

## THE COMPETITIVENESS OF INDONESIAN TUNA EXPORT FACING THE ASEAN ECONOMIC COMMUNITY

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**Abstract:** This study tried to estimate the competitiveness of Indonesian tuna exports in the ASEAN market during the period 2005-2010 and analyze the factors affecting the competitiveness of exports of tuna. Several data analysis methods were used to measure the commodity of Indonesian tuna with competitiveness to the ASEAN market are the Revealed Comparative Advantage (RCA) and Constant Market Share Analysis (CMSA); while the panel data regression is used to examine the factors that affect the export competitiveness of Indonesian tuna to the ASEAN countries. This is indicated by the value of RCA obtained less than 1. This also shows that the competitiveness of Indonesian tuna is still relatively high (strong); while the value of CMSA is positive, it indicates that Indonesia is still be able to maintain the competitiveness of tuna fish in the ASEAN market. RCA and CMSA size is then used as the dependent variable in the regression analysis panel. The results of the panel regression estimated using a random effects indicate that GDP<sub>i</sub> negative and significant, while GDP<sub>j</sub>, POP<sub>j</sub>, Distance and exports have a positive and significant effect on RCA. The result of the *pooled least square* estimation indicates that GDP<sub>i</sub> and POP<sub>i</sub> are negative and significant, while the POP<sub>j</sub> gives a positive and significant influence toward CMSA decreased.

**Keywords:** Competitiveness Revealed Comparative Advantage, Constant Market Share Analysis, Panel Data Regression.

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### Introduction

Indonesia is the largest archipelagic state in the world, possesses abundance marine and fisheries natural resources. With a sea area of 5.8 million km<sup>2</sup> (Ministry of Maritime Affairs and Fisheries 2010), the development of marine and fisheries sector can be one of promising future national economic development. FAO (2000) states that currently, fishes are accounted to provide for approximately 13.8 to 16.5% of the animal protein of humans' intake. During the period 1961 to 1998, despite the 3.6% per year, the growth of the world's fish supply for food consumption remained fall of sort. The fish are marketed worldwide at 79.60% for food consumption (food) and the rest (20.40%) for non-food consumption, there is evidence that fish is on demand for consumption.

The increasing demand for the food in the world which includes fishery commodities will indirectly increases the transaction for Indonesian fish production in the international market. According to World Fishery Organization (2010) there are three potential markets for Indonesian fishery commodities, namely the Asian, the US and the European regions. The Marine and Fisheries Data Statistics of 2010 shown that Indonesia's main export commodities in the period 2005-2010 were shrimp and tuna. Indonesia also plans to implement the agreements of ASEAN

Economic Community by 2015 which can also be a challenge to the fisheries sector, particularly of the tuna products. Based on data from FAO (2011a) among ASEAN countries which are potential tuna exporters are Indonesia, Malaysia, the Philippine and Thailand. Of the four countries, Indonesia is the largest Tuna exporter in the ASEAN.

In the Southeast Asian region, Indonesia is considered as the world leading tuna producers. However, the export of tuna from Indonesia to ASEAN countries in 2010 had experienced down slope by 27.46% compared to the previous year. In contrast to the volume of tuna export throughout the continent, it had increased by the same year, as more countries were willing to

open their market for Indonesian Tuna; and that had doubled up the value of exports and the flow of foreign exchange into the country.

Based on FAO report (2011a), ASEAN produces at least four types of tuna: albacore (*Thunnus alalunga*), Bigeye Tuna (*Thunnus* sp), Skipjack and Yellowfin (*Thunnus albac*). In addition, the data from UN-Comtrade (2011) showed that in the last ten years, the Indonesian fish and fishery products exports have been experiencing significant changes. In 2000, Indonesian fish and fishery products had exported mainly to Japan (50%), the United States (19%), the EU (6%) and other Asian countries. However, in 2010, the direction of export, instead of Japan and the EU, had shifted to Asian countries, such as Malaysia, Singapore, Thailand, the Philippines, Vietnam, China, Hong Kong and several other East Asian countries.

The total volume of tuna exports to countries like the E U, Taiwan, and Singapore had decreased respectively approximately between 1152.8 tons, 1614.5 tons, and 3105.5 tons in 2007 compared with the total export in 2003. The Decline in tuna exports to the E U was not mainly due to the competitiveness, but more to the provisions of the E U trade policy. The EU had discriminatively applied the duty rate for Tuna Exporter countries. It had imposed discriminatively import duty of 9.5 per cent for Indonesian fishery products, but not for the similar products that of Vietnam and some other countries. Such trade barriers obviously would affect the Indonesia tuna export to the E U. Nevertheless, there were other reasons that caused the uncertain condition of Indonesian tuna export to those countries. Seemed the Indonesian tuna products were not well managed, because of several constraints, such as the limitation or ill equipped port facilities and transportation that had caused the quality of tuna dropped. In terms of the tuna price it was very competitive at the local and international lever, approximately, the variance between 15.000 IDR at the local and 3 to 4 USD at the international market. Although the market is open competitively, it remained unable to compete at the global market.

Accordingly, it was very important to examine the competitiveness of Indonesian fisheries sector, focusing on the prospect of tuna commodities in facing the ASEAN Free Trade in 2015. Certainly, this study would provide very useful input for the sustainability of Indonesia economy at the marine and fishery sectors, which would especially helped in improving the welfare of the fishermen, fish farmers and fish processed company, as well as the securing the sustainability of fish resources.

## Literature Review

In such a competitive world market, a country to compete fairly, it should be able to evaluate the comparative and competitive advantages of its specialized products with in the world market, as exporter or importer. Through this strategy, each country could identify the differences in terms of factors related to the production or efficiency and *cost comparative advantage*. For a country to be able to compete it should focuses on ability to increase level of productivity and efficiency. In this case, the government plays important role to boost competitiveness, as facilitator and regulator to maintain market dynamism. It can do so through research and development policies, socialization, enhancing access to the market, improvement of infrastructure and market information center.

This strategy is the main point of the competitive advantage theory, which aims to improve the system for Industries' development in a country. It has refuted the present assumption that the success of Industrial development is mainly influenced by present of the comparative advantage.

An analysis of *Revealed Comparative Advantage* (RCA) is a method that is used to analyze or measure the competitive advantage of a country. It is considered to be an exceptional method, because the value of comparative advantage is reflected in value of exports. Meanwhile, the *Constant Market Share Analysis* (CMSA) in used to know the export competitiveness of a country in the global market, in term export across countries. Leamer and Stern (1970) argued that based on CMSA analysis, the failure of export of a country with lower export development in the world was

due to the concentration on the export of relatively less demanded commodities, stagnant region as its distention of export, as well as the inability to compete with other exporter countries.

Cahya (2010), using *Revealed Competitive Advantage* (RCA) stated that fresh and processed tuna are commodities with high comparative competitiveness, but not for the frozen tuna. Putthipokin (2001) has used RCA indexes to examine the comparative advantages of the canned tuna industry in Thailand in comparison with the Philippines and Indonesia, whereby Thailand was the prime competitor, to the big five importers, the United States, The European Unions, Canada, Australia and Japan in the year 1994-1999. It found the Thailand's export RCA indexes was higher than the Philippines and Indonesia, with the exception of the European Unions.

Furthermore, Kijboonchoo and Kalayanakupt (2003) analyze the comparative and competitive advantages of canned tuna exports in the world market. They compared the RCA index against the major exporter for over four (4) periods: 1982-1986, 1987-1991, 1992-1995, and 1996-1998. The results showed that the comparative advantage of Thai canned tuna exports has declined. Despite that the Philippines' and Indonesian's comparative advantage exports of canned tuna was relatively lower than Thailand. The reasons were that Thailand's have a bigger resources of tuna, more efficient and lower cost fishing vessels on the high seas.

Gates *et.al* (2007) analyzed the fluctuation of Indonesia's net exports vis a vis the other two export competitors. The results showed that within the period of 1999-2005 there were positive changes in the Indonesian exports especially to Japan, ASEAN, and the East Asian countries. Indicating that after liberalization the export performance in general was very encouraging, with the exception of exports to the United States and the EU, in comparison to the others.

However, Yuniarti (2007), in her analysis of the determination of Indonesia's bilateral trade, found that the gravity model could explain the conditions of the Indonesia's bilateral trade with the 10 major trading partners. She argued that the variables -national income of the trading partners both exporters and importers, importers population, the similarity of economic growth-have positive effect on bilateral trade, but the distance of trading partner variable showed negative effect. The relative differences of the endowment factor and membership in the free trade zone have no influence on the bilateral trade.

Cahya (2010) argued that the monopolistic structure of the market for tuna commodities tends to create an oligopoly trading condition; and that would make the Indonesia's position weaker, as the followers of the market. It cannot set its own price for the products. Such a weak position is due to several reasons, the availability of resources, intense competition structure, and lower support for related industries. Thus, based on the analysis, it can be concluded that the competitive advantage of the Indonesian tuna commodity does not have a competitive advantage.

## Research Methodology

### *The Model Specification*

To analyze the comparative advantage, this article applied the *Revealed Comparative Advantage* (RCA) model. The RCA is the ratio between the country market share of a product and a market share of a country's exports to total world exports. Utkulu and Seymen (2004) offered the following formula to calculate the RCA:

$$RCA = \frac{X_i^j / X_i}{Y_j / Y}$$

Where  $X_i^j$  is the tuna export type i from country j (Malaysia, Singapore, Thailand, the Philippine and Vietnam),  $Y_j$  is j Country's total export,  $X_i$  is the total export tuna type i or total export of fishery product of the country j to the world, and Y is World Total export (tuna or fishery products).

To analyze competitive advantage, it can be done by adopting *Constant Market Share Analysis* (CMSA) model. CMSA is a general accounting procedures to determine the source of a country's

export growth. The basic assumption of the model is a country's market share in the world market remains constant over time.

The formula CMSA:

1. *Scale effect.*

$$\sum_i \sum_j \Delta q_{ij} = s^0 \Delta Q$$

2. *Geographical market effect*

$$\sum_i \sum_j s^0_{ij} \Delta Q_{ij} + \sum_i s^0_i \Delta Q_i$$

3. *Commodity effect*

$$\sum_i \sum_j s^0_{ij} \Delta Q_{ij} + \sum_i s^0_j \Delta Q_j$$

4. *Interaction effect*

$$\left( \sum_i s^0_i \Delta Q_i \right) - \left( \sum_i \sum_j s^0_{ij} \Delta Q_{ij} - \sum_j s^0_j \Delta Q_j \right)$$

5. *Static effect*

$$\sum_i \sum_j \Delta s_{ij} Q^0_{ij}$$

6. *Dynamic effect*

$$\sum_i \sum_j \Delta s_{ij} Q_{ij}$$

Where:

q = Value of Country's Export under investigation,

Q = Value World Total Exports

s = Export share (q/Q),

0 = Base Year,

i = Commodities under investigation, and

j = Country or Territory.

The value of RCA and CMSA are considered as dependent variable in the regression analysis panel, then it is supported by the gravity model which has widely been applied in economic research; and the basic of the gravity model (Hemkamon, 2007) is as followed:

$$X_{ij} = \alpha Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} \varepsilon_{ij}$$

or, Natural logarithm (ln):

$$\ln X_{ij} = \alpha + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln N_i + \beta_4 \ln N_j + \beta_5 \ln D_{ij} + \beta_6 \ln A_{ij} + \varepsilon_{ij}$$

Where:

X<sub>ij</sub> : Trade flow from country i to j

Y<sub>i</sub> and Y<sub>j</sub> : GDP of Country i and j

N<sub>i</sub> and N<sub>j</sub> : Population of country i and j

D<sub>ij</sub> : Distance between country i and j

A<sub>ij</sub> : Other factors (increase/decrease trade) between country i and j

ε<sub>ij</sub> : error term

### Data

This research focuses on the flow of bilateral trade of tuna commodities among ASEAN members country from 2005 – 2010. The data were based on Gross Domestic Product of Indonesia (GDP<sub>i</sub>) and Gross Domestic Product of ASEAN countries (GDP<sub>j</sub>) such as Malaysia, Singapore, Thailand, the Philippine, and Vietnam. Total Population of Indonesia (POP<sub>i</sub>), Total population of ASEAN

countries (POPj), distance between Indonesia to other ASEAN countries (distance), and Total value of Indonesian export of tuna to ASEAN countries (Export). Those data were based on statistical report provided by the Indonesian Fisheries and Marine Board, Secretariat of ASEAN in Jakarta and the Bureau of Statistics Centre.

### Empirical Results

Among the major tuna exporters of the ASEAN countries to the world market were Indonesia, Malaysia, Singapore Thailand, the Philippines and Vietnam. Based on Data provided by the UN-Comtrade (2011) pointed that within the period of 2000-2010, Indonesia, on average, tuna export growth was lower than Thailand and the Philippines. The former could only achieve 5,2 per cent which was below average of 7, and 4 per cent of the world growth of tuna exports. Thailand and the Philippines achieved respectively up to 14,3 and 12,0 per cent.

**Table 1.** Tuna Export Growth based on Type and Form of Products 2000-2010

Type of Exported Tuna Product	Indonesia	Malaysia	Singapore	Thailand	The Philippines	Vietnam	World
Tuna (albacore,longfin) Fresh or Chilled, whole	-22.5	-	-	345.8	-	-	1.3
Tuna (yellowfin,longfin) Fresh or Chilled, whole	-9.3	2.1	-1.27	11.5	-17.5	0.01	0.4
Tuna (Skipjack,stripe-belly bonito) Fresh or Chilled, whole	-20	0.12	11.2	24.6	52.2	0.25	-2.1
Tuna nes, Fresh or Chilled, whole	9.5	0.17	1.12	-44.3	-23.9	-	2.3
Tuna (albacore,longfin) Frozen, whole	-3.6	-2.02	-	65.2	-	0.21	3.1
Tuna (yellowfin,longfin) Frozen, whole	6	1.1	3.16	31.4	23.6	2.12	4.8
Tuna (Skipjack,stripe-belly bonito) Frozen, whole	19.8	0.023	2.09	25.8	-8.9	-	16.4
Tuna nes, Frozen, whole	12.1	(2,01)	10.05	-8.9	43.5	10.1	-3.6
Tuna,Skipjack, Bonito, prepared-preserved, not minced	9	0	16.14	14.2	16.4	-	12.7
Avarage	5.2	1.9	10	14.3	12	-	7.4

Source: The Indonesian Fisheries and Marin Board, ITC calculations based on Eurostat, United Nations Statistics Division, World Trade Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) statistics, 2011

Within the period of 2000 - 2010, Indonesia, Malaysia, Singapore, Thailand, the Philippines and Vietnam showed an impressive growth of tuna exports. They had achieved an increasing market share from 24,2 per cent in 2000 to the 67, and 7 per cent in 2010. Thailand in particular, had experienced the growth faster than Indonesia and the Philippines. For 9 years, Thailand had shown rapid growth in exports in the world market, from 14,6 per cent in 2000 to 48, and 6 per cent in 2010. Meanwhile, Indonesia and the Philippines could only achieved 6,3 per cent in 2000 and, 3,3 per cent in 2010, accumulatively, both respectively had increased about 9,9 and 9,2 per cents. Among the three countries, Indonesian had the slower export growth in the world. Table 2 showed that Indonesian tuna export experienced decrease in market sharing, except for the fresh tuna export.

**Table 2.** Export Share of the Major ASEAN Countries According to Type and Form of Commodities in the World Market 2010 (in percentage)

Tuna Commodities	Indonesia	Malaysia	Singapore	Thailand	The Philippines	Vietnam
<b>1. Fish, Fresh or Chilled</b>						
a. Tuna Albacore	0,00	-	-	-	-	-
b. Tuna Yellowfin	0,72	-	0,00	0,00	-	-
c. Tuna Skipjack	0,00	-	-	-	-	0,02
d. Other	1,40	0,00	0,02	0,00	-	
Total	2.12	0.00	0.02	0.00	-	0.02
<b>2. Frozen Fish</b>						
a. Tuna Albacore	0,36	0,00	0,06	0,12	-	0,13
b. Tuna Yellowfin	1,34	0,01	0,02	0,09	0,03	0,06
c. Tuna Skipjack	3,31	0,01	0,01	0,75	0,01	0,02
d. Other	0,87	0,00	0,05	0,10	0,01	0,13
Total	5.87	0.02	0.14	1.07	0.04	0.34

Source: The Indonesian Statistic Fisheries Export and Marin Board, ITC calculations based on Eurostat, United Nations Statistics Division, World Trade Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) statistics, 2011

Notes : 0,00 : Relative Lowest value, (e.g. Tuna Albacore Indonesia value 0,0001)  
 - : No export

During the period of 2000-2010, the three countries were able to maintain their competitive advantage. Having varieties of tuna, Indonesia, especially, had an advantage to compete in the world market. However, in term of albacore tuna, either fresh or frozen, both showed decrease in the value of RCA, 0,8 for fresh and 1,0 for frozen in 2000 became 0,1 and 0,8 in 2010 (see Table 3).

**Table 3.** *Revealed Comparative Advantage* Tuna Export, Period 2005-2010

Year	Indonesia	Malaysia	Singapore	Thailand	The Philippines	Vietnam
2005	3.34	2.44	1.04	1.61	5.52	4.26
2006	2.83	1.65	0.81	1.22	4.26	3.44
2007	3.34	0.41	0.57	0.30	4.15	3.96
2008	3.66	2.13	0.71	0.38	4.67	4.41
2009	3.30	0.60	0.77	0.37	4.39	4.32

Source: The Indonesian Statistic Fisheries Export, United Nations Statistics Division, World Trade Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) statistics, (processed), 201

The Philippines also showed similar pattern of export growth. It performed better in supplying frozen yellow fin and skipjack tuna. The value of RCA respectively increased from 0.15 in 2005 to 0.22 in 2009.

In terms of tuna export ratio in the world market, Indonesia was far behind Thailand. It had decreased from 0,4 in 2000 to 0, and 2 in 2009. Yet, comparing to the Philippines, the former performed slight better, and closely followed by the latter.

**Table 4.** Ratio of Indonesian Tuna Export Value vis-à-vis the ASEAN countries in 2005 – 2010 (percentage)

Year	Malaysia	Singapore	Thailand	The Philippines	Vietnam
2005	8,7	2,3	4,1	13,2	3,2
2006	6,4	2,0	4,0	8,6	3,0
2007	5,4	1,7	4,1	4,8	3,3
2008	6,4	1,6	3,9	4,6	3,3
2009	9,2	2,2	5,4	7,0	4,9
2010	7,9	1,9	5,6	6,5	3,9

Source: The Indonesian Statistic Fisheries Export, ITC calculations based on Eurostat, United Nations Statistics Division, World Trade Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) statistics (2011).

Furthermore, in Tabel4, Indonesia still performed better in providing fresh and frozen skipjanc and nes tuna. For fresh and frozen Nes tuna, Indonesia is ahead of Thailand, it had increased in terms of export ration from 14,4 and 6,1 in 2000 to 6.253,4 and 39,4 in 2009. Nevertheless, it had experienced down slop in fresh and frozen skipjack and frozen albacore tuna. Especially, for fresh albacore, frozen yellowfin and processed tuna Thailand exceeded the Indonesian export in the global market.

Within the period of 2005-2010, CMSA model had been adopted to analyze factors contributed to the growth of exports. Based on this model, the Tables 5 and 6 explained the positive effect that was the increased of the growth of tuna export to global market had increased the commodities of tuna export from Indonesia.

**Table 5.** *Constant Market Share Analysis* of Indonesian Tuna export to the ASEAN countries 2005-2010 (US \$)

Country	Year	Scale Effect	Market Effect	Commodity Effect	Interaction Effect	Static Effect	Dynamic Effect
Malaysia	2005	12,004,845	20,429,098	492,034,972	37,995,334,425	45,701.43	49,027
	2006	(7,152,900)	(7,026,340)	1,002,528,590	(36,341,026,000)	43,730.87	45,017
	2007	(1,990,785)	(19,895,270)	27,701,884,291	(1,891,249,524)	45,954.02	46,751
	2008	6,766,770	41,735,898	(27,756,754,038)	58,914,728	44,329.92	46,917
	2009	1,591,995	(1,155,894)	17,218,533,553	13,860,668	43,773.95	46,751
	2010	2,987,760	11,782,064	12,163,232,250	26,012,864	43,196.89	46,917
Singapore	2005	6,516,374	12,004,845	939,853,110	11,195,130,532	31,908.13	34,230
	2006	(3,882,680)	9,062,600	1,645,387,100	(21,858,946,000)	36,273.20	37,340
	2007	(1,080,622)	(1,090,686)	721,564,227	(84,506,955,749)	25,310.05	25,749
	2008	3,673,084	354,908	22,561,749	23,113,798,272	27,435.85	29,037
	2009	864,154	(83,498)	78,071,310	12,479,611,583	31,851.77	34,018
	2010	1,621,792	156,704	(267,248,382)	857,349,296	32,198.10	34,971
Thailand	2005	16,177,145	6,516,374	275,513,478	68,995,523,425	23,585.73	25,302
	2006	0	(7,028,600)	359,718,534	0	24,579.13	25,302
	2007	(2,682,685)	7,290,739	12,567,042,966	(787,609,269)	25,970.59	26,421
	2008	9,118,570	7,029,744	(205,181,256)	28,499,114,538	28,413.78	30,072
	2009	2,145,295	2,505,443	(17,305,714,944)	2,994,660,800	30,441.67	32,512
	2010	4,026,160	899,632	18,151,326,869	240,743,600	30,399.04	33,017
The Philippines	2005	2,290,972	16,177,145	(72,342,288)	1,383,747,088	30,403.61	32,616
	2006	(1,365,040)	0	1,912,162,095	(1,032,766,051,540)	52,450.43	53,993
	2007	(379,916)	(703,851)	7,181,320,195	(989,064,581,364)	92,050.57	93,647
	2008	1,291,352	7,805,838	(75,664,548)	12,049,502,888	90,726.24	96,021
	2009	303,812	1,227,320	(416,515,041)	957,913,200	88,614.37	94,641
	2010	570,176	476,720	405,825,767	27,425,182,400	92,099.41	100,031
Vietnam	2005	54,569,891	2,290,972	(134,773,038)	785,097,021,817	79,377.85	78,402
	2006	(32,514,620)	(48,312,020)	860,907,327	(8,409,552,660)	83,714.43	80,331
	2007	(9,049,423)	(24,942,366)	117,270,988	(1,424,700,725)	86,294.39	81,836
	2008	30,759,406	5,075,612	(79,927,168)	2,475,325,088	79,698.74	82,912
	2009	7,236,661	(694,140)	312,400,908	25,851,464,183	85,807.53	90,081
	2010	13,581,328	5,088,160	296,925,630	699,807,024	89,425.60	90,942

Source: The Indonesian Statistic Fisheries Export, ITC calculations based on Eurostat, United Nations Statistics Division, World Trade Organisation, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) statistics (2011).

Notes: ( ) figure in bracket was negative

Based on the CMSA, it was found an interesting point that Indonesian tuna export had been selectively distributed in the market where import grown rapidly and market which was growing slowly. In the market which grown rapidly, commodities such as fresh and frozen albacore, and processed tuna were dominant. Accordingly, based on the market share export, Indonesia vis-à-vis the ASEAN countries was relatively weaker than its counterpart, as it was revealed by the indicator of competitiveness effect to the negative value of export to some countries.

However, based on scale effect analysis, Indonesian commodities were better than other ASEAN countries. It had opportunity to produce large quantity of tuna productions and market seemed to love them. Yet, the growing import into the country had weakened Indonesia export. To calculate further the competitiveness of Indonesian tuna against ASEAN countries, *fixed Effect* model was adopted by testing panel data.

**Table 6.** Result of the Calculation Regression Data Panel

Variable	Coefficient	
	RCA	CMSA
Constant	116.8537 *** [25.27572]	5872.845 *** [1693.907]
Ln_GDPi?	-3.765414 *** [0.971548]	-306.2234 *** [86.72932]
Ln_GDPj?	-3.584527 *** [1.096035]	-292.9318 *** [86.45420]
Ln_POPi?	1.440104 [1.003647]	278.1778 *** [83.18181]
Ln_POPj?	2.428180 ** [1.085549]	290.5048 *** [82.41284]
Ln_Distance	-5.739058 [3.858596]	-992.0173 *** [82.41284]
Ln_Export?	0.512100 *** [0.155458]	-1.962720 [2.294354]
R-squared	0.915536	0.631177
Adjusted R-squared	0.876824	0.462133
F-statistic	23.64966	3.733809
Prob(F-statistic)	0.000000	0.003370

Source: fishstat.seafdec.org (processed), 2013

Explanation: \*\*\*, \*\* and \*, Significant level 1%, 5% and 10%

GDPi = GDP Indonesia; GDPj = GDP MEA countries;

POPi = Indonesian Population; POPj = MEA Countries Population

Table 6, above, showed that the total output of variables independent and dependent with the significant level at 1% and 5% with R-squared ( $R^2$ ) value at 91.55% (RCA) and 63.12% (CMSA). Thus, the ASEAN countries' tuna export was influenced by their independent variables. (GDPi, GDPj, POPi, POPj, Distance and Export).

GDPi (GDP of Indonesia) and GDPj (GDP MEA countries) had negative influence and the level of significant against *constant market share* at 1%. It can be concluded that GDPi influence negatively and significant against *constants market share* and *revealed comparative advantage*. POPi (Population of Indonesia) and POPj (Population of MEA countries) affected positively the *constant market share* and *revealed comparative advantage*. The variable (distance) influenced negatively *constant market share* and *revealed comparative advantage*. Meanwhile, the variable (export) had negative effect on *constant market share*, but positively affected *revealed comparative analysis*.

Accordingly, it could be concluded that Indonesia possessed great potential in fisheries sector as leading export commodities. If Thailand, a country without marine potential, could generate income from fishery sector, what is more Indonesia, with such great sea and huge marine resources, it could become future leader in the fishery and marine industries. It had been considered as leading world leading tuna producer in from the South East Asia region. According

to FAO data in 2007, Indonesia had produced 26,2% of the world tuna product or 1,7 million ton; and that had generated considerable income for the country. In 2011, the tuna export from Indonesia had increased 30,1 per cent from 122.450 ton = US \$ 383 million in 2010 to 141.774 ton with market value US \$ 499 million.

The Export also increased to the ASEAN countries. In 2011 it had reached 75,88 per cent, it was expected to increase in 2015. Notwithstanding that, during the unfriendly weather season and fishing was impossible had increased the import of tuna; and that certainly affected tuna production in the country. Further explanations about the value of *Revealed Comparative Advantage* and *Constants Market Share* of Indonesian tuna export to several ASEAN countries in 2005- 2010 are provided in the following figure.

**Figure 1.** The Growth of Indonesian RCA and CMSA Period 2005 – 2010



Source: The Indonesian Statistic Fisheries Export and fishstat.seafdec.org, (processed), 2012

Within the period of 2011 – 2015, Indonesian competitiveness had increased in comparison to other ASEAN countries' tuna export commodities to Indonesian market. Yet, the growth of import in the country had caused the Indonesian RCA and CMSA indexes condition was stable. Only the value of *constant market share analysis* (CMSA) was fluctuating, a condition that reflexes that in certain season the value of Indonesian export was higher than the import.

The value of fishery export had experienced surplus in 2007 greater than in 2006. It was due to the Indonesian fishery products won market confidence of several major developed countries like America, EU and Japan. To main and increase its tuna export, Indonesia signed trade agreement bilaterally or joined regional cooperation with other ASEAN countries. Indonesia signed agreement with Malaysia on the safe guard of the sea against pirate and fishery theft. ASEAN is the world largest tuna producers region, but there was no proper coordination among them. They had to face all problems from tariff and other disadvantages policies of destination countries individually; and that had slow down the growth of export.

To improve this unfavorable condition, Indonesian government had jointly established corporation on tuna fishery and pushed the world tuna market. It improved the usage of technology and human resources development. These moves were expected to improve and upgrade the quality and value of tuna product, fresh, frozen and even the use of tuna bone.

During the years 2011-2015, the volume of Indonesian tuna export has been expected to increase based on the assumption that the RCA will increase by 5% annually at the rate of ASEAN countries economic growth. The greater the ASEAN countries' economic are growth, the greater comparative value that Indonesia will gain. Based on this projection, the prospect of Indonesian tuna export are very promising and it might contribute much for the national income; and so does the fishermen, who would gain more income in few year to come, as long as other factors rare

constants (*Ceteris Paribus*). In 2011, Indonesian tuna export increased from 122.450 ton in 2010 to 141.774 ton.

In 2012 the tuna export had positively increased and the destination also had expanded not only to the ASEAN countries, but also some developed countries, the US and Japan. By 2011, the value of Indonesian tuna export was closed at 499 million US dollar, increased by 30,1 per cent. Indonesia had to maintain this surplus and continued to look for more market for its tuna products to push the alternative source of national income.

Having such huge natural marine and fishery resources, and varieties of tuna in particular, Indonesia is a very potential state that out run the other tuna exporter such as Vietnam and the Philippines. It has 11 fishery (Wilayah Potensi Perikanan/ WPP), the Andaman SEA (Malacca Straits), Western Sea of Sumatera, Southern Sea of Java, Java Sea, Karimata Straits, Makassar Straits, Banda Sea, Halmahera Sea, Sulawesi Sea, Papua Sea and Aru sea. For the tuna, exclusively they populated the eastern Indonesian water, the Halmahera and Banda Sea.

## Conclusion

According to Revealed Comparative Advantage (RCA), Indonesian tuna competitiveness was weaker than the Philippines. The latter had produced most favourable tuna, because of it nutritious and supple flesh. Based on *Constant Market Share Analysis* (CMSA) the weakness was due to relative higher growth of export dominated by commodities factors. Indonesian tuna has been favored among ASEAN countries because of the taste and high quality. On the scale effect and commodities composition, it has higher competitive advantage than other ASEAN countries. Indonesia gained third position after the Philippines and Vietnam. It was higher than Malaysia, Singapore and Thailand.

The result of gravity model explained factors influenced tuna trading among ASEAN countries. For the Revealed Comparative Advantage (RCA) model was better to use random models effect. As for the Constant Market Share (CMS) model the pooled least squares model was better. Factors influenced *revealed comparative advantage* (RCA) were GDP<sub>i</sub>, GDP<sub>j</sub>, POP<sub>i</sub>, POP<sub>j</sub> and Export, with exception the *distance*. Each significant value was below 5%. So did *Constant Market Share Analysis* (CMSA) all independent variables -GDP<sub>i</sub>, GDP<sub>j</sub>, POP<sub>i</sub>, POP<sub>j</sub>, Distance, and Export were significantly affected.

Despite the expectation that in 2015, Indonesian tuna export will increase, but the rise in exports was not able to improve competitiveness, because it is still dependent on imports although at certain seasons, however, the level of imports will dominate the Indonesian market; and that would lower competitiveness.

South East Asia is the world largest tuna producers. Cooperation in the fishery sector among ASEAN countries must be built and strengthened. One of the strategies is by establishing an integrated economic development that specifically focuses on developing tuna industry center that closed to the fishing ground, with reasonable infrastructure, such as Fish Processed Industry, Fish landing Flat form, Cold Storage, etc. There must be an agreement and commitment among ASEAN economic community as the force in identifying all opportunities, challenges, and weaknesses that confronted them. Then they must be able to formulate strategies for development in marine sector that might work efficiently and effectively for Indonesia. To encourage more tuna trading among ASEAN countries, improve product competitiveness, cooperation for sustainable management of tuna fisheries, and strengthen and build alliances in dealing with regional and international issues.

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