic, and political aspects as threats to organizations that can affect competitive advantage (Suharman & Hidayah, 2021).

**H<sub>10</sub>:** *Environmental uncertainty moderates the effect of product design innovation on company performance.*

**H<sub>11</sub>:** *Environmental uncertainty moderates the effect of competitive advantage on company performance.*

**H<sub>12</sub>:** *Product design innovation mediates the effect of sustainable supply chain management on company performance.*

**H<sub>13</sub>:** *Competitive advantage mediates the effect of sustainable supply chain management on company performance.*

**H<sub>14</sub>:** *Product design innovation mediates the effect of organizational learning capability on company performance.*

**H<sub>15</sub>:** *Competitive advantage mediates the effect of organizational learning capability on company performance.*

### 3. Research Methods

The quantitative approach used in this study is based on the need for researchers to examine the phenomena that exist in the object of research that is still general, namely those related to the influence of sustainable supply chain management and organizational learning capabilities on company performance. Through product design innovation and competitive advantage as intervening and environmental variables. Uncertainty as a moderating variable. Using a quantitative approach, researchers can formulate the variables studied for further causality testing using statistical tests. The population in this study consisted of large and medium-scale manufacturing companies in East Java Province, Indonesia amounting to 5,495 companies. The sample size in this study will be determined using the Slovin formula as follows (Smith & Hasan, 2020):

$$n = \frac{N}{N(d)^2 + 1}$$

Information;

n = number of samples sought

N = total population

d = Precision value of 0.05

Based on the formula above, the calculation of the sample obtained in this study is as follows:

$$n = 5495 / (5495 \times 0.05^2 + 1) \approx 383.$$

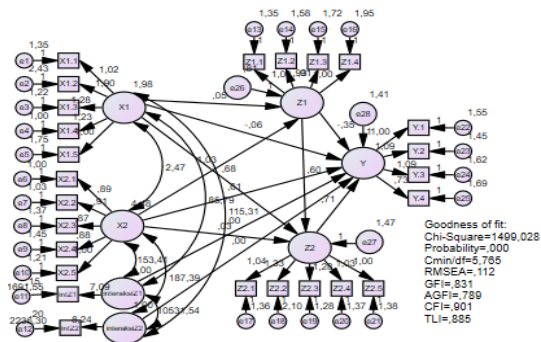
According to the calculations with the Slovin formula, the number of samples was 383 companies. While the technique of determining the sample in this study used a purposive sampling technique, namely the technique of determining the sample based on specific criteria, where the requirements are:

1. Medium and large-scale manufacturing company in East Java province.
2. Incorporated
3. Have a minimum workforce of 20 people
4. Have a minimum turnover of 2.5 billion in a year

The samples used as research targets are managers who have knowledge and understanding related to the company's supply chain activities and production and product development activities.

**4. Result**

The structural model in this study is described as follows.

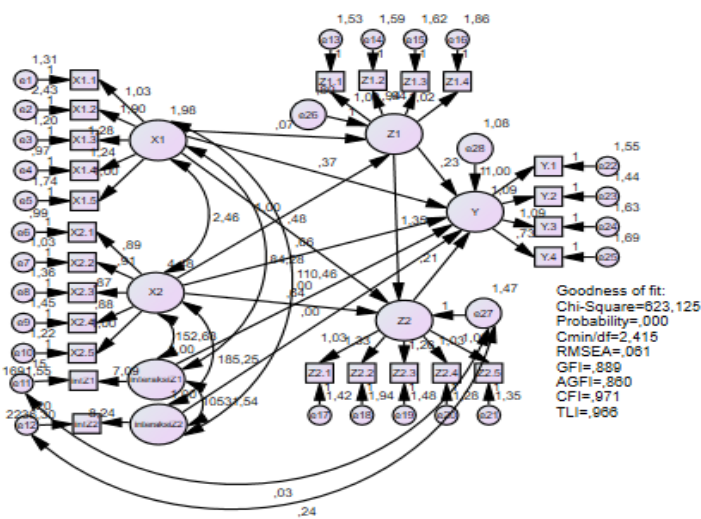


**Fig. 2. Structural Model**

**Table 1**  
The goodness of Fit and Cut-off Value Structural Model

Goodness of Fit Index	Cut-off Value	Hasil	Information
Probability	≥ 0.05	0.000	Not fit
RMSEA	≤ 0.08	0.112	Not fit
GFI	≥ 0.90	0.831	Marginal
AGFI	≥ 0.90	0.789	Not fit
CMIND/DF	2.00 - 3.00	5.765	Not fit
TLI	≥ 0.95	0.885	Marginal
CFI	≥ 0.95	0.901	Marginal

The calculation results for the goodness of fit indices in the structural model are as given in Table 1. Based on Table 1, it can be seen that most of the goodness of fit criteria are not appropriate, so they cannot provide an index according to the cut-off value. The model is modified based on the output modification indices to improve the research model to meet the honor of suitable criteria. The results of the modification of the research model are shown in the following figure.



**Fig. 2. Model Modification**

**Table 2**  
Exogenous Variable Construct Reliability Results

Construct	Indicator	Standardize Factor Loading	SFL Square	Error [ej]	CR
<i>Sustainable supply chain management</i>	X1.1	0.785	0.616	0.384	0.912
	X1.2	0.864	0.746	0.254	
	X1.3	0.855	0.731	0.269	
	X1.4	0.871	0.759	0.241	
	X1.5	0.729	0.531	0.469	
<i>Organizational learning capability</i>	X2.1	0.884	0.781	0.219	0.939
	X2.2	0.884	0.781	0.219	
	X2.3	0.844	0.712	0.288	
	X2.4	0.840	0.706	0.294	
	X2.5	0.887	0.787	0.213	

Table 2 and Table 3 show that all the indicators contained in the exogenous variables and endogenous of sustainable supply chain management, organizational learning capability, product design innovation, competitive advantage, and company performance have a construct reliability value greater than 0.7. This indicates that the indicator has a reliable ability to construct exogenous variable constructs.

**Table 3**  
Endogenous Variable Construct Reliability Results

Construct	Indicator	Standardize Factor Loading	SFL Square	Error [ej]	CR
<i>Product design innovation</i>	Z1.1	0.886	0.785	0.215	0.928
	Z1.2	0.870	0.757	0.243	
	Z1.3	0.868	0.753	0.247	
	Z1.4	0.871	0.759	0.241	
<i>Competitive advantage</i>	Z2.1	0.924	0.854	0.146	0.971
	Z2.2	0.931	0.867	0.133	
	Z2.3	0.945	0.893	0.107	
	Z2.4	0.937	0.878	0.122	
	Z2.5	0.924	0.854	0.146	
<i>Company performance</i>	Y.1	0.921	0.848	0.152	0.951
	Y.2	0.937	0.878	0.122	
	Y.3	0.929	0.863	0.137	
	Y.4	0.854	0.729	0.271	

**Table 4**  
Direct Effect Hypothesis Testing

		Estimate	S.E.	C.R.	P	Information
<i>Product design innovation</i>	← <i>Sustainable supply chain management</i>	0.073	0.107	0.683	0.494	Not Sig
<i>Competitive advantage</i>	← <i>Sustainable supply chain management</i>	0.476	0.140	3.397	0.000	Sig
<i>Company performance</i>	← <i>Sustainable supply chain management</i>	0.368	0.117	3.148	0.002	Sig
<i>Product design innovation</i>	← <i>Organizational learning capability</i>	0.996	0.078	12.731	0.000	Sig
<i>Competitive advantage</i>	← <i>Organizational learning capability</i>	0.638	0.139	4.579	0.000	Sig
<i>Company performance</i>	← <i>Organizational learning capability</i>	0.663	0.233	2.852	0.004	Sig
<i>Competitive advantage</i>	← <i>Product design innovation</i>	1.351	0.095	14.231	0.000	Sig
<i>Company performance</i>	← <i>Product design innovation</i>	0.235	0.157	1.498	0.134	Not sig
<i>Company performance</i>	← <i>Competitive advantage</i>	0.213	0.068	3.139	0.002	Sig
<i>Company performance</i>	← InteraksiZ1	-0.001	0.002	-0.362	0.718	Not sig
<i>Company performance</i>	← InteraksiZ2	-0.001	0.002	-0.413	0.680	Not sig

Hypothesis 1: Sustainable supply chain management has a significant effect on product design innovation

The results of hypothesis testing on the sustainable supply chain management variable on product design innovation showed insignificant results. The path coefficient obtained is positive at 0.073. The C.R value obtained is 0.683, which is smaller than 1.96, and the resulting probability level is 0.494, which is greater than 0.05.

Hypothesis 2: Sustainable supply chain management has a significant effect on competitive advantage

The results of the hypothesis testing of the sustainable supply chain management variable on competitive advantage show significant results. The path coefficient obtained is positive at 0.476. The C.R value obtained is 3.397, which is greater than 1.96, and the resulting probability level is 0.000, which is smaller than 0.05.

Hypothesis 3: Sustainable supply chain management has a significant effect on company performance

The results of hypothesis testing on sustainable supply chain management variables on company performance show significant results. The path coefficient obtained is positive at 0.368. The C.R value obtained is 3.148, which is greater than 1.96, and the resulting probability level is 0.002, which is smaller than 0.05.

Hypothesis 4: Organizational learning capability has a significant effect on product design innovation

The hypothesis testing of organizational learning capability variables on product design innovation showed significant results. The path coefficient obtained is positive at 0.996. The C.R value obtained is 12.731, which is greater than 1.96, and the resulting probability level is 0.000, which is smaller than 0.05.

Hypothesis 5: Organizational learning capability has a significant effect on competitive advantage

The hypothesis testing of organizational learning capability variables on competitive advantage showed significant results. The path coefficient obtained is positive at 0.638. The C.R value obtained is 4.579, which is greater than 1.96, and the resulting probability level is 0.000, which is smaller than 0.05.

Hypothesis 6: Organizational learning capability has a significant effect on company performance

The hypothesis testing of organizational learning capability variables on company performance showed significant results. The path coefficient obtained is positive at 0.663. The C.R value obtained is 2.852, which is greater than 1.96, and the resulting probability level is 0.004, which is smaller than 0.05.

Hypothesis 7: Product design innovation has a significant effect on competitive advantage

The results of the hypothesis testing of product design innovation variables on competitive advantage show significant results. The path coefficient obtained is positive at 1,351. The C.R. value obtained is 14,231, more significant than 1.96, and the resulting probability level is 0.000, which is smaller than 0.05.

Hypothesis 8: Product design innovation has a significant effect on company performance

The hypothesis testing of product design innovation variables on company performance showed insignificant results. The path coefficient obtained is positive at 0.235. The C.R. value obtained is 1.498, more diminutive than 1.96, and the resulting probability level is 0.134, which is greater than 0,5.

Hypothesis 9: Competitive advantage has a significant effect on company performance

The hypothesis testing of the competitive advantage variable on company performance results shows significant results. The path coefficient obtained is positive at 0.213. The C.R. value obtained is 3.139, which is greater than 1.96, and the resulting probability level is 0.002, which is smaller than 0.05.

Hypothesis 10: Environmental uncertainty moderates the effect of product design innovation on company performance

The results of testing the moderation test hypothesis showed insignificant results. The path coefficient obtained is negative at -0.001. The C.R. value obtained is -0.362, which is smaller than 1.96, and the resulting probability level is 0.718, which is greater than 0.05.

Hypothesis 11: Environmental uncertainty moderates the effect of competitive advantage on company performance

The results of testing the moderation test hypothesis showed insignificant results. The path coefficient obtained is negative at -0.001. The C.R. value obtained is -0.413, which is smaller than 1.96, and the resulting probability level is 0.680, which is greater than 0.05.

Hypothesis 12: Product design innovation mediates the effect of sustainable supply chain management on company performance

The effect of sustainable supply chain management on product design innovation has a path coefficient value of 0.073 and a standard error of 0.107. In contrast, the impact of product design innovation on company performance has a path coefficient value of 0.235 and a standard error of 0.157, so the results of the Sobel Test are as follows.



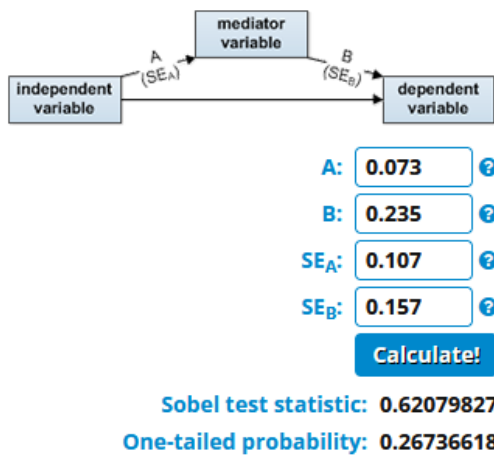


Fig. 3. Sobel Test Hypothesis 12

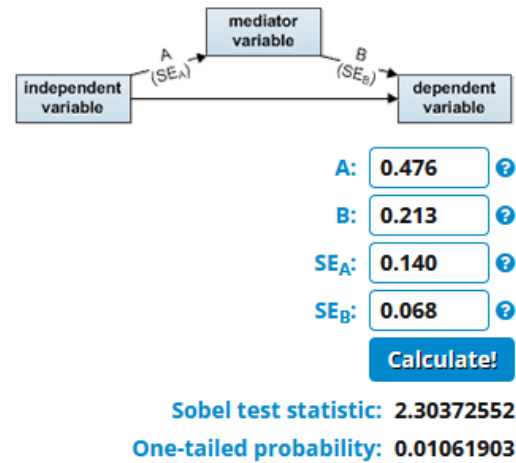


Fig. 4. Sobel Test Hypothesis 13

Fig. 3 shows that the resulting Sobel Test Statistics is 0.621, more diminutive than 1.96, with a probability level of 0.267, more significant than 0.05.

Hypothesis 13: Competitive advantage mediates the effect of sustainable supply chain management on company performance

The effect of sustainable supply chain management on competitive advantage has a path coefficient value of 0.476 and a standard error of 0.140. In contrast, the impact of competitive advantage on company performance has a path coefficient value of 0.213 and a standard error of 0.068, so the results of the Sobel Test are given in Fig. 4.

Fig. 4 shows that the resulting Sobel Test Statistics is 2.304, more significant than 1.96, with a probability level of 0.010, more diminutive than 0.05.

Hypothesis 14: Product design innovation mediates the effect of organizational learning capability on company performance

The effect of organizational learning capability on product design innovation has a path coefficient value of 0.996 and a standard error of 0.078. In contrast, the impact of product design innovation on company performance has a path coefficient value of 0.235 and a standard error of 0.157, so the results of the Sobel Test are given in Fig. 5.

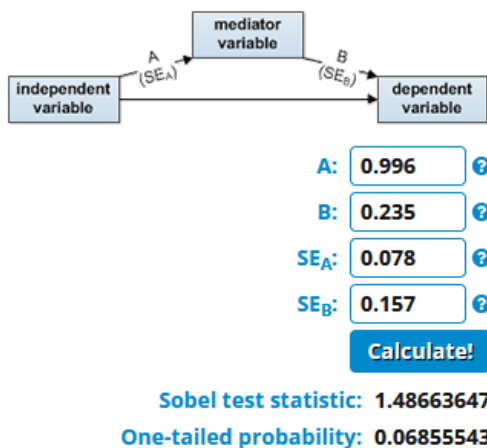


Fig. 5. Sobel Test Hypothesis 14

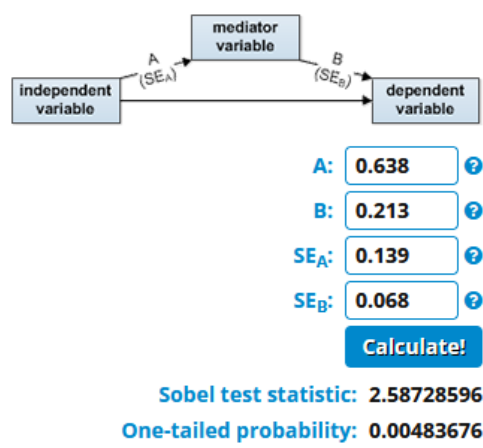


Fig. 6. Sobel Test Hypothesis 15

Fig. 5 shows that the resulting Sobel Test Statistics is 1.487, more significant than 1.96, with a probability level of 0.068, more significant than 0.05.

Hypothesis 15: Competitive advantage mediates the effect of organizational learning capability on company performance

The effect of organizational learning capability on competitive advantage has a path coefficient value of 0.638 and a standard error of 0.139. In contrast, the impact of competitive advantage on company performance has a path coefficient value of 0.213 and a standard error of 0.068, so the results of the Sobel Test are given in Fig. 6.

Fig. 6 shows that the resulting Sobel Test Statistics is 2.587, which is more significant than 1.96, with a probability level of 0.004, which is smaller than 0.05. These results show that the fourteenth hypothesis, which states that competitive advantage mediates the effect of organizational learning capability on company performance, is proven to be true.

## 5. Discussion

Sustainable supply chain management has not been able to encourage manufacturing companies to innovate product design. The company's ability to reduce the use of materials, energy, or water and find more efficient solutions by improving its supply chain management does not significantly encourage product design innovation. This, of course, contradicts the opinion of (Jabbour et al., 2015) that companies that implement sustainable supply chain management will make breakthroughs in product design by minimizing the environmental impact of the product life cycle. This difference can occur because companies that innovate on product design must think carefully, primarily related to customer acceptance of new product designs. Innovation also requires not small costs, so these factors can become obstacles for companies to innovate. Other findings from this study support previous research conducted by (Khaksar et al., 2015). They were able to prove that sustainable supply chain management has a significant effect on competitive advantage. Implementing sustainable supply chain management can be an effective strategy to achieve competitive advantage and the company's interests in the future. The results of this study also support a previous study from (Baah & Jin, 2019) that sustainable supply chain management has a significant positive effect on competitive advantage. This is because implementing sustainable supply chain management activities encourages the creation of competitive advantages by producing products that are more environmentally friendly and cost-efficient than competitors. Sustainable supply chain management is reflected by indicators of sustainable design and packaging, sustainable production, sustainable marketing, sustainable transportation, and sustainable purchasing, all of which have a factor loading value greater than 0.5. However, if observed, it shows that the sustainable transportation indicator is more dominant in implementing sustainable supply chain management with the highest factor loading achievement of 0.874. The results of this study certainly support empirical studies from previous research conducted by (Baah & Jin, 2019), which can prove that sustainable supply chain management has a positive and significant effect on company performance. that organizational learning capability affects innovation. In this case, it can be explained that companies with organizational learning abilities have acquired the ability to adapt to environmental changes, which is an essential factor in developing innovation capabilities. Organizational learning capability is a set of management practices that facilitate the learning process or a group of mechanisms that improve organizational capabilities. Improvements that occur in organizational capabilities can encourage an increase in better company performance. The results of this study have supported previous studies that proved that organizational learning capability plays an essential role in improving company performance (Nafei, 2015; Rehman et al., 2019; Shurafa & Mohamed, 2016). The purpose of organizational learning capability itself, explained by (Pham & Hoang., 2019), is to create, acquire, transfer, and integrate knowledge to improve its performance, so it can be stated that organizational learning capability plays an essential role in determining company performance. Organizational learning capability is an important factor that can support companies to improve company performance. Product design innovation referred to here is an innovation made by the company in making changes to product designs that are different from before. Innovations in design that companies can carry out can be related to the beauty of appearance, comfort when used, product colors, and the safety of the materials used to provide added value to the products or services produced. This study's findings contradict previous studies' results, which showed that invention significantly affected company performance (Gomes & Wojahn, 2017; Sulisty & Sri Ayuni, 2020). This can happen because, in this research, the innovations carried out by the company are more specific to innovation in product design. Customer acceptance of new design changes also determines the success or failure of product design innovation in improving company performance. The results obtained in this study empirically indicate that product design innovation has not been able to encourage the implementation of manufacturing companies. The results of the testing hypothesis show that competitive advantage mediates the effect of sustainable supply chain management on company performance. These results empirically show that the thirteenth hypothesis used to answer the research problem is proven true. A study conducted by (Vargas et al., 2018) shows that companies that implement sustainable supply chain management have a competitive advantage over competitors.

## 6. Conclusion

This study concludes that the higher value of sustainable supply chain management does not significantly impact predicting innovation and product design; this is because a work climate has not been fully created that pays attention to environmental conditions and only focuses on the market. Then automatically, the value of the company's competitive advantage will increase if sustainable supply chain management is implemented properly by creating a controlled system. This research has empirically proven that the higher the implementation of sustainable supply chain management in manufacturing companies, the better the company's performance from the perspective of finance, customers, internal business processes, and growth and learning. The findings in this study indicate that sustainable supply chain management can explain the variation of changes in the company performance of manufacturing companies in East Java Province. Empirically, companies that can integrate information or knowledge within the organization are more motivated to innovate in product design. Management commitment to building an environment that supports a participatory culture and increasing employee commitment to learning, providing new ideas, and participating in decision-making or problem-solving plays an important role in organizational learning capability. Organizational learning capability can explain variations in changes in competitive

advantage in manufacturing companies in the East Java Province. Companies that integrate information or knowledge within the organization will have a stronger position in the market. Organizational learning capability is a set of management practices that facilitate the learning process or mechanisms that improve organizational capabilities.

Product design innovation referred to here is an innovation made by the company in making changes to product designs that are different from before. Innovations in design that companies can carry out can be related to the beauty of appearance, comfort when used, product colours, and the safety of the materials used to provide added value to the products or services produced. Competitive advantage in this study is the extent to which an organization can create a superior position in the market as long as competitors remain. The ideal place achieved by the company so that competitors cannot imitate it is useful in maximizing profits, which can improve company performance. Uncertainty does not moderate because the company can predict or anticipate conditions of environmental uncertainty so that it does not interfere with the innovations made by the company to improve performance. Environmental uncertainty requires a company to adapt and take preventive steps to survive in the business environment. However, maintaining a competitive advantage is not easy because the dynamic external environment is full of uncertainty. The ability of the company's management to anticipate conditions of tension in the external environment will not reduce the company's competitive advantage so that it does not have an impact on the company's performance decline. The results of testing the thirteenth hypothesis show that competitive advantage mediates the effect of sustainable supply chain management on company performance. These results empirically show that the thirteenth hypothesis used to answer the research problem is proven true. The results of testing the fifteenth hypothesis show that competitive advantage mediates the effect of organizational learning capability on company performance. These results empirically show that the fifteenth hypothesis used to answer the research problem is proven true. Organizations that can learn can produce a culture that is open to new ideas that are useful for achieving a competitive advantage.

## References

- Anning-Dorson, T. (2018). Innovation and competitive advantage creation: The role of organisational leadership in service firms from emerging markets. *International Marketing Review*, 35(4), 580–600. <https://doi.org/10.1108/IMR-11-2015-0262>
- Argote, L. (2013). Organization learning: A theoretical framework. In *Organizational learning* (pp. 31–56). Springer.
- ARIF, D., YUCHA, N., SETIAWAN, S., OKTARINA, D., MARTAH, V., & MUTTAQIIN, N. (2020). Applications of Goods Mutation Control Form in Accounting Information System: A Case Study in Sumber Indah Perkasa Manufacturing, Indonesia. *The Journal of Asian Finance, Economics and Business*, 7(8), 419–424.
- 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. <https://doi.org/10.5539/jms.v9n1p119>
- Belvedere, V., & Grando, A. (2017). *Sustainable operations and supply chain management*. John Wiley & Sons.
- Bstieler, L. (2005). The moderating effect of environmental uncertainty on new product development and time efficiency. *Journal of Product Innovation Management*, 22(3), 267–284.
- Chiappetta-Jabbour, C., & Jabbour, A. (2015). Green Human Resource Management and Green Supply Chain Management: Linking two emerging agendas. *Journal of Cleaner Production*, 112. <https://doi.org/10.1016/j.jclepro.2015.01.052>
- Darvishmotevali, M., Altinay, L., & Köseoglu, M. A. (2020). The link between environmental uncertainty, organizational agility, and organizational creativity in the hotel industry. *International Journal of Hospitality Management*, 87, 102499.
- Das, S., & Hassan, H. M. K. (2021). Impact of sustainable supply chain management and customer relationship management on organizational performance. *International Journal of Productivity and Performance Management*.
- David, F., & David, F. R. (2016). *Strategic management: A competitive advantage approach, concepts and cases*. Pearson–Prentice Hall Florence.
- Donthu, N., & Gustafsson, A. (2020). Effects of COVID-19 on business and research. In *Journal of business research* (Vol. 117, pp. 284–289). Elsevier.
- Eker, M., & Eker, S. (2019). Exploring the relationships between environmental uncertainty, business strategy and management control system on firm performance. *Business and Economics Research Journal*, 10(1), 115–130.
- Esper, T. L. (2021). Supply chain management amid the coronavirus pandemic. *Journal of Public Policy & Marketing*, 40(1), 101–102.
- Expósito, A., & Sanchis-Llopis, J. A. (2019). The relationship between types of innovation and SMEs' performance: A multi-dimensional empirical assessment. *Eurasian Business Review*, 9(2), 115–135.
- Farooq, M. U., Hussain, A., Masood, T., & Habib, M. S. (2021). Supply chain operations management in pandemics: a state-of-the-art review inspired by COVID-19. *Sustainability*, 13(5), 2504.
- Ferreira, J., Cardim, S., & Coelho, A. (2021). Dynamic capabilities and mediating effects of innovation on the competitive advantage and firm's performance: The moderating role of organizational learning capability. *Journal of the Knowledge Economy*, 12(2), 620–644.
- Ford, J. B. (2020). Competitive advantage. In *The Routledge Companion to Strategic Marketing* (pp. 141–150). Routledge.
- Ganbold, O., & Matsui, Y. (2017). Impact of environmental uncertainty on supply chain integration empirical evidence. *The Journal of Japanese Operations Management and Strategy*, 7(1), 37–56.
- Ghorbanpour, A., & Azimi, Z. N. (2022). Application of green supply chain management in the oil Industries: modeling and performance analysis. *Materials Today: Proceedings*, 49, 542–553.
- Goh, S. C. (2003). Improving organizational learning capability: lessons from two case studies. *The Learning Organization*.

- Grant, D. B., Wong, C. Y., & Trautrim, A. (2017). *Sustainable logistics and supply chain management: principles and practices for sustainable operations and management*. Kogan Page Publishers.
- Harris, J. L., Sunley, P., Evenhuis, E., Martin, R., Pike, A., & Harris, R. (2020). The Covid-19 crisis and manufacturing: How should national and local industrial strategies respond? *Local Economy*, 35(4), 403–415.
- Heizer, J. (2020). *Operations management: Sustainability and supply chain management*. Ontario; Pearson Canada.
- Herman, H., Hady, H., & Arafah, W. (2018). The influence of market orientation and product innovation on the competitive advantage and its implication toward Small and Medium Enterprises (UKM) performance. *International Journal of Science and Engineering Invention*, 4(08), 08-to.
- Hesterly, W., & Barney, J. (2008). *Strategic management and competitive advantage*. Pearson Prentice Hall: Upper Saddle River, NJ, USA.
- Iriani, S. S., Musdholifah, M., & Kautsar, A. (2021). The moderation effect of uncertainty environment on SME business performance. *Technium Soc. Sci. J.*, 15, 99.
- Kamboj, S., Goyal, P., & Rahman, Z. (2015). A resource-based view on marketing capability, operations capability and financial performance: An empirical examination of mediating role. *Procedia-Social and Behavioral Sciences*, 189, 406–415.
- Kamya, M. T., Ntayi, J. M., & Ahiauzu, A. (2011). Organisational learning and competitive advantage: testing for the interacting influence of knowledge management and innovation. *International Journal of Innovation and Learning*, 10(4), 376–401.
- Kijkasiwat, P., & Phuensane, P. (2020). Innovation and firm performance: The moderating and mediating roles of firm size and small and medium enterprise finance. *Journal of Risk and Financial Management*, 13(5), 97.
- Kim, K., Watkins, K. E., & Lu, Z. L. (2017). The impact of a learning organization on performance: Focusing on knowledge performance and financial performance. *European Journal of Training and Development*.
- Kiziloglu, M. (2015). The Effect of Organizational Learning on Firm Innovation Capability: An Investigation in the Banking Sector. *Global Business & Management Research*, 7(3).
- Linke, B. S., Corman, G. J., Dornfeld, D. A., & Tönissen, S. (2013). Sustainability indicators for discrete manufacturing processes applied to grinding technology. *Journal of Manufacturing Systems*, 32(4), 556–563.
- Mafimisebi, O. P., Obembe, D., & Aluko, O. (2020). Organization and product design pairings: A review of product innovation capabilities, conceptualization, and future directions. *Strategic Change*, 29(1), 13–24.
- Makabila, G., Iravo, M., & Waititugichuhi, A. (2017). Does Organizational Learning Lead To Competitive Advantage?: An Evaluation Of State Corporations In Kenya. *International Journal Of Scientific And Research Publications*, 7(8), 142.
- Maury, B. (2018). Sustainable competitive advantage and profitability persistence: Sources versus outcomes for assessing advantage. *Journal of Business Research*, 84, 100–113.
- Mujanah, S., Ardiana, I. D. K. R., Nugroho, R., Candraningrat, Fianto, A. Y. A., & Arif, D. (2022). Critical thinking and creativity of msme in improving business performance during the covid-19 pandemic. *Uncertain Supply Chain Management*, 10(1), 19–28. <https://doi.org/10.5267/j.uscm.2021.10.014>
- Oladimeji, M. S., Amida, O. A., & Essien, E. A. (2019). Business innovation and competitive advantage in Nigerian manufacturing sector. *EMAJ: Emerging Markets Journal*, 9(2), 37–43.
- Onikoyi, I. A. (2017). Impact of product innovation on organizational performance (A Survey of Nestle Nigeria Plc). *Journal of Marketing and Consumer Research*, 37(1), 2422–8451.
- Palandeng, I. D., Kindangen, P., Tumbel, A., & Massie, J. (2018). Influence analysis of supply chain management and supply chain flexibility to competitive advantage and impact on company performance of fish processing in Bitung city. *Journal of Research in Business, Economics and Management*, 10(1), 1783–1802.
- Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability, innovation type, and firm performance. *Journal of Innovation & Knowledge*, 3(1), 44–55.
- Riyadi, S., Nugroho, M., & Arif, D. (2021). The effect of supply network and management control system on the efficiency and profitability of manufacturing companies. *Uncertain Supply Chain Management*, 9(4), 963–972. <https://doi.org/10.5267/j.uscm.2021.7.004>
- Sadalia, I., Muharam, H., & Mulyana, A. (2020). Entrepreneurial Orientation And Innovation To Competitive Advantage Of Smes In North Sumatera Mediated With Business Financing Factor. *Journal of Critical Reviews*, 7(1), 236–240.
- Saleh, M. H. M., Azmin, A. A., & Saraih, U. N. (2021). The effects of market orientation, product innovation and marketing ethics on firm performance: A theoretical framework. *International Journal of Innovation and Industrial Revolution (IJIREV)*, 7(3), 31–47.
- Sánchez-Flores, R. B., Cruz-Sotelo, S. E., Ojeda-Benitez, S., & Ramírez-Barreto, M. (2020). Sustainable supply chain management—A literature review on emerging economies. *Sustainability*, 12(17), 6972.
- Saunila, M. (2020). Innovation capability in SMEs: A systematic review of the literature. *Journal of Innovation & Knowledge*, 5(4), 260–265.
- Setiawan, Arif, D., Mahmudah, S., Agustina, H., & Martah, V. (2021). The effect of supply chain management on multi-channel retailing and business performance. *Uncertain Supply Chain Management*, 9(4), 823–830. <https://doi.org/10.5267/j.uscm.2021.8.007>
- Shurafa, R., & Mohamed, R. B. (2016). Management control system, organizational learning, and firm's performance: An empirical study from developing economy. *International Journal of Advanced and Applied Sciences*, 3(10), 79–88.
- Singh, H., Kennedy, R. D., Lagasse, L. P., Czaplicki, L. M., & Cohen, J. E. (2018). E-cigarettes and weight loss—product

- design innovation insights from industry patents. *Nicotine and Tobacco Research*, 20(8), 1010–1014.
- Smith, J. D., & Hasan, M. (2020). Quantitative approaches for the evaluation of implementation research studies. *Psychiatry Research*, 283(August 2019), 112521. <https://doi.org/10.1016/j.psychres.2019.112521>
- Sparrow, R., Dartanto, T., & Hartwig, R. (2020). Indonesia under the new normal: Challenges and the way ahead. *Bulletin of Indonesian Economic Studies*, 56(3), 269–299.
- Sulistiyani, S. R. (2020). The impact of the Covid-19 pandemic on the manufacturing industry. *International Journal of Research and Innovation in Social Science*, 4(6), 172–175.
- Sulistyo, H., & Ayuni, S. (2020). Competitive advantages of SMEs: The roles of innovation capability, entrepreneurial orientation, and social capital. *Contaduría y Administración*, 65(1).
- Susilawati, S., Falefi, R., & Purwoko, A. (2020). Impact of COVID-19's Pandemic on the Economy of Indonesia. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 3(2), 1147–1156.
- Tebaldi, L., Vignali, G., & Bottani, E. (2021). Digital twin in the agri-food supply chain: A literature review. *IFIP International Conference on Advances in Production Management Systems*, 276–283.
- Ting, H.-F., Wang, H.-B., & Wang, D.-S. (2012). The moderating role of environmental dynamism on the influence of innovation strategy and firm performance. *International Journal of Innovation, Management and Technology*, 3(5), 517.
- Ur Rehman, S., Bhatti, A., & Chaudhry, N. I. (2019). Mediating effect of innovative culture and organizational learning between leadership styles at third-order and organizational performance in Malaysian SMEs. *Journal of Global Entrepreneurship Research*, 9(1), 1–24.
- Utomo, H. S., & Susanta, S. (2021). Environmental Uncertainty as a Moderator of Entrepreneurship Orientation and Innovation Capability during the Pandemic: A Case of Written Batik SMEs in Yogyakarta. *F1000Research*, 10(844), 844.
- Vitenu-Sackey, P. A., & Barfi, R. (2021). The impact of Covid-19 pandemic on the Global economy: emphasis on poverty alleviation and economic growth. *The Economics and Finance Letters*, 8(1), 32–43.
- Wang, Z., & Sarkis, J. (2013). Investigating the relationship of sustainable supply chain management with corporate financial performance. *International Journal of Productivity and Performance Management*.
- Wheelen, T. L., & Hunger, J. D. (2018). *Concepts in strategic management and business policy: Globalization, innovation and sustainability*. Pearson Education.
- Wong, C. Y., & Boon-Itt, S. (2008). The influence of institutional norms and environmental uncertainty on supply chain integration in the Thai automotive industry. *International Journal of Production Economics*, 115(2), 400–410.
- Yoo, J. J.-E., & Cho, M. (2021). Supply chain flexibility fit and green practices: evidence from the event industry. *International Journal of Contemporary Hospitality Management*.
- Zorn, M. L., Norman, P. M., Butler, F. C., & Bhussar, M. S. (2017). Cure or curse: Does downsizing increase the likelihood of bankruptcy? *Journal of Business Research*, 76, 24–33.



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