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

A THESIS

Presented as Partial Fulfillment of the Requirements to Obtain the Bachelor Degree in Economics Department

By

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YOGYAKARTA

2005

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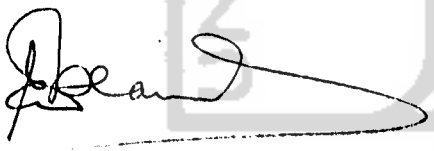

Prof. Dr. Edy Suandi Hamid, M.Ec. March 30, 2005

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Defended before the Board of Examiners
on April 29, 2005
and Declared Acceptable

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ABSTRACT

Muhamad Karisma Yoedistira (2005), "An Analysis On The Factors Affecting Indonesian Shrimp Export in Japan Market in 1982-2004". Faculty of Economics, Developmental Economics Studies, International Program, Islamic University of Indonesia, Yogyakarta.

In the early period of the new order government, export gas and oil had given the biggest contribution to the revenue of Indonesian export. The role of gas and oil export to the annual revenue of Indonesian reserve is about 60% to 80%. The crisis of oil trade in the world that happened since 1982, 1986 and reached to the top in the year 2004 had caused the decrease of reserve which was used for financing to development. To the thinning of gas and oil resources as the nation primary reserve, it is very reasonable if the reserve is based on export of non-gas and oil. One of the primary exports of non-gas and oil is shrimp commodity. Indonesia is included into the biggest producer and exporter of shrimp to the world and Japan is the country that has the biggest import value.

This thesis aims to analyze what factors which affect the export of Indonesian shrimp in Japan market, and the influence on the changing prices to the export of Indonesian shrimp. Those influences can be seen from the demand side. The variables which are assumed can affect the demands of Indonesian shrimp export are the price of shrimp itself (US$/Kg), the exchange rate of Yen toward Rupiah, the population of Japan, and the Gross Domestic Product (GDP) per capita of Japan. The calculation which used the ordinary least square method during the period of 1982 – 2004 showed that the demand of Indonesian shrimp export have a strong response to the change of shrimp price, the Japan GDP per capita, the exchange rate of Yen toward Rupiah, and the population of Japan.

This research summarizes the determination of the analysis factors affecting Indonesian shrimp export in Japan market; they are Japan Gross Domestic Product per capita, Prices of shrimp, exchange rate of Yen toward to Rupiah and the population of Japan. Based on the research, the coefficient determination R-square is 0.948014. Where, each independent variable has influences to Indonesian shrimp export to Japan and all variables are significant to the demand of shrimp imported by Japan and also has positive relationship in Japan GDP per capita, the exchange rate of Yen toward to Rupiah, and the population of Japan. Contradictory with the other variables, it has negative relationship – it means the decrease in shrimp price will affect the increase in the demand of shrimp imported by Japan. The four variables are tested by econometric method in classical assumption deviation, which are Multicollinearity test, autocorrelation test and heterocedasticity test. They show that the classical assumption deviation does not exist.

ABSTRAK

Muhamad Karisma Yoedistira (2005), "An Analysis On The Factors Affecting Indonesian Shrimp Export in Japan Market in 1982-2004". Fakultas Ekonomi, Ilmu Ekonomi Studi Pembangunan, Program Internasional, Universitas Islam Indonesia, Yogyakarta.

Diawal pemerintahan orde baru, ekspor minyak dan gas telah memberikan kontribusi yang sangat besar terhadap pendapatan ekspor Indonesia. Peranan dari ekspor minyak dan gas terhadap pendapatan tahunan Indonesia yaitu sekitar 60 samapi 80 persen. Krisis perdagangan minyak di dunia telah terjadi semenjak tahun 1982 dan 1986, dan puncaknya pada tahun 2004 yang mana telah menyebabkan menurunkan pendapatan yang mana untuk digunakan untuk membiayai untuk pembangunan. Untuk mengurangi eksploitasi dari sumber daya minyak dan gas sebagai penerimaan utama negara, ini sangat beralasan jika ekspor minyak dan gas sebagai pendapatan negara. Salah satu dari ekspor utama dari non-minyak dan gas adalah komoditas udang. Indonesia termasuk kedalam produser dan eksporter terbesar di dunia, dan negara Jepang adalah salah satu negara terbesar yang mengimpor udang.

Skripsi ini bertujuan untuk menganalisis faktor-faktor apa saja yang mempengaruhi ekspor udang Indonesia dipasar Jepang, dan seberapa besar pengaruh perubahan harga (udang) terhadap ekspor udang Indonesia.Pengaruh itu bisa dilihat dari sisi permintaan. Variabel-variabel yang diasumsikan dapat mempengaruhi permintaan ekspor udang Indonesia adalah harga udang itu sendiri (US$/Kg), nilai mata uang Yen terhadap Rupiah, Populasi Jepang, dan PDB per capita Jepang. Yang mana perhitungan menggunakan metode ordinary least square selama periode 1982-2004 menunjukan permintaan ekspor udang Indonesia mempunyai respon yang sangat kuat terhadap perubahan harga udang, PDB per kapita Jepang, nilai mata uang Yen terhadap Rupiah, dan populasi Jepang.

Penelitian ini merangkum kepastian dalam faktor-faktor yang mempengaruhi ekspor udang Indonesia dipasar Jepang; yaitu PDB per kapita, harga udang, nilai mata uang Yen, dan populasi Jepang. Berdasarkan penelitian, determinasi koefisien R-square adalah 0.948014. Dimana tiap-tiap variable tidak bebas memepunyai penfgaruh terhadap ekspor udang Indonesia ke Jepang. Semua variabel tidak bebas signifikan terhadap permintaan impor udang oleh Jepang dan juga mempunyai hubungan yang positive terhadap PDB per kapita Jepang, nilai mata uang Yen, dan populasi Jepang, lain halnya dengan harga udang mempunyai hubungan yang negative, itu berarti menurunnya harga udang akan berpengaruh meningkatnya impor udang oleh Jepang. Dan dalam penelitian ini juga setelah dilakukan tes ekonometri tentang adanya penyimpangan asumsi klasik yang diantaranya, tes multikolinearitas, tes autokorelasi dan tes heterokedastisitas. Menunjukkan tidak adanya penyimpangan asumsi.

CHAPTER I

INTRODUCTION

1.1. Background of the Study

In the beginning of the new order government, gas and oil export had given the biggest contribution to the revenue of Indonesian export. The role of gas and oil export to the annual revenue of Indonesian reserve is about 60% to 80%. The crisis of oil trade in the world that happened in 1982 and 1986, according to Indonesian statistical year books had made the price of oil reached to the top in the year 2004 which was around $35.00/barel and also had decreased the reserve used for financing to development. To the thinning of gas and oil resources as the nation primary reserve, it is very reasonable if the reserve based on export of non-gas and oil. One of the primary exports of non-gas and oil is fisheries commodity. Indonesia is included into the biggest producer and exporter of shrimp to the world especially to Japan (see table 1.1.). Moreover, Indonesia is an archipelago comprising over 17,508 islands. It is estimated that Indonesian has 6.26 million metric ton of fish consisting of 4.40 million tons annually from Indonesian Economic Exclusive Zone.

The world demand for shrimp will increase for a number of reasons : a) The increase of population and income of the world society, b) The increasing life quality which is followed by preferences to shift toward healthy food with low cholesterol and higher protein as can be found in shrimp, c) In the future , the world society is predicted to be very busy (people are on the run) that the

preference will shift to food that are healthy and easy to prepare, and d) The effect of globalization is expected to course people is activities to cross boarders which made food become more international regardless of age, nationality even religion, which in this case fish is one alternative commodity.

The role of fisheries to support marine fishery sector growth is clearly shown by the increasing contribution even during this monetary crisis that has not been recovered until recently. The program of fisheries products export is implemented by applying products development and fish inspection and quality control strategy, improve quality and past harvest as well as supported by providing conducive climate. This program will be implemented by not ignoring efforts to prepared fish for the local consumption. In order to optimize the utilization of fisheries resources, reduced loss due to quality control and supervision is needed.

According to the Directorate General of Capture Fisheries (2002) directory of exporter/producer fishery commodities, in the period of year 2000, the fishery product export showed a significant increase both in volume and value. In the last few years, 1994 -2000, fish products export increased from 545,371 MT (1994) to 703,155 MT in 2002, so there was an approximate increase of 157,783 MT (4.82%) in volume, and 0.72% in value per year. The export volume increase was not compared yet by the export value, these problems caused the average cost of export to be reduced due to quality deterioration.

Such fish products export condition, the effort must be taken are: a) To increase the qualities and products development based on the Hazard Analysis

Critical Control Point (HACCP), b) developing of market link including of export market diversification, c) Export or commodities diversification, and d) Empowering of market information system or market intelligence.

Looking at the market structure, more than 75% of fish products export from Indonesia is aimed to Asian countries such as Singapore, Thailand, and Japan etc in form of whole frozen products. Export to Asia is dominated by Japan (50%), followed by USA (17%), and Europe (13%). Production of capture fisheries in 2001 is recorded 4,276,720 MT. This production is bigger 3.66% than production in 2000. The increase of marine fisheries production caused the rise of capture fisheries production. Production of inland open-water decreased than the year before.

According to the Statistics of Capture Fisheries of Indonesia (2003), the production of marine capture fisheries in 2001 was 3,966,480 MT which increased up to 4.18% than in 2000. In 2001, the marine fisheries production was landed 7.22 % in the coast of West Sumatera, 2.94% in the coast of South Java, 15.1% in the coast of Mallacca Strait, 9.01% in the coast of East Sumatera, 20.48% in the coast of North Java, 5.79% in the coast of Bali-Nusatenggara, 3.04% in the coast of South-West Kalimantan, 4.59% in the coast of East Kalimantan, 11.75% in the coast of South Sulawesi, 7.21% in the coast of North Sulawesi and 12.87% in the coast of Maluku-Papua.

The production of shrimp in 2001 increased than in 2000, the production of shrimp also increased up to 5.62%. Among commodities of inland open-water, the production of shrimp in 2001 increased the highest compared to the

production in 2000, which was 199.37%. And Indonesia is also included into the biggest producer and exporter of shrimp to the world, Japan is the ultimate export country (as seen on the table 1.1.).

Table 1.1.

Top Ten of Origin Country of Japanese Imports of Frozen Shrimp, 2001-2003

Origin Country	2001	2002	2003
Indonesia	52,367	53,608	55,617
China	47,626	41,516	35,664
Vietnam	28,191	34,795	42,991
India	20,494	19,598	14,926
Thailand	16,803	18,907	20,574
Philippines	6,421	7,996	9,423
Myanmar	5,377	5,568	4,148
Australia	3,971	4,946	4,965
Malaysia	3,262	4,481	3,748
Bangladesh	3,004	3,241	3,169

Source: Warta Pasar Ikan. (Edisi Mei 2004). Promosi dan Misi Dagang ESE 2004. Direktorat Pemasaran Hasil Laut dan Ikan

According to Food and Agriculture Organization of the United Nations Japan is the number one shrimp importer in the world. In 1982, 17 percent ($ 221.873 million) of the shrimp imported was from Indonesia. There were also

eleven joint-stock fishery companies between Indonesia and Japan since 1982 (see table 1.2.). They were mainly shrimp trawling. Those companies petitioned the government to ease the restrictions.

Table 1.2.

Joint-Stock Fishery Companies in Indonesia (1982)

Company Name	Export to Japan (ton)
Misafa Mitra	1,548
West Irian Fishing Industry	1,325
Central Java Marine Products	1,283
Mina Kartika	890
Irian Marine Product Development	802
Toyo Fishing Industry	779
Dwi Bina Utama	643
Alfa Kurnia Fish Enterprise	606
Mitra Kartika Sejati Bonecom	583
Nusantara Fishery	390
Minaraya Aceh Fishing Industry	NA

Source: Direktorat Bina Produksi, Direktorat Jendral Perikanan, Laporan Ekspor Produk Perikanan Indonesia, 1982.

There are some prospects of Indonesian shrimp export in the future because the government has been speeding up the development of shrimp farming business in order to take the opportunity to export more to Europe after Thailand,

the major exporter to the region, faces anti-dumping measurement implemented by the European Union (EU), a move that will cause Thailand to lose the edge against other exporting countries. Earlier in 2004 the government had focused on shrimp exports to the United States, following the imposition of import duty of up to 40% to six world shrimp producing countries except Indonesia. Minister of Marine and Fishery Affairs, Rokhmin Dahuri said import duty for shrimps from Indonesia into the United States was only 8%. "This is an opportunity that must be used by Indonesia shrimp exporters", said Dahuri (*Jakarta, Business News-10 August 2004*).

He said the United States market was the second largest market in the world for shrimp after Japan. Shrimp consumption in the United States today is experiencing a high increase, so it has become the object of struggle among shrimp producing countries in the world such as India, Vietnam, Thailand, Brazil, Ecuador, and China. Dahuri added that the consumption of shrimp of the country had been increasing so that some producing countries such as India, China, Vietnam, Thailand, Brazil, and Ecuador had been boosting their export to the US. The US had been accusing those countries of conducting dumping practices.

Therefore the US sets such a high import tariff of shrimps from those countries, and the export from those countries had decreased automatically, he said. The data of the US Trade Attaché mentioned that the trade deficit of the country with Indonesia was US$ 600 million. On August 2003 the export of the country to Indonesia reached US$ 194, 3 million or it increased by 4, 75% from the export of the previous year as much as US$ 185.5 million. But the figure was

much lower than the export on August 2002 which was as much as US$ 262.2 million. Meanwhile Indonesian export to the US on August 2003 was US$ 52.5 million, representing an increase of 26, 46% from August 2002 and a decrease of 0, 56% from July last year.

Meanwhile, the Vice Chairman of Indonesia Fishery Entrepreneurs Federation, Johanes Kitono, said the imposition of antidumping duty by the United States to those six world shrimp exporting countries had caused the supply of shrimps to the United States declined. The United States import of windu shrimps was around 500,000 tons, of which 300,000 tons were supplied by China, Thailand, Ecuador, India, Vietnam, and Brazil, which have been sanctioned by the United States', he said.

With that condition, he said, the market for windu or tiger shrimps in the Unites States with markets in Japan and Europe became imbalanced, because those countries, which had been sanctioned, had shifted their export to Japan and Europe. In the United States alone, he said, the supply was declining, while in Japan and Europe, tight competition had occurred. Actually, the United States market is profitable for Indonesia, because a part of the US shrimp imports can be supplied by Indonesia.

On the contrary, he said, the competition at shrimp markets in Europe had become tight, because the shrimp producing countries, which felt it was difficult to compete in the US market, were looking for a new market in Europe. The Director General of the Increase of Institutional Capacity & Marketing of the

this change affect the demand of shrimp export? Hopefully this research is able to answer the question on what kind of factors that affect the demand of Indonesian shrimp export.

In order to have a clear and bright framework, it is important to identify the main problem of this research as the basis framework of this thesis. Problem identification is an important and the first step in solving the problems discussed in this thesis. The problem identification in this research is analyzing factors that affect Indonesian Shrimp export to Japan in 1982-2004.

1.3. Problem Formulation

Based on the study background and the significance of the analysis on factors affecting Indonesian shrimp export to Japan, the writer formulates the following problems:

1. Can the price of shrimp affect the Indonesian shrimp export?
2. Can the Japan GDP affect the Indonesian shrimp export?
3. Can the exchange rate in both countries (in this case Indonesia and Japan) affect the Indonesian shrimp export?
4. Can Japan total population affect the Indonesian shrimp export?

1.4. Problem Limitation

In order to have an effective and focused writing, the writer restricts the research variables on the following problem limitations:

1. The volume of Indonesian shrimp export to Japan (Ton) from 1982 to 2004.
2. The price of shrimp from1982 to 2004.
3. The value of gross domestic product per capita from1982 to 2004.
4. The exchange rate of Yen toward Rupiah from 1982 to 2004.
5. The total population of Japan from1982 to 2004.

1.5. Research Objectives

This research objective is to analyze factors affecting the value of Indonesian shrimp export to Japan by using regression analysis so it can obtain the contribution from each independent variable used in this research.

The objectives are:

1. To analyze the effect the price of shrimp concerning the Indonesian shrimp export.
2. To analyze the effect of Japan real GDP concerning the Indonesian shrimp export.
3. To analyze the effect of exchange rate Yen to Rupiah concerning the Indonesian shrimp export.
4. To analyze the effect of Japan total population concerning the Indonesian shrimp export.

1.6. Research Contribution

The final result of this research is expected to be useful and contributive for the following parties:

a. For the writer, this research is the opportunity to apply the knowledge and theory that has been studied.
b. To study further about the international trade and its relation with a country's economic growth.
c. To give other researchers temporary data and arguments about the Indonesia shrimp export.
d. To show the effect of the Indonesian shrimp export on the government balance of trade.
e. As an additional information to Shrimp commodity so it can increase the government balance of trade.
f. As a requirement to have a bachelor degree from the faculty of economics, at Islamic University of Indonesia.

1.7. Definition of Terms

The demand for Indonesia Shrimp in Japan market means the demand from Indonesia as exporter of Shrimp to Japan market as the importer country. An export of Shrimp is one of revenue contribution to Indonesian export.

This research explains the demand of Indonesian Shrimp export from Japan. The writer wants to search on what factors that would affect the quantity of

Indonesian shrimp export. On this thesis the factors to be examined are price, Japan income (GDP), exchange rate and population.

The writer also wants to describe biology of shrimp itself. There are a lot of shrimp varieties – there are many kinds of shrimp species. And there is a popular name of this species. The popular names, shrimps and prawns, have been used variously to denote decapod crustaceans of the families Penaeidae and Palaemonidae. But in the recent aquaculture literature, a distinction has been drawn between the two groups. The name prawn is used for freshwater forms of Palaemonids and shrimp for the marine penaeids.

There are more than 50 species/ varieties of shrimps available in marine waters, with a very wide distribution in both tropical and temperate ecosystems. Most are very small and not suitable for farming or human consumption. However, the giant tiger shrimp (*Penaeus monodon*), which is internationally known as tiger shrimp, has been and continues to be the leading cultured species. *P. monodon* is also the largest (maximum length 363 millimeters) and fastest growing of the farmed shrimp species. In India, other than *P. monodon*, species such as *P. indicus* (white shrimp), *P. penicillatus* (like white shrimp), *P. semisulcatus* (green tiger prawn) and *P. merguiensis* (banana shrimp) are also farmed), but the two shrimp species – *P. monodon* and *P. indicus* form the mainstay of shrimp aquaculture in the country.

Assured supply of seed from hatcheries is one of the main reasons for this dependence. In traditional systems of farming, minor penaeid shrimps, which enter along with the tidal waters are also cultured. In other parts of the world, *P.*

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1. Literature Review

2.1.1. Freddy Hendradjaja (2000)

Many articles discuss about the problem of Indonesia's shrimp export commodities. One of the articles is written by Freddy Hendradjaja; He is an Alumnus of Brandeis University, Graduate School of Economics and Finance, and former economic analysis and planning staff of BAPPENAS. In his article he describes to estimate a model of Indonesia's export of non-oil and gas commodities which is shrimp. The objective was to produce projections for both total exports and each commodity. Then he includes the projection numbers in the Gross Domestic Product equation to get the whole macroeconomic outlook of Indonesian economy. And he limits only to four agricultural and forestry commodities. He aims to capture the export behavior in recent economic condition, which is quite different from the booming economy in the late eighties.

He uses data from early 1990 (1992 to be exact, because the Central Bureau Statistics of Indonesia does not have reliable data related to exports before 1992) to 1998 in quarterly series. It is understandable that there are many problems using the quarterly data, but he can at least capture the movements of export during the uncertain economic condition, especially in the late nineties.

to buy the commodities. Also, if the exchange rates of Indonesia are weaken, there is a possibility that importers will buy more since the commodities will be relatively cheaper. Dummy variables were used to capture the seasonal factor in the quarterly data. It is understandable that there is usually a seasonal factor especially in commodity like agricultures, which have harvesting season that can affect supply. He also employed dummy variable to capture the influence of Asian financial crisis since mid 1997. And the export models of shrimp commodities are like these:

Q SHRIMPt = ß0 + ß1LNPWSHRIMPt + ß2LNPWSHRIMPt-1 + 3dLNGDP_USt + ß4dLNGDP_JPt + ß5LNRERt + ß6LNRERt-1 + ß7DUMQ1 + ß8DUMQ2 + ß9DUMQ3 + ß10DUMCRISIS

And this estimation uses quarterly data to lengthen the period of observations. Using quarterly data can present a problem to this model, because there might be a seasonal factor in the data. Dummy variables can be used to capture the seasonality in the data. The data were taken from the Central Bureau Statistics of Indonesia and International Financial Statistics of IMF.

Using regression tools from Excel the results are:

Q SHRIMPhatt = 19.021 – 0.865 LNPWSHRIMPt + 0.797 LNPWSHRIMPt-1 – 1.809dLNGDP_USt – 5.686 dLNGDP_JPt + 0.095 LNRERt – 0.003 LNRERt-1 – 0.097DUMQ1 + 0.026 DUMQ2 – 0.008 DUMQ3 + 0.150 DUMCRISIS

The results can be interpreted using excel and e-views. Thus, even though there are only three significant coefficients from this model, at least we can also interpret each coefficient, *ceteris paribus*. First of all, if there are no changes in explanatory variables, the shrimp export will increase by 26.45 %. A good result is shown in the price coefficient; a 1% increase in shrimp price will decrease the export by 0.86 %. From shrimp commodities it can be seen that they have different price elasticity. Shrimps are inelastic, which means a change in prices does not affect to export shrimp (which unfortunately, has insignificant coefficient). There is a strange result with the influence economic growth rate in this equation. It is shown that that a 1% increase of economic growth rate in Japan will decrease the shrimp export by 1.8 %, which is not the same as Hendradjadja expected that an increase in economic growth of importer should increase the export because Japan will buy Indonesian goods more. Again, dummy variables that Hendradjadja intend to use to capture the quarterly movements or variations of export are not significant enough in explaining the variations in shrimp export. Hendradjadja found the same intriguing result; the Asian crisis did affect the shrimp export.

Hendradjadja remain four components do inter-link in each variables. Econometricians spend a lot of time telling us how to estimate an equation when he know the *correct* model and when we have the *full* data know the *true* properties of the data and the *correct* structural form. In reality, Hendradjadja usually know none of the above. Almost invariably, when Hendradjadja have problems with the estimation, this is not because he have used the wrong

estimation technique but because he have miss-specified the equation (theory and structural form) or because of poor data. This is where he shall be concerned.

1. Data availability

Data must be available, and he has to be careful with use of proxies if data is not available. Which should he use - quarterly at quarterly or annualized rates. Still, what matters is consistency and care in interpretation. Perhaps data at quarterly rates makes more economic sense. But data at annualized rates is easier to interpret and follow and is the industry standard.

2. Fit into model framework

Hendradjadja should keep in mind that the equation will have to fit into whole model framework. The whole model outline should be worked out first. So he need to think about what the explanatory variables are and whether they are endogenous or exogenous to the model. If exogenous, is a forecast available for them? he need to work back from ideal theory to what is available. What works well in a single equation may not work well in multiple regression models. The worst thing is: he cannot tell until finished the model and run the regression.

2.1.2. Helga Josupeit (2004)

Internationally, many articles and journals discuss about world shrimp market. A paper written by Helga Josupeit's describes the development of shrimp market in the world. This paper had been presented on the seminar 'An overview on the world shrimp market' and held by globefish organization on 26-27 October 2004 in Madrid-Spain. He explains about shrimp market in the world, like

production, export-import, and price of shrimp in the world. In his paper he explains that, shrimp production that is captured and aqua cultured has expanded over the past decade from 2.4 million tons (MT) in 1987 to 4.2 MT in 2000. At this level, shrimp production has been stabilized since. The world main shrimp producing country is China with 1.3 MT. This country is mainly responsible for the strong increase. The other three major shrimp producing countries are Indonesia, India and Thailand - have experienced many up-and-downs during the period with production oscillating between 300,000 and 400,000 MT each.

The world shrimp aquaculture production, which had stabilized in the 1990s, has shown strong increases in recent years. In 2003, shrimp aquaculture exceeded 1.6 MT. Disease problems overshadowed the production, There was a disease which whipped out Chinese production (in 1993), created a lot of problems to the Thai production (in 1996 and 1997) and Ecuadorian production (1999). However, in recent years, most of the disease problems have been overcome. In addition, the shrimp export to Asia has created a boom production, especially in Indonesia. The share of aquaculture production in total shrimp production grew during the 1980s. In 1988 this share already exceeded 20%, and the positive trend continued until 1992, when farmed shrimp accounted for almost 30% of total shrimp output. Since then, disease problems and the positive trend of shrimp capture fisheries led to a decline in the role the aquaculture plays. At present, only 25% of total shrimp production comes from aquaculture, and this share has been stable over the past years.

of its volumes exported to Spain but also of Brazil and Ecuador which both doubled the volume of their exports to Spain. Brazil also increased its shrimp exports to France by almost 70% during the first half of this year (compared to the same period in 2003) thanks to increased volumes at a unit value as low as €2.65/kg. Consequently, France showed a 14% increase in shrimp imports. The slight decrease in UK shrimp imports is explained by lower exports of frozen warm-water shrimp from India and Bangladesh, its two main suppliers for this product form. Regarding Italy, the good results for the first six months of the year are mainly due to an increase in volumes exported by Ecuador (+60%) but also to higher volumes from other traditional key suppliers.

He has seen that shrimp supply expanded in recent years, but not so much for shrimp going into international trade. Shrimp trade has not grown in value terms during recent years. The overall market situation is bleak at the moment, due to various factors, the most important is that the US market, the main player in recent years, reports lower imports in recent months, due to the anti dumping tariffs enforced. We will hear more about the anti-dumping and its impact on trade tomorrow. The Japanese market also reports bleak demand due to an economic crisis, some moments can bring an elusion of better sales (recent Bon festival), but these are only of a temporary nature. The EU market seems at the moment the strongest of the three, as demand is quite good and the Euro is strong on the US dollar. But the economic growth seems to be less than forecasted some time ago, and any further expansion of shrimp consumption in EU countries depends on the value of the Euro and on the future economic outlooks.

2.1.3. Gellwyn Jusuf and Rokhmin Dahuri (1999)

This paper explains about the impact of the economic crisis on Indonesia's fishery sector. Gellwyn Jusuf is a Chief Bureau for Agriculture and Forestry National Development Planning Board in Jakarta and Rokhmini Dahuri is a Lecturer at Faculty of Fishery and also the for the Director, Center for Coastal and Marine Resource Studies Bogor in Agricultural University Bogor.

From their explanations, it can be concluded that the impact of economic crisis to fishery sub sector has dualism in nature. Export oriented fishery received very high positive impacts because its products become more competitive, but domestic oriented fishery received moderate positive impacts. However, freshwater aquaculture, industry particularly those which use high input of supplemental food (pellet) like "common carp" aquaculture, received negative impacts, because increased of cost production was not followed by substantial selling price. On the other hand, with the increase of other animal protein sources such as eggs, meat, or chicken, fish products have potential to substitute their position.

Even though export oriented entrepreneurs enjoyed significant improvement in their well being, other players in this sector were economically getting worse. Therefore, this sector needs to launch programs that are able to empower those groups of unfortunate. From environmental point of view, this crisis could trigger over exploitation and increase pressures for both coastal and marine resources and land use, with different reasoning. It therefore needs to be

anticipated early on the difficulty to plan and execute an appropriate land use if this situation is still happening.

An economically sustainable fisheries development requires the management which enforces that the level of fisheries development should not exceed the carrying capacity of a given coastal/marine area. Frozen shrimp comprises more than 90 % of the total shrimp export from Indonesia. Indonesia's market share has substantially increased in the Japanese shrimp market. In 1995 Indonesia was the largest frozen shrimp supply in Japan market about 64.3 thousand tons. In the period January - October 1996 were still the largest country supply in Japan market about 52.6 thousand tons or Y 69.8 billion. However in this period, Indonesia, India and Thailand supplied more than 50 % of Japan shrimp market.

The second largest export markets of frozen shrimp are US and East Asia. Although Indonesia market share in the US is still small, it has been increasing significantly. In 1995 US import shrimp from Indonesia was about 5,341,289 Kg or US $ 58,567,969 compared with 9,884,649 Kg or US $ 110,710,539 in 1996. It grows 85 % in volume or 89 % in value. It has a very small portion in the European market and these needs to be targeted systematically over the next few years. The prospect of Indonesian shrimp in the export market looks quite promising in the Japanese market, the world, biggest import of shrimp. Indonesia now becomes the market leader.

2.1.4. David Batker and Isabel de la Torre (1998)

In this article they want to explain about the pillars of increased global shrimp trade. This articles mention that the internationalization of "free" trade, with reduced tariffs, quotas and non-tariff trade barriers provide exotic products to lucrative markets. And the World Trade Organization (WTO), the global institution chartered to regulate global trade together with international agencies and banks (FAO, World Bank, etc.) behind all that, fostering an intensive production-demand pattern. Developing countries become the suppliers through increased loans and credits from lending institutions, which typically finance intensive monoculture production systems.

Such is the case of the shrimp trade. Shrimp consumption is quite expanded in the US, Europe and in some Asian countries. The landings of wild shrimp from "capture" fisheries have hovered between 2 to 3 million tons a year. For some developing countries, the trade in seafood products is greater than that of coffee, tea, rubber, and banana combined. In the 1980s, the development of shrimp aquaculture which has meant the conversion of huge parts of tropical mangrove forests into aquaculture ponds allowed a dramatic increase of shrimp consumption as well as plummeted shrimp prices. For example, many US restaurants now offer cheap all-shrimp menu and all-you-can-eat shrimp bars of what was once an expensive delicacy. Intensive export-led shrimp farming with a short term, high rate of return on investment and cheap supply at the expense of degraded environment, displaced communities, loss of traditional livelihoods, human rights violations are then the pillars of a global shrimp trade which on the

CHAPTER III

THEORETICAL BACKGROUND AND HYPOTHESIS

3.1. Theoretical Background

3.1.1. Absolute Advantage Theory

The absolute advantage theory is declared by Adam Smith. He is a classical economist. This theory criticized from the *mercantilism theory*. According to Smith, mercantilist failed to draw distinction between wealth and treasure. It is already known that mercantilism it is neglected success when it can draw back the optimum metals (gold and silver). But we forget that the big part from large amount of the treasure is to finance large armies and navies and their activities in war and peace.

The main thought of Absolute advantage is the specialization and efficiency in producing goods. A country that has specialization in one product will allocate their resource to specialize in products that have high profits and also are potential export goods. On the other hand when a country specializes in one product, they will import products that can not be produce domestically. Specializing in one product will give absolute advantage benefit to the country in the international trade.

But although absolute advantage theory has many benefits, it also has a weakness. This theory doesn't analyze the condition of a country if the country doesn't have absolute advantage. Or may be this absolute advantage is

only possessed by one country. Based on this assumption, this theory is far from the reality.

3.1.2. Comparative Advantage Theory

This theory was declared by David Ricardo as the new idea from absolute advantage theory by Adam Smith. This theory mention that even though a country is less efficient (not have absolute advantage) than other country in producing commodity, international trade can still be done. A country that has a specialization on certain products exports the commodity that has small absolute advantage loss (commodity that has comparative benefit) and then imports the commodity that has greater absolute advantage loss (this commodity has comparative loss).

Comparative advantage has an exception, it happens when the value of absolute advantage loss by a country in both products is same. If this happens, trade would not occur and comparative advantage is not accepted.

3.1.3. International Trade Theory

International Trade is the exchange of goods and services among residents of different countries. Countries cannot live alone anymore effectively than individuals can. Each country tends to specialize in the production of those commodities it can produce more cheaply than other

countries and then exchange its surplus for the surpluses of other countries. (Chacholiades. M; 1995:7).

In the beginning, international trade appeared because of the difference of taste and consumption from each country. In the other side the difference of endowment factors like quality, quantity and composition among the countries also make the difference in the demand of goods and services among them.

In this modern era, the economist scientists believe that international trade appears because the difference in the consumption among countries. A country can produce goods more efficiently but still depends on the other country in the trading of other goods that can be produced domestically but have expensive price.

3.1.4. Hecksher – Ohlin Theory

According to Eli Hecksher and Bertil Ohlin international trade is moved by the difference of production factors among the countries. This theory said that every country has different certain production factors. The differences on the production factors create differences in price for the same commodity in every country. Heckhsher – Ohlin also explains about trading pattern, they explain about when a country wants to produce it will use the greater production factor so it can reduce the price of the related goods.

The summary of Heckhsher – Ohlin theory would be explained clearly from Samuelson thought.

1. This theory explains the failures of H-O theory. Assumption is used in this theory.
2. In this theory the condition of demand and supply commodities in trading always changes because the variables that depend on it is always moving. In H-O theory the condition of demand and supply are constant because there is ceteris paribus.
3. In this theory the competition condition has been changed from monopoly (in a short time, are the steps of "taped sales growth") up to oligopoly. In H-O theory, it is a perfect competition.
4. In this theory, the quality and the quantity of production and technology factor can be changed in a short time. H-O theory assumes constant.
5. In this theory of international trade, a trade shouldn't have a free trade. It might be a tariff of import has been burdened. H-O theory assumes that a trade is a free.

From the explanation above, it's known that Product Life Cycle (PLC) theory consider the entire dynamic variable that could be change in a time. The theory is the answer of the validness of H – O theory that is changed from comparative statistics too dynamic. Those assumptions are:

a. In PLC theory the demand and supply commodity trading always change because the variables that affect demand and supply always move and change every time (H – O theory). The demand and supply condition is stable because the assumption of ceteris paribus.

b. In PLC theory the competition in trading is changing from monopoly (in short time Rapid Sales Growth) to oligopoly. (In H – O theory competition condition is in perfectly competition).

c. In PLC theory the quantity and quality of production factor and technology are changing time to time. (in H – O theory trading is free)

d. In PLC theory international trade is not suppose to be free, the import tariff are known by trader. (in H – O theory the international trade are free)

As mentioned above, the PLC theory considered about all of the variable that affect international trade as a dynamic variable, that is always changing time to time, the changing are happened in the model, because PLC theory is build from testable hypothesis about what will happen if all the curve are relevant (that the assumption before is constant in comparative statistics). This changing are affect of trading and also affecting the whole welfare. (Samuelson, Microeconomics Seventeenth Edition)

3.1.5. Lewis' Research (1980)

He argued that the mechanism of trade as engine of growth was efficient. His argument was withdrawn from his study where he conduct a simple regression analysis of the quantum index of world trade in primary product (in logarithm), as proxy of LDCs export, with respect to production of manufactured goods in the world which served as a proxy for developed

countries' income. He used a sample data series from 1953-1977 in this regression. He found that the parameter estimate was statically significant and had a substantial magnitude: 0.832. This finding was claimed to support the same analysis carried out before which used a sample data series of 1881-1929, which found a parameter estimate of 0.87.

3.1.6. Dominick Salvatore's Research (1983)

He developed the analysis that has been presented earlier. Instead of estimating a single equation, he used simultaneous equation by specifying export, investment and industrialization as endogenous. By arguing that trade and development process are dynamic, he performed a dynamic simulation to get clear picture of the effect of variables of economic growth. He found that trade was positively associated with economic growth, but, the extent of the association was not sizable.

3.1.7. Quantity Demand Theory

Demands are determined by quantity demanded of product, are the total amount of any particular goods and services that an economy's consumers wish to purchase in some time period. It is important to notice three things about this concept (Lipsey, 1996: 63)

First, quantity demanded is a *desire* quantity. It is the amount that consumers wish to purchase that the price of the other product is assumed to

be constant. Second, *effective demand.* Are the amounts that people are willing to buy, given the price they must pay for the products. Third, quantity demand refers to a continuous *flow* of purchase. The amount of some product that all costumers wish to buy in a given time period is influence by the following important variable (Lipsey, 1996: 65).

1. Product's own price

   A basic economic hypothesis is that the price of a product and the quantity that will demanded are related negatively, other thing being equal. That is, the lower the price, the higher the quantity demanded, and the higher the price, the lower the quantity demanded. According to Alfred Marshall this fundamental concept is called "Law of Demand." On the case of demand for electricity related to the prices of electricity is when the prices of electricity is increasing the quantity demand for electricity will decreasing.

2. Average Consumer Income

   If consumers receive more income on average, they can be expected to purchase more of most products even though product prices remain the same. In the case of demand for electricity related to the income is when the National income or GDP is increasing the quantity demand for electricity will also increasing.

Other economist, Gregory Mankiw (2001: 67) determines that quantity demand is *the amount of good that buyers are willing and able to purchase*. According to him the quantity of every individual demand are determine by,

1. Price, if the price of good is increasing the quantity of demand will decreasing.
2. Income, if the income is increasing the quantity demand is also increasing but this theory is happen on the normal goods, and for the inferior goods increasing to the income will lend to the decreasing to the quantity demand for that goods.
3. Prices of related goods, means that substitution and complement goods, substitution if two goods for which an increasing in the price of one leads to an increasing in the demand for the other. And complement if two goods for which an increasing in the prices of one leads to a decreasing in the demand for the other. In the case of electricity and gasoline is if the price of gasoline is increasing the demand for electricity is increasing so electricity and gasoline related to the substitution goods.
4. Taste, economists normally do not try to explain people's taste because tastes are based on historical and

psychological forces that are beyond the realm of economists.

5. Expectation, expectation of every individual will affect to the quantity of demand in the future.

3.1.8. Change in Demand

The amount of some product that all customers wish to buy in a given time period is influenced by the following important variables (Lipsey, 1996: 70).

1. Products Own Price

   A basic economic hypothesis is that the price of a product and the quantity that will be demanded are related negatively, other things being equal. That is, the lower the price, the higher the quantity demanded, and the higher the price, the lower the quantity demanded. According to Alfred Marshall (1842-1924) these fundamental concepts are called "Law of Demand." For example, the case of demand for shrimp related to the prices of shrimp, when the prices of shrimp increase the quantity demand for shrimp will decrease.

2. Average Consumer Income

If consumers have higher income than the average, they can be expected to purchase more of most products even though the prices of the product remain the same. For example, in the case of demand for shrimp related to the income, when the National income or GDP is increasing the quantity demand for shrimp will also increase.

3. Other Price

It means that in other product prices or substitutes, a rise in the prices of products substitute will make the demanded for the product become increasing. It will make the demand curve shift to the right. For example, when the price of oil is the substitution product for the gas, when the price of oil is increasing, the demand for gas is increasing or vice versa.

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 taste in favor of a product shift the demand curve to the right. For example is between demand for rice and wheat. In

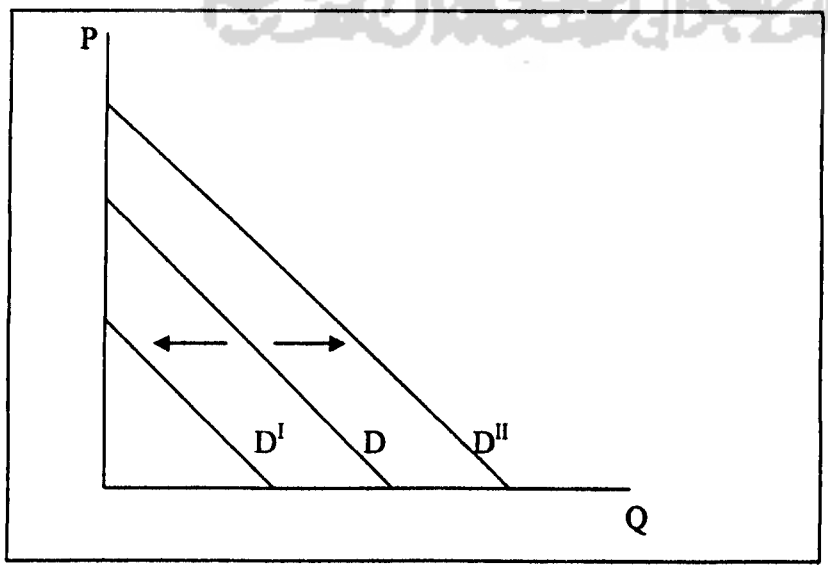
Indonesia demand of rice is higher than demand of wheat, because Indonesian people tend to eat rice than wheat. It reverse with western people, their demand of wheat is higher than rice. Because western people prefer eat wheat better than rice.

5. Population

An increase in population will shift the demand curves for most products to the right, indicating that more products will be bought at each price. For example, case in shrimp. When the population is higher, it will increase the demand for shrimp since more people need more shrimp in their daily lives.

Graph 3.1.

Change in Demand



From the graph above it can be seen, for the example if the price of good increases, there is a movement along the demand curve and a change in the quantity of the good being demanded. If the demand curve D arises in the price of a good, it produces a decrease in the demand and a fall in the price of the good produces an increase in demand. The arrows on demand curve D^{II} represent the movement along the demand curve. If some other factors on the demand change, which increase the quantity that people plan to buy, there is a shift in the demand curve to the right (from D to D^{II}) and an increase in demand. If some other factors on the demand change, which reduces the quantity that people plan to buy that goods, there is a shift in the demand curve to the left (from D to D^{I}) and a decrease in demand. (Samuelson, Microeconomics Seventeenth Edition, 1995)

3.1.9. Elasticity of Demand

The laws of demand and supply predict the direction of changes in price and quantity in response to various shifts in demand and supply. However, it is usually not enough to know merely whether the quantity and price each rise or fall; it is also important to know *how much the change.* This is what the concept of *elasticity* does.

Elasticity is a term in economics to denote the responsiveness of one variable to change another, for example the elasticity of X with respect to the Y means the percentage of change in X for every 1 percent change in Y. In the term of demanding one good, the elasticity of demand will be showed by the

1) Higher indifference curve are preferred to lower ones.
2) Indifference curve are downward sloping.
3) Indifference curve do not cross.
4) Indifference curve are bowed inward, means the slope are marginal rate of substitution.

Marginal rate of substitution is the rate at which a consumer is willing to trade one good for another. *The Consumer Optimal Choices*, The consumer choose the point on his budget constraint that lies on the highest indifferent curve. At this point, called optimum, the marginal rate of substitution equals the relative prices of two goods.

3.1.11. Export: Demand Side

In international trade, supply and demand have strong connection. It is proven in the market mechanism where both supply and demand together determine the quantity of goods to purchased or sold and also determine the relative price of the goods. Demand in the market is determined by the consumers taste and income. Taste and income can obstruct the reaction between quantity of demand and change in cost. (Lindert, Peter H; 1994: 46)

By doing international trade both countries can get benefits. It is shown on the indifference curve that by trading both countries can achieve maximum satisfaction. The difference in taste is profitable in trade because the producer can also produce different kinds of goods. According to Lindert (1994) if some countries have different taste with another country but not in

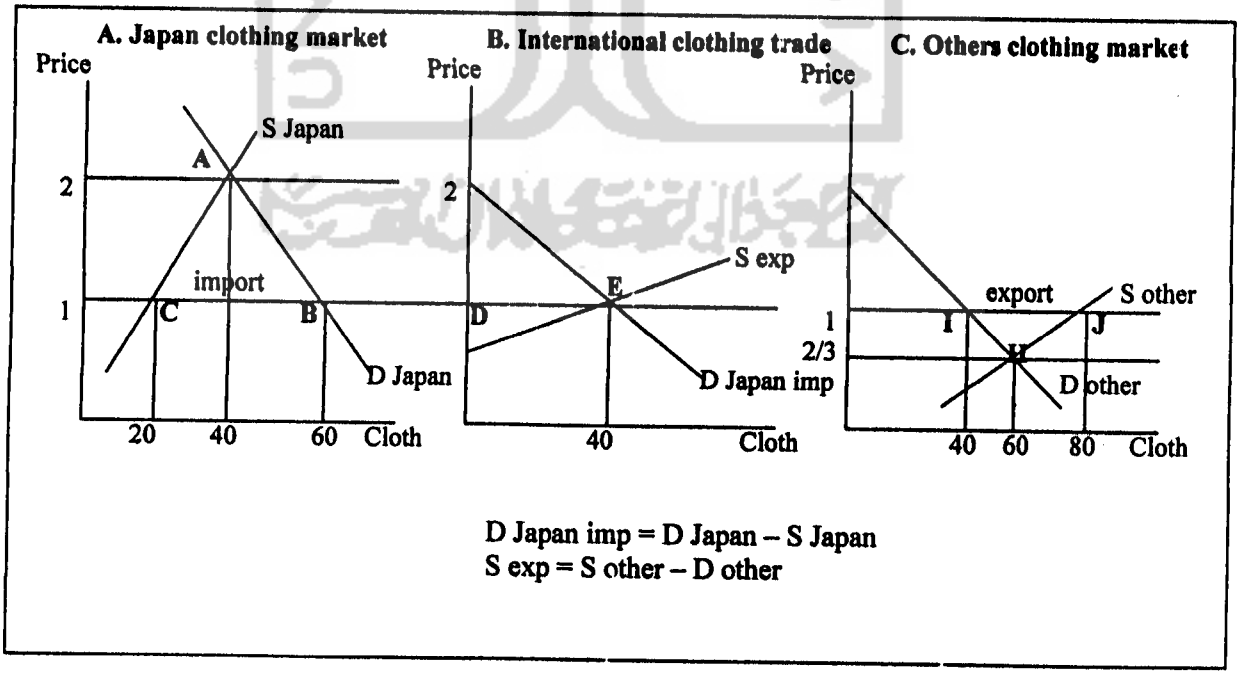
the production ability, so trading among countries can develop international specialization on consumption but not in the production.

In the case of the Japan government about their clothing production, Japan clothing companies will sell clothes by 2 quarts wheat per yard (as show in point A) but in other countries it is known that cloth is sold by 2/3 quart per yard as show in point H). It means that Japan should import cloth from other country because it is cheaper. Thus, when both countries make international trading both countries will get benefits from the trade. The graph below provides a better description:

Graph 3.2.

Affect of Japan production trade, consumption and price of related good

That showed by demand and supply curve



D Japan imp = D Japan – S Japan
S exp = S other – D other

The graph above explains about the effect of Japan production trade, consumption and price of related goods. From graph, it is seen that if the Japan government doesn't make international trade because of several reasons, so Japan market and the other country market will apply different price. In Japan, clothing would have price on 2 quarts wheat per yard and in other country clothing would have 2/3 quarts wheat per yard. With international trade both countries can get advantages, buyers in Japan and sellers in the other country will look for opportunity by doing international trade. Buyers in Japan will get advantages that they can get cheaper clothing because in the other country cloth price is only 2/3 per yard. Sellers in other country will also get advantages because their products will be sold with higher price in Japan. Both parties will tend to search the best and equal profit between each other and they will begin the transaction to trade their merchandise.

3.1.12. Two Factors Affecting Export in Indonesia (GDP and Exchange Rates)

3.1.12.1. The Gross Domestic Product

In general, economists judge macroeconomic performance by looking at a few key variables, the most important of which is gross domestic product (GDP) beside the inflation and unemployment. Gross Domestic Product (GDP) is the value of all final goods and services

produced in the economy in a given time period (quarter or year). It is the basic measure of economic activity (Dornbusch and Fischer, 1994: 8).

GDP can be computed in two ways. One is to add up the amount spent on all final goods during a given period. This is the expenditure approach to calculating GDP. The other is to add up the income (wages, rents, interests, and profits) received by all factors of production in producing final goods. This is the income approach to calculating GDP. These two methods lead to the same value for GDP for the reason: *every payment (expenditure) by a buyer is at the same time a receipt (income) for the seller.* We can measure either income received or expenditures made, and we will end up with the same total output[1] (Case and Fair, 1999: 136).

Gross Domestic Product is the key concept in national income accounting as the total market value of all final goods and services produced within a given period by factors of production located within a country. It represents the welfare and economic growth of a country. The level of welfare is determined by the value of a country's national income divided by the number of its population that is called per capita income. The higher a country's GDP value the higher per capita income of people in that country. When people have more income, they will have extra money to be saved or

[1] Suppose the economy is made up of just one firm and the total firm's output this year sells for $1 million. Because the total amount spent on output this year is $1 million, this year's GDP is $1 million. Remember: The expenditure approach calculates GDP on the basis of total expenditures for final goods and services in the economy. But *every one* of the million dollars of GDP is either paid to someone or remains with the owners of the firms as profit. Using the income approach, we add up the wages paid to employees of the firm, the interest paid to those who lent money to the firm, and the rents paid to those who leased land, buildings, or equipment to the firm. What is left over is profit, which is, of course, income to the owners of the firm. If we add up the incomes of all the factors of production, including profits to the owners, we get a GDP of $1 million.

invested in various investment vehicles including in mutual fund, besides fulfilling their consumptions.

3.1.12.2. The Exchange Rate

Exchange rate is the price of one currency in terms of another (Mishkin and Eakins, 2000; 331). Each country has a currency in which the prices of goods and services are quoted; the dollar in the United States, the Pound sterling in Britain, the Yen in Japan and the Peso in Mexico, to name just a few. Exchange rates play a central role in international trade because they allow us to compare the prices of goods and services produced in different countries (Krugman and Obstfeld, 1997: 332).

Foreign exchange rates, for the most part, are not fixed over time. Instead, like any other price, they vary from week to week and month to month according to the forces of supply and demand. The foreign exchange market is the market in which currencies of different countries are traded; it is here that foreign exchange rates are determined. Foreign exchange is traded at the retail level in many banks and firms specializing in that business. Organized markets in New York, Tokyo, London, and Zurich trade hundreds of billions of dollars' worth of currencies each day (Samuelson and Nordhaus, 1995: 668).

Exchange rate affects the economy because when the Rupiah become more valuable relative to foreign currencies, for example US. Dollar, Indonesian goods become more expensive and foreign (American) goods

become cheaper. When the Rupiah falls in value, Indonesian goods become cheaper and American goods become more expensive. In addition, changes in exchange rate have a major impact on financial institution because many of their assets are denominated in foreign currencies. When the value of foreign currencies changes, the market value of financial institutions changes as well (Mishkin and Eakins, 2000; 331).

Some companies that operate and produce output which depend on imported production factors will suffer from the increase of exchange rate. The increase of exchange rate impacts on the higher production cost that influence productivity. The increase of production costs then will burden the companies and force them to shift the increase to the consumers, by raising the prices in the market. As a consequence, the products are difficult to be sold in expensive prices. This will affect company's income. The lower the income earned by a company, the worst the performance of the company in the economy and the lower the possibility for the company to share dividend. And also, can be affecting to the level of export-import in one country.

3.2. Hypothesis Formulation

The research investigated whether the independent variables of this research affect Indonesian shrimp export to Japan. The hypotheses in this research are:

a. Price of shrimp (P).

   The regression result on the price of shrimp is significant and has negative sign. It means that according to the theory, when the price of shrimp increases the shrimp demand from the imported country decreases.

b. Japan GDP (GDP).

   The regression result on the Japan GDP is significant and has positive sign. It means that according to the theory when the Japan GDP increases, it also increases the demand of the shrimp exported from Indonesia.

c. Exchange rate (Exc).

   The regression result on the exchange rate is significant and has positive sign. It means that according to the theory, when the value of Yen to Rupiah is increase it makes price of shrimp became cheaper. So the demands of Indonesian shrimp export increases.

d. Total of population (Pop).

The regression result on the total of population Japan is significant and has positive sign. It means that according to the theory, when the total population of Japan is increase it makes the demand of the shrimp exported from Indonesia also increase to.

CHAPTER IV

RESEARCH METHOD

4.1. Research Method

The research method used in this research is quantitative analysis. Quantitative analysis is a characteristic of variables where the mark is stated on the numerical form. The characteristics of the measurement variable make the mark to be placed in interval.

The writer also used literature study. This literature study uses some sources of the theories that are related to the research.

4.2. Research Subject

The research is concentrate on the Japan's demand of Shrimp export from Indonesia. The research sought what variables that have impacts on the Japan's Shrimp demand.

4.3. Research Setting

The study of this thesis takes three places: on Faculty of Economics Islamic University of Indonesia, Directorate General of Capture Fisheries, Jalan, Harsono RM. No.3. Ragunan Pasar Minggu Jakarta Selatan and also in BPS (Badan Pusat Statistik) Yogyakarta. The writer does the research through literature and data analysis that are available on the library and the reference room

- Dependent variable

  The dependent variable in this research is the volume of Indonesian Shrimp export to Japan (Q)

- Independent variable

  The independent variables in this research consist of four variables, they are:

  - Price of Shrimp (P)
  - GDP of Japan (GDP)
  - Exchange rate Yen/Rupiah (Exc)
  - Total number of Japan population (Pop)

4.6. Technique of Data Analysis

The basic theory that is used in this research is the demand theory. This demand is affected by the price of goods, income of the importer country, population and the exchange rate between both countries. In general the basic model of the demand is:

$$Q = F(P, GDP, Exc, Pop)$$

Where:

Q = Volume of Indonesian Shrimp export to Japan (Ton)

P = Price of Shrimp (US $/kg)

GDP = Japan GDP per capita

Exc = Exchange rate (Yen/Rp)

Pop = The total number of Japan population

appears in regression problem, in simple terms it can be said that Least Square (LS) solution can not be achieved. In the regression analysis, multicollinearity gives into these several conditions below:

a. Two independent variables having perfect correlation (because of that vectors that show the variables are collinear).
b. Two independent variables almost having perfect correlation (for the example correlation between them is close +1 or -1).
c. Linear combination from several independent variables having perfect correlation (or close to perfect) with other independent variable.
d. Linear combination from one sub-collection of independent variables having perfect correlations (or close) with one linear combination from other sub-collection of independent variable.

To detect multicollinearity, the correlation method is used. The multicollinearity is predicted to happen when R^2 is high, say in excess of 0.8. If R^2 is high, the F test in most cases will reject the hypothesis that the partial slope coefficients are simultaneously equal to zero.

4.7.1.2. Autocorrelation Test

The term autocorrelation may be defined as correlation between members of series of observations ordered in time (as in time series data) or space (as in cross-sectional data) (Gujarati, 1995: 400). If there is autocorrelation in the model, it will raise the value of residual and the impact is the number of t-test, f-test and R^2 will decline.

In other words, the presence of autocorrelation on the model makes the data become not valid.

The tool of analysis used to detect autocorrelation is LM test (Langrange Multiplier test). This test uses the level of degree (X^2). Ho expresses that there is no autocorrelation, with the guidance if X^2 statistic bigger from value of X^2 tables, hence Ho is denied, and also on the contrary. Beside that, to get the fittest lag is by estimate the smallest number of Akaike Info Criteria.

And according to Sriyana (2001) the causes of autocorrelation are:

a. The presence of backward lag operations on the model with time series data.
b. Mistake in function type.
c. Lack of data or the data were gone.
d. There is a data transformation.

To test the autocorrelation Lagrange Multiplier test (LM-test) is used. This test uses the level of degree (χ^2) to express that there is no

autocorrelation. The rule is when χ^2 statistic is bigger than the value of χ^2 table, hence H_o is denied and also on the contrary.

4.7.2. T- Statistic Test

T- Stats test is used to obtain the correlation between the dependent variable with independent variable individually. In this research, the writer uses one tail test because this research has a strong theoretical expectation.

- Hypothesis that uses one tail test positive:
  - Ho : $\beta_i < 0$; i= 1.2....etc

    Individually, the independent variables negatively affect the dependent variable.
  - Ha : $\beta_i > 0$; i= 1.2....etc

    Individually, the independent variables positively affect the dependent variable.
- Hypothesis that uses one tail test negative:
  - Ho : $\beta_i > 0$; i= 1.2....etc

    Individually, the independent variables positively affect the dependent variable.
  - Ha : $\beta_i < 0$; i= 1.2....etc

    Individually, the independent variables negatively affect the dependent variable.

The following hypothesis are examined individually:

$H_0 : \beta_i = 0$: It means that the independent variable individually does not have an impact on the dependent variables.

H_a : $\beta_i > 0$: It means that the independent variable individually have impacts on the dependent variable.

The decision are made with the parameter (α) 5% based on the following rules:

a. When the value of computed t is lower than the critical value (t table value), H_o is accepted. In this case the independent variable individually does not influence the dependent variable significantly.
b. When the value of computed t is bigger than the critical value (t table value), H_o is rejected. In this case the independent variable individually influences the dependent variable significantly.

4.7.3. F- Statistic Test

This test is used to detect the correlation between both dependent variable and independent variables simultaneously. The testing of F test is the same as the testing for t test. Hypothesis is formulated as follows:

- Ho : $\beta_1 = \beta_2 = \beta_3 = 0$

  Hence all the independent variables simultaneously do not affect the dependent variable.

- Ho : $\beta_1 \neq \beta_2 \neq \beta_3 = 0$

  Hence all the independent variables simultaneously affect the dependent variable.

CHAPTER V

RESEARCH FINDINGS AND DISCUSSION

5.1. Research Description

This chapter described about the research result and secondary testing data collected from many resources to obtain the factors affecting Indonesian Shrimp exports to Japan in the year 1982 to 2004. The analysis descriptions are based on the secondary data collected from many resources. The resources are:

a. International Financial Statistics (IFS), various editions.

b. Statistics year book of Indonesia, various editions.

c. Central bureau of statistics (BPS, International Indonesian Trading Statistics).

This analysis provides the data, mean, and deviation standard, on each research variable:

5.1.1. Volume Exports of Shrimp by Country of Destination: Japan.

The demand import volumes of Indonesian shrimp by Japan from year 1982 – 2004 are:

Table 5.1.

The Import Demand Volume of Indonesian Shrimp by Japan

(Ton)

Year	Volume	Year	Volume	Year	Volume
1982	21660.50	1991	53062.90	2000	74064.20
1983	20962.60	1992	57120.70	2001	79438.80
1984	21608.00	1993	61454.00	2002	88514.00
1985	23965.00	1994	63996.10	2003	95845.20
1986	22365.20	1995	65523.80	2004	99563.90
1987	29665.30	1996	66452.50		
1988	40396.80	1997	75015.80		
1989	48033.60	1998	78405.60		
1990	57851.00	1999	70474.00		

Source: Central Bureau of Statistics, International Indonesian Trading Statistics, various editions 1982-2004.

From the table 5.1. above, it can be concluded that from 1983 until 1998 the volume of imported shrimp was increasing, but in the year 1999 the volume of import was decreasing. It was decreasing until the lowest level of import that is 20962.6 ton in the year 1983. In the year 2000 volume of import increased again, and at the beginning of the year 2001 the volume of import was increasing again, and steadily increased again at 88514 in 2002. Finally the volumes of import increased step by step from 2003 until the year 2004.

5.1.2. Price of Shrimp by Country of Destination: Japan US$/Kg

The Price of Indonesian shrimp, from the year 1982 until 2004, is in table 5.2.:

Table 5.2.

The price of Indonesian shrimp

(000US$/000Kg)

Year	Price	Year	Price	Year	Price
1982	7.710833	1991	9.068871	2000	8.254460
1983	8.122270	1992	8.558803	2001	7.119848
1984	7.777295	1993	10.25171	2002	5.720293
1985	7.309326	1994	11.92848	2003	4.938326
1986	4.872552	1995	12.80745	2004	5.611420
1987	9.283864	1996	11.67025		
1988	9.748695	1997	9.315643		
1989	8.101421	1998	8.113441		
1990	7.716662	1999	7.345810		

Source: Central Bureau of Statistics, International Indonesian Trading Statistics, various editions 1982-2004.

From the table 5.2. above, The highest price level was in the year 1995, it reached 12.80745 US$/Kg, and the lowest level of price occurred in the year 1998 and the price is 7.195689 US$/Kg. The fluctuations on international price of Indonesian shrimp were varied but it seemed declining in the years being observed. In the beginning of the year 1984 and 1985 the prices of Indonesian shrimp export were below the rate while the other years were above the rate.

5.1.3. Exchange Value of Yen to Rupiah (¥/ Rp)

Exchange values of yen to Rupiah, from the year 1982 until 2004, are on table 5.3. below:

Table 5.3.

Exchange value of yen to Rupiah

(¥/ Rp)

Year	Exchange rate	Year	Exchange rate	Year	Exchange rate
1982	4.78	1991	15.69	2000	84
1983	4.98	1992	16.62	2001	79.83
1984	5.64	1993	18.96	2002	73.74
1985	5.65	1994	22.05	2003	74.5
1986	10.23	1995	22.5	2004	76.98
1987	13.5	1996	20.6		
1988	13.84	1997	43		
1989	12.66	1998	70.67		
1990	13.98	1999	71.2		

Source: Central Bureau of Statistics, International Indonesian Trading Statistics, various editions 1982-2004.

The table 5.3. shows that the mean of Exchange value of Yen to Rupiah is Rp 33.72/¥. From year to year the exchange value was getting higher and higher and reached the top level in the year 2001 on the value Rp 79.83/¥ and declined in the year 2002 on the value of Rp 73.74/¥. The highest fluctuation happened in the year 1997 until 2002.

5.1.4. GDP per capita of Japan

GDP per capita Japan, from the year 1982 until 2004, is on table 5.4. below:

Table 5.4.

GDP per capita Japan

1982 – 2004

Year	GDP	Year	GDP	Year	GDP
1982	0.002293	1991	0.003867	2000	0.004256
1983	0.002371	1992	0.003903	2001	0.004216
1984	0.002513	1993	0.003948	2002	0.004225
1985	0.003053	1994	0.003952	2003	0.004234
1986	0.003118	1995	0.004000	2004	0.004265
1987	0.003231	1996	0.004125		
1988	0.003419	1997	0.004196		
1989	0.003568	1998	0.004142		
1990	0.003729	1999	0.004169		

Source: International Financial Statistics, Japan, various editions 1982-2004.

The table 5.4. shows that in the first ten years, GDP per capita Japan is increasing step by step. Also from year to year the GDP real of Japan tend to increase except in the year 1998 to 1999.

5.1.5. Total Population in Japan (annually and in thousand people)

Total population in Japan, from the year 1982 until 2004, is on table 5.5. below:

Table 5.5.
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		

Source: Official website Central Bureau of Statistics of Japan, Population, 2005.

The table 5.5. shows that the population of Japan year by the year was increasing around 0.14 percent. We can see from table 5.5. that from year 1982 until 2004 it was increasing by almost 11 millions people.

5.2. Research Findings

5.2.1. Regression Results Analysis

The first step to analyze the data is by regressing the data with the assistance of the supported computer package that is competent and representative with the research. The writer uses E-views 4.0 computer program in order to make the data estimation easier. Besides, E-views 4.0 computer program helps the writer avoiding the computation error.

The writer uses the aid of computer program E-views 4.0 where about the result of estimation is by using Ordinary Least Square (OLS). Through this test, a line regression equation is obtained that is created from the series of data observation and the level of data influence including all independent variables toward dependent variables. The reason of choosing the log linear model in this research is caused by a better estimation result given by log linear compared to the linear model.

Table 5.6.

The result of regression by using E-views 4.0 program is as follows:

Dependent Variable: LY
Method: Least Squares
Date: 03/17/05 Time: 07:49
Sample: 1982 2004
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-184.7108	72.92931	-2.532737	0.0208
LEXC	0.035748	0.099096	2.360738	0.0725
LGDP	0.528235	0.472017	2.119103	0.0278
LPOP	16.87435	6.069321	2.780269	0.0123
LPS	-0.274093	0.136808	-1.617902	0.0604
R-squared	0.948014	Mean dependent var		10.83941
Adjusted R-squared	0.936462	S.D. dependent var		0.523784
S.E. of regression	0.132029	Akaike info criterion		-1.021926
Sum squared resid	0.313771	Schwarz criterion		-0.775079
Log likelihood	16.75215	F-statistic		82.06179
Durbin-Watson stat	0.795941	Prob(F-statistic)		0.000000

The last column shows that the probability of drawing t-statistic of the magnitude of the one previous column from a t-distribution. With this information, it can tell at a glance if the data reject or accept the hypothesis that the true coefficient is zero. From the result above, the probability shows the one tail test. Because not all independent variables have strong theoretical expectation then the writer decided to use the t-table that have exact measurement rather than probability, to check the hypothesis is accepted or rejected.[2]

[2] Gujarati, Damodar,(2003). *Basic Econometrics: Fourth Edition*.McGraw-Hill. NewYork.

Based on the result of the regression test, the writer obtian the estimation equation for the growth of mutual fund in Indonesia, that is:

LY = -184.7108+0.035748 LEXC+0.528235LGDP+16.87435LPOP-0.274093LPS+*u*

Where:

LY : Demand Volume of Indonesian Shrimp by Japan (Ton)

LEXC : Exchange Rate of Yen to Rupiah

LGDP : Gross Domestic Product Per Capita

LPOP : Population of Japan

LPS : Price of Shrimp (US$/Kg)

5.2.2. Statistical Result Analysis

5.2.2.1. Constant or Intercept

The constant value is -184.7108 indicating that the average level of The Import Demand Volume of Indonesian Shrimp by Japan is -184.7108 when the other variable is zero. The sign is negative, meaning to say that the import demand volume of Indonesian shrimp by Japan tends to decrease. Meanwhile, the other variables are constant.

5.2.2.2. T- Test

The t-test is done to test the independent variables individually by t-statistic. The regression result gathered the value of the computed t-value for each independent variable which is compared to the value of t-table. The way to find the value of t-table is:

t table = t α df (n-k)

α : the level of significance

df : degree of freedom

n : the number of data

k : the number of parameter

This research estimates the t-table with α 0.05 and df (23-5) that is 18. From the table, it is found that the value of t-table is 1.734. If the value of t-statistic or computed t-value > t-table value; the independent variables affect the dependent variable significantly. Likewise, if the computed t-value < t-table value; the independent variables do not significantly affect the dependent variable.

From the regression result, the computed t-value for each independents variable are found and shown in the following table 5.7.:

Table 5.7.
The Comparison Value of t-statistic and t-table

Variable	t-statistic	α	t-table	Result
LEXC	2.360738	5%	1.734	Significant
LGDP	2.119103	5%	1.734	Significant
LPOP	2.780269	5%	1.734	Significant
LPS	-1.617902	5%	-1.734	Significant

5.2.2.2.1. T – Test of Exchange Rate (EXC)

$H_0 : \beta_1 > 0$

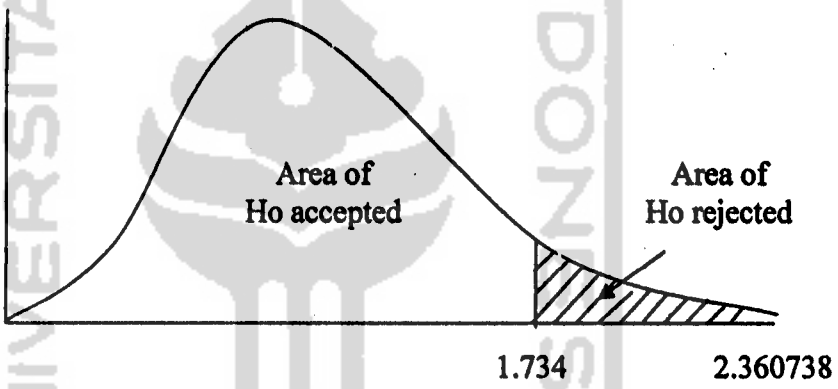
$H_a : \beta_1 < 0$

The computed value is 2.360738.

The value of t table with α 5% and df 18 is 1.734.

Graph 5.1.

Area of accepted and rejected on exchange rate of Yen to Rupiah.



Since the value of computed t value is bigger than the t table, the H_0 is rejected statistically. It means that the Exchange rate of Yen to Rupiah has positive impact on the import of shrimp Indonesia by Japan.

5.2.2.2.2. T – Test of Gross Domestic Product (GDP)

$H_0 : \beta_1 > 0$

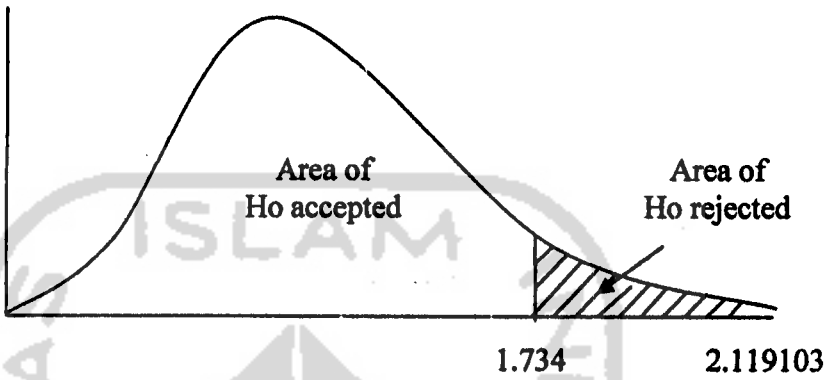
$H_a : \beta_1 < 0$

The computed t value is 2.119103.

The value of t table with α 5% and df 18 is 1.734

Graph 5.2.

Area of accepted and rejected on Gross Domestic Product of Japan.



Since the value of computed t value is bigger than the t table, the H_0 is rejected statistically. It means that the Gross Domestic Product has positive impact on the import of shrimp Indonesia by Japan.

5.2.2.2.3. T – Test of Population Japan (Pop)

$H_0 : \beta_1 > 0$

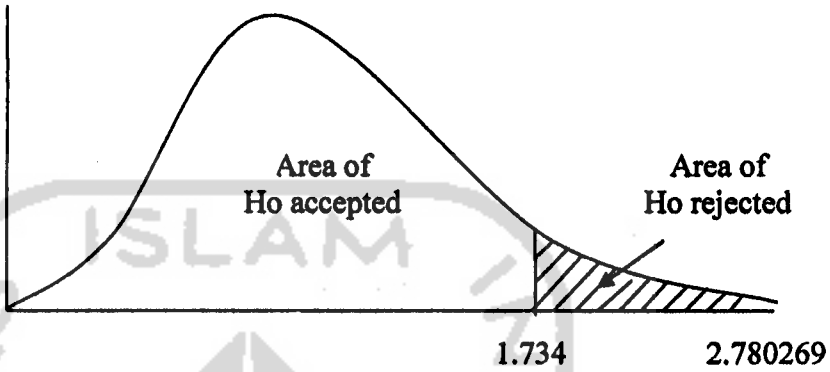
$H_a : \beta_1 < 0$

The computed t value is 2.780269.

The value of t table with α 5% and df 18 is 1.734

Graph 5.3.

Area of accepted and rejected on Population of Japan.



Since the computed t value is bigger than the t table, the Ho is rejected statistically. It means that the Population Japan has a positive impact on the import of shrimp Indonesian by Japan significantly.

5.2.2.2.4. T – Test of Shrimp Price (PS)

$H_0 : \beta_1 > 0$

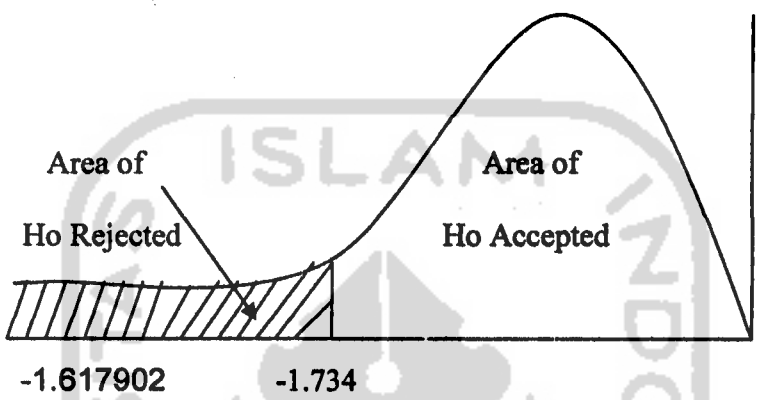
$H_a : \beta_1 < 0$

The computed t value is -1.617902.

The value of t table with α 5% and df 18 is -1.734.

Graph 5.4

Area of accepted and rejected on price of shrimp.



Since the computed t value is bigger than the t table, the Ho is rejected statistically. It means that the price of shrimp has a negative impact on the import of shrimp Indonesian by Japan.

5.2.2.3. F-Test

The joined impact on price of Indonesian shrimp, exchange value of Yen to rupiah, GDP of Japan, and population of Japan toward the Japan import demand volume of Indonesian shrimp by Japan.

Hypothesis:

Ho : There is no joined impact on price of Indonesian shrimp, exchange value of Yen to rupiah, GDP of Japan, and population of Japan toward the Japan import demand volume of Indonesian shrimp by Japan.

Ha : There is joined impact on price of Indonesian shrimp, exchange value of Yen to rupiah, GDP of Japan, and population of Japan toward the Japan import demand volume of Indonesian shrimp by Japan.

F- Statistics:

From the test results

F Statistics = 82.06179

F-table (5%; df = 4; 18) = 2.93

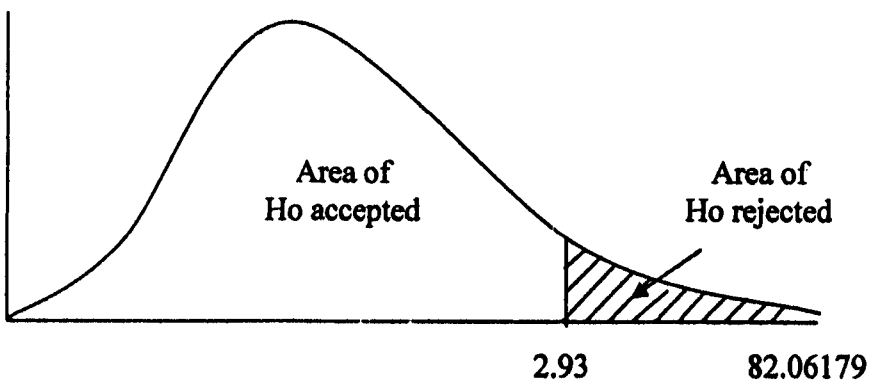
Decision criteria :

- If F > 2.93; p < 0.05; Ho is rejected and Ha is accepted.
- If F < 2.93, and p > 0.05, Ho is accepted and Ha is rejected.

Visually the area of accepted and rejected F test hypothesis is shown on figure 5.5. below:

Graph 5.5.

Area of accepted and rejected F test hypothesis



Conclusion

Because F = 82.06179 > F-table = 2.93, and p = 0.000 < 0.05 (5%), it can be concluded that Ho is rejected and Ha is accepted. It can be said that there is a significant joined effect among Price of Indonesian Shrimp, Exchange value of Yen to rupiah, GDP of Japan, and Population of Japan toward the Japan import demand volume of Indonesian Shrimp by Japan.

5.2.3. Goodness of Fit (R^2)

From the regression run test, the result of the coefficient determination (R^2) is 0.948014. This value shows a relative high measurement for independent variables to explain its impact on dependent variable in the model. It means that the variation of the dependent variable can be explained by the independent variables about 94.8014%, while the rest 5.1986% are explained by factors outside the model.

5.2.4. Classical Assumption

5.2.4.1. Autocorrelation Test.

The term autocorrelation is defined as correlation between residual of one observation ordered in time (as in time series data) or space (in cross sectional data). The analysis tool used to detect autocorrelation is LM test (Lagrange Multiplier Test). This test uses the

level of degree (X^2), Ho expresses that there is no autocorrelation, with the guidance if X^2 statistics is bigger than the value of X^2 tables, hence Ho is denied, and also the contrary. Besides that, to get the fittest lag is by estimating the smallest number of akaike info criteria.

The decision whether there is autocorrelation or not in the model is drawn by watching and comparing the value of χ^2 computed (Obs*R-square) and χ^2 table. When the value of computed χ^2 is greater than χ^2 table with α 5%, the hypothesis stating that there is no autocorrelation in the model is rejected, and vice versa.

From the LM test it is found that the value of χ^2 computed is 1.197652 which is smaller than the value of χ^2 Table; in other words; there is no autocorrelation in the model because the value of computed χ^2 is smaller than the value of χ^2 table.

Table 5.8.

Autocorrelation Test with LM Method

Test	X^2 stat	$X^2_{(df=4)\ 0,05}$ table	Autocorrelation
Obs*R-squared	1.197652	9.48773	No autocorrelation

The results of autocorrelation test at table 5.8. shows that there is no Autocorrelation.

5.2.4.2. Multicollinearity Test

Multicollinearity refers to the existence of more than one exact linear relationship or a linear relationship among some or all explanatory variable. There are several sources of multicollinearity. Multicollinearity may due to the following factors:

1. The data collection method employed, for example, sampling over a limited range of the values taken by the regression in population.
2. Constrains on the model or in the population being sampled.
3. Model specification.
4. An over determinate model.

Multicollinearity refers to the existence of more than one exact linear relationship among some or all explanatory variables. In this research, the writer uses the *Correlation matrix* in understanding whether the model used has serious multicollinearity problem or not. If there is a problem, a healing utilize is required to obtain a good result.

The way to detect Multicollinearity:

- If (r) > 0.85 → Multicollinearity
- If (r) < 0.85 → No Multicollinearity

Complete results is shown in table 5.9.

Table 5.9.

Multicollinierity Test with Correlation Matrix

Variable	LEXC	LGDP	LPOP	LPS
LEXC	1.000000	-0.178057	-0.122722	-0.152994
LGDP	-0.178057	1.000000	0.218494	0.053918
LPOP	-0.122722	0.218494	1.000000	-0.055835
LPS	-0.152994	0.053918	-0.055835	1.000000

From the result above, it shows that all independent variables have r less than 0.85, it means there is no Multicollinearity.

5.2.4.3. Heterocedasticity Test

To detect whether there is heterocedasticity or not, the writer used *White Heterocedasticity Test (cross term).*

The decisions are as follow:

If the Obs*R-squared is less than *X*-table at level = 5%, df = 7, there is heterocedasticity in variance disturbance term in this model; otherwise, there is no heterocedasticity.

Table 5.10.

Result of White Heterocedasticity Test

Test	X^2 stat	$X^2_{(7)\ 0,05}$ table	Result
Obs*R-squared	9.015849	14.0671	No Heterocedasticity

Results shown in table 5.10. above mention that there is *no heterocedasticity* problem.

5.3.Research Discussion

The discussion in this part is meant to have a deep and advanced discussion related to the model.

5.3.1. Price of shrimp

Shrimp price is very important because price of related good highly affects the demand of the good itself. The hypothesis for this variable is prices of shrimp influence the demand on Indonesian shrimp export to Japan negatively. It means that an increase in the price of shrimp makes the Japan demand of shrimp decreases. This hypothesis is correct since there is the law of demand that says "*when the price of a commodity is raised (and other things are held constant), buyers tend to buy less of the commodity. Similarly, when the price is lowered, other things being equal, quantity demanded increases*".

The statistical test supports this hypothesis correctly. The coefficient from the regression test for price of shrimp is -0.274093. The value shows the impact of shrimp price on the demand of Indonesian shrimp export to Japan. When the price of shrimp increases by 1 US$/Kg, the quantity demand of Indonesian shrimp export decreases by 0.00274093 ton holding all variables constant. This statistical result fits the previous hypothesis that stated a negative relationship between the shrimp price and the demand of Indonesian shrimp export to Japan.

The decrease in price in early 1997 which is crisis economy in Indonesia where the number of shrimp demand from Japan and Indonesia as exporter will automatically increase like demand theory said, when the price is decrease the commodity that offered by producer will increase right away. This analysis is to provide stronger statistical hypothesis to the price of shrimp. That is the reason why shrimp price has a negative relationship to the demand of Indonesian shrimp to Japan.

Based on the analysis of the shrimp price, it shows that the variable negatively affected the quantity of Indonesian shrimp export to Japan. It means that when the price of shrimp increases, the Japan government will decrease their export. Shrimp is not only provided by Indonesia, because of that Japan will search for another country that offers a lower shrimp price than Indonesia. This condition will make Indonesia suffers because Indonesia will lose the loyal trade partner; therefore, therefore the Indonesian government must stabilize the price of shrimp.

5.3.2. GDP per capita of Japan

The other factor used in this research is Japanese GDP. Using Japan GDP as the factor to analyze is very important because GDP is representing income from a country and income is one of the factors that can change the demand. GDP or gross domestic product is the total value of a country's output. It is the market value of all final goods and services

produces within a given period of time by factors of production located within a country. (Case: 2002).

In this research GDP is one variable that affects the demand for shrimp, because GDP represent income, it says from the method of calculating GDP, there are two methods of calculating GDP, first expenditure approach, second income approach which includes all incomes such as wages, rents, interest and profit. In this research the data used by the writer is Per capita GDP. It means a country's GDP is divided by its population. The reason of using per capita GDP is because it is a better measurement of well-being for the average person than the total GDP.

An increase of Japan GDP per capita will affect the consumption of shrimp in Japan because it means that individual income in Japan increases, so their (shrimp) consumption will increase too. And also it is known that Japan is a country whose people mostly consume seafood.

According to statistical test, the coefficient value of Japan GDP variable is 0.528235. This value represents that when Japan GDP per capita increases by 1 unit, the demands of Indonesian shrimp export to Japan also increases by 0.528235 ton holding all variables constant. It agrees with the previous hypothesis in this research about the positive relationship between both variables Japan GDP and demand of Indonesian shrimp export to Japan. That is the reason why GDP per capita has a positive relationship to the demand of Indonesian shrimp to Japan.

5.3.3. Exchange Rate

Another factor used in this research is the exchange rate between the two countries in this case between Indonesia and Japan. Using exchange rate as the factor to analyze is very important because exchange rate has a strong relation with price. For example, when the Rupiah value is to depreciated toward other foreign currency it will make price of shrimp become cheaper according to the foreign market and Japan will increase their (shrimp) consumption because Japan citizens consume sea food a lot. This condition can create an increase in demand of Indonesian shrimp export to Japan.

The statistical result for the exchange rate shows that the positive impact on demand of Indonesian shrimp export to Japan can be supported by some reasons related to the economic perspective. When the exchange rate of Yen depreciates toward Rupiah, generally Japan will reduce their consumption (shrimp) because Rupiah strengthens to Yen, it affects price of shrimp to be more expensive. This condition also makes Indonesia as exporter will decrease the production because the demand of shrimp in Japan market declines.

According to statistical test, the coefficient value of the exchange rate is 0.035748. This value represents that when the exchange rate increases by 1 Yen/Rupiah, the demand of Indonesian shrimp export also increases by 0.035748 ton holding all variables constant. It agrees with the previous hypothesis in this research about the positive relationship between both

variables exchange rate and demand of Indonesian shrimp export to Japan. That is the reason why exchange rate has a positive relationship to the demand of Indonesian shrimp to Japan.

5.4.4. Population of Japan

Another factor used in this research is the population of Japan between two countries this case between Indonesia and Japan. Using Japan population as the factor to analyze is very important because population of Japan has strong relation with shrimp import demand. When the population of Japan increases, the demand of shrimp import from Indonesian to Japan will also increase automatically. Thus, this condition can create an increase in the demand of Indonesia shrimp export to Japan.

Population of Japan tends to increase year by year, in 2004 it reached the peak which was 127,700 (in thousand). This indicates that a big number population will affect the amount of (shrimp) consumption in Japan, or more people to eat because the population increases.

According to statistical test, the coefficient value of the population is 16.87435. This value represents that when population increases by 1 thousand people, the demand of Indonesian shrimp export also increases by 16.87435 ton holding all variables constant. It agrees with the previous hypothesis in this research about the positive relationship between both variables population and demand of Indonesian shrimp export to Japan. That

is the reason why population of Japan has a positive relationship to the demand of Indonesian shrimp to Japan.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

From the analysis and discussion of the previous chapters, several conclusions and recommendations are outlined as followed:

6.1. Conclusions

1. This research summarizes the determination of factors affecting Indonesian shrimp exports to Japan in the year 1982 – 2004; they are price of shrimp, Gross Domestic Product per capita of Japan, Exchange Rate of Yen toward Rupiah, and Population of Japan.
2. Based on the research, the coefficient of determination R-squared is 0.948014. It means that about 94.8014% of variation in Indonesian shrimp exports to Japan can be explained by variation in the explanatory variables that are Price of shrimp, Gross Domestic Product per capita of Japan, Exchange Rate of Yen toward Rupiah and Population of Japan. Meanwhile, the rest which is around 5.1986% may be explained by the outside factors of this model.
3. According to the regression result, the F test value of this research is greater than the F table value; meaning that those independent variables (PS, GDP, EXC and POP) affect the Indonesian shrimp exports to Japan.

4. The t-test for the Exchange Rate statistically expresses that the relationship between the Exchange Rate and Indonesian shrimp exports to Japan is positive. It is proved by the coefficient value of the Exchange Rate variable which is 2.360738. This coefficient value means that the increase of Exchange Rate as much as 1% will increase Indonesian shrimp exports to Japan by 2.360738% holding all variables constant.
5. The T-test of Japan GDP is statistically expressing the positive relation between Japan GDP with the demand of Indonesian shrimp export. It is already proven that the coefficient value of Japan GDP is 2.119103. This coefficient value means that the increase in Japan GDP as much as 1% will increase the quantity of Indonesian shrimp export by 2.119103% while other variables remain constant. This is significant with the law of demand. The increase in Japan GDP (i.e. income) makes the demand increases.
6. The T-test of the price of shrimp is statistically expressing the negative relation between the prices of shrimp with the demand of Indonesian shrimp export. It is already proven that the coefficient value of the price of shrimp is -1.617902. This coefficient value means that the increase in shrimp price as much as 1% will decrease the quantity of Indonesian shrimp export by 1.617902% while the other variables remain constant. This is significant with the law of demand. The increase in price of related good makes the demand decreases.

6.2. Implication

1. Based on the analysis of the shrimp price, it shows that the variable affects negatively to the quantity of Indonesian shrimp export to Japan. It means that when the price of shrimp increases, the Japan government will decrease their export. Shrimp is not only provided by Indonesia, because of that Japan will search for another country that offers a lower shrimp price than Indonesia. This condition will make Indonesia suffers because Indonesia will lose the loyal trade partner; therefore, the Indonesian government must stabilize the price of shrimp.
2. Based on the analysis of Japan GDP, it shows that the variable affects positively to the quantity of Indonesian shrimp export to Japan. It means that when Japan income increases it will make an increase in Japan's demand of shrimp.
3. Based on the analysis of the exchange rate between Yen to Rupiah, it shows that the variable affects positively to the quantity of Indonesian shrimp export to Japan. It means that when Rupiah depreciates, the price of shrimp is getting cheaper so the Japan's demand of shrimp will increase.
4. Based on the analysis population of Japan, it shows that the variable affects positively to the quantity of Indonesian shrimp export to Japan. It means that when the population of Japan increases it will make an increase in Japan's demand of shrimp.

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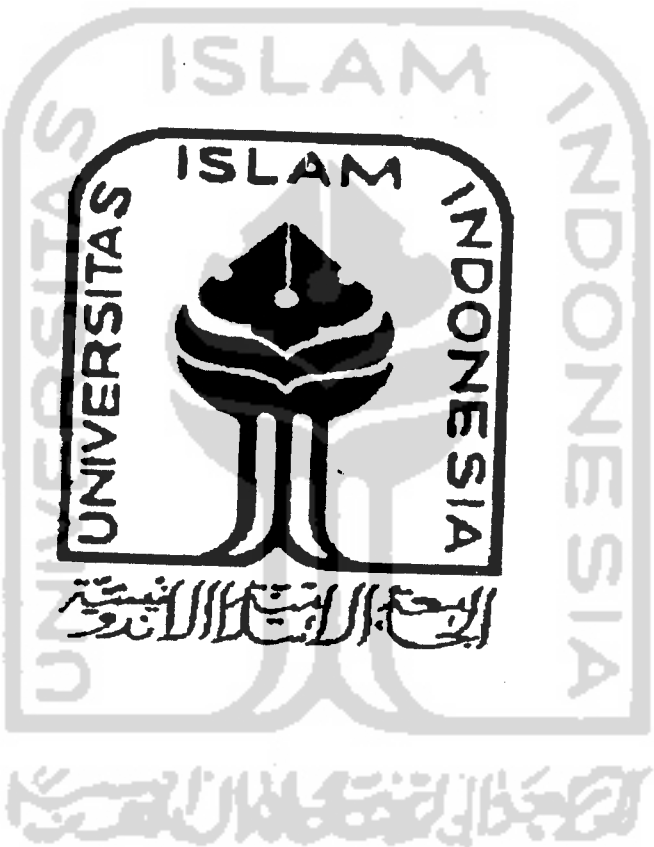
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APPENDICES

RESEARCH DATA

The Import Demand Volume of Indonesian Shrimp by Japan (Ton)

Year	Volume	Year	Volume	Year	Volume
1982	21660.50	1991	53062.90	2000	74064.20
1983	20962.60	1992	57120.70	2001	79438.80
1984	21608.00	1993	61454.00	2002	88514.00
1985	23965.00	1994	63996.10	2003	95845.20
1986	22365.20	1995	65523.80	2004	99563.90
1987	29665.30	1996	66452.50		
1988	40396.80	1997	75015.80		
1989	48033.60	1998	78405.60		
1990	57851.00	1999	70474.00		

The price of Indonesian shrimp

(000US$/000Kg)

Year	Price	Year	Price	Year	Price
1982	7.710833	1991	9.068871	2000	8.254460
1983	8.122270	1992	8.558803	2001	7.119848
1984	7.777295	1993	10.25171	2002	5.720293
1985	7.309326	1994	11.92848	2003	4.938326
1986	4.872552	1995	12.80745	2004	5.611420
1987	9.283864	1996	11.67025		
1988	9.748695	1997	9.315643		
1989	8.101421	1998	8.113441		
1990	7.716662	1999	7.345810		

Exchange value of yen to Rupiah

(¥/ Rp)

Year	Exchange rate	Year	Exchange rate	Year	Exchange rate
1982	4.78	1991	15.69	2000	84
1983	4.98	1992	16.62	2001	79.83
1984	5.64	1993	18.96	2002	73.74
1985	5.65	1994	22.05	2003	74.5
1986	10.23	1995	22.5	2004	76.98
1987	13.5	1996	20.6		
1988	13.84	1997	43		
1989	12.66	1998	70.67		
1990	13.98	1999	71.2		

GDP per capita Japan

1982 – 2004

Year	GDP	Year	GDP	Year	GDP
1982	0.002293	1991	0.003867	2000	0.004256
1983	0.002371	1992	0.003903	2001	0.004216
1984	0.002513	1993	0.003948	2002	0.004225
1985	0.003053	1994	0.003952	2003	0.004234
1986	0.003118	1995	0.004000	2004	0.004265
1987	0.003231	1996	0.004125		
1988	0.003419	1997	0.004196		
1989	0.003568	1998	0.004142		
1990	0.003729	1999	0.004169		

REGRERESSION RESULT

Dependent Variable: LY
Method: Least Squares
Date: 03/17/05 Time: 07:49
Sample: 1982 2004
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-184.7108	72.92931	-2.532737	0.0208
LEXC	0.035748	0.099096	2.360738	0.0725
LGDP	0.528235	0.472017	2.119103	0.0278
LPOP	16.87435	6.069321	2.780269	0.0123
LPS	-0.274093	0.136808	-1.617902	0.0604

R-squared	0.948014	Mean dependent var	10.83941
Adjusted R-squared	0.936462	S.D. dependent var	0.523784
S.E. of regression	0.132029	Akaike info criterion	-1.021926
Sum squared resid	0.313771	Schwarz criterion	-0.775079
Log likelihood	16.75215	F-statistic	82.06179
Durbin-Watson stat	0.795941	Prob(F-statistic)	0.000000

The Comparison Value of t-statistic and t-table

Variable	t-statistic	α	t-table	Result
LEXC	2.360738	5%	1.734	Significant
LGDP	2.119103	5%	1.734	Significant
LPOP	2.780269	5%	1.734	Significant
LPS	-1.617902	5%	-1.734	Significant

Autocorrelation Test (LM Method)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.374197	Probability	0.699272
Obs*R-squared	1.197652	Probability	0.549456

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 03/26/05 Time: 11:47
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.668819	61.40973	0.076027	0.9403
LEXC	0.001573	0.083438	0.018849	0.9852
LGDP	0.038519	0.396303	0.097197	0.9238
LPOP	-0.380246	5.110370	-0.074407	0.9416
LPS	0.000205	0.115943	0.001764	0.9986
RESID(-1)	0.723230	0.231948	3.118075	0.0066
RESID(-2)	-0.383749	0.240014	-1.598858	0.1294
R-squared	0.378001	Mean dependent var		5.67E-14
Adjusted R-squared	0.144751	S.D. dependent var		0.119425
S.E. of regression	0.110444	Akaike info criterion		-1.322829
Sum squared resid	0.195165	Schwarz criterion		-0.977244
Log likelihood	22.21254	F-statistic		1.620585
Durbin-Watson stat	2.023653	Prob(F-statistic)		0.205393

Multicollinierity Test

Correlation matrix

Variable	LEXC	LGDP	LPOP	LPS
LEXC	1.000000	-0.178057	-0.122722	-0.152994
LGDP	-0.178057	1.000000	0.218494	0.053918
LPOP	-0.122722	0.218494	1.000000	-0.055835
LPS	-0.152994	0.053918	-0.055835	1.000000

Residual

dual
1658
3704
5265
4841
2136
2678
2245
2555
4778
3858
6734
3510
1295
5382
6531
4817
5059
2657
5067
5715
0641
5309
3060

White Heterocedasticity Test

White Heteroskedasticity Test:

F-statistic	1.381541	Probability	0.282471
Obs*R-squared	9.015849	Probability	0.251520

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/20/05 Time: 20:56
Sample: 1982 2004
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.903215	16.41954	0.420427	0.6801
LEXC	0.074305	0.079032	0.940190	0.3620
LEXC^2	-0.010288	0.011673	-0.881316	0.3921
LGDP	-0.563486	2.479256	-0.227280	0.8233
LGDP^2	-0.047662	0.211961	-0.224859	0.8251
LPOP	-0.735207	1.039505	-0.707266	0.4902
LPS	-0.006630	0.240303	-0.027588	0.9784
LPS^2	-0.008506	0.058979	-0.144215	0.8873

R-squared	0.391993	Mean dependent var	0.013642
Adjusted R-squared	0.108257	S.D. dependent var	0.019173
S.E. of regression	0.018106	Akaike info criterion	-4.916968
Sum squared resid	0.004917	Schwarz criterion	-4.522013
Log likelihood	64.54513	F-statistic	1.381541
Durbin-Watson stat	2.363285	Prob(F-statistic)	0.282471

Actual Fitted Residual Table

Obs	Actual	Fitted	Residual	Residual Plot
1982	9.98325	9.96666	0.01658	| . |* . |
1983	9.95050	9.91346	0.03704	| . |* . |
1984	9.98082	10.0435	-0.06265	| . * | . |
1985	10.0843	10.1328	-0.04841	| . * | . |
1986	10.0153	10.0366	-0.02136	| . *| . |
1987	10.2977	10.3245	-0.02678	| . *| . |
1988	10.6065	10.6290	-0.02245	| . *| . |
1989	10.7797	10.7541	0.02555	| . |* . |
1990	10.9656	10.9179	0.04778	| . |* . |
1991	10.8792	10.8407	0.03858	| . |* . |
1992	10.9529	10.8856	0.06734	| . | * . |
1993	11.0260	10.9909	0.03510	| . |* . |
1994	11.0666	11.0795	-0.01295	| . *| . |
1995	11.0902	11.1440	-0.05382	| . * | . |
1996	11.1042	11.1696	-0.06531	| . * | . |
1997	11.2255	11.1773	0.04817	| . |* . |
1998	11.2697	11.2191	0.05059	| . |* . |
1999	11.1630	11.1896	-0.02657	| . *| . |
2000	11.2127	11.2634	-0.05067	| . * | . |
2001	11.2827	11.3399	-0.05715	| . * | . |
2002	11.3909	11.3973	-0.00641	| . * . |
2003	11.4705	11.4074	0.06309	| . | * . |
2004	11.5086	11.4780	0.03060	| . |* . |