Analysis of Value Chain toward Enhancement Competitiveness of Tuna Fishery Industries using Structural Equation Modeling (SEM) and Confirmatory Factor Analysis: Case Study in Cilacap Regency

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Abstract

Indonesia is the world’s largest tuna producer with contributing 15 percent to the world tuna market. Nowadays, Indonesia hasn’t been maximizing a tuna trade commodity, not have a good management system. To compete in world tuna trade, structuring the value chain needs to be done. The aim of this paper is giving impact analysis value chain and productivities of tuna fishery toward competitiveness of tuna industry using Structural Equation Modeling method (SEM) combination with Confirmatory Factor Analysis (CFA) method. Result of this paper explains that test of research model simultaneously gives evidence that the model is fitted. It gives indication with variables value, such as: Value of Vhi-square is low with value 752.155; 0.076 for Root Mean Square Error of Approximation (RMSEA); 0.903 for Goodness Fit Index (GFI); 0.875 for (CFI); and 1.974 for minimum discrepancy (CMIN/DF). Value chain of tuna fishery industries (RNIT) gives influence toward competitiveness of tuna fishery industries (DSIT) with loading factor 0.189. Value chain of tuna fishery industries (RNIT) gives significant influence toward productivity of tuna fishery industries (PDIT) with loading factor 0.52. Value chain of tuna fishery industries (RNIT) gives significant influence toward competitiveness of tuna fishery industries (DSIT) through productivity of tuna fishery industries (PDIT) with loading factor 0.4105. The best strategies to increase competitiveness of tuna fishery industries is increasing a value chain of of tuna fishery industries (RNIT) to raise tuna commodity productivity in global market.

Keyword: Tuna Fishery Industries, Value Chain, Structural Equation Modeling (SEM), Confirmatory Factor Analysis (CFA).

INTRODUCTION

Marine fisheries plays a very important role to supporting and securing the human food (1). World fishery production has continued to grow in the last five decades, with food fish supply increasing at an average annual rate of 3.2 percent, outpacing world population growth at 1.6 percent. World per capita apparent fish consumption increased from an average of 9.9 kg in the 1960s to 19.2 kg in 2012 (2). Paquotte explains that 70 percent of the world fisheries in seafood international trade is tuna fish (3). Of the 4 million of tuna caught all over the world, 65 percent come from the Pacific Ocean, 20 percent from the Indian Ocean and the remaining 15 percent from the Atlantic Ocean (4).

According to Lailossa (2015), Indonesia is the biggest Tuna-producing country in the world, contributing 15 percent of global tuna production in 2009, followed by the Philippines, China, Japan, Korea, Taiwan, and Spain (5). The fishing grounds for Indonesian Tuna fall under two convention areas, Indian Ocean and Western Central Pacific Ocean (WCPO). The Western Central Pacific Ocean currently supports the largest industrial Tuna fishery in Indonesia, contributing almost 80 percent of total Indonesian commercial Tuna production, while Eastern Indian Ocean contributes 20 percent. Based on data reported to the world’s regional fisheries management bodies, the top tuna-fishing nation is Indonesia, with total landings in 2014 of more than 620,000 metric tons (6). Skipjack is the most important tuna species for the Indonesian tuna sector. In the period 2006-2010, a yearly average of about 300,000 tonnes of Skipjack was caught. In 2009 and 2010, Skipjack catches were higher than in previous years (7).

Nowadays, Indonesia hasn’t been maximizing a tuna trade commodities in the world. In governance of tuna fishery, do not have a good management system. While on the other side, to compete in world tuna trade, structuring the value chain needs to be done. From the value chain, it can be guaranteed of quality and quantity toward tuna commodity, as required from importer.

The aim of this paper is giving impact analysis value chain and productivities of tuna fishery toward competitiveness of tuna industry using Structural Equation Modeling method (SEM) combination with Confirmatory Factor Analysis (CFA) method.

Structural Equation Modelling (SEM) method uses to analyze, simultaneously, both the relations of dependence between
structural model and the links between indicator and measurement model (8). According to Ullman, SEM has been described as a combination of exploratory factor analysis and multiple regression (9). SEM is more appropriate with a latent variable system in which the construct (latent variable) has a causal influence on the observed variable (10). SEM was used in order to evaluate the proposed model and find the optimal model with the most significant factors (11). SEM is an extension of the general linear model (GLM) that enables researcher to test a set of regression equations simultaneously (12).

Confirmatory Factor Analysis (CFA) provides a validation aspect of construct, especially in producing good reliability value (13). CFA was selected to refine and validate the measurement scales (14). CFA involves the specification and estimation of one or more putative models of factor structure, each of which proposes a set of latent variables (factors) (15). CFA represents the actual testing of hypotheses about structures underlying responses to individual items on an instrument (16). CFA is used to measure the observed variables and latent variables which is specified by the theoretical construct (17).

The benefit of this paper is giving description about management system of tuna fishery in Indonesia. Secondly, it as literature for fishery study.


This paper is organized as follows. Section 2 explains about the method approach of this paper. Section 3 gives result and discussion of this paper. Section 4 presents a conclusion of this paper.

MATERIAL & METHODOLOGY

Conceptual framework.

Figure 1: Conceptual Framework of tuna Fishery Industries
Value Chain.

According to Porter (1985) Value Chain is a representation of a firm’s value-adding activities, based on its pricing strategy and cost structure (28). Porter developed a general-purpose value chain that manufacturing companies can use to examine all of their activities, and to see how they’re connected (29). Value chain focuses on systems, and how business inputs are changed into business outputs purchased by customers. Each primary activity creates value while at the same time also creating cost. Aggregate perceived use value is equal to the sum of perceived use values resulting from the different business activities, and aggregate costs correspond to the total costs that are incurred as part of the different activities (30). The value chain model consists of five primary activities and four supporting activities as explained above can be used (25).

Primary activities consists of five activities, such as Inbound logistics (Tuna Fishing Activities), Operation (Tuna Processing Industry), Outbound Logistics (Tuna Storage), Marketing & Sales, Services (Commerce of Tuna Commodity). Secondary activities consists of four activities, such as Firm Infrastructure (Organizational Structure, Company Strategies, Vision and Mission). Human Resources Development (Education and Training), Technology Development (Product Design, Development of Information and Technology), Procurement (Banking, Tools, Machinery, Port, Building).

Competitiveness Theory.

Competitiveness is a capability and its potential has to be realized in a firm’s everyday operations. According to Porter (1990), competitiveness is rooted most importantly in a nation’s microeconomic fundamentals, contained in the sophistication of company operations, the quality of the microeconomic business environment, and the strength of cluster (31). For a firm, competitiveness is the ability to produce the right goods and services of the right quality, at the right price, at the right time. Generally, competitiveness is the ability of an organization to compete successfully with its commercial rivals (32).

Porter (1990) argues that the main concern of diamond model is to explain the impact of national condition on the global competitiveness of industry. The Diamond model is one of the few models in international business research that illustrates what comprises national competitiveness within a given industry. The diamond model is composed of two parts: indigenous and exogenous variables. The indigenous variables are (1) Factor Conditions, (2) Firm Structure, Strategy and Rivalry, (3) Related and Supporting Industries, and (4) Demand Conditions. The exogenous variables are Government and Chances.
Productivity Theory.

The design, control and optimization of engineering processes generally require determination of performance measures such as efficiency or productivity \((33)\). Productivity is a basic and intuitive measure of performance. Productivity is defined as the ratio of output to input \((34)\).

The measurement of productivity is an attempt to assess the performance of industries or individual firms to produce goods and service \((35)\). In economic theory, Total factor Productivity (TFP) is measured by productivity indexes or productivity indicator. TFP is an attempt to measure productivity taking into account all factors of production, thus the underlying assumption that labor is not the only input \((36)\).

To calculate the total factor productivity of production, it was used according to equation \((37)\) :

\[
\text{TFP} = Q - \alpha L - \beta K
\]  

where \(L\) represents the labor; \(K\), the volume of capital; and \(Q\), the gross domestic product. The coefficients \(\alpha\) and \(\beta\) show the contribution of labor and capital in production, which, according to similar empirical studies, are considered equivalent to 0.4 and 0.6 respectively.

Cilacap Regency.

Indonesian tuna fisheries can be divided into industrial fisheries and artisanal fisheries. The major tuna fisheries, especially The major tuna fisheries, especially artisanal fisheries are concentrated along the west coast of Sumatera (Banda Aceh, Sibolga, Padang, Bengkulu, Lampung), the south coast of Java (Banten, Pelabuhan Ratu, Cilacap, Yogyakarta, Trenggalek/Prigi), Malang/Sendang Biru, Banyuwangi), Bali (Benoa), Nusa Tenggara Barat, Nusa tenggara Timur (Kupang). Big fishing ports such as Bungus (Padang), Pelabuhan Ratu (West Java), Cilacap (Central Java), Benoa (Bali), Kupang (East Timor), including Jakarta fishing port spur on the development of Industrial tuna fisheries activities in Indian Ocean, of which mainly tuna long line fishing fleets \((38)\).

Tuna is potential commodity in Cilacap. Cilacap regency located on Central Java near Indian Ocean. Cilacap Regency has twelve Fish Auction Place (TPI) covered of six TPI Provinces and six TPI Regencies. 7 from 11 (TPI) located in District of South Cilacap. Cilacap has a tuna fishing potential of 72,000 tons. However, the utilization of sea potential is only 21 percent or 14,982 tons \((39)\).
Targets.

a. It gives analysis the effect of value chain toward competitiveness of tuna fish.

b. It gives analysis the effect of productivity toward competitiveness of tuna fishery industry.

c. It gives analysis the effect of productivity toward competitiveness of tuna fishery industry.

Data Sources, processing and analyze.

In this paper, data obtained include primary and secondary, consists of many stakeholder such as tuna fisherman, fisgery industries, wholesalers, exporter, ice fabrication, banking and etc which integrated in value chain of Tuna Fishery Industries. Sampling is done with purposive sampling technique. Whereas, for businessmen, sampling using cluster sampling method with 20 business units.

Processing data and analysis consists of two a apart, descriptive and inferential. Descriptive analysis used to get the initial description from research object and characteristic in each construct. Whereas, inferential analysis used to test the research hypothesis with Second-Order SEM. CFA used to measure and analysis a factors from performance of value chain and competitivenes of Tuna Fishery Industries.

In this paper, the conclusion is done by analyzing the value of loading factor which is related. While in the research model of SEM, indicator used is value index of Goodness Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA). Adjusted Good of Fit (AGFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI) and Probability (p) value.

RESULTS AND DISCUSSION

Compatibility Evaluation toward Model.

The result of Conceptual model Value Chain of Tuna Fishery Industries (RNIT) with Structural Equation Model (SEM) using AMOS 23.

<table>
<thead>
<tr>
<th>Year</th>
<th>EXPORT (TON)</th>
<th>EXPORT (.000 US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>54,451.0</td>
<td>126,377.2</td>
</tr>
<tr>
<td>2003</td>
<td>70,246.1</td>
<td>111,937.3</td>
</tr>
<tr>
<td>2004</td>
<td>45,874.1</td>
<td>125,488.7</td>
</tr>
<tr>
<td>2005</td>
<td>40,872.3</td>
<td>117,667.3</td>
</tr>
<tr>
<td>2006</td>
<td>44,730.1</td>
<td>120,776.4</td>
</tr>
<tr>
<td>2007</td>
<td>68,885.8</td>
<td>152,406.2</td>
</tr>
<tr>
<td>2008</td>
<td>85,205.8</td>
<td>172,847.7</td>
</tr>
<tr>
<td>2009</td>
<td>76,356.5</td>
<td>162,127.5</td>
</tr>
<tr>
<td>2010</td>
<td>67,882.5</td>
<td>197,052.4</td>
</tr>
<tr>
<td>2011</td>
<td>71,784.9</td>
<td>219,440.3</td>
</tr>
<tr>
<td>2012</td>
<td>105,727.8</td>
<td>298,888.0</td>
</tr>
<tr>
<td>2013</td>
<td>112,347.4</td>
<td>276,607.2</td>
</tr>
<tr>
<td>2014</td>
<td>101,111.0</td>
<td>210,341.5</td>
</tr>
<tr>
<td>2015</td>
<td>27,465.3</td>
<td>148,355.8</td>
</tr>
</tbody>
</table>

Table 1: Value of Tuna Export between 2002-2015

Figure 4: Overall Research Model
**Explanation:**

a. Construct of Value chain of Tuna Fishery Industries (RNIT) as a second order latent variable consisting of two variable, likely (1) Primary activity of value chain (AURN), (2) Secondary activities of value chain (APRN).

1) Primary activities of value chain (AURN) consists of five indicators, such as:
   a) X111 : Inbound Logistics in Value Chain System of Tuna Fishery Industries.
   b) X112 : Operational in Value Chain System of Tuna Fishery Industries.
   c) X113 : Outbound Logistics in Value Chain System of Tuna Fishery Industries.
   d) X114 : Marketing in Value Chain System of Tuna Fishery Industries.
   e) X115 : Service in Value Chain System of Tuna Fishery Industries.

2) Secondary activities (APRN) consists of four indicators, such as:
   a) X121 : Infrastructure development.
   b) X122 : human resources development.
   c) X123 : Technology development in Value Chain System of Tuna Fishery Industries.
   d) X124 : Procurement in Value Chain System of Tuna Fishery Industries.
   e) X125 : Service in Value Chain System of Tuna Fishery Industries.

b. Construct of Industries tuna productivity aims to measuring performance of productivity level in Cilacap regency. The productivity measured by two latent variables, namely Input condition of Tuna Fishery Industries (KIIT) and Output condition of Tuna Fishery Industries (KOIT).

1) Input condition of Tuna Fishery Industries (KIIT) consists of three indicators, such as:
   a) X211 : Input price factor.
   b) X212 : Input quantity factor.
   c) X213 : Input Availability factor of tuna from sources.

2) Output condition of Tuna Fishery Industries (KOIT) consists of three indicators, such as:
   a) X221 : Output price factor.
   b) X222 : Output quantity factor.
   c) X223 : Output Availability factor.

c. Construct of Competitiveness consists of six variable, likely (1) Factor condition of Tuna Fishery Industries (KFIT), (2) Demand condition of Tuna Fishery Industries (KPIT), (3) Factor of structure, strategies, and competition from Tuna Fishery Industries (FSSP), (4) Factor of related and supportive industries (FITM), (5) Government support toward Tuna Fishery Industries (DPIT), (6) Business chance of tuna fishery industries (KBIT).

1) Factor condition of Tuna Fishery Industries (KFIT) consists of three indicators, such as:
   a) Y112 : Capital of Tuna Fishery Industries.
   b) Y113 : Labour of Tuna Fishery Industries.
   c) Y114 : Staple of Tuna Fishery Industries.

2) Demand of Tuna Fishery Industries (KPIT) consists of three indicators, such as:
   a) Y121 : Demand from consumers.
   b) Y122 : Market Access.
   c) Y123 : Product quality of Tuna Fishery Industries.

3) Factor of structure, strategies, and competition from Tuna Fishery Industries (FSSP) consists of three indicators, such as:
   a) Y132 : Drop price of product.
   b) Y133 : Management ability.
   c) Y134 : Competitive Strategi.

4) Factor of related and supportive industries (FITM) consists of two indicators, such as:
   a) Y141 : Business relation with other industries.
   b) Y142 : Strength of supporting industries.

5) Government support toward Tuna Fishery Industries (DPIT) consists of two indicators, such as:
   a) Y153 : Quality control from tuna fishery industries.
   b) Y154 : Fishery conversation of Tuna Industries.

6) Business chance of tuna fishery industries (KBIT) consists of two indicators, such as:
   a) Y162 : Upgrade of technology
   b) Y164 : Preferency Enhancement from importer.

Next step, the result from model which is a combination of constructs conducted testing with AMOS 23.
Based on table upon, all of fitting model cannot be met. Because of that, the research model must be repaired. The purpose of investigate is to matching variables to the model. Result of model repaired in figure below.

Based on five criterias upon, the model is fit. Then, the model can use for analyzing the effect of value chain and productivity system toward competitiveness of tuna fishery industries in Cilacap regency. The model can explains the direct or undirect effect between latent variable (value chain with competitiveness, value chain with productivity)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Standard of Kindness</th>
<th>Calculation Result</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI-SQUARE</td>
<td>low</td>
<td>1236.241</td>
<td>unfit</td>
</tr>
<tr>
<td>RMSEA</td>
<td>≤ 0.080</td>
<td>0.115</td>
<td>unfit</td>
</tr>
<tr>
<td>GFI</td>
<td>≥ 0.900</td>
<td>0.716</td>
<td>unfit</td>
</tr>
<tr>
<td>CFI</td>
<td>≥ 0.900</td>
<td>0.757</td>
<td>unfit</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>≤ 2.000</td>
<td>4.278</td>
<td>unfit</td>
</tr>
</tbody>
</table>

**Table 2: Kindnees Value of Model with Second Order Structural Equation Model**

**Figure 5: Output Path Diagram of Research Model**

**Table 3: Kindnees Value of Model with Second Order Structural Equation Model (after repaired)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Standard of Kindness</th>
<th>Calculation Result</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI-SQUARE</td>
<td>low</td>
<td>752.155</td>
<td>Fit</td>
</tr>
<tr>
<td>RMSEA</td>
<td>≤ 0.080</td>
<td>0.076</td>
<td>Fit</td>
</tr>
<tr>
<td>GFI</td>
<td>≥ 0.900</td>
<td>0.903</td>
<td>Fit</td>
</tr>
<tr>
<td>CFI</td>
<td>≥ 0.900</td>
<td>0.875</td>
<td>Marginal Fit</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>≤ 2.000</td>
<td>1.974</td>
<td>Fit</td>
</tr>
</tbody>
</table>
Table 4: Result of Overall Model Calculation

<table>
<thead>
<tr>
<th>Endogenous Variable</th>
<th>Exogenous Variable</th>
<th>Estimate</th>
<th>Loading Factor</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTIVITY</td>
<td>---</td>
<td>0.609</td>
<td>0.520</td>
<td>0.093</td>
<td>6,523</td>
<td>***</td>
<td>par_2</td>
</tr>
<tr>
<td>COMPETITIVENESS</td>
<td>---</td>
<td>1.563</td>
<td>0.789</td>
<td>0.233</td>
<td>6,717</td>
<td>***</td>
<td>par_1</td>
</tr>
<tr>
<td>COMPETITIVENESS</td>
<td>---</td>
<td>0.439</td>
<td>0.189</td>
<td>0.127</td>
<td>3,454</td>
<td>***</td>
<td>par_29</td>
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<tr>
<td>KPIT</td>
<td>---</td>
<td>1.967</td>
<td>0.977</td>
<td>0.250</td>
<td>7,877</td>
<td>***</td>
<td>par_3</td>
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<tr>
<td>FSSP</td>
<td>---</td>
<td>1.879</td>
<td>0.975</td>
<td>0.255</td>
<td>7,370</td>
<td>***</td>
<td>par_4</td>
</tr>
<tr>
<td>KFIT</td>
<td>---</td>
<td>2.120</td>
<td>0.980</td>
<td>0.258</td>
<td>8,232</td>
<td>***</td>
<td>par_16</td>
</tr>
<tr>
<td>FTIM</td>
<td>---</td>
<td>1.860</td>
<td>0.974</td>
<td>0.244</td>
<td>7,637</td>
<td>***</td>
<td>par_17</td>
</tr>
<tr>
<td>KOIT</td>
<td>---</td>
<td>4.032</td>
<td>0.978</td>
<td>0.365</td>
<td>11,038</td>
<td>***</td>
<td>par_19</td>
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<tr>
<td>KIIT</td>
<td>---</td>
<td>3.686</td>
<td>0.974</td>
<td>0.350</td>
<td>10,517</td>
<td>***</td>
<td>par_20</td>
</tr>
<tr>
<td>APRN</td>
<td>VALUE CHAIN</td>
<td>4.512</td>
<td>0.976</td>
<td>1.545</td>
<td>2,921</td>
<td>0.003</td>
<td>par_21</td>
</tr>
<tr>
<td>AURN</td>
<td>VALUE CHAIN</td>
<td>5.903</td>
<td>0.986</td>
<td>0.368</td>
<td>16,046</td>
<td>***</td>
<td>par_22</td>
</tr>
<tr>
<td>DPIT</td>
<td>COMPETITIVENESS</td>
<td>1.163</td>
<td>0.616</td>
<td>0.208</td>
<td>5,585</td>
<td>***</td>
<td>par_26</td>
</tr>
<tr>
<td>KBIT</td>
<td>COMPETITIVENESS</td>
<td>2.270</td>
<td>0.982</td>
<td>0.266</td>
<td>8,521</td>
<td>***</td>
<td>par_28</td>
</tr>
</tbody>
</table>

Explanation:

*** = Significant probability value ($\alpha=5\%$)

Competitiveness = 0.1899*Value chain
**Direct Influence of Model Between Value Chain and Competitiveness**

First hypothesis, the influence model of value chain system (RNIT) toward competitiveness of tuna fishery industries (DSIT) described with table 3. It explains that Value chain has a direct influence toward DSIT with estimate value = 0.189 ; Construct Reliability (CR) = 4.454; p value = 0.000. Therefore, Value chain of tuna industries (RNIT) has a direct influence toward Competitiveness and gives significant effect.

**Influence of Model Between Value Chain and Productivity.**

Second hypothesis, the influence model of value chain system (RNIT) toward Productivity of tuna fishery industries (PDIT) described with table 4. It explains that Value chain has a direct influence toward PDIT with estimate value = 0.52 ; Construct Reliability (CR) = 6.046; p value = 0.000. Therefore, the influence is to increasing productivity of tuna fishery industries can be implemented through improvement at RNIT based on model created. It can be described as follows :

\[
\text{Productivity} = 0.52 \times \text{Value Chain} \quad (2)
\]

**Influence of Model Between Productivity and Competitiveness**

Third hypothesis, the influence model of Productivity of tuna fishery industries (PDIT) toward Competitiveness of tuna fishery industries (DSIT) described with table 4. It explains that Value chain has a direct influence toward PDIT with estimate value = 0.789 ; Construct Reliability (CR) = 6.717; p value = 0.000. Therefore, the influence is to increasing competitiveness of tuna fishery industries can be implemented through improvement at productivity (PDIT) based on model created. It can be described as follows :

\[
\text{Competitiveness} = 0.789 \times \text{Productivity} \quad (3)
\]

**Indirect Influence of Model Between Value Chain and Competitiveness through productivity**

Indirect influence Value Chain toward Competitiveness = 0.52 x 0.789 = 0.4103. Direct influence Value Chain toward Competitiveness = 0.189. beacuse of direct influence smaller than indirect influence, the value chain of tuna fisheries gives strengh influence toward competitiveness through enhancement of productivity. Then, establishment of Value Chain (RNIT) can be increasing productivity of tuna fisheries. It gives influence for competitiveness of tuna fisheries industries at Cilacap regency, because p value is significant (α=5%).

**Managerial Implication**

a. Implication toward enhancement of Value Chain of Tuna Fishery Industries (RNIT).

Based on CFA data analysis toward main construct variables, DSIT needs more focus to increase performance of value chain.

b. Implication toward Productivity of Tuna Fishery Industries (PDIT).

Based on second order CFA toward system variable of value chain, it seen that loading factor between primary activities (0.986) and secondary activities (0.976) is equally strong. It gives indication that to arrange value chain (RNIT), to improve it must be fosued on both variable. It gives implication that to increase productivity of tuna fishery, first step is improvement at value chain system of tuna fishery industries.

c. Implication toward enhancement of Competitiveness of Tuna Fishery Industries (DSIT).

Based on CFA data analysis toward main construct variables of competitiveness. It has needs more focused in many variables such as : (KFit), (FSSP), (FTIM), (KBIT). Whereas, (DPIT) with loading factor value 0.62 bigger than others factor. It gives implication that Government policy is enough for enhancement of competitiveness of tuna fishery industries.

**CONCLUSION**

Test of research model simultaneously gives evidence that the model is fitted. It gives indication with variables value, such as : Value of Vhi-square is low with value 752.155; 0.076 for Root Mean Square Error of Approximation (RMSEA); 0.903 for Goodness Fit Index (GFI); 0.875 for (CFI); and 1.974 for minimum discrepancy (CMIN/DF). Value chain of tuna fishery industries (RNIT) gives influence toward competitiveness of tuna fishery industries (DSIT) with loading factor 0.189. Value chain of tuna fishery industries (RNIT) gives significant influence toward productivity of tuna fishery industries (PDIT) with loading factor 0.52. Value chain of tuna fishery industries (RNIT) gives significant influence toward competitiveness of tuna fishery industries (DSIT) through productivity of tuna fishery industries (PDIT) with loading factor 0.4105.

It research gives evidence that a value chain of tuna fishery industries (RNIT) has significant influenced toward
competitiveness of tuna fishery industries (DSIT) through productivity of tuna fishery industries (PDIT). Accordingly, the best strategies to increase competitiveness of tuna fishery industries is increasing a value chain of of tuna fishery industries (RNIT) to raise tuna commodity productivity in global market.

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