# ANALYSIS ON SHRIMP TRADE BETWEEN INDONESIA AND BELGIUM

By Suharno

## ABSTRACT

Tulisan ini menganalisis faktor-faktor yang mempengaruhi pasokan ekspor udang Indonesia ke pasar Belgia dan faktor-faktor yang mempengaruhi permintaan impor pasar Belgia terhadap udang Indonesia. Analisis didasarkan pada analisis partial dengan menggunakan model perdagangan satu negara. Pada penelitian diketahui bahwa nilai tukar Rupiah terhadap dollar Amerika Serikat merupakan faktor dengan pengaruh terbesar yang menentukan ekspor udang Indonesia ke pasar Belgia. Pada sisi impor diketahui bahwa tingkat pendapatan perkapita di Belgia menjadi faktor yang paling penting menentukan permintaan impor pasar Belgia terhadap udang Indonesia. Hasil prakiraan tentang pola ekspor impor udang antara Belgia dan Indonesia menunjukkan bahwa dalam kurun sepuluh tahun mendatang, sampai tahun 2000, volume ekspor udang Indonesia ke pasar Belgia akan tumbuh dengan rata-rata pertumbuhan per tahun sebesar 9.8 persen, ceteris paribus.

## 1. Introduction

To increase foreign currencies through non oil and natural gas commodities, shrimp has been chosen by the Indonesian authority to be an export oriented commodity. The choice is based upon several reasons :

1. Shrimp is already accepted on the international market.
2. Shrimp has a high earning power to generate foreign exchange.
3. International market for shrimp is relatively more stable and resistant than for other agricultural products.

There are two factors which can introduce potential problems regarding the shrimp commodity : the strong dependence on the Japanese market and fast growth of the shrimp production coming from aquaculture operation.

These two potential problems lead to the need of creating or searching a new market. One potential market for the Indonesian shrimp is the European market. For the moment the most potential market for the Indonesian shrimp is the Western European market.

The Western European market as a matter of fact, is a conglomerate of a separate nations with pronounced differences in taste, preference, duties, regulations, purchasing power and so on. Therefore the overseas exporters must enter the Western European market on a country by country basis.

Because of that reason, the current study is focused on one of the potential markets of Europe, namely Belgium.

## 2. Objective and Significance of the Study

The objective is to assess issues on the trade relation between Indonesia and Belgium for the shrimp. More specifically, the objective is to analyze the factors affecting export and import.

1. to analyze the factors affecting the Belgian import of Indonesian shrimp
2. to analyze the effect of variation of important factor(s) affecting the import
3. to analyze the factors affecting the Indonesian export to the Belgian market
4. to analyze the effect of variation of important factor(s) affecting the export supply.
5. to predict the import and export of Indonesian shrimp on the Belgian market.

The result of this study will be valuable especially for the trade policy related to the Indonesia-Belgium relation. In addition, this present study may present some perspectives for the further study on related areas.

## 3. Approach and Operational Model

To attain these objectives, the import demand and export supply functions of Indonesian shrimp on the Belgian market are specified and empirically estimated. From the estimation some coefficients will be found. Analysis will be undertaken on the found estimates.

Following the work of Gonarsyah (1983), there are three sets of empirical models for assessment of export - import relation between two countries. They are **a single country model, a two country model** and three country model. These three set of models are basically based on above discussed theoretical model.

For the purpose of this study one country model is employed.
The models are represented by equation (1) and (2).

$$IMP = a_o - a_1MPB - a_2ERB + a_3PFB - a_4QSB + a_5YI + a_6QMB + \mu_1 \text{ ........ } (1)$$

$$EXP = b_o + b_1PBI + b_2PMI - b_3YI + b_4QSI + b_5ERI + \mu_2 \text{ .................... } (2)$$

Signs of the parameters (a's and b's) indicate the direction of the relationship as hypothesized.

Due to the nature of the specification, the single-country models were estimated using the ordinary least square technique. The model was estimated in linear forms, because the existence of the additive identity equation prevents the use of logarithmic forms.

## 4. METHODOLOGY

The analysis consists two parts a literary and an empirical analysis are carried out.

The literature analysis describes the productions, the consumptions, the port/import patterns and policy related to the shrimp commodity.

The empirical approach is carried out by correlation and multiple regression analysis of the time series data.

In this paper only empirical analysis is presented.

Definition and measurement for the variables used in this study are represented in table 1.

## 5. Result and Discussion

### 5.1 Export of the Indonesian Shrimp on the Belgian Market

The estimated Coefficients for the export supply is demonstrated in Table 2.

Table 2 shows us some important indications:

- The statistical fitness of the estimation is good. This isshown by the high value of $R^2$ (0.985) meaning that 98 percent of variation of the export supply of the Indonesian shrimp on the Belgian market can be explained by the variables in the model simultaneously.

- But the estimated model also suffers from multicollinearity in any degree.

- The overall outcome of that circumstance is that there are only two variables which significantly can explain the variation of the export supply of the Indonesian shrimp on the Belgian market. These variables are the exchange rate of the Indonesian Rupiah to the US Dollar (90 percent level of confidence) and the per capita income in Indonesia (80 percent level of confidence). The production level of shrimp in Indonesia does influence insignificantly.

Table 1. Definition, Measurement and Source of Data Used in the Study

| Table name | Definition and Measurement | Source of data |
|---|---|---|
| IMP | Belgian shrimp import from Indonesia (thousand of kg) | DGF- RI* |
| NB | Number of population in Belgium (million persons) | NIS** |
| PBI | Price of Shrimp in the world market (US$/kg) | DGF - RI |
| ERB | Exchange rate for BFR to US $ (BFR/US$) | NBB*** |
| MPB | Price of Shrimp in Belgian (BF/kg) | NIS |
| YB | Belgian GDP per capita (BF 1000/capita) | NBB |
| QSB | Shrimp production in Belgium (1000 kg ) | NIS |
| PFB | Average price of Fish other than Shrimp in Belgium (BF/kg) | NIS |
| EXP | Indonesian shrimp Export to Belgium (thousand kg) | DGF - RI |
| PMI | Price of meat in Indonesia (Rp/kg) | BI - RI**** |
| YI | Indonesian GDP per capita (US $/capita) | BI - RI |
| ERI | Exchange rate for Indonesian Rupiah to US$ | BI - RI |
| QSI | Production of Shrimp in Indonesia (thousand kg) | DGF - RI |
| QMB | Meat supply in Belgium (1000 kg) | NIS |

* D.G. Fishery of Republic of Indonesia
** Nationaal Instituut voor Statistiek België
*** Nationaal Bank van België
**** Bank of Indonesia

The clearer indication is shown by the estimated elasticity coefficients presented in table 3. From this table it is evidence that the exchange rate is the most influencing factor for the export supply of the Indonesian shrimp to the Belgian market. This finding is slightly in line with the result found by Retnowati.

Table 2. Estimated Export of Indonesian Shrimp to Belgium

| Variable | Estimate | t statistic |
|---|---|---|
| Constant | - 5807.5623 | |
| PBI | 10.6141 | 0.043 |
| PMI | 0.0981 | 0.196 |
| YO | 5.8097 | 1.170* |
| QSI | -.0021 | -.192 |
| ERI | 2.6992 | 2.203** |
| Rsquare | | 0.9850 |
| F table | | 5.79 |
| F ratio | | 26.302 |

Table 3. Estimated Elasticities For Export of Indonesian Shrimp on The Belgian Market

| Variable | Coefficient | Type |
|---|---|---|
| PBI | 0.0721 | Own Price |
| PMI | 0.3966 | Cross Price |
| YI | 2.7619 | Income Elasticity |
| QSI | -.3763 | Shrimp Production in Indonesia |
| ERI | 3.5667 | Foreign Exchange |

In investigating the Japanese market for Indonesian shrimp, Retnowati found that the export supply of the Indonesian shrimp on the Japanese market is significantly affected by, 1. the exchange rate of the Indonesian Rupiah to the US Dollar, 2. the production level of shrimp in Indonesia. The price of shrimp in the world market was also found not to be influencing.

From the finding it is obvious that the exchange rate of the Indonesian Rupiah to the US Dollar is of important factor determining the Indonesian shrimp in foreign market.

1. The export supply of the Indonesian shrimp to the Belgian market has a positive-significant relationship with the exchange rate, the price of meat in Indonesia, and the production level of shrimp in Indonesia.

2. The export supply of Indonesian shrimp to the Belgian market has a negative - insignificant relation with the per capita income in Indonesia.

3. The export supply of Indonesian shrimp to Belgian market dependent upon the exchange rate of Indonesian Rupiah to US dollar, the price of meat in Indonesia, The production level of shrimp in Indonesia, the per capita of these variables the exchange rate was found to be the most affecting factor.

4. The prediction of the export supply indicates that, by the year 2000, the export supply of the Indonesian shrimp to the Belgian market is expected on the average growth of 9.8 percent per annum.

## 5.2 The Import Indonesian Shrimp by The Belgian Market

With respect to the import demand of the Indonesian shrimp of the Belgian market, the finding are as follows:

1. The import demand of the Indonesian shrimp on the Belgian market has a positive-significant relationship with the price of meat in Belgium, the price of fish in Belgium, and the per capita income in the country. Negative relations were found between the import demand of the Indonesian shrimp and the production level of shrimp in Belgium.

2. All the variables mentioned above are influencing simultaneously the import demand of the Indonesian shrimp by the Belgian market. Of all these variables per capita income in Belgium was found to be the most influencing factor for the import demand of Indonesian shrimp by the Belgian market.

3. On the basis of the annual growth of per capita income in Belgium, it is predicted that the import demand of the Indonesian shrimp on the Belgian market will be 6014,73 ton by the year 2000. The expected average growth of the import demand for the coming decade is 8.9 per cent.

Table 4. Estimated Demand for Indonesian Shrimp in Belgium

| Variable | Estimate | T value |
|---|---|---|
| Constant | -11402.5481 | |
| MPB | 334.3151 | 5.404** |
| ERB | 8.6539 | 0.846 |
| PFB | -11.0142 | -2.548* |
| QSB | -2.1380 | 5.062** |
| YB | 0.0132 | 21.7660*** |
| QMB | 0.110 | 1.815 |
| Rsquare | | 0.9996 |
| F table | | (0.05) 13.75 |
| F ratio | | 455.524 |

*** significant at 95 % level of confidence
** significant at 90 % level of confidence
* significant at 80 % level of confodence

Table 5. Estimated Elasticity for Import of Indoensian shrimp in Belgium

| Variable | Coefficient | Type |
|---|---|---|
| MPB | 1.995 | Own Price |
| ERB | 0.373 | Exchange Rate |
| PFB | -.869 | Cross Price |
| QSB | 1.344 | Shrimp Production in Belgium |
| YB | 6.055 | Income Elasticity |
| QMB | 27.28 | Supply of Meat |

## 6. Policy Implication

Since domestic production of shrimp in Indonesia is found to be insignificant with shrimp export of Indonesia it implies that production approach in Indonesian shrimp industry should be revised comprehensively. In other words production policy in Indonesian shrimp industry should be followed closely with marketing policy in finding new market.

## 7. Conclusions

On the basis of regression analysis, it was found that the five proposed variables, - the exchange rate, shrimp production level in Indonesia, price of shrimp in world market, the per capita income in Indonesia, and the price of meat in Indonesia, are simultaneously significantly influencing the export supply of Indonesian shrimp in Belgian market, in a simultaneous way.

Of these five variables, exchange rate of Indonesian Rupiah to the US dollar, was found to be the most affecting variable the export supply of the Indonesian shrimp into the Belgian market.

Using the estimates of export function as a predictor, it is predicted that up to the year 2000, the export supply of Indonesian shrimp to the Belgian market will be growing with the expected average growth of 9.8 percent per annum.

Concerning import the demand model, some conclusions can be drawn from the correlation.analysis.
Accordingly, the import demand of Indonesian shrimp by the Belgian market has a positive -significant relationship in respect with the following variables :

- price of meat in the Belgium market;
- price of fish on the Belgian market;
- per capita income of Belgium.

The relationship of import demand of Indonesian shrimp by the Belgian market was found to be negatively significant correlated in with a exchange rate of Belgian Frank to the US Dollar, and negatively insignificant the shrimp production in belgium.

On the basis the regression analysis, it was found that the import demand of the Indonesian shrimp on the Belgian market is significantly affected by the variation of the exchange rate, the price of meat in Belgium, the price of fish in Belgium, and the production level of shrimp in Indonesia.

Of the six variables which are proposed in the model it was found that, per capita income in Belgium is the most significant variable in affecting the variation in import demand of the Indonesian shrimp by Belgium.

These findings also suggest that fish and meat are the substitute for shrimp, and shrimp is a normal good, because the demand is increasing with respect to the increase in the per capita income.

Using the per capita income of Belgian Frank to The US dollar as an predictor, it is estimated that up to the year 2000, the import demand of Indonesian shrimp by the Belgian market is expected to be growing with the expected average growth of 8.9 percent per annum.

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