The effect of supplier innovation on supply chain agility: Evidence from coffee shops in Malang area

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Abstract. With the agility of supply chain, competitive advantage can be maintained by business people by responding to environmental changes quickly and facing uncertainty. This research investigates the impact of supplier innovation on supply chain agility with information sharing and strategic resource as a mediator. At the same time testing the effect of information sharing and strategic sourcing on supply chain agility. The research sample used 65 coffee shops which were obtained from the response of the owner or manager of the coffee shop in Malang Area, known as the city of a million coffee shops. The rapid development of coffee shops in Malang Area demanding coffee businesses to respond quickly to changing consumer trends by maintaining the supply of coffee beans from the highest quality suppliers. This study was analyzed using structural equation modelling methods. The results revealed that supplier innovation significantly influences information sharing, strategic resources and supply chain agility. In addition, information sharing and strategic resources have a strong influence on supply chain agility. Thus, managers and or coffee shop owners need to establish good and sustainable relationships, especially to deal with changes in the business environment.

1. Introduction

The concept of agility means that a company is able to respond quickly and adapt and has a strategy to overcome it [1]. Business actors will produce a product which is then distributed to consumers. However, in the production process, business actors cannot work alone but need other parties who have a role to support the creation of quality, effective and efficient products. Meanwhile, business actors will always be faced with uncertain environmental changes. Supply chain expertise in responding quickly, minimizing costs, maintaining flexibility, maintaining productivity at the highest level at all times, and being able to create innovations called supply chain agility [2]. Supply chain agility is important because it is a concept that can be used by business people to be able to maintain a competitive advantage. The key underlying supply chain agility is speed, cost and efficiency so that in facing uncertainty, business actors need to develop the right strategy to develop agility and innovation at reasonable costs [3].

The goal of business actors is to win the competition in the market by achieving a competitive advantage. Companies need to implement supply chain management in their practice so that the supply chain of business people can be more responsive [4]. Supply chain agility opens up opportunities to win the market by connecting the three important variables, namely supplier...
innovation, strategic resource and information sharing. In the face of increasingly fierce and complex market competition, strategic resource plays a positive role in uncertainty. The results of Chiang et al., [5] study state that the ability to use resources such as human, physical, technology, and company reputation can continue to grow when collaborated with creativity and innovation. Exchange of information is also very important as the key to success in relationships and relationships and provides an opportunity for every actor in the supply chain to obtain, maintain, and convey information, especially in making decisions.

The results of research by Cavusoglu et al., (2011) show that information sharing has a positive effect on supply chain performance and the better the quality of information sharing, the more it will impact supply chain performance [6]. Thus, strategic resource and information sharing can have a positive effect on supply chain agility. Direct supplier innovation also shows a positive influence on information exchange and supply chain agility [7]. It is also reported that innovations made by suppliers have a direct impact on the agility of the supply chain of companies, which in turn can lead to a business towards a competitive advantage [8, 9]. On the other hand, business actors become more confident and confident in planning production to marketing it.

Meanwhile, Malang City is currently known as the city of a million coffee shops. This is influenced by the trend that first emerged after the release of the film Filosofi Kopi in 2015. Malang, which has cool air and is located in a mountainous area, has become a supporting factor for the increasing trend of gathering and drinking coffee. The coffee shop in Malang City continues to grow by applying a simple concept combined with various facilities to attract public interest, especially for students to gather or do assignments [10]. This development requires coffee business actors to respond quickly to changes in consumer trends in their business environment. The key to success in competing in the market for coffee shop entrepreneurs is to maintain the quality of the coffee beans used and the sustainable supply of coffee beans from suppliers, in this case, coffee farmers. The uniqueness of the product, especially in terms of taste, is one of the factors determining the success of coffee shop entrepreneurs in getting lots of consumers. So, this needs to be supported by coffee suppliers to continue to develop innovations in response to changes to maintain, improve performance, and support the sustainability of the coffee shop.

In this case, business actors need to collaborate both with suppliers and consumers to harmonize supply and demand in the supply chain so that it becomes balanced [11]. Thus, coffee shop business players do not only focus on suppliers but also take into account what customers want and need either by creating new products in accordance with consumer trends or by improving service quality for consumers. Therefore, supply chain agility management is needed to win the market [4]. That way, it is hoped that this research can provide information for business people and coffee shop owners by analyzing the impact of supplier innovation on supply chain agility through information sharing and strategic resource and how important the role of business people is to provide external motivation to their suppliers to adopt innovations in increasing collaboration.

2. Research Method
The sampling method used is judgment sampling with sample criteria, namely a coffee shop that has been established for at least 2 years and has a coffee bean supplier. The number of research samples used as many as 65 coffee shops in Malang City with respondents as the owner or manager of the coffee shop. The recommended number of samples used is based on the research model by considering the statistical power of 80% in PLS-SEM [12]. Meanwhile, the research data was collected through a questionnaire distributed online in accordance with the required sample criteria. This research was conducted in July 2020 using the PLS-SEM analysis method.

Researchers developed a questionnaire in the survey using a unit of measurement that had existed in previous research to align the research model used with the data. All units of measurement are adjusted to match the research topics listed in Table 1.
| Variable               | Items                                                                 |
|-----------------------|----------------------------------------------------------------------|
| Supplier Innovation (SI) [13] [14] | 1. Coffee bean suppliers are often the first to introduce new products (new types of coffee beans)  
                              2. Coffee bean suppliers have introduced more useful and creative products in recent years compared to their competitors  
                              3. Coffee bean suppliers are very aggressive in marketing their product innovations  
                              4. Coffee bean suppliers take the lead in product introduction  
                              5. Coffee bean suppliers continue to develop their production processes  
                              6. Suppliers produce coffee beans faster than their competitors  
                              7. Coffee bean suppliers have new methods of overcoming problems. Suppliers have made new management approaches   |
| Information Sharing (IS) [15] [16] [17] | 1. The information system is integrated into the coffee bean supply chain management  
                                           2. Application of information has been integrated with the coffee shop  
                                           3. Application of additional information systems related to customers has been implemented properly  
                                           4. The existing additional information system is linked with coffee bean suppliers  
                                           5. The current information system fulfills the communication needs of the coffee bean supply chain  
                                           6. There is a managerial interaction between members of the coffee bean supplier  
                                           7. There is a desire to share information among members in managing the coffee bean supply chain  
                                           8. To improve coffee bean supply and product quality, we often get information from customers   |
| Strategic Resource (SS) [18] [19] | 1. Purchasing is one of the coffee shop strategic planning processes  
                                         2. The purchasing function has a strong relationship with the strategic objectives of the coffee Shop  
                                         3. Purchasing performance is seen from its role in the success of the Coffee Shop  
                                         4. Development of professional purchasing centered on elements of the coffee shop competitive strategy   |
Variable: Supply Chain Agility (SC) [20] [21]

| Items                                                                 |
|-----------------------------------------------------------------------|
| 1. The supply chain is able to respond to changes in demand without excess coffee bean stock |
| 2. Cooperation with suppliers is very important in the purchasing, production and logistics |
| 3. Integration of information with purchasing, production and logistics in the supply chain is very important |
| 4. Development of customer service level is a top priority           |
| 5. Developing a response rate for changing markets is a top priority |
| 6. Inventory and demand levels are evident in the supply chain       |

3. Results and Discussions

Cronbach's Alpha Value and Factor Loadings are used to see how the reliability level of all compositions in this study. The results obtained indicate that all factor loads in the research measurement have a value greater than 0.708, which means that each variable is able to provide an explanation of more than 50% of the indicator [22]. Table 2. shows that Cronbach's Alpha value for all measurement variables gets results with a value of more than 0.7, so it can be concluded that all compositions in this study have a strong level of reliability. Next is to test the convergent validity by measuring the value of Composite Reliability (CR) and the value of Average Variances Extracted (AVE). The CR and AVE values range from 0 to 1. The higher the values of CR and AVE, the more stable and solid the convergent validity is. To see whether the measurement of composition in the study has internal consistency, the value of CR must be greater than 0.7 [23] and the value of AVE must be greater than 0.5.

Table 2. Reliability of measurement items.

| Variables | Cronbach's Alpha | Average Variances Extracted (AVE) | Composite Reliability Coefficients |
|-----------|------------------|-----------------------------------|-----------------------------------|
| SI        | 0.912            | 0.655                             | 0.930                             |
| IS        | 0.946            | 0.729                             | 0.956                             |
| SS        | 0.933            | 0.832                             | 0.952                             |
| SC        | 0.914            | 0.704                             | 0.934                             |

In Table 2., the results can be seen that all variables in the study have a CR value of more than 0.7 and an AVE value of more than 0.5. This indicates a stable convergent validity. The next thing that is done in this study is to calculate the value of discriminant validity in the measurement model by rooting the AVE value and then comparing the results obtained with the relationship of each variable, following the research of [7]. The results obtained can be seen in Table 3. where the diagonal value in the table is the result of the square root of AVE and shows a result that is greater than the value of the relationship number between all variables. Furthermore, following [24], a collinearity test was carried out through the VIF value with a tolerance limit of 5 to see whether the data contained multicollinearity. The test results show that the highest VIF value is 2.997 and the lowest VIF value is 1.929. This value is lower than the cut-off value of 5.0, so it can be said that there is no multicollinearity problem in the data of this study [25].
Table 3. Factors loading.

| Variable | SI   | IS   | SS   | SC   |
|----------|------|------|------|------|
| SI1      | 0.742| 0.178| 0.010| -0.283|
| SI2      | 0.844| 0.260| -0.101| -0.027|
| SI3      | 0.804| -0.198| 0.087| -0.048|
| SI4      | 0.768| -0.383| 0.179| -0.109|
| SI5      | 0.837| 0.120| -0.008| 0.169|
| SI6      | 0.804| -0.189| -0.057| 0.338|
| SI7      | 0.860| 0.177| -0.091| -0.068|
| IS1      | 0.074| 0.874| -0.093| -0.127|
| IS2      | 0.095| 0.891| -0.054| -0.149|
| IS3      | 0.150| 0.865| 0.176| -0.103|
| IS4      | 0.158| 0.914| -0.040| -0.138|
| IS5      | 0.019| 0.897| -0.139| 0.025|
| IS6      | -0.096| 0.829| -0.223| 0.188|
| IS7      | -0.428| 0.807| 0.029| 0.299|
| IS8      | -0.022| 0.741| 0.403| 0.053|
| SS1      | -0.055| 0.038| 0.920| 0.125|
| SS2      | 0.040| 0.008| 0.932| 0.007|
| SS3      | 0.078| -0.082| 0.897| -0.078|
| SS4      | -0.063| 0.035| 0.899| -0.058|
| SC1      | -0.072| 0.126| -0.446| 0.721|
| SC2      | 0.102| -0.017| -0.158| 0.912|
| SC3      | 0.051| 0.056| 0.122| 0.892|
| SC4      | -0.039| -0.057| 0.256| 0.882|
| SC5      | 0.204| -0.114| 0.051| 0.836|
| SC6      | -0.289| 0.026| 0.114| 0.774|

Table 4. Correlation matrix: discriminant validity.

| Variables | SI   | IS   | SS   | SC   |
|-----------|------|------|------|------|
| SI        | 0.809| 0.603| 0.421| 0.651|
| IS        | 0.603| 0.854| 0.604| 0.684|
| SS        | 0.421| 0.604| 0.912| 0.696|
| SC        | 0.651| 0.684| 0.696| 0.839|

Table 5. Path coefficient and p-value.

| Path Correlation                  | Path Coefficient | P-Value |
|-----------------------------------|------------------|---------|
| Supplier innovation → Information sharing | β = 0.61         | <0.01   |
| Supplier innovation → Strategic resource | β = 0.43         | <0.01   |
| Information sharing → Supply chain agility | β = 0.52         | <0.01   |
| Strategic resource → Supply chain agility | β = 0.39         | <0.01   |

The structural model (Figure 1) used in this study is the PLS-SEM method. Based on the results in the schematic image above, it can be said empirically that the innovation made by suppliers has a significant relationship to information sharing which has a path coefficient value of 0.61 at a
significance level of 0.01 with a moderate level of accuracy (R² = 0.37). This shows that the innovations made by coffee shop suppliers encourage relationships between suppliers and coffee shop owners to exchange information. The results (Table 5 & Figure 1) also show that supplier innovation has a significant relationship to the strategic source with a path coefficient of 0.43 at a significance level of 0.01 with a low level of accuracy (R² = 0.18). The results showed that information sharing and strategic sources had a significant positive relationship with supply chain agility with the path coefficient values of 0.52 and 0.39 respectively at the 0.01 significance level and high accuracy (R² = 0.68). Thus, it can be concluded that the innovation carried out by suppliers has a positive role in supply chain agility which is significantly influenced by information sharing and strategic source variables.

Figure 1. Research model.

The results showed that every aspect of the coffee bean supplier innovation has a big and positive role for the coffee shop owner. This shows that the innovation made by coffee bean suppliers has a significant impact on coffee shop managers. The path coefficient of supplier innovation to information sharing is 0.61; while supplier innovation to the strategic resource was 0.43 (see Table 5). Both coefficients are positive and significant. Coffee bean suppliers were among the first to introduce new coffee bean varieties. On the other hand, the introduction of new products introduced by coffee bean suppliers is considered to provide great benefits as well as a level of creativity that has been considered quite large in recent years when compared to its competitors. This can be seen from the level of aggressiveness of the coffee bean suppliers, which are considered better in marketing their product innovations. The results also show that in creating new innovations, coffee bean suppliers continue to develop their production processes to make them better. The production process in this case is intended as an activity using the production factors that are owned to create goods or services that have benefits for the buyer (coffee shop).

In this study, information sharing is put into two different dimensions, namely connectivity in communicating and the willingness of actors in the supply chain to share information [16]. The results show that the innovations made by coffee bean suppliers have an impact on actors in the supply chain to have better connectivity in communicating because in the supply chain process, suppliers and buyers will intensely carry out communication activities so that they directly increase the willingness of each actor to share information. There are efforts that need to be made by both the coffee bean supplier and the coffee shop manager so that the innovation adoption process runs well. The coffee shop as the buyer of course also needs to motivate suppliers to be able to adopt innovations that have a
direct impact on the long-term sustainability of the coffee shop. These efforts are proven to provide creation for communicating and sharing information.

Meanwhile, so that communication and information sharing activities can run well, of course, by having an integrated information system between the coffee bean supplier and the coffee shop. A well-integrated information system will make it easier to communicate more frequently. The communication process, if often carried out with coffee bean suppliers, has a positive impact on the supply chain [7]. Cooperation between coffee shops and coffee bean suppliers can create benefits and better collaboration. Thus, when an inventory manager is about to purchase raw materials and select a supply chain, it is necessary to consider the innovation made by the supplier as a main requirement because innovative coffee bean suppliers have a good commitment and a suitable environment for collaboration. Inventory managers also need to consider what benefits will result from these innovations in order to create opportunities. On the other hand, managers who have established a supply chain strategy need to provide motivational encouragement to coffee bean suppliers to facilitate innovation so that supply chain agility can be improved [26] [7].

In this study, it can be seen that the innovations made by coffee bean suppliers provide a very important role, namely providing encouragement to be able to increase response to market changes. Supplier innovation provides change activities in products and production processes that are distributed to each member of the supply chain. Thus, supplier innovation can be a strong strategy for increasing supply chain agility [7]. Coffee shop owners and managers in dealing with existing changes and problems can work with coffee bean suppliers to be able to adopt innovations that can simultaneously increase supply chain agility. Collaboration with coffee bean suppliers can be done by providing a stimulus for innovation creation, selecting innovative coffee bean suppliers, and evaluating coffee bean supplier innovations as the main requirement [27].

In contrast to previous research [7], supplier innovation has a significant relationship with strategic sources. Supplier innovation is indeed capable of improving and influencing relationships in the supply chain and has a significant impact on procurement activities. This is indicated by a positive relationship where the purchasing activities carried out to provide a stimulus to the coffee shop owner and manager to change the planning strategy and achieve the coffee shop's strategic goals. Purchasing performance is measured by looking at the extent of the purchase to provide a stimulus to the coffee shop owner and manager to change the planning strategy and achieve the coffee shop's strategic goals. Therefore, the information sharing aspect needs to be considered by managers in developing a supply chain agility strategy because the information sharing aspect has a critical role in shortening the time needed to make decisions. This will provide a great opportunity for managers to make decisions based on the most correct information. Thus, sharing information will really help managers to make quick and appropriate decisions in responding to changes by frequently having discussions with suppliers.

The strategic sources in this study show a positive relationship to supply chain agility. This is in line with previous research [5] which confirmed a positive relationship between strategic resources and supply chain agility. Strategic resources are concerned with the purchasing role associated with the manager's strategy. A good manager's strategy will positively affect the agility of the supply chain. Managers do not need to worry about external factors such as the development carried out by suppliers when applying strategic resources to increase supply chain agility. Inventory and purchasing managers should consider forming an interrelated relationship between the company's procurement and its strategy [7].
4. Conclusions
This study can be used as information for researchers and coffee shop managers in Malang City. This study explains how to apply the innovations made by coffee suppliers to then improve supply chain performance. In this study, a model was established to see the extent of the relationship between supplier innovativeness and supply chain management practices such as information sharing and strategic resources. This study also establishes a framework of thinking about the role of innovation by coffee suppliers to increase the agility of the supply rate directly and indirectly through information sharing between coffee shops and suppliers in purchasing procurement activities. This study results that coffee shops are able to implement the innovations that have been provided by their suppliers in order to increase supply chain agility through information sharing and strategic resources. Thus, a long-term, sustainable relationship between coffee bean suppliers and coffee shop managers must be well-established for the sake of a good supply chain.

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