THE IMPACT OF PADDY FLOOR PRICE AND IMPORT TARIFF ON THE DEMAND AND SUPPLY OF RICE IN INDONESIA

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Submitted by:

JANE NATASHA GIRSANG
12020115140074

FACULTY OF ECONOMICS AND BUSINESS

UNIVERSITY OF DIPONEGORO

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THESIS APPROVAL

Author Name   : Jane Natasha Girsang

Student ID   : 12020115140074

Faculty/ Department : Economics and Business/ Economics and Development Studies

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Thesis Supervisor   : Prof. Dr. FX Sugiyanto, MS

Semarang, 15 June 2019

Supervisor,

(Prof. Dr. FX Sugiyanto, MS)

NIP 195810081986031002

SUBMISSION

Author Name   : Jane Natasha Girsang

Student ID   : 12020115140074

Faculty/ Department : Economics and Business/Economics and Development
Studies

Thesis Title   : **THE IMPACT OF PADDY FLOOR PRICE AND
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OF RICE IN INDONESIA**

**Has been declared to pass the bachelor thesis exam in front of the Board of
Reviewers on June 28, 2019.**

Board of Reviewers:

1. Prof. Dr. FX Sugiyanto, MS   (……………..……..)

2. Akhmad Syakir Kurnia, S.E., M.Si., Ph.D.   (………..…………..)

3. Firmansyah, S.E., M.Si., Ph.D.   (………..…………..)

Informed consent

Vice Dean 1,

Anis Chariri, S.E., Mcom., Ph.D., Akt

NIP. 196708091992031001

CERTIFICATE OF ORIGINALITY

I, Jane Natasha Girsang, hereby certify that this assignment is true and accurate to be my own work specially written for partial requirement to complete Undergraduate Program of Economics and Development Studies and has not initially been presented in any other occasion. I bear full responsibility for my bachelor thesis.

Semarang, 15 June 2019

Undersigned,

Jane Natasha Girsang
NIM. 12020115140074

ABSTRACT

Rice is known both as a staple food and salient cultural symbol in Asia, specifically Indonesia, whereas most countries have a strong link toward this commodity. The market failure of supply to meet the demand for rice can intrude social instability. To understand the holistic view of rice economy in Indonesia, this study aims to examine the impact of Indonesia's liberalization agreements towards Indonesian rice economy and all participants involved in the rice trade in Indonesia. Overall, it will subsequently describe the performance of Indonesian rice trade, i.e., supply and demand.

This study emphasizes time series secondary data for rice, from 1983-2017. Next, Two Stages Least Squares (2SLS) method was used to quantitatively estimate the parameters of the behavioral equations in the model, consisting of five behavioral equations and three identity equations. Finally, three policy alternatives set were simulated for the period 1983-2017.

The results from this study shows that reasonable tariff and government involvement are still required to stabilize the rice supply system in Indonesia. Unhusked paddy price which creates farmer's margin, drives farmer's motivation to produce paddy. Therefore, the government should establish and support new programs aimed at increasing paddy production and, in particular, paddy productivity.

Keywords: Rice Supply and Demand, Rice Trade, Price Stabilization, Two Stages Least Squares (2SLS), Policy Historical Simulation

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Jane Natasha Girsang

12020115140074

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CHAPTER I

INTRODUCTION

1.1   Background

Rice is known both as a staple food and salient cultural symbol, mainly in Asia whereas most countries have a strong link toward this commodity. The connection between Asia civilization and rice was introduced through the early rice cultivation that followed two pathways toward domestication in India and China, in which farming population grew and expanded by migration and incorporation of the pre-existing population (Fuller et al., 2011). Through these pathways, rice slowly evolves into becoming a predominant commodity of consumption. Subsequently, rice became the source of livelihood for farmers and agricultural household, along with other primary commodities such as corn, maize, etc. on the account of nations' food production (Hutagaol and Sinaga, 2017).

Rice portrays an essential behavior of Southeast Asia's people lives, in particular, nations that carry agriculture baseline such as Indonesia. Indonesian small farmers and agricultural households contribute 7.1% to the total workforce employed at the farm and 7.2% of the consumer expenditure in the rice sector (Warr 2005).

Figure 1.1
The Share of Agriculture in Indonesia's GDP (%), 2006-2017
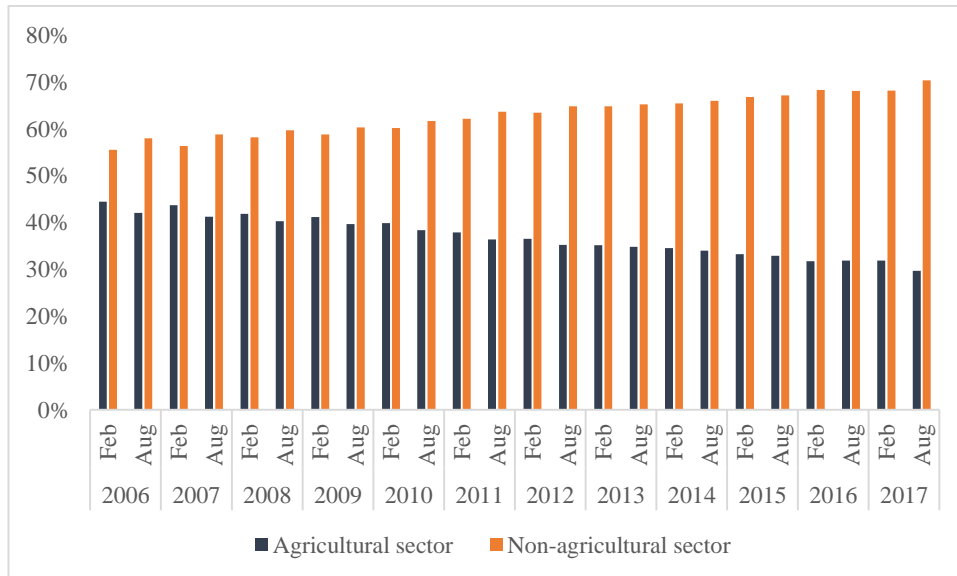
Source: Central Bureau of Statistics, 2017

In the Figure 1.1, the overall share of agricultural sector declines consequently. Around 900,000 jobs were lost in the last decade due to the new jobs generated in urban areas—a reflection of the country's rising urbanization (Quincieu, 2015). However, throughout 2006-2017, agriculture remained to be the leading sector to contribute to job creation and absorbs on average 35% of the country's workforce.

Despite having the position as the primary buffer of Indonesia's economy, inefficiency in regards to the agricultural sector still exists. Not-well targeted budget allocation by the government in the funding of fertilizer, seed, and other agro-input subsidies for food crop production gives unfavorable feedback on farmers. Other difficulties convey low-level agricultural support services and public investment in rural infrastructure, resulting in a deterioration of rural roads,

irrigation systems, research and development, disease control, and extension services.

Figure 1.2
Indonesia Rice Consumption (ton), 2006-2017
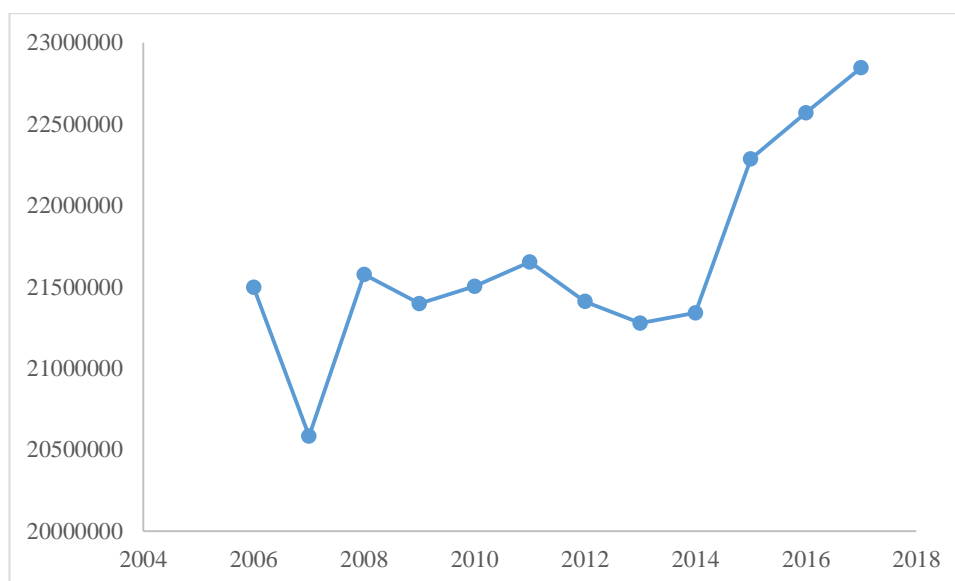
Source: Central Bureau of Statistics, 2017

Figure 1.2 describes rice consumption in Indonesia from 2006 to 2017. The overall trend showed an increase even though the fluctuation is resilient. Starting 2014, the consumption of rice steadily rose. In contrast, rice consumption fell 913,369 Mt ton in 2017 which suggested a declining trend of rice consumption. This is in line with Sudaryanto, Y., Simatupang, and Swastika (2002) that argued an underlying downturn trend of rice as the source of calories for Indonesia. Most of the high-income and middle-income Asian countries, i.e. Japan, South Korea, Taiwan, and Thailand also have similar behavior. The rising urbanization has influenced a change in people's lifestyle; the preference continuously shift into a more diversified and convenient diet, notably when various modern retail markets begin to take place. Alongside with urbanization,

the changing economic condition, socio-demographic, and geographic characteristics of consumers also have contributed to the decline in rice demand in recent years.

Figure 1.3
Production and Productivity of Paddy (ton), 2006-2017
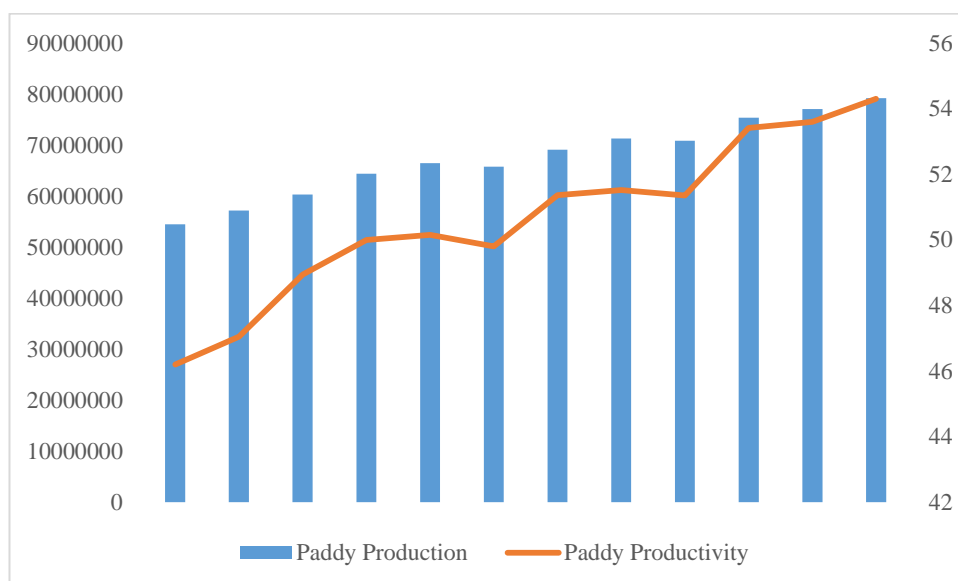
Source: Central Bureau of Statistics, 2017

The Figure 1.3 gives an insight of how paddy productivity correlates to the production of paddy. On the production side, paddy production and paddy productivity have shown a similar tendency. Both variables increase yearly, although in 2014 the trend of paddy production declined 433,244 Mt ton. Therefore, the failure of supply to meet the market's demand can intrude social instability. Barichello and Patunru (2009) stated that rice is the most 'politicized' commodity in many countries in the world due to its trait to as the main staple food and also both wage good and political good.

Political setting, structure, and conflict are necessary to understand the importance of price stabilization in the context of the rice economy in a nation. Uncertainty in food grain world price in 2007/08, 2010/11 and also 2012 has made food price constancy a crucial concern for a nations' sustainability. According to Dawe and Timmer (2012), there are three benefits of staple food prices stabilization: microeconomic benefit for poor consumers, a microeconomic benefit for producers and macroeconomic benefit. For poor consumers, the advantage of rice price steadiness is expressed from its ability to prevent sharp price fluctuation before price increases and hasty implementation of food distribution program ensue.

For producers, price stability is needed to secure farm rice from abnormally low price periods. This cause farmers to lower their demand for credit, leading to minimal cash flow problems. By avoiding large costs and inefficiencies associated with subsidized credit program, price balance thereby helps promote a well-functioning rural financial system in the long run. Stable rice price is likely to benefit investment and growth among other macroeconomic gains, especially in poor countries where rice becomes an important share of economic output. Myers (2006) suggests that growth and food security force may dominate more conventional welfare costs of food price fluctuation. Under the condition of imperfect market information and price fluctuation, stabilizing staple food price one ward may prompt private investment and growth while also inducing the stability of the social and political area.

In 1945, international support for Indonesia global political policy was driven by rice commodity. Thousand tons of rice were shipped to other countries as a gesture of solidarity to strengthen Indonesia international policy (Sidik, 2004). Indonesia government sought to protect the domestic market from global market volatility by maintaining price stabilization. In the case of rice, demand is normally very inelastic; moderate price increase can cause hardships for those in need to make cutbacks on other expenditures. On the supply side, the cross-price effect is also relatively small since the nature of rice cultivation makes land conversion much less flexible than those for wheat and corn (Wailes 2003).

Indonesia's government emphasized rice as a staple food in1966. It expected a low rice price for consumers and high income for paddy farmers in order to boost growth. As in early 1950, agricultural based performance – in particular, paddy – was conducted; this targets the increase of production by controlling the operations of expansion and intensification policy. The programs were designed to strengthen food security and alleviate poverty since rice heavily relied as a political instrument. At this period, rice policy covered various steps from input to production such as providing seed, fertilizer, pesticide, and financial support through special credit line set up in government banks with low interest.

The expansion and intensification policy was formulated on the goal to reach higher productivity level of the rice. The accelerated expansion focuses on infrastructure and irrigation program, which later became costly due to technical reason. Intensification specifies the use of high-yield varieties, efficient farming system promotion, and efficient post-harvest to reduce yield loss. Within this

scope, the government provides subsidized seeds, fertilizers, low-interest credits, and a 'procurement price' for up to 5 percent of unhusked paddy production to encourage technology application by farmers. Later on, the campaign to reduce rice consumption was introduced, intending to attract more food diversification, promoting alternative staple foods such as noodles and reducing the dependence on import of rice.

Rice production stimulation at the rate of 4.5% in 1969-1990 was a result of massive subsidy and large government investment on irrigation improvement and rice policy. To encourage production and maintain price stability, the government controlled the domestic rice market by intervening the market. The peak of rice production in 1984 enabled Indonesia to supply their need for rice. In the following year, Indonesia turned into a net rice exporter during 1985 and 1987. Household food security was considered to be very strong, and domestic production becomes dependable for primary food supply source.

The rice price stabilization policy that made government successful in maintaining food security has been associated with the state-owned logistic affairs agency, BULOG (*Badan Urusan Logistik*) since the 1970s. BULOG mandate was to intervene the market and manage huge governmental stocks. Many privileges were given to this institution, for instance, the monopoly right to import basic food commodities such as rice, sugar, wheat, soybean, corn etc. Consequently, to adsorb supply and prevent the price from declining, buffer stock strategy was done by buying rice at floor price level during harvest season. This farm gate price was set-up well above the production cost, aiming to ensure farmers gain

more and thus earn a better income for their livelihood. Among others, import is strictly regulated by tariff and import control policies. Market intervention was conducted to smooth-out price fluctuation, as an effort to maintain the affordability of lower-income groups to ensure their household food security (Sidik 2004).

Due to operation issues on accountability, transparency, and efficiency, BULOG was abolished and the commodities were then switched to private importers. For financial support, the government approached the IMF by adopting IMF and World Bank's structural adjustment program on trade and agricultural policies. The import tariff was nil and unlimited imports were allowed between 1998 and 1999. Indonesia's food policy was redirected to an open and fair international trade.

Import of rice boosted to 6 million Metric tons in 1998 and 4 million Metric tons in 1999, mainly originating from Thailand and followed by Vietnam (United Nations Development Programme, 2005). The main reason of Indonesia rice market liberalization and rice import influx was due to the effect of Asian economic crisis, market deregulation, and incidents of bad drought, in particular, El Niño phenomenon in 1997-1998 and flood of La Niña in 1998-1999 (Arifin, 2008). These events disturb other sectors; the severe economic crisis in 1997 followed by stock exchange crash in 1998 made firms' close, poor people rose and malnutrition prevalence increased significantly.

Over the drawbacks from market liberalization on producer and consumer prices, the government has returned to domestic rice market intervention with some various adjustment from the period before liberalization in 1997. The alteration policy was developed to protect farmers from price decline, especially during harvest season. However, Sidik (2004) arguments that in this system the government purchases 2 million Metric tonnes of unhusked paddy at a guaranteed minimum price and less than 5 percent of national production falls under the procurement price. Thus, trade and price policies combination had minimal effect on the recovery of paddy farmers.

Food policy shortfall in the economic downturn enforces the government to adjust its strategy in 1998. The government imposes subsidy program addressed to the poor instead of intervening market operation or price stabilization strategy. This program provides around 2.2 MMT rice distributed to the poor with total of subsidy worth of Rp.4.6 trillions, where one family could withdraw up to 20 kg rice per month with the price of Rp 1.000,00. While the purpose of this policy was to strengthen food security in the lower income group classification, there are some restrictions and conditions that need to be fulfilled as targeted beneficiary.

The difference between floor price of unhusked paddy (HDG) before 1997 and government procurement price (HPP) after 1997 is presented in Table 1.

Table 1.1
Floor Price of Unhusked Paddy (HDG) and Government Procurement Price
(HPP) Comparison

No.	Description	HDG Policy	HPP Policy
1.	Policy objectives	Maintain price at or above a minimum floor level (HDG) through the year	Help to buffer price of unhusked paddy, particularly during harvest, to avoid unacceptable low price
2.	Policy instruments	Purchasing of unhusked paddy at the guaranteed minimum level until the market price rises above that level (no limitation of purchasing volume)	Purchasing of unhusked paddy up to a maximum volume at a guaranteed minimum price (no mandate to keep market price of unhusked paddy above the minimum price)
3.	Supporting instruments	Tariff and import limitation	3. Tariff and import limitation
4.	Policy effectiveness	Effective to keep the marketplace price of unhusked paddy above the stipulated level	4. Effective to stabilize prices outside the high season; not as effective during harvest because of the too limited volume that comes under this measure

5. Costs of policy	Approximately double the cost of the second option because it was usually necessary to buy about 4 million Metric tonnes (approximately Rp 16 trillion) of rice during the peak harvesting season to keep the price up	5. Currently, the purchased volume of unhusked paddy is 2 million Metric tonnes (around Rp 8 trillion)
6. Political accountability	Government is obliged	6. Government is not obliged

Source: (Garbers and Hirsch 2007)

As a member of Association of South East Asia Nations (ASEAN), Indonesia has had to implement its commitments under the ASEAN Free Trade Area (AFTA); until trade liberalization among these countries was fully implemented in the year of 2003. AFTA agreement was namely about the application of nil to five percent tariff for agricultural products by January 2010. Starting 2005 the same agreement was implemented for countries in the Asia-Pacific region to achieve "free and open trade and investment" no later than 2020. In spite of rice sensitivity, Indonesia is allowed to maintain its current applicable import tariff until 2010 and up to a 20 percent maximum until 2020 (United

Nations Development Programme, 2005). AFTA does not require a decrease in rice tariff in the short and medium term.

By becoming a business entity in 2003, Bulog is no longer in charge for price stabilization of basic food commodities or in improving farmer's welfare and needs to compete fairly with other company either as rice importer or other food crops business activities. Bulog activities, in fact, were mostly dominated by public service responsibility. Bulog is responsible to maintain farm-gate price at the guaranteed buying price that will contribute significantly to the farmers' income and encourage farmers to improve rice productivity. In contrast, farmers continued to demand protection against cheap import due to the constant threat of world market stabilization at levels of 40 percent below domestic rice prices. The Ministry of Agriculture decided to impose a "seasonal" import ban in early 2004, which allowed the importation of rice only one month before and two months after the country's harvest peak which runs from February to May (Sidik 2004).

Under this trade-restrictive regulation, good harvest and substantial stocks (i.e. a combination of attractive farmgate prices and affordable consumer prices) caused the impact of price ban not-so significant. This led to a constant hike of consumer prices, whereas farm gate prices grow only moderate from 2004 until 2007. Amid the implementation of this policy, rice prices started to increase substantially in the domestic market, around 40–50% above import prices (Warr, 2005). In 2007, rice import tariff was reduced from 750 IDR/kg to 550 IDR/kg and further reduced to 450 IDR/kg (equivalent to a tariff rate of about 30%).

Figure 1.4
Rice Import Quantity (thousand tons), 2006-2017
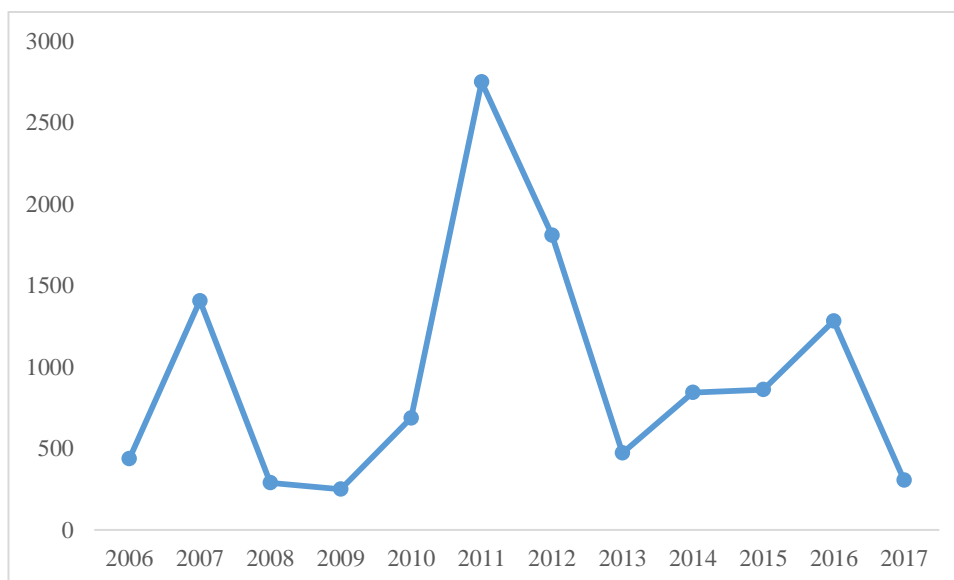
Source: Central Bureau Statistics, 2017

Viet Nam and Thailand are the two main suppliers which account together two-thirds of the Indonesia rice imports (The Rice Trader, various editions). At the time of 2007, the price hike benefits the traders instead of farmers. Hence, ad hoc imports were raised as a response toward government reconsideration on its rice policy. The specific tariff rate remains unchanged except for a short period from December 2010 to March 2011 when tariff was set to zero (Dartanto, 2018). In Figure 1.3 above, the rice import reached its highest peak in 2011 before it then fell on the following year. Nevertheless, it is still difficult to manage a market controlled by the oligopoly of traders.

The year 2008 marks the introduction of cattle, a technology adaptation managed by farmers' groups, as a source of manure and compost, necessary to improve the soil organic matter pool. The government financially supports farmer's groups in Information and Communication Management (ICM)

implementation through the direct subsidies for construction of cattle stables, provision of 80 head of cattle for each farmers' group comprising 100-200 farmers or 50-100 ha of rice area, credit for rice and cattle inputs. The Ministry of Agriculture developed ICM field school to accelerate the adoption of ICM technology. The development of this program was supported by precision farming and information technology such as crop calendar and site-specific nutrient management. Thus, in 2012 there was 3.1 million ha rice field covered throughout Indonesia including inbred and hybrid rice.

During 2001-2014 the distribution of rice to the poor through Bulog increased tremendously from around 1.48 million ton to 2.77 million ton, affecting domestic rice supply. In order to regulate the market, the government implements policy instrument in the given market structure of commodity where interest groups exist in the market (Barret 1999). For that reason, and also to cope with market failure, the government of Indonesia intervenes the domestic rice market to achieve self-sufficiency by giving the mandate to a state-owned parastatal, i.e. Bulog.

A study conducted by (Jonasson et al. 2014) presents a model of transaction costs impact on rural welfare of market price supports, production subsidies, and the removal of transactions costs. Here, transaction costs disconnect "remote" farmers from output markets. Under these circumstances the household produces what it wants to consume, and the dual problem of utility and profit maximization become non-separable. Jonasson developed a model, Development Policy Evaluation Model (DEVPEM), that takes into account the

characteristics of structural features of less-developed countries. The result shows that market price support for food crops harms net buyers of food, often the poorest farm and non-farm (landless) households, although the proportion of net buyers varies significantly across countries. This complement the study from (Coxhead, Linh, and Tam 2012) about world food prices shock impacts on food importers and exporters in Vietnam. The study shows that in the short run (when labor markets do not clear across regions), rural workers and small farmers, who make up the largest poor subpopulation, capture large indirect gains through the employment and labor productivity effects of higher rice prices. In the longer run, these gains are dissipated somewhat through interregional migration; nevertheless, wage and employment effects persist as important determinants of changes in household welfare and poverty.

Haryati and Aji (2005) address rice performance in terms of supply and its relationship toward trade liberalization era. Their motivation revolves from the issue in which rice supply self-sufficiency is unable to be maintained. Their study found that introduction of reasonable tariff and government involvements are still required to stabilize the rice supply system in Indonesia. Removal of import tariff and government involvement, e.g. BULOG, will significantly reduce producer surplus. Another study from Kusnadi and Tinaprilla (2011) confirms the previous study that the demand for rice in Indonesia is high and difficult to decrease. Thus, the unbalanced condition between demand and supply can threat the sustainability of food security. The result of their study reveals that conversion makes land farming does not increase rapidly and land extensification program is bounded by

the available land. To achieve rice self-sufficiency in supply side, production technology is very important to increase productivity. In demand side, they need to decrease rice consumption through consumption diversification campaign.

Hoang and Meyers (2015) study on the impact of trade liberalization in major rice trading countries of Southeast Asia, focusing on the price stabilization mechanism that has long been adopted by governments in Indonesia, Malaysia and the Philippines reveals a rather different view. The simulation result suggests that the removal of state trading enterprises in these three countries would lower their domestic prices as much as 34% but increase the world prices by about 20%. When free trade liberalization is realized in 2020, domestic prices decline further in Indonesia and the Philippines, leading to an increase in their imports, which are estimated to be as much as 4.5 million tons. The impact on domestic prices, however, is absorbed nearly evenly among Indonesia, the Philippines, Thailand, and Vietnam.

To understand the holistic view of rice economy in Indonesia, this study aims to examine the impact of Indonesia's liberalization agreements towards Indonesian rice economy and all participants involved in the rice trade in Indonesia. The impact will be measured and will subsequently describe the performance of Indonesian rice trade, i.e., supply and demand.

1.2 Research Questions

Indonesia rice demand increases yearly as a result of the increasing number of population. To support national food security and balanced equilibrium, the improvement of paddy production stability must be attained. One

of the most prominent issues related to this is the conversion of paddy land proportion into other non-agricultural land use. Due to this problem, the research questions are as following.

1. What are the factors determining the supply of rice in Indonesia?

2. What are the factors determining the demand for rice in Indonesia?

3. How are the impacts of paddy floor price and import tariff toward the demand and supply of rice in Indonesia?

1.3   Purpose

1. To estimate the factors determining the supply of rice in Indonesia.

2.To estimate the factors determining the demand for rice in Indonesia.

3.To assess the effect of government policies toward the demand and supply of rice in Indonesia.

1.4   Usefulness

The usefulness is split into two, academic and practice level.

1. This study is expected to give empirical insight regarding the current government policy.

2. This study is expected to become an evaluation consideration for policy-makers.

1.5   Structure of Writing

The structure of this thesis is divided into five chapters as follows.

Chapter I: Introduction

Chapter I consists of background, problem statement, purposes, usefulness, and structure of the thesis. The description will be firstly viewed from the current perspective, subsequently, historical policy assessment done by the government in the past years from Indonesia Soekarno era until the current situation in 2018. Then, the objectives of this empirical study will be asserted along with the function of this research. Lastly, the structure of thesis is described.

Chapter II: Literature Review

Chapter II explains the theory of supply and demand specifically for the agricultural sector, followed by international trade, and surplus for consumers and producers. Then, previous studies are presented along with the research framework and hypothesis of this thesis.

Chapter III: Research Method

Chapter III explains the variables and operational definition, population and sample, data collection, and analysis method. Analysis method comprises of empirical model where every single model is explicated to answer each research question.

Chapter IV: Results and Discussions

Chapter IV explains and describes the research objects, the results of econometric analysis, and implications of the study.

Chapter V: Conclusions and Suggestions

Chapter V concludes and resolves the conclusions of the research, limitations during the research process and give remarkable suggestions for the next researchers.