UNIVERSITI PUTRA MALAYSIA

THE EFFECTS OF IMPORT TARIFF ON DEMAND AND FARM PRODUCTIVITY OF SOYBEAN INDUSTRY IN INDONESIA

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FEM 2008 4

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2008

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Thesis Submitted in Fulfilment of the Requirements for the Doctor of Philosophy Universiti Putra Malaysia

September 2008

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirements for the degree of Doctor of Philosophy

THE EFFECTS OF IMPORT TARIFF ON DEMAND AND FARM PRODUCTIVITY OF SOYBEAN INDUSTRY IN INDONESIA

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September 2008

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Soybean industry plays an important role in the Indonesian economy. For many years, the country has an excess demand of soybean. Indonesian government has chosen to import soybean to meet the shortage of the domestic supply. However, the import has increased rapidly over the years. This dependency has become a serious problem in maintaining food security in the country.

The general objective of this study is to investigate why the domestic demand of soybean relies on the imported soybean. Further, there are four specific objectives. First, this study attempts to determine factors that affect to the import demand of soybean. Second, it is carried out to analyze the effect of import tariff on the soybean industry in the country. Third, it is an

attempt to estimate the producers' surplus and lastly, it is done to analyze the productivity of soybean farming in the country.

In this study, the market model of soybean industry, estimated by the two stages least squares method is used to determine factors that affect the import demand of soybean. The model is simulated by increasing import tariff so that its effect on soybean industry can be measured. Tariff has an effect on welfare, so the producer surplus' analysis is carried out to estimate the producer's net gain. Finally, this study uses the Total Factor Productivity (TFP) analysis in order to determine the productivity growth of the soybean farming.

The results of this study show that increases in income and price of corn (substitute commodity) lead to a rise in import demand. On the other hand, an increase in import tariff will cause import demand to decline. As import demand declines, the price of soybean will rise, resulting in an increase in domestic production. Moreover, an increase in tariff will increase the producers' welfare. Lastly, there was some evidence of growth in TFP of soybean farming in Indonesia during the period of analysis, particularly in the non-Java regions. As the growth was found to be contributed by technological progress, the government should develop these regions by improving the related farming technology (seed, fertilizer and pesticide).

Abstrak thesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijasah Doktor Falsafah

PENGARUH TARIF IMPORT TERHADAP PERMINTAAN DAN PRODUKTIVITI LADANG DALAM INDUSTRI KACANG SOYA DI INDONESIA

oleh

Eti Suminartika

September 2008

Pengurusi: Professor Zakariah Abdul Rashid

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Industri kacang soya mempunyai peranan yang penting dalam ekonomi Indonesia. Permintaan terhadap kacang soya telah sekian lama melebihi bekalan yang ada. Oleh itu, kerajaan negara ini telah mengimport kacang soya untuk mengatasi masalah tersebut. Akibatnya, terjadi peningkatan import kacang soya yang ketara yang akhirnya telah menjejaskan pengeluaran kacang soya tempatan. Kebergantungan terhadap import ini telah menjadi suatu masalah yang serius dalam usaha kerajaan memastikan tahap keselamatan makanan terjamin.

Objektif kajian ini secara umumnya adalah untuk menyiasat mengapa negara ini bergantung terhadap kacang soya yang diimport bagi

memenuhi permintaan tempatan. Seterusnya, terdapat empat objektif khusus. Pertama, kajian ini bertujuan menentukan faktor-faktor yang mempengaruhi import kacang soya. Kedua, ia dijalankan untuk menganalisa pengaruh dan kesan tarif terhadap industri kacang soya tempatan. Ketiga, ia adalah untuk menganggar nilai lebihan pengeluar kacang soya dan akhir sekali, ia dilakukan bagi menganalisa tahap produktiviti ladang kacang soya di negara ini.

Dalam kajian ini, model pasaran bagi industri kacang soya beserta kaedah "*two stages least squares*" digunakan untuk menentukan faktor-faktor yang mempengaruhi import kacang soya. Model tersebut disimulasi dengan cara meningkatkan tarif import supaya kesannya terhadap industri kacang soya dapat dilihat. Tarif mempunyai kesan terhadap kesejahteraan. Jadi, analisis lebihan pengeluar dilakukan untuk menganggarkan keuntungan bersih para petani. Akhir sekali, kajian ini menggunakan kaedah analisis Jumlah Faktor Produktiviti (TFP) bagi menentukan tahap pertumbuhan produktiviti yang dicapai oleh ladang kacang soya..

Kajian ini mendapati bahawa peningkatan gaji dan harga jagung akan meningkatkan permintaan import kacang soya. Sebaliknya, kenaikan tarif pula akan menurunkan permintaannya. Apabila permintaan import menurun, harga kacang soya tempatan akan naik dan menyebabkan

golongan petani meningkatkan pengeluaran. Selain itu, peningkatan tarif meningkatan kesejahteraan petani-petani kacang soya. Akhir sekali, didapati juga bahawa terdapat peningkatan dalam pertumbuhan produktiviti bagi ladang kacang soya di kawasan-kawasan selain daripada Pulau Jawa. Disebabkan ia berpunca daripada peningkatan teknologi, kerajaan harus memajukan ladang-ladang kaca soya di semua kawasan ini dengan meningkatkan tahap penggunaan teknologi yang berkaitan (biji-benih, baja, dan racun perosak).

ACKNOWLEDGEMENTS

All praise due to Allah, the most gracious and merciful, for giving me the strength, courage, and determination to complete this study.

I would like to express my deepest gratitude and sincere appreciation to Professor Zakariah Abdul Rashid, for his invaluable guidance, encouragement and constructive criticism throughout the study period. His enthusiasm and patient have left a felling of indebtedness that cannot be fully expressed.

I would like also to express my deepest gratitude and sincere appreciation to Professor Mohd. Ghazali Mohayidin a member supervisory committee, for his invaluable guidance, encouragement, useful suggestion during the entire length of this study and his supporting to study in Economic and Management Faculty.

Furthermore, I would like to sincerely and earnestly record my indebtedness to Professor Madya Mohd. Mansor Ismail, a member supervisory committee, for his advises guidance, critical assessment and useful suggestion during the entire length of this study.

My grateful appreciation also goes to Doctor Rosli Saleh, a member to the supervisory committee, for his advises, supervision and useful suggestion during the entire length of this study.

I would like to express my deepest gratitude to my husband, for his support, advice, guidance, useful suggestion and his care during my study.

My heartfelt appreciation and gratitude also goes to the staff member of the faculty of Economic and post graduate school, University Putra Malaysia, for their generous guidance and help during the entire length of my study.

My thanks and appreciation also goes to my friends in UPM, who extended a helping hand and cooperation during the entire length of this study.

I certify that an Examination Committee has met on 5 September 2008 to conduct the final examination of Eti Suminartika on her Doctor of Philosophy thesis entitled "The Effects of Import Tariff on Demand and Farm Productivity of Soybean Industry in Indonesia" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The committee recommends that the candidate be awarded Doctor of Philosophy.

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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that is has not been previously or concurrently, submitted for any other degree at UPM or at any other institution

Eti Suminartika

Date: 5 September 2008

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INTRODUCTION

1.1 Background

Soybean is one of the important oil products to the human kind throughout the world. In Indonesia, soybean is mainly used for human consumption; only a small quantity is used for other purposes. Many products such as *tauhu, tempe, kicap*, flavor, and chips can be processed from soybean. *Tauhu* and *tempe* industries together use 60 percent of the domestic supply of soybean in the country. Another 33 percent is used in the processing of soybean oil, milk, grain, and flavor while the remaining 7 percent is used for other purposes such as animal feed and seeds.

The consumption of soybean is gradually increasing. In 1970, 440 930 tons of soybean was consumed by the Indonesians, but the figure rose to 1 717 516 tons in 2004 (Table 2.6). The increase was mainly due to an increase in the per capita consumption. Each person in the country consumed just 3.7 kilogram of soybean in 1970, but the figure climbed to 4.6 kilograms in 1980 and 8.6 kilograms in 1990. In 1996, the per capita consumption of soybean stood at 10.5 kilograms. Shortly after the economic crisis in 1997, the per capita income in Indonesia started to decline. So did the per capita consumption of soybean. In 1997, the per capita consumption of soybean

was 9.0 kilograms, a drop of 14 percent from the previous year, before going down further to 8.3 kilograms in 2004.

The production of other beans such as peanut and mungbean tends to increase but their per capita consumption is not as much as that of soybean (Table 2.9). Therefore, these beans cannot be the substitutes for soybean.

Consuming soybean in the forms of *tauhu* and *tempe* is an old habit among the people of Indonesia. Today, soybean is the second largest source of protein consumed by the Indonesian people after fish. It contributes 10 percent to the total protein intake of all people in the country. It is a commodity which plays an important role in maintaining food security, both in terms of quantity and quality. The quality of food is closely related to nutrient content. Soybean is made up of 42-50 percent of crude protein, making it the third best food in terms of protein content after fish and peanut (Table 2.10). Furthermore, it is cheaper and more affordable than other sources of protein (Table 2.21). Therefore, soybean has a substantial role in maintaining food security in Indonesia.

To maintain food security in terms of food quantity, the domestic supply of soybean must be warranted. However, there has been an excess of the imported soybean over the local production in the domestic market. In 2005, approximately 61 percent of the country's domestic supply of

soybean was met by imports and the remaining 39 percent was produced locally. This situation is unfavorable because there is no guarantee that the country can continue to provide enough food to the people in the future.

The second role of soybean industry is to distribute income to many Indonesian people. Distribution of income can be measured by the per capita income of a worker in this industry and the number of workers employed. In 2005, the per capita income of an Indonesian worker in the country was 28 749 483 Rupiah. In the agriculture sector (including the soybean farming) the per capita income was only 8 742 445 Rupiah, while it was 12 360 493 Rupiah for the small scale industry (including the soybean processing industry). This means that the soybean industry (farming and product processing) distributes less income to the people compared with other industries in the country.

The third role of soybean industry is as a source of job. The industry has employed many labors both at forward and backward linkage streams. Since the economic crisis in 1997, the unemployment rate has been increasing. In 2001, the rate of unemployment was 8.1 percent, and it soared to 10.26 percent in 2005 (Table 2.13). In an attempt to overcome this problem, the government has begun to develop all the business sectors including the soybean industry. Currently, the soybean farming employs more than 2 million workers, while the soybean processing industry

employs more than 260 000 workers. It means that there are more than 2 260 000 workers employed in the whole soybean industry nationwide. However, many of the firms in the soybean farming and soybean processing industry in Indonesia are small scale businesses. Further development of these firms may reduce the unemployment problem in the country.

Indonesia's total supply of soybean is covered by both imports and domestic production. However, the price of domestically-produced soybean in the country is higher than the imported soybean. There has been an increase in the import of this commodity, which was first imported in 1974. In 1980, the import only made up 14 percent of the total supply of soybean in the country. Then, it started to increase gradually due to trade liberalization agreement.

The government of Indonesia reduced its tariff on soybean step by step. The import tariffs on this commodity during the periods of 1974-1980, 1981-1993, and 1994-1996 were 30 percent, 10 percent, and 5 percent respectively. The tariff was further cut to 2.5 percent in 1997 and a year later in 1998, the government introduced a free trade policy where no tariff on imported soybean would be imposed any longer. Since then, there has been no monopoly importer of soybean and the import of soybean has increased sharply. In 2002, the imported soybean accounted for 67.70

percent of the total supply or 1 365 771 tons, and it was the largest import during the period of 2000-2005 (Table 2.7). However, the dependency on the imported soybean can potentially pose a serious problem for the country as far as food security is concerned.

Although the imported soybean is demanded more, its quality is no better than the domestically produced soybean. Basically, the local soybean is fresher as it is stocked for a shorter period of time due to quick domestic demand. Therefore, *tauhu* producers prefer to use the locally produced soybean as the raw material than the imported soybean.

Most of the soybean's domestic production is produced in Java. Productions from the island make up 70.32 percent of the national production, and the rest is produced in other regions (Table 2.18). In 1970, the domestic production of soybean was only 49 882 tons with 695 hectares of land size, before rising quickly afterwards. In 1999, the production reached a record high of 1 382 848 tons with 1 551 079 hectares of land size. After 1999, the production declined sharply as there was so much imported soybean in the domestic market (Table 2.6).

As discussed earlier, the price of locally produced soybean is more expensive than the imported soybean (Table 2.25). This problem can be analyzed in terms of the costs of production. The local soybean farmers