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5 Indonesian fish consumption: an analysis of dynamic panel regression model

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Abstract. The level of Indonesian fish consumption is relatively lower than other countries in Southeast Asian countries and Asia as a whole, while Indonesia is a large fish producing country which is one of the archipelagic countries with the longest coastline in the world. The research employs the panel co-integration analysis and panel-based Error Correction Models (ECM) to examine the short and long-term relationship of 31-province incomes and fish prices toward fishery consumption in Indonesia along 2010–2015. The research finds that fish price and income statistically significant affect fish consumption in short and long-term, except the income in the short-term model. Price and income elasticity for fish consumption is inelastic in the short and the long-term in Indonesia.

1. Introduction

Indonesia has a highest fisheries production in Southeast Asian. In 2011, the production of Indonesian fish was recorded at 13.6 million tons; which is superior compared to other Southeast Asian countries such as Vietnam (5.15 million tons), Myanmar (2.98 million tons), the Phillipines (2.93 million tons), Thailand (2.6 million tons) and Malaysia 1.6 million tons. However, the high of the levels of fish production does not indicate the levels of consumption. Based on 2011 data, it shows that the Indonesia's fish consumption is 32.25 kg/capita/year, and 2017 fish consumption is 47.34 g / capita. Compared to other countries in 2011, the fish consumption of Indonesia is lower than Malaysia (58.1 kg/capita/year), Myanmar (55 kg/capita/year), Vietnam (33.2 kg/capita/year) and the Phillipines (32.7 kg/capita/year) [1] [2].

Now, an intensive program called 'Gemarikan' is implemented. The 'Gemarikan' is a government program to increase the community fish consumption. The program aims to improve the protein consumption derived from fish which relevant with the government's policies to improve the quality of life of Indonesian people, outright increasing the economic of marine and fisheries. Based on Ministry of Marine Affairs and Fisheries Republic of Indonesia data, there are 9.9 million tons of potential fish resources and 83.6 million hectares of cultivation potency that are expected to improve employment, and increase the availability and consumption of fish protein for the community. The increase of fisheries industry activity by investment increase will attract production inputs such as fuel-producing, trade of boats and fishery



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equipment, and also promote the other industries which use fishery output as its inputs, such as the fish preservation industry [3].

In economics, the main determinant of the consumption of goods is the price of goods, which have a negative relationship between the two. A rise in the price leads to a decrease in the quantity consumed, and vice versa. The other determinant was the consumer income, which has the positive relationship to the quantity consumed. An increase in income lead to a rise in quantity consumed, vice versa [4]. The percentage change of quantity consumed is affected by the percentage change of the independent variables is called the elasticity. The elasticity of the price of fish is the ratio of the percentage change in fish quantity consumed to the percentage change in price of fish. Whereas the income elasticity of consumption is the ratio of percentage changes in quantity of fish consumed for the percentage changes in income.

Indonesian people's consumptions of fish are dominated by the consumption of fresh fish. According to Virgantari [5], the elasticity value of the fresh fish is inelastic in price or income. Dey [6] finds that the demand of fish in Asia showing that the elasticity of estimated price and income of all fish types are more elastic in group of the poorer households. Onizine [7] examines the elasticity of the demand of fresh fish in Oman, an Arabian Gulf country, and finds that the income and price elasticity of the fresh fish are small but positive, which indicating that the demand of fish will continue to increase with the growing of incomes, a driving force for market development and marketing efficiency. It is stated that in the long run, the fish consumption per capita will be stable but its composition would shift towards high value-added products, which then are a profitable market segment for the Oman fish business. Zeraatkish, et al. [8] finds that the imported fishery products are elastic to import prices. Can [9] indicates that the elasticity of fish price and demand is low, which are caused by the existing traditional eating habits. According to the discussion above, this study aims to analyze the effect of fish prices and per capita income on fish consumption in Indonesia in the long and short term.

2. Research Methods

This research employs panel co-integration and panel-based Error Correction Models (ECM) to examines the short and long-term relationship of 31-province income and fish price toward fishery consumption in Indonesia along 2010–2015 [12] [13] [14]. The econometric model for the relationship of the variables as follows:

$$\text{LnFISH_CONSUMPTION}_{it} = \beta_0 + \beta_1 \text{LnFISHPRICE}_{it} + \beta_2 \text{LnINCOME}_{it} + \varepsilon_{it} \quad (1)$$

where the β_0 is constant; β_1, β_2 are the regression coefficients and ε is the error terms, the subscript t and i denote the time series and the cross section indicator. LnFISH_CONSUMPTION is the growth of fish consumption (in percent), LnFISHPRICE is the growth of fish price (in percent) and LnINCOME is the growth of income(in percent).

This study applied Engle-Granger (EG) procedure of Error Correction Model (ECM) to analyses the dynamics of the short-run effect of economic growth on fish consumption, where the long-run relationships can be performed by estimating the regression of all co-integrated equations [9]. The co-integration of the two (or more) time series variables indicates there is a long-run nexus or equilibrium between the variables, then the short-run disequilibrium relationship between dependent and independent variables can be estimated.

EG test is conducted to test the cointegration of the residual ε_{it} , using the Dicky-Fuller (DF) stationary test [10] [11]:

$$\otimes u_i = \Omega 1 \varepsilon_{it-1} + v_i \quad (2)$$

Following the stationarity and cointegration test, the short-term equation is run with the regression model as follows:

$$\Delta \text{LnFISH_CONSUMPTION}_{it} = \alpha_0 + \alpha_1 \Delta \text{LnFISHPRICE}_{it} + \alpha_2 \Delta \text{LnINCOME}_{it} + \alpha_3 \varepsilon_{it-1} + \varepsilon_{2it} \quad (3)$$

In the equation of the short-term model ε_{it-1} as an *Error Correction Term*.

3. Result and Discussion

The consumption of fish data collected from Statistics Indonesia [3], and include consumption of household (fresh/wet fish and shrimp, preserved fish and shrimp, processed food and spices), consumption outside the household (consumption in restaurants, hotels, prisons, houses sickness, and school), and consumption of processed fish such as fish meatballs, nuggets, 'somya', 'pempek', fish crackers, and others.

From data on consumer preferences for fishery products consumed in 2017, fresh fish is the most desirable part (76 percent). The other largest portion of consumption is fish and processed food (19 percent) and salted fish by 15 percent. Based on the Indonesian Ministry of Maritime Affairs and Fisheries, the types of fish most consumed by Indonesians per year (2010-2017) are Catfish and Tuna Fish (16.45 percent) and processed fish and fish such as meatballs, sausages, nuggets and others (9.02 percent). Then followed by groups of catfish, catfish, and cork (7.92 percent), mackerel (6.65 percent), Milkfish (5.43 percent), Tilapia (5.26 percent), Shrimp and Calamari (3.87 percent), Anchovy (3.36 percent), salted fish group (2 percent), and salted mackerel (1.36 percent) [2].

This study applies a dynamic model of Error Correction Model (ECM) with Fix Effect Model (FEM). The dynamic model of ECM is used to balance economic relations. The results of the long-term empirical model are as follows:

$$\ln FISHCONSUMPTION = 0.342124807326 - 0.1018 * \ln FISHPRICE + 0.1320 * \ln INCOME \quad (4)$$

The results of the short-term model equation, after cointegration tests are as follows:

$$\ln FISHCONSUMPTION = 0.0631 - 0.0622 * \ln FISHPRICE + 0.1604 * \ln INCOME - 0.1044 ECT \quad (5)$$

Table 1. Estimation result

	5 Short -term		Long-term	
	Coefficient	t-statistic	Coefficient	t-statistic
C	0.063152	4.691741	0.342125	2.243466
LN FISHPRICE	-0.062281	-2.012997*	-0.101869	-2.393408*
LN INCOME	0.160499	0.481411	0.132066	11.66901*
RES1(-1)	-0.104477	-6.134992		

Notes: *) significant at 5%

Table 1 displays the short and long-term estimation results. It shows the same direction of independent variables to dependent. The price of fish has a negative effect and people's income has a positive effect towards fish consumption. All independent variables in all models are statistically significant affect the fish consumption, except the income at the 5 percent significance level in the short-term. The short-term fish price coefficient indicates that a fish price increase of 1 percent then fish consumption will decrease by 0.062 percent in the short-term.

The long-term coefficient indicates that 1 percent increase by fish prices will decrease fish consumption by 0.102 percent. The effect of income on fish consumption is significantly positive at 5 percent level of significant. The coefficient value is 0.132 indicates that the increase of income by 1 percent leads to increase the fish consumption by 0.132 percent.

Overall results of the study indicate the consistency in the relationship between the effect of income and fish prices for fish consumption in Indonesia. The negatively effect of fish price toward fish consumption, and the percentage effect of fish prices is very small or inelastic. The changes of price of fish leads small changes in fish consumption. In fact, the society dependence on animal protein source and plant-based food

sources is also large. The income variable, in both models shows consistency in the direction of the relationship, but only in the long-term model that shows a positive and significant relationship.

4. Conclusion

Price and income elasticity of the consumption of fish in Indonesia is inelastic for the short and long-term. Fish price and income are statistically significant affect the fish consumption in short and long-term, except the income in the short-term, in all province along 2010-2015. Fish price stability important to be maintained by the government. In addition, it suggest that for the future research on fish production and consumption between regions.

Government policies, which are directed to improve the fish consumption, include: (1) Provision of quality fishery products through guidance and certification of Fish Processing Units; (2) Implementation of 'Gemarikan' massively, especially in provinces where fish consumption is still low; (3) Cooperating with local governments, fostering culinary centers and hygienic fish markets; (4) Development of the modern fish market in big cities to bring fish products closer to consumers; (5) Maintaining the availability of fish products that have quality and hygienic standards.

Reference

- [1] Kata Data Publication Team Graph Info 2016 *Abundant Fish, Consumption is encouraged*
- [2] Ministry of Marine Affairs and Fisheries Republic of Indonesia 2018 *Work report 2017* (Jakarta: Ministry of Marine Affairs and Fisheries Republic of Indonesia) [in Indonesia]
- [3] Firmansyah 2018 *Impact of fishery policy on fishery manufacture output, economy and welfare in Indonesia IOP Conference Series: Earth and Environmental Science* **116(1)** 012-016
- [4] Mankiw, Gregory 2012 *Macroeconomics* 8th edition (New York: NY Worth)
- [5] Virgantari, Daryanto, Harianto and Kuntjoro 2011 *Analysis of fish demand in Indonesia: quadratic almost ideal demand system (QUAIDS) model approach Marine and Fisheries Socio-Economic Journal* **6 (2)** 191-203 [in Indonesia]
- [6] Dey MM, Yolanda T, Kumar P, Piumsombun S, Haque Muhammad S, Li L, Radam A, Senaratne A, Khiem TN and Koeshendrajana S 2008 *Demand for fish in Asia: a cross-country analysis The Australian Journal of Agricultural and Resource Economics* 321-338
- [7] Omezzine, Boughani H, Al-Oufi 2003 *Demand elasticities of fresh fish commodities: a case study Agricultural and Marine Sciences* **8(2)** 55-61
- [8] Zeraatkish, Rashidi, Rashidi 2016 *Estimate of Armington substitution elasticity for fishery products in Iran Iranian Journal of Fisheries Sciences* **17(3)** 603-612
- [9] Can, Gunlu and Can H 2015 *Fish consumption preferences and factors influencing it Food Sci. Technol Campinas* **35(2)** 339-346
- [10] Thomas, R. L 1997 *Modern econometrics* (Harlow, United Kingdom: Addison Wesley Logman)
- [11] Gujarati D N and Porter D C 2009 *Basic Econometrics* 5th ed (New York: McGraw-Hill)
- [12] BPS 2017 prices received by farmers indices (it), prices paid by farmers indices (ib), and farmers' terms of trade of fishery subsector (NTN) by province (2007=100), 2008-2016 (Jakarta: BPS)
- [13] BPS 2018 Per capita gross regional domestic product at 2010 *constant market prices by province, 2010-2017 (Jakarta: BPS)*
- [14] BPS 2018 Per Capita Gross Regional Domestic Product at 2010 *Constant Market Prices by Province 2010-2017 (Jakarta: BPS)*

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