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Achieving Supply Chain Performance During the Covid-19 Pandemic: Antecedent Studies and the Important Role of Supply Chain Agility

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ABSTRACT

The COVID-19 pandemic seriously threatens the sustainability of a business byaffecting its supply chain. To address business continuity in the future, companies need to develop their strategies through supply chain agility. Supply chain agility is largely determined by three influencing factors, namely strategic resources, learning orientation, and technology orientation. This study has involved 120 SMEs (Small Medium Enterprises) in Yogyakarta. The data has been processed using PLS-SEM. The results of this study found that strategic resources have a positive effect on supply chain agility, learning orientation has a positive effect on supply chain agility, technology orientation has a positive effect on supply chain agility, and supply chain agility has a positive effecton business performance.

Keywords: Strategic Resources, Learning Orientation, Technology Orientation, Supply Chain Agility, Business Performance

INTRODUCTION

The emergence of the COVID-19 pandemic has ushered in a new eera in the world (Do et al., 2021), and all related control measures applied can significantly jeopardize the sustainability of a business by directly affecting the supply chain (Fan et al., 2020; Min et al., 2020; Wang et al., 2020). A business faces a highly significant risk due to the unprecedented nature of the COVID-19 pandemic (McMaster et al., 2020). This pandemic is also quite unique when compared to previous epidemic disruptions (Paul et al., 2021) and has a serious impact on the sustainability of a business. The COVID-19 pandemic has also led to severe disruptions in the supply chain (Shen & Sun, 2021), with one of the provinces in Indonesia most affected by COVID-19 cases and disruptions being the Special Region of Yogyakarta (Erawan et al., 2021).

Small and Medium-sized Enterprises (SMEs) play a pivotal role in both developed and developing countries (Carey, 2015).

In dynamic, competitive, and unpredictable markets, meeting customer demands requires a strategic orientation approach(Al-Zabidi et al., 2021; Zhu & Gao, 2021). To explore strategic orientation, a business must be capable of shaping alternative strategies. Supply chain agility is one such alternative strategy that has garnered significant attention, particularly in the wake of the COVID-19 pandemic (Do et al., 2021; Mutebi et al., 2021; Naimi et al., 2020; Pratondo et al., 2021). Supply chain agility reflects a company's ability to swiftly adapt its supply chain operations and strategies to respond to changes, opportunities, and threats in its environment (Gligor et al., 2013). Despite being a broad and multidimensional concept that bridges various disciplines (Gligor & Holcomb, 2012).

agile supply chains are influenced by learning orientation, technological orientation (Zhu & Gao, 2021) and strategic resources (Kim & Chai, 2017). Learning and technological orientation involve transforming ideas into new products or services that meet and satisfy customer needs and expectations (Byukusenge & Munene, 2017; Zhu & Gao, 2021). Learning and technological orientation are considered critical core competencies, especially in the midst of turbulent business competition (Zhu & Gao, 2021). Strategic resources, on the other hand, can synergize resources in achieving supply chain agility (Chiang et al., 2012).

The aim of this study is to examine the impact of strategic resources, learning orientation, and technological orientation on supply chain agility, ultimately affecting the performance of SMEs. In the context of this research, strategic resources refer to procurement and purchasing activities to support the supply chain's vision of serving end customers. Learning orientation pertains to enhancing the company's capabilities in supply chain-related learning processes, and technological orientation involves the utilization of the latest technology in product development.

Supply chain agility refers to a company's ability to quickly adapt to or respond to market changes, while business performance is assessed in terms of profit, sales growth, and market share. This research posits that without supply chain agility, SMEs may not perform well. Therefore, supply chain agility, preceded by strategic resources, learning orientation, and technological orientation, can better explain the variances in SME business performance.

LITERATURE REVIEW

Hypothesis Research

Based on the causal relationship above, 5 hypotheses are produced, including:

H1 : Strategic sourcing has a positive effect on supply chain agility
H2 : Learning orientation positively affects supply chain agility
H3 : Technology orientation has a positive effect on supply chain agility
H4 : Supply chain agility has a positive effect on business performance.

RESEARCH METHOD

This research employs a causal quantitative research design. Causal research involves the collection of data and information to model cause-and-effect relationships between two or more variables, allowing for managerial decision-making (Hair et al., 2017). Causal research is most appropriate when the research goal includes the need to understand the independent variables' impact on the dependent variables. This study aims to investigate the influence of strategic resources on supply chain agility, the impact of learning orientation on supply chain agility, technological orientation on supply chain agility, and ultimately, how supply chain agility affects business performance.

Data collection in this research utilizes a questionnaire. The questionnaire comprises five variables, each measured on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) for all items. The strategic resources variable is adapted from the study conducted by Kim & Chai (2017), while the learning orientation, technological orientation, supply chain agility, and business performance variables are adopted from the research by Zhu & Gao (2021) with each being measured using several question items. The questionnaire is distributed to 120 SMEs in the Special Region of Yogyakarta, with criteria including an operational process that transforms raw materials into finished products and the use of technology in production and operational processes.

After the data is collected, the next step involves analyzing the data based on the Structural Equation Model (SEM) using the Smart PLS software version 3.3.3 to test hypotheses (Hair et al., 2019). Partial Least Squares - Structural Equation Modeling (PLS-SEM) is a suitable method for measuring complex structural models. PLS-SEM breaks down the model into two stages: the measurement model (outer model) and the structural model (inner model) (Hair et al., 2019). Before drawing conclusions about the relationships between variables, it is essential to ensure that the measurement of variables meets reliability and validity requirements. This process ensures that the data used in the analysis is robust and valid, making the analytical results reliable for supporting research hypotheses.

RESULTS

Measurement Model Test Result: Outer Model

Convergent Validity

The *convergent validity* value is *the outer loading value* of the latent variable with its indicator. The expected value > 0.7. For early stage research on the development of measurement scales, loading values of 0.5–0.6 are considered sufficient (Ghozali & Latan, 2015). The outer *loading* results in this study are shown in the following table:

Table 1. Outer Loading Value

Variable	Item	*Outer Loading*	Ket
Strategic Sourcing	Every member of the supply chain must understand each other (Sourcing centricity-learning orientation)	0.890	Valid
	Every member of the supply chain must always provide the best performance (Performance orientation)	0.891	Valid
	Having a mature plan is one of the keys to success (Planning orientation)	0.884	Valid
	Learning from past data makes supply chains better in the future (Relational orientation)	0.919	Valid
Learning Orientation	The sense around here is that employee learning is an investment, not an expense in the supply chain	0.893	Valid
	The basic values of this supply chain process include learning as a key to improvement	0.860	Valid
	Once we quit learning in the supply chain we endanger our future	0.869	Valid
	We agree that our ability to learn is the key to improvement in the supply chain process	0.914	Valid
Technology Orientation	We use sophisticated technologies in our new product development	0.812	Valid
	Our new products always use state -of -the-art technology	0.825	Valid
	Technological innovation based on research results is readily accepted in our organization	0.885	Valid
	Technological innovation is readily accepted in our program/project management	0.849	Valid
Supply Chain Agility	We can quickly detect changes in our environment	0.854	Valid
	Our firm can promptly identify opportunities in its environment	0.846	Valid
	My organization can rapidly sense threats in its environment	0.857	Valid
	My company can make resolute decisions to deal with changes in its environment	0.849	Valid
	My organization can make firm decisions to respond to threats in its environment	0.858	Valid
	My firm can quickly respond to changes in the business environment	0.850	Valid
	We can rapidly address opportunities in our environment	0.856	Valid
	We can swiftly deal with threats in our environment	0.856	Valid
	When needed, we can adjust our supply chain operations to the extent necessary to execute our decisions	0.880	Valid
Business Performance	We always minimize sales returns due to product discrepancies	0.930	Valid
	The return on sales decreases progressively from one period to another	0.895	Valid
	Profit growth fluctuates every period, but tends to increase	0.961	Valid

Variable	Item	*Outer Loading*	Ket
	Market share tends to expand because customer needs are increasing.	0.736	Valid
	The rate of return invested is proportional to the income earned	0.817	Valid
	More and more related parties are helping the development of our MSMEs	0.914	Valid
	We feel that we have utilized all assets to the maximum to generate profits.	0.931	Valid
	With the increasing demand, SME assets are also growing.	0.904	Valid

Source: Primary data processed, 2021

Based on the test results above, it can be seen that the outer loading value > 0.7, so it can be concluded that the indicators that measure each variable do not need to be removed and this study has met the requirements of convergent validity.

Discriminant Validity

The cross loading factor value serves to find out whether the selected variable has an adequate discriminant value. The results of the cross loading factor can be seen in the following table:

Table 2. Cross Loading Value

	Strategic Sourcing	Learning Orientation	Technology Orientation	Supply Chain Agility	Business Performance
X1.1	**0.890**	0.751	0.687	0.694	0.797
X1.2	**0.891**	0.675	0.658	0.735	0.748
X1.3	**0.884**	0.663	0.588	0.712	0.758
X1.4	**0.919**	0.722	0.606	0.714	0.768
X2.1	0.744	**0.893**	0.594	0.634	0.760
X2.2	0.716	**0.860**	0.577	0.718	0.783
X2.3	0.646	**0.869**	0.474	0.667	0.748
X2.4	0.668	**0.914**	0.520	0.686	0.765
X3.1	0.567	0.584	**0.812**	0.571	0.619
X3.2	0.576	0.560	**0.825**	0.560	0.689
X3.3	0.624	0.481	**0.885**	0.598	0.614
X4.3	0.621	0.442	**0.849**	0.628	0.611
Z1	0.666	0.636	0.579	**0.854**	0.657
Z2	0.666	0.668	0.587	**0.846**	0.759
Z3	0.723	0.681	0.628	**0.857**	0.790
Z4	0.644	0.619	0.587	**0.849**	0.638
Z5	0.685	0.638	0.549	**0.858**	0.637
Z6	0.661	0.666	0.588	**0.850**	0.764
Z7	0.722	0.679	0.620	**0.856**	0.783
Z8	0.660	0.643	0.568	**0.856**	0.647
Z9	0.703	0.662	0.669	**0.880**	0.783
Y1	0.751	0.812	0.679	0.756	**0.930**
Y2	0.796	0.736	0.720	0.759	**0.895**
Y3	0.833	0.819	0.722	0.801	**0.961**
Y4	0.641	0.664	0.617	0.653	**0.736**
Y5	0.771	0.788	0.572	0.727	**0.817**
Y6	0.758	0.767	0.667	0.762	**0.914**

	Strategic Sourcing	Learning Orientation	Technology Orientation	Supply Chain Agility	Business Performance
Y7	0.734	0.799	0.673	0.761	**0.931**
Y8	0.792	0.750	0.688	0.759	**0.904**

Source: Primary data processed, 2021

Based on the results of the cross loading test in Table 5 above, it can be seen that the loading value of each item against its construct is greater than the value of cross loading with other constructs, so this study meets the assumption of discrimanant validity.

Average Variance Extraced (AVE)

Ghozali (2014:45) recommends the use of AVE for a criterion in assessing convergent validity. An AVE value of at least 0.5 indicates a good measure of convergent validity. That is, latent variables can explain on average more than half the variance of its indicators.

Tabel 3. AVE Value

Variable	Value
Strategic Sourcing	0.803
Learning Orientation	0.782
Technology Orientation	0.711
Supply Chain Agility	0.733
Business Performance	0.790

Source: Primary data processed, 2021

Based on the test results above, it can be seen that the AVE value of each variable has a value of > 0.5. This suggests that each bariabel can be declared valid, so it can be used for further research.

Composite Reliability

One way to see the reliability of SmartPLS data processing results is to look at the value of composite reliability. Here is the value of composite reliability in this study:

Tabel 4. Composite Reliability Value

Variable	Value
Strategic Sourcing	0.942
Learning Orientation	0.935
Technology Orientation	0.908
Supply Chain Agility	0.961
Business Performance	0.968

Source: Primary data processed, 2021

From Table 4. It can be seen that the value of the composite reliability of each variable has a value of > 0.7. This shows that each variable is declared reliable and can be used for further research and analysis.

Cronbach's Alpha

To strengthen the reliability test results, the Cronbach alpha value is also used. Where a variable can be declared reliable if it has a cronbach alpha value of ≥ 0.7 for confirmatory research and cronbach alpha ≥ 0.6 - 0.7 is still acceptable for exploratory research (Ghozali & Latan, 2015).

Table 5. Cronbach's Alpha Value

Variable	Value
Strategic Sourcing	0.918
Learning Orientation	0.907
Technology Orientation	0.864
Supply Chain Agility	0.955
Business Performance	0.961

Source: Primary data processed, 2021

Based on table 5, it can be seen that the value of Cronbach's alpha of each variable has a value of > 0.7. This shows that each variable can be declared reliable, so that it can be used for further research and analysis.

Measurement Model Test Results: Inner Model

Goodness-of-Fit Test

Testing of structural models is carried out by looking at the value of the coefficient of determination (R^2) which is a goodness-fit test of the model. The value of the coefficient of determination (R^2) in the PLS Algorithm report can be seen by selecting R Square (Ghozali &; Latan, 2015). The R^2 value is used to measure how much an endogenous variable is affected by other variables. R^2 values of 0.67 (strong), 0.33 (moderate) and 0.19 (weak) (Chin, 1998).

Tabel 6. Coefficient of Determination

Variable	R-Square	R-Square Adjusted
Supply Chain Agility	0.713	0.705
Business Performance	0.872	0.867

Source: Primary data processed, 2021

Based on the results of the study, it can be seen that the value of the coefficient of determination of Supply Chain Agility is 0.713, meaning that the regression model of the factors that affect the variable is 71.3%. While the coefficient of determination of Business Performance is 0.872, it means that the regression model of the factors that affect the variable is 87.2%.

Uji Path Coefficient

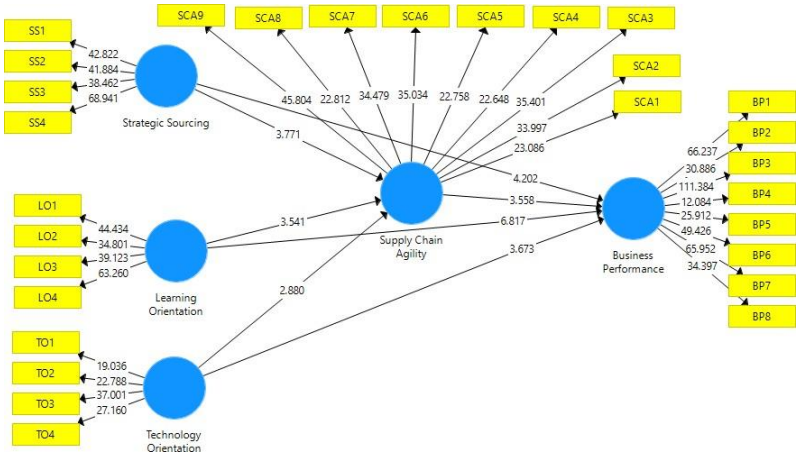

Figure 1. Path Coefficient Results
Source: Primary data processed, 2021

Based on the picture above, it can be seen that the largest path coefficient value is shown by the influence of Learning Orientation on Business Performance with a value of 6,817. While the smallest influence is shown by the influence of Technology Orientation on Supply Chain Agility with a value of 2,880.

Hypothesis Test Result

Hypothesis testing can be done by looking at statistical t values and probability values.

Table 7. Bootstrapping Result

Variable	Original Sample	t-stats	p-value	Keterangan	Hypothesis
X1 → Z	0.371	3.771	0.000	Significant	Accepted
X2 → Z	0.332	3.541	0.000	Significant	Accepted
X3 → Z	0.233	2.880	0.004	Significant	Accepted
Z → Y	0.217	3.558	0.000	Significant	Accepted

Source: Primary data processed, 2021

Based on table 7 it can be seen that the overall p value of each variable has a value below 0.05 with each positive sample original value. Therefore, it can be concluded that the overall results of this study have positive and significant results. So that the whole hypothesis is accepted.

DISCUSSION

Strategic Sourcing Has a Positive and Significant Effect on Supply Chain Agility

Based on the results of the first hypothesis testing, it can be seen that there is a positive influence of Strategic Sourcing on Supply Chain Agility. A positive value on the parameter coefficient means that the better the Strategic Sourcing applied, the better the Supply Chain Agility in SMEs. This indicates that when all SMEs in Yogyakarta simultaneously understand each other related in their supply chain, consistently provide their best, have careful planning, and always learn from past mistakes, the ability of the supply chain process to adapt in facing problems such as disruptions, changes in customer desires, and product competitiveness will also be better.

The study also reinforces previous research belonging to Kim & Chai (2017) entitled "The Impact of supplier innovativeness, information sharing and strategic sourcing on improving supply chain agility: Global supply chain perspective" which states that Strategic Sourcing has a positive and significant effect on Supply Chain Agility. In addition, this research is also supported by research belonging to Hardian & Wardhani (2018) which has results that are in line with this study.

Likewise with SMEs that were used as objects in this study, when conducting research researchers also conducted short interviews and observations. Based on this, it was found that every SME has a good sourcing centricity-learning orientation with each other because they still have a very close sense of kinship between suppliers, sellers, and even competitors. This is also considered to trigger each SME to always provide their best performance (performance orientation) to be able to satisfy customers. This is done by learning from past data in making every future plan.

Learning Orientation Has a Positive and Significant Effect on Supply Chain Agility

Based on the second hypothesis, it can be seen that there is a positive and significant influence of Learning Orientation on Supply Chain Agility. A positive value in the parameter coefficient means that the better the Learning Orientation, the better the Supply Chain Agility. This indicates that when the object of research applies to assume

that providing learning provisions to employees is an investment, understand that learning is the basic value of the supply chain, never stop learning and must quickly respond to changes and realize that good learning skills are the key to improving the supply chain, the ability of the supply chain process to adapt (supply chain agility) will also be better in the future.

The study also reinforces previous research belonging to Zhu & Gao (2021) entitled "The antecedents of supply chain agility and their effect on business performance: an organizational strategy perspective". In the study, it was explained that learning orientation is considered as one of the core important competencies in a business (Slater & Narver 1995; Hurley & Hult 1998).

With regular training provided by related agencies in Yogyakarta, SME owners are also increasingly aware that having extensive knowledge is important. This knowledge must not only be owned by the owner, but also all employees so that they have broad insight when interacting directly with customers. The learning in question must also be carried out continuously because SMEs have also realized that customer trends/desires will always change, so it is very important to always be up-to-date if you do not want to be eroded by the market.

Technology Orientation Has a Positive and Significant Effect on Supply Chain Agility

Based on the results of testing the third hypothesis, it can be seen that there is a positive influence of Technology Orientation on Supply Chain Agility. A positive value in the parameter coefficient means that the better and according to the technology used, the better the Supply Chain Agility in Yogyakarta SMEs. This means that when SMEs are willing to involve technology in product development, use technology that best suits the capacity of SMEs, accept the results of technological innovation with open arms, and understand how technology works, supply chain agility will also be better in order to face changes in the future.

The study also reinforces previous research belonging to Zhu & Gao (2021) In the study mentioned that a technology-oriented business can keep up with the changing technological environment and customer desires, because companies with strong technology orientation tend to develop and adopt unique new product ideas in the process of developing new products (Kim dkk. 2013). But on research belongs to Kocak, Carsrud, and Oflazoglu (2017) states that technology orientation has no significant effect. In the study, it was mentioned that what influences a business to develop is the behavior of managers who have innovative traits. Especially for businesses at the SME level, expanding market share and mastering products to produce consistent products is still a challenge that still needs to be resolved first.

But in this study, it proves that technology orientation has a positive and significant influence. It can also be seen in the field that SMEs in Yogyakarta have begun to be technology-oriented, along with the increasing number of requests from customers, they are also fully aware that by using technology, the planned innovations will be easier to implement.

Supply Chain Agility Has a Positive and Significant Effect on Business Performance

Based on the results of the latest hypothesis testing, it can be seen that there is a significant positive influence of Supply Chain Agility on Business Performance. A positive value in the parameter coefficient means that the better the implementation of Supply Chain Agility in Yogyakarta SMEs, the better the business performance. This indicates that when SMEs are able to respond quickly to changes, are able to identify

opportunities, are sensitive to problems, make decisions decisively, and quickly adapt to changes that occur, it will certainly improve the performance of a business, both in terms of finance, operations, market share, and employee management.

The study also supports previous research belonging to Zhu & Gao (2021) which states that learning-oriented companies are good at acquiring all kinds of useful knowledge and information outside the organization, and this knowledge and information can help companies to realize external changes in the environment, understand market trends, seize market opportunities, increase market share, and finally improve business performance (Liu et al. 2013).

Similar to what is applied in SMEs Yogyakarta, that they have been able to identify opportunities and threats that might jeopardize the sustainability of their products. They think that not stopping innovating is one way to avoid this, so it is expected to improve overall business performance.

CONCLUSION

The study yields several noteworthy conclusions. Firstly, it is found that strategic sourcing has a positive and significant impact on supply chain agility. Secondly, the research indicates that learning orientation also exerts a positive and significant influence on supply chain agility. Additionally, the study reveals that technology orientation plays a positive and significant role in enhancing supply chain agility. Lastly, the data shows that supply chain agility positively and significantly contributes to improved business performance.

Based on the research findings discussed in the preceding chapter and the conclusions drawn, several recommendations can be put forward. Firstly, it is suggested that the Commander of Education Squadron 105 at Lanud Adisucipto focuses on enhancing personnel performance. This can be achieved by strengthening work discipline through tailored supervision, motivating personnel to engage in self-development, and organizing activities such as outbound programs to alleviate work-related stress.
Furthermore, for researchers in the field of management, particularly those dealing with aspects of work discipline, work motivation, work stress, and performance, the outcomes of this study offer a valuable reference point for future research and exploration in these areas.

LIMITATIONS

This research still has variables, the number of respondents, and the scope of research is still very limited. Therefore, researchers suggest that further researchers can maximize existing research by expanding the scope of research or by adding other variables that are in accordance with the conditions of the research object when the research is conducted.

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