Supply chain management performance toward competitiveness of chili as main agriculture commodity

M Arhim[1], D A Putri[1], Nurlaela[1], Rahmaniah[1], A Anisa[2], M R Rukka[2], P I M Risamasu[3] and N Kamariah[4]

[1]Agribusiness Study Program, Faculty of Agriculture and Forestry, Universitas Sulawesi Barat, Majene, Indonesia
[2]Department of Agriculture Socio-Economic, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia
[3]Department of Management, Faculty of Business and Economic, Universitas Musamus, Merauke, Indonesia
[4]Department of Business Administration, STIA LAN, Makassar

Email: Muhammadarhim@unsulbar.ac.id

Abstract. Chili has a good prospect demand, but the sector of chili cultivation in small-scale enterprises still face many problems, especially the ability of Supply Chain Performance Management in improving business competitiveness in agricultural chili plants. This study aims to show the effect of Supply Chain Management Performance toward the competitiveness of agricultural chili plants business in Tanralili District, Maros Regency. This research is descriptive quantitative research with a sample of 80 people chosen by quota sampling consisting of farmers, wholesalers, and small traders. The data are collected through observation, interview, and questionnaire (multiple choice questions and an open question). Multiple regression analysis and SEM analysis are used to see the influence of variables. Simple regression test results show that the R^2 value for 0.598, amounting to 116.245 F value, and amounted to 10.782 t. It is acceptable that the hypothesis of the Supply Chain Management performance affects competitiveness. Meanwhile, the result of the evaluation of the structural model coefficients which reveal the effect of the Supply Chain Management performance on the competitiveness has been confirmed to have a significant effect where the p-value (0.000 <0.05). It is concluded that the application of Supply Chain Performance Management on chili plants business in Tanralili district, Maros regency can increase the competitiveness. It is expected that the implementation performance of the strategic formulation of Supply Chain Management may bring an impact on the development of business competitiveness in the area.

1. Introduction

Chili is one of the types of horticulture that is popular with consumers in Indonesia. Chili consumption level is quite high and increases every year. In 2010, the demand for national chili for large chili and cayenne reached 1,220,088 tons. The average consumption of chili per capita can reach 0.43 kg/capita/ month, so the level of consumption of chili per capita per year can reach 4-5 kg. This figure is much higher than other types of vegetables, such as tomatoes and potatoes. Each of these vegetables has an average per capita consumption of 3.13 kg and 3.69 kg per year. A red onion, which is one type of seasoning that is often used in almost all Indonesian dishes, only reaches 0.38 kg/capita/ month or 4.56

kg [1]. However, fresh chili and chili are needed for this industry, which has not been able to be balanced by the agreed domestic chili production by farmers. This prompted the government to import chili from other countries. Based on data from Indonesian Bank [2] in the period between January and February 2011, the number of fresh chili imports reached 2,796 tons with a value of 2.49 million US dollars. Compared to the rate of imports last year, the number of these increases was quite significant. In 2010, chili imports were only 1,852 tons, valued at 1.45 million US dollars. As a result of the increasing importance of chili, the price of local chili has dropped dramatically. The role of mediators can be replaced with a farmer institution that is strong and can guarantee the welfare of farmers. The formation of cooperatives can provide solutions for farmers to market chili directly to consumers. Also, crop yields need to be made so that the chili is still approved. Even though it is only a vegetable, the fact is that chili can affect and have a big impact on the state's financial sector. The price of chili can increase the value of national comparison. In 2010, chili commodities accounted for emissions of 6.96%. Meanwhile, in December 2010, chili commodities contributed 0.22% of inflation to the total gain of 0.92% [1].

According to Royaldi [3], the fluctuations in the price of curly red chili caused the commodity prices to change in the short term due to inefficient supply chains. The efficient supply chain is achieved if the management and supervision of the distribution channel relationship are cooperative for the benefit of all parties involved, to streamline the use of resources in achieving the objectives of supply chain customer satisfaction. The increase in the price of red chili has an impact on the market situation that is not conducive, resulting in an increase in prices of commodities and processed products from the chili. Generally, chili price increases are caused by unbalanced conditions of supply and demand conditions. When the price of chili was increased then the market conditions at that time there was a shortage of supply of red chili from several suppliers to market traders. One factor that causes scarcity of red chili on the market is an inefficient supply chain from suppliers to consumers. Even though red chili has good demand prospects, the red chili cultivation sector in the small scale business still faces various problems or obstacles. The main problems that can cause small chili cultivation business often face the risk of failure, the lack of certainty of selling, fluctuating prices, the possibility of low business margins, weak market access, and the inability to meet capital lending requirements.

Related to the above, it is considered important to conduct this research which aims to see the influence of supply chain management performance on the business competitiveness of chili farming in Tanralili subdistrict, Maros.

2. Methods

2.1. Research approaches and types
The research approach is quantitative descriptive research, which is to describe the supply chain performance activities of chili farming by chili farmers, collectors, big traders in Tanralili District. Maros Regency and small traders in the traditional market as large-scale customers who make direct sales to consumers by considering the number of high or many chili supplies directly obtained in Tanralili District, Maros Regency, while the quantitative approach used in this study is used to test the theory of certain theories by looking at the relationship between variables. This variable is usually measured by a research instrument so that data consisting of numbers can be analyzed based on statistical procedures. The type of research used is survey research methods (descriptive surveys), namely research conducted in the field to obtain facts from existing symptoms and find information, through the process of examining the relationship between farmers, traders and traders on the market modern and traditional, and consumers related to problems in research.

2.2. Location and time of research
This research was conducted in Tanralili District, Maros Regency. The location of the study was done purely purposively (purposive sampling), namely the Maros Regency area in Tanralili subdistrict

which has eight parts, but the research location was only carried out in two Kelurahan namely Borong and Todopuli Villages with the consideration that the area is one of the chili producing centers in Tanralili District, Maros Regency. Also, the researchers also researched three traditional markets (Mandai market, Daya market, and Terong market). The study was conducted for three months.

2.3. Types and data sources
The data used in this study are grouped into two, namely primary data obtained directly from the object studied, namely chili farmers, traders related to the two research areas, namely Borong Village, Todopuli Village, in Tanralili District, Maros Regency, as a producing center chili commodity, and 3 markets (Mandai, Daya, and Terong) as locations for selling chili commodities that get direct supplies from Tanralili District, Maros Regency. Secondary data obtained indirectly obtained from data or archives held by the relevant agencies, namely BPS of South Sulawesi Province and Maros Regency, Food Security Agency of Maros Regency, Agriculture Service and also Department of Industry and Trade of South Sulawesi province and Tanralili District Office.

2.4. Method of collecting data
The collection of primary data is done through observation, interviews and questionnaires as a guide for interviews consisting of a list of multiple-choice questions and open questions. Open question forms, namely respondents, are given a question to answer freely by what they know, experience and practice. The form of multiple choice questions is a statement to be answered by the respondent with answers using the Likert scale 3 points between agreeing, disagreeing, and disagreeing. Likert scale is used to measure attitudes, opinions and perceptions of a person or group of people about social phenomena. Secondary data collection is carried out through library research and collecting data from relevant agency documents, the internet, previous theses and research, journals, articles and scientific literature relevant to research.

2.5. Populasi and sample
The population in this study were the parties involved in the supply chain in Tanralili sub-district, Maros Regency, namely chili farmers, wholesalers and small traders in three different traditional markets. The sampling method is nonprobability sampling. The sampling of this study refers to the quota sampling technique where this technique attracts sample members from each layer, without randomization but uses an accidental method [4]. In this case, because the population in Tanralili Subdistrict, Maros Regency is homogeneous, the researchers only take 10% of the population, so that the number of samples collected is 80 people consisting of 65 farmers, three large traders and 12 small traders.

2.6. Analysis techniques
The analysis technique used is descriptive and quantitative statistics. Simple descriptive statistical analysis by considering the results of rating scoring, this analysis is used to calculate and describe the level of suitability of interests interpreted with three categories of supply chain management performance and competitiveness applied in the study. The quantitative analysis used in this study includes a simple linear regression analysis and path analysis. Simple regression can be calculated using computer aids, namely the Statistical Package for the Social Sciences (SPSS) program. Hypothesis testing, through simple linear analysis, is to look for the influence of supply chain management performance (X), Competitiveness (Y). The general form of a simple linear regression equation is systematic. Whereas path analysis is processed using the Lisrel 8.80 program. Reasons for using Analysis path because statistical testing in this way allows testing of a relatively complicated circuit simultaneously. Another advantage of the analysis path is to confirm the dimensions of a concept or factor, and at the same time measure the influence of the degree of relationship between factors that have identified dimensions.

3. Results and discussion

3.1. Validity test

Based on table 1 the results of the validity test, it is known that all statement items used in this study have a positive correlation coefficient and greater than r Table which is equal to 0.220, so it can be concluded that all items are valid questions.

Table 1. Test results for validity of variables (X) and (Y)

Research variable	Indicator	Corrected item-total correlation	r table	Information
	Product availability			
	KSCM1	0.818	0.220	Valid
	KSCM2	0.911	0.220	Valid
	Responsiveness			
	KSCM3	0.911	0.220	Valid
	KSCM4	0.777	0.220	Valid
Supply chain management performance (X)	Flexibility			
	KSCM5	0.846	0.220	Valid
	KSCM6	0.863	0.220	Valid
	Efficiency			
	KSCM7	0.615	0.220	Valid
	KSCM8	0.676	0.220	Valid
	Price			
	DYS1	0.703	0.220	Valid
	DYS2	0.721	0.220	Valid
	Quality			
	DYS3	0.853	0.220	Valid
Competitiveness (Y)	DYS4	0.855	0.220	Valid
	Delivery dependability			
	DYS5	0.788	0.220	Valid
	DYS6	0.914	0.220	Valid
	Time to market			
	DYS7	0.797	0.220	Valid

Referring to table 2 it can be seen that Cronbach's Alpha from each of the Supply Chain Management Performance variables is 0.930, and the Competitiveness variable is 0.936. Cronbach's Alpha from both variables all have a value of ≥ of 0.60, so it can be concluded that the question items are reliable.

Table 2. Performance variable reliability results (X) and (Y)

Questions	Variables	*Cronbach's Alpha*	Results
8	Performance of s*upply chain management*	0.930	Reliabel
8	Competitiveness	0.936	Reliabel

3.2. Multivariate analysis

Multivariate analysis was conducted to see the effect of Supply Chain Management Performance on Competitiveness. The analysis used is a simple linear regression test.

Table 3. Results of simple regression analysis variables (X) and (Y)

Type of testing	R square	F test	T test
Test result	0.598	116.245	10.782

Based on the results of SPSS calculations as in table 3 it can be seen that the effect of the independent variable on the Supply Chain Management Performance variable is expressed by the coefficient of determination (R^2) which is equal to 0.598 or 59.8%. This means that 59.8% of the variation in Supply Chain Management Performance can be explained by variations in the two independent variables, namely Competitiveness. While the remaining 100% -59.8% = 40.2% is explained by other reasons outside the model, referring to table 3, the results of the f-test regression analysis can be seen that together (simultaneously) the independent variables have a significant effect on the dependent variable. This can be proven from the value of F value of 116.245 while f table at a significant level of 0.05 (5%) of 3.96 so that the calculation results show that the calculated f is greater than f table (116.245> 3.96), thus supply chain management performance affect competitiveness. While t value for competitiveness variable is 10,782, with a significant level of 0.05 (5%) of 1,664.

From these data, it appears that t value is greater than t table (t value> t table) which means that Competitiveness (DYS) influences the Supply Chain Management Performance of chili plant business in Tanralili District, Maros Regency. Besides, the results of the significance test can also be seen by looking at the partial effect (t-test) on the Competitiveness variable (DYS), resulting in a significance of 0,000. The significance level of 0,000 is smaller than 0.05, and it can be seen that the hypothesis that Competitiveness (DYS) influences the Supply Chain Management (KSCM) performance is acceptable. Multivariate analysis was conducted to see the effect of Supply Chain Management Performance on Competitiveness. The analysis used is a simple linear regression test.

3.3. Path analysis test results

Table 4. Test results of construct variables on latent variables.

Latent variables	Indicator/manifest	*Loading factor*	T value	R^2	Result
Supply chain management performance (X)	Product availability (X1)	4.38	37.67	0.89	Significant
	Responsiveness (X2)	0.99	19.73	0.82	Significant
	Flexibility (X3)	2.60	19.60	0.76	Significant
	Efficiency (X4)	0.82	41.01	0.84	Significant
Competitiveness (Y)	Harga (Y1)	1.28	-	0.94	Significant
	Kualitas (Y2)	1.87	-	0.89	Significant
	Delivery dependability (Y3)	1.28	-	0.86	Significant
	Time to market (Y4)	1.87	-	0.89	Significant

Table 4 shows that indicators of product availability (X1), responsiveness (X2), flexibility (X3) and efficiency (X4) have a value of t> 1.96, which means that all of these indicators are statistically significant. Of the four best supply chain management performance indicators because it has the greatest R^2 value, namely product availability (X1) = 0.89, compared with responsiveness (X2) = 0.82, flexibility (X3) = 0.76, and efficiency (X4) = 0.84.The overall construct indicator of the latent variable Competitiveness has the same unit of measurement as the observed variable, the variable is known as the reference variable. So that researchers assume that the four construct variables do not have measurement errors (error variance indicator = 0). Of the four indicators competitiveness is the best

because it has the highest R^2 value, Price (Y1) = 0.94, compared to quality (Y2) = 0.89, delivery dependability (Y3) = 0.86, and time to market (Y4) = 0.89.

Table 5. Evaluation of the structural model coefficients and their relation to the research hypothesis (direct effect).

Hipotesis (Path)	Direct effect			
	Loading factor	*P value*	Chi square	Result
Supply chain management performance ⟶ Competitiveness	0.83	0.000	0.000	Significant
The model is saturated. The fit is perfect				

Referring to table 5, it can be seen that the conclusion of the influence of supply chain management performance on the competitiveness of chili farming business in Tanralili sub-district, Maros district by looking at the evaluation of structural model coefficients has been confirmed to have a significant influence where the p-value (0.000 <0.05). In addition, the chi-square value of 0.000 indicates that the unit of measurement is the same as the observed variable, the variable is known as the reference variable. So the researcher assumes that the two variables do not have measurement errors (*error variance indicator* = 0) so it can be concluded that there is a significant relationship between supply chain management performance variables on the competitiveness of chili farming business in Tanralili sub-district, Maros district. The results of the interpretation of the indirect relationship between the two variables assumed in the research model are described below: The indirect effect of supply chain management performance on the competitiveness of chili farming business in Tanralili sub-district, Maros district is 0.83. This means that every 1 point increase in supply chain management performance will indirectly be able to increase 0.83 points competitiveness.

3.4. Compare theory with research results
The results showed that statistically, the availability of products to supply chain management performance in the model was said to be significant. This result is in line with the research conducted by Ragatz et al. [5], which argues that the success of supply chain management performance is highly dependent on the availability of its products, with the availability of good products in the supply chain can be taken into account. Meeting consumer demand in an appropriate amount has become a very important thing for future competition. The size of a successful company is seen from how well they know the market needs and how much the company can fulfill the size of customer orders.

Responsiveness influence significantly to supply chain management performance in the model is said to be significant. This result is in line with research conducted by Li et al. [6], which explains that responsiveness is closely related to customer interests. The accuracy and speed of providing consumer products can affect supply chain management performance both in terms of cost and assets. When product shipments are late, then payments from consumers will also be late. This causes the cash-to-cash cycle time in asset metrics to be longer.

And also variable flexibility to supply chain management performance in the model is said to be significant. This result is in line with the research conducted by Li et al. [6], which shows that the increase in flexibility and speed of response that continues to increase is very significant as a way to achieve better supply chain management performance. So do with another variables showed that statistically the efficiency of Supply chain management performance in the model is said to be significant. This result is in line with the research conducted by Tracey & Vonderembse [7], which states that indicators of company supply chain performance assessment are assessed from the company's ability to make standards desired by customers by considering the efficiency of production costs, product quality, inventory, cost reduction material handling and submission deadline. The Price significantly influenced the competitiveness in the model. This result is in line with research conducted by Li et al. [6] stating that companies have a competitive advantage if companies can compete against

the main competitors by providing low prices. Prices always have a relationship with a quality, so companies that have good products will be able to set a high enough price. This high product determination will be able to increase profit margins or returns on investments that have been made.

The quality variable showed relation to competitiveness in the model. This result is in line with the research conducted by Li et al. [6], saying that companies have a competitive advantage if companies can provide product quality and performance that can provide higher value for consumers. Quality is always related to price. Companies that have quality products will be able to set premium prices, which will ultimately increase profit margins or return on investment that has been made. The results of the study show that statistically the delivery dependability of competitiveness in the model is said to be significant. This result is in line with the research conducted by Greasley [8], which says that companies are said to have competitive advantages in the aspect of delivery dependability if the company can meet the demands of its customers appropriately, both in terms of quantity, type of product, and time. Companies that have delivery dependability will be able to create consumer trust and satisfaction, which will ultimately be able to create loyalty in consumers. Companies that have high customer loyalty will face the possibility of the low consumer movement, which will ultimately be able to increase sales and profitability.

The results show that statistically time to market competitiveness in the model is said to be significant. This result is in line with the research conducted by Li et al. [6], which revealed that companies must be able to introduce their new products to the market faster than their competitors. Time to market is one of the determinants of a company's performance to achieve competitiveness. Companies that can have a fast time to market can enter the market quickly and can enjoy high market share and sales volume. Therefore, companies must pay attention to the timeliness in launching products to customers [6].

The results of simple linear regression analysis and SEM analysis in seeing the effect of supply chain management performance on competitiveness show a significant stage. The results of this study are supported by research previously conducted by Li et al. [6], which found that the higher the level of application of supply chain management performance, the higher the competitiveness.

This means that a company with a higher level of supply chain management performance has a higher level of competitiveness. This result gives the meaning that with the existence of competitive advantage, it will have a positive influence on company performance. This is consistent with the study of previous researchers from the research of Gimenez and Ventura [9], who think that supply chain management performance is very important for companies in providing fast service with high product quality and low costs so that companies can survive during competition getting tighter. Strategic competitiveness is achieved when a company succeeds in formulating and implementing supply chain management performance. When a company implements a strategy in supply chain management performance that cannot be replicated by other companies or is too expensive to imitate, this company has a sustained or sustainable competitive advantage, in the future referred to as competitive advantage). After the company gets strategic competitiveness and successfully exploits its competitive advantage, a company can achieve its main goal: earning a profit above the average, namely the excess income expected by an investor from investment.

4. Conclusions

Based on the results of the descriptive statistics, it can be concluded as follows: application of supply chain management performance and competitiveness in chili peppers in Tanralili sub-district, Maros regency according to descriptive statistics is considered strong with the breakdown of results for Supply chain management performance of 1602 and competitiveness of 1556. According to the results of descriptive statistics evaluation, all functions in supply chain performance management that are related to fundamental problems, require an internal integration process to be able to plan a better framework, and have a significant impact on the development of farming processes and plant distribution. Chili to achieve competitiveness during intense competition. The results of the tests conducted show that supply chain management performance has a positive and significant effect on

the competitiveness of the chili plant business in Tanralili sub-district, Maros Regency. The application of supply chain management performance to chili plant business in Tanralili sub-district, Maros Regency, which is good, will be able to increase the competitiveness of the business. This research still has limitations, so it still needs to be improved. This study uses questionnaire measurements that might lead to perceptual bias. Further research can use experimental methods to avoid perceptual bias.

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