The Effect of Supply Chain Practices on Competitive Advantages and Supply Chain Performance in Small Household Agroindustry: Direct and Indirect Effect with Partial Least Square Method

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Abstract. This study aims to determine the effect of supply chain practices on the competitive advantage and Supply Chain Performance (SCP) in Small Household Agro-industry. Data was collected through 150 respondents consisting of producers, Central Processing Unit, Production Centers, and Consumers. The study used the Structure Equation Modelling-Partial Least Square method. Dimensions of the practices supply chain uses strategic partnerships, information sharing, internal integration, and customer integration. The results of the study state that there is a positive relationship between supply chain practices, competitive advantage and supply chain performance.

Keyword: Supply Chain Practices, Competitive Advantages, Supply Chain Performances (SCP), Partial Least Square (PLS)

1. Introduction

The most characteristics of agro-industry are integrity between elements in the agro-industry system. Related to the relationship between these elements is very necessary to achieve success in agro-industry, which consists of three activities, namely the procurement of raw materials, processing, and product marketing. All elements will be introduced with a perfect supply management method that has been implemented properly. Supply chain management practices become one of the important factors in the agro-industry process. Supply chain management Controls effectively and efficiently is one of the keys to the success of a business. The linkages between corporate networks that work together to create and deliver products to consumers must be able to independently. So far the concept of group management is not much that can be used by producer, Central Processing unit, cooperatives, and retailers as an extension of groups that can apply it.

Cooperatives and business groups are faced with problems with the large number of suppliers scattered in various villages, the quantity, and quality produced are very diverse. The quality of sugar is often not in accordance with the standards requested by the company. Information flow in the supply chain is often not timely because the marketing chain is very long. Partnership relationships that occur between agro-industrial households, suppliers and customers greatly influence Supply Chain performance. The relationship between agroindustrial households, suppliers and customers, the more practical the supply chain practices will be in supporting the performance of the agro-industry Supply Chain.
2. Literature Review and Research Framework

Supply Chain Practices
Supply chain practices are a set of activities used to encourage the effectiveness of supply chains (12, 13). The purpose of supply chain practices is so that companies can reduce supply chain costs and achieve competitive advantage. The company will be able to have a competitive advantage if the company realizes the importance of supply chain practices with the aim of improving the company's performance together and coordinating with supply chain partners. The implementation of supply chain practices will lead to customer satisfaction so that it will bring the company's performance to good (15).

Table 1. Dimensions of Supply Chain Practices from Various Researches

| Reference       | Dimensions of Supply Chain Practices                                      |
|-----------------|--------------------------------------------------------------------------|
| Shen (2005)     | Supply Chain Integration, Management Complexity, Aligning strategies and supply chains, Information Technology (IT), Operational Innovation |
| Ciptono (2006)  | Just in Time Delivery (JIT), Supplier Base Reduction, Supplier evaluation based on shipping performance, Determination of long-term contracts with suppliers, Document deletion, Purchasing strategy |
| Li et.al (2006) | Supplier Partnership Strategy, Customer Relations Management, Information sharing level, Information Quality, Delay / postponement |

This study uses Supply Chain Practices dimensions (13, 19), namely supplier partnership strategies / supplier integration; internal integration; information sharing and customer integration.

Competitive Advantages
The concept of competitive advantage was first popularized by Porter (1). This concept is a continuation of the concept of competitive strategy introduced by Porter in 1980. The concept of competitive advantage aims to build a bridge between the formulation and implementation of strategies rather than treating the two subjects separately. Competitive advantage is defined as the ability of an organization or company to create a position that can be maintained above its competitors (13). Competitive advantage begins with the creation of superior leverage competencies to create customer value and achieve cost advantages and differentiation so that the company's performance and profitability increase. The dimensions of competitive advantage from various studies can be seen in table 2.
Table 2. Dimensions of Competitive Advantage from Various Researches

| References       | Dimensions of Competitive Advantage         |
|------------------|---------------------------------------------|
| Koufteros et.al. (2000) | Competitive price  |
|                  | Premium price                                |
|                  | Value for quality customers                 |
|                  | Reliable shipping                            |
|                  | Product innovation                           |
| Li et. al (2006) and Thatte (2007) | Cost / price  |
|                  | Quality                                      |
|                  | Delivery reliability                         |
|                  | Product Innovation                           |
|                  | Time for the market                          |

Source: Summary of various Literatures, 2017

3. Materials and methods

The research location was done by a purposive method, namely in Kulon Progo Regency with the consideration that the area has the largest coconut production in DIY and is an brown sugar agroindustry center. The research sample was taken in stages. The minimum number of samples in a study using SEM-PLS (Structural Equation Model- Partial Least Square) is 10 times the number of the most reflective indicators that lead to a constructor 10 times the number of most arrows leading to latent variables in the structural model used (5,6). The minimum number of samples for regression equations with 6 or more variables is 10 times the number of variables (20). In this study, the number is 6 variables consisting of 3 exogenous variables and 3 endogenous variables. Therefore the minimum number of samples needed to be tested using SEM-PLS according to Vanvoorhis and Morgan is 6 X 10 = 60 samples. This study will take a sample of 150 samples.

Table 3 Variables of Supply Chain Practices, Competitive Advantages, Supply Chain Performance

| No. | Unobserved Variabel | Observed Variabel | Symbol |
|-----|---------------------|-------------------|--------|
| 1.  | Supply Chain Practices (X1) | Strategic Partnership | X1.1 |
|     |                     | Information Sharing | X1.2 |
|     |                     | Internal Integration | X1.3 |
|     |                     | Customers Integration | X1.4 |
| 3.  | scale enterprises   |                   | X2     |
| 4.  | government policy   |                   | X3     |
| 3.  | Competitive Advantages (Y1) | Cost/Prices | Y1.1 |
|     |                     | Quality           | Y1.2 |
|     |                     | Delivery Reliability | Y1.3 |
|     |                     | Product Innovation | Y1.4 |
| 3.  | Supply Chain Performances (Y2) | Product Flow | Y2.1 |
|     |                     | Money Flow        | Y2.2 |
|     |                     | Information Flow  | Y2.3 |

Source: Summary of various Literatures, 2017
4. Results and discussion
This study used an instrument in the form of a questionnaire with a 5 Likert Scale choice of answers from strongly disagrees to strongly agree. Before the data from the questionnaire collection can be used for further analysis, it is necessary to test the validity and reliability of the instrument. Validity testing with Pearson correlation, the instrument is declared valid if the correlation value > 0.3. Validity results in the appendix.
The table above shows the correlation value of all statement items on the questionnaire for all indicators and items worth above 0.3. Thus it can be concluded that all items have fulfilled the validity. The next stage presented instrument reliability testing. The instrument is considered reliable if the Cronbach Alpha value is > 0.6, and is summarized in the following Table 4:

| Variable                        | Alpha  | Conclusion |
|---------------------------------|--------|------------|
| Supply Chain Practices (X1)     | 0.704  | Reliable   |
| Competitive Advantages (Y1)     | 0.703  | Reliable   |
| Supply Chain Performances (Y2)  | 0.700  | Reliable   |

Source: Primary Data Processed, 2018

The table above shows the Cronbach Alpha value to the four research variables worth above 0.6. Thus it can be concluded that the instrument has fulfilled the valid and reliable requirements, so that the data obtained from the instrument (questionnaire) can be used for data analysis at the next stage.

**Testing Linearity Assumptions**

In PLS analysis, there is one assumption that must be fulfilled before the analysis is carried out, namely the linearity assumption, which requires the existence of relationships between variables that are linear. The linearity assumption using the Curve Fit method is that the relationship between variables is expressed linearly if it fulfills one of the following two possibilities: (1) linear model is significant (linear model sig < 0.05), (2) non-significant linear model and all possible models are non-significant (sig linear model > 0.05, and other than linear sig model > 0.05). The test results show some linear model values that are < 0.05 and some p.value values of all models > 0.005 so that the model is said to be linear and fit the assumptions set.

**Goodness Of Fit**

The feasibility of the research model can be proven by looking at the analysis of the coefficients of multivariate determination expressed by Q-Square (Q). Q-Square is a measure of how well the observations made give results to the research model. Q > 0 indicates the model has predictive relevance. The criteria for strong weakness of the model are measured based on Q-square predictive relevance values ranging from 0 (zero) to one (Latan and Ghozali, 2012). The closer to 0 Q-Square predictive relevance gives a clue that the research model is getting weaker, the opposite is getting away from 0 (zero) and getting closer to the value of 1 (one), meaning the research model is getting better. Based on R2 value, it can be calculated Q2 or Stone Geiser Q-Square test, namely:

\[
Q^2 = 1 - (1 - R_1^2) (1 - R_2^2) (1 - R_3^2)
\]

\[
Q^2 = 1 - (1 - 0.156) (1 - 0.105) (1 - 0.370)
\]

\[
Q^2 = 0.5241 = 52.41\%
\]

The calculation results show predictive-relevance value of 0.5241 or 52.41%. Predictive relevance value of 52.41% also indicates that the diversity of data that can be explained by the model is 52.41% or the model can explain in other words the information contained in 52.41% data. While the remaining 47.59% is explained by other variables (which are not contained in the model) and errors. Thus the structural model that has been formed is appropriate.
**PLS Analysis**

Testing the inner model (structural model) essentially tests the hypothesis in the study. Hypothesis testing is done by t test (T-statistic) on each path of partial direct influence. The results of the PLS analysis as well as the results of testing the influence hypothesis are immediately summarized in the following table:

| Path | Relationship Between Variables | Coefficient | P-value | Sig  |
|------|--------------------------------|-------------|---------|------|
| Supply Chain Practices (X1) to Competitive Advantages (Y1) | 0.240 | 0.001 | Significant |
| Scala Enterprises (X2) to Competitive Advantages (Y1) | 0.321 | <0.001 | Significant |
| Government Policy (X3) to Competitive Advantages (Y1) | -0.064 | 0.214 | Not Significant |
| Supply Chain Practices (X1) to Supply Chain Performances (Y2) | 0.143 | 0.036 | Significant |
| Competitive Advantages (Y1) to Supply Chain Performances (Y2) | 0.268 | <0.001 | Significant |

Sources: Primary Data Processed, 2018

**Figure 2** Partial Least Square Structural Model Results
Sources: Primary Data Processed, 2018

Based on Table 5 and Figure 2, it is known that there is a significant influence between Supply Practice (X1) and Business Scale (X2) variables on Competitive Advantage (Y1). The coefficient with positive sign indicates a unidirectional relationship, which means that the higher the Supply Practice (X1) and Business Scale (X2) variables will increase the value of Competitive Advantage (Y1). The same results were obtained from the influence of Supply Practice variables (X1) and Competitive Advantages (Y1) which had a significant and positive effect on Supply Chain Performance (Y2), as well as the effect of Supply Chain Performance variables (Y2) which have a significant and positive effect on Agroindustry Performance (Y3) However, it is different from the influence between Government Policy (X3) on Competitive Advantage (Y1) which has no significant effect, thus indicating that the high and low Government Policy (X3) will not affect the high and low Competitive Advantage (Y1). Mediation testing is obtained from several studies of direct influences that form mediation. The following are the results of the mediation test using Sobel test:

Supply Chain Practices

Scala Enterprises

Government Policy

Competitive Advantages

Supply Chain Performances

0.143

0.240

0.321

-0.064

0.268

0.036

<0.001

Significant

Significant

Not Significant

Significant

Significant
Table 6 Structural Model Results of SEM Mediation

| Indirect Effect | Coefficient Direct Effect | Coefficient Indirect Effect | Sig |
|-----------------|---------------------------|-----------------------------|-----|
| X1 → Y1 → Y2    | X1 → Y1 = 0.240*          | Y1 → Y2 = 0.268*            |     |
|                 |                           |                             | Significant |
| X2 → Y1 → Y2    | X2 → Y1 = 0.321*          | Y1 → Y2 = 0.268*            |     |
|                 |                           |                             | Significant |
| X3 → Y1 → Y2    | X3 → Y1 = -0.064*         | Y1 → Y2 = 0.268*            |     |
|                 |                           |                             | Not Significant |

Sources: Primary Data Processed, 2018

Mediating Effects of Competitive Advantages on Supply Practice Effect and Supply Chain Performance

Indirect influence between Supply Practice (X1) on Supply Chain Performance (Y2) through Competitive Advantage (Y1), obtained an indirect influence coefficient of 0.064. The direct effect of Supply Practice (X1) to Competitive Advantage (Y1) is significant, and the direct effect between Competitive Advantage (Y1) to Supply Chain Performance (Y2) is also significant, it can be concluded that there is a significant indirect effect between Supply Practice (X1) and Supply Chain Performance (Y2) through Competitive Advantage (Y1). Positive coefficient means that the higher the Supply Practice (X1), the higher the Supply Chain Performance (Y2) through Competitive Advantage (Y1).
Mediating Effects of Competitive Advantages on the Effect of Business Scales and Supply Chain Performance

Indirect influence between Business Scale (X2) on Supply Chain Performance (Y2) through Competitive Advantage (Y1), obtained indirect effect coefficient of 0.086. The direct effect of Business Scale (X2) to Competitive Advantage (Y1) is significant, and the direct effect between Competitive Advantage (Y1) to Supply Chain Performance (Y2) is also significant, it can be concluded that there is a significant indirect effect between Business Scale (X2) Supply Chain Performance (Y2) through Competitive Advantage (Y1). The coefficient of positive sign means that the higher the Business Scale (X2), the higher the Supply Chain Performance (Y2) which will be through Competitive Advantage (Y1).
Mediating Effects of Competitive Advantages on the Influence of Government Policy and Supply Chain Performance

![Diagram showing the relationship between Government Policy (X3), Competitive Advantages (Y1), and Supply Chain Performance (Y2).]

Figure 5 Mediation Effects of Competitive Advantages on the Influence of Government Policy on Supply Chain Performance
Sources: Primary Data Processed, 2018

Indirect influence between Government Policy (X3) on Supply Chain Performance (Y2) through Competitive Advantage (Y1), obtained indirect coefficient of influence of -0.017. The direct influence of Government Policy (X3) to Competitive Advantage (Y1) is insignificant, and the direct influence between Competitive Advantage (Y1) to Supply Chain Performance (Y2) is significant, it can be concluded that there is insignificant indirect influence between Government Policy (X3) on Supply Chain Performance (Y2) through Competitive Advantage (Y1). This means that the high and low Government Policy (X3) will not affect the high and low Supply Chain Performance (Y2) through Competitive Advantage (Y1).

5. Conclusion
The results of the study found that there was a positive effect between supply chain practices on competitive advantage and supply chain performance in the small household agroindustry. This is consistent with the study of The higher the Supply Practice will result in higher Competitive Advantage. Scale Enterprises Variables have a significant effect on competitive advantage. The higher the Scale enterprises will result in higher Competitive Advantage. However, there is also an indirect effect between the Scale enterprises that has a significant effect on Supply Chain Performance through Competitive Advantage. Government policy has no effect on competitive advantage. This is because government policies do not reach to small households agro-industry. The results of this study recommend that there is a need to increase supply chain management practices as a whole in all tier of agro-industry from upstream to downstream, increasing the scale of production, and government policy in terms of providing fund, marketing and education that are directly given to small households agroindustry.
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