

**ECONOMIC EVALUATION OF  
THE POTENTIAL OF MYANMAR RICE MARKET  
UNDER CHANGING POLICY MIX**

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## **ABSTRACT**

The importance of rice in both rural and urban economic development subjects the Myanmar rice economy to political pressures. As a consequence, maintaining adequate rice supplies, particularly in the urban areas, at relatively low and stable prices becomes an important objective of the Myanmar rice policy. Other objectives of the rice policy include increasing government revenues by saving scarce foreign exchange, increasing producer incentives and farm income, and achieving greater equity in income and more adequate nutrition among the poor. Some of these objectives conflict with one another and the emphasis placed on each of the individual goal will change over time depending on the prevailing production and overall economic conditions. The most obvious and classic policy dilemma in Myanmar is the conflict of securing adequate income of farmers whilst ensuring low price to consumers and accelerating foreign earnings from rice export.

The overall objective of the study is to analyze the subsequent transformation of Myanmar's rice market under changing policy mix. The specific objectives of the study are as follows: to examine the potential of Myanmar's rice market under changing government export policies by evaluating the structure and performance of Myanmar's rice export system; to build up a theoretical framework of Myanmar rice policy mix with the existing rice trade policies in order to measure the potential impact of those policies; to investigate the impact of Myanmar rice policy mix, explore various policy mix options available under the distinct and restricted condition of Myanmar rice market and to weigh the incidence of loss and gain from those alternative rice policies against its economic, social and political goals.

Although some researchers provide overviews of Myanmar rice marketing system, researches on the dilemma of Myanmar rice policy mix have not been fully documented yet. After exploring the potential of Myanmar's rice market under changing government export policies, a theoretical framework by using the static partial equilibrium trade model was built up in order to verify the impact of Myanmar rice policy mix. This study will emphasize the impact of three government intervention policies on rice trade: namely, export quota policy, price ceiling policy and production control policy, which are

conflicting between the export enhancement and the stable domestic food market objectives. Although the single policy simulation is a common and widely used method in food policy analysis, the policy mix simulation in this study is a scarce research and a newly functional application on Myanmar rice trade policies.

After the second market liberalization in 2003, Myanmar's rice trade policy is still characterized by frequent changes and uncertain export licensing. The highly volatile rice export policies reduced the confidence of traders to invest in the business and rice exports were reduced year by year in which exported only 0.4 percent to 12 percent of its rice surplus after the second market liberalization. Myanmar is exporting primarily Indica rice, mainly of intermediate and low quality, to a few countries especially to low income markets. Moreover, the challenge facing Myanmar rice export was the high proportion of transportation costs, almost 57 percent of the total export processing cost because of insufficient port facilities. Compared to the price of Thai and Vietnam rice, the Myanmar rice export price was significantly lower, only 58 percent to 78 percent of the Thai and Vietnam rice price. One result of the long-lasting government's monopoly over rice exporting has been the separation of the domestic and international markets, which has led to few trading partners and a huge disparity between the domestic and international rice prices.

According to the low ceiling price setting of Myanmar rice policy mix in 2008, the rice farmers who were the targeted recipients of the benefits of policy reforms did not receive the full reward of their effort. Price disincentives to farmers are the underlying cause of inadequate investment in agriculture and slow adoption of improved technologies. By using 2 main scenarios: single policy shifting and policy mix shifting; 7 options of favorable policy choices will be available under the recent government intervention. In searching for the feasible use of the merits at those options by weighing gains and losses against each other, the objectives of the farmers, consumers and the government can be gainfully served simultaneously if the alternative compensation schemes are followed for the opportunity cost of farmers by increasing rice production amount. Therefore, a balanced strategy of producer price incentives, improved technology and associated input distribution is essential for transforming the rice sector.

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Rice is one of the most important food grains and has been highly protected in both industrial and developing nations. It is accounting for 19.2 percent of global calories consumed and 26.3 percent in low income countries (FAOSTAT, 2010). Thus, policies that affect rice prices, production, and trade have a large impact on the poor. Moreover, rice policies in developing countries have not changed significantly since the early 1990s as a result of the more limited and longer market access reforms required for developing countries under the Uruguay Round. This lack of rice policy reforms has intensified price volatility, placing a heavy burden on poor consumers and on governments to provide food distribution programs for the poor.

Despite the importance of rice as a basic staple, global trade accounts for only 7.1 percent of consumption. It means that most countries are self-sufficient in rice and face increased price volatility in times of production shortfall. The thinness of trade for rice stems primarily from the use of protectionist mechanisms to achieve national policy objectives of domestic food security and support for producer prices and incomes in major rice producing and consuming countries.

In addition to the thinness of rice trade, another important structural characteristic is the geographic concentration of production and consumption in Asia. More than 90 percent of production and consumption occur in Asia. In 2008, Myanmar's rice production ranked 6th among the top 10 rice producing countries in the world. On the other hand, per capita rice consumption of 196kg per year indicates the extremely high dependency of

Myanmar's people on rice, compared to neighboring Asian countries. Because of 2 percent annual population growth, national long term planning has been established to enhance annual rice production by all means to maintain food security, but also to generate a considerable surplus for foreign export. As a consequence, rice is becoming a nationally important crop for the social and political stability of Myanmar throughout history. The stabilization of essential rice prices at a low level conforms to the main objective, which is to avoid social unrest. This explains why rice policies in Myanmar have a strong inclination towards production increases for their own sakes while paying rather less attention to farmers' income and welfare.

## 1.2 Problem statement

As a staple food of Myanmar, rice production is historically the priority of the nation. It is important not only for food security but also as a source of the government revenue and foreign exchange earnings. For this reason, successive Myanmar governments have put great political importance on ensuring a stable supply of rice as a key to maintaining the stability of the regime. Because of the imperative role of rice, agricultural policy in Myanmar is identical with rice policy.

As a member of the WTO since 1995 and of the Association of South East Asian Nations (ASEAN) since 1997, Myanmar government has been pressured to undertake market oriented policy reforms in line with economic globalization under the structural adjustment program. Liberalizations of rice marketing were implemented twice in 1987 and 2003 to accelerate a market oriented economy by favoring competitive market price for rice producers and consumers. However, Myanmar government could not withdraw its hand completely from the rice market even after the market liberalization announcement in 2003 in order to follow the regional agreements on trade liberalization. The importance of

rice in both rural and urban economic development subjects the Myanmar rice economy to political pressures.

Unavoidably, the food policy question dealing with Myanmar government is how to resolve the conflicting objectives of providing low rice prices to consumers and rewarding incentives to farmers. Moreover, given the political importance of rice and instability of the world rice market, Myanmar aims for the stable domestic food market rather than rely on the international trade. As a consequence, maintaining adequate rice supplies, particularly in the urban areas, at relatively low and stable prices becomes an important objective of the Myanmar rice policy. Other objectives of the rice policy include increasing government revenues by saving scarce foreign exchange, increasing producer incentives and farm income, and achieving greater equity in income and more adequate nutrition among the poor.

Some of these objectives conflict with one another and the emphasis placed on each of the individual goal will change over time depending on the prevailing production and overall economic conditions. The most obvious and classic policy dilemma in Myanmar is the conflict of securing adequate income of farmers whilst ensuring low price to consumers and accelerating foreign earnings from rice export. To achieve the above objectives, a wide variety of policy instruments have been used to influence output and input prices directly or to increase productivity or to introduce trade barriers.

The analysis process of this study begins by asking some basic questions. What is the current system of Myanmar rice export implied by agricultural price policy? What is the structure of incentives generated by such a system? Is the structure consistent with the sector's comparative advantage and conducive to the achievement of the country's goals for development? What is gained and what is lost by the current system, or an alternative change in it, in terms of furthering private and social interests?

### 1.3 Objectives of the study

Thorough studies of the Myanmar rice export market conditions, including institutional changes and the currently established marketing system and dilemma of Myanmar rice policies have not been sufficiently documented. Thanda (2000), MAPT (2003), Okamoto (2005), Lwin (2005), Aung (2006) and Theingi (2007) provide overviews of Myanmar rice marketing system before and just after the second market liberalization.

The overall objective of the study is to analyze the subsequent transformation of Myanmar's rice market under changing the policy mix. This study will emphasize the impact of three government intervention policies on rice trade: namely, export quota policy, price ceiling policy and production control policy, which are conflicting between the export enhancement and the stable domestic food market objectives. With the results, appropriate policy applications are recommended to improve its development.

The specific objectives of the study are as follows:

- to examine the potential of Myanmar's rice market under changing government export policies by evaluating the role of rice sector in the national economy, exploring Myanmar rice policy context, and examining the structure, performance and constraints of existing Myanmar's rice export system
- to build up a theoretical framework of Myanmar rice policy mix with the existing rice trade policies in order to measure the potential impact of those policies
- to investigate the impact of Myanmar rice policy mix, explore various policy mix options available under the distinct and restricted condition of Myanmar rice market and to weigh the incidence of loss and gain from those alternative rice policies against its economic, social and political goals.

#### 1.4 Research hypothesis

The following hypotheses are composed for this study:

1. A competent rice export marketing structure is an imperative way to elevate the earnings of farmers and to endorse the development of country's economy.
2. Government price intervention causes domestic producer or consumer prices, or both, to deviate from their "free-market" level.
3. Understanding the various stakeholders' pressures on the government policy formulation process is an indispensable input to politicians in their attempts to alter incentive constraints through institutional reforms.

#### 1.5 Expected outcome of the study

Rice prices have subtle and dynamic effects on the entire economy in addition to their direct and more immediate impact on the agricultural sector itself. An efficient rice production, domestic and export marketing system is an important means for raising the income levels of farmers and for promoting the economic development of the country. Moreover, policies to improve the efficiency of rice marketing followed by the well-organized rice market institution would also support a self-accelerating impact on productivity.

Before formulating any such policies, it is necessary to find out and examine the current rice export marketing system of the country and the policy context in order to find out the major conflict in the rice market. The descriptive analysis of this study can also be expounded the systematic document for the current situation of rice export marketing system of the studied area concerned.

Given the crucial role of rice for growth of agriculture and for food security, the government needs to ensure that markets develop in a balanced manner, without

adversely affecting the development of the rural economy and the food security of vulnerable groups. This “need to intervene” exists even when the intervention would otherwise be considered as distorting market signals to producers and consumers, and some balance between the need for revenue and the magnitude and impact of the distortions must be struck. Price policy analysis can help identify the trade-offs in given circumstances and can even point the way to more efficient sources of revenue. But the analysis cannot eliminate the dilemma and the need for government price interventions. With appropriate weights attached to reflect this variance, the general objectives for the food sector which are the representative of the goals can be pursued by the government.

#### 1.6 Organization of the study

The study is composed with six chapters as follows:

**Chapter 1** includes the background information of rice and rice trade policies of Myanmar. Problem statement, objectives of the study and usefulness of the study are also presented in this chapter.

**Chapter 2** provides the theoretical background and conceptual framework for this study. In this chapter, the literature review for rationales of government intervention; government intervention in agriculture; agricultural price policy analysis; and measuring the effect of agricultural policies will be prescribed.

**Chapter 3** mentions Myanmar’s rice market under changing government export policies including performance of the rice sector in the national economy; Myanmar rice policy context before and after the first market liberalization; existing Myanmar rice export system; regional rice surplus export scheme in 2007-08 and marketing activities and constraints of the surveyed companies.

**Chapter 4** describes the methodology accepted for the study. In this chapter, a theoretical

framework of Myanmar rice policy mix model will be built up in order to specify the impact of government interventions in the rice market including concept of price policy analysis; review of government interventions in Myanmar rice sector; Myanmar rice policy mix model build up; data collection and calculation procedure; distinct feature of Myanmar rice policy mix; and theoretical concept of Myanmar rice policy mix shifting impact and feasible region determination.

**Chapter 5** explores the impact of Myanmar rice policy mix by using the theoretical model built up in the chapter 4 in order to verify the potential gainers and losers from the recent Myanmar rice policy setting and to generate alternative policies which will be relevant to its social, economic and political goals. This chapter is composed of functions of the rice policies in Myanmar; estimating the impact of Myanmar rice policy mix; simulation of the rice policies in 2008; results of the policy mix simulations; and weighing the policy shift conflict.

**Chapter 6** deals with the synthesis of the results and findings of the study. This final chapter encompasses with the drawing conclusion, policy application and suggestion for the further studies.

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Rationales of government intervention

Government interventions induce a diversity of consequences and they are also motivated by a multiplicity of desired effects. Some of these interventions contribute to enhancing the efficiency of resource use and, hence, the aggregate level of income. Others clearly pursue non-efficiency objectives, which often will have an efficiency cost. By creating net social gains, policies that enhance efficiency can achieve political feasibility either if there are no losers or if compensation of losers by gainers can be managed. Policies which have non-efficiency objectives can achieve political feasibility directly or through political management if they create efficiency gains. If they do not, the political feasibility of non-efficiency goals depends on the relative political power of gainers and losers. Identifying the incidence and magnitude of these gains and losses is thus fundamental to managing the political feasibility of policy reforms (Gardner, 1987).

The efficiency rationale for government intervention is based on policy makers' perceptions that markets are failing to perform adequately in conveying price signals, in allowing low cost transactions, or in prompting entry in a sector of economic activity, resulting in suboptimal use of resources for achieving maximum aggregate income. This includes both long recognized forms of market failure, such as public goods, externalities, economies of scale, and imperfect competition, as well as more recently recognized forms such as transactions costs and imperfect information.

Government intervention is also motivated by objectives other than efficiency. It can be in response to self-interested government officials' concerns with the income

consequences of the outcome of market forces and efficiency oriented policies, or in response to the demands of organized interest groups; generally it is a combination of both (Zusman, 1976).

## 2.2 Government intervention in agriculture

Governments intervene in agricultural markets with trade and domestic support policies differ widely across developed and developing countries, with quite different impacts on their producers, consumers, and taxpayers. Support for agriculture in developed countries came into sharp focus during the 1986–94 negotiations of the Uruguay Round Agreement on Agriculture (URAA) of the World Trade Organization (WTO). Agriculture in OECD countries receives support from government policies of one form or another totaling almost a billion dollars a day, a level that has significant repercussions on developing country agriculture (Orden, et al 2007).

Schiff and Valdés (1992) said that protection for food producers has been a publicly stated objective of many developing countries which have sought to raise their level of self-sufficiency in response to the perceived unreliability of world markets. Direct intervention has also been used frequently to stabilize domestic producer prices relative to prices on world markets. In contrast, the government of some developing countries has also intervened in agricultural markets by subsidizing the costs of food for urban consumers by fixing retail food prices by government edict, or imposing ceilings on producer prices. Another approach has been to establish dual pricing systems that keep producer prices high and consumer prices low, with the government making up the difference out of its own budgetary resources.

Intervention usually reduced agriculture's share of gross national product and led to slower growth in agricultural production and agricultural exports. At the same time, the

administrative complexity of intervention increased, and so did illegal activities such as smuggling, as producers and traders sought to evade the costs imposed by price intervention. Policymakers often failed to gauge accurately the effects of price intervention on such things as agricultural output, the government budget, and the balance of payments and also failed to anticipate the reactions of specific groups to price intervention. For all these reasons, the policymakers often found it necessary to amend existing policies or to devise new ones.

Timmer (1975) argues that food prices are irrelevant to the long-run development process since both producers and consumers are insensitive to changes in prices. Consequently, political leaders can feel free to manipulate food prices for whatever short-run political effect is desirable. Usually this manipulation takes the form of keeping urban food prices low to satisfy workers, politically active students, and the urban middle class. Moreover, food prices are a critical factor in farmers' decisions about what crops to grow and how intensively to grow them, even in fairly traditional peasant economies. In the presence of new biological and chemical technologies that offer significantly higher yields for basic food crops when used properly in a package, price incentives become the major factor in determining what yields farmers will achieve.

Sadoulet, and de Janvry (1995) convinced that security is an important dimension of welfare. This requires that the poor be able to successfully engage in consumption smoothing. The policy instrument to use for this purpose depends on the sources of income the poor have and the institutional mechanisms they use to gain access to food. For net buyers, this will require interventions to stabilize price, which can be achieved through international trade controls (variable levies and quota), buffer stocks, price fixing and rationing, and use of futures markets. For net sellers, it is stabilizing income, not the prices of what they produce, which is important. This requires calling on irrigation,

diversification, and crop insurance schemes. Access to credit for consumption smoothing is an effective mechanism for allowing the poor to assume greater risks in income generation and, thus, to achieve both efficiency and welfare gains. Policies and programs, such as food subsidies and social funds, are also introduced to compensate for the welfare effects of unexpected external shocks.

World development report (2008) mentioned that complementary policies and programs are needed to compensate losers in developing countries and to facilitate rapid and equitable adjustment to emerging comparative advantages. Supply response to trade reforms depends on public investments in core public goods such as irrigation, roads, research and development, education, and associated institutional support. But public investments in agriculture are too often squandered on regressive subsidies. Significant room remains for improving the efficiency of public resources by increasing investments on high-priority public goods. Needed are actions to increase information, accountability, and commitment. Information gaps in public knowledge of budget allocations and impacts of public spending on agriculture have to be closed through greater publicity and transparency of budget allocation and evaluation.

### 2.3 Agricultural price policy analysis

Agricultural price policy has been a major instrument of government intervention, with the goal either of increasing the contributions of agriculture to economic development or of enhancing the welfare of farm households. In other instances, price policy has been used to satisfy the rent-seeking demands of special interests. Price distortions against agriculture have been blamed for the stagnation of agriculture in the LDCs (Schultz, 1978) and for the squeeze on agricultural incomes (Sah and Stiglitz, 1984). In the MDCs, price distortions in favor of farmers are blamed for exhausting government budgets and

imposing heavy taxes on consumers (Gardner, 1987). In many LDCs, food subsidies also create heavy drains on government budgets. These distortions in agricultural and food prices have become a hotly debated political issue among any array of interest groups representing producers, consumers, governments, international competitors, and environmentalists (Sadoulet and de Janvry, 1995).

However, fewer estimates are available of support provided by developing countries for the recent period, such as from the Uruguay Round onward. One does not really know how much support (positive or negative) the governments of developing countries are providing to their agriculture through a complex web of policies, nor what impact this support has on their own agriculture and on world agriculture more broadly.

A first level of analysis in assessing agriculture price policy consists of characterizing the magnitude of domestic price distortions through a set of indicators and tracing out the impact of these distortions in a partial equilibrium framework. Even if the analysis is subsequently extended to multimarket and general equilibrium analyses, a necessary starting point is to first characterize the nature of the distortions in each market. Partial equilibrium analysis of these distortions indeed gives a reliable first-order approximation of their total effects that will rarely be fully overwhelmed by second-round and general equilibrium effects (Gardner, 1987).

The analysis of agricultural price policy has two concerns: understanding the influence of current prices on the structure of production and the distribution of welfare; and tracing the dynamic impact of changes in those prices. The standard partial-equilibrium using border prices as the measure of domestic opportunity cost addresses their issues at one level by measuring gains and losses in producer and consumer welfare, transfers to and from the budget, changes in foreign exchange earnings and expenditures and dead-weight efficiency losses. But these welfare effects

are at an aggregate level only. They do not distinguish among the consequences for low income and high income consumers, for example, or among the various producers who receive or pay the transfers implied by domestic prices set at a level different from world prices (Timmer 1986).

The initial framework for the welfare analysis of changes in price policy is a static and partial equilibrium one. The dynamic and general equilibrium consequences of price changes are extremely hard to measure or predict, since no economy is understood well enough for these effects to be modeled except in the roughest, intuitive way. But this does not mean that the consequences are unimportant or that price policy analysts could or should ignore them. Incorporating the impact of changed food and agricultural prices on other markets, on the structure of investment, and on long-run patterns and distribution of economic growth is also an important analytical task, no matter how rough the answers may turn out to be. These issues also take the analyst of price policy into the macro policy debate, this time via budgetary, fiscal, and monetary issues in addition to the debate over macro price policy.

#### 2.4 Measuring the effect of agricultural policies

Krueger, Schiff and Valdés (1988) estimated the impact of sector-specific (direct) and economywide (indirect) policies on agricultural incentives for eighteen developing countries for the period 1975-84. The direct effect is measured by the proportional difference between the producer price and the border price (adjusting for distribution, storage, transport, and other marketing costs). The indirect effect has two components. The first is the impact of the unsustainable portion of the current account deficit and of industrial protection policies on the real exchange rate and thus on the price of agricultural commodities relative to nonagricultural nontradables. The second is the

impact of industrial protection policies on the relative price of agricultural commodities to that of nonagricultural tradable goods.

Moreover, in 1991, Krueger, Schiff, and Valdés also studied agricultural policy distortions in 18 developing countries over the period 1960–85. Their findings, based on a partial equilibrium framework, revealed that developing countries had inflicted substantial implicit taxation on their agricultural sectors through their restrictive trade, pricing, and exchange rate policies. The implication was that the policies of developing countries had limited the output and growth of their agriculture. The effect of removing these distortions was estimated to be substantial. In particular, it was estimated that the rate of growth in agriculture in these countries would as much as double if the distortions were removed.

Coady, Dorosh, and Minten (2009) set out a partial equilibrium framework to evaluate the efficiency, distributional, and revenue implications of alternative policy responses. The model is applied to evaluate tariff reductions and targeted transfers in Madagascar. Although lowering tariffs generates substantial efficiency gains, these accrue mainly to the top half of the welfare distribution, and poor net sellers are actually worse off. Developing a system of targeted direct transfers to poor households is likely to be a substantially more cost-effective approach to poverty alleviation.

Kizilaslan and Gurler (2005) measured the market price support and difference payment system practices in Turkey using partial equilibrium model. In the study, "wheat" has been taken into account, which is generally accepted as the key product. In accordance with the results of the study, it has been established that "DPS" is the preferred alternative as far as net social revenues are concerned, and "MPS" is the preferred alternative as far as reducing the budget burden is concerned.

Mergos, Karadeloglou and Stoforos (1999) showed the use of such a partial

equilibrium, multi-market, synthetic-type model as a tool for agricultural policy analysis in a country in transition. The model is applied for Albania, a predominantly agricultural country that, after a period of centralism and autarky, aims to re-join the international economic system. The model, albeit its many limitations, offers some useful insights on the impact of alternative options available for agricultural price and trade policy.

Breisinger, Yokogawa and Song (2005) discussed the obstacles on the way to political reform and to more openness of the rice trade of Japan. With the framework of a partial equilibrium model we quantify the benefits that can be expected by extensive trade liberalisation and show that the Japanese consumer and rice producers in developing countries largely carry the burden of the current system that only conserves the highly inefficient Japanese rice farming structure.

Cramer et al. (1990) used a partial equilibrium framework to estimate the deadweight loss arising from government intervention in the US rice market in order to protect domestic producers. The efficiency of the rice program is compared to other grain programs. Deadweight losses relative to taxpayer and consumer costs from rice programs in recent years were only slightly higher compared to the same measure associated with major commodity programs. The primary source of deadweight losses in rice programs result from set-asides. The potential savings from completely decoupling the rice program are estimated to reach US\$387 million for 1987.

Alston et al. (1999) addressed the issue of why different governments select different food subsidy policies, using multiple instruments rather than a simple across-the-board subsidy to provide consumers with access to cheap food. It examines the optimal structure of cheap-food policies in the context of a partial equilibrium model in which the country may be large in trade, and is able to combine import subsidies or tariffs, and output taxes or subsidies, to transfer income to consumers through the market.

Bakhshoodeh and Thomson (2006) measured the welfare effects of removing the current controls on the rice trade, and a domestic rice coupon program, evaluated by applying a partial equilibrium analysis to 1961–1999 data in Iran. The results show that, as far as foreign exchange is concerned, liberalization of the rice market causes an increase in rice imports, mainly due to a decrease in domestic supply. In welfare terms, the loss in producer surplus from rice market liberalization is relatively high, but most rice consumers, and the Iranian taxpayer, would gain. Overall, gains to consumers and taxpayers are estimated to be higher than the losses incurred by domestic suppliers, and therefore net social welfare at national level can be improved by rice market liberalization in Iran.

Choeun, Godo and Hayami (2006) tried to identify the factors underlying changes in rice export taxation in Thailand in 1950-1985 based on simulation analysis using the partial equilibrium trade model. It was found that the Thai government over-taxed rice exports during the low-income stage and gradually reduced it to a more optimum level corresponding to increases in per-capita income, but more recently moved to under-taxation in terms of social welfare maximization for the nation. The results are consistent with the hypothesis that the process of export tax reductions reflects the shifts in the political equilibrium from the point of favoring urban interests at the expense of farmers to that of favoring farmers more. In this process, the economic welfare of the nation as a whole does not appear to have entered into politicians' calculations as a significant factor in their policy decisions.

Minot and Goletti (2000) used a partial equilibrium model of the national economy to investigate the effects of Vietnamese rice policy liberalization. Proponents of partial equilibrium models stress that a higher degree of detail allows for more focused analyses in which more efforts can be devoted to correct policy representation, and

parameters and functional forms can be estimated for the specific purpose at hand. The main objective of this report is to examine the new set of food policy issues facing Vietnam as a result of its transformation into a major rice exporter and its transition toward a market economy.

Won and Taylor (1999) analyzed supply and demand fundamentals for rice in the world market under alternative trade liberalization policies in Japan and Korea and implications on the world rice economy. The study is based on the baseline and trade liberalization scenarios. The baseline scenario is based on the most likely assumptions on macroeconomic conditions and trade policies in the countries in the scenario. The trade policies are mainly individual countries' commitments under the UR agreement. On the other hand, the partial trade liberalization scenario includes a partial liberalization of rice imports in Korea and Japan from the year completing the minimum market access commitments under the UR agreement to 2010.

The economic impact of marketing and trade policy research in Vietnam (Ryan, 2002) conducted by the International Food Policy Research Institute (IFPRI) is assessed using a novel benefit-cost framework. Linking a spatial equilibrium model with income distribution analysis based on national household surveys, allowed IFPRI to satisfy policymakers that relaxing rice export quotas and internal trade restrictions on rice would not adversely impact on regional disparities and food security, and would have beneficial effects on farm prices and poverty.

Aung (2006) used a partial equilibrium model to evaluate the impact of the Myanmar government's pricing policy focusing in particular on the effects of welfare for rice producers and consumers from 1990 to 2003. The results indicate that producers are losers and hurt the rural people who especially grow rice. At the same time consumers get benefit from the intervention almost every year except in 1993, 1995 and 2003.

## CHAPTER III

### **MYANMAR'S RICE MARKET UNDER CHANGING GOVERNMENT EXPORT POLICIES**

Adequate supplies of rice and relatively low rice prices benefit urban consumers and help to maintain competitive prices for consumer and export goods. Conversely, short supplies and rising rice prices generate inflationary pressures on wages and tend to create political instability. The importance of rice in both rural and urban economic development subjects the rice economy to political pressures that are often detrimental to efficient growth. To protect against uncertainty, policies to improve the efficiency of rice marketing are necessary followed to build up a well-organized rice market institution by supporting a self-accelerating impact on productivity.

Before formulating any such policies, it is necessary to find out and examine the current rice export marketing system of the country and the policy context in order to find out the majority conflict in the rice market. The descriptive analysis of this study can also illustrate the systematic document for the current situation of rice export marketing system of the studied area concerned. A competent rice export marketing structure is also a mean to elevate the earnings of farmers and to endorse the development of country's economy.

Thorough studies of the Myanmar rice export market conditions, including institutional changes and the currently established marketing system and dilemma of Myanmar rice policies have not been sufficiently documented. Thanda (2000), MAPT (2003), Lwin (2005), Okamoto (2005) and Theingi (2007) provide overviews of

Myanmar rice marketing system. This chapter will be composed of performance of the rice sector in the national economy, Myanmar rice policy context before and after the first market liberalization, existing Myanmar rice export system, regional rice surplus export scheme in 2007-08 and marketing activities and constraints of the surveyed companies.

### 3.1 Performance of the rice sector in the national economy

Rice is important to a large proportion of the world population as it is consumed in 175 countries. Rely on rice as a staple food is particularly factual in Asian countries, where almost 90.5 percent of global paddy was produced and in which 78.9 percent of the paddy produced was used as domestic food supply in 2005 (FAOSTAT). Since rice production was geographically concentrated in Asia, 9 out of top 10 paddy producing countries in 2008 were Asian countries (Table 3.1). China and India supplied 49.9 percent of total world paddy produce and Brazil was the only one non-Asian producer in the top 10 paddy producing countries. In 2008, Myanmar's paddy production ranked 6th among the top 10 paddy producing countries in the world.

Table 3. 1: Major paddy production countries in the world (2008)

No.	Countries	Production, Paddy Thousand MT
1	China	193,354
2	India	148,260
3	Indonesia	60,251
4	Bangladesh	46,905
5	Vietnam	38,725
6	Myanmar	30,500
7	Thailand	30,467
8	Philippines	16,816
9	Brazil	12,100
10	Japan	11,029

Source: FAO online database, FAO update December 2009

On the other hand, per capita rice consumption of 196kg per year indicates the extremely high dependency of Myanmar's people on rice, compared to neighboring Asian countries in 2003 (Table 3.2). Because of 2 percent annual population growth, national long term planning has been established to enhance annual rice production by all means to maintain food security, but also to generate a considerable surplus for foreign export. As a consequence, rice is becoming a nationally important crop for the social and political stability of Myanmar throughout history. The stabilization of essential rice prices at a low level conforms to the main objective, which is to avoid social unrest. This explains why rice policies in Myanmar have a strong inclination towards production increases for their own sakes while paying rather less attention to farmers' income and welfare.

Table 3. 2: Rice consumption pattern in major rice consumption countries (2003)

No.	Countries	Consumption of milled rice	
		kg/capita/yr	kcal/capita/day
1	Myanmar	196	1915
2	Vietnam	169	1663
3	Lao People's Democratic Republic	168	1493
4	Bangladesh	160	1598
5	Cambodia	148	1421
6	Indonesia	141	1392
7	Timor-Leste	112	1184
8	Philippines	110	1087
9	Thailand	104	1040
10	Madagascar	98	1000

Source: FAO online database, FAO update October 2008

In recent years, rice, oilseed crops, industrial crops and maize have been the crops on which the present government has placed a strong priority with the provisions of the regime in mind. In this regard, the avoidance of social unrest and the maintenance of the state enterprises have been two key imperatives. Farmers, traders and processors dealing

with these crops are daily struggling to find a way of avoiding, or of reducing, the negative impact of government policy. The effect of the government's role has been to limit exports (for example of rice) and to promote the cultivation of crops under disadvantageous conditions (rice, oilseed crops, and industrial crops).

Myanmar could not fully utilize its potential in the development of rice sector. Myanmar government's rice export policy is diverged from the neighboring rice export countries' which attains a remarkable increase in rice production and occupies an extensive share in world rice trade. While those countries accelerate the rice export by introducing export quota system, the rice export ban in Myanmar limits the development of rice sector which is the largest agricultural producing sector until now.

Regarding the rice export policy, it is evident that if export is allowed, the domestic market price will be increased, given other things being equal. Because rice is the staple food, the government has to be very sensitive to the problem of higher rice price, especially at the early stage of economic development. Even a slight increase in the rice price will easily endanger the life of many urban people. However, the same problem becomes much more serious in Myanmar where in addition to urban population there are numerous net rice purchasers in rural areas, in the form of poor landless agricultural laborers. This also explains why Myanmar government could not dare to liberalize rice export even gradually, in contrast to the case of the neighboring countries.

### 3.2 Myanmar rice policy context before and after the first market liberalization

As the rice policy was different in each government era, exportable amounts varied from about 3 million MT under the British government (colonial I, II, III) to 0.2 million MT under the present government, as shown in Table 3.3. Because of the revolution of export-oriented commercialized agriculture by the British government, Myanmar was the

number one rice exporter and the ‘Rice Bowl of Asia’ as early as 1890 (MAPT, 2003). After independence, the Myanmar government started to fulfill the implementation of national food security policy and releasing rice export amount after rationing shrank year by year.

Table 3. 3: Average export variation in different government eras

Year	Regime	Harvested area (‘000 ha)	Yield (MT/ha)	Production (‘000 MT)	Export (‘000 MT)
1826-00	Colonial I	n.a	n.a	n.a	639
1901-20	Colonial II	n.a	n.a	n.a	2,179
1921-41	Colonial III	4,713	1.6	7,415	2,863
1942-45	Japanese Gov.	3,495	1.3	4,761	0
1946-61	Parliament	3,667	1.5	5,437	1,404
1962-73	Revolutionary	4,751	1.6	7,369	552
1974-87	Socialist Gov.	4,742	2.6	12,141	483
1988-03	Present Gov.	5,552	3.1	17,632	280

Source: Theingi Myint (2007) & MAPT (2003)

In December 1963, the government nationalized the rice marketing, and had paid special attention to the domestic rice distribution system. The Public Trade Corporation, one of the State Enterprises, carried out the domestic rice distribution. The required amount of rice for domestic distribution was supported by the Union of Burma Agricultural Marketing Board. Since July 1964, the government fixed the domestic rice price all over the country regardless of the region whether rice was produced or not.

In September 1987, the first market liberalization process began with the domestic agricultural market. Myanma Agricultural Produce Trading (MAPT) was responsible for marketing of rice and paddy and implemented a rice ration system to the target groups including public servants and social welfare with reasonable price. Purchasing only about 10 percent of national paddy output at the prices fixed from time to time had been shown

the relaxation of domestic rice marketing with the objectives of permitting farmers, traders and millers to trade 90 percent of the total output freely in the domestic market. As shown in Figure 3.1, private rice marketing and government procurement channels existed after the first market liberalization. The rice rationing system targeting general consumers was abolished with the first market liberalization, and the system was limited to targeting public servants and welfare. As the national food security policy was the priority issue of the nation, rice export was under the state control as a major source of foreign earnings.

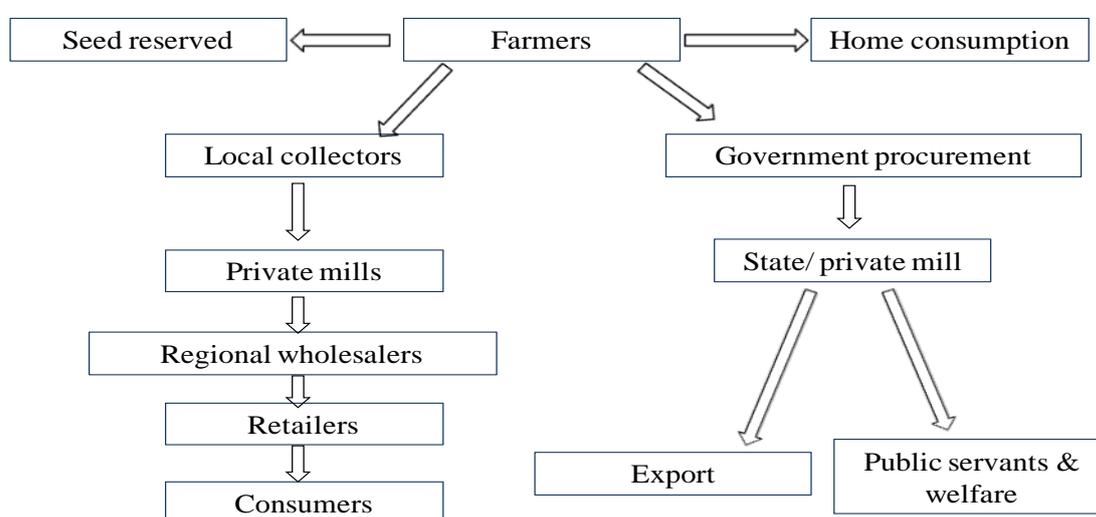


Fig 3. 1: Rice marketing channel in Myanmar after the first market liberalization

The ban on the private export of agricultural produce was lifted, and the marketing of some crops enjoyed full liberalization including pulses (peas and beans) in October 1988. However, the rice marketing was remained under state control to maintain the stability of the nation (Okamoto, 2005). As a result of the full liberalization of the pulses market, pulses export earning was increasing gradually and occupied a significant role in agricultural export. A sharp decline in rice export earning under state monopoly, which fell from 42 percent of total export earnings in 1980 to 3.2 percent in 2002 (CSO, 2006) revealed the unreliability of Myanmar's rice exports for the world demand. As a result of

the long-lasting state monopoly and unreliable rice supply, Myanmar lost trading partners year after year. In 2002-03, major importers of Myanmar rice were Southeast Asian and the Middle East countries. Almost 85 percent of Myanmar rice was sold to low income countries under the state monopoly control of rice trading.

### 3.3 Existing Myanmar rice export system

Myanmar has been a member of the WTO since 1995 and of the Association of South East Asian Nations (ASEAN) since 1997, and has therefore committed itself to reducing tariffs and dismantling non-tariff barriers over a specified period of time. These institutions pressured the government to undertake market oriented policy reforms in line with economic globalization under the structural adjustment program. These reforms included the state withdrawal from production and marketing protection in the overall agricultural sector, including the rice sector, in order to develop greater trade and industrial linkages among member countries.

In April 2003, the Myanmar government suddenly announced the second liberalization of rice marketing aimed at ensuring a beneficial paddy price to farmers and at the same time at enabling consumers to get rice at a fair price (MAPT, 2003). Under this liberalization, the rice ration system was totally abolished, and the government allowed traders to export surplus rice. An entrepreneur who developed an uncultivated deep-water area was also entitled to export. The government imposed taxes on rice exports, and the rate had been fixed at 10 percent. However, the rice export plan was pulled back again in January 2004, because of an uncertain rice surplus. In this case, the highly volatile rice export policies reduced the confidence of traders in the government, and increased risk-averse attitudes toward business expansion and investment in new facilities.

After the second liberalization, rice exports were still reduced year by year. Myanmar

exported only 0.4 percent to 12 percent of its rice surplus, compared to about 40 percent to 60 percent of rice surplus in 1994-95 and 2001-2002 respectively, as shown in Table 3.4. Uncertainty about the national rice surplus, and the unpredictable amount of illegal rice export to neighboring countries could not allow the government to withdrawal its hand completely from the rice export sector. Myanmar's self-sufficiency policies, which generated an unstable rice export, and the loss of trading partners, introduced significant barriers to international rice trade. As a consequence, Myanmar's rice export share dropped to a negligible amount, when the neighboring countries possessed one third or one fourth of the world market.

Table 3. 4: Unstable supply of Myanmar rice exports

Year	Production (mil MT)	Consumption (mil MT)	Surplus		Export (mil MT)	Export % per surplus (%)
			Paddy (mil MT)	Equivalent rice (mil MT)		
Before second liberalization						
1994-95	18.03	15.28	2.75	1.65	1.04	64
2001-02	21.57	17.63	3.93	2.36	0.94	40
After second liberalization						
2003-04	23.13	18.34	4.79	2.87	0.33	12
2004-05	24.72	18.75	5.97	3.58	0.09	3
2005-06	27.68	19.24	8.44	5.06	0.19	4
2006-07	30.49	19.76	10.73	6.43	0.06	0.9
2007-08	31.44	20.11	11.33	6.79	0.03	0.4

Source: raw data from Ministry of Commerce and Ministry of Agriculture and Irrigation, 2008

Because of the unclear rice export licensing procedure, the number of rice export companies and export quantities were fluctuating in each year after the Myanmar rice market was fully liberalized (Table 3.5). The uncertain licensing procedure itself incurs costs on applicants for rice exports, and it deters applications. After liberalization, two Government associations, Myanma Agricultural Produce Trading (MAPT) and Ministry of

Agriculture and Irrigation (MOAI) were not involved in rice exports, except for allocating the existing stock.

Table 3. 5: Government export and private export after the 2nd liberalization

Year	Government enterprise export		No. <sup>a</sup>	Company export		Total export (MT)
	Quantity (MT)	%		Quantity (MT)	%	
2003	323,424.4	97.9	10	6,861.5	2.1	330,285.9
2004	88,881.3	94.7	3	5,000.0	5.3	93,881.3
2005	81,818.0	42.8	13	109,303.6	57.2	191,121.6
2006	744.0	1.2	8	61,148.0	98.8	61,892.0
2007 Jan-Nov	0.0	0.0	9	34,013.7	100.0	34,013.7

Source: raw data from Ministry of Commerce, 2008

<sup>a</sup> the number of rice export companies

### 3.4 Regional rice surplus export scheme in 2007-08

On December 7, 2007, the chairmen of the Commodity Price Stabilization Committee and the Export Import Supervising Committee called a meeting that aimed at enforcing the rice export sector by introducing a regional rice surplus export scheme. In attendance were representatives of State Peace and Development Council, the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) and rice exporters. The export quotas and the export companies for rice surplus regions were decided at that meeting. In addition, the explicit targets for the domestic paddy price and the market price were set up to avoid consumer price hikes as a result of rice export. The Emahta, Indica variety paddy (unhusked rice) price was fixed at 350,000Kyats in Myanmar currency per 100 baskets of paddy (2086kg), and the Emahta 25 percent (broken rice) of milled rice price was set at 14,500Kyats per 1.5baskets of milled rice (50kg). If the domestic rice price increased because of manipulation, the government would restrict rice export permission in favor of local rice price stability. Moreover, scheduled shipping periods (from 2008 January to March), the number of rice export companies for the respective regions,

supervisory methods for buying rice to export from the surplus regions, and the designated exporting countries were also established at that meeting .

Table 3. 6: Regional rice surplus in the respective region (2006)

Region	Sown acre (‘000 ha)	Production (‘000 MT)	Consumption (‘000 MT)	Surplus		
				Paddy (‘000 MT)	Rice (‘000 MT)	Share (%)
Ayeyarwady	2,005.7	8,287.6	2,779.0	5,508.7	2,640.8	44.3
Bago	1,380.4	5,287.9	2,114.6	3,173.3	1,521.3	25.5
Sagaing	923.9	3,740.2	2,125.7	1,614.5	773.9	13.0
Yakhine	496.6	1,810.6	1,097.8	712.8	341.7	5.7
Country total	8,085.4	31,448.4	19,008.0	12,440.4	5,963.8	100

Source: Ministry of Commerce, 2008

Table 3. 7: Proportion of rice export in the respective region (2007 Dec-2008 May)

Region & association	Export license permitted			Actual export	
	Companies no.	Quantity (MT)	Proportion (%)	Quantity (MT)	Proportion (%)
Ayeyarwady	13	200,000	43.0	175,441	87.7
Bago	5	100,000	21.5	70,407	70.4
Sagaing	4	100,000	21.5	33,396	33.4
Yakhine	2	10,000	2.2	6,050	60.5
Other associations	2	55,000	11.8	34,107	62.0
Total	26	465,000	100.0	319,401	68.7

Source: Ministry of Commerce, 2008

Although the members of the rice and paddy traders associations were 12,426 in March 31, 2008, only 26 trading companies were allowed to export rice. Barriers to enter rice export business exist as a result of government restriction on the export license allotment. The four highest rice surplus regions — Ayeyarwady, Bago, Sagaing and Yakhine Division — were allowed to export surplus rice. Among them, Ayeyarwady Delta region possessed 44.3 percent of the country’s surplus. Rice surplus from Ayeyarwady,

Bago and Sagaing Division had to be exported via Yangon Port.

Ayeyarwady delta region was allowed to export the highest rice amount (200,000 MT) which was 43 percent of the total regional export allowance (465,000 MT). Because of Cyclone Nargis in May 2008, the tentatively approved rice amount could not be exported and the actual export amount was different from the export license permitted as shown in Table 3.7. Among the four regions, Ayeyarwady was able to export the greatest percentage, about 87 percent of the permitted amount, 200,000 MT.

### 3.5 Marketing activities and constraints of the surveyed companies

In order to gather more accurate information about the merchants' activities in the rice export sector, marketing surveys were conducted in July and August of 2008. The selection of Ayeyarwady-based companies to study the export marketing system was motivated by the fact that it was the largest rice producing area, and was thus believed to provide a fair representation of the overall rice export market. One company from the association group was selected to conduct the survey, as it was the only one associated with rice and paddy traders in Yangon.

Table 3. 8: Surveyed area and share of export in the respective region

Trading associations	Actual export (MT)	Surveyed companies		
		No.	Export quantity (MT)	Proportion of export to actual export (%)
Ayeyarwady companies	175,441	8	141,495	80.7
Other associations	34,107	1	18,187	53.3
Total	209,548	9	159,682	76.2

Source: Marketing survey (2008) and own calculation

As mentioned in Table 3.8, eight surveyed companies in Ayeyarwady exported 141,495 MT, which held about 80 percent of actual export (175,441 MT) in the respective

region, and one company among the other associations possessed a 53 percent share of actual exports in that group. Therefore, the export quantity of surveyed area (159,682 MT) covered an average 76 percent share of the total actual export (209,548 MT) of the respective region.

Table 3. 9: Business experience of the surveyed companies

Business experiences	Range of the year
Establishment of company	1994~2007
Entry of rice business	1999~2007
Exporting rice	2005~2008

Source: Marketing survey (2008) and own calculation

The year of the surveyed company's establishment ranged between 1994 and 2007 and the rice business beginning years also varied between 1999 and 2007 (Table 3.9). 55.6 percent of the surveyed companies started the rice export business from 2005 and 44.4 percent of those companies began from 2008. About the assets of those companies as rice export trading, 33.3 percent of the surveyed companies owned warehouse in Yangon and in local area. Those companies did not hold depot at the biggest rice wholesale market, so called Bayint Naung market and did not also possess rice polishing machine and sorting machine which were necessary for the quality improvement of export rice. However, they owned milling plants at the local areas.

The export rice (not unhusked rice, paddy) was purchased separately from the millers at the designated rice producing regions by the government. Only one company which was the cooperation of regional rice traders shared the permitted exportable rice amount to their members to ship to the warehouse in Yangon. One cooperation company from Yangon also bought 50 percent of rice export from Yangon Traders and others from local millers. The major purchasing period ranged from December to May after the main rainy harvest. There

was no storage period because of the attempt to export immediately after the purchase. The transactions of rice purchasing for export were contract buying at the local rice mills by the measure of local area such as 105lb per bag instead of 50kg (110lb per bag). Provision of capital in advance to the local millers depended on the trust, 30-50 percent or 70-80 percent in advance according to the business relations with the millers.

To penetrate the world rice market by high quality rice export, uniform quality rice will be necessary from good rice varieties. Although the requirement of export quality rice was 25 percent (broken rice) of milled rice, the quality of purchased rice in the local area could not uniform because of the different types of rice mills. Buying from several mills in order to fulfill the required amount within the time allotted induced quality variations and uneven rice appearance. It was necessary to mix and repack the shipped rice from the local area to obtain the suitable quality for export, which significantly increased transportation and labor costs. Moreover, lack of warehouse facilities at the port was one of the main factors that increased the export processing cost. High quality rice mill, polishing machine, color sorter machine and government support are also necessary for the improvement of the Myanmar export rice.

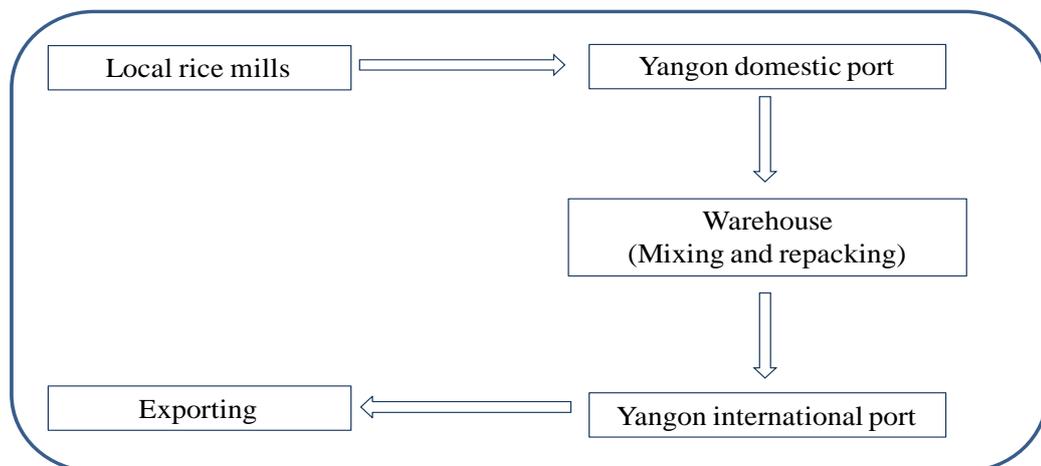


Fig 3. 2: Consigning and processing of rice exports

Source: Marketing survey (2008)

Table 3. 10: Rice export processing costs (2007 Dec-2008 May)

Item	Average cost per MT (Kyats <sup>a</sup> )
1. Average rice price at the Ayeyarwady division	260,000
2. Processing cost for export	
a. Agent fees for export license applying	200
b. Transportation cost from the Ayeyarwady division to Yangon	8,000
c. Transportation cost to warehouse	5,000
d. Loading/ unloading cost	1,260
e. Mixing and repacking cost	1,300
f. Packing material cost	6,440
g. Warehouse leasing cost	880
h. Loading cost	400
i. Transportation cost to port	5,120
j. Port charges	60
k. Customs examination charges	150
l. Labor charges	400
m. Fumigation charges	920
n. Certificate charges	1,117
o. Service charges	400
Total processing cost	31,647
3. Total transportation cost (b+c+i)	18,120 (57.3)
4. Total labor cost (d+e+h+l)	3,360 (10.6)

Source: Marketing survey (2008) and own calculation

<sup>a</sup> Kyat is the Myanmar currency; ( ) indicates % of cost to total processing cost

As mentioned in Figure 3.2, exporters had to transport purchased rice from the local mills of the respective regions to the domestic port of Yangon by boats or trucks. From the domestic port of Yangon, it was necessary to convey the cargo to the warehouse for mixing and repacking to obtain the required quality. When the freight was ready, cargo was sent to Yangon port to be shipped. According to the survey data in Table 3.10, transportation accounted for 57.3 percent and labor cost was 10.6 percent of the total rice export processing cost. As mentioned above, the considerable amount of transportation cost in

export processing was the outcome of the several steps needed to convey cargo from local areas to the port.

Table 3. 11: Rice export prices and profits (2007 Dec-2008 May)

FOB Yangon price per MT (US\$)	Price after deducted 10% export tax	Average earning rate <sup>b</sup> (Kyats/US\$)	Price per MT (Kyats)	Cost per MT (Kyats)	Profit per MT (Kyats)	% of profit per investment (%)
288.2 <sup>a</sup>	259.4	1,209.5	313,678.3	291,647	22,031	7.6
270	243	1,209.5	293,902.0	291,647	2,255	0.8
280	252	1,209.5	304,787.3	291,647	13,140	4.5
290	261	1,209.5	315,672.5	291,647	24,026	8.2
310	279	1,209.5	337,443.0	291,647	45,796	15.7
320	288	1,209.5	348,328.3	291,647	56,681	19.4

Source: Marketing survey (2008) and own calculation <sup>a</sup> Average FOB Yangon price pre MT (US\$);

<sup>b</sup> the selling rate of exporter's bank account of US\$ (export earning)

According to the trade policy in Myanmar, a company which possesses export earnings in terms of US dollars can import only the general commodities allowed by the government. Therefore, the export earning exchange rate should be used in calculating the gross income of rice exports, as mentioned in Table 3.11. It explains the variations in exporter profits according to export price variations during the exporting period from 2007 December to 2008 March. Exporters' profits varied from 0.8 percent to 19.4 percent per investment, with prices varying from US\$ 280 to US\$ 320 per MT of milled rice.

For the regional surplus export, the government allowed only low quality Indica variety, the Emahta to be exported. The trade name was "25 percent broken Myanmar rice Emahta." Exporters had to arrange to export within 3 months. Only the FOB Yangon price was used for rice exports. Although there are two types of payments — Telegraphic

Transfer (TT) and Letter of Credit (LC) — because of insufficient working capital, exporters preferred the TT method for their transactions. The uncertain rice export policy, the brief allotted time for exports, and the preferable Telegraphic Transfer payment method did not allow the rice exporters in 2007-08 to penetrate the world market, especially the world’s leading importers, Indonesia and the Philippines.

Instead of searching buyers in the international markets, all exporters usually accept the contact of usual foreign buyers. In negotiation method of pricing, 4 companies checked the world, Vietnam and Thai markets prices and 2 companies accepted the minimum price of rice export decided by Ministry of Commerce. Although the decision criteria of selling rice to the foreign buyers was adjusted according to the world market price, the Myanmar exporters needed to sell during the rice export license allotment period decided by Ministry of Commerce, and as a consequence to an extent, they were using the usual foreign buyer companies for selling their rice. Meanwhile, the paddy trader association sold their rice according to the decision of the directors of association.

Table 3. 12: World market penetration of the Myanmar rice (2007 Dec-2008 March)

Destination	No. of rice exporting company	Proportion of export quantity (%)
Bangladesh	22	56.7
Singapore	12	15.0
South Africa	5	17.3
United Arab Emirates	3	8.1
Bulgaria	3	2.1
India	1	0.9

Source: Ministry of Commerce, 2008

In 2007-08, about 57 percent of Myanmar rice exports went to Bangladesh. According to the data, Singapore purchased 15 percent of Myanmar’s rice. Almost all of Bangladesh’s purchase was via Singaporean buyers who could offer the TT advance payment preferred

by the Myanmar exporters. A small number of companies and few export quantities went to South Africa, UAE, Bulgaria and India. Low quality export, advance payment method, and few trading partners were reducing the efficiency of Myanmar rice export.

One result of the long-lasting government's intervention in rice export has been the separation of the domestic and international markets, which has led to a huge disparity between the domestic and international price of rice. Myanmar rice exporters failed to achieve the same price as neighboring countries did. Compared to the price of Thai and Vietnam rice, the Myanmar rice export price was significantly lower, only 58 percent to 78 percent of the Thai and Vietnam rice price.

Table 3. 13: Relatively low price of the Myanmar rice (2008 January - March)

2008 Month	Export prices of rice (US\$/tonne, FOB)			% of Myanmar rice price compared to	
	Thai	Vietnam	Myanmar	Thai	Vietnam
	25% rice	25% rice	25% rice	25% rice	25% rice
January	368	357	280	76.1	78.4
February	455	430	310	68.1	72.1
March	540	555	320	59.3	57.7

Source: FAO Rice Market Monitor (July, 2008) & Ministry of Commerce (2008)

## CHAPTER IV

### **A THEORETICAL FRAMEWORK OF MYANMAR RICE POLICY MIX**

Most governments actively seek to design and implement policies that are intended to improve this “hand-off” performance from the perspective of key interest groups in the society. Nearly any government intervention has at least indirect effects on food prices facing consumers or crop prices facing farmers and influences agricultural incentives in subtle and roundabout ways (Timmer, Falcon and Pearson, 1985). Agricultural prices have subtle and dynamic effects on the entire economy in addition to the direct and more immediate impact on the agricultural sector itself.

The initial analysis will explore the major ways in which current policy affects agriculture especially rice sector, to identify the important issues, and thus to initiate a policy dialogue aimed at improving the policy environment. At the outset, the motivation on the part of both analyst and policy maker engaging in such a policy dialogue is to understand the consequences of current intervention, to determine if they promote or undermine major objectives, and to design and implement more effective policies. Improving the policy framework is a continuous process, and the analysis itself should be viewed as part of continuing, iterative process that facilitates the policy dialogue.

The question now is more specific: What are the direct economic consequences of a government price intervention that causes domestic rice producers or consumer prices, or both, to deviate from their “free-market” level? In this chapter, a theoretical framework of Myanmar rice policy mix will be built up in order to specify the impact of government interventions in the rice market including concept of price policy analysis; review of government interventions in Myanmar rice sector; Myanmar rice policy mix

model build up; data collection and calculation procedure; distinct feature of Myanmar rice policy mix; and theoretical concept of Myanmar rice policy mix shifting impact and feasible region determination.

#### 4.1 Concept of price policy analysis

##### 4.1.a The market paradigm

The free-market level of price is subject to the working of the entire economy along with the full range of government policies and programs, and the word *equilibrium* as a situation in which various forces are in balance—and this also describes a market's equilibrium. At the equilibrium price, the quantity of the good that buyers are willing and able to buy exactly balances the quantity that sellers are willing and able to sell. The equilibrium price is sometimes called the market-clearing price because, at this price, everyone in the market has been satisfied.

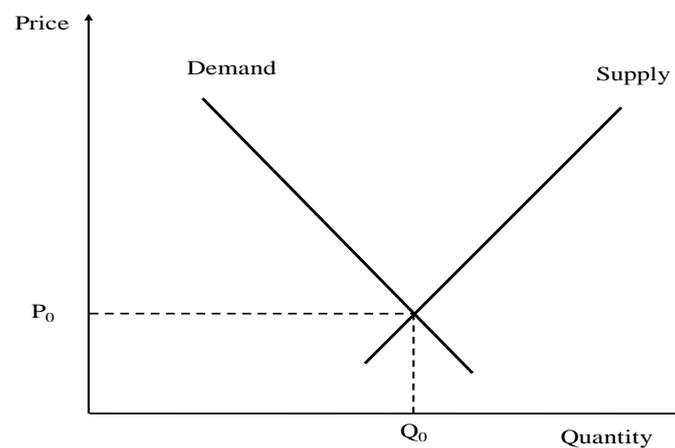


Fig 4. 1: Market without government intervention

Figure 4.1 shows a standard result. The supply curve intersects the demand curve at an equilibrium price  $P_0$  at which quantities supplied and demanded are equal to

each other at level  $Q_0$ . In particular, the supply curve must reflect the social marginal costs of producing each level of output, whereas the demand curve must reflect the marginal value of gains to consumers at each level of consumption. If the empirical supply and demand curves for all commodities meet these normative conditions, market equilibrium leads to the equality of social marginal costs and social marginal benefits and to Pareto optimality for the existing income distribution – no one can be made better off by reallocating society’s resources in either production or consumption without simultaneously making someone worse off. However, in some cases, the government will interfere with the market, putting in price ceilings or price floors, charging taxes, fixing export quota or using other measures to reshape the economy.

#### 4.1.b Market intervened by export quotas

Ricardo (1968) mentioned that export quotas have been extensively used in some countries. Two of the most frequently mentioned reasons for their use are (1) that quotas are a good way to keep food prices low, and (2) that quotas lead to an improvement of the terms of trade. The first reason is applicable for exportable products which are consumed primarily in the domestic market. The second is applicable for products sold mainly in external markets where they face an imperfectly elastic demand. When the world price is  $P_w$  and the domestic price is  $P_d$ , the net social loss (area “*abe*” and “*cdf*” in Fig 4.2) exists as the loss from not practicing free trade. It measures the social opportunity cost of subsidizing consumers through the mechanism of export quotas.

The export quota ( $Q_d - Q_s$  in Fig 4.2) has the same effects as the export tax except for the difference in the distribution of revenue. While the revenue from the export tax is collected by the government, the excess profit or rent due to the export quota is captured

by export license holders if the license is issued free of charge. However, if the quota is auctioned under competitive bidding, the government can collect the revenue equivalent to the export tax revenue. In order to estimate the quota rent to rice exporters (area “*bcef*” in Fig 4.2) , the export-tax-equivalent rate of the quota is computed as the difference between the nominal protection rate and the sum of the rice premium, the reserve requirement, and the export duty.

In the framework of supply and demand fluctuations, quotas play a crucially different role from that of export taxes. The primary consequence of a quota is that it introduces a barrier between internal and external markets, a kind of barrier that, in the face of instability, differs widely from taxes, tariffs, import deposits, and other hindrances to trade. The latter introduce differences between external and internal prices, as the quota does, but price changes are transmitted from one market to another. On the other hand, whenever the quota is effective, price changes in the external market do not extend to the domestic one.

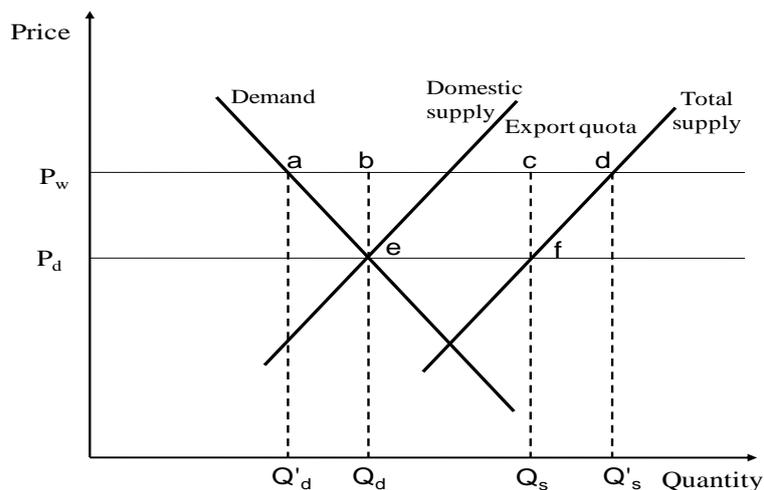


Fig 4. 2: Export quota introduced market

#### 4.1.c Market intervened by ceiling price

A ceiling price is an upper limit for the price of a good and occurs when the government puts a legal limit on how high the price of a product can be. In order for a ceiling price to be effective, it must be set below the natural market equilibrium. When a ceiling price imposed by a government is higher than the market equilibrium price, the price ceiling has no impact on the economy. It does not restrict supply nor encourage demand and is only a preventative measure.

A low ceiling price  $P_{ce}$  (Fig 4.3) can drive suppliers out of the market (reducing the supplied resources), while the lower price drives increased consumer demand. When the demand increases beyond the ability to supply, shortages ( $Q_d - Q_s$ ) occur. This creates a rationing of the product by the market. Some consumers could experience longer lines for the product or no available products when they need or desire to purchase.

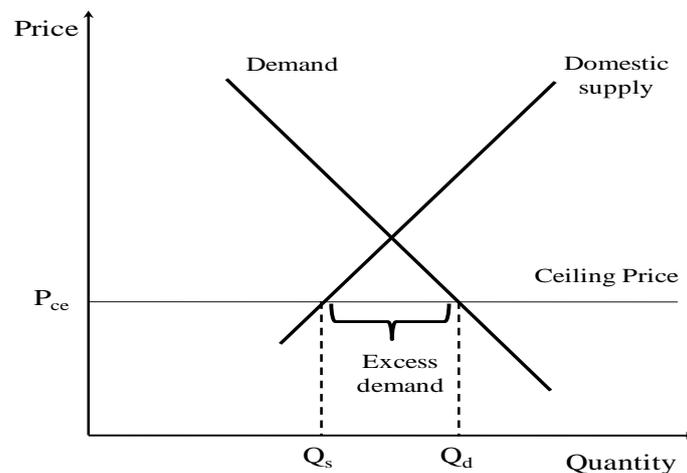


Fig 4. 3: Ceiling price induced market

At the price ceiling, quantity supplied the marginal benefit exceeds the marginal cost and as a result, inefficiency occurs. This inefficiency is equal to the deadweight welfare loss. Sometimes governments combine low price ceilings with government rationing programs or domestic production enhancement program that mandate how the

market will allocate the inadequate supply of goods.

Among less-developed regions, especially the larger countries of Asia, the central food policy issue is for self-sufficiency, but means can be found to increase domestic food production at a rate high enough to keep pace with demand as expanding agricultural output is consistent with the comparative advantage of many Asian nations (Barker et al., 1985).

Policy tends to be associated with prices and various production incentive programs initiated to affect a production response in keeping with short-run political objectives. However, the long-run consequences of these and other policies are the prime determinants of growth over time. Research and improvement of land quality are activities that loosen constraints. By investing in these areas, it is possible to raise production potential, shifting the “frontier” production function upward or creating “economic slack.” Slack-reducing activities, such as improving extension services or developing local organizations for water management, become more profitable when production potential is increased.

#### 4.2 Review of government interventions in Myanmar rice sector

As mentioned in the previous chapter, several objectives in Myanmar rice sector have been fulfilled through a complex set of interventions in both domestic and export markets by influencing output and input prices directly or by enforcing productivity or by introducing trade barriers. It is important to review the framework within which Myanmar policy goals were defined, the types of direct and indirect intervention typical for the rice sector, and the specific institutional structures and practices through which the government has carried out its agricultural policy since 1973 (Table 4.1).

Table 4. 1: Historical government intervention in Myanmar rice sector

Period	Paddy cultivation	Domestic rice marketing			Rice exporting
		Purchasing	Distribution	Price setting	
1973 ~1987	1973: Special paddy producing regions 1978: Set up agricultural plan 1978: State owned farmlands	1973-74: Law of obligatory sale of paddy to the State	State control	Fixed price of purchasing and distributing	Rice exceeding the domestic consumption was exported by the State
1988 ~2002	1992: Introduce summer paddy cultivation	Reduce obligatory sale amount	Priority to targeted groups	Fixed price for target group	Rice exceeding the domestic consumption was exported by the State
2003 ~now	Domestic consumption and export	2003 April: New rice liberalization policy	Private	2006: Commodity price stabilization committee	Private Export license Export quota Export banned

Source: 1973~2003 data from MAPT (2003) & 2003~now data from Ministry of Commerce (2008)

Concerning the rice cultivation in Myanmar, special paddy producing regions were designated in 1973. In addition, an agricultural plan was set up by the Ministry of Agriculture and Forests in 1978, in which farmers had to grow the prescribed crops in the plan. Moreover, land reform was implemented in 1978 and until now, the State is the ultimate owner of all farmlands. It was distinctively evident that the production control policy was strongly exercised in those eras. In the domestic rice marketing, the obligatory sale of paddy was practiced since 1973 and the domestic distribution was also carried out by the State with the fixed price. The excess amount of rice over the domestic consumption was exported by the State. Therefore, it was also obvious that domestic and export markets were controlled by the State.

In 2003, a rice market liberalization policy was implemented in order to enhance the market oriented economy which allowed the rice market freely influenced by the market demand and supply. However, because of the uncertainty about the national rice surplus, and the unpredictable amount of illegal rice export to neighboring countries, the rice export plan was pulled back again in January 2004 and introduced several restrictions on rice trade in order to maintain the stable domestic market.

Although the agricultural plan has not been organized by the Ministry of Agriculture and irrigation, since then it has been indirectly practiced by the regional administration level. While the domestic marketing has been privatized after the market liberalization, a Commodity Price Stabilization Committee has also been established in 2006 for the stability of domestic food price which can be affected by the export quota allotment. Export license, export quota, export tax and export banned have been practiced after the liberalization.

Based on the July 2008 survey (Chapter 3), a regional rice surplus export scheme was introduced as a pilot project in which the four regions were allowed to export their surplus. The rice export license was limited and allowed only to 26 trading companies. The export quota amount was also limited and the ceiling price for the domestic market was also set up.

#### 4.3 Myanmar rice policy mix model build up

For the sake of simplification, the complex structure of government intervention could be summarized as production control (by accelerating acreage), price control (by ceiling price) and export control (by export quota) policies were exercised strongly in the recent years. Those complex structures of government intervention could be summarized as shown in Table 4.2.

Production control, price control and export control policies were exercised strongly in the circled area; partially implemented in the triangle area; and not exercised in the cross area. To accelerate the rice production, the production control policy was also taken into account by driving the domestic production. On the other hand, to stabilize the domestic rice market price, the price control policy was implemented by setting the ceiling price which could restrict the domestic market price. In addition, to enhance the rice export earning and stabilize the domestic rice consumption, the export quota policy was exercised and as a result, the export quantity was restricted. From this table, it is clearly recognized that the rice market in 2003 had the freest market situation throughout the history as trade restrictions were introduced again since 2004.

Table 4. 2: Summary of implemented Myanmar's rice policies

Year	Production control policy	Price control policy	Export control policy
1973~1987	○	○	○
1988~1997	○	○	○
1998~2002	○	○	○
2003	△	×	×
2004~2005	△	△	○
2006~2008	△	○	○

Note: 1) Circle area “○” – policies were strongly exercised  
 2) Triangle area “△” – policies were partially implemented  
 3) Cross area “×” – policies were not exercised

Source: 1973~2003 data from MAPT (2003) & 2003~now data from Ministry of Commerce (2008)

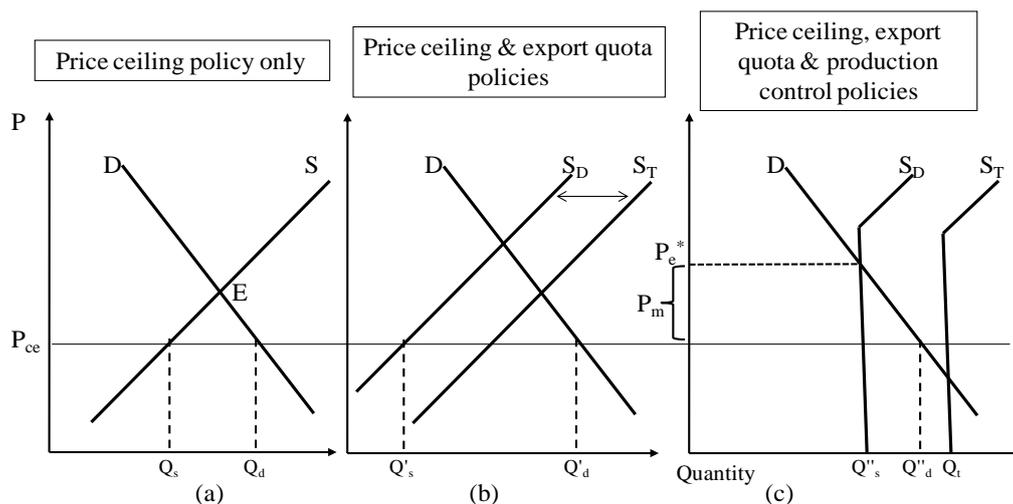


Fig 4. 4: A theoretical model of Myanmar rice policy mix

A theoretical model of Myanmar rice policy mix was built up by using those policies, as shown in Figure 4.4. The price ceiling policy, a kind of consumer favor intervention policy, lowers producers' price and increases consumers' surplus. If the ceiling price is higher than the price of free market equilibrium (E), there will be no ceiling price effect. If the ceiling price is lower than the price of free market equilibrium (E), and so called effective ceiling price ( $P_{ce}$ ), an excess demand ( $Q_d - Q_s$ ) can be occurred (Fig 4.4 a). The export control policy by export quota caused the domestic supply curve to shift to the left (from  $S_T$  to  $S_D$ ) and expand the excess demand ( $Q'_d - Q'_s$ ) in Fig 4.4 b. Because of the implementation of production control policy, it could be assumed that the production curve would not be linear rather kinked in the elbow shape. In addition, the production control policy can reduce the excess demand ( $Q''_d - Q''_s$ ) by fulfilling the domestic supply amount ( $Q''_s$ ) which is the total rice consumption amount of the domestic consumers (Fig 4.4 c).  $P_e^*$  is an equilibrium price under the production control and export quota policies. The market price  $P_m$  under the price ceiling policy will be between  $P_e^*$  and  $P_{ce}$  which is determined along the demand curve D.

Government needs to adjust the proper setting of production control, export

quota and price ceiling policies in order to balance the merits and demerits of the market participants including producers, consumers and the government. Therefore, the impact of exercising three rice policies simultaneously will be examined by the above mentioned framework of theoretical Myanmar rice policy mix model. The following section shows data collection and calculation procedure of the study on the estimating the effects of the intervention policies imposed in Myanmar rice sector.

#### 4.4 Data collection and calculation procedure

In the data assumption, the total production ( $Q_t$ ) will be the total amount of milled rice production. The effective ceiling price ( $P_{ce}$ ) in this model is the retail price in the respective year. The domestic supply amount ( $Q_s$ ) is assumed to be the total food consumption amount of milled rice. The export quota ( $Q_t - Q_s$ ) is the summation of the export amount and the stock amount, in fact, it will be the rice surplus over the total domestic consumption amount of milled rice. The stock in the respective year is assumed as a constant or an exogenous variable as it has not been controlled by the government after the market liberalization in 2003 and has been handled by intermediaries of the rice market. Moreover, Myanmar government intended to extend the export quota after allowing the first term export permission from January to May, 2008. However, the cyclone Nargis devastation in May could not allow the government to extend the export quota in order to compensate the 2008 rainy rice production. After confirming the rainy rice production, the rice surplus over the domestic rice consumption amount became the stock and the potential export amount.

The total amount of production and consumption in terms of milled rice from 2003 to 2008 are collected from Ministry of Agriculture and Irrigation, Myanmar. The retail price data are the average Yangon retail market prices (2003-2008) taken from the

monthly economic indicator, Central Statistical Organization, Ministry of National Planning and Economic Development, Myanmar. Per capita GDP and population data (2003-2008) required in the demand function estimations are taken from International Monetary Fund Data and Statistics.

In order to conduct an assessment on the impact of Myanmar rice policy mix, it is firstly necessary to determine the potential domestic rice demand for 2008 by using 2 step calculations as mentioned below (Eq 1). The initial domestic rice demand is calculated by assuming 2003 as a freest market year and using the concerned price, population and income (Eq 2). The potential domestic rice demands from the year 2004 to 2008 according to the price, population and income of the respective years were calculated by using Eq 3. The price and income elasticities of demand are required for that potential domestic rice demand calculations. A few researches were done on the Myanmar rice price elasticities because of the scarce resources of data availability. Soe, et al. (1994) estimated the income elasticity of demand (0.23) and the price elasticity of demand (-0.15) by using the quarterly time series data from 1975 to 1987. Aung (2006) estimated the income elasticity of demand (0.12) and the price elasticity of demand (-0.1) by using cross sectional data of national household survey at 1997. Therefore, the elasticities in this study are taken from the previous recent research (Aung, 2006).

$$D = aP^b I^c N \quad \dots\dots\dots (1)$$

where,

- D = demand of milled rice (MT)                      a = coefficient
- P = retail price of 2003 (Kyats/ MT)              I = per capita GDP (Kyats)
- N = population
- c = income elasticity of demand (0.12)        b = price elasticity of demand (-0.1)

Assuming the year 2003 as a free market condition,

$$a = \frac{D_{2003}}{P_{2003}^b I_{2003}^c N_{2003}} \quad \dots\dots\dots (2)$$

$$a = \frac{9740829}{(167584)^{-0.1} (144967)^{0.12} 53230000}$$

$$a = 0.146$$

Potential domestic rice demand of the year 2004~2008

$$D_i = 0.146 P_i^b I_i^c N_i \quad \dots\dots\dots (3)$$

where  $i = 2004 \sim 2008$  years

Table 4. 3: Production, consumption, export quota, retail price, GDP per capita and population

Year	Production <sup>a</sup> (mil MT)	Consumption <sup>b</sup> (mil MT)	Export quota <sup>c</sup> (mil MT)	Retail price <sup>d</sup> (Kyats/MT)	GDP per capita <sup>e</sup> (Kyats) <sup>g</sup>	Population <sup>f</sup> (Million)
2003	13.86	9.74	4.11	167,584	144,967	53.23
2004	14.81	10.67	4.14	132,223	167,199	54.3
2005	16.58	10.89	5.70	147,763	221,817	5.539
2006	18.26	11.10	7.16	198,823	295,827	56.51
2007	18.83	11.33	7.51	247,216	409,536	57.64
2008	19.53	11.56	7.97	323,861	550,975	58.8

Source: <sup>a&b</sup> Ministry of Agriculture and Irrigation, Myanmar; <sup>c</sup> Export quota includes the stock and actual export amount; <sup>d</sup> Monthly economic indicator, CSO; <sup>e & f</sup> Data and statistics, IMF; <sup>g</sup> Myanmar currency

Secondly, in order to investigate the impact of Myanmar rice policies from 2004-2008, an equilibrium price under the government interventions,  $P_e^*$ , is derived from the intersection point of demand (D) and domestic supply ( $Q''_s$ ). In addition, domestic supply ( $Q''_s$ ) is the difference between total production ( $Q_t$ ) and export quota ( $Q_t - Q''_s$ ). Finally, in the policy simulation of 2008 rice policies, market price ( $P_m$ ) and quantity of demand ( $Q''_d$ ) will be estimated. In the simulations, the market price will be the estimated retail price as a model output, and the market price  $P_m = \min(P_e^*, P_{ce})$ . If the  $P_{ce}$  is lower than  $P_e^*$ , domestic supply ( $Q''_s$ ) and quantity of demand ( $Q''_d$ ) will not be identical, and market price  $P_m$  will be  $P_{ce}$ . At the equilibrium point where domestic supply ( $Q''_s$ ) and quantity of demand ( $Q''_d$ ) are identical, market price ( $P_m$ ) and quantity of demand ( $Q''_d$ ) will be derived from that equilibrium intersection point. If  $P_e^*$  is lower than  $P_{ce}$ , market price  $P_m$  will be equal to  $P_e^*$ .

#### 4.5 Distinct feature of Myanmar rice policy mix

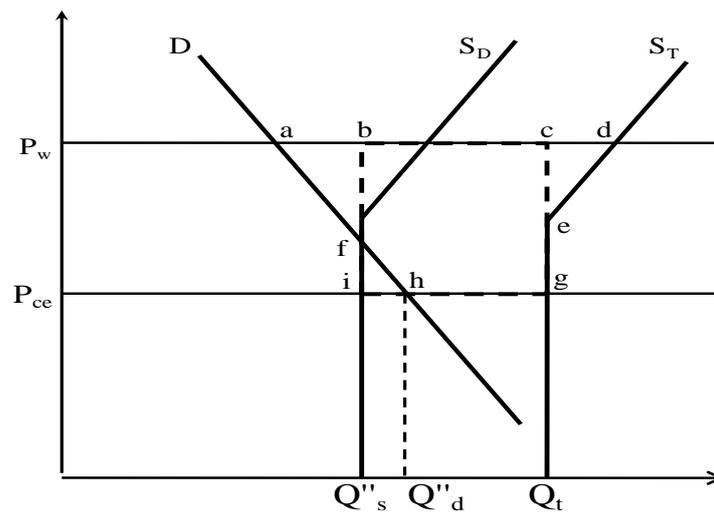


Fig 4. 5: The impact of Myanmar rice policy mix

When  $P_w$  is the world rice price and  $P_{ce}$  is the domestic ceiling price, the welfare of consumers will increase by absorbing part of domestic production for facing lower domestic prices. This gain comes from a transfer of revenue equal to area  $P_w a f i P_{ce}$  from producers to consumers. Government or exporters will capture a rent ( $\Delta \text{rent} = bcgi$ ), which is also transferred from producers. According to the survey result in chapter 3, the estimated government export revenue will be 10 percent of rice export value (approximately US\$28.82 per MT of milled rice in 2008). For the simplification of interpretation in this study, the revenue from export quota is inferred as the government revenue. Producers, however, lose by more than these two transfers. Their total loss due to lower domestic price is equal to area  $P_w d e g P_{ce}$ . Since areas “ $abf$ ” and “ $cde$ ” are lost by them but not captured by anyone else, they constitute a net social loss that measures the total efficiency loss for the country in Fig 4.5.

The recent government intervention policies in Myanmar rice market such as production control, export quota and ceiling price policies, create a net social loss and will not a zero-sum game as shown in Fig 4.5. The net social loss is the loss from not practicing free trade including deadweight loss of consumption in area “ $abf$ ” and that of production in area “ $cde$ ”. It measures the social opportunity cost of subsidizing consumers through the mechanism of export quota.

Net social loss in consumption originates in the fact that consumers now spend more on the commodity that has been cheapened by tax, creating a misallocation of their expenditures which is rational from their stand point but socially suboptimal. Net social loss in production is a loss in efficiency because, while rational from the standpoint of individual producers, resources are being drawn away from the production of this good and used for the production of other goods with lower productivity.

As a limitation of the study, the supply curve could not be calculated as it would not be linear rather kinked in the elbow shape by implementing the production control policy. Consequently, in evaluating the impact of Myanmar rice policies, the welfare analysis of the market participants would not be estimated as the typical policy analysis (Sadoulet and de Janvry, 1995 and Tsakok, 1990). Although the estimation method in this study is deviated from that standard procedure, the optimum point under the mixed policies of Myanmar rice sector ( $P_e^*$ ) could be generated by the intersection point of the demand curve (D) and the domestic supply ( $Q_s''$ ), which was determined by the production control policy as shown in Fig 4.4.

#### 4.6 Theoretical concept of Myanmar rice policy shifting impact

##### 4.6.a. Single policy shifting

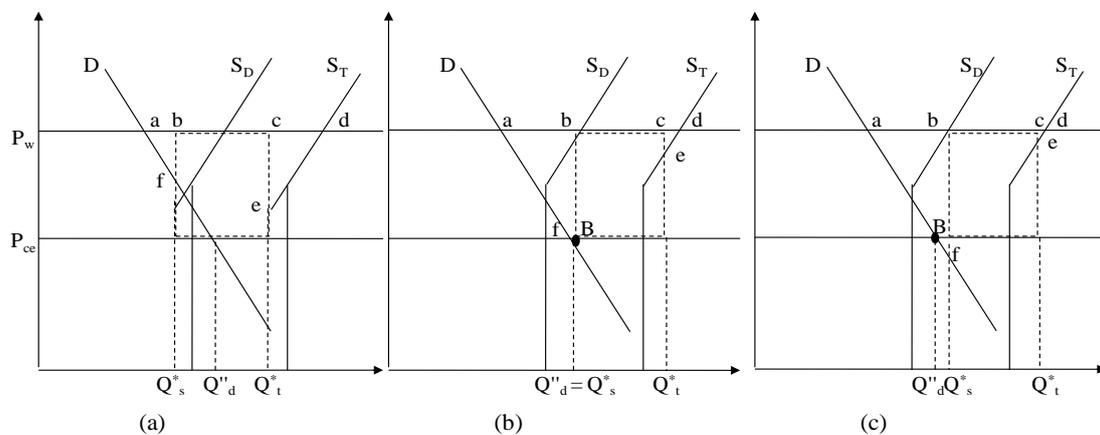


Fig 4. 6: Production control policy shifting

Fig 4.6 explains the concept of production control policy shifting when another 2 policies, price ceiling and export quota are fixed. When production control policy shifts to the left (Fig a), there will be less production than the recent rice production amount. Differently, when it shifts to the right (Fig b & c), it creates more rice production amount.

When production control policy shifts to the left, excess demand becomes large because of the decrease of total production ( $Q_t^*$ ) and domestic supply ( $Q_s^*$ ). New domestic supply ( $Q_s^*$ ) amount is less than the recent supply amount which is the total domestic rice consumption amount and will result starvation of the citizens. According to the objective of domestic rice sufficiency, production control policy could not shift to the left by reducing the recent domestic production.

When production control policy shifts to the intersection point of ceiling price and demand (point B in Fig b), domestic supply can fulfill domestic demand ( $Q_d''=Q_s^*$ ). When production control policy shifts more than that intersection point of price and demand in Fig (c), domestic supply will be larger than domestic demand and will result excess supply.

Although the deadweight losses of consumption area “*abf*” and of production area “*cde*” are changed in the shift of production control policy, those area cannot be eliminated as a consequence of the Myanmar rice policy mix intervention.

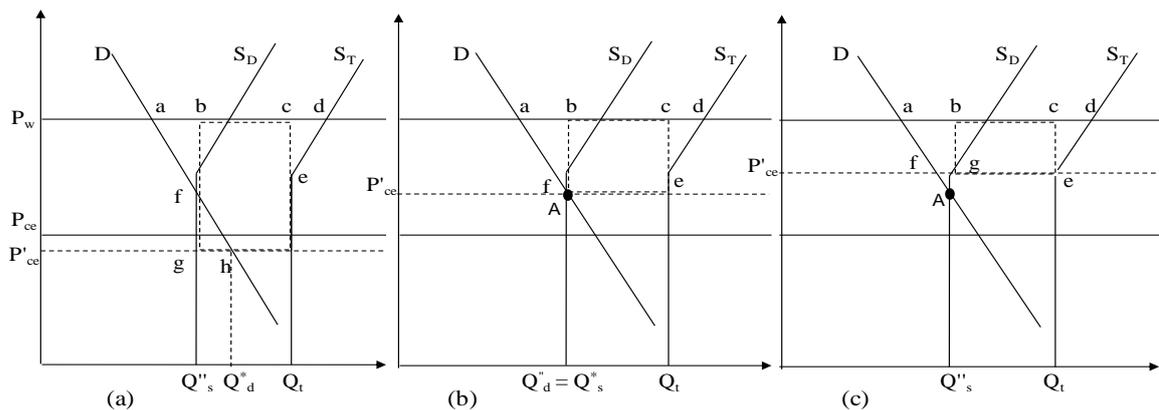


Fig 4. 7: Price ceiling policy shifting

Fig 4.7 explains the concept of price ceiling policy shifting when another 2 policies, production control and export quota are fixed. When price ceiling policy shifts

down (Fig a), ceiling price ( $P'_{ce}$ ) will be lower than the recent ceiling price ( $P_{ce}$ ). On the contrary, when it shifts up (Fig b & c), it creates a high ceiling price.

When price ceiling policy shifts downward, excess demand become larger because of the cheap price. New domestic demand ( $Q^*_d$ ) amount is more than the recent domestic demand as consumers want to buy more rice at the cheap price. On the other hand, rice farmers have to suffer from the domestic low rice price.

When price ceiling policy shifts to the intersection point of price and demand (point A in Fig b), domestic supply is identical with domestic demand ( $Q''_d=Q^*_s$ ). When price ceiling policy shifts higher than that intersection point of price and demand in Fig (c), ceiling price will be higher than the equilibrium price and there will be no ceiling price effect.

The deadweight losses of consumption area “ $abf$ ” and that of production area “ $cde$ ” are not changed when ceiling price is lower than “A” point. Although the deadweight loss areas can be reduced when ceiling price is higher than “A” point, consumers have to suffer from high domestic price.

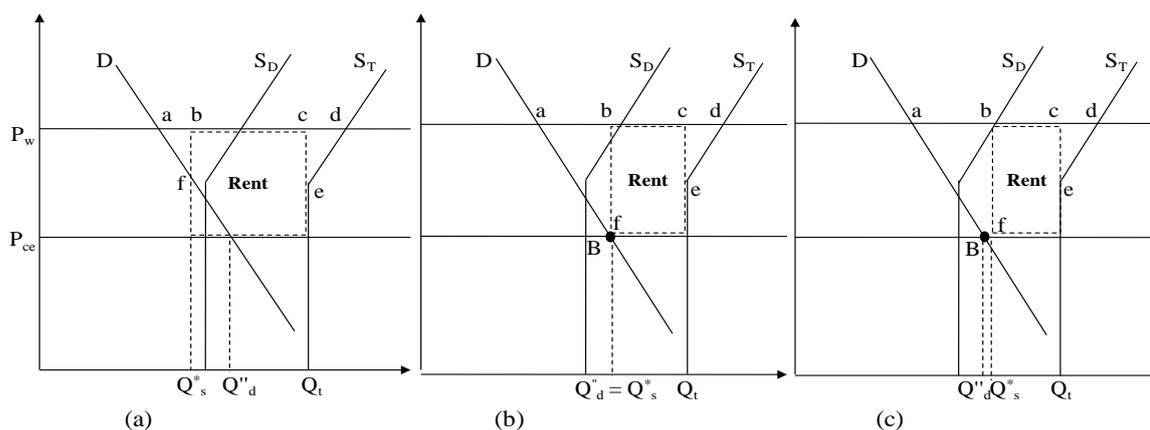


Fig 4. 8: Export quota policy shifting

Fig 4.8 explains the concept of export quota policy shifting when production control and price ceiling are fixed. When export quota policy shifts to the left (Fig a),

export quota ( $Q_t - Q_s^*$ ) is larger than the recent export quota amount. In contrast, when it shifts to the right (Fig b & c), it creates lesser export quota amount.

When export quota policy shifts to the left, excess demand becomes large because of the decrease of domestic supply. New domestic supply ( $Q_s^*$ ) amount is less than the recent supply which is the total domestic rice consumption amount and will result starvation of the citizens. According to the objective of domestic rice sufficiency, export quota policy could not shift to the left by reducing domestic supply.

When export quota policy shifts to the intersection point of price and demand (point B in Fig b), domestic supply coincides with domestic demand ( $Q_d'' = Q_s^*$ ). When export quota policy shifts more than that intersection point of price and demand in Fig (c), domestic supply will be larger than domestic demand and will result excess supply.

Although the deadweight losses of consumption area “*abf*” and of production area “*cde*” are changed in the shift of export quota policy, those area cannot be eliminated as a consequence of the Myanmar rice policy mix intervention.

#### 4.6.b. Policy mix shifting

Fig 4.9 explains the concept of policy mix shifting such as production control and price ceiling policies shift simultaneously when export quota policy is fixed. When production and ceiling price decrease simultaneously in Fig (a), there will be lesser production and cheaper price than the recent condition. In the same way, production decreases and price increases in Fig (b); production increases and price decreases in Fig (c); and production and price increase simultaneously in Fig (d).

When production and ceiling price decrease simultaneously in Fig (a), domestic demand will increase to  $Q_d^*$  because of the cheap price ( $P'_{ce}$ ) and domestic supply decreases to  $Q_s^*$  as total production reduces to  $Q_t^*$ , as a result, excess demand will

undeniably occur. When production decreases and price increases condition in Fig (b), domestic supply can be coincide with domestic demand ( $Q_d^* = Q_s^*$ ) which depends on the proportion of those policies shifting.

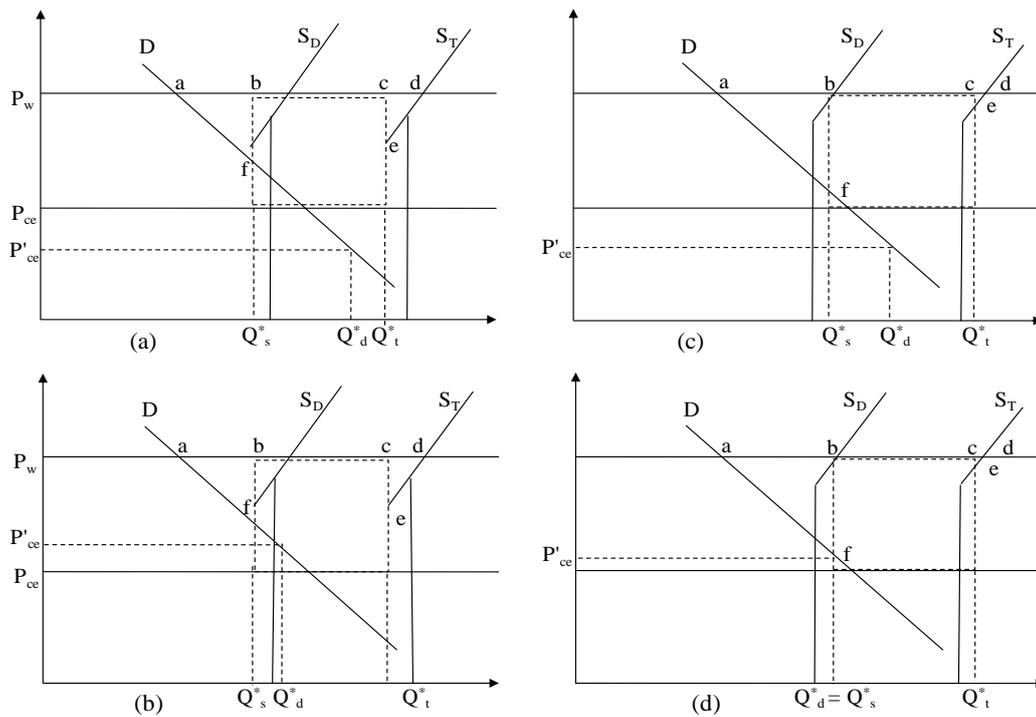


Fig 4. 9: Production control and price ceiling policies shifting

In Fig (c), if the increase proportion of production amount covers the domestic demand occurred by the cheap price, excess demand cannot occur. In Fig (d), the simultaneous increase of production and price stimulate the domestic supply ( $Q_s^*$ ) and reduce the domestic demand ( $Q_d^*$ ) at the high price ( $P'_{ce}$ ).

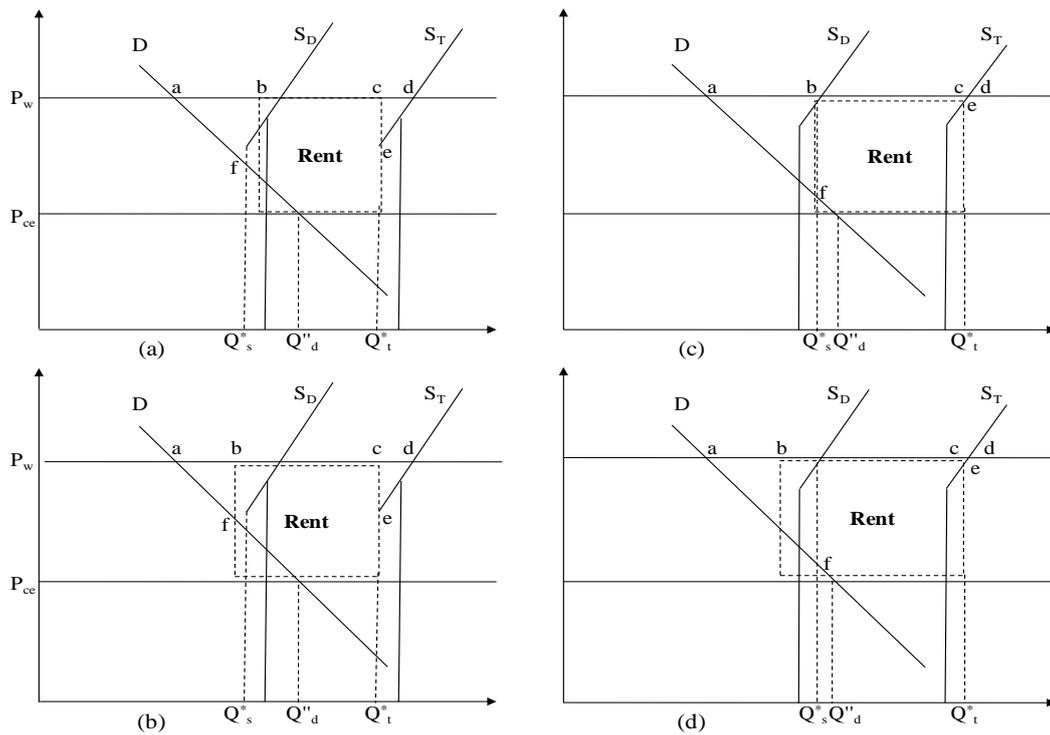


Fig 4. 10: Production control and export quota policies shifting

Fig 4.10 explains the concept of policy mix shifting such as production control and export quota policies shift simultaneously when price ceiling policy is fixed. When production and export quota decrease simultaneously in Fig (a), there will be lesser production and export quota than the recent condition. In the same way, production decreases and export quota increases in Fig (b); production increases and export quota decreases in Fig (c); and production and export quota increase simultaneously in Fig (d).

In Fig (a), if the proportion of production amount reduction covers the export quota, excess demand cannot occur. When production decreases and export quota increases condition in Fig (b), the lessening domestic supply (Q<sub>s</sub><sup>\*</sup>) because of the increase export quota and production reduction cannot be coincide with domestic demand (Q<sub>d</sub><sup>\*\*</sup>).

In Fig (c), when production increases and export quota decreases, domestic supply coincide with domestic demand (Q<sub>d</sub><sup>\*\*</sup>=Q<sub>s</sub><sup>\*</sup>) as a result of the increase of production

and the reduction of export quota. In Fig (d), if the increase proportion of production amount covers the export quota, excess demand cannot occur.

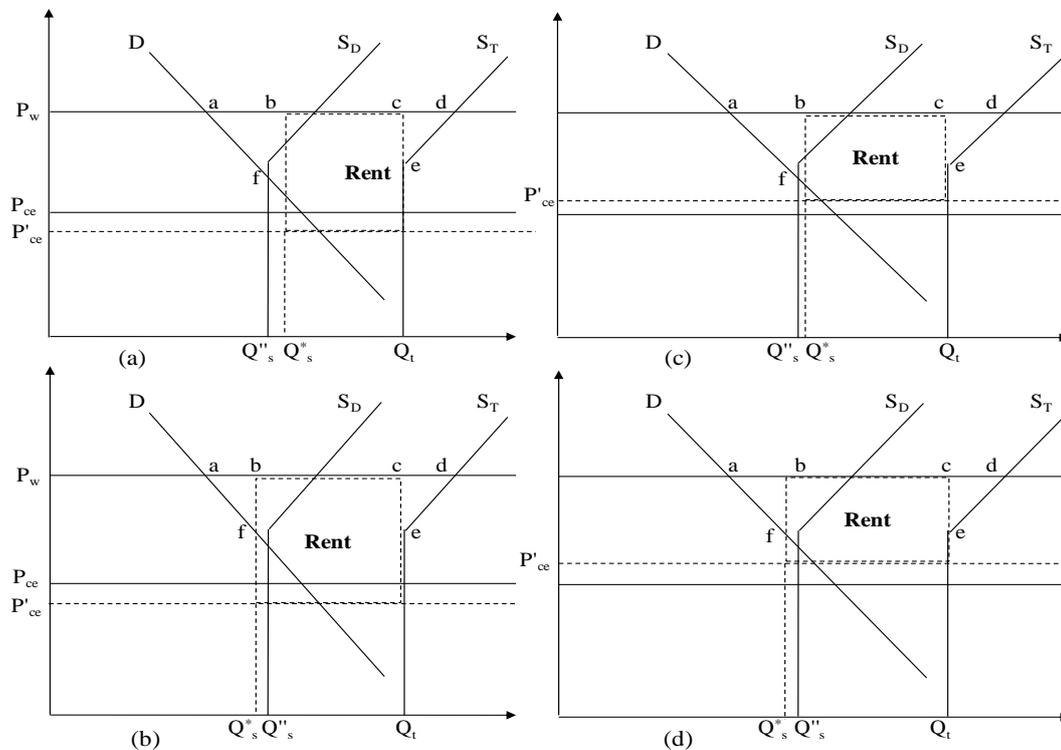


Fig 4. 11: Price ceiling and export quota policies shifting

Fig 4.11 explains the concept of policy mix shifting such as price ceiling and export quota policies shift simultaneously when production control policy is fixed. When ceiling price and export quota decrease simultaneously in Fig (a), there will be cheap price and less export quota than the recent condition. In the same way, ceiling price decreases and export quota increases in Fig (b); ceiling price increases and export quota decreases in Fig (c) and ceiling price and export quota increase simultaneously in Fig (d).

When ceiling price and export quota decrease simultaneously in Fig (a), domestic supply can be coincide with domestic demand ( $Q_d^* = Q_s^*$ ), which depends on the proportion of those policies shifting. When ceiling price decreases and export quota up in Fig (b), domestic demand increases to  $Q_d^*$  because of the cheap price while domestic

supply reduces to  $Q_s^*$  as a result of expand export quota and excess demand will definitely occur.

In Fig (c), when ceiling price increases and export quota decreases, domestic demand will reduce because of high price and the reduction of export quota also fulfills the domestic demand. In Fig (d), if the amount of domestic demand reduction because of high price covers the export quota amount, excess demand cannot occur.

#### 4.7 Theoretical concept of feasible region determination

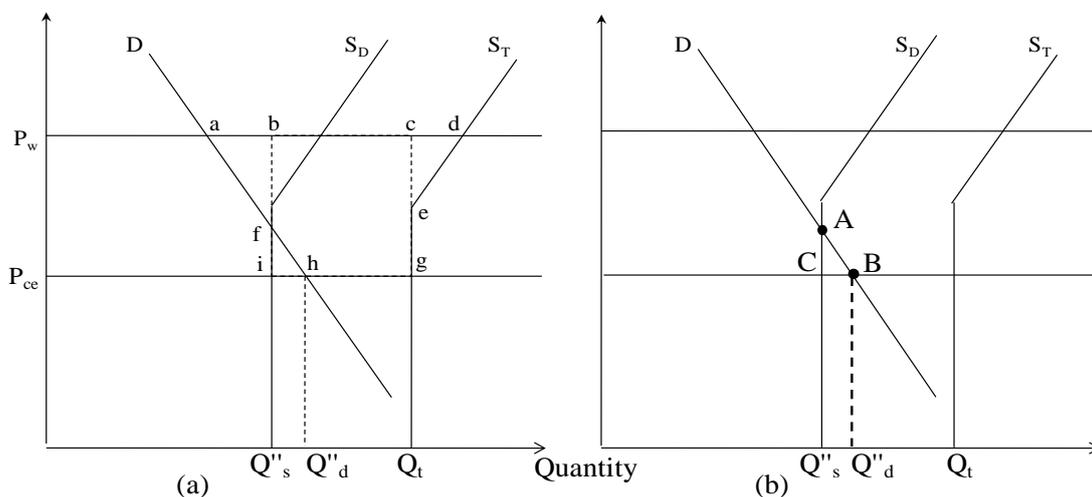


Fig 4. 12: Feasible region of Myanmar rice policy mix

Under the distinct and restricted conditions of Myanmar rice policy mix, it is necessary to formulate alternative policies which will be the best use of its merits to the domestic market stability and the government export revenue while at the same time minimizing its demerits to the producers because of the low domestic rice price. Generally, alternative policy simulations are emphasized to increase the net social surplus by extensively eliminating the deadweight loss concerned. However, according to the role of consumers and producers in Myanmar as mentioned in the previous section, the

rice policy setting in Myanmar could not emphasize merely to increase the net social surplus by reducing deadweight loss area “abf” and “cde” in Fig 4.12a. In addition, policy instruments create merit and demerit to the market participants by increasing or reducing the benefit concerned.

Producers will enjoy positive gains from the increase of effective ceiling price ( $P_{ce}$ ) and point “A” will be the point where domestic demand and supply will be equal and excess demand will not occur (Fig 4.12 b). If the ceiling price ( $P_{ce}$ ) becomes higher than “A” point, the price hike will reduce the domestic demand and as a consequence, it will not increase the benefit of farmers. Consumers will also enjoy more rice for consumption from the increase of rice production amount ( $Q_t$  and  $Q_s$ ) or the reduction of export quota ( $Q_t - Q_s$ ). Likewise, point “B” will also be the point where domestic demand and supply will be equal and excess demand will not occur (Fig 4.12b). However, when domestic supply ( $Q_s$ ) occurs at the right hand side of B point by increasing total production  $Q_t$  or decreasing export quota ( $Q_t - Q_d$ ), the dead weight loss will definitely exist and not be captured by anyone else. Under the above restrictions, the feasible conditions for the stakeholders of the rice market will exist in the region where one’s loss can be captured as a surplus by the other rice market participants. Therefore, it is imperative that the area “ABC” will be the feasible region for the combination of policy shifts. Given the net social loss is inevitable in the recent Myanmar rice policies, hot to make the best use of its merits while at the same time minimizing its demerits is likely to be the most important for the recent rice market system.

After the theoretical framework of Myanmar rice policy mix model is built up by exploring the theoretical impact of the existing policies and the possible policy shifting, the numerical and qualitative investigation of the impact of the Myanmar rice policy mix and the policy shift simulation will present in the next chapter.

## CHAPTER V

### INVESTIGATION OF THE IMPACT OF MYANMAR RICE POLICY MIX

Agricultural policy making can be seen as the outcome of a political bargain between politicians and their citizens. More often, policy makers seek to maximize political support within their resource constraints. Certain policy instruments are politically more effective than others, even if less efficient economically. As politicians maximize short-run political support rather than their constituency's welfare, they prefer the former instruments over the latter. The cause of delays to multilateral trade negotiations in the Uruguay and Doha Rounds is a source of political tension, especially in transforming countries and is a challenging area for policy dialogue with development partners, particularly in the poorest countries.

World development report (2008) mentioned that fewer estimates are available of support provided by developing countries for the recent period such as how much support (positive or negative) the governments of developing countries are providing to their agriculture through a complex web of policies, nor what impact this support has on their own agriculture and world agriculture more broadly. In some countries, nonstrategic subsidies amount to as much as half of the public budget for agriculture. To mobilize political support for better use of public expenditures in agriculture, an initial step is greater public disclosure and transparency of budget allocation, and analysis of impacts.

In this chapter, the impact of Myanmar rice market model will be explored by using the theoretical model built up in the chapter 4 in order to verify the potential gainers and losers from the recent Myanmar rice policy setting and to generate alternative policies

which will be relevant to its social, economic and political goals. This chapter is composed of functions of the rice policies in Myanmar; estimating the impact of Myanmar rice policy mix; simulation of the rice policies in 2008; results of the simulations; and weighing the policy shift conflict.

### 5.1 Functions of the rice policies in Myanmar

As a result of the historical rice production accelerating intervention policy, based on the Myanmar official data from 1981 to 2008, average growth rate per annum of rice sector were 2 percent, 1.38 percent and 3.41 percent in terms of harvested area, yield and total production respectively. Export quota, which can generate the rent of government and exporters, maintains the production control policy as an accelerating policy rather than crop diversification policy. The enlargement of the areas targeted for the increase rice production will add to the burden of farmers in general. Okamoto (2006) mentioned that the net revenue for pulse was 1.4 times higher than paddy and 1.9 times higher in terms of cash income. Unless alternative compensative schemes through input subsidies and public investment projects are followed, perhaps gradually over a period of time, there will be lesser incentives for the rice farmers to produce an adequate supply of food for their people or to achieve sustained economic growth.

Prices play an important part in the rice policy because prices act on signaling the demand for production inputs and outputs, influencing the income of the producers and the welfare of the consumers, and determining the level of the nation's export earnings. The high dependency of Myanmar people on rice, 196 kg per capita per year, and the high percentage of low income consumers, who are spending around 70 percent of their income for food alone, pressure the domestic rice price and the distribution setting for the intention on the domestic consumers. The problem for policymakers is made more difficult by the

considerable controversy about the actual as opposed to the theoretical effect of prices on consumption and production (Timmer, 1975).

In principle, it is thus a politically attractive policy for government, typical of the food-price dilemma: seek to please all constituents by giving high prices to farmers and low prices to consumers (Tweeten, 1989). On the other hand, Sadoulet and de Janvry (1995) mentioned that government revenues generated by tax on agriculture can be used to shift the supply function through investments in public goods as an alternative compensation scheme. However, when faced with the charge that food (and fuel) subsidies present excessive budgetary exposure, and are responsible for a large part of the fiscal deficit, Myanmar government introduces the multitude interventions frequently combined to achieve simultaneously a variety of policy objectives.

## 5.2 Estimating the impact of Myanmar rice policy mix

A theoretical model of Myanmar rice market was built up in the chapter 4 by using the recent policies including production control, export quota and price ceiling policies. The reliability of the theoretical model of Myanmar rice market will be investigated in this section by estimating the impact of Myanmar rice policies using the actual market data after the market liberalization. As previously mentioned, the Commodity Price Stabilization Committee was established in the mid 2006 and the ceiling price setting has been well performed since 2007. The investigations of impacts of Myanmar rice policies after the market liberalization are separated into 2 periods: the first period is from 2004 to 2006 and the second period will be from 2007 to 2008.

According to the estimation result of the year 2004 to 2006 in Table 5.1, the lack of strong implementation of ceiling price by the government in the retail market during the transition period of market liberalization and the speculation of the traders on the export

liberalization resulted the retail prices from 2004 to 2006 to be higher than its equilibrium prices ( $P_e^*$ ) which could fulfill the total rice consumption amount of the low income consumers. The price difference between the retail price and the equilibrium price ( $P_e^*$ ) was reduced year after year, which could express the government's intention to implement the ceiling price by letting the low income consumers fulfill the total rice consumption amount with the reasonable price.

Table 5. 1: Impact of Myanmar rice policy (2004-2006)

Year	Data			Solution	Comparison
	Production $Q_t$ (mil MT)	Retail price <sup>a</sup> (Kyats/MT)	Export quota <sup>b</sup> (mil MT)	Equilibrium price $P_e^*$ (Kyats/MT)	Retail price – Equilibrium price (Kyats/MT)
2004	14.81	132,223	4.14	97,614	34,609
2005	16.58	147,763	5.70	137,185	10,578
2006	18.26	198,823	7.16	193,599	5,223

Source: model output

Note: <sup>a</sup> retail price without ceiling price control;

<sup>b</sup> export quota includes the stock and actual export amount of the respective year.

Table 5. 2: Impact of Myanmar rice policy (2007-2008)

Year	Data			Solution	Comparison
	Production $Q_t$ (mil MT)	Retail price <sup>a</sup> (Kyats/MT)	Export quota <sup>b</sup> (mil MT)	Equilibrium price $P_e^*$ (Kyats/MT)	Retail price – Equilibrium price (Kyats/MT)
2007	18.83	247,216	7.51	285,761	-38,545
2008	19.52	323,861	7.97	407,513	-83,652

Source: model output

Note: <sup>a</sup> retail price with ceiling price control;

<sup>a</sup> export quota includes the stock and actual export amount of the respective year.

The estimation result of Myanmar rice policies in 2008 was very similar to that of 2007 as shown in Table 5.2. The retail prices of 2007 and 2008, which were lower than its equilibrium price ( $P_e^*$ ) showed that the commodity price stabilization committee has introduced the ceiling price effectively and the retail prices of rice were binding to the ceiling prices prevailed during those years. It illustrated the deviation of the optimum condition of the rice market because of price distortion and led to efficiency loss in the

market by reducing producers' surplus with low price. Moreover, cheap price could be attractive to the consumers who wanted to buy more at that low price which generated the excess demand in those periods. However, the production control policy reduced the excess demand amount by fulfilling the total consumption amount of low income consumers. It also expressed the intention of government intervention on the acceleration of export from the surplus concerned by not allowing the domestic consumers to suffer from starvation.

As the rice producers who are one of the targets of the market liberalization cannot get benefit from such kind of market interventions, we may not say that those market interventions are the best world for the rice market participants. However, removal of one distortion such as the elimination of production control policy may not create an efficiency gain as it was compensation for the efficiency effect of the others; export quota and price ceiling policies and we could say it will be in a second-best world. In such conditions, it will be tremendously important to understand the various options of policy implementation and weighing incentives and disincentives conflict of those options.

### 5.3 Simulation of the rice policies in 2008

In view of the widespread government intervention in the rice sector, the multitude of goals that government try to achieve through food-price manipulations, and the large number of policy instruments accessible, it is extremely important to understand how the various options available to the government are likely to influence income distribution, resource utilization and growth in the short and long run. Unless alternative compensation schemes are followed, a change in the rice policies will create gainers and losers, and the mission of this analysis is to present a framework in which these gains and losses can be weighed against each other. As such understanding improves, the choice of

policy instruments could become more appropriate and the goals — whether economic, social, or political — could be achieved more efficiently.

In searching alternative conditions of the rice policy setting under the restrictions, 2 main scenarios will be done as mentioned in Table 5.3: single policy shifting and policy mix shifting. Single policy shift simulation is the usual and widely used method in most researches on the impact of the policies. In contrast, policy mix simulation is a scarce research and newly functional application which is initiated in this study on the Myanmar rice policies. Gainers and losers can exist in the policy mix simulation as the impact of the several combinations of policy shifts. After identifying the trade-offs of policy shifting by exploring alternative conditions, the best condition of policy combinations can be balanced between the need for revenue and the magnitude and impact of distortion in order to point out the way to more efficient sources of revenue.

Table 5. 3: Scenarios of the policy mix shifting simulation

Scenarios	
1.	Single policy shifting
1.1	Production control policy shifting
1.2	Price ceiling policy shifting
1.3	Export quota policy shifting
2.	Policy mix shifting to alternative conditions
2.1	Production control and price ceiling policies shifting
2.2	Production control and export quota policies shifting
2.3	Price ceiling and export quota policies shifting
3.	Policy mix shifting to feasible conditions
3.1	Production control and price ceiling policies shifting
3.2	Production control and export quota policies shifting
3.3	Price ceiling and export quota policies shifting
3.4	Production control, price ceiling and export quota policies shifting

In the single policy simulation, when one policy shifts such as production control policy in scenario 1.1, the other 2 policies will be fixed (price ceiling and export quota policies) and the equivalent approach of simulations will be done in scenario 1.2 and 1.3. In the policy mix simulation, when 2 policies such as production control and price ceiling policies shift simultaneously in scenario 2.1, the remaining policy, export quota policy will be fixed and the same way will be carried out in the following scenarios. In the policy mix simulation, alternative policies will be explored by estimating the potential excess demand as a result of the policy mix shifting. After that, feasible conditions of the policy mix simulations will be investigated as a second best world of the restricted rice market conditions.

#### 5.4 Results of the policy mix simulations

##### 5.4.a. Single policy shifting (Scenario 1)

Table 5. 4: Production control policy shifting (Scenario 1.1)

Change (%)	Policy	Solution			
	Production $Q_t$ (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
-0.5	19.43	323,861	11.46	11.82	336,202
recent	19.52	323,861	11.56	11.82	268,578
+0.5	19.62	323,861	11.65	11.82	171,202
+1	19.72	323,861	11.75	11.82	74,202
+1.38	19.79	323,643	11.83	11.83	0
+1.5	19.82	317,415	11.85	11.85	0
+2	19.92	292,316	11.95	11.95	0

Source: model output

In scenario 1.1 (Table 5.4), the reduction of milled rice production from the recent condition, which is the left shift of production control policy in Fig 4.6 (a) will decrease

the domestic supply ( $Q_s$ ) and cannot cover the quantity of domestic demand ( $Q_d$ ) by extending excess demand. The less production than the recent domestic supply will disturb the nation's objective of food security and can lead to social unrest.

The production of milled rice can be increased to approximately 19.79 mil MT (where  $Q_d=Q_s$ , point B in Fig 4.6 b), which is 1.38 percent of the recent production (19.52 mil MT). At this increased amount, although the producers will increase their loss by enforcing rice production, it can fulfill the larger amount of consumption which the consumers want to buy at the recent price and can eliminate the excess demand. The government can also maintain its rent from the recent export amount. In contrast, the increase of milled rice production over the equilibrium point B will reduce the market price because of excess supply in the domestic market.

Table 5. 5: Price ceiling policy shifting (Scenario 1.2)

Change (%)	Policy		Solution		
	Retail price $P_{ce}$ (Kyats/MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d$ or $Q_d^*$ (mil MT)	Excess demand (MT)
-0.5	307,660	307,660	11.56	11.89	329,416
recent	323,861	323,861	11.56	11.82	268,578
+5	340,050	340,050	11.56	11.77	211,041
+10	356,240	356,240	11.56	11.71	156,438
+15	372,440	372,440	11.56	11.66	104,468
+20	388,630	388,630	11.56	11.61	54,956
+25	404,820	404,820	11.56	11.56	7,664
+25.83	407,520	407,513	11.56	11.56	0
+30	421,010	407,513	11.56	11.56	0
+35	437,212	407,513	11.56	11.56	0

Source: model output

In scenario 1.2 (Table 5.5), the reduction of ceiling price of milled rice from the

recent condition, which is the downward shift of the price ceiling policy as in Fig 4.7 (b) will stimulate more domestic demand resulting the recent domestic supply ( $Q''_s$ ) cannot cover the increased quantity of demand ( $Q^*_d$ ). Although the consumers demand more rice because of the cheap price, it will be controversial for the producers to produce rice at the low profitable domestic price.

The increase of ceiling price of milled rice to 407 thousand Kyats/MT, which is about 25.83 percent of the recent ceiling price (323 thousand Kyats/MT) is the equilibrium point “A” as in Fig 4.7(b). At this high market price, although the consumers and the government will lose their benefit because of the high price, it can be redistributed to the producers as a benefit. If the ceiling price shifts higher than that equilibrium point (Fig 4.7 c), the ceiling price will not be binding with the market price which can fulfill the total domestic rice consumption.

Table 5. 6: Export quota policy shifting (Scenario 1.3)

Policy		Solution			
Change (%)	Export quota (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q''_s$ or $Q^*_s$ (mil MT)	Quantity of demand $Q''_d$ or $Q^*_d$ (mil MT)	Excess demand (MT)
+0.5	8.08	323,861	11.52	11.82	307,802
recent	7.97	323,861	11.56	11.82	268,578
-0.5	7.93	323,861	11.60	11.82	227,803
-1.0	7.89	323,861	11.64	11.82	188,803
-1.5	7.85	323,861	11.68	11.82	148,803
-2.0	7.81	323,861	11.72	11.82	108,803
-2.5	7.77	323,861	11.76	11.82	68,803
-3.0	7.73	323,861	11.80	11.82	28,803
-3.36	7.70	323,807	11.82	11.82	0
-3.5	7.69	320,810	11.84	11.84	0
-4.0	7.65	310,428	11.87	11.87	0

Source: model output

In scenario 1.3 (Table 5.6), the increase of export quota under the limited milled rice production, which is the left shift of export quota policy as in Fig 4.8 (a) will decrease the domestic supply ( $Q_s^*$ ) and cannot cover the quantity of domestic demand ( $Q_d^*$ ) by extending excess demand. The increase of export quota under the recent production will disturb the nation's objective of food security and can lead to social unrest.

The decrease of export quota of milled rice to 7.70 mil MT is the equilibrium point B as in Fig 4.8 (b), which is about 3.36 percent less than the recent export quota (7.97 mil MT of milled rice). At the low export quota, although the government will lose its rent by reducing the recent rice export, it can be redistributed to the consumers as a gain and can eliminate the excess demand. In contrast, the decrease of export quota over the equilibrium point B will reduce the market price because of excess supply in the domestic market.

#### 5.4.b. Policy mix shifting to alternative conditions (Scenario 2)

Table 5.7: Production control and price ceiling policies shifting to alternative conditions (Scenario 2.1)

Ceiling price shifting	Production control shifting										
	-5%	-4%	-3%	-2%	-1%	0%	+1%	+2%	+3%	+4%	+5%
-50%	2.09	1.90	1.70	1.51	1.31	1.12	0.92	0.73	0.53	0.34	0.14
-40%	1.86	1.67	1.47	1.28	1.08	0.89	0.69	0.50	0.30	0.11	0
-30%	1.67	1.48	1.28	1.09	0.89	0.70	0.50	0.31	0.11	0	0
-20%	1.51	1.32	1.12	0.93	0.73	0.54	0.34	0.14	0	0	0
-10%	1.37	1.17	0.98	0.78	0.59	0.39	0.20	0	0	0	0
0%	1.24	1.05	0.85	0.66	0.46	0.27	0.07	0	0	0	0
+10%	1.13	0.94	0.74	0.55	0.35	0.16	0	0	0	0	0
+20%	1.03	0.84	0.64	0.45	0.25	0.05	0	0	0	0	0
+30%	0.94	0.74	0.55	0.35	0.16	0	0	0	0	0	0
+40%	0.85	0.66	0.46	0.27	0.07	0	0	0	0	0	0
+50%	0.77	0.58	0.38	0.19	0	0	0	0	0	0	0

Source: model output

Unit: Excess demand of milled rice (mil MT)

Table 5.7 mentions the impact of production control and price ceiling policies shifting to alternative conditions (Scenario 2.1) by estimating the potential excess demand in the several combinations of those policies shift. Production and ceiling price reduce simultaneously in the left hand upper corner; production decreases and ceiling price increases in the left hand lower corner; production increases and ceiling price reduces in the right hand upper corner; production and ceiling price increase simultaneously in the right hand lower corner.

When the production and the ceiling price reduce simultaneously as in Fig 4.9 (a), the domestic demand will increase because of the cheap price and the domestic supply decreases as the total production reduces. A minimum excess demand of 0.59mil MT will result when 1 percent of the production and 10 percent of the ceiling price reduce simultaneously. In addition, there will be a maximum of 2.09mil MT excess demand by reducing the production and the ceiling price simultaneously in 5 percent and 50 percent respectively.

About the production shrink and ceiling price up policy as in Fig 4.9 (b), the domestic supply can coincide with the domestic demand which depends on the proportion of those policies shifting. If the production decreases 1 percent, it will be necessary to reduce the 50 percent ceiling price in order to meet the domestic supply and demand. Moreover, 1.13mil MT of milled rice will be necessary in maximum to fulfill the excess demand when 5 percent reduction of the production and 10 percent up of the ceiling price policy is simulated.

Concerning the production increase and ceiling price decline policy as in Fig 4.9 (c), 2 percent increase in the rice production can cover the excess demand occurred by 10 percent reduction of the ceiling price. The maximum requirement of milled rice to fulfill the excess demand will be 0.92mil MT when 50 percent reduction of the ceiling price

and 1 percent increase of the production. When the production and the ceiling price increase simultaneously as in Fig 4.9 (d), the increase of 1 percent production will cover the domestic demand occurred by the ceiling price 10 percent increase.

Table 5.8: Production control and export quota policies shifting to alternative conditions (Scenario 2.2)

Export quota shifting	Production control shifting										
	-5%	-4%	-3%	-2%	-1%	0%	+1%	+2%	+3%	+4%	+5%
-5%	0.85	0.65	0.46	0.26	0.07	0	0	0	0	0	0
-4%	0.93	0.73	0.54	0.34	0.15	0	0	0	0	0	0
-3%	1.01	0.81	0.61	0.42	0.22	0.03	0	0	0	0	0
-2%	1.09	0.89	0.69	0.50	0.30	0.11	0	0	0	0	0
-1%	1.17	0.97	0.77	0.58	0.38	0.19	0	0	0	0	0
0%	1.24	1.05	0.85	0.66	0.46	0.27	0.07	0	0	0	0
+1%	1.32	1.13	0.93	0.74	0.54	0.35	0.15	0	0	0	0
+2%	1.40	1.21	1.01	0.82	0.62	0.43	0.23	0.04	0	0	0
+3%	1.48	1.29	1.09	0.90	0.70	0.51	0.31	0.12	0	0	0
+4%	1.56	1.37	1.17	0.98	0.78	0.59	0.39	0.20	0	0	0
+5%	1.64	1.45	1.25	1.06	0.86	0.67	0.47	0.28	0.08	0	0

Source: model output

Unit: Excess demand of milled rice (mil MT)

Table 5.8 explains the impact of production and export quota policies shifting to alternative conditions (scenario 2.2) by estimating the potential excess demand in the several combination of those policies shift. Production and export quota reduce simultaneously in the left hand upper corner; production decreases and export quota increases in the left hand lower corner; production increases and export quota reduces in the right hand upper corner; production and export quota increase simultaneously in the right hand lower corner.

When the production and the export quota reduce simultaneously as in Fig 4.10 (a), the domestic supply cannot fulfill the quantity of domestic demand. A minimum excess demand of 0.07mil MT will result when 1 percent of the production and 5 percent

of the export quota reduce simultaneously. In addition, there will be a maximum of 1.17mil MT excess demand by the reduction of the production and the export quota, 5 percent and 1 percent respectively.

Regarding the production decrease and export quota increase policy as in Fig 4.10 (b), 1 percent decrease of the production and 1 percent increase of the export quota will generate 0.54mil MT of excess demand in minimum. In addition, a maximum excess demand of milled rice, 1.64mil MT will be necessary to fulfill the domestic consumption when 5 percent reduction of the production and 5 percent export quota up policy is simulated.

About the production increase and the export quota decline policy as in Fig 4.10 (c), the domestic supply and demand will be coincided by 1 percent increase of the production and 1 percent decrease of the export quota. When the production and the export quota increase simultaneously as in Fig 4.10 (d); the domestic supply and demand will be equal by increasing the production and the export quota, 2 percent and 1 percent respectively. 0.47mil MT of milled rice as a maximum will be necessary to fulfill the excess demand of domestic consumption when 1 percent of the production and 5 percent of the export quota increase at the same time.

Table 5.9 shows the impact of ceiling price and export quota policies shifting to alternative conditions (Scenario 2.3) by estimating the potential excess demand in the several combinations of those policies shift. Ceiling price and export quota reduce simultaneously in the left hand upper corner; ceiling price decrease and export quota increase in the left hand lower corner; ceiling price increase and export quota reduce in the right hand upper corner; ceiling price and export quota increase simultaneously in the right hand lower corner.

Table 5.9: Price ceiling and export quota policies shifting to alternative conditions (Scenario 2.3)

Export quota shifting	Ceiling price shifting										
	-50%	-40%	-30%	-20%	-10%	0%	+10%	+20%	+30%	+40%	+50%
-5%	0.72	0.49	0.30	0.14	0	0	0	0	0	0	0
-4%	0.80	0.57	0.38	0.22	0.08	0	0	0	0	0	0
-3%	0.88	0.65	0.46	0.30	0.15	0.03	0	0	0	0	0
-2%	0.96	0.73	0.54	0.38	0.23	0.11	0	0	0	0	0
-1%	1.04	0.81	0.62	0.46	0.31	0.19	0.08	0	0	0	0
0%	1.12	0.89	0.70	0.54	0.39	0.27	0.16	0.05	0	0	0
+1%	1.20	0.97	0.78	0.62	0.47	0.35	0.24	0.13	0.04	0	0
+2%	1.28	1.05	0.86	0.69	0.55	0.43	0.32	0.21	0.12	0.04	0
+3%	1.36	1.13	0.94	0.77	0.63	0.51	0.40	0.29	0.20	0.12	0.04
+4%	1.44	1.21	1.02	0.85	0.71	0.59	0.48	0.37	0.28	0.20	0.12
+5%	1.52	1.29	1.10	0.93	0.79	0.67	0.55	0.45	0.36	0.28	0.20

Source: model output

Unit: Excess demand of milled rice (mil MT)

Concerning the ceiling price and export quota reduce simultaneously policy as in Fig 4.11 (a), if the decrease of domestic supply covers the domestic demand, excess demand cannot occur. When 10 percent of the ceiling price and 5 percent of the export quota reduce concurrently, the domestic supply and demand will be equal and excess demand cannot occur. However, a maximum of excess demand (1.04mil MT of milled rice) will be resulted in 50 percent and 1 percent reduction of the ceiling price and the export quota respectively.

Regarding the ceiling price decrease and export quota up policy as in Fig 4.11 (b), 0.47mil MT of excess demand as a minimum will be existed in 10 percent decrease of the ceiling price and 1 percent increase of the export quota. The maximum requirement of excess demand fulfilled the domestic consumption will be 1.52mil MT when the ceiling price reduces 50 percent and the export quota increases 5 percent.

About the ceiling price increase and export quota down policy as in Fig 4.11 (c),

the domestic demand will reduce because of the high price and the reduction of export quota can also fulfill the domestic demand. As a result, the domestic supply and demand will be equal when 10 percent of the ceiling price increase and 2 percent of the export quota decrease simultaneously. When 1 percent of the export quota decrease at that ceiling price increase level, 0.08mil MT of excess demand will be necessary as a maximum to meet the need of the domestic consumption.

When the ceiling price and the export quota increase simultaneously as in Fig 4.11 (d), the proportion of ceiling price increase amount covers the export quota amount or otherwise. The domestic supply and the quantity of demand will be equal in 40 percent of the ceiling price and 1 percent of the export quota increase at once. In contrast, a maximum of excess demand, 0.55mil MT of milled rice will be necessary to fulfill the domestic consumption when 10 percent of the ceiling price and 5 percent of the export quota increase.

#### 5.4.c. Policy mix shifting to feasible conditions (Scenario 3)

Table 5.10 a: Production control and price ceiling policies shifting to feasible conditions (Scenario 3.1)

Change (%)	Policy		Solution		
	Retail price $P_{ce}$ (Kyats/MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	323,861	323,861	11.65	11.82	170,598
+5	340,054	340,054	11.65	11.77	113,418
+10	356,247	356,247	11.65	11.71	58,815
+15	372,440	372,440	11.65	11.66	6,845
+15.68	374,640	374,633	11.65	11.65	0
+20	388,633	388,633	11.65	11.65	0
+25	404,826	404,826	11.65	11.65	0

Source: model output

Note: 0.5% increase production (19.62 mil MT of milled rice)

Table 5.10 b: Production control and price ceiling policies shifting to feasible conditions (Scenario 3.1)

Change (%)	Policy		Solution		
	Retail price $P_{ce}$ (Kyats/MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	323,861	323,861	11.75	11.82	73,335
+5	340,054	340,054	11.75	11.77	15,795
+6.42	344,650	344,648	11.75	11.75	0
+10	356,247	344,649	11.75	11.75	0
+15	372,440	344,649	11.75	11.75	0

Source: model output

Note: 1.0% increase production (19.72 mil MT of milled rice)

In scenario 3.1 (Table 5.10a), when the production control policy shifts 0.5 percent from the recent production which is equivalent to 19.62 mil MT of milled rice production amount, 15.68 percent of the ceiling price lifting will be the suitable movement in the feasible region “ABC” mentioned in Fig 4.12 (b). On the other hand, when the production control policy shifts 1 percent which is equivalent to 19.72 mil MT of milled rice production amount (Table 5.10b), 6.42 percent increase in the ceiling price will be necessary to reach the equilibrium point in the feasible region.

In this scenario, when the production control and the price ceiling policies shift simultaneously, the producers will lose more by increasing production and at the same time, will gain more by getting high price. Similarly, the consumers will lose their benefit because of high price while they can consume more because of increasing production amount. But, the proportion of each policy shift in policy mix simulation accounted for 0.5 percent or 1 percent of production increase and 15.68 percent or 6.42 percent of price up will be much less than in single policy simulation mentioned in the section 5.4 a. In addition, the government’s rent will be reduced because of the high domestic price.

Table 5.11 a: Production control and export quota policies shifting to feasible conditions (Scenario 3.2)

Policy		Solution			
Change (%)	Export quota (MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	7.97	323,861	11.65	11.82	170,180
-0.5	7.93	323,861	11.69	11.82	130,180
-1.0	7.89	323,861	11.73	11.82	91,180
-1.5	7.85	323,861	11.77	11.82	51,180
-2.0	7.81	323,861	11.81	11.82	11,180
-2.16	7.80	323,636	11.82	11.82	0
-2.5	7.77	316,072	11.85	11.85	0
-3.0	7.73	305,601	11.89	11.89	0

Source: model output

Note: 0.5% increase production (19.62 mil MT of milled rice)

Table 5.11 b: Production control and export quota policies shifting to feasible conditions (Scenario 3.2)

Policy		Solution			
Change (%)	Export quota (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	7.97	323,861	11.75	11.82	72,557
-0.5	7.93	323,861	11.79	11.82	32,557
-0.93	7.90	323,739	11.82	11.82	0
-1.0	7.89	322,102	11.83	11.83	0
-1.5	7.85	311,411	11.87	11.87	0

Source: model output

Note: 1.0% increase production (19.72 mil MT of milled rice)

In scenario 3.2 (Table 5.11a), when the production control policy shifts 0.5 percent from the recent condition which is equivalent to 19.62 mil MT of milled rice production amount, 2.16 percent decrease in the export quota will be the practicable movement in the feasible region “ABC”. When the production control policy shifts 1.0 percent (Table 5.11b), which is equivalent to 19.72 mil MT of milled rice production

amount, 0.93 percent decrease in the export quota will be the reasonable movement.

In this scenario, when the production control and the export quota policies shift simultaneously in the feasible region, the consumers can consume more rice with the recent cheap price because of the fixed price ceiling policy. In contrast, the producers will increase their loss because of increasing production at the recent price. In the same way, the government will also reduce its rent because of the declining export quota. The proportion of each policy shift in policy mix simulation (0.5 percent or 1 percent of the production up and 2.16 percent or 0.93 percent of export quota down) will be much lower than in single policy simulation.

Table 5.12 a: Price ceiling and export quota policies shifting to feasible conditions (Scenario 3.3)

Policy		Solution			
Change (%)	Export quota (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	7.97	340,054	11.56	11.77	210,252
-0.5	7.93	340,054	11.60	11.77	170,252
-1.0	7.89	340,054	11.64	11.77	131,252
-1.5	7.85	340,054	11.68	11.77	91,252
-2.0	7.81	340,054	11.72	11.77	51,252
-2.5	7.77	340,054	11.76	11.77	11,252
-2.66	7.76	339,837	11.77	11.77	0
-3.0	7.73	331,857	11.80	11.80	0
-3.5	7.69	320,810	11.84	11.84	0

Source: model output

Note: Price 5% increase (340054 Kyats/MT)

In scenario 3.3, when the price ceiling policy shifts 5% from the recent condition which is equivalent to 340,054 Kyats/MT of milled rice (Table 5.12a), 2.66 percent decrease in the export quota will be the feasible movement. On the other hand, when the price ceiling policy shifts 10 percent (Table 5.12b), which is equivalent to 356,247

Kyats/MT of milled rice, 1.97 percent decrease in the export quota will be the feasible movement.

Table 5. 12 b: Price ceiling and export quota policies shifting to feasible conditions (Scenario 3.3)

Policy		Solution			
Change (%)	Export quota (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s''$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d''$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	7.97	356,247	11.56	11.71	155,640
-0.5	7.93	356,247	11.60	11.71	115,640
-1.0	7.89	356,247	11.64	11.71	76,640
-1.5	7.85	356,247	11.68	11.71	36,640
-1.97	7.81	356,137	11.71	11.71	0
-2.0	7.81	355,227	11.72	11.72	0
-2.5	7.77	343,323	11.76	11.76	0

Source: model output

Note: Price 10% increase (356247 Kyats/MT)

In this scenario, the price ceiling and the export quota policies shift simultaneously, although the consumers and the government will lose its rent because of the price hike and the reduction of export quota, those losses can be captured by the producers as a gain. But the proportion of each policy shift in policy mix simulation accounted for 5 percent or 10 percent of the price increase and 2.66 percent or 1.97 percent of the export quota decrease will be much less than in single policy simulation.

In scenario 3.4 (Table 5.13), when the production control policy shifts 0.5 percent of the recent condition (19.62 mil MT of milled rice), 10 percent increase in the ceiling price (340 thousand Kyats/MT), 1.43 percent decrease in the export quota will be the feasible movement. In this scenario, the producers' benefit will increase because of getting high price and its opportunity cost will also rise because of increasing rice production. The consumers' cost becomes high because of price hike even they can

consume more rice as a consequence of the increase of total production. The government's rent will decrease because of the export quota reduction and of the high domestic price.

Table 5.13: Production control, price ceiling and export quota policies shifting to feasible conditions (Scenario 3.4)

Policy		Solution			
Change (%)	Export quota (mil MT)	Market price $P_m$ (Kyats/MT)	Domestic supply $Q_s$ or $Q_s^*$ (mil MT)	Quantity of demand $Q_d$ or $Q_d^*$ (mil MT)	Excess demand (MT)
recent	7.97	340,054	11.65	11.77	112,629
-0.5	7.93	340,054	11.69	11.77	72,629
-1.0	7.89	340,054	11.73	11.77	33,629
-1.43	7.86	339,946	11.77	11.77	0
-1.5	7.85	338,218	11.77	11.77	0
-2.0	7.81	326,939	11.81	11.81	0

Source: model output      Note: Production 5% increase (19.62 mil MT) and price ceiling 5% increase (340054 Kyats/MT)

## 5.5 Weighing the policy shift conflict

Under the rice sector objective conflict of securing adequate income of farmers whilst ensuring low prices to consumers and accelerating foreign earnings from rice export, the emphasis of government placed on each of the individual goal will change over time depending on the prevailing production and overall economic conditions. The explored alternative rice policies need to weigh the direction of loss and gain of the market participants against its economic, social and political goals (Table 5.14). After numerically investigating the possible shifts of rice policies in the previous section, those alternative policies need to weigh qualitatively in this section against its economic, social and political goals. The direction of loss and gain of the market participants will be measured based on the year 2008 condition accounted for 19.52 mil MT of total

production ( $Q_t$ ), 323,861 Kyats per MT of retail price, 7.97 mil MT of export quota and 11.56 mil MT of domestic supply ( $Q_s$ ).

Table 5.14: Direction of loss and gain in the policy shifting to the feasible conditions

Scenario	Policy shifting (%)			Loss (-) and Gain (+)			Favor policy
	Production $Q_t$	Retail price $P_{ce}$	Export	Producers	Consumers	Government	
1.3	0	0	-3.36		+	-	
3.2	+0.5	0	-2.16	-	+	-	Consumers
	+1.0		-0.93				
1.2	0	+25.83	0	+	-	-	Producers
3.1	+0.5	+15.68	0	±	±	-	Producers
	+1.0	+6.42					
3.3	0	+5	-2.66	+	±	- -	& consumers
		+10	-1.97				
3.4	+0.5	+5	-1.43	±	±	- -	
1.1	+1.38	0	0	-	+		Consumers & government

Source: model output

Producers' gain (+) or loss (-) will be clarified according to the change of benefit from price ceiling policy movement and the change of its opportunity cost from production control policy movement. The change of government's export rent (+) or (-) will also be affected by the price ceiling and the export quota policies movement. The consumers' benefit (+) or (-) will be measured by the impact of the price ceiling policy on their expenditure and by the impact of the production and export quota policies on their rice consumption amount. After clarify gain (+) and loss (-) of each simulation, those impact will be judged by weighing the possible redistribution of one's gain (+) to the other's loss (-) as a compensation scheme.

The widely favored consumer interest policy can be simulated by reducing merely the export quota in scenario 1.3 or by increasing the production and reducing the export

quota simultaneously in scenario 3.2. In those scenarios, the government's rent will be influenced by both the price hike and the export quota reduction in scenario 3.2, on the other hand, it will be affected by only the export quota reduction in scenario 1.3. The producers' benefit will also be reduced by the increasing production in scenario 3.2.

The producer favored policy with the incentive price by moving the ceiling price to the point A (in Fig 4.12. b) will be in scenario 1.2 in which the government and the consumers will be losers because of the price hike.

The producers and the consumers who simultaneously gain from the intervention policies are in scenario 3.1, 3.3 and 3.4 as the producers and the consumers can sell and buy at the competitive price. The producer's loss will be existed in scenarios 3.1 and 3.4 because of the production promotion effect even there will be benefit because of the price up policy effect. Similarly, the consumers will obtain more benefit because of the increase production even they have to pay high competitive price. In those scenarios, the government will lose its rent because of the high domestic price and the low export quota in scenarios 3.3 and 3.4.

The increase rice production scenario 1.1 can satisfy the consumers who can consume more rice at the recent cheap price. This scenario is the only policy which can maintain the government's rent by allowing the recent export quota compared to the other alternatives. However, the enlargement of the areas targeted for the increase production will add to the burden of rice farmers by increasing their opportunity cost and will reduce the incentive of investment in productivity because of the low price. Therefore, in scenario 1.1, the alternative compensation schemes such as technology improvement, modern technology transfer by existing extension services and associated input distribution should be effectively supported by the government from its rent to meet its economic, social and political goals.

## CHAPTER VI

### CONCLUSIONS

The results of this research opened up new spots of further research by leaving open-ended questions. Following is a detailed summary of the findings per objective and the recommendations for policy change. Although there are immense evidence of changes both in conduct and performance in the rice export sector, urgent attention should be placed in policy changes with regard to composition of export market structure and rice policy mix in order to exploit the potential of Myanmar rice export.

#### 6.1 Summary findings and conclusions

##### 6.1.1 The route of amendment in Myanmar rice policy context

Although Myanmar's rice production ranked the 6th among the top 10 paddy producing countries in the world, extremely high dependency of Myanmar's people on rice compared to neighboring Asian countries enhance annual rice production as a national long term planning to maintain food security and generate a considerable surplus for foreign export. As rice is becoming a nationally important crop for the social and political stability of Myanmar throughout history, rice policies in Myanmar have a strong inclination towards production increases for their own sakes while paying rather less attention to farmers' income and welfare.

Regarding the rice export policy, it is evident that if export is allowed, the domestic market price will be increased, given other things being equal. The stabilization of essential rice prices at a low level conforms to the main objective, which is to avoid social

unrest. Even a slight increase in the rice price will easily endanger the life of many urban people. However, the same problem becomes much more serious in Myanmar where in addition to urban population there are numerous net rice purchasers in rural areas, in the form of poor landless agricultural laborers. This explains why Myanmar government could not dare to liberalize rice export even gradually, in contrast to the case of the neighboring countries.

Myanmar was the number one rice exporter and the 'Rice Bowl of Asia' because of the revolution of export-oriented commercialized agriculture by the British government. Since 1963, the Myanmar government nationalized the rice marketing to fulfill the implementation of national food security policy, and had paid special attention to the domestic rice distribution system. In September 1987, the first market liberalization process began with the domestic agricultural market. Although some crops enjoyed full liberalization including pulses (peas and beans) in October 1988, the rice export was under the state control as a major source of foreign earnings.

Myanmar has been a member of the WTO since 1995 and of the Association of South East Asian Nations (ASEAN) since 1997, and has therefore committed itself to reducing tariffs and dismantling non-tariff barriers over a specified period of time. These institutions pressured the government to undertake market oriented policy reforms in line with economic globalization under the structural adjustment program. In April 2003, the Myanmar government suddenly announced the second liberalization of rice marketing aimed at ensuring a beneficial paddy price to farmers and at the same time at enabling consumers to get rice at a fair price (MAPT, 2003). Under this liberalization, the rice ration system was totally abolished, and the government allowed traders to export surplus rice. However, the rice export plan was pulled back again in January 2004, because of an uncertain rice surplus. A regional rice surplus export scheme has been introduced since

December 2007 in order to enhance the rice export marketing system.

#### 6.1.2 The process of competition in the rice export market

The four highest rice surplus regions were allowed to export surplus rice according to the regional rice surplus export scheme introduced on December 7, 2007. Among those regions, the delta region occupied the highest amount of export quota.

For the regional rice surplus export, the government allowed only low quality Indica rice variety, the Emahta to be exported. The rice export quotas, the export companies, the domestic paddy price and the minimum rice export price were decided by the government. Moreover, scheduled shipping periods, supervisory methods for buying rice to export from the surplus regions, and the designated exporting countries were also established.

A marketing survey in 2008, found that about half of the surveyed companies started the rice export business from 2005 and the others began from 2008. Concerning the assets of those companies as rice export trading; only one-third of surveyed companies owned warehouses at Yangon and local regions. Those companies did not own rice polishing and color sorting machines which are necessary for the quality improvement of export rice.

The export rice (not un-husked rice, paddy) were purchased from the millers at the designated rice producing regions by the government. The major purchasing period was ranged from December to May after the main rainy harvest. The transactions of rice purchasing for export were contract buying at the local rice mills by local measurement of the weight in instead of standardized measurement for export. Provision of capital in advance to the local millers depends on the trust on the business relations with the millers.

The exporters had to ship the purchased rice from the local mills of the respective regions to the international port in several steps, accordingly its transportation and labor

costs occupied a large share of the total rice export processing cost. Exporters' profits varied from 0.8 percent to 19.4 percent per investment, with export prices varying from US\$ 280 to US\$ 320 per MT of milled rice. Almost three-fourth of Myanmar rice export transaction was carried out via Singaporean buyers who could offer the TT advance payment preferred by Myanmar exporters. A small number of companies and small export quantities went to South Africa, UAE, Bulgaria and India.

Instead of searching buyers in the international markets, the exporters usually accept the contact of usual foreign buyers. Compared to the price of Thai and Vietnam rice, the Myanmar rice export price was significantly lower, only 58 percent to 78 percent of the Thai and Vietnam rice price.

#### 6.1.3 The course of policy mix impact in Myanmar rice market

The Myanmar government tried to promote its rice export market by liberalizing its market in 2003 and additionally introduced a regional rice surplus export scheme in 2007. However, the political and social stability of the domestic market advocated the government to reintroduce several restrictions including domestic rice price control by establishing a Commodity Price Stabilization Committee; export license restriction by export quota allotment, etc. For the sake of simplification, the complex structure of the government intervention could be summarized as production control, price control (by ceiling price) and export control (by export quota) policies and built up a Myanmar rice policy mix model in the chapter 4. In view of the widespread government intervention in the Myanmar rice sector, it is extremely important to understand the impact of the recent implementing major rice policies, how the various options available to the government are likely to influence income distribution, resource utilization and growth in the short and long run.

When estimating the impact of Myanmar rice policies from the year 2004 to 2006 as the first period of the study, the retail prices were higher than its equilibrium prices which could fulfill the total rice consumption amount of the low income consumers. This phenomenon explained lack of strong implementation of ceiling price by the government in the retail market during the transition period of market liberalization. In contrast, the retail prices of 2007 and 2008, which were lower than its equilibrium prices, showed that the Commodity Price Stabilization Committee has introduced the ceiling price effectively and the retail prices of rice were binding to the ceiling prices prevailed during those years.

The recent government intervention policies in Myanmar rice market create a net social loss and will not result a zero-sum social welfare policy setting. Moreover, the rice producers who were the targets of the market liberalization could not get full benefit from their effort because of low price setting in 2008, it cannot be said that it would be the best world for the rice market participants. Government needs to adjust the proper setting of production control, export quota and price ceiling policies in order to balance the merits and demerits of the market participants including producers, consumers and the government.

When single policy shifts, the increase of production of milled rice to an equilibrium point (19.79mil MT of milled rice) can fulfill the larger amount of consumption which the consumers want to buy at the cheap price and can eliminate the excess demand. Moreover, the government can also earn the benefit from the recent export amount. However, it will increase the loss of producers by enforcing rice production.

In addition, the increase of ceiling price of milled rice to an equilibrium point (407 thousand Kyats/MT of milled rice) will increase the benefit of producers by redistributing the loss of consumers and government because of high price. Finally, the reduction of export quota of milled rice to an equilibrium point (7.70mil MT of milled

rice) will reduce the rent of the government by reducing rice export which can be redistributed to the consumers as a gain and can eliminate the excess demand.

Policy mix shifting to alternative conditions can verify the impact of the several combinations of those policies shift by estimating the potential excess demand from adjusting the domestic demand and supply after the policies shift. Such kind of investigation provides the policy makers to know the possibility of the benefits and losses of the market participants when the policy setting is changed in accordance with its economical, political and social developmental goals.

When the production and the ceiling price shifts simultaneously, the potential of excess demand can depend on the direction of policy shift. The domestic supply cannot fulfill the domestic demand with a minimum of 0.59mil MT and a maximum of 2.09mil MT excess demand when both the production and the ceiling price reduce simultaneously. In other shifts, the domestic demand and supply can coincide depending on the proportion of policy shift. To reach the equilibrium point where the domestic demand and supply will be equal: 1 percent less production will be necessary at least 50 percent ceiling price rise; 10 percent reduction of the ceiling price will need 2 percent increase of the production; 1 percent and 10 percent increase of the production and the ceiling price respectively can also fulfill excess demand.

When the production and the export quota policies shift simultaneously, the decreasing domestic supply because of the production reduction cannot cover the domestic demand fluctuations affected by the export quota simulations. When a minimum of 0.07mil MT and a maximum of 1.17mil MT of milled rice will be necessary in export reduction simulation, 0.54mil MT and 1.64mil MT as a minimum and a maximum will be required in the export quota increasing simulation. In the others, 1 percent and 2 percent production increase shifting will satisfy the domestic demand by 1

percent increase and decrease of the export quota.

When the price ceiling and the export quota policies shift simultaneously, the existing production cannot cover the domestic demand when the ceiling price fall and the export quota increase and the potential excess demand of 0.47mil MT as a minimum and of 1.52mil MT as a maximum can occur. The equilibrium conditions where the domestic supply and demand will be equal at: 10 percent and 5 percent reduction of the ceiling price and the export quota simultaneously; 10 percent ceiling price increase and 2 percent export quota reduce; 1 percent and 40 percent increase of the export quota and the ceiling price respectively.

After exploring the alternative conditions of policy mix shifting by investigating the potential impact of policy mix shift on the rice market, it will be preferable to search the preferable policy mix shift in the feasible region (such as in Fig 4.12) by maximizing the benefits and minimizing the losses of the market participants.

When the production control policy shifts 0.5 percent or 1 percent from the recent production, approximately 15.68 percent or 6.42 percent of the ceiling price lifting will be required to reach the equilibrium points in the feasible region “ABC”. When the production control policy shifts 0.5 percent or 1 percent from the recent production, approximately 2.16 percent or 0.93 percent decrease in the export quota will be necessary to reach the best points. When the price ceiling policy shifts 5 percent or 10 percent from the recent ceiling price, approximately 2.66 percent or 1.97 percent decrease in the export quota will be necessary to meet the domestic supply with the domestic demand. When the production control policy shifts 0.5 percent and the price ceiling policy shift 5 percent, 1.43 percent of the export quota reduction will be the feasible movement.

In weighing the explored alternative policies, the widely favored consumer interest policy movement can be simulated by reducing merely the export quota or by

increasing the production and reducing the export quota simultaneously. The producer favored policy with the incentive price by moving the ceiling price in which the government and the consumers will be losers because of the price hike. The producers and the consumers who simultaneously gain from the intervention policies are in scenario 3.1, 3.3 and 3.4 as the producers and the consumers can sell and buy at the competitive price. The producer's loss will occur in scenario 3.1 and 3.4 because of the production promotion effect. The government will lose its rent because of the high domestic price and the low export quota in scenario 3.3 and 3.4. The increase rice production scenario 1.1 can satisfy the consumers who can consume more rice at the recent cheap price.

## 6.2 Policy implication

### 6.2.1 Requirements for the exploitation of the potential of Myanmar rice export from the market structure

Since the revolution of export-oriented commercialized agriculture by the British government, Myanmar was the number one rice exporter and the ‘Rice Bowl of Asia’ in those eras. After independence, successive Myanmar governments had paid special attention to the national food security policy, and as a result, the share of Myanmar rice export in the world market reduced to a negligible amount compared to the neighboring countries. Importance of rice as a staple food in Myanmar generates the rice policies towards production accelerates while paying rather less attention to farmers’ income and welfare. Moreover, the government could not dare to liberalize rice export even gradually, in contrast to the case of the neighboring countries and the stabilization of essential rice prices at a low level become a main objective, which is to avoid social unrest.

To undertake market oriented policy reforms in line with economic globalization, the Myanmar government liberalized agricultural market twice in 1987 and 2003. However, uncertainty about the national rice surplus and the avoidance of social unrest could not allow the government to withdraw its hand completely from the rice market and started introducing several restriction on rice export such as fluctuate rice export quota, frequent export ban, domestic rice price control, minimum rice export price and export tax etc.

As a result of the long-lasting state monopoly and unreliable rice supply, Myanmar loses trading partners year after year. In this case, the highly volatile rice export policies reduced the confidence of traders in the government, and increased risk-averse attitudes toward business expansion and investment in new facilities. The action of confirming the exact national rice surplus by the nationwide survey is the very first urgent requirement for the fixing of volatile national rice policies. Implementing the stable rice policies is

enormously essential to build up the confidence of traders toward business expansion and investment in new facilities in order to exploit the potential of Myanmar rice export. Prohibiting the private sector from getting exposure to international markets may limit the ability of the exporters to exploit the opportunities for increasing market share and to acquire the flexibility needed to operate in world markets.

The regional rice surplus export scheme was introduced on December 7, 2007 in order to accelerate the Myanmar rice export sector. The designated regional surplus export scheme can be the speedy development strategy of the concerned regions in the early stage of economic development. However, regionally unbalanced development should be taken into consideration in the long term economic development of the nation.

In the regional surplus export scheme, only 26 trading companies were allowed to export rice which shows the entry barrier of rice export sector compared to the 12,426 members of the rice and paddy traders association. The beneficiaries of the rice export quota policy and the associated export licensing system are only few proportions of the traders and reduce the incentives to improve performance of rice export market.

The government allowed only low quality Indica rice variety, the Emahta to be exported. The low quality Indica variety is also the main variety consumed by the low income consumers in rural and urban areas. High quality Japonica variety consumed by the high and medium income consumers should also be taken into considering to be exported to the world market. The increase in rice quality which is the result of improvements in processing is necessary in response to growing foreign demand.

Although the domestic paddy and rice prices were fixed as a ceiling price to avoid the domestic price hike because of the export quota allotment, the welfare of the rice farmers could be affected by the low domestic price setting. In the long run, the low domestic price will reduce the incentive of rice farmers to invest in their farm for the productivity

enhancement. In particular, rice prices have been kept artificially low, thereby reducing the incentive to increase production and hence exports.

The minimum rice export price and the short-term scheduled shipping periods decided by the government are substantially hard restrictions for Myanmar rice export. The setting of minimum export price should be reflected by the world market price fluctuation not to lose the government's rent and the exporters' profit. Short-term scheduled shipping periods such as 3-5 months duration to export all allotment could not allow the rice exporters to check the world price trend when selling their rice and just to emphasize shipping the allowed export quota within the limited time. It is also one of the reasons which causes Myanmar rice export price low and creates the exploiting chance for the foreign buyers on the restrictions of Myanmar rice policy. By and large, the rice exporters ignore the world price movements and the world market penetrating channels than the accomplishment of their transaction in time.

According to the marketing survey in 2008, the existing rice export companies have not enough business experiences to penetrate world market and do not own facilities to improve rice quality. The local millers play an essential role in procuring rice from farmers, supplying rice to exporters, and distributing rice within the country. The local nature of marketing is also reflected the issue of low quality, which despite private sectors involved in the export regime, has been compounded by the lack of standardization systems, limited rice seed control, and insufficient drying, storage and processing facilities. Most agents indicate personal contacts as the main source of information for prices and regulations affecting their business.

Lack of standardization at the local market and insufficient port facilities such as facilitate ware house are the main factors which increase the export processing cost especially transportation and labor costs. Moreover, indecisive exchange rate which is

implicitly influenced by not transparent trade policy can also affect the profit of the rice export. The government should be aware of these issues to facilitate the rice export market.

Credit constraints have serious implications for procurement activities, storage, and investment for the exporters. Accordingly, the Myanmar rice export went to the usual buyers especially to Singapore buyers who could offer the advance payment and got the low price compared to the price of neighboring countries. Limited scheduled shipping period could not encourage the exporters to search the international buyers by competing in the world market. The destination of rice exports also has important penalty for the quality of rice exports. Getting low price can also reduce the incentive for the exporter to compete to get back the rice exporter position in the world market. Moreover, when the domestic rice price hike, the exporter may possibly not afford to export more with the cheap rice export price and the local market can be easily collapsed as a consequence.

Although the participation of private sector in the rice export is clearly step in the right direction to the market oriented economy, there are a number of remaining constraints – structural and political – that will restrict farmers from realizing the full potential of these reforms. In terms of politically motivated constraints, a key limitation of the reform of the rice export regime is that the Government will continue to nominate rice export companies, hence there is still a far way to go in terms of increasing private sector participation in rice exports.

Recurring issues in the description of the challenges facing Myanmar rice exports are precisely unreliable supplies and (a reputation of) low quality. Clearly these are issues of which Myanmar officials are well aware and efforts are being made to improve the quality of rice destined for exports. Notwithstanding the above caveats, the rice export quota has been a strong regulatory tool in terms of achieving the goals of national self-sufficiency and stable rice prices in Myanmar. However, the export quota has also been a very

restrictive policy tool that has kept Myanmar rice production and exports well below potential.

Myanmar has the potential to take back the position as the leading rice exporter. This potential, however, is constrained by the structure of the marketing system with its still largely underdeveloped private sector and inefficient public sector. If Myanmar is to acquire and maintain world rice leadership, several constraints to the development of the marketing system will have to be alleviated. Restrictive policies continue to prevent open competition in the rice exports and, to a lesser degree, in internal marketing. Recent policy changes are encouraging, but need to be extended to allow the private sector to participate in rice exports. The sustainability of Myanmar's success as a rice exporter depends, to a large degree, on the development of a competitive and adaptable marketing system.

#### 6.2.2 Requirements for the exploitation of the potential of Myanmar rice export from the policy mix simulations

Given the crucial role of rice for growth of agriculture and for food security, the Myanmar government needs to ensure that the rice market develops in a balanced manner, without adversely affecting the development of the rural economy and the food security of vulnerable groups. Price policy analysis can help identify the trade-offs in given circumstances and can even point the way to more efficient sources of revenue. But the analysis cannot eliminate the dilemma and the need for government price interventions. With appropriate weights attached to reflect this variance, the general objectives for the food sector which are the representative of the goals can be pursued by the government.

In analyzing the effects of price interventions, the basic premise is that the government intervention causes a distortion in rice price which would affect incentives and

efficiency through the price mechanism. This study provides a clear picture of the adverse impacts of exercising inefficient trade policies to mitigate the price pressure in the rice market.

As the Commodity Price Stabilization Committee was established in the mid 2006, the ceiling price setting has been well performed since 2007. Therefore, in the transition period of market liberalization, because of the speculation of the export liberalization by the traders, the retail prices from 2004 to 2006 were higher than its equilibrium prices. The price difference between the retail price and the equilibrium price was reduced year after year, which could express the government's intention to implement the ceiling price by letting the low income consumers fulfill their food consumption amount with the reasonable price.

The retail prices of 2007 and 2008, which were lower than its equilibrium price and binding to the ceiling prices prevailed during those years. The policy-makers need to carefully consider these policy options as the rice prices are crucial to the social stability and food security of the nation. A quick and convenient decision of imposing trade policy barriers may temporarily release the domestic price pressure, but in the long-term will negatively impact the global and domestic food markets. Encourage productivity improvements that boost the supply would be a much more beneficial and long-term solution for the price inflation problem of today's rice market.

It also illustrated the deviation of the optimum condition of the rice market because of price distortion and led to efficiency loss in the market by reducing producers' surplus with low price. Moreover, cheap price could be attractive to the consumers who wanted to buy more at that low price which generated the excess demand in those periods. However, the production control policy reduced the excess demand amount by fulfilling the total consumption amount of low income consumers. It also expressed the intention

of government intervention on the acceleration of export from the surplus concerned by not allowing the domestic consumers to suffer from starvation.

As the rice producers who were one of the targets of the market liberalization could not get benefit from such kind of market interventions, we could not say that those market interventions will be the best world for the rice market participants. However, removal of one distortion such as the elimination of production control policy may not create an efficiency gain as it was compensation for the efficiency effect of the others; export quota and price ceiling policies and we could say it will be in a second-best world. In such conditions, it will be extremely important to understand the various options of policy implementation and weighing incentives and disincentives conflict of those options.

A change in the rice policies will create gainers and losers unless alternative compensation schemes are followed and a mission to present a framework in which these gains and losses can be expressed will be necessary to judge the alternative policy conflicts. Identifying the incidence and magnitude of these gains and losses is thus fundamental to managing the political feasibility of policy reforms

In the single policy shifting, the decrease of production of milled rice from the recent production loses the average domestic rice consumption amount and increases the excess demand amount in one hand. On the other hand, the increase of production of milled rice over than its equilibrium point (19.79 mil MT of milled rice) will increase the loss of producers by not redistributing as a gain to consumers and government.

Clearly, the decrease of ceiling price from the recent price will increase the benefit of consumers and the government because of the cheap price although it extends the producers' loss. The increase of price over its equilibrium price of milled rice (407 thousand Kyats/MT) will not be binding with the market price.

Lastly, when the export quota increases more than the recent condition, the domestic average consumption amount is not fulfilled and it results more excess demand. The reduction of export quota more than its equilibrium amount increases the loss of government by not increasing the benefits of consumers and producers.

The alternatives of policy mix can help identify the trade-offs in given circumstances and can even point the way to more efficient sources of revenue. But the analysis cannot eliminate the dilemma and the need for government price interventions. Those alternatives are designed to illuminate the consequences of a movement of a food system in some desired direction. What is desired obviously varies from society to society and over time against its economic, social and political goals.

When the reduction of rice production policy is implemented simultaneously with the ceiling price reduction or the export quota enhancement policy, the social stability statement will be necessary to take into consideration as the excess demand will be definitely extended by not allowing total domestic rice consumption amount. In the reduction of rice production policy setting, the price hike or export reduction policy can fulfill the domestic demand depending on the proportion of policy shifts. When production is increasing, the price and export policy setting can be flexibly implemented as the domestic consumption has been fulfilled.

When the export accelerating policy is implemented simultaneously with the price reduction policy, the deficit which will not allow the total domestic rice consumption amount can lead to social unrest. Regarding the export accelerating policy, the higher proportion of price shift than its shift can support the equilibrium condition of domestic supply and demand.

As previously mentioned, net social loss is inevitable in the recent Myanmar rice policies, how to make the best use of its merits while at the same time minimizing its

demerits is likely to be the most important issue for the recent rice market system. In the alternative conditions of the policy mix shifting movement, there were equilibrium points in which some needed high proportion of policy shift in order to fulfill the domestic rice demand under the impact of simulated policy shifting. The policy mix shifting within the feasible area of “ABC” (Fig 4.12) can minimize its demerits by shifting a small proportion of each policy to reach its equilibrium point where the merits of the policy mix shifting can be exploited.

When the production and the ceiling price policies shift simultaneously, 0.5 percent or 1 percent of production increase policy shift will be the feasible movement when the ceiling price increases to 15.68 percent or 6.42 percent from the recent condition. In the policy mix of production control and export quota policies, 0.5 percent or 1 percent of the production increase will be a rational shift when export quota reduce 2.16 percent or 0.93 percent from the recent. The preferable condition for the price ceiling and the export quota policies mix shifting will be 5 percent or 10 percent of the ceiling price hike together with the reduction of the export quota 2.66 percent or 1.97 percent respectively. When the production, the ceiling price and export quota policies shift simultaneously, 0.5 percent of production increase and 5 percent of price up will reach equilibrium point by reducing 1.43 percent of export quota.

It is generally believed that inefficient trade policies, such as export restrictions or import tariffs, can only create a short-term impact of mitigating the upward pressure on domestic commodity prices, but ultimately to have an adverse impact on domestic prices. Unfortunately, most policy makers focus on the short-term impacts and adopt these policies as a way to combat price inflation. In order to slow down the domestic price increases, adopted policies that included export bans or at least partial export restrictions will try to keep enough domestic production for the local consumption. Introducing

export bans will diminish the incentives for producers to expand production. It is a contention, however, that rationality must be judged in terms of the effectiveness of achieving the broad spectrum of political and economic objectives of the nation.

Getting the policies right is crucial for the development of the agricultural sector, for the development of rural areas and for the incomes of the rural population. But designing efficient policies is very difficult and the effects of policies are often not known or impossible to predict in advance. The economic environment in which they are implemented can also change, further making policy decisions more difficult. Due to different agendas and capacity, politicians might not construct the best policies from an economic point of view, but rather from a political point of view.

The widely favored consumer interest policy movement can be simulated by reducing merely the export quota as a single policy shifting or by increasing the production and reducing the export quota simultaneously as a policy mix shifting. The producer favored policy with the incentive price is the increasing ceiling price to its equilibrium point in which the government and the consumers will be losers because of the price hike. The producers and the consumers simultaneously gain from the policy mix shifts to the feasible conditions such as production and price up shifting; price up and export quota decline shifting; and production increase, price up and export quota decline shifting as the producers and the consumers can sell and buy at the competitive price. The producer's loss will be enlarged in production increase policy. The government will also lose its rent because of the high ceiling price or the low export quota.

The increase of rice production amount can satisfy the consumers who can consume more rice at the recent cheap price. This increase of rice production is the only one policy which can maintain the government's rent by allowing the recent export quota compared to the other alternatives. However, the enlargement of the areas targeted for the

increase production will add to the burden of rice farmers by increasing their opportunity cost and will reduce the incentive of investment in productivity because of the low price. Therefore, in that simulation, the alternative compensation schemes such as technology improvement, modern technology transfer by existing extension services and associated input distribution should be effectively supported by the government from its rent of rice export to meet its economic, social and political goals.

By using 2 main scenarios: single policy shifting and policy mix shifting; 7 options of policy choices to the best condition will be available under the recent government intervention. In searching for the best use of the merits at those options by weighing gains and losses against each other, the objectives of both the farmers, consumers and the government can be gainfully served simultaneously if the alternative compensation schemes are followed for the opportunity cost of farmers by increasing rice production amount. Therefore, a balanced strategy of producer price incentives, of improved technology and of associated input distribution is essential for transforming the rice sector.

While this assessment can support Myanmar rice policies impact by providing a comprehensive measure of market distortion, much work remains to be done. For example, efficiency of government investment in agricultural productivity such as agricultural research, irrigation infrastructure and fertilizer subsidy, with the result of not only increasing social economic welfare for the nation as a whole but also improving inter-sectoral equity would serve as fruitful areas of investigation for future studies.

## REFERENCES

- Alston, J.M. Smith, V.H., Acquaye, A. and Hosseini, S. 1999. Least-cost cheap-food policies: Some implications of international food aid. *Agricultural Economics*, Volume 20, Issue 3, Pages 191-201.
- Aung, N.M. 2006. *Evaluation of Pricing Policy in Myanmar Rice Economy*. M.Sc Thesis, Tokyo University.
- Bakhshoodeh, M. and Thomson K.J. 2006. Social welfare effects of removing multiple exchange rates: Evidence from the rice trade. *Iran Agricultural Economics*, Volume 34, Pages 17–23.
- Breisinger, C., Yokogawa, H. and Song, M. 2003. Policy analysis of the liberalization of the rice market in Japan. *Journal of Faculty of Agriculture*, Kyushu University, Part 2, Pages 503-531.
- Choeun, H., Godo, Y. and Hayami, Y. 2006. The economics and politics of rice export taxation in Thailand: A historical simulation analysis, 1950-1985. *Journal of Asian Economics*, Volume 17, Issue 1, Pages 103-125.
- Coady, D., Dorosh, P. and Minten, B. 2009. Evaluating alternative policy responses to higher world food prices: The case of increasing rice prices in Madagascar. *American Journal of Agricultural Economics*, Volume 91, Issue 3, Pages 711-722.
- Cramer, G.L., Wailes, E.J., Gardner, B. and Lin, W. 1990. Regulation in the US rice industry, 1965-89. *American Journal of Agricultural Economics*, Volume 72, Issue 4, Pages 1056-1065.
- CSO, 2006. Statistical Yearbook (Various Issues). Central Statistical Organization, Naypyitaw, Myanmar.
- FAO, 2008. FAO Rice Market Monitor. <http://www.fao.org/es/esc/en/index.html>. Volume 6, Issue 2.

- FAO, 2010. FAOSTAT. <http://faostat.fao.org>. Updated December 2009.
- Francois, J.F. and Hall, K.H. 1997. Partial equilibrium modeling. In: Francois, J.F. and Reinert K.A. (ed.) *Applied Methods for Trade Policy Analysis*. Cambridge University Press, New York, Pages 122-155.
- Gardner, B. 1987. *The Economics of Agricultural Policies*. Macmillan Publishing Co., New York.
- Kizilaslan, H., Gurler, A.Z., and Kizilaslan, N. 2005. The analysis of the market price support and difference payment system practices in Turkey using partial equilibrium model. *Ekonomicky Casopis*, Volume 53, Issue 9, Pages 924-940.
- Krueger, A.O., Schiff, M. and Valdés, A. 1988. Agricultural incentives in developing countries: Measuring the effect of sectoral and economy wide policies. *World Bank Econ. Rev.* Volume 2, Pages 255-71.
- Krueger, A.O., Schiff, M. and Valdés, A. 1991. *The Political Economy of Agricultural Pricing Policy*. Volume 1: Latin America, Volume 2: Asia, and Volume 3: Africa and the Mediterranean, Baltimore: Johns Hopkins University Press for the World Bank.
- Lwin, H.Y., 2005. *A Study of Rice Market Performance in Myanmar*, M.Sc Thesis, Kyushu University, Japan.
- MAPT, 2003. *History of Rice Marketing in Myanmar*. Myanma Agricultural Produce Trading, Ministry of Commerce, Yangon, Myanmar.
- Mergos, G., Karadeloglou, P. and Stoforos, C. 1999. Exploring the impact of agricultural price and trade policy reform under transition in Albania. *Economic Change and Restructuring*, Volume 32, Issue 2, Pages 89-101.
- Ministry of Commerce, 2008. (Various Rice Reports) Naypyitaw, Myanmar.
- Minot, N. and Goletti, F. 2000. Rice market liberalization and poverty in Vietnam. Research Report, International Food Policy Research Institute, Washington, D.C.

- Okamoto, I. 2005. Transformation of the rice marketing system and Myanmar's transition to a market economy. Discussion Paper 43, Institute of Developing Economies (IDE), JETRO, Chiba, Japan.
- Okamoto I. 2006. Agricultural policies and development of Myanmar's agricultural sector: An overview. Discussion Paper 63, Institute of Developing Economies (IDE), JETRO, Chiba, Japan.
- Orden, D., Cheng, F., Nguyen, H., Grote, U., Thomas, M., Mullen, K., and Sun, D. 2007. Agricultural producer support estimates for developing countries: Measurement issues and evidence from India, Indonesia, China, and Vietnam. *Research Report of the International Food Policy Research Institute* (152), Pages 1-140.
- Ricardo F.M. 1968. Export quotas and allocative efficiency under market instability. *American journal of agricultural economics*, Volume 50, Number 3, Pages 643-59.
- Ryan, J. 2002. Assessing the impact of food policy research: Rice trade policies in Vietnam. *Food Policy*, Volume 27, Issue 1, Pages 1-29.
- Sadoulet, E., and de Janvry, A., 1995. *Quantitative Development Policy Analysis*. Johns Hopkins University Press, Baltimore and London.
- Sah, R.K. and Stiglitz J.E. 1984. The economics of price scissors. *The American Economic Review*, Volume 74, No. 1, Pages 125-138.
- Schiff, M. and Valdés, A. 1992. *The Political Economy of Agricultural Pricing Policy, Volume 4: A Synthesis of the Economics in Developing Countries*. Baltimore, Md.: Johns Hopkins University Press.
- Schultz, T. 1978. *Distortion of Agricultural Incentives*. Bloomington: Indiana University Press.
- Soe, T., Batterham, R.L. and Drynan, R.G. 1994. Demand for food in Myanmar (Burma). *Journal of Agricultural Economics*, Volume 11, Pages 207-217.

- Stiglitz, J. and Weiss, A. 1981. Credit rationing in markets with imperfect information. *American Economic Review*, Volume 71, Pages 393-410.
- Thanda, K. 2000. *Market Induced Shifts in Agricultural Supply and Effects on Trade Patterns in Myanmar*. Ph.D Dissertation, Hohenheim University, Verlag Grauer. Stuttgart, Germany.
- Theingi, M. 2007. *Myanmar Rice Market: Marketing Integration and Price Causality*. Ph.D Dissertation, Yezin Agricultural University, Yezin, Naypyitaw, Myanmar.
- Timmer, C.P. 1975. The political economy of rice in Asia: A methodological introduction. *Food Research Institute Studies*, Volume 14, No.3, Pages 191-196.
- Timmer, C.P. 1986. *Getting Prices Right: The Scope and Limits of Agricultural Price Policy*. Cornell University Press, Ithaca and London.
- Timmer, C.P., Falcon, W.P. and Pearson, S.R. 1985. *Food Policy Analysis*. World Bank Publication, Johns Hopkins University Press, Maryland, USA.
- Tsakok, I. 1990. *Agricultural Price Policy: A Practitioner's Guide to Partial-Equilibrium Analysis*. Cornell University Press, Ithaca and London.
- Tweeten, L. 1989. Classical welfare analysis. In: Tweeten, L. (ed.) *Agricultural Policy Analysis Tools for Economic Development*. Boulder, Colo., Westview Press.
- Won W.K. and Taylor R.D. 1999. Outlook of the world rice industry under alternative trade liberalization policies in Japan and Korea agricultural economics. Report No. 433, Department of Agricultural Economics, Northern Plains Trade Research Center, North Dakota State University.
- World Bank 2008. *World Development Report, 2008*. Washington D.C., Oxford University Press for the World Bank.
- Zusman, P. 1976. The incorporation and measurement of social power in economic models. *International Economic Review*, Volume 17, Pages 447-62.