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Supply Chain Integration and Flexibility as a Competitive Advantage in the Southeast Sulawesi Fishery Sector

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Abstract: The purpose of this study is to examine and explain the effect of internal and external of supply chain integration on Supply Chain Flexibility (SCF) and competitive advantage. More specifically, this research aims to test and explain the role of SCF as mediator for the relation between supply chain integration and competitive advantage. Design of this research used is explanatory research approach. The data are collected through survey methods as cross-section using questionnaire. The unit of analysis is big-scale fishery companies. The respondents as sample are the managers of fishery companies. The 3 hypothesis are tested through a Partial Least Square analysis (PLS). Results show that internal and external supply chain integration can increase SCF and company's competitive advantage, there for SCF has significant effect on competitive advantage. Furthermore, season factor is as control variable in this study model has negative and no significant effect on competitive advantage. Finally, SCF becomes a partial mediation relationship between supply chain integration and competitive advantage. The originality of this research was to provide the basis for an integrated configuration model in testing the relationship between internal and external of supply chain integration on SCF and competitive advantage and also on the role of SCF as mediator in improving competitive advantage.

Key words: Supply chain management, flexibility, competitive advantage, SCF, PLS, internal

INTRODUCTION

Competitions between companies happened these days are not only very tight but it also occurs among many companies from different countries as the impact of globalization and the demands of the free market economy. In responding the increasing complex business competition including the marine and fisheries sector, it can be a driving force for local and national economy if it is managed properly. Indonesia has the role as producer as well as consumer of fishery products around the world. The efforts to support the industrialization of fishery sector which is excellent local commodity by prioritizing the improvement of competitive advantage and added value such as program of Supply Chain Management (SCM) and value chain improvement. Competitive advantage improvement lies on the company's ability to establish the effectiveness of integrated relationships through cooperation, coordination and collaboration among business partners (Heizer and Render, 2008).

SCM is a competitive strategy in the 21st century (Anatan and Elitan, 2008; Rose-Anderssen *et al*., 2010). One of the very important strategies in doing a good SCM is to raise and improve cooperation, coordination and collaboration among all Supply Chain (SC) actors from downstream to upstream. The success level of SC integration implementation involving internal or external companie's process in Asia through enterprise resource planning is lower than in Western countries 10% versus 33% (Han *et al*., 2009). SC integration continues to be a key theme amongst those seeking to understand how to harness the potential of the supply chain to create sustainable value. Much attention has been given to the implementation of integrative SCM, both from academicians and from practitioners. Some practitioners have realized the importance of SCM implementation but have not understood how to implement it. This condition is caused by a lack of clarity and consistency in what is to be measured in the implementation of integrative SCM (Boon and Wong, 2011). The theoretical basis for justifying the role of integrative SCM implementation in improving competitiveness and performance of the company is still weak and this has been the cause of many debates (Danese and Romano, 2011). It is important to carry out further study in relation to this finding, especially by using a contingency approach where the impact of integration of supply chain on competitiveness and performance is variable from upstream to downstream (Boon and Wong, 2011).

Competitive advantage is the core of success or failure for a company. SC integration continues to be a key theme amongst those seeking to understand how to

harness the potential of the SC to create sustainable value. Over the years the attention of practitioners and academic literature on integration practices between SC partners has significantly grown (Van de Vaart and Van Donk, 2008). The intensification of global competition and the demand for better customer service have considerably increased the need for integration between companies. Consequently, SC integration, aimed at coordinating processes along the SC seamlessly, nowadays is considered an important determinant to maintain a competitive advantage over competitors. Competition would determine the appropriateness of the activities carried out by company to support its performance (Porter, 2008). Numerous studies have explored the concept of SC integration in different research areas such as information processing (Boon and Wong, 2011), inventory planning and logistics (Gimanez and Ventura, 2005; Romano, 2009) or partnership (Fynes *et al*., 2005; Han *et al*., 2009). In particular, it has been proposed that implementing integration both upstream and downstream is better than concentrating the firm's efforts on integrating customers or suppliers only (Boon and Wong, 2011).

The reality that competition between companies is very high is indicated by increasing demands of consumers who want products not only by low price but also the quality, innovation and according to customer desires and punctual that cause significant SCF to be applied. Environmental uncertainties factors, inter-organization relationships and sharing information are all factors that must be considered in the SCF (Stevenson and Spring, 2007). Previous studies indicate SCF can improve competitive advantage (Kumar *et al*., 2006; Pujawan, 2004). Then the results of theoretical review propositions (Yi *et al*., 2011; Soon and Udin, 2011) state that the company facing a very dynamic environment must be agile and increase flexibility if it wants to survive in fierce competitions. In contrast to the results of the study (Fantazy *et al*., 2009) that direct SCF has no significant effect on the company's performance, so, the concept of SCF should be extended through competitive advantage. In contrast to the results of the study (Fantazy *et al*., 2009) that direct SCF has no significant effect on the company's performance, so, the concept of SCF should be extended through competitive advantage. Thus, it recommends the need of empirical research to examine the nature and extent of the division of responsibilities among different SC partners.

The fish processing production decline in Southeast Sulawesi Province was caused by management crisis in some fishery firms, so, reduced the activity. It was indication of firm inability to create SCF and build an integrated long-term relationship, especially with suppliers (fish collector) and customers. Competition between fish processing firm was happened primarily because fish processing firms from outside Southeast Sulawesi areas offer higher price to buy fish from the suppliers (fishermen). Based on the problems faced by the fishery firm in Southeast Sulawesi, theoretical debates and empirical gaps from previous research has attracted researchers attention to conduct this study. Key issues of this study is whether the implementation of internal and external of SC integration affects the SCF and competitive advantage of fishery companies. Specifically, the problem of this research are: whether internal and external of SC integration significantly influence SCF and competitive advantage and whether SCF capable to act as mediating the relationship between internal and external of SC integration and competitive advantage.

The objective of this research is to test and explain the impact of internal and external of SC integration on SCF and competitive advantage. This research also attempts to test and explain the role of SCF as mediator for the relation between internal and external of SC integration and competitive advantage. Theoretical contribution of this study is capable to identify and explain the relationship between variables that are expected to be useful for the development of operational management science in particular SCM. The research is conducted in the fishery companies with consideration that fisheries sector as a commodity in Southeast Sulawesi has tried to implement integrated management of fisheries resources from suppliers through to the customer. In addition, potential resource support in Southeast Sulawesi Province containing marine resources and fisheries with very big long run hope for Southeast Sulawesi people, especially Indonesia. So, the implementation of internal and external of SC integration can create added value in enhancing the SCF and company's competitive advantage but is still being debated both theoretically and empirically.

Literature review: This study begins with theoretical study by reviewing the theories relevant to the study which are: Resource-Based View (RBV) and SCM theory. RBV theory explains that the resources and capabilities owned by the company are sources for competitive advantage (Barney, 1991). Any companies can create a competitive advantage if the resources are owned by the company is unique has value, difficult or cannot be

copied and cannot be substituted. The core of the RBV approach is that companies are fundamentally different because it has a unique set of resources (Grant, 2002). Halldorsson *et al*. (2007) state the company can improve the advantage when competing to develop and utilize its unique resources, valuable, rare, difficult to imitate and replaced. Competitive advantage determines the accuracy of the company's activities to support the performance if it is well implemented (Porter, 2008). Competition is a capability that is unique to the company itself and difficult to replicate (Peng *et al*., 2011).

The research is carried out at fishery companies based on the RBV theory which is one of the strategies in utilizing a variety of resources and capabilities as special firm value, it cannot be imitated, rare and cannot be replaced by a competitor (Halldorsson *et al*., 2007). Referring to the RBV theory, so that, the grounding in measuring and test the relationship between the variables of SCF, internal and external of SC integration on competitive advantage. Heizer and Render (2008) declare that the implementation of integrated SCM both internal and external provide strategic opportunities to create competitive advantage. Furthermore, Pujawan (2004) also states that SCF should be considered as a major determining factor in competitive advantage. SCF requires that the integration starting from suppliers to customers have be flexible to any changes that occur due to customer demand which is more critical (Duclos *et al*., 2003; Fantazy *et al*., 2009).

The company has sustained competitive advantage if the company is implementing a value creating strategy which is not simultaneously implemented by existing competitors or potential competitors and when other companies cannot imitate (Barney, 1991). The basic RBV assumption is that the resources within the company are to merge into one (bundles) and the ability of the underlying production is not equal to one another. Resource based view is an approach in designing strategy to achieve excellence by using internal resources of the company. Excellence is achieved when resources are only owned by the company or it is not easy to be imitated by a competitor. Therefore, it needs to be recognized the factors that affect the existence of limited resources whether from supply limitation or from its innovation efforts done continuously.

SCM is an integrative philosophy to manage the total flow of channel from the earliest supplier of raw materials to the ultimate customer and beyond including the disposal process (Cooper *et al*., 1997). SCM is the synchronization of firm processes with those of its suppliers and customers to match the flow of materials, services and information with customer demand (Krawjeski *et al*., 2010). Integration on SC requires an internal integration across the functions in the company and requires external integration with the supplier and customers (Boon and Wong, 2011). SC integration involves the processes of collaboration across functional departments, suppliers and customers to arrive at mutually acceptable outcomes (Pagell, 2004; Boon and Wong, 2011). Collaboration is a key element of SC integration because strategic collaboration is required to enable cross-functional communication and joint efforts (Anatan and Elitan, 2008; Flynn *et al*., 2010; Weigarten *et al*., 2010). SC integration is required "internally" within and across functions and "externally" across suppliers and customers (Stevenson and Spring, 2007; Vargas *et al*., 2000; Gimenez and Ventura 2005).

The integration of all internal functions from materials management to production, sales and distribution is paramount to meeting customer requirements at the lowest total system cost. Thus, internal integration is characterized by full systems visibility across functions such as procurement, production, logistics, marketing, sales and distribution (Han *et al*., 2009; Flynn *et al*., 2010). External integration extends the scope of information sharing and collaboration to include suppliers and customers (Gimenez and Ventura, 2005; Kim, 2006; Krajewski *et al*., 2010).

Implementation of SCM which is integrated both internally and externally has opened a strategic opportunity to create competitiveness (Heizer and Render, 2008). Efforts to achieve high competitive advantage on every company can also by implementing internal and external integration that is reflected through SC coordination, cooperation and collaboration in the SC activities between suppliers, companies and customers. Internal integration is an activity that emphasizes the flow of material and information carried in functional areas of production department, purchasing, inventory, packaging, sale and transportation departments through coordination, collaboration and cooperation between the cross functions under the company's control (Flynn *et al*., 2010; Boon and Wong, 2011). Next, external integration is the integration of SC activities which is out of the company's border and can be measured by coordination, cooperation and collaboration with other SC members that are supplier and customer. This research does not value at global level of external integration in the

company; there is necessity to concern on external integration focus of SC relationships which are supplier and customer.

Previous research (Gimenez and Ventura, 2003, 2005) found that a firm which can achieve a high level for implementation of internal integration and external SC integration can improve its competitiveness. However, there are other research findings (Kim, 2006) which shows that internal integration and external SC integration do not have real impact on the competitiveness of small companies and only significant for large companies. Vargas *et al.* (2000) show that internal and external integration do not provide competitiveness. These differences in research findings are caused by variety in the indicators for measurement in the objects being studied and in the theoretical base which is used and therefore, our research is important in the sense that it tests the contradictions in the result of previous studies.

Thus, internal integration is characterized by full systems visibility across functions such as procurement, production, logistics, marketing, sales and distribution (Han *et al.*, 2009; Flynn *et al.*, 2010; Kannan and Tan, 2010). Research finding shows that a company which can achieve high level of implementation for internal integration SC can improve its SCF (Pujawan, 2005; Yi *et al.*, 2011; Hatani *et al.*, 2016) and competitive advantage (Gimenez and Ventura, 2003; 2005; Kim, 2006; Heizer and Render, 2008; Krajewski *et al.*, 2010; Hatani *et al.*, 2013). These arguments and prior studies appear to support the positive association between internal integration SC on SCF and competitive advantage:

- H_{1a}: internal integration will be positively associated with SCF
- H_{1b}: internal integration will be positively associated with competitive advantage

The external integration of supply chain is an effective coordination between the processes in the supply chain through continuous flow of information, material and cash flow into the supplier and customer (Krajewski *et al.*, 2010). External integration is the integration of supply chain and information beyond the boundaries of the firm where external integration can be measured through coordination, cooperation and collaboration with members of the supply chain that is supplier and customers (Gimenez and Ventura, 2003, 2005; Hatani, 2013). Through external integration, a firm can build cooperation, coordination and coordination for procurement of goods and services for the consumer in an efficient manner Hussain and Othman. The measurement of construct of external integration in this research is not aimed at evaluating the global level of firm's external integration which would require us to study the integration in all parts of the supply chain but is more focused on the integration to the supplier and customer. External integration of supply chain can have significant impact on the SCF (Soon and Udin, 2011; Hatani and Mahrani, 2013) and can improve competitive advantage (Gimenez and Ventura, 2005; Hatani *et al.*, 2016). Referring to the arguments from the previous studies, then the second hypothesis which is proposed here states that good external integration would have positive significant impact on SCF and competitive advantage as follows:

- H_{2a}: external integration will be positively associated with SCF
- H_{2b}: external integration will be positively associated with competitive advantage

SCF starts from manufacturing flexibility which is a very complex concept. SCF is the ability of the partners in a SC to respond to the market changes in gaining or maintaining competitiveness to adapt the strategy and share responsibility in giving quick response to the consumer's demand (Hamel *et al.*, 1998). Increasing competitive advantage needs SC relationship coordination by adding the flow of information and communication business (Stevenson and Spring, 2007). Soon and Udin (2011) suggest a model that can help organizations to select SC strategies based on the customer at time of entering the market to global competition. There is criticism of SCF concept proposed (Pujawan, 2005; Stevenson and Spring, 2007). It says that research on SCF is still focused on how environmental uncertainty may affect SCF but there are other factors that also important role in the SCF which is inter-organizational relationship. SCF should be viewed as integrated and customer-oriented. Duclos *et al.* (2003) state that literature review of flexibility is weak in considering cross-functional, cross-business nature of SCF. SCF should be as an approach to integrate suppliers, companies up to the customers.

Flexibility is the ability to adapt to changes which is important for companies in maintaining their competitiveness in the future and therefore, the emphasis on various indicators of SCF should be directly related to

competitiveness (Fantazy *et al*., 2009). SCF will impact the form of competition carried out by the form and will influence profit as a whole. The firm must know how far SCF can be implemented, so, as to achieve competitiveness in terms of both cost, quality, innovation and time required to market (Hatani *et al*., 2016, Pujawan, 2004; Kumar *et al*., 2006). Further, some propositions from research (Soon and Udin, 2011; Hatani *et al*., 2013) shows that the company in a very dynamic environment must be agile and improve their flexibility if the company wishes to survive in the tight competition. A flexible SC would have flexibility in operation and in supply and logistic network; the flexibility of a SC would be very advantageous for the SC and enable them to provide real benefit for the customers who are responsive.

Previous studies have shown that SCF is capable of improving competitiveness (Pujawan, 2004; Fantazy *et al*., 2009). This is different from the result of Fantazy *et al*., (2009) which found that SCF does not have significant impact on firm performance, so, the concept of SCF should be extended through competitive advantage. Improvement of competitiveness requires a coordination in a SC relation by adding information flow and increasing efforts at communication (Stevenson and Spring, 2007). Soon and Udin (2011) recommend a model which can assist the organization in selecting SC based on the customer when they enter a market with global competition. Therefore, while the general link between SCF and competitive advantage is widely acknowledged, inconsistencies across previous studies suggest the need for further research and hypothesis testing. Hence, we intend to analyze the following hypothesis:

- H_3: SCF is positively related to competitive advantage

Competitive advantage is based on the idea that firm performance is influenced by resources and the unique or inimitable capability of the company Peng *et al*. (2011). SCM incorporates multiple processes and activities from suppliers to customers. With global competitive pressures, organizations have responded with a variety of business strategies to enhance customer value (Porter, 2008). SCM integration is a theory which is based on the idea that effective coordination, cooperation and collaboration can improve competitive advantage and in the end would support company performance (Krajewski *et al*., 2010). Theory of SCM integration in this research is applied in this research using contingency perspective in order to test and explains the impact of supply chain integration on SCF and competitive advantage on different kinds of critical contingency variables. Contingency perspective requires the researcher to choose a variable which would be specified further on how to implement the integrative SCM which are individually interacting with contingency variables in SCF and competitive advantage (Danese and Romano, 2011). The propositions of the literature review proposed (Boon and Wong, 2011) states that from contingency perspective, competitive advantage as a variable of mediation can really influence the relation between internal integration and external integration to SC on competitive advantage competitive advantage. Integration of supply chain, both internal and external, can improve firm performance but through competitive advantage (Heizer and Render, 2008). Integration along the SC is important for managers and researchers because it is a foundation for improving the competitive advantage of the firm and a source of SCF (Pujawan, 2005; Fantazy *et al*., 2009; Hatani *et al*., 2016). Based on the argument from previous research, the following fifth hypothesis is proposed here that SCF plays important role as mediator for the relation between SC integration and competitive advantage as follows:

- H_{4a}: SCF mediates the effect of internal integration SC toward competitive advantage
- H_{4b}: SCF mediates the effect of external integration SC toward competitive advantage

The research is conducted at the company where the fishery resources of raw materials (fish) have unique handling characteristics and greatly depends on the season, so that, the level of turbulence in fish obtaining is very high. Season is a regular movement both increases and decreases in a certain period of time associated with recurrent events such as weather or climate (Heizer and Render, 2008). In this study, the control variable is seasonal factor that can be measured through the movement impact caused by the increase and decrease of fish supply quantity, quality and delivery time as the supply of fish from the suppliers as raw materials in production process caused by weather or climate. Based on the explanation above, this research is considered important given the lack of scientific research on the implementation of SCF, internal and external of SC integration in order to enhance competitive advantage in an integrated implementation, specifically in fishery companies. In brief conceptual framework and hypothesis of this study can be seen in Fig. 1.

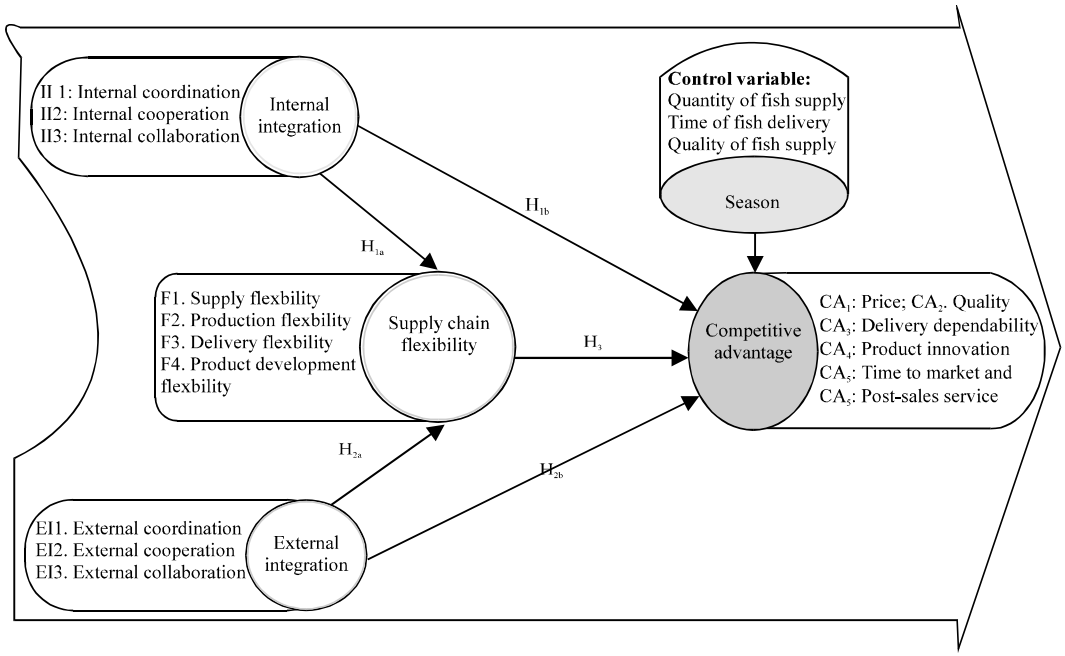

Fig. 1: Research framework

MATERIALS AND METHODS

The design of this research uses explanatory research approach with the aim of making clear the relation between variables through hypothesis testing and making causal conclusion and then followed by choosing among alternatives of action. The reason for the use of explanatory research design is due to the objective of this research that is to prove empirically and explain the impact of the implementation of integrative SCM and SCF on competitiveness and performance of fishery companies. The population of this study is all large-scale fishery companies operating in Southeast Sulawesi which is as the unit of analysis amounted at 44 companies. The sample frame was conducted by selecting only the first tier suppliers in fishery companies. We have chosen the fishery companies in Southeast Sulawesi as the population for this study for several reasons. First, the Southeast Sulawesi fishery companies is seen as an indicator of the wealth of an economy (CSA, 2011). Second, the fishery sector has been a leader in Southeast Sulawesi industry in implementing SCM strategies. The population for this research is all big scale fishery companies operating in Southeast Sulawesi. The criteria of big scale manufacturing company refers to the rule used by central statistics agency that is a company with more than 100 employees. The number of population for big-scale fishery company used as the unit of analysis for this study is 44 companies with 8,924 employees (CSA, 2011).

The sampling technique in this study uses population sampling because the population is relatively small and easily accessible by researcher which are 44 fishery companies. The respondents are directors and managers of the companies. The number of respondent for each company is one person that is the person from management level with titles such as director, CEO, operational manager, logistics manager and quality control manager. Until the expiration of data collection period, the number of collected questionnaires is 42 or 95.45% of the total companies in the sample. Two companies cannot be access due to lack of permission from the management without any reason being given. The directors or managers were chosen as respondent, since, they have the knowledge, ability and accuracy of response to the statements in the survey or questionnaire.

The data collection method used in this study was triangulation. First, a literature review conducted to assess the theories or results of previous studies which are relevant to the measures used in this study. Conceptual framework of this study begins by explaining the construct of competitive advantage which can be achieved if the company is able to anticipate the uncertainty during the process of product making. The research develops generally five indicators in the measurement of competitive advantage, namely: price, quality, delivery dependability, product innovation and time to market (Li *et al*., 2006; Kim, 2006; Peng *et al*., 2011; Hatani *et al*., 2013). This study is developed it into

Table 1: Mean, loading, Average Variance Extracted (AVE) and composite reliability

Constructs and indicators	Mean	Outer loadings		AVE	Composite reliability
		Estimate	t-statistic/CR		
Internal Integration (II)	3.74			0.837	0.939
II_1: Internal coordination	3.71	0.917	12.386*		
II_2: Internal cooperation	3.68	0.914	23.807*		
II_3: Internal collaboration	3.81	0.914	15.931*		
External Integration (EI)	3.71			0.806	0.926
EI_1: External coordination	3.70	0.908	22.578*		
EI_2: External cooperation	3.77	0.895	22.073*		
EI_3: External collaboration	3.62	0.890	19.236*		
Supply chain Flexibility (F)	3.67			0.734	0.917
F_1: Supply flexibility	3.65	0.911	25.209*		
F_2: Production flexibility	3.83	0.813	12.372*		
F_3: Delivery flexibility	3.75	0.878	33.775*		
F_4: Product development Flexibility	3.45	0.821	15.745*		
Competitive Advantage (CA):	3.63			0.671	0.9240
CA_1: Pricing	3.90	0.842	24.623*		
CA_2: Production quality	3.95	0.859	11.766*		
CA_3: Delivery dependability	3.26	0.885	17.613*		
CA_4: Product innovation	3.36	0.810	12.435*		
CA_5: Time to market	3.76	0.749	9.811*		
CA_6: Post-sales service to supplier	3.57	0.762	9.397*		
Season (S):	3.41			0.950	0.983
S_1: Quantity of fish supply	3.38	0.982	341.705*		
S_2: Quality of fish supply	3.31	0.962	186.584*		
S_3: Time of fish delivery	3.55	0.979	205.914*		

CR* = Significant at $\alpha = 0.05$; AVE >0.50 and Average variance extracted >0.70

six indicators which is the needs for after-sales service to the supplier. Thus, this study constructs of SCF which is measured by four indicators adopted from Hamel *et al.* (1998), Duclos *et al.* (2003), Pujawan (2004), Fantazy *et al.* (2009), Yi *et al.* (2011) and Hatani *et al.* (2013, 2016) that are: supply flexibility, production flexibility, delivery flexibility and product development flexibility. The construct of SC integration implementation consist of two variables that is internal integration and external integration where the measurements are SC indicators, that is: cooperation and coordination (Gimenez and Ventura, 2005; Kannan and Tan, 2010; Towill and Childerhouse, 2011; Hatani *et al.*, 2013) and indicator of collaboration which is adopted from theoretical review (Lejeune and Yakova, 2005; Wiengarten *et al.*, 2010). Table 1 reports the items comprising each construct and the outputs of SPSS and PLS obtained by factor analyzing the items of each construct separately along with reliability test results using alpha. Convergent validity is demonstrated, since, for each construct only one component with AVE (Average Variance Extracted) the variance explained is above 50% and factor loadings are all above 0.70 (Hair *et al.*, 2010). Then as suggested by Hwang *et al.* (2010), AVE value of all latent variables is >0.50 it can be said to construct or latent variable has good diskriminan validity. Finally, the value of entire construct derived alpha is >0.70, means that all latent variables have a good composite reliability. Second, data collected using questionnaires, questions sent to managers at each fishery firm.

Finally, the data collection in this study was completed with in-depth interviews. This technique was used to support and to uncover the facts behind the findings of quantitative analysis. Data collection with in-depth interviews method refer to Creswell. In-depth interviews using two ways, namely open-closed interviews and documentation. Informants who agreed to be interviewed until the study discussions ended were 10 manager. More detailed interviews conducted by researchers at the respondent who was able to explain the substance of this research study. Our questionnaire consisted of three sections which included the SC integration, SCF and competitive advantage. Data measurement from all study variables uses Likert scale. A five-point Likert scale was employed with a score of 1, indicating "strongly disagree" and 5, representing "strongly agree" to extract the different attitudes of respondents (Naresh, 2010). The questionnaire was pre-tested by three professionals with extensive experience in SCM practices. According to their recommendations from the pre-test result, several questions were consequently rewritten. Data analysis method used in this study is qualitative and PLS method.

The reasons of choosing PLS method are: This study uses latent variable measured by the indicators, PLS is suitable to confirm unidimensionality from various indicators of latent variables which are both reflexive and formative, PLS is a power full method of analysis that is not based on many assumptions and is possible to do analysis from some latent variables simultaneously, thus provides efficiency statistically, PLS method is easy to operate, does not require any index modifications and is accurate to generalize from a small sample relatively.

Data analysis and results: The study begins with a description of variables analysis that aims to interpret the meaning of each variable based on the mean value of research respondents. The results of the analysis of the description of respondents who indicate the mean value referred in Table 1 that the implementation of internal and external of SC integration; SCF and competitive advantage can be concluded that the average of the respondents is quite good or at the level of neutral. This condition occurs because of the reality that there is a statement by the respondent conveying that in the implementation of internal and external of SC integration; SCF and competitive advantage, there are some companies that are less good in creating coordination, cooperation and internal cross-functional or external collaboration with suppliers and customers to anticipate uncertainty of supply, quality of production, distribution channel of fish supply, changes in customer's demand and effort to improve the fish supply quality that hamper the company's production process. Some companies are reluctant in sharing the knowledge in the implementation of internal integration while external integration of suppliers and customers some respondents have mutual suspicion, lack of trust and lack of transparency of information between suppliers and customers of the company. In addition, they do not have any professional human resources, good infrastructure in realizing information technology to fulfill fish supply needs, product quality and customer demand changes.

The companies still use the old ways in doing product delivery. Delivery capability is still low because of inadequate infrastructure support other than because of bad weather (season) because most of the fish delivery to customers via. sea transport (ship) that indicates the company is often too late in delivery process of finished products. The evaluation results of the respondents on competitive advantage found at medium level, since, the implementation of coordination, cooperation and collaboration, there are some respondents say that it is still not good with all business partners, so, it gives impact on the production flow and less producing a superior product. Besides that, it is due to the lack of understanding and agreement that high flexibility of the SC between business partners and companies to improve the smoothness of production process. Ability of SC partners to respond market change determines significantly the competitive advantage and performance of the companies. Based on the evaluation of this research model, it begins with the measure of fit as measurement model that aims to examine (test) whether the research instruments are valid or reliable as research tool in explaining or reflecting latent variables. The test results mean, estimate loading, AVE and alpha of each variable indicator are presented in Table 1.

Entire measurement model of latent variables in Table 1 appears that the estimated value of the overall loading indicator variable has a value >0.70 (Hwang *et al*., 2010) and CR values significant at 95% confidence level $\alpha = 0.05$. Reflecting that all variable correlations are positive, significant and valid indicator variables and valid to be used in latent variables measurement reflecting SCF, competitive advantage and performance of the companies. Value of the Critical Ratio (CR*) shows all that the indicators can be used to measure latent variables with significant at $\alpha = 0.05$. AVE value of all latent variables is >0.50 (Henseler, 2012), it can be said to construct or latent variable has good discriminant validity. Thus, the research instrument used to measure all latent variables discriminant validity criteria. Furthermore, the value of entire construct derived alpha is >0.70, means that all latent variables have a good composite reliability. It can be concluded that research instruments used in the measurement meets the criteria or feasible because it has high compatibility and reliability.

Thus, further analysis can be done structural model evaluation was performed after the model relationship was built in accordance with the data observation. For the appropriate "goodness of fit" test the PLS Software. The calculations show the predictive value-relevance is $Q^2 = 1-(1-R_1^2)(1-R_2^2) = 1-\{(1-0.665^2)(1-0.949^2)\} = 1-.041 = 0.959$ or 95.90%. That is accuracy or timeliness of this research model can explain variance of internal and external of SC integration toward SCF and competitive advantage of 95.90%. The remaining 4.10% is explained by other variables that are not included in this research model. The results of influence testing among variables can be seen from the path coefficients and the Critical Ratio (CR*) significant at $\alpha = 0.05$ are presented in the path diagram (Fig. 2).

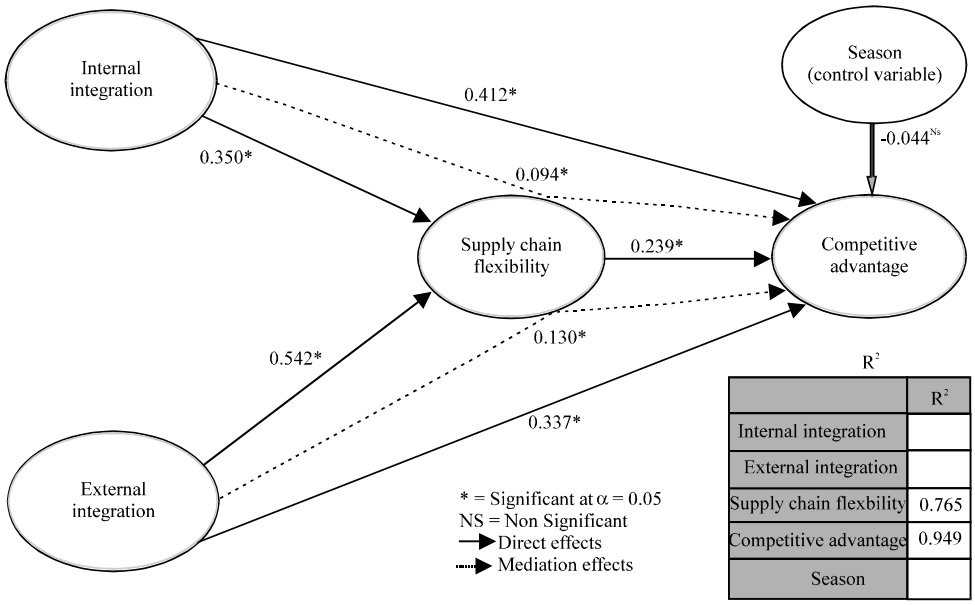

Fig. 2: Diagram for hypothesis testing and path coefficient for PLS

Table 2: Hypothesis testing and path coefficient for PLS

Direct influence	Path coefficient	t-statistics (CR)*	p-values	Empirical	Evidence
H_{1a}: Internal integration --> Supply chain flexibility	0.350	2.680	0.010	Significant	Accepted
H_{1b}: Internal integration --> Competitive advantage	0.542	3.366	0.002	Significant	Accepted
H_{2a}: External integration --> Supply chain flexibility	0.412	4.220	0.000	Significant	Accepted
H_{2b}: External integration --> Competitive advantage	0.337	5.009	0.000	Significant	Accepted
H_3: Supply chain flexibility--> Competitive advantage	0.239	2.405	0.021	Significant	Accepted
Season --> Competitive advantage	-0.054	-0.469	0.641	Not-significant	

Table 3: Test for the impact of mediating variable

Exogenous	Mediation	Endogenous	Path coefficient	Nature of mediation	Empirical evidence
H_{4a}: Internal integration	-->Supply chain flexibility	Competitive advantage	0.094	Partial	Significant accepted
H_{4a}: External integration	-->Supply chain flexibility	-->Competitive advantage	0.130	Partial	Significant accepted

In Fig. 2, it is obtained goodness-of-fit of the structural model and the overall model. The use of PLS estimates the effects simultaneously and is thus more true to the simultaneous nature of the impact of these variables in the research model. It also allows for convenient estimation of the effects of individual predictors (Hair *et al*., 2010). The results of variables influence testing in this study may be presented completely in Table 2.

From Fig. 2 and Table 3 the result of hypothesis testing H_{1a} and H_{1b} shows that internal integration SC has positive and significant impact on SCF and competitive advantage. Therefore, the result of this research has proven that better implementation of internal integration SC would increase SCF and competitive advantage of fishery companies. Coefficients value estimation the effect internal integration on SCF was 0.350 with a probability value of 0.010 ($p<0.05$) and competitive advantage was 0.542 with a probability value of 0.002 ($p<0.05$). The test results prove the better internal integration implementation, the higher SCF and competitive advantage. Therefore, the hypothesis H_{1a} and H_{1b} can be accepted or supported by empirical evidence. The results of interviews with "SCM Manager A" indicates the responsibility of SCF only at management level. Operational level which was responsible for the firm daily operations, still less understand the meaning and function of SCF. Therefore, the fishery firm in Southeast Sulawesi should communicate at all levels in firm about the function and implementation of SCF.

Path coefficients the effect of external integration on SCF was 0.412 with a probability value of 0.000 ($p<0.05$) and competitive advantage is 0.337 with a probability value of 0.000 ($p<0.05$). The test results prove the better external integration implementation, the higher SCF and competitive advantage. Therefore, the hypothesis H_{2a} and H_{2b} can be accepted or supported by empirical evidence. Today, the Indonesian fisheries sector strive for competitiveness, although ability of the fishing industry was still low. As noted by the "SCM Manager B" quality

guarantee and value added products was a key to winning the competition in global trade era. Ministry was prioritizes higher competitiveness and value added through improved supply chain and value chain management using the following four strategies: increase fisheries production through various programs, namely: provision of larger vessel to replace small vessels were now used by fishermen, increasing aquaculture production, increasing the production of high value-added processed products by increasing the SMEs capacity and processing industrialization, developing supporting industries and other related industries.

Direct influence of SCF on competitive advantage generate an estimated path coefficient of 0.239 with a probability value of 0.021 ($p<0.05$). The test results prove the better SCF implementation, the higher firm competitive advantage. Therefore, the hypothesis H_3 can be accepted or supported by empirical evidence. The results of interviews with "Operational Manager C" was also supported, suggesting that SCF both in firms and business partners, particularly with suppliers in meeting fish supply need can improve firm ability to serve the growing demand and diverse consumer tastes. In addition, competitiveness can be achieved, according to target of management firm. Therefore, the SCF effectively make benefits due increased competitive advantage of fisheries. The test of coefficient for the seasonal variables as control finds that it has negative and not significant impact on competitive advantage an estimated path coefficient of -0.054 with a probability value of 0.641 ($p>0.05$). Mediating variables of SCF in Table 2 and Fig. 2 show that internal and external integration SC affect on SCF and SCF affect toward competitive advantage. Test on the impact of mediation aims to detect the intervening variable in the model through the differences in coefficients using an examination method. The test result of path coefficient and hypothesis for the impact of mediation variable in Table 2 shows that the impact of internal and external integration on competitive advantage through SCF is partial mediation. There was enough empirical evidence to accept H_{4a} and H_{4b}, the high SCF act as mediating the relationship between internal and external integration and competitive advantage. This means that the relation between internal and external integration can directly impact competitive advantage and can also do so, through the mediation of SCF.

RESULTS AND DISCUSSION

The results obtained by analyzing the internal integration SC toward SCF and competitive advantage show a positive and significant impact. The test results indicate that there is enough empirical evidence to accept H_{1a} and H_{1b} which states that internal integration significantly enhances the SCF and competitive advantage. The result of hypothesis testing shows that internal integration has positive and significant impact on SCF and competitive advantage. Therefore, the result of this research has proven that better implementation of internal integration would increase SCF and competitive advantage of fishery companies. The result of this research is consistent with the theory from Pujawan (2005) and Krajewski *et al.* (2010) that well-integrated SCM implementation, both internally and externally, would create strategic opportunity for achieving competitiveness. The result of this research is also consistent with the findings by Kim (2006), Yi *et al.* (2011) and Hatani (2013) that internal integration is capable of improving SCF and competitive advantage. This finding supports the research by (Gimenez and Ventura, 2003, 2005) that external integration of supply chain as reflected through external cooperation and coordination is capable of increasing competitive advantage.

The results external SC integration on the SCF and competitive advantage show a positive and significant impact. The test results indicate that there is enough empirical evidence to accept H_{2a} and H_{2b} which states that external integration significantly enhances the SCF and company's competitive advantage. It means that the better external SC integration, the SCF and competitive advantage is increasing. The findings of this study support the SC integration of coordination, cooperation and collaboration is able to improve competitive advantage (Krajewski *et al.*, 2010). It states that the better application of external SC integration, the SCF and company's competitive advantage is expected to increase. This result reflects that external integration can explain the variation in the implementation of an integrated SCM change and competitive advantage of the fishery company. The findings reinforce the theory presented (Heizer and Render, 2008). Anatan and Elitan (2008) that the external SC integration is associated with the integration of data base applications among business partners which are suppliers and customers. Furthermore, Pujawan (2005) states that companies a SC system has the objectives to satisfy the end-user customers similarly, they must research together to make a cheap product, send it punctually and with good quality. Heizer and Render (2010) mention that the implementation of an integrated SCM both internal and external will provide strategic opportunities to create competitive advantage. The results are consistent with studies done by Gimenez and Ventura (2003, 2005) and Peng *et al.* (2011)

which state that external integration can improve competitive advantage. The findings of this study support the research (Pujawan, 2004; Fantazy *et al*., 2009; Hatani *et al*., 2013) that external integration has significant and positive influence on SCF. The research was conducted on a large-scale fishery companies and the results of this study support the findings of study by Kim (2006) showing that the internal SC integration has no significant effect on the competitive advantage of small firms but big companies have significant effect. The findings of this study contrast with research (Vargas *et al*., 2000) that the internal SC integration does not provide a competitive advantage.

Test results of SCF to competitive advantage are positive and significant. This is empirically proven that the facts support to accept the hypothesis H_3 that the better implementation of SCF then the company's competitive advantage is expected to increase. SCF was ability of supply chain partners (suppliers and customers) to respond the changes in achieving or maintaining market competitiveness. Responsiveness of supply chain partners must be integrated, particularly through flexibility in supply; products development; production and delivery. Fishery SCF in Southeast Sulawesi was able to contribute on competitiveness. Test results demonstrate the SCF has significant and positive effect on competitiveness. That is, the empirical evidence prove that better implementation of SCF has increased firm competitiveness. Variable measurement model of SCF was more dominant, reflected by supply flexibility indicator. These results confirm ability of the supplier (fish collector) to provide a fresh supply with needed quantity, delivering fish supply timely and quality suitable with firm demand to determine the increase of delivery dependability, a reflection of competitiveness. If related to studied products characteristics, fish need of a fast process (speed of delivery) because it was very important and determine the product quality of fishery company's.

The results reinforce the SCF theory conveyed by Pujawan (2005) who proposes a framework on the concept of SCF that should be considered as a major determining factor in competitive advantage. Hamel *et al*. (1998) state that SCF is the ability of SC partners to respond to market changes and maintain competitive advantage. The findings of this study also reinforces the RBV theory, which is complementary theories SCM (Halldorsson *et al*., 2007) which declares that the company can improve its competitive advantage when competing to develop and utilize its unique, valuable, rare resources that are difficult to imitate and hard to replace. The findings of this study support the research (Pujawan, 2004; Fantazy *et al*., 2009) that SCF has significant and positive influence on company's competitive advantage. Companies must determine how extent SCF is applied in order to achieve competitive advantage which in terms of aspects of cost, quality, innovation and time to market (Kumar *et al*., 2006). Sanchez and Perez (2005) state SCF can improve company excellence especially in the decision process implementation and the technology implementation which can be an important resource in improving competitive advantage. Stevenson and Spring (2007) claim in improving competitiveness in the global era, it is needed to implement SCF which not only consider the SC uncertainty but also other factors, e.g., cooperation, collaboration and coordination both internal and external to suppliers and customers.

The result of coefficient test for the impact of control variable of season on competitive advantage shows that season has negative impact toward competitive advantage. This shows that higher impact of season would result in reduction of competitive advantage for fishery companies. Our findings confirms by Heizer and Render (2008) which states that season is regular movement either up or down which can reduce productivity and competitive advantage. This results in a reduction in fish supply to the fishery companies. Path analysis for the impact of internal and external integration on competitive advantage which is mediated by SCF, shows a positive and significant coefficient and this is enough evidence to accept H_{4a} and H_{4b}. This means that SCF is really influenced by internal and external integration to supply chain and SCF has significant impact on competitive advantage and then internal and external integration has an impact on competitive advantage. It can be concluded that improvement of the implementation for internal integration will have direct impact for the increasing competitive advantage for the company and the same effect can flow through high level of SCF. The result of mediation test shows that SCF has a partial mediation effect.

This findings are empirical evidence that SCF is an intervening variable which mediates the relation between implementation of internal and external integration to supply chain on competitive advantage partially. This lends support to the theory of supply chain integration (Krajewski *et al*., 2010) that the effective coordination, cooperation and collaboration can improve competitiveness and in the end can improve firm performance. This findings also supports the proposition from Boon and Wong (2011) and Danese (2011) that in contingency perspective, competitiveness as mediation variable is capable of exerting real influence on the relation of internal and external integration to supply

chain on competitive advantage. Our findings also support the propositions from Fantazy *et al.* (2009) and Hatani *et al.* (2016) which states that integration of supply chain, both internal and external can improve company performance but through competitive advantage. High level of competitive advantage would directly increase firm performance. Based on tests on mediation to SCF it was found that the impact of internal and external integration on competitive advantage as mediated by SCF, has the greatest value for path coefficient compared to internal integration. This shows that external integration has a contribution or has dominant role for competitive advantage, mediated through SCF. This result confirms the proposition of (Stevenson and Spring, 2007; Fantazy *et al.*, 2009 and Hatani *et al.*, 2013, 2016) which state that SCF cannot have significant impact on performance but the concept of SCF should be expanded by including competitive advantage.

Research implications: Theoretical implications is expectedly able to develop science in particular the implementation of SCF, internal integration, external integration and competitive advantage. The concept of SCF begins with the development of manufacturing flexibility (Hamel *et al.*, 1998; Duclos *et al.*, 2003; Pujawan, 2005) and theoretical review propositions (Yi *et al.*, 2011; Soon and Udin, 2011) which state that SCF should be integrated and to see SC partner ability in responding changes in the market that can be considered as a determining factor for competitive advantage. Additionally, SCM which develops integration theory (Cooper *et al.*, 1997; Halldorsson *et al.*, 2007; Anatan and Elitan, 2008; Heizer and Render, 2008; Krajewski *et al.*, 2010) states that SCM implementation is based on the philosophy of integration both internally and externally to increase competitive advantage. Criticism conveyed by the SCF concept that is currently focused on environmental uncertainty but there are other factors that play important role that is interorganisasi relationship (Stevenson and Spring, 2007; Yi *et al.*, 2011; Hatani *et al.*, 2013, 2016).

Practical implications of this research is expected to provide managerial implications in managing SCF to increase the competitive advantage of fishery companies. The results of this study provide managerial knowledge and understanding for the importance of integrative SCF application, it is insufficient just to look at the ability of SC partners to respond to market changes to achieve or maintain the company's competitive advantage. Finally, the study is able to prove the importance of business partner relationships in applying the concept of SCF and integrative SCM. The ultimate success of the company in implementing SCF, internal and external integration must go through: coordination, collaboration and research closely with business partners to establish on a long-term partner relationship.

This research global implications to an overall conceptual understanding of the structural relations and the importance of facets of the SCF, internal integration and external integration in affecting company's competitive advantage through interactive relationships, synergetic cross-functional team, building a common understanding, integrated planning, shared knowledge, mutual trust and determining mutual goal of internal capabilities, suppliers and customers in manufacturing company. From a theoretical perspective, the finding of this study implies that SCF, internal and external integration are important direct factors to company's competitive advantage. In addition, SCF, internal and external integration can play a critical role in forming an effectively interactive space for collaboration in terms of information sharing, incentive alignment and joint decision or synchronization practices. SCF, internal and external integration would enhance team members to share knowledge about customers, suppliers and internal distinctive capabilities with each other and they are direct on outcomes through shared knowledge and information that leads to greater effect on competitive advantage. Supply chain integration and SCF adaptations are an important consideration for any manufacturing expansion effort, especially international ones. Previous research has discussed critical SCF and supply chain integration capabilities that can lead to long-term competitive advantages. It is very important for a manufacturing company to choose an appropriate set of sources for interorganizational competitive advantages so that it may successfully accomplish its supply base evolution.

Research originality: The findings of this study provide the basis for integrated model of conceptual model of internal and external integration which have significant influence on the SCF and company's competitive advantage, the testing from previous researchers were conducted separately. The research was to provide the basis for an integrated model relationship between internal and external of supply chain integration on SCF and competitive advantage and also on the role of SCF as partial mediator in improving competitive advantage. The findings of this research also provide managerial knowledge and insight concerning the importance of SCM integrated manner by observing the ability of supply chain partner in responding to the changes in market demand in order to maintain SCF and competitive advantage. Director or managers of fishery companies are

the leaders of the organization and in the upcoming future they have to drive the implementation of integrative SCM. Effective leadership is not only focused on communicating the importance of SCM to the supplier and customer and other business partner but also to express the goals and philosophy of SCM to the employees. This research is expected to provide contribution for the fishery industry in the implementation of integrative SCM for the improvement of SCF and competitive advantage of companies. Consideration on seasonal variation is also important in anticipating the demand for fish supply, so as to maintain the flow of production.

The test results can provide empirical evidence that the development of the indicator measurement model of collaboration is a key element of the integration SC. These results prove that the measurement model of development by including indicators of collaboration are preferred and perceived dominantly or being the most important in the implementation of the internal and external integration of SC. Then the measurement of model development indicators in the after-sales service plays an important supplier or contributes in reflecting company's competitive advantage. Finally, the findings turns out that the control variables largely determine the ability of the company's competitive advantage and performance of fishery companies.

CONCLUSION

This study intends to contribute to existing literature on SCM by investigating the impact of internal and external integration of SC toward SCF and competitive advantage. Furthermore, the internal and external of SC integration are well able increasing the SCF and company's competitive advantage. The measurement results are more dominant in reflected by SCF while the of internal and external of SC integration is internal coordination and coordination on suppliers and customers. While the company's advantage is more or dominantly reflected by product delivery reliability. It can be concluded that the high supply flexibility, good internal and external coordination on suppliers and customers are able to increase the improvement of delivery reliability products which reflects the company's competitive advantage.

Higher SCF can increase the competitive advantage of enterprises. These results indicate that better firm delivery dependability, compared to competitors was the dominant factor in supporting advantage of enterprises. Furthermore, the results of this research could prove a real role of SCF as mediating the relationship between internal and external of SC integration to improve competitive advantage of fishery firms in the Southeast Sulawesi. This means that SCF is really influenced by internal and external integration to supply chain and SCF has significant impact on competitive advantage and then internal and external integration has an impact on competitive advantage. It can be concluded that improvement of the implementation for internal integration will have direct impact for the increasing competitive advantage for the company and the same effect can flow through high level of SCF. The result of mediation test shows that SCF has a partial mediation effect. This shows that external integration has a contribution or has dominant role for competitive advantage, mediated through SCF.

Empirical facts show the impact of seasonal factors resulted in the reduction in the quantity, quality and delivery time delayed supply of fish resulting in lower product delivery reliability and inhibit the production process. Thus, seasonal factors have a negative effect on increasing the competitiveness of enterprises. Finally, as an effort to support the fishery industries, the synergy of central government, local governments, private and public, especially fishermen will be the key to success in improving competitive advantage of the fishery industry. However, in the implementation, local governments, especially in Southeast Sulawesi has not concerned seriously. It can be seen from the provision of supporting infrastructure such as bridges, renovation and industrial restructuring which is needed in order to increase the company's competitive advantage.

LIMITATIONS

There are several limitations of this research, especially in terms of its research object which is limited only to fishery companies in Southeast Sulawesi using the directors or managers as respondents. This limits the generalizability of the research findings only for manufacture industry, especially fishery sector within the same region. Further studies on integrative SCM should involve the suppliers, customer and business partners of the company. Then, the empirical analysis based on survey data here is still limited to cross-sectional relations and therefore, further studies need to be conducted with longitudinal flow up design to enable such study to re-test whether the relations among analyzed variables in the research have changed or not.

The wide scope of topics as well as the corporate environment continuing to change, the limitations of this research method is in preparing a cross-sectional analysis of the relationship, so that, it is necessary to identify

changes in advanced research studies with longitudinal design follow up study to re-examine whether the relationship among the variables analyzed in this study will find any changes. Accuracy or precision of the model are analyzed for 0.635. This means that the diversity of the variable SCF, internal and external integration and competitive advantage can be explained by the model for 63.50% and the remaining 37.50% explained by other variables. Therefore, further research to develop a research model by adding other variables such as the characteristics of SC, integrative information, the quality and performance of the company's culture.

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