

**AN ANALYSIS ON THE FACTORS AFFECTING INDONESIAN SHRIMP
EXPORT IN JAPAN MARKET IN 1982 – 2004**

A THESIS

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By

MUHAMAD KARISMA YOEDISTIRA

Student Number : 01313064

**DEPARTMENT OF ECONOMICS
INTERNATIONAL PROGRAM
FACULTY OF ECONOMICS
ISLAMIC UNIVERSITY OF INDONESIA
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*Intelligence is not privilege, it's a gift and you use it
for the good of mankind. (Dr. Otto)*

Vouloir, c'est Pouvoir (N. N.)

*Being the best is important but the most important
thing is that we have done our best. (C. Y.)*

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Ministry of Marine and Fishery Affairs (DKP), Soempeno Putro said that before March 2004 the price of windu shrimp was still at US\$ 10 per kg. However, the present price is climbing up to around US\$ 11, 6 per kg. It is possible that the increase of the price of windu shrimps from Indonesia was triggered by the issue of antidumping of those six shrimp exporting countries.

According to Soempeno Putro, the increase of the selling price was triggered by the requirement of the United States domestic market due to the short of supplies after those six countries, namely China, Thailand, Ecuador, India, Vietnam, and Brazil have been accused of committing dumping practice. With this condition, the government hope that the farmers of shrimp ponds in Indonesia would enjoy the increase of purchasing price from shrimp processing factories for exports.

Based on the background above, shrimp commodity in Indonesia becomes as the object of this research and the title would be:

AN ANALYSIS ON THE FACTORS AFFECTING INDONESIAN SHRIMP EXPORT IN JAPAN MARKET IN 1982 – 2004.

1.2. Problem Identification

This research focuses on factors affecting the demand of Indonesian shrimp export to Japan. The factors that are discussed are price of related good, income of the country and exchange rate among countries that have international trade. The writer wants to find out whether the changes in the factors would affect on the demand. For example if there is an increase in the price of shrimp, would

vannamei is the dominant species in South American countries and *P. chinensis* is the most popular farmed species in China. Most of the south and south-east Asian countries farm only *P. monodon*. Kuruma shrimp (*P. japonicus*), native to the Indian Ocean and the south-western Pacific Ocean is commonly farmed in Japan and Australia.

Shrimps mature and breed only in marine habitat. In the ocean, a single female shrimp spawns 100,000 – 500,000 eggs at a time. Within 24 hours, the eggs hatch into larvae, which feed on microscopic plants and animals present in the water known as plankton. After passing through three stages and various sub-stages, in a period of about 12 days, the larvae develop into young shrimp known as postlarvae. These postlarvae tolerate wide range of salinity from slightly greater than to full-strength ocean water. Postlarvae migrate to low-saline, nutrient-rich estuaries and backwaters where they grow from postlarvae to larger juveniles/ sub-adults. This phase of the life-cycle of the shrimps is used for farming. The juveniles' then return to the sea to mature and breed, thus completing the lifecycle.

He uses the econometric model approach, and the model is shown like this:

$$QEXPORT_t = f(dLNGDP_t, PRICE_t, PRICE_{t-1}, RER_t, RER_{t-1})$$

Where:

$QEXPORT_t$ = Export in constant value period t

$dLNGDP_t$ = Difference in LN of importer's Gross Domestic Product

$PRICE_t$ = World price of commodity period t

$PRICE_{t-1}$ = World price of commodity period t-1

RER_t = Indonesian Real Exchange Rate period t

RER_{t-1} = Indonesian Real Exchange Rate period t-1

Export quantity depends on income of the importer, relative price and exchange rates. He uses export in constant value rather than in current value, and he wants to remove the price component in this dependent variable. The difference in normal log of GDP of each importer is used in order to capture the rate of economic growth of importers. Therefore, importers' decision to buy Indonesian export depends on their economic growth. Or an increase in Japan economic growth rate will increase the Indonesia export of shrimp. Since it is possible that importers would decide to buy after looking at the price on the previous period, Hendradjadja decided to put price from the previous period as one of the explanatory variables. He did the same thing for the exchange rate. If price of commodities increase this period, importers will decrease their spending

Shrimp imports have grown strongly in the last three years. The value of shrimp trade was quite stable at US\$ 10 billion over the past 6 years, which indicates a steady decline in shrimp prices. The main shrimp importing countries have always been Japan and the USA, with the USA taking over in recent years. In the last years, Japanese imports have declined, due to the low demand caused by economical un-certainty. The shift from Japan to the USA as main importer created substantial problems for the main traditional exporters to the Japanese market, mainly from Asia. A shrimp import into Europe continues to grow, with Spain as the main market, followed by France and UK. The Danish shrimp imports are mainly re-exported. On the other hand, the change in the GSP for many shrimp exporting countries - Thailand, India, Indonesia and Viet Nam - made exports from these countries to the EU more difficult.

During the first half of 2004, all key markets continued to experience a significant increase of their shrimp imports, to the exception of the UK. The USA purchased huge volumes of shrimp during the first six months of this year due to the anti-dumping measures. The current Japanese trend contrasts with last year with frozen shrimp volume imports up 8% for the first half of the year, although it is still lower than previous years' import levels. The increase in Japanese volume imports during the first half of this year reflected a significant jump in sales from Vietnam, India and China while volumes from Indonesia, the number one supplier to Japan, remained stable.

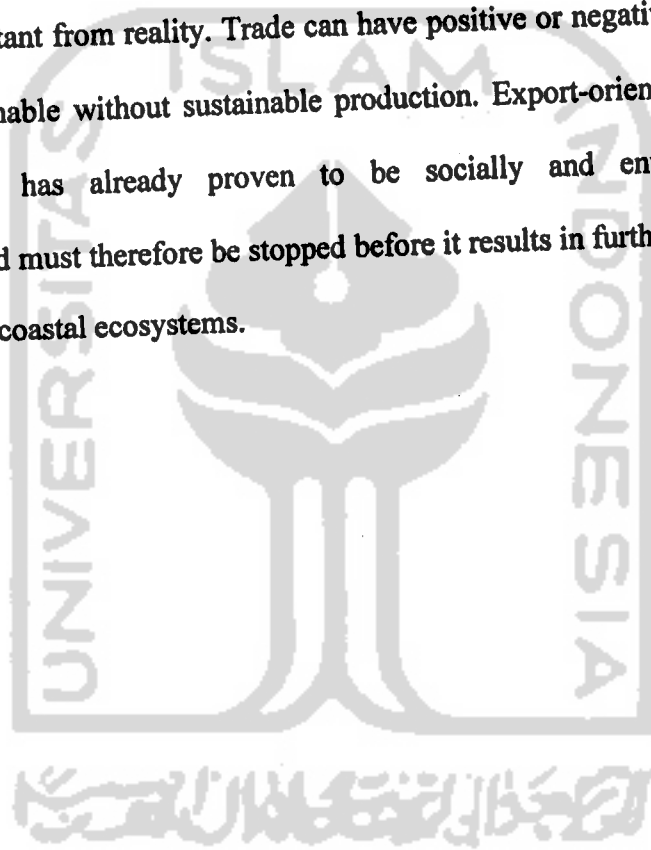
The 16% increase in Spanish shrimp imports is mainly due to sales from Argentina which consolidated its position as the first supplier with a 13% increase

As a result the shrimp markets in these three traditional markets are difficult in the coming year. The best possibility for shrimp producers and traders is to look for new market, and here we can see that new markets are emerging in South East Asia, Latin America and China. The latter is already now the seventh major importer of shrimp, some of this goes for reprocessing, but an increasing share stays in the country. As most of the shrimp production also concentrates in these areas, it should be rather easy to diversify exports, and create markets in neighboring areas.

There are some opportunities to increase shrimp prices, or at least to get more from the shrimp production. One possibility is the diversification of markets: when Bangladesh could no longer export shrimp to the EU, back in 1998, they had to look for new markets, and were very successful in opening up new opportunities. Now they sell both in the EU and into these new markets. This is especially true for shrimp producers, where the price goes down every year, and still they sell almost all their production to UK. With just a bit of market promotion, this shrimp could be shipped to Italy or Spain, practically untouched by this species. There are a lot of opportunities for value added shrimp products, the block frozen headless shrimp should be really a thing of the past. There are other possibilities to add value, by producing organic shrimp, we will hear more about this, or by highlighting the quality of a product through a geographical denomination of origin.

other hand has also implied over-fishing and depletion of the seas. In between there is a full battery of vested corporate interests.

The promoters of global trade maintain that trade is neutral with respect to the environment, society, sustainable management and economic efficiency. But nothing more distant from reality. Trade can have positive or negative effects but cannot be sustainable without sustainable production. Export-oriented industrial shrimp farming has already proven to be socially and environmentally unsustainable and must therefore be stopped before it results in further damages to people and their coastal ecosystems.



3. Other Price

It means other product prices or substitutes, A rise in the prices of substitute for a product its will make the quantity demanded for the product increase. It will make the demand curve shift to the right. In this case the price of gasoline is the substitution product for the electricity, when the price of gasoline is increasing the quantity demand for electricity is increasing or otherwise.

4. Taste

Tastes have an effect on people's desire to purchase. A change in the taste maybe long-lasting or short- lasting, a change in the tastes in favor of a product shift the demand curve to the right. In the case of demand for electricity we don't talk about the taste because every person have different taste and electricity is a commodity that needed by every individual.

5. Population

An increase in population will shift the demand curves for most products to the right, indicating that more will be bought at each price. It means that the increase of the population will increase the quantity demand for electricity because more people need more electricity in their daily lives.

percentage change price as the independent variable (X) and percentage change in quantity demand of good as the dependent variable (Y).

In economic there are several concept of elasticity (Gregory Mankiw, 2001: 75).

1. *Price elasticity of demand*, a measure of how much the quantity demanded of a good responds to a change in price to that good, computed as the percentage change in quantity demanded divided by the percentage change in prices.

$$\text{Prices elasticity of demand} = \frac{\% \text{ change in quantity of demanded}}{\% \text{ change in price}}$$

2. *Income elasticity of demand*, a measure of how much the quantity demanded of a good responds to a change in costumers income, computed as the percentage change in quantity demanded divided by the percentage change in income.

$$\text{Income elasticity of demand} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

For most goods, increasing in income can lead to increasing in the demand this happen on the *normal goods*. Goods for which consumption decreasing in response to a rise in income has negative income elastic ties and is called *inferior goods*. Even among normal goods, income elastic

ties vary substantially in size. Necessities such as food and clothing, tend to have small elastic ties because consumer regardless of how low their incomes, choose to buy some of these goods. Luxuries, such as caviar and furs, tend to have large income elastic ties because consumer feels that they can do without these goods altogether if their income is too low. (Gregory Mankiw, p.104). In the case of demand for shrimp the shrimp is the normal goods cause if people income is increasing the consumption of shrimp also can increase so they demand more shrimp.

3.1.10. The Theory of Consumer Choice

Examine the trade off that people face in their role as costumer. When a costumer buys more of one goods, he can afford less of other goods. When he spends more time enjoying leisure and less time working, he has lower income and can afford less consumption. So these theories examine how consumer facing these tradeoffs makes decision and they respond to change in their environment. *The Consumer Budget Constraint*, the budget constraint shows the various bundles of goods that the consumer can afford for a given income.

Indifference curve, a curve that shows consumption bundles that give the consumer the same level of satisfaction. Four properties of indifference curve:

in Economics Faculty of Islamic University of Indonesia and also from Department of Marine Affairs and Fisheries at Jakarta.

4.4. Types and Sources of Data

The data used in this research analysis are taken from books, literature study and secondary data. They are:

- a. International Financial Statistics (IFS), various editions.
- b. Statistical Year Book of Indonesia (Statistik Indonesia), various editions.
- c. Indonesian Foreign Trade Statistic (Biro Pusat Statistik), various editions.
- d. Statistical of Capture Fisheries of Indonesia (Department of Marine Affairs and Fisheries), various editions.
- e. Directory of Exporter/Producer Fishery Commodities (Department of Marine Affairs and Fisheries), various editions.
- f. Export Statistics of Fishery (Department of Marine Affairs and Fisheries), various editions.

4.5. Research Variables

Based on the data used in this research, variables in this thesis are categorized into two variables; dependent variable and independent variables.

Both variables are described as follows:

To achieve the research objectives, the regression analysis is conducted by using time series data from 1982 until 2004. In this analysis logarithmic model is used because:

- According to actual fitted residual table, it is not linier.
- In general logarithmic model, it is more valid than linear model.

Logarithmic regression model can be written as follow:

$$LQ = L \beta_0 + \beta_1 LPs + \beta_2 LGDP + \beta_3 LExc + \beta_4 LPop + v$$

Where:

- . β_0 : Constant
- . $\beta_1, \beta_2, \beta_3, \beta_4$: Regression coefficient of each variable.
- . v : Error term

4.7. Method of Data Analysis

4.7.1. Classical Assumption Test

This test basically is done to detect the validity of empirical model that is used in the research. And also to interpret the regression result that consists of regression coefficient number. A model becomes valid if it is free from the presence of multicollinearity, autocorrelation and heterocedasticity.

4.7.1.1. Multicollinearity Test

According to Gujarati (1995:320) multicollinearity means the existence of a perfect or exact linear relationship among some or all explanatory variables of regression model. If perfect multicollinearity

4.7.1.3. Heterocedasticity Test

Heterocedasticity is a situation when there is a relationship between the values of independent variables with the residual value from the model. To detect the heterocedasticity, the writer used one of the formal methods; that is the White test. The White model is:

$$E^2 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \delta_1 X_1^2 + \delta_2 X_2^2 + \delta_3 X_3^2 + \delta_4 X_1 X_2 + \delta_5 X_1 X_3 + \delta_6 X_2 X_3 + \epsilon$$

That is, the squared residual from the original regression on the original X variable, there squared values, and the cross product of the regressors.

Under the null hypothesis that there is no heterocedasticity, it can be shown that sample size (n) to the R^2 obtained from the regression asymptotically follows the chi-square distribution with df equal to the number of independent variables (excluding the constant term) in the auxiliary regression. That is:

$$n \cdot R^2 = \chi^2_{df}$$

If the chi-square value obtained in above exceeds the critical chi-squared value at the chosen level of significance, the conclusion is there is heterocedasticity in the model. If it does not exceed the critical chi-square value, there is no heterocedasticity, which is to say that in the auxiliary regression, $\alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 + \alpha_6 = 0$

With using F – stats table:

1. If F-statistic < F-table

df denominator = (n-k), df numerator = (k-1)

Ho is accepted and Ha is rejected

2. If F-statistic > F-table

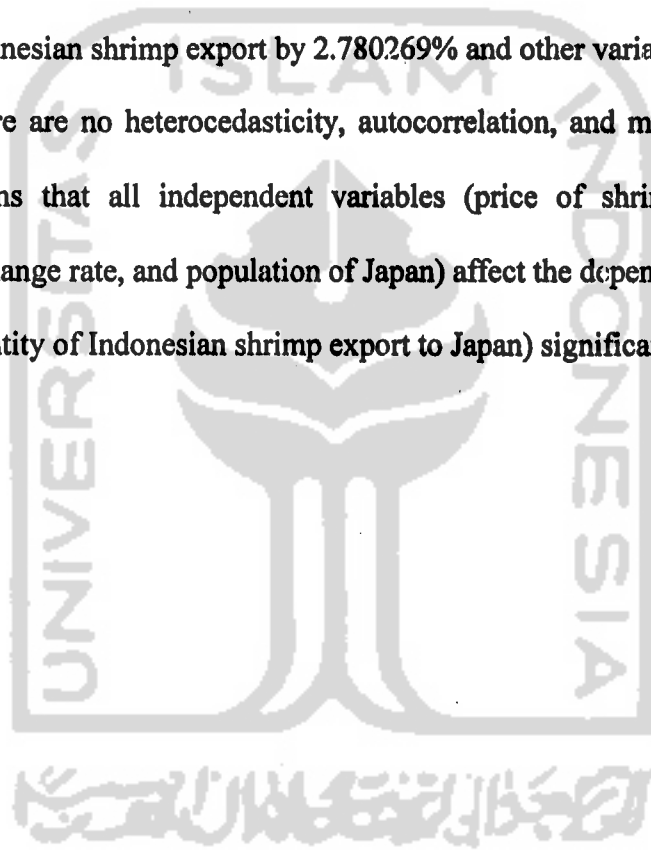
df denominator = (n-k), df numerator = (k-1)

Ho is rejected and Ha is accepted

4.7.4 Coefficient of Determination (R^2)

It is an important property of R^2 because it is a non-decreasing function of the number of explanatory variables or regressors present in the model; as the number of regressor increase. R^2 almost invariably increases and never decreases. R^2 is used to detect how far the independent variable influences the dependent variable in the model (Gujarati, 1995: 207). R^2 is being a measure of the goodness of fit of a sample least squares linear regression in a body of data. The number of R^2 is between 0 – 1. The closer the number of R^2 to 1 the better the model explains about the relationship between dependent variable and independent variables.

7. The T-test of the population of Japan is statistically expressing the positive relation between the population of Japan and the demand of Indonesian shrimp export. It is already proven that the coefficient value of Japan population is 2.780269. This coefficient value means that the increase in Japan Population as much as 1% will increase the quantity of Indonesian shrimp export by 2.780269% and other variables are constant.
8. There are no heterocedasticity, autocorrelation, and multicollinearity. It means that all independent variables (price of shrimp, Japan GDP, exchange rate, and population of Japan) affect the dependent variable (the quantity of Indonesian shrimp export to Japan) significantly.



Oxford University (1995), Oxford Advance Learner's Dictionary, Britain,
Oxford University press

Posner, M.V. (1961), International Trade and Technical Change, *Oxford
Economic Paper*, October 1961, pp.323-41

Samuelson, Paul A., and Nordhaus, William D. Economics 15th ed., USA: Mc
Graw Hill, 1995.



Population of Japan
1982 – 2004
(In Thousand People)

Year	Population	Year	Population	Year	Population
1982	118043	1991	123123	2000	125613
1983	118839	1992	123516	2001	127291
1984	119593	1993	123847	2002	127435
1985	120328	1994	124149	2003	127619
1986	120919	1995	124428	2004	127700
1987	121482	1996	124708		
1988	121947	1997	124961		
1989	122356	1998	125248		
1990	122721	1999	125427		