

# 1. Introduction

---

## 1.1 Background

The sugar industry in Indonesia has long been associated with government involvement and regulation. This goes back to the colonial era when sugar was an important commodity which generated substantial revenue for government. At the time, the government intervention was to enforce the law giving farmers an obligation to cultivate sugarcane. The success of the system brought Indonesia to the status of one of the biggest sugar exporting countries. The importance of the industry in the colonial era was described by Mubyarto (1969), who quoted from Selosoemarjan (1962), as “the life belt upon which the Netherland Indies economy was floating”. During the peak years, sugar contributed more than one-quarter of the total income of the Netherland Indies government (Mubyarto 1969).

The portrait of the sugar industry after independence is still dominated by government intervention. The intervention in the sugar market has created a monopolistic structure where Bulog, the government marketing board, controls the market. The strong and stable government over the years resulted in an environment where Bulog’s position as a single authority was unchallenged. Notwithstanding several critiques of the tied control which burdens the industry, creating market distortions, a high level of regulation continues to characterise the sugar industry.

While the intervention objective in the colonial era was simply to boost production for government revenue, it has relatively complex objectives in the independence era where it is a necessity to accommodate several parties, sometimes with conflicting interests.

The structure of the sugar industry makes it amenable to government intervention. The industry is dominated by estate mills and most of them are government-owned. The estate mills, which have been centres of the sugar industry, provide an environment where government involvement seems inevitable. On the one hand, government has an interest in keeping estate mills operating; though some studies reveal that they are mostly old and inefficient (Mubyarto and Daryanti 1991). However, sugar production, which is now mainly aimed at domestic consumption, makes the government also consider consumers. The government even includes sugar as one of the basic commodities which makes the policy for it has to be designed to protect people's interests or consumers. At the same time, the view that the sugar industry is one source of government income still occupies the government policy after independence, which brings the government to the situation where it has to balance some different interests.

Recently, following the currency crisis, a deregulation process in Indonesia's economy has begun. The crisis, starting in August 1997, has made it necessary for the Indonesian government to seek assistance from the IMF. An assistance package was agreed to, in October 1997, by the IMF along with an agreement from the Indonesian government to implement policy reforms which not only cover the financial sector but

also structural adjustment in the real sector of the economy. More specifically, it includes structural reforms such as the elimination of state and private monopolies.

On the structural reforms, Bulog's monopoly on sugar and wheat and wheat flour has to be eliminated. Since then, the policy reform in the sugar industry has commenced. Bulog has relaxed its import monopoly by giving other processors the right to import raw sugar. On the production side, a new decree has been enacted to review the previous decree of Intensified Smallholder Cane Program (ISCP) of 1975, giving farmers more choice whether they cultivate cane or other crops. The other agricultural act of the Cultivation System was actually enacted in 1992, providing a legal guarantee for farmers to cultivate crops based on their own preferences. However, the decree of 1998 is a new spirit in the sugar industry which had been previously bound by the ISCP of 1975. Moves to the more open market was accelerated several months later when Bulog decided not to procure farmers' sugar, giving authority for farmers to sell their sugar in the free market with more competitive prices.

## **1.2 Research Questions**

The study is motivated by the fact that the government heavily regulates the sugar market in Indonesia. The regulation of the market was originally aimed at achieving self-sufficiency. However, the policy has been over-shadowed by problems in the production sector and conflict between giving consumers a stable affordable supply while providing adequate incentives to producers. Indonesian sugar policy, in this regard, involves wealth transfer between different groups. However, the necessity for transfer has been constrained by a view that sugar is also a source of government

revenue (Amang 1993). This creates to a totally different set of circumstances in the arena of the policy process in which the government also has an interest.

The conflicting objective is one impetus in considering several different parties in policy decision making. It may not only be economic reasons which drive the policy process, but also political ones. Processes in finding a balance between interest groups may produce some policy choices which are not optimal in terms of welfare but provide a politically acceptable solution.

The main concern now arising from the nature of the Indonesian sugar market is to find an optimal policy solution accommodating all interest groups without, at the same time jeopardising economic considerations. While the existing policy may not fulfil the necessary criterion, it is important to understand the origin of the policy in order to formulate a better alternative. This inquiry will provide an answer as to why the existing policy is in place.

### **1.3 Objectives of the Study**

The main objective of this study is to explain the features of government intervention in the Indonesian sugar market and how they evolved. This objective will provide an understanding of the origins of the policy today.

The above objective means that this study attempts to develop a framework for the assessment of the Indonesian sugar policy. More specifically, it attempts

- (a) to construct a political economic framework with emphasis on a political

preference function (PPF) framework capturing several interest groups in the policy process;

(b) to use the framework to explain the origins of Indonesia's sugar policy;

(c) to investigate how the power of interest groups influences policy; and

(d) to draw up specific recommendations for appropriate policy measures.

## **1.4 Method of the Study**

In this study, policy, or government intervention, is viewed as the outcome of a complex process. This means identification of the determinants of the policy and the rules that govern it are important elements of understanding that process. The conceptual framework used in this study is traced to the literature on economic regulation which holds that the agricultural sector may be regulated through political institutions. A review of the literature is carried out to provide some critical hypotheses which will be incorporated into the framework.

The regulation approach suggests that understanding the historical background of policy is a necessity. Thus a policy record will be discussed prior to developing a political-economy framework. The understanding of government constituents is also an important factor in the explanation of political economic motives behind the policy. Thus, apart from quantitative measures of policy impact, a qualitative explanation will be given on the policy phenomenon.

This study covers the period when Indonesia was re-focusing sugar policy for domestic use. Thus, it starts from the end of the 1960s when Indonesia started to import and goes up to 1995. It does not cover the recent deregulation started at the end of 1997. This is because the study was being completed when new reforms were

beginning. While the new developments have totally changed intervention policy, the new regulation has not been fully established at time of writing. Thus, it is not possible to have a complete evaluation of the new policy. However, some remarks will be made at the end of this thesis on the importance and relevance of recent deregulation on the studies of government intervention, and will be an agenda for further research.

## **1.5 Outline of the Study**

Chapter 2 explores the background of sugar policy in Indonesia. It starts with an economic analysis of the sugar industry in relation to production, consumption and trade. A historical review of the sugar industry is also presented, followed by the discussion of the existing Indonesian sugar policy.

More specifics about the political economy background of the industry are presented in Chapter 3. It explores several interest parties involved in the sugar industry.

Chapter 4 reviews the political economy approach to agricultural policy. Special attention is given to the economic theory of regulation focusing on government intervention in the agricultural sector. This leads to the political economic framework for Indonesian sugar policy presented in Chapter 5.

The political economic framework, with special emphasise on the political preference function (PPF), is explored in Chapter 5. Here, the mathematical approach of the PPF is derived and the results relevant to the policy decision making are explained.

Following the framework, an empirical model is constructed in Chapter 6. The model consists of a market model and political economic model. The market model is firstly developed and it is then linked to the PPF model developed earlier to construct the political economic model.

The model is estimated in Chapter 7. The potential methods and the method of estimation used are discussed. The results are presented and compared to the relevant previous studies.

Following the results for estimation of the PPF, an approach to investigation of policy efficiency is presented in Chapter 8. This alternative measure will be used to further interpret the PPF in the Indonesian sugar market.

Chapter 9 concentrates on the interpretation of the PPF estimate relevant to the Indonesian sugar market.

Finally, conclusions for the study are presented in Chapter 10. This chapter also presents some policy implications arising from the study.

## **2. Background: Indonesian Sugar Economy and Policy**

---

### **2.1 Introduction**

This chapter presents the characteristics of the Indonesian sugar economy and policy. The aim of the chapter is to provide a basis from which the argument of the thesis is developed. It begins with a brief historical review and the main feature of the sugar industry in Indonesia. A section concerning the sugar economy follows, which includes description of production, consumption, and international trade. The following section describes and discusses the Indonesia sugar policy record. This policy section is divided into two policy spheres, one the production sector, and the other the marketing sector. The chapter concludes with a section which presents more detail about policy with special emphasis on the marketing system which represents the most important measure in the Indonesian sugar policy.

### **2.2 Sugar Industry: A Brief Historical Review**

Cane cultivation for sugar production in Java was introduced by the Chinese immigrants who came to Java around the 15th century. Dutch arrivals in the mid 17th century expanded the sugar industry. It was noted that at the beginning of the 18th century the Dutch operated more than 100 mills in Java (Mubyarto 1969, Soetrisno 1980). This marked the development of the sugar industry in Indonesia.



The policy toward the sugar industry during these times was simply to encourage cane production and to promote sugar exports. The industry reached the peak years in the early 1900s when Indonesia was the second-largest exporting country after Cuba. However, the industry declined during the great depression of the early thirties. Then, following the Japanese occupation and independence revolution, the industry was crippled. Intervention by the Indonesian government started in the 1950s with nationalization of sugar mills. The government focused on the sugar industry again in the 1960s when production fell below domestic requirements, and Indonesia started to import. This marked the turning point for policy with the main objective to encourage domestic sugar production, and the achievement of self-sufficiency in the long run.

### **2.3 Structure of the Industry**

There are two main stages of production in the sugar industry. The first one is concerned with growing of sugarcane; the second stage is the processing industry for sugar production. The early history of the sugar industry in Indonesia revealed that those two stages were highly integrated as one entity, but recently they have been treated as two separated entities.

Prior to 1975, the most prominent feature of Indonesian sugar production was the estate mills which cultivated sugarcane on lands rented from farmers. Introduction of the Intensified Smallholder Cane Program (ISCP) in 1975 was designed to transform the rental system to a smallholder cane system, and to separate sugarcane production and sugar processing. In effect this has resulted in an end of the mill plantation system; however, the ISCP has not yet completely displaced the former system.

Consequently, current modes of production fall into four categories: ISCP cane<sup>1)</sup>, Non Intensified cane,<sup>2)</sup> state mill cane and private mill cane. Their contributions to the sugar production in Indonesia in 1989 were respectively 69.38 per cent, 8.69 per cent, 16.65 per cent, and 5.27 per cent, while the proportions of area harvested were 60.2 per cent, 14.2 per cent, 20.5 per cent, and 5.1 per cent respectively. This represents the current situation in the sugar industry. Although the industry has separated the processing sector from sugarcane production, the state mills, which are supposed to concentrate on processing, are also growing their own sugarcane on their limited land.

There has been a marked change in the respective share of sugar production contributed by mills and smallholders since 1975 when the ISCP was introduced. Cultivation by farmers on their own land, replacing the state mill rental system, resulted in a decline in state mill production and a dramatic increase in ISCP farmers' share of total output. The new policy, however, did not affect production levels of private millers and non-intensified cane farmers, both of whom retained their traditional lands.

### **Estate Mills**

Most of the estate mills in Indonesia are government-owned, categorized as limited liability companies (*Perseroan Terbatas Perkebunan* or *PTP*). A PTP operates several sugar mills. The PTPs are usually organized on the basis of geographic region, and, in the case of sugar, some mills in the sugar-producing areas are grouped in a particular

---

<sup>1)</sup> ISCP smallholder cane is cane produced by farmers engaged in the Intensified Smallholder Cane Program

<sup>2)</sup> Non Intensified cane is cane produced by farmers who are not engaged in the program

PTP in their respective areas. A new establishment mill is attached to one of the existing PTPs.

Historically, sugar mills were developed in the most fertile areas, i.e. East Java and other fertile areas in Central and West Java. It is only recently that new sugar mills have been developed outside Java. In addition to government owned mills, there are some estate mills established and operated by private companies. Bulog (1990) reported that in the early 1990s there were 67 estate mills in Indonesia, of which 50 were government-owned.

### **Smallholder Farmers**

The term 'smallholder farmers' refers to those who grow sugarcane to be delivered to the mills. Some farmers may also operate their own traditional mills which produce traditional brown sugar. The smallholder farmers have been present since the beginning of the industry. The significant role of these smallholder farmers, however, has only been recognised since 1975 when the ISCP began. Currently, smallholder farmers are known as those who engaged in the ISCP, and those who are not. While ISCP farmers deliver their sugarcane to estate mills, non-ISCP farmers have the choice to deliver their cane either to estate mills or to traditional mills. However, there are no reliable data on the sugarcane share to be processed for traditional brown sugar. In one study, Wiroatmodjo et al. (1984) reports in that in 1982 about 11 per cent sugarcane from the non-ISCP farmers was processed for traditional brown sugar. This was assuming that all ISCP cane was sent to estate mills for white sugar. Since the ISCP farmers have dominated sugar cane supply, this proportion of sugarcane processed for traditional brown sugar is very small.

## **Production Areas**

Sugar production is mainly concentrated in Java which accounted for about 90 per cent of the total sugarcane area harvested and 95 per cent of total sugar production during 1969-1985. Among the five provinces in Java, East Java is the major producer with slightly less than half the total harvested and about 60 per cent of total production in the early 1980s. After the mid-1980s, however, the area harvested in Java declined. Starting from a small base, sugar cultivation off-Java increased significantly during the 1980s. The declining area trend in Java, and the expansion of external cultivation beginning in the early 1980s, reflect a gradual change in emphasis in government sugar production policy (Gonzales et. al. 1993). Given this trend in on-Java and off-Java production, it is unlikely that Java will soon be displaced as the predominant sugar-producing area of Indonesia.

Apart from the area harvested, there has also been a shift from irrigated to dryland cultivation, with irrigated land decreasing at about 38 000 ha per year or about 4 per cent per year since 1983, while dryland on and off-Java increased from 128700 ha in 1983 to be 182 300 ha in 1983 (Bulog 1990). The increasing rate off-Java, however is higher than that on Java.

Despite the secondary importance of the off-Java region, its share of area under cultivation has gradually increased from 8.6 per cent in 1969-1974 to 11.6 per cent in 1981-1985 (Rosegrant et. al. 1987). A number of production factors peculiar to the off-Java region distinguishes it from on-Java production. Cultivation on Java is mostly under irrigation while that of the external region is of the dryland type.

Institutional arrangements also vary between Java and the other islands. In contrast with Java, where cane is cultivated under the supervision of sugar mills expertise, sugarcane off Java is usually grown and refined within a vertically integrated sugar mills system. Off-Java cultivation units are also on a grander scale and Rosegrant et. al. (1987) notes that sugar factories on the outer islands service on average more than 6 000 hectares of sugar land, while those on Java average below 3 500 hectares.

## **2.4 Sugar Economy in Indonesia**

The role of sugar in Indonesia is providing the main source of sweeteners. In the mid 1980s sugar accounted for more than 60 per cent of sweetener followed by other sources. This indicates that sugar availability is very important for most people.

The Indonesian sugar industry serves two primary functions in supplying increasing domestic consumption demands, as indicated above, and providing a source of employment which is the main cash income of many smallholder farmers. Basri (1991) notes that in 1988, approximately 1 million smallholder farmers derived their income from 261 000 hectares of smallholder sugarcane. In the same year, the share of smallholder cane was 72 per cent of total area harvested and 80 per cent of total sugar production in Indonesia. Thus, the importance of sugar could be viewed from the perspective of both consumers and producers.

### **2.4.1 Production**

Since the revival of the industry in the 1950s, the industry has increased production to satisfy a primarily domestic demand. Production expanded on average by 4.8 per cent

per year during the 1960-1989 period. However, growth was attributable to the expansion of area under cultivation rather than the growth of yields per hectare. Area under sugarcane during this period grew at 6.7 per cent while yields decreased.

National sugar yields declined steadily until 1982, when a modest recovery began. Yield in the late 1980s, however, fell well below the yields achieved in the early 1970s. Gonzales et. al. (1993) notes that the long decline in yield appears to be the result of a failure to generate improved varieties of sugarcane, deterioration of sugar mills, and inadequate incentives for intensive farming in spite of government price support and input subsidies. Yield is also measured in term of sugar extraction rate (SER) of which the level also decrease.

**Table 2.1: Sugar Production in Indonesia for Selected Years**

<b>Year</b>	<b>Govt. Mills</b>	<b>Private Mills</b>	<b>Smallholders</b>	<b>Smallholders (ISCP)</b>	<b>Total</b>
----- 000 tonnes -----					
1960	618.7 *)	-	59.3	0	678.0
1965	673.3 *)	-	101.7	0	775.0
1970	602.7	73.9	37.9	0	714.5
1975	877.7	142.7	221.2	0	1241.6
1980	273.4	93.5	195.7	697.4	1260.0
1985	343.0	105.6	216.9	1233.3	1898.8
1989	354.3	112.2	184.9	1475.9	2127.3

Note: \*) Govt. and private mills

Source: Sumodiningrat (1977)  
 Bulog (1990)  
 Indonesia (1993)

It may be that declining yield is a consequence of production policy related to the land problem. The change from a rental system to a smallholder system has enabled smallholder farmers to cultivate their own land. In contrast to scientific estate cultivation, farmers usually have little experience in sugar farm management, while the fact that smallholder farmers grow cane on thousands of small plots could be a cause of decreasing yield (Mubyarto 1977). In order to cope with the problem of the scarcity of land, dryland cane cultivation has recently been developed. However, this technology has not been able to achieve yields as high as those from irrigated land.

**Table 2.2: Yields of Sugarcane in Indonesia for Selected Years**

Year	Sugar Yield (tones/ha.)		Sugar Extraction Rate (per cent)	
	Estate	Smallholder	Estate	Smallholder
1960-1964	8.6	5.3	10.3	9.9
1970-1974	10.1	5.9	8.3	8.9
1975	10.7	6.0	10.7	7.2
1980	6.7	6.6	8.7	9.1
1985	4.7	7.0	7.1	8.6
1990	4.8	6.3	6.7	7.9

Source: Indonesia (1993)  
Basri (1995)

### 2.4.2 Consumption

Rahmat (1993) notes that sugar in 1985 contributed about 63.3 per cent of the sucrose equivalent of sweeteners in Indonesia, followed by other sweeteners such as fruits, traditional brown sugar and artificial sweeteners. Sugar is also a source of calories. Mubyarto and Daryanti (1991) say that sugar supplies about 5 per cent of the calories consumed by the Indonesian population.

Data from the Socio-economic National Survey show that during 1976-1984 sugar consumption per capita increased about 3.9 per cent per year. The highest increases were in the rural area with 4.4 per cent per year as compared to 1.8 per cent in urban areas. These findings accord with some previous studies which depict a sugar income elasticity of 0.69 in urban areas and 0.75 in rural areas (Mubyarto 1990, Rahmat 1993). Other studies such as Soetrisno (1984) estimated that during 1967-1981 the income elasticity for sugar in Indonesia was 0.916. The findings suggest that demand for sugar will still increase in the future years.

Sugar consumption is highly correlated with income and expenditure, increasing with expenditure throughout the range of expenditure classes (Rosegrant et. al. 1987). Average consumption in urban areas is nearly 50 per cent higher than in rural areas and sugar consumption off Java is nearly double that on Java. Statistics seem to indicate a different response among rural consumers from that of their urban counterparts. On the basis of expenditure classifications derived from research, Rosegrant et. al. (1987) argues that sugar consumption increases rapidly with increases in income and expenditure. Per capita consumption of the high expenditure class is more than three times that of the low expenditure class which also suggests that income is increasing more rapidly in rural areas than in urban areas. However, consumption may also be affected by some other factors such as the availability of substitute products.

One important substitute for sugar is traditional brown sugar which until recent times was the unassailed mainstay of rural areas. In the early sixties, the share of traditional



brown sugar in domestic consumption was large, especially in the rural areas where the average per capita consumption in 1965 was 4.68 kg per year. By 1970, however, traditional brown sugar consumption had declined to 2.97 kg per year, while the average consumption for centrifugal sugar of 4.16 kg per year in 1965 had risen to 5.16 kg per year in 1970 (Sumodiningrat 1977). In contrast with the incursions of centrifugal sugar in rural areas, the consumption in urban regions during the same period shows a different trend. While consumption of refined sugar decreased from 7.8 kg per capita per year in 1965 to 5.5 kg per capita per year in 1970, consumption of traditional brown sugar increased slightly from 2.6 kg. per capita per year in 1965 to 2.7 kg per capita per year. However, these trends were countered by several studies. Mubyarto (1990), for example, notes that during the 1970s and 1980s consumption of refined sugar had steadily increased in both urban and rural areas while consumption of traditional brown sugar had declined during the same period. The figures in 1984 show that per capita consumption of refined sugar in urban and rural areas was 9.17 kg per year and 6.15 kg. per year respectively, while that of traditional brown sugar was 1.19 kg per year and 1.61 kg. per year. The above statistics notwithstanding, refined sugar consumption has generally tended to increase, while traditional brown sugar consumption has decreased. In addition, Mubyarto and Daryanti (1991) notes that in twenty years from 1965 to 1984 traditional brown sugar consumption underwent a decline at the rate of about 5.6 per cent per year, and in rural areas this decline was higher than in urban areas. This evidence indicates that traditional brown sugar as a substitute product retains an important role in rural areas where it is traditionally produced.

Consumption trends for different regions are also variable in Indonesia. Java as an important production centre consumes less than other regions. While average consumption in Java is less than 6 kg per capita per year, other regions consume about 10 kg per capita per year (Table 2.3). One reason behind this difference is the availability of substitute products in the form of alternative sweeteners in Java.

**Table 2.3: Per capita Sugar Consumption by Region**

<b>Year</b>	<b>Java</b>	<b>Outside Java</b>
	----- kg/year -----	
1976	5.15	9.46
1979	5.10	10.56
1981	5.15	9.39
1984	5.85	10.41

Source: Calculated from Mubyarto and Daryanti (1991)

In general, the income elasticity of sugarcane was higher in rural areas and in the outer island of Java-Madura the coefficient was even higher. If this is correct it would imply that in the future, the amount of the sugar demanded will continue to increase in these areas. In addition, the preference of the people in the rural areas has changed with a marked shift from the consumption of brown sugar to refined sugar. As a matter of fact, in most rural areas, sugar is still considered as a luxury food and its consumption may be evidence of rising living standards. Sumodiningrat (1977) notes that in cases where families can afford sustenance, the increase in family income

would be spent on refined sugar instead of traditional brown sugar while other expenses remained constant.

The rapid increase in total domestic consumption has been caused partly by high economic and population growth rates. Indeed, Sumodiningrat (1977) says that in the sixties, population growth seemed to be the main source of consumption increase, while in the seventies, indirect sugar consumption of the food and beverage industries also rose as a result of significant growth in these industries. At the same time, the role of traditional brown sugar has become less important. Due to the availability of affordable centrifugal sugar, these three factors, namely, population, income and the increase in consumption of food and beverage industries have caused rapid increases in domestic consumption.

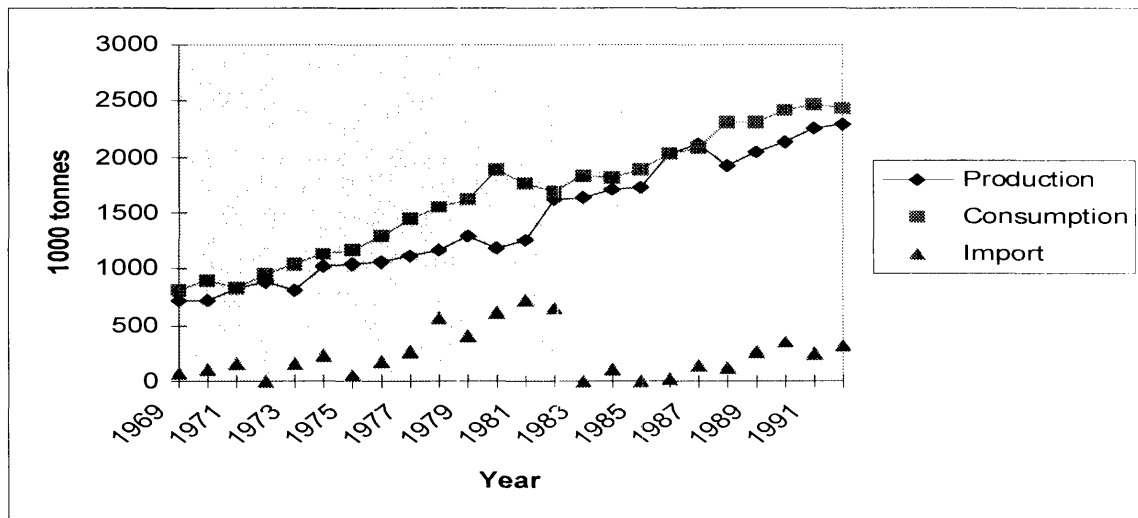
### **2.4.3 International Trade**

In the colonial era, the sugar industry was export oriented. With this orientation, the domestic market was left to consume alternative sweeteners usually in the form of ubiquitous brown sugar. The fall of the industry during the great depression and the revolutionary era resulted in a substantial decline in exports. Then, following the revival of the industry in the 1950s the domestic market has been given priority.

The important position of sugar as a trade commodity was shown by a trade value which represented 45 per cent of total Indonesian export earnings in the early 1900s (Soetrisno 1980). By the mid-fifties, however, the share of sugar in Indonesia exports had fallen to 2 per cent, by 1964 to 0.3 per cent, and in 1966 exports virtually ceased (Mubyarto 1969). The exports in the 1960s were sustained only to meet the

Indonesian quota of 50 000 tonnes under the International Sugar Agreement (Mubyarto 1969, Sumodiningrat 1977), but even this became impossible with growing domestic demand and in 1967 Indonesia became a net sugar importer. Since then, the amount of imports has been increasing every year. This is coupled with an increase in per capita consumption (Figure 2.1).

During the mid-1980s sugar imports accounted for less than 10 per cent of domestic consumption. However, increasing consumption and limited domestic production have increased the amount of imports. Imports have subsequently risen above 10 per cent since the late 1980s. This figure has remained unchanged until recent times.



**Figure 2.1: Sugar Production, Consumption, and Import in Indonesia**

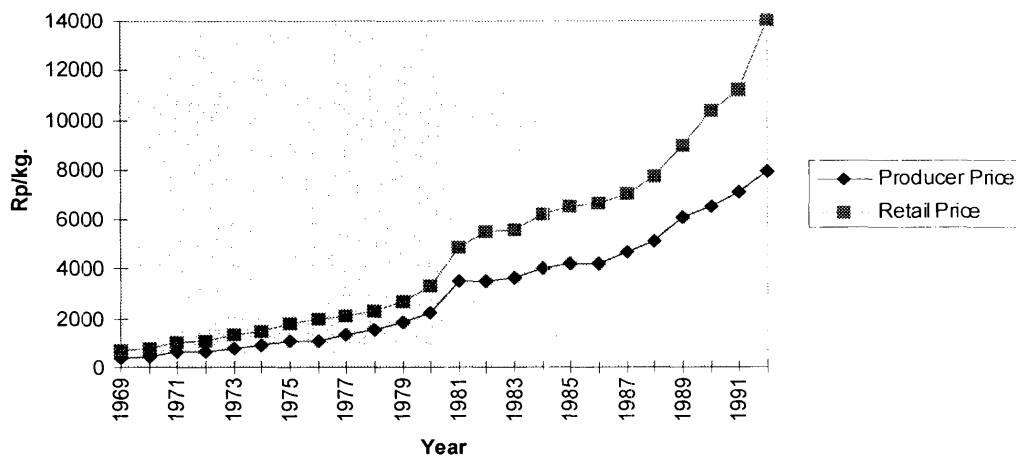
As the current productive capacity of sugar mills cannot cope with increasing domestic demand, it is expected that imports will rise and in turn stimulate an increasing demand for foreign exchange.

#### **2.4.4 Price Movements**

Sugar in Indonesia is considered as one of basic commodities whose price is controlled. This control consists of stabilising the price, since Indonesia had experienced rapidly increasing prices in previous years. Sumodiningrat (1977) gives an example that before 1966 spiraling sugar retail prices paralleled rapid inflation during the same period.

Other factors affecting sugar price are marketing policy and the institutional environment. As a response to improvements in marketing, the sugar price spiral has declined and fluctuation has stabilised. Since 1971, when Bulog imposed controls on the market and distribution, prices have been subject to control by this institution. The trend in sugar price, however, is steadily increasing (Figure 2.2).

Sugar price also varies spatially. It is cheaper closer to its locus of production in Java and more expensive on the outer islands. Distribution costs on Java are also relatively cheaper, while transportation to the outer islands adds to the eventual retail price.



**Figure 2.2: Sugar Price in Indonesia**

## 2.5 Indonesian Sugar Policy

The policy of the Indonesian government towards the sugar industry is directed at production and marketing spheres, both of which have experienced gradual development over the last thirty years. While this development serves a major objective of increasing domestic production, the unwanted effects are a common occurrence during that evolution. The following sections describe and discuss the history of the policies and their major reforms both on the production and marketing sides.

### 2.5.1 Production Policy

Following the mill nationalisation program, government policy towards the sugar industry focused on a rehabilitation program which attempted to renovate old mills inherited from the colonial era. The main objective of the program was to improve the

mills' efficiency and make sugar production more cost effective. The program also incorporated measures to increase cane production.

The objective of increasing production, however, has been directly influenced by the problems concerning land for growing cane. Disputes between farmers who own land for sugarcane and mills which grow and process the sugarcane are a common problem. These problems have been known since the introduction of sugarcane in Indonesia, but many have never been completely solved (Sumodiningrat 1977). The production policy, therefore, has also been directed toward establishment of a better relationship between farmers or land owners and sugar mills.

### **The Cultivation System**

The export-oriented sugar industry during the 1800s was developed within the framework of a particular cultivation system. The essence of the cultivation system was that peasants in Java were to surrender one-fifth of their land to the government for export crop planting and to deliver the produce to the government at a fixed price (Soetrisno 1980). After cane harvesting, the land was returned to the owners for paddy planting. Under this system, the cultivation of sugarcane was expanded in 1830 by a decree of the Governor General (Soetrisno 1980). This decree marked the beginning of a large-scale sugar industry.

After the Agrarian Law of 1870, the government changed the forced cultivation system into the *glebagan* system with compulsory leases of farmers' land to the sugar companies. This system operated by dividing the irrigated rice fields of the village into thirds and assigning the first third for sugar mills in the first year, the second third

in the next year and the remaining third in the third year (Soetrisno 1984). After harvest, the land was converted to riceland. Then, several decades later, the Dutch rental system was introduced in 1918. Under the 1918 land rent regulation, rent was paid by the sugar mills for a 16-month growing period of sugar based on two rice crops (one wet and one dry) plus one non-rice crop such as corn, peanuts, or soybean (Mubyarto 1969). The 1918 rental system regulation -with some modifications- remained in force after independence.

### **The Rental System**

In the past, when the Indonesia sugar industry was dominated by estate sugar mills, cane supply needs could not be met from their own sources alone. Indeed, this shortage of land under sugar production was a major problem associated with the mill system. Mills overcame the problem that land shortage posed for supply by renting land from farmers. Prior to the 1960s, cane production was subsequently characterised by the rental system. Under this system, mills rented lands from farmers, hired labour to cultivate and harvest crops, and exercised supervision over cultivation (Mubyarto 1969). The amount of money (land rent) was decided upon by the mills, the Minister of Agriculture, and the farmers' representative (Sumodiningrat 1977). Modified from the colonial era, the rental system was based on annual or single-crop periods. The Ministry of Agriculture set rent standards which were reviewed every year.

Disputes between farmers and other parties concerning the level of rent were a frequent occurrence. The issue dates of rent values were often late, while in many instances rent returns were lower than expected and proved disappointing to farmers. Indeed, from the farmers' side of things, the system had many disadvantages.



Sumodiningrat (1977) found that the adjustment of the land rent level usually did not follow the rate of increase of prices in the economy, so the real value of land rent received by the land owners dropped and high inflation inflicted financial losses upon farmers. The other factor that made farmers reluctant to rent out their land was that they needed land for food consumption. Declines in staple food production resulted in increased prices as supply decreased and population expanded. In the colonial period the Dutch profited from the inflationary trend by attempting to fix rents while regulating the importation of rice and adjusting the price to the market. The overall effect made sugar production progressively less profitable for Javanese farmers. It was cheaper for them to produce their own staples than grow sugar or rent their land to the mills. The compulsory system, however, required farmers to rent their land to the mills.

The above factors made farmers unwilling to lease their land to the mills and they reacted by providing low quality land and by prolonging the delivery of land. Mubyarto (1969) noted that farmers, and the village cooperatives, tended more and more to give the mills the lowest quality land. This in turn contributed to a tendency for land rented to the mills to be spread in small parcels over a wide area, making cultivation inefficient and difficult. Again, farmers would delay the delivery of land as long as possible, often in the hope of extracting one extra crop of rice. If, as frequently happened, this meant that the sugar missed the critical growing period of May and June, the effect on output was liable to be serious.

## **The Share-cropping System**

In the early 1960s the cane-production system was modified. In order to upgrade the rental system the government introduced a share-cropping system where farmers as land owners leased the land to the mills and received rent in the form of a share system. The principle was similar to the rental system. The scheme was regulated so that farmers were to receive a share portion. This system was designed to counteract the decline in yields by directly relating the rental paid to output (Mubyarto 1969).

This share cropping system can be divided into two systems: the share-cropping system of SK.4, and the share cropping system of SK.3<sup>3)</sup>. Under the SK.4 share cropping system, land owners leased the land to mills and all the activities from the cultivation until the processing of the product were managed by the mills. Land owners did not participate in any activity but would receive land rent only in the form of shares (Mubyarto 1968, Sumodiningrat 1977). With the SK.4, the sharing ratio proposed was 80 percent to mills and 20 per cent to farmers. It was then modified to improve the position of land owners so that a share ratio of 75:25 was issued instead (Sumodiningrat 1977). Of that share, 40 per cent could be purchased back by the government while another 60 per cent was received in kind (Mubyarto 1968).

Under the SK.3 share cropping system all of the cultivation activities and the delivery of products were managed by the farmers. With the SK.3, farmers would receive a 60 per cent share of refined sugar. Of that share, the farmers received 20 per cent in kind and another 80 per cent was purchased by the government at the government price (Sumodiningrat 1977).

---

<sup>3)</sup> SK4 and SK3 refer to the sugar regulation embodied in the SK.4/Ka/1963 and SK.3/Ka/1963

Under the share-cropping system, the role of smallholder farmers was recognised, since they were allowed to cultivate cane on their own land and divide the crop with the mill at a price imposed at the beginning of the season. A payment system which was a combination of money and sugar could give better earnings to the farmers since it would adjust payment to any price increase. By cultivating himself and having a share, a farmer's revenue would depend on product yield. Hence, this system created incentives for the farmers. In addition, farmers could choose the area according to their requirements which resulted in farmer-controlled earnings as the product was influenced by land condition.

However, the farmers felt that the systems were complicated and did not give them a benefit. The objections were, among others, that (a) the payment involved instalments, (b) there was an unfavorable price of the production share fixed by the government, and (c) the sharing ratio rule was unclear (Mubyarto 1968, Sumodiningrat 1977). In practice, the system did not work as planned. Generally, the farmers felt that the system was not much better than the rental system. In 1967 the share-cropping system was consequently abandoned and the former simple lease system re-established.

The re-establishment of the rental system meant the classic problem of relationship between farmers and the millers was raised again and it seems that domestic production would not promise any significant increase. The uncompetitive rent level, again, made farmers reluctant to rent their land to the mills. This problem had made the mills temporarily stop their production because of insufficient supply of

sugarcane. Return on alternative crops was so much higher than the level of rent that farmers preferred to grow alternative crops. To some extent, production policy at that time had focused more on the mills while rewards to the farmers had been forgotten.

### **Intensified Smallholder Cane System Program**

Facing a complex problem in the industry, the Indonesian government initiated a major study of the industry with the objective of gaining a comprehensive understanding of industry problems and devising some remedies for them (see UNDP 1972a, 1972b, 1972c). The study reports, as noted by Mubyarto (1977), that smallholder farming promised to increase the area under sugar production, that it would improve the position of the farmers and that it would help provide employment in rural areas.

The above study initiated a major reform in the sugar policy in Indonesia in 1975.

This was the introduction of a new system called Intensified Smallholder Cane Program and gave it the legal force of a Presidential Instruction. In this system, greater recognition was given to the role of smallholder farmers. Indeed, this marked a substantial change in government sugar-policy orientation, from previously focusing on consumers to primary consideration of the interests of the producers, especially smallholder farmers. This is reflected in the main objective of the program: to transform the traditional system of estate production based on the rental system into a system of smallholder production. Under the new system, the mills were to be responsible for provision of seeds, pesticides and fertilisers and for their distribution to the farmers; they were also to act as extension centers, providing advice and

support for the farmers (Mubyarto 1977). This system also provided subsidised credit for planting and cost-of-living loans during the times that they received no income from cane-growing (Soetrisno 1984). Under the intensification program, farmers deliver cane to the mills to be processed as refined sugar. Farmers then receive a share of total sugar output obtained from the cane. The share has been reviewed several times. Farmers now receive 62 per cent subject to extraction yield of 8 per cent. Farmers will receive a higher share for higher extraction yield.

The replacement of the rental system with the intensified smallholder cane was completed in 1980. Following the implementation of ISCP, production has increased continuously. Under this system, farmers have contributed significantly to the national cane supply (Table 2.1). The increase is mainly due to increase in area harvested, especially area under the intensification program.

However, there is a concern that the introduction of ISCP could decrease sugar yield. The experience prior to 1975 showed that smallholders had always had much lower yields than mills. However, it was argued that in the past the best sugar land was rented by the mills, leaving smallholders to grow cane mostly on unirrigated fields. If cane is now to be grown by smallholders on good land formerly rented, the average yield of smallholder cane may well improve (Mubyarto 1977). However, as the rental system is abandoned and farmers cultivate cane on their own land, a ratooning system might be practised. If this is so, it will result in a decreasing yield. Indeed, yield has continuously dropped since the intensification program was introduced.

The most controversial element of the program, and certainly the hardest about which to get firm evidence, is the impact upon smallholders' welfare. However, there does seem to be evidence that on at least three, and possibly four points, many farmers are worse off as cane producers than they had been previously as producers of rice and palawija crops: these points relate to prices, risks, farm size and employment opportunities (Brown 1982).

Some previous studies have found that the returns on alternative crops in Java are considerably higher (Brown 1982, Nelson and Panggabean 1991, Gonzales et. al. 1993). However, Brown (1982) pointed out that quality of land significantly influences cane production. Irrigated land, which suits both cane and rice, gives higher returns for rice and other food crops than cane does. On poorer, less well irrigated land which is suited to rice production, cane production may have been more profitable than rice production even before the price rise. In other words, the comparative returns between the crops would depend on the type of land. Improvement of this system by including dryland farmers in the program has given rise to a new system in which type of land is a criterion for different treatments. The recent system, provides more incentives for growing sugar as opposed to competing crops.

The problem posed by land scarcity and the higher domestic prices compared to world price lead to concern about the sustainability of the self-sufficiency objective. Amang (1993) considers that facing the liberalisation in world trade, the self-sufficiency objective may need to be re-examined.

### **2.5.2 Marketing Policy**

Sugar distribution and marketing policy has also experienced some gradual changes in the last thirty years. The objective of the marketing policy has also been reviewed and altered from a policy to promote exports, into the policy to support domestic producers and to protect domestic consumers. Inherited from NIVAS (*Nederlandsch Indische Vereniging voor de Afzet van Suiker*) from the colonial era which acted as an exporting marketing board, the marketing institution has also changed several times according to prevailing marketing problems and objectives.

#### **The NIVAS System**

The NIVAS system was the first move of the sugar industry in regulating and managing the marketing system. This marketing board was established following the world depression in 1932, and aimed to coordinate and promote foreign exports. It was not really regulation imposed by the government, as this body was initiated and established under coordination of some private mills. The support from the mills was also provided by contribution of some of their production costs to finance the body. This system was remained in place after independence and the NIVAS itself operated until 1959.

#### **BPU-PPN System**

After nationalisation of the Dutch mills in 1957, and removing NIVAS, the sugar industry was managed by the State Plantation Enterprise (Perusahaan Perkebunan Negara or PPN) which was placed under a General Management Board (Badan Pimpinan Umum or BPU) which was in turn under the control of the Ministry of Agriculture. Marketing was centralised in the hands of the marketing section of the

BPU. The individual mills were not allowed to sell their sugar in the market (Mubyarto 1969, Bulog 1990). Management centralisation financed the huge administrative superstructure that had been imposed on the industry after 1957. The amount of 5 per cent was deducted from the producer price for each mill to finance this management. However, this centralisation was evaluated as being ineffective and the system was modified in 1968.

Moves towards decentralisation of management were commenced when BPU was replaced by eight Government Estate Enterprises (Perusahaan Negara Perkebunan or PNP), which each managed 4-7 mills. Decentralisation, however, was not carried to the point of allocating managerial autonomy to the individual mills, as it was considered that the mill managers were not 'quite ready' to do the job (Mubyarto 1969). In actuality, there was not much difference from the centralised system since each mill remained subordinate to a PNP under the control of the Ministry of Agriculture.

Following the moves by the Minister of Trade, eight directors of government estates formed a Joint Marketing Board with the purpose of coordinating sugar marketing. Lack of finance, however, resulted in the failure of the board to handle the domestic production and the mills began to organise their own marketing.



## **Syndicate System**

In the BPU-PPN system there was no separation between production and marketing. This mixed management had been evaluated as ineffective. Having understood the problem posed by marketing, another attempt at regulation was made through establishment of a syndicate system.

In 1969, the Ministry of Trade built a syndicate consisting of 52 members and appointed 4 leaders among them. This time the policy clearly separated production and marketing functions. Whereas the syndicate under the Ministry of Trade handled the marketing function, the mills under the Ministry of Agriculture concentrated on production. Under this system, the syndicate had responsibility for buying all sugar produced by government sugar estates and for supervising distribution and marketing.

The main problem in this system was the inability of the private traders - the syndicates - to provide funds for buying sugar, thus the syndicate could not properly handle sugar production. It forced the government to call for the state banks to provide credit for sugar distribution and marketing. However, this did not provide the final solution. It became clear later, as Rachman and Baharsyah (1981) note, that the institutional (syndicate) and marketing costs were too high. It did not take long before the government set a new regulation giving authority for distribution and marketing to Bulog.

## **Bulog System**

Inspired by the syndicate system, and following the establishment of Bulog, the government assigned the latter sole distribution of sugar in 1971, while BBD (Bumi

Daya Bank), a government owned bank, acted as a national stockholder. There were now three parties involved in the sugar industry; namely PNP estate mills, Bumi Daya Bank, and Bulog. PNPs, which were under the jurisdiction of Ministry of Agriculture, were responsible for production. Bumi Daya Bank was financier and stock holder for sugar from the government owned estate mills. Bulog acted as sole agent responsible for distributing and maintaining the sugar price. The main objective of the new system was to control availability of supply and stability of price. The control was mainly in the hands of Bulog.

In the beginning Bulog controlled around 60 per cent of marketed sugar, comprising the output from the government estate mills. When the ISC was introduced, the reforms also gave the right to the farmers to market their own sugar, making Bulog control an even smaller stock of about 50 per cent. This amount had been considered as too low to defend the price. The sugar crisis and inflating price in the early 1980s was one example of Bulog's inability to cope with the unstable market because of an inadequate stock. Amang (1993) records that during the sugar crisis, retail price in Java was Rp. 435/kg, far beyond the maximum retail price of Rp. 227/kg, and, at the same, time there was a lack of supply outside Java. Learning from this crisis, and the belief at the government level that controlling prices is closely related to a reliable amount of stock, the government gave Bulog the authority to control more marketed sugar by holding more stock. Then, in 1984 Bumi Daya Bank sustained a financial loss which caused it to relinquish its role as national stock holder. Following these developments the government issued a new regulation giving Bulog sole responsibility as national stock holder in addition to its previous roles. Since then Bulog has exercised total control over the marketing of sugar.

## **2.6 Current Marketing System and Policy**

### **2.6.1 The Marketing System**

While the policy on the production side culminated in 1975 by reform of the rental system, the major reform on the marketing side was in 1971. But it was not until 1981, after some modified regulation took place, that Bulog gained total control over the market.

The current system installing Bulog as the only marketing board controlling the market has as the main objective to guarantee continuous sugar availability for consumers. Amang (1993) notes the additional objective of reducing sugar imports, thus indirectly encourages domestic production.

The current system also adopts several measures as noted by Rachman and Baharsyah (1981), namely:

- introducing Village Cooperatives (KUDs) in the sugar market as the only agent to buy sugar from the farmers;
- maintaining the ratio of sugar price to other related commodities, in this case rice;
- buying all domestic sugar production except two per cent<sup>10</sup> be returned to farmers for home consumption.

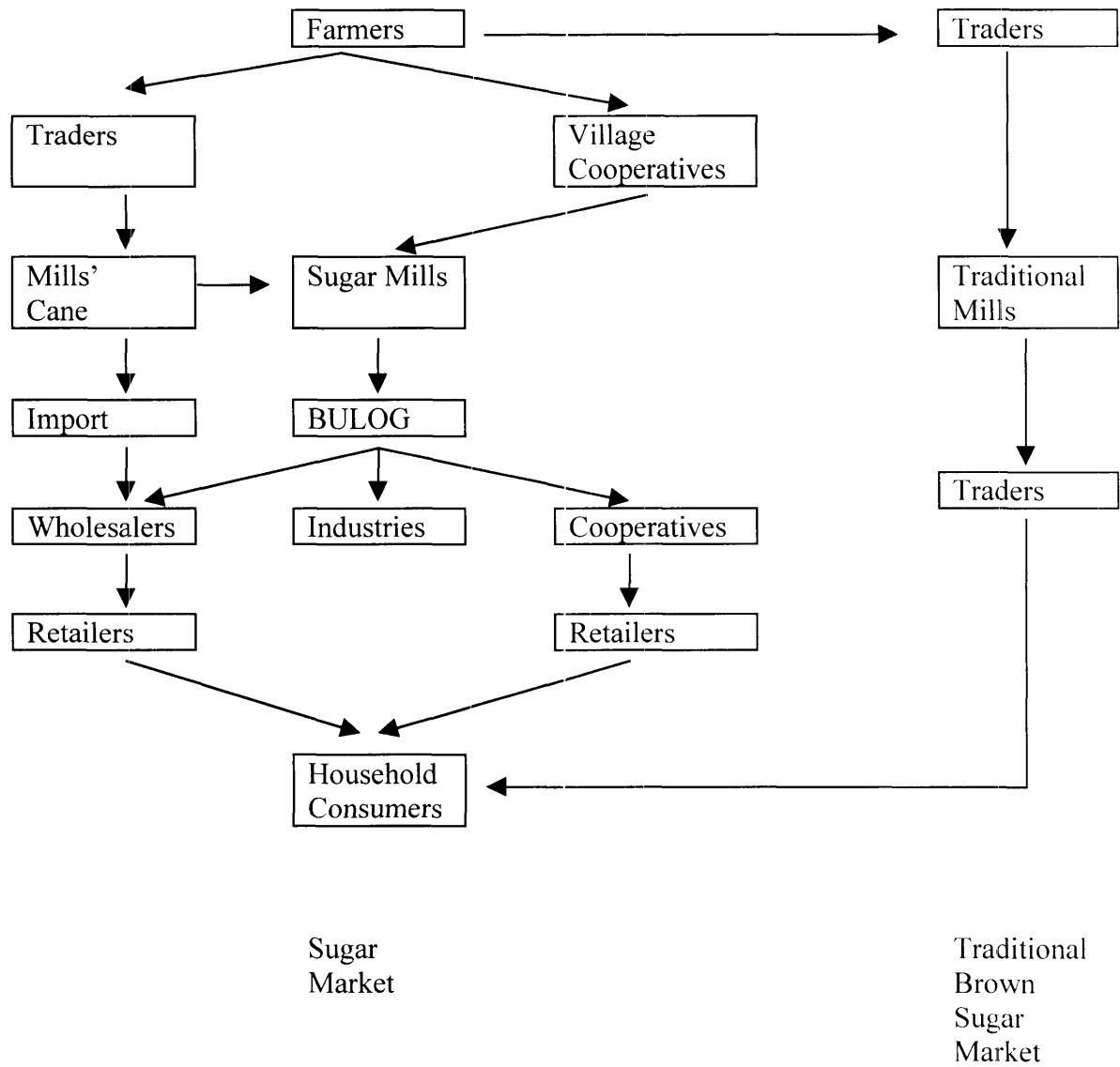
Thus under the current system, Bulog procures all domestic sugar directly from the mills and, at the same time, holds national stock and distributes sugar across the country through licensed wholesalers. Currently, Bulog allocates sugar to three main channels, namely the licensed wholesalers, cooperatives and the food and beverage

industries. The licensed wholesalers are private traders who have exclusive right to distribute Bulog commodities, the prominent agents which will be discussed later (see Chapter 3). Bulog distributes sugar on a monthly basis, allocating a certain amount of sugar to the wholesalers in each province according to its estimated demand. In addition, Bulog has also an exclusive right to be a sole importer to meet domestic demand. (Figure 2.3).

The marketing system under Bulog management has been viewed as a solution to continuous distribution problems. The presence of Bulog as the only governing body for the sugar industry has been defended on the grounds that this public agency serves the community better in terms of stability of sugar availability and price. On the other hand, Bulog procurement policy means the guarantee of sugar marketing for the mills in spite of the predetermined producer price.

### **2.6.2 Sugar Policy Instruments**

The heavy intervention by the government in the sugar industry is implemented using various instruments. Currently, the stated main instruments are sugar prices. They are the instruments used by Bulog to directly influence sugar marketing. Though some other instruments may affect sugar production and marketing, such as input price policy, the following section will describe in more detail sugar prices specially designed for the sugar industry.



**Figure 2.3: Sugar Distribution in Indonesia**

### **2.6.3 Sugar Price Policy**

Despite the gradual changes in sugar-marketing institutions, the price feature remains the same as it is controlled by the government. The objective of price policy is in accordance with the current marketing system. That is to provide sugar for consumers at a stable affordable price level, to encourage producers to increase production and to give incentives for private traders to do their job. This policy is multifaceted, as noted by Amang (1993), since the price policy is also set to secure government revenue. Thus, the government has an interest in extracting rent from sugar policy.

Currently, three price instruments are set and are being used in sugar marketing. They are producer price, Bulog price and maximum retail price (Bulog 1990). Two of them, producer price and maximum retail price, are used by the government, in this case Bulog, to directly control production and consumption respectively, while the Bulog price is set as a standard to determine marketing costs. Producer price is a sugar buying price from government to producers. Bulog price is also a sugar-buying price paid by wholesalers to Bulog. Retail price, or as it is usually called, 'local guidance price', is the allowed maximum retail price for consumers.

Producer price acts as farmers' support price to encourage production. However, it cannot be evaluated as a floor price since all domestic production is procured using this predetermined price. This price is conceptually a gross revenue received by the farmers. Under the sharing system of ISCP, farmers process their cane at the mills, and the costs are deducted from the farmers total revenue. Currently, farmers receive 62 per cent and the mills 38 per cent of the total sugar value. Thus, in this system, the

producer price may be best defined as the price received by farmers and mills, both treated as producers.

Bulog price is set to indicate the marketing margin from the producer to Bulog as the last stage before sugar is handed to the private traders. Along with the producer price, the Bulog price is set and reviewed annually by the government through the Ministry of Finance. When the prices are officially announced, they reveal the producer price, Bulog price, and some marketing costs to bring sugar from producers to Bulog (Table 2.3).

Maximum Retail Price is the instrument used by Bulog to protect the consumers, since it acts as a ceiling price. The retail price itself is the market-determined price whose level is controlled by Bulog. Unlike the producer price and Bulog price, the maximum retail price is officially determined by Bulog. However, the maximum price is not set and announced directly at the fixed level; instead Bulog distributes sugar to the appointed wholesalers along with the guidance formula to determine consumer price. In this respect, Bulog sets the price standard, on the basis of Bulog price, by adding some charges for estimated marketing costs plus reasonable profit for traders or retailers. Bulog uses its monthly allocation to control this price.

Though it is a fact that price policy instruments have improved the marketing system, the setting of price itself has been of some concern for a long time. The prevailing level of producer price is supposed to be reviewed every year and announced before the planting season to encourage farmers into cane production. In practice, however, the announcement is frequently late with the result that farmers have to make their

own adjustments for planting sugarcane. The late announcement not only affects sugarcane farmers but also the millers. This will cause only some sugar from the last processing to be procured with new, hopefully, increasing price, whereas sugar from the early processing will have been procured with the previous lower price. However, the expected increasing price is not always the case in Indonesia. The prices announced in 1992 had been in place for three consecutive years without any change, before the new higher price was announced in 1995. Siswohardjono (1981) noted that this practice has caused mills difficulty in processing in the face of the steadily increasing processing costs.

In addition, the efforts to maintain the price ratio between sugar-producer price and rice-producer price should be examined with care. While the use of price ratio is motivated by the fact that sugar and rice compete in the same irrigated land, the ratio may not be directly comparable. Rice is a seasonal crop, while sugarcane is an annual crop, and they are planted in different seasons/months. In practice, the different announcement times also reflect these differences, since the rice price is announced in January, and sugar price is usually announced between May and July. In short, when sugar price is announced, the farmers have lost one rice-planting season, while the following planting season is still several months away. At best, the price ratio between sugar and rice may only provide a rough idea for farmers on the return of these respective crops; while, again, they have to make their own judgment whether or not to plant sugarcane for reasons other than price.

The determined level of Bulog sugar price, along with its marketing cost component has also been criticised as having unnecessary charges. It is heavily taxed and is



saddled with several fees so that the difference between producer price and Bulog price, and then consumer price, is high (Table 2.3). The tax and duty, for example, were inherited from the colonial era when sugar was an export commodity. At that time, they were set to attract more revenue for the government and at the same time to prevent domestic consumption (Wiroatmodjo et al. 1984). After independence, when sugar became a staple food for domestic consumption, the taxes remained in force. On one hand, the government declared that sugar is a staple food with price control, but on the other hand it is also treated as a source of government revenue through several taxes. These unnecessary charges have made the margin high and are a burden to consumers while not providing much benefit to producers. Indeed, sugar is the only staple food whose price is taxed. It was only in 1995 that the government began to subsidise the excise duty in the last price setting. The sugar price structure of 1995 was without duty, but it was still taxed, and included some unrelated market charges.

The objective of protecting the sugar industry has led government to set a high price in order to provide incentives for producers. Along with this price policy, government protection toward domestic production is implemented by import controls. This combined policy has set the domestic price higher than the world price.

While consumer prices have been declared as market determined, they may not fully reflect the competitiveness of the market. Previous studies (Rachman and Baharsyah 1981, Azahari and Baharsjah 1982, Sapuan et al. 1985), discuss the possible existence of market integration indicated by price correlation between some important cities, should be interpreted with care. Here the positive high correlation between the regions

may only be viewed as the effectiveness of the control over the sugar market but not reflecting the integration itself.

**Table 2.4: Structure of Domestic Sugar Prices 1992 and 1995**

Components	1992	1995
	----- Rp. -----	
Producer price	792.00	910.80
Excise duty	31.68	0.00
Tax	82.368	91.08
Handling charges	66.3815	61.053
Management fees	10.00	6.00
Additional fund	1.00	1.00
Bulog price	983.4295	1069.933

#### **2.6.4 Input Price Policy**

Apart from policies specifically designed for sugar, sugar production is also affected by the general agricultural policy to subsidise agricultural inputs. The purpose of this policy is to encourage farmers to use new technology, while at the same time supporting farmers' revenue without escalating the price of the product.

The distribution of inputs has been regulated, and its price has been controlled by the government. Since 1973, the government has assigned the village cooperative (BUUD/KUD) to be the sole distributor of fertilisers and pesticides for the crop sector (Slayton and Exawirja 1978). Recently, the government has also given private traders the authority to sell fertilisers and pesticides. Fertiliser prices as well as margins for distribution are fixed every year by government. By these means, the price level and its subsidy are subject to periodic review.

In fact, the input subsidy has fluctuated over time. Since 1975, the government has reduced the amount of fertiliser subsidy by about 30 per cent (Slayton 1978). However, the subsidy increased again in early 1980. In terms of the agricultural budget, this subsidy has burgeoned from virtually nothing in the early years to two-thirds of the agriculture and irrigation sector budget in 1986-1987 (Hedley and Tabor 1989). Then, the pesticide subsidy was removed in 1989 (BIMAS 1992), while the fertiliser subsidy has been gradually reduced. As a result of these trends, the input subsidy has contracted from its former allocation.

## **2.7 Summary**

It is obvious from the policy evolution that the main issue in the sugar industry is the consideration of welfare between producers and consumers. Following the revival of the industry after independence, efforts had been made to support sugar producers by rehabilitating sugar mills, and boosting sugarcane production to supply domestic millers. The disruption on the marketing side, however, has shifted the government interest to fix the problem of distribution. The appointment of Bulog as a sugar distributor in 1971 was no more than to cope with the problem in the consumers' side.

The objective of stabilising distribution and price at the certain affordable level represents the willingness to enhance consumers welfare. The role of Bulog had been enhanced since then, and its position in consumers' interest has become blurred.

## **3. Prominent Participants in Sugar Policy Formulation**

---

### **3.1 Introduction**

In this chapter the participants involved in the sugar industry are discussed. These participants consist of those who directly determine the policy and those who are affected by the policy. The objective of this description is to present a general picture of the political structure of the sugar industry. Thus, each player will be discussed in terms of its functions and how it is constituted. This will provide insights into its position in the policy process and its consequences and at the same time provide a basis on which a theory will be developed to explain the policy.

### **3.2 General Feature: Emergence of Government Control**

It is obvious from the previous chapter that the sugar industry in Indonesia is characterised by the dominant role of the government. The structure of the industry also reveals that the industry is not independent. Almost all estate mills are government-owned, established and operated under the jurisdiction of the Ministry of Agriculture (MOA). Concerning the policy process, the government of Indonesia, through its National Logistic Agency (Bulog), has become the largest single player in the domestic sugar market, determining almost everything in the industry. However, Bulog does not exclusively design and implement the policy. Several other agencies are involved in designing the policy and several interests are considered in the policy decision-making.

The existence of a single governing body which represents the industry interests is the case only in the early period, for example in the form of BPU-PPN. This was partly because the industry was not fragmented as it is today because the structure of production was highly integrated in the hands of estate mills. Indeed, the policy was product-oriented, especially in order to extend the lives of old estate mills.

Through history, though, the policy pendulum has moved to give more advantages for consumers. The inward-oriented industry for fulfilling domestic consumption then provided the government with an impetus to create a market-oriented governing body. The rise of several marketing bodies indicates clearly that the government has given more emphasis to consumers. The industry reform (ISCP) in 1975 was not to revert to estate-mill problems, but to provide a new measure in the industry in the form of separation in production. It is true that policy reform in 1975 was in the interests of producers and should be viewed as a reform to restructure the industry in the interest of smallholder farmers. Thus, the ISCP itself may have degraded the power of estate mills.

The influence of each group could be reflected in the institutional arrangements of sugar marketing and sugar-price setting. In the case of sugar marketing in Indonesia, some institutions have been raised and others brought down through policy development. This policy arrangement is usually seen as a long-run institutional development intended to increase marketing efficiency (Falcon and Timmer 1991). However, because this and subsequent arrangements led to programs whose benefits

are concentrated much of this legislation has become a vehicle for groups' self-interest.

The government itself has a special interest in sugar. The commodity was a source of income in the peak years when Indonesia was a big exporting country. Not only did sugar provide foreign exchange from exports but the government also taxed sugar. This tax was actually aimed at reducing domestic demand, given sugar was export-oriented. However, this tax was not removed when the policy changed from export orientation to domestic fulfillment. The structure of sugar price now contains several taxes; excise duty, development tax, and several fees (Bulog 1990, Panggabean 1995). These taxes provide extra revenue to the government at a cost to consumers who pay for sugar at a higher price. It means the price setting, along with the margin, shows that there would be transfer from consumers to the government and producers. At national policy level Amang (1993) notes that the setting of producer and Bulog price leads to some consequences of which the stock level is not the only solution to hold back the inflating consumer price. Efforts to control price at affordable levels may need to be made in accordance with the reviewing of the government setting of price. This indicates that marketing charges and the government revenue could be affected by setting of the retail price. In other words, it reflects that the setting of price policy must consider all interests in the market: consumers, producers, and also the government itself.

However, the stated policy to support producers does not guarantee there is a transfer of wealth from the government to producers. The fact that the government has a special interest in the sugar industry may only show that the government is less

'tough' on producers than it is on consumers. This may be what Barichello (1989) means by the observation that although concern for farmers is often expressed, it is understood that this conclusion should not be taken too literally as indicative of the actual policy. The consensus which is so essential in arriving at a decision or policy often obscures wide differences in underlying support.

### **3.3 Badan Urusan Logistik (Bulog)**

Bulog is a National Food Authority established in 1967 as the successor of Komando Logistik National (Kolognas) or National Logistic and several previous food agencies. It is a government marketing board, or in Abbott's (1987a, 1987b) term a *parastatal*, formerly established as a sole agent for domestic food procurement. Its function was expanded later to distribute and stabilise domestic food price, e.g. rice price. More specifically, the initial objectives of Bulog were to (Abbot 1987b):

- (1) stabilise supplies and prices to consumers;
- (2) promote increased domestic production and improve the income of small-scale producers;
- (3) maintain reserve stocks to ensure food security.

All these objectives are mainly for rice. Though the main concern of Bulog is rice, but major proportion of rice trade in Indonesia is in the hand of private traders. As a proxy, Bulog procures only about 6 per cent of the domestic harvest. However, Bulog has to maintain its storage which has capacity about 3.5 million tons across the country and annual turnover of 1.8 million tons (Ellis, Trotter, and Magrath 1992). The costs of such operation are considerably high. Timmer (1996) estimates the annual cost of Bulog's efforts to stabilise rice prices could be held to \$70-100 million.



This is a rough proxy. Bulog has to finance this stabilisation costs from its own management. However, as mentioned by Timmer (1996), disentangling the costs of rice stabilisation from the costs of Bulog's other myriad activities is not an easy task; but it could be predicted that the sources are from the other commodities. In fact Bulog also control some agricultural commodities other than rice; and it is inevitable that there is a cross-subsidy between those commodities.

Following the success with rice, in 1971 Bulog was assigned to handle sugar distribution. Bulog's role in sugar marketing has become stronger over time as has been previously explained. However, sugar is only one of the commodities handled by Bulog. As a parastatal, Bulog has also been a sole importer for wheat and soybean. Other commodities managed by Bulog are garlic and palm oil. In the case of wheat, Bulog has also monopoly power for domestic trade of wheat flour. While, soybean import, which constitutes about 30 per cent of domestic consumption, must be distributed to the private traders similar to sugar. These commodities could be potential sources for Bulog's revenue, and source of fund for financing rice stabilisation.

However, the trade reform, following the currency crisis, has eliminated almost all those commodities from Bulog except rice. Though it controls only small portion of rice, but in some special events, the stock held by Bulog is even much higher. Recently, following the currency crisis, stock of rice drastically jump. The currency crisis has simply created a much higher inflation rate. Increasing consumer prices, including food, have greater impact on low income family to access food. It is in the condition of increasing relative poverty or the number of poor family that the government launches a food program called 'special market operation', part of the

safety program during the economic crisis, with the objective to provide poor family with 20 kg. of rice each month at the subsidised price. With estimated 17.5 million poor family being target of the program, it has made Bulog to accumulate its stock. far beyond it used to be at normal time, with a large scale operation. Though it is only part of the safety program managed by Bulog, but it has shown the power of Bulog in trade.

In the sugar marketing, among those on the Bulog side are licensed wholesalers who are authorised to distribute sugar to the consumers. They are private traders but exclusively handle Bulog commodities including sugar. There are two important groups in this category, they are cooperatives and the licensed wholesalers incorporated in the 'Indonesian Sugar and Flour Wholesalers Association' (*Asosiasi Penyalur Gula dan Tepung Terigu Indonesia*) or APEGTI. Bulog distribution of sugar, however, is also allocated to a third group; the food and beverage industries which use sugar as raw material. Since these industries are direct consumers, the appointed private traders are the cooperatives group and APEGTI.

Though APEGTI is appointed as distributors which are profit oriented private traders, they are more likely to be Bulog's agents which report their operation to Dolog - a Bulog branch at provincial level (BIMAS and IPB 1992, Amang 1993), and at national level their activities are supervised by Bulog (Gapegti-Bulog 1992). Their costs and profit have been estimated by Bulog, such that the maximum retail price, set by Bulog, directly affects final consumers and indirectly the traders profit.

The cooperatives distributors more or less have the same position as appointed private traders. The appointment of cooperatives as distributors, however, is part of government policy to promote cooperatives' performance.

### **3.4 Ministry of Cooperatives (MOC)**

The Ministry of Cooperatives (MOC) is not directly involved in the policy process. However, this ministry is a superstructure of the Village Cooperatives (KUDs) and some functional cooperatives, institutions whose role in the sugar industry is quite significant. The role of cooperatives in the sugar industry has become eminent since the introduction of the ISCP. In essence, their role has been formulated to provide technical and marketing support for farmers.

How the cooperatives' role is mainly directed by the superstructure has been lucidly described by Tjakrawerdaja (1989). He explains that the Village Cooperatives have been operationally involved in the ISCP program to provide advice to the farmers about increasing their production. However, lack of 'detailed instruction' made it difficult for them to do the job, a fact that has been realised by some related government institutions, such as the MOC and MOA. Then, he notes that the significant rise of the cooperatives' role was a result of a move at the ministerial level under the Coordinator Ministry of Economics and Finance including Bulog in late 1980 to evaluate sugar policy. This move has modified sugar policy to give more power to Bulog and, at the same time, enhances the Village Cooperatives' role. But it was not until 1982 that the cooperative responsibility was granted legal force through instructions from the Ministry of Agriculture. This legal force explicitly defined the role of KUDs as being to

- identify farmers who are willing to join in the ISC program
- provide advice for farmer groups involved in the ISC
- provide a service for farmers to get credit packages for their production
- involve themselves in the area arrangements for the ISC
- act as agent for delivering production inputs
- harvest and transport sugarcane to mills
- observe sugarcane weighing and SER examination in the mills.

In short, the Village Cooperatives have represented the farmers' interests in the sugar industry, especially those engaged in the ISCP.

The role of KUDs is even extended to the marketing sphere. KUDs, along with other licensed wholesalers, have been authorised to distribute sugar to final consumers. Their double role to support producers and consumers has made KUDs important players in the sugar market, especially in rural areas. These functions have been justified on the ground that KUDs act in support of their members who, in this case, are mainly farmers in the rural area. It is important to note that the modified marketing policy at the end of 1980 was also motivated partly by the sugar crisis, for which the government blamed the profit oriented private traders who were accused of speculating in the stock. The decision to grant Bulog more sugar distribution, and to decisively assign KUDs as farmers' representatives, is also indicative of the government belief that this important commodity should be controlled by the public sectors whose objective is not solely making of a profit.

It is not an easy task to judge whether cooperatives are government agents or purely volunteer organisations for the interests of their members. The fact that KUDs are not

purely voluntary organisations may raise some questions concerning their wide role in the industry. Previous studies (Wiraatmadja et. al. 1984) on the role of the village cooperatives indicate that the cooperative involvement in the sugar market is not solely the result of their effort to enhance their functions. It is also the result of the government willingness to promote cooperatives, the motivation that is justified by the State Constitution. While they may make profit as sugar traders, the government has treated them as special institutions in the industry. Apart from this profit, the government has also provided special fees for their role in the sugar industry. The fee is included as one component of the annual prices announced by government. While the prices are set for the level of producer and Bulog, it is clear that prices are becoming a burden to the consumers.

### **3.5 Indonesian Sugar Council**

The Indonesian Sugar Council (ISC) was established in 1982 through Presidential Instruction No.28/1982. The ISC provides a formal forum through which the cabinet ministers or representatives from the ministerial offices discuss the sugar policy issues. The ISC itself is chaired by the Minister of Agriculture, with the members consisting of some ministers and representatives from the ministerial offices related to sugar policy. The objectives of the ISC have been defined by the Act. They are to (i) formulate policy for development of sugar industry, and at the same time be responsible for controlling the policy implementation, (ii) provide consultative services relating to the sugar policy, (iii) monitor all activities in the sugar industry from production to marketing in order to enhance policy implementation, and (iv) coordinate any efforts to deal with problems in sugar production.

Previous studies on sugar policy hardly mention the role of ISC (Bulog 1990, Rachmat 1993). While the ISC has an important position in the policy process, the Council itself has no formal power to legally enforce regulations. Though the Council is a government body, it performs largely a consultative role, operated at the ministerial level. Hence, the decisions made by the Council may not be considered binding. As a forum for policy coordination, however, the ISC has provided an understanding of government policy alternatives.

### **3.6 Ministry of Agriculture (MOA)**

The Ministry of Agriculture (MOA) is the relevant institution relating to the sugar policy. From the beginning, the Ministry has been responsible for the production of sugarcane and sugar. At least three agencies in the MOA are responsible for the sugar production. They are Directorate for Estate Plantation (DGE), Mass Guidance Board (*Badan Pengendali Bimbingan Massal* or BIMAS) and the Indonesian Sugar Council (ISC). The latter has been described and discussed before.

DGE has an important position in the industry, since it is responsible for, especially, estate plantations, or the sugar mills, which have dominated sugar production since the early period. Its role, however, has been reduced since the introduction of the ISCP when the mills' role and the smallholder farmers' role were clearly separated. The ISCP itself and the smallholders' production are mostly handled by BIMAS.

BIMAS is mainly responsible for the agronomist nature of the ISCP. Selection of planted sugarcane land and delivery of input packages such as fertiliser to the smallholders lies with the BIMAS. However, the share proportion of the producer

price, which directly affects farmers' welfare, is under the jurisdiction of the MOA, and set by BIMAS.

### **3.7 Ministry of Finance (MOF)**

The role of the Ministry of Finance (MOF) has become important since Bulog took charge of the marketing of sugar. Currently, MOF is responsible for declaring the government sugar prices along with its marketing charges. Previously, the sugar prices were announced by MOA and the Ministry of Trade (MOT). The reasons for shifting the declared prices announcement from the MOA and the MOT to the MOF which occurred in the mid 1970s are not readily apparent. However, the structure of sugar prices may reveal that motivation. The sugar prices are saddled with tax, duty and some additional charges which go to the government exchequer. While the level of charges is subject to some other government considerations, the MOF could have a direct interest in the setting of prices.

### **3.8 Producers**

Producers in the Indonesian sugar industry consist of smallholder farmers and the estate mills. Prior to 1975, the production sector was dominated by the estate mills but the introduction of the ISCP has made the estate mills and the farmers two separate entities. To some extent, however, the government sugar policy has treated them as one party, i.e. producers, which have different tasks. While smallholders are sugarcane suppliers, the estate mills are sugar processors. Indeed, the producer price set by the government applies to both of them, with different revenue shares.

Since the sugar-estate mills are mainly processors with limited land for sugarcane, their production is heavily dependent on the sugarcane supply from smallholder farmers. Producer-price policy, in this case, may not affect the mills very much. With the predetermined sugar price, the mills are only left to manage the processing cost to improve their revenue. This means the smallholder farmers are the most important part in the sugar industry as cane suppliers, especially after the major policy reform in 1975. The farmers are the party most influenced by sugar price policy.

Though the farmers' revenue is directly affected by the policy, their bargaining position in the policy process is not strong (Mubyarto and Daryanti 1991). Some cases over history provide evidence about this matter. The determination of rent level in the early 1960s, the bargaining on the sugarcane price and revenue share of the producer price after 1975 are examples of the farmers position in the bargaining process.

Farmers have been able to organise themselves into associations in order to protect and promote their interests in the industry. The farmers Group (*Kelompok Tani or KT*) may best represent this association. However, the KT which performs well for agricultural extension, may not fully represent the interests of smallholder farmers in the sugar industry. At best, its role is to help farmers in technical aspects of growing sugarcane.

The village cooperatives are the other institutions representing farmers in the industry, the official role under the ISCP program beginning in 1975. However, the wide spectrum of the cooperatives' role has left little room for village cooperatives to act on behalf of farmers. The role as a mediator between farmers and mills may best



describe their job in the industry, especially in observing the *Sugar Extract Yield* on behalf of farmers. While the main concern of farmers is producer price, of which the share is based on the *Sugar Extract Yield*, the role of cooperatives is crucial in guaranteeing farmers get the 'right' revenue.

The objective of self-sufficiency means increasing domestic supply is necessary, suggesting that policy-makers to give special incentives to producers. According to stated policy, Bulog should redistribute income (as incentive) to farmers and support sugar mills (processors).

### **3.9 Consumers**

Consumers are the biggest group affected by the setting of sugar price, i.e. consumer price. Any change in the policy will directly affect consumer welfare. Though sugar consumption represents only a small portion of consumer expenditure, there is evidence from the market parameters of previous studies (Soetrisno 1984, Susmiadi 1986) that this commodity is very important to consumers. The importance of sugar, however, does not imply that it is providing an incentive for consumers to protect their interests by organising themselves. The fact that consumers are a big group, spread all over the country, may be the main reason they have difficulty organising. Lack of any formal organisation also makes them an easy target for any adverse change in policy.

Consumers neither organise themselves, nor are represented by another party in the policy process. Unlike the government, producers and consumers do not have representatives in policy decision-making. To some extent, the Ministry of

Agriculture and Indonesian Sugar Council act as a proxy for producers. This is not the case for consumers who only have a representative, the Indonesian Consumers Foundation, outside the policy circle. The Indonesian Consumers Foundation may undertake to represent consumers interests but it does not mean acting in specific way, such as protecting consumers from inflating prices. In term of representation, consumers have been the weakest group compared to producers and the government.

### **3.10 Summary**

This chapter has identified and described the participants involved in the sugar industry. Although there are many government bodies involved in the policy initiative, Bulog is the only body directly driving the policy instruments and represents the government interest in the industry. It is reflected in the structure of price, explained in the previous chapter, where the margin between producer and Bulog prices all goes to the government and is then distributed to the respective government bodies, cooperatives, MOF etc.

While the government is well represented by several prominent bodies, this is not the case for producers and consumers. The only organisation which acts on behalf of producers is the village cooperative, whose role is a result of government initiative rather than the efforts made by producers. The most vulnerable party is consumers who are left without any representative body in the policy process.

## **4. Review on Economic Theory of Regulation**

---

### **4.1 Introduction**

This chapter reviews one paradigm in the study of political economy addressing the basis of government intervention. The review focuses on the origin of economic theory of regulation in an attempt to trace the motivation for government intervention. Preceding this review, a brief introduction to political economy approaches in a broader line is presented. It provides a map on which the economic theory of regulation can be located within the more general theory. The review of the economic theory of regulation is devoted to political preference function framework and its application to agricultural policy. Political weights and efficiency of the policy are specially investigated as a major focus of the political preference framework.

### **4.2 Political Economy Approach**

Political economy in a broader approach used here is neoclassical one. An attempt is made here to provide a brief introduction to political economy literature by categorizing the studies into three broad lines. They are (1) public choice theory, (2) Chicago school, and (3) normative theories of government failure. This classification is somewhat arbitrary but it serves to highlight the differences among neoclassical political economy. Following the presentation of these three approaches, the further discussion of the Chicago school, especially the economic theory of regulation, is made in greater detail, which provide a basis framework of the study.

### **4.2.1 Public Choice Theory**

The definition of public choice may be best described by Mueller (1989). He defines Public Choice as the economic study of nonmarket decision-making, or simply the application of economics to political science (Mueller 1989). Applying concept of economic theory to the analysis of policy decision means political choice could be evaluated on the basis of people acting rationally to maximise their own utility. This alternative approach began to reject the notion of governments as benevolent social welfare maximisers in favour of the idea that governments are driven by agents, who are motivated by their own private interests, to perform its social function. Under this assumption, government is viewed as collection of individuals comprising legislative and executive institutions, which have powers and goals of their own. By this description, Swinnen and van der Zee (1992, p.2) state that the public choice approach is to explain 'the divergences between economic prescription and governmental practice'.

Downs (1957) is among the first who make early attempt to explain politics in terms of economic principles. He argues that the operation of governments is analogous to that of the firm: politicians attempt to maximise political support just as entrepreneurs try to maximise profits. Buchanan and Tullock (1962) follow Downs to propose that voters and elected politicians seek their own self-interest in the political market place and that the preferences of politicians are expressed by how people vote. They show that individuals may organise collective action while at the same time acting in rational self-interest.

The relationship between organisational costs and group size was originally been addressed by Olson (1965). Olson maintains that 'free-riders' present the primary obstacle to collective action. He further discusses which type of groups are best able to control free riding and claims that small groups can achieve effective lobbying because they are more likely to overcome the free riding problem.

The idea that government is driven by self-interest agents provides an alternative basis for study of government intervention. While conventional wisdom considers the intervention is to correct market failure, public choice views that the intervention comes from government itself. Thus, government failure should be considered in evaluating such intervention. Orchard and Stretton (1997) make point to state that public choice theory may alert investigators of governments to a range of malfunctions which can reduce their justice or efficiency in particular cases.

### **Legislative Failure**

Legislature refers to the set of elected individuals who make laws according to procedures specified in the constitution. Understanding legislative system, especially the voting decision for given policies, is important in the public choice. This is because the system reflects the support given to various groups.

It is assumed that the main goal of legislator is to get re-elected. Considering this objective, legislative could be a source of political failure (Wittman 1989; Young, Marchant, and McCalla 1991). Legislators represent the interests of their constituent. Since different legislators have different constituent, they push for policy only of benefit to their constituent, and may harm the others. The results are they resist the

pressure, or even worse, as stated by Martin (1990), practice of pursuing votes by 'pork-barreling'.

### **Bureaucratic Failure**

Modern discussion of bureaucracy in public choice begins with a model proposed by Niskanen (1971) which is known as budget-maximising. Since bureaucrats do not run for re-election, their concern is to manage the bureau, their own power and influence. Rewards are based on the budget they administer, which acts as an incentive to growth, to make their office bigger. Thus, budget maximisation should be an adequate proxy for bureaucrat behaviour. This behaviour makes government bigger; and bureaucracies will grow beyond it need be for the efficient distribution of service.

The question about bureaucrats is similar to the legislator on how could the administrators would act impartially and be efficient. Thus, bureaucratic could also be considered as a source of failure.

### **Rent-seeking**

Rent-seeking is an activity of people or firms that expend resources to gain rents, for themselves, created by government legislation and regulation. Krueger (1974) originally formalizes the notion of rent-seeking activity. By definition, interest groups behaviour in the political market is a form of rent-seeking, since they try to influence policy maker in order to benefit themselves, by gaining special privileges, at the expenses of others. Rent-seeking activity is inefficient, and as Johnson (1994) notes, it biases the perspective of elected government representatives as they cater to groups seeking policies that benefit the few at the expense of many.

### **4.2.2 Chicago School**

Chicago school could be noted as the Chicago version of public choice theory. The Chicago school is political economy which has absolute reliance on market mechanism. The role of market mechanism means political process is equilibrium theory. Here, political process is motivated by the same forces as market behaviour.

Tollison (1989) notes that the thrust of the Chicago school research program derives from Stigler (1971) paper on economic theory of regulation. Scope of the Chicago began as a theory of regulation, which concerns on the form of transfer to special interests. This work introduces a new focus on the role of private interests in the process of policy formulation. Instead of private interest pressures being seen as an obstacle to the adoption of better policies, they are seen as the response of rational actors attempting to improve their own welfare (Martin 1990).

The Chicago school views is that competition leads politicians to make such transfer efficient. It minimises the deadweight costs of government intervention. This efficiency result implies that problem related to voting rules, legislature, bureaucracy do not arise in Chicago political economy (Becker 1985, Peltzman 1989), since these process are all perfect agents of interest groups. Tollison (1989) and Pasour, Jr. (1992) also note that another consequence of efficiency result is that the role of rent-seeking is less important.

### **4.2.3 Normative Economic Theories of Government Failure**

Normative economic theories of government failure has emerged as an alternative concept analog to the market failure in order to provide a basis from which nonmarket outcome of government actions can be evaluated. Comparing the function of market and government, one proposes that problem of nonmarket failure must be considered in evaluating the relative merit of the market versus government action.

To some, government failure is judged simply using (policy) efficiency measure in term of benefit and cost of making correction of market failure. If the government tend to use fund less efficiently than the private sector does when engaged in market-oriented activities, it can be said that there is government failure. Assuming that government is driven by self-interest agents, government failure could be defined as a tendency of the legislative and policy makers to be influenced by those self-interest agents. Thus, if government can not properly deliver its functions, it could be described as government failure (Rausser and Irwin 1986, Easter and Feder 1996). In addition Wittman (1989) demonstrates that nonmarket failure implicitly built into some political market models. However, to be comparable to market failure, where inadequacies of the market are matched against externalities, nonmarket inadequacies must also be associated with government action. In this line, (Pasour, Jr. 1981) suggests identification of nonmarket or government failure should be on the basis that real world political institutions are judged against the idealized model.

In an effort to evaluate the development of the theory of government failure, Dollery and Worthington (1996) have reviewed the growing literature on normative theory of government failure. They classify the theory in three strands: Wolf's theory of nonmarket failure, Le Grand's theory of government failure, and Vining and Weimers's theory of government production failure. Wolf (1979) identifies four



sources and types of nonmarket failure: internalities and private goals, redundant and rising costs, derived externalities, and distributional equity. On the second strand: according to Dollery and Worthington (1996), Le Grand argues that government actions; described as *provision, taxation or subsidy*, and *regulation*; should be examined using allocative efficiency, x-inefficiency, and egalitarianism in economic outcomes. Then, Vining and Weimer's theory of government production failure suggests to develop a normative and positive perspective on government supply in order to provide a framework for understanding the efficiency consequences of alternative pattern of that supply.

Those characteristics of government failure have been criticised on the ground that the theory lacks comparative measure. Policy analysis requires a general theory of organisational failure, which facilitate a comparative framework for both market and government. However, Donnelly and Worthington (1996) state "...given the current state of the art in the normative evaluation of alternative social states, a comparatively unified or general theory of comparative organisational behaviour is unlikely to appear in the near future" (Donnelly and Worthington 1996, p.36). To be optimistic, however, they claim that the significant progress has already been made towards the construction of workable conceptual framework for policy analysis.

### **4.3 Economic Theory of Regulation**

The perceptions of how political markets operate have been developed and synthesised by Stigler (1971), Peltzman (1976) and Becker (1983) in what has been known as the economic theory of regulation. The common assumption in this

representation is in line with the early development of the political economy approach, that politicians seek to maximise political support.

The economic theory of regulation was pioneered by Stigler (1971) who emphasised the transfer of wealth resulting from market regulation. He argued that politicians supply regulations because there is a demand for them from interest groups. Here, regulation can be viewed as a product whose allocation is governed by laws of supply and demand. He specifically states that, as a rule, regulation is acquired by industry and is designed and operated primarily for its benefit. In other words, there are economic interests in regulation. In Stigler's formulation, the political process -of which the outcome is regulation- is determined by representative politicians. The industries - interest groups - spend resources and give votes to influence in the political process.

Stigler theory of regulation is also known as 'capture' theory of regulation. In the original work, this capture theory means regulation serves the producer interest. The capture theory term is used to differentiate the theory from the 'public interest' theory of regulation (Posner 1974). The latter means regulation is supplied in response to demand of the public for the correction of inefficiencies market practices, while the former, as has been explained, sees that regulation is supplied in response to the demand of interest groups.

The capture theory of regulation stems from findings of ineffective regulation as in the tradition of correcting market failure. Stigler (1971) adopts the producer-protection hypothesis, summarized by Jordan (1972), to explain his theory of

regulation. The hypothesis says that the actual effect of regulation is to increase or sustain the economic power of an industry. While the original regulation is directed to protect consumers against the industry, accepting that hypothesis means producers rather than consumers gain from legislation. The legislation does not benefit the consumers, and does not promote 'general welfare' (Becker 1976), because it is 'captured' by producers.

Peltzman (1976) generalises Stigler's idea by proposing a formal model explaining the role of opposition groups in determining regulatory behaviour. The regulator - similar to the representative politician in the Stigler's term - is assumed to maximise his political support -or votes- taking into account the probability that those who benefit will vote for him and those who lose -those who are taxed- will vote against him. The regulator maximises 'majority generating function' defined by:

$$M = M(p, \pi) \quad \text{s. t.} \quad \pi = f(p, c) \quad (4.1)$$

where  $M$  - the politician's objective function

$p$  - price of good

$\pi$  - wealth of producer

$c$  - production cost as a function of quantity

The Lagrangian solution gives

$$-\frac{M_p}{f_p} = M_\pi = -\lambda \quad (4.2)$$

This says that the regulator sets a regulated price where the marginal political support elicited from increased producer profits is just equal to the marginal political enmity generated by losing consumers. In other words, his model of equilibrium political processes shows that a vote maximising regulator trade off the benefits he gives to producers with the costs he imposes on consumers in the process of setting regulated prices. This supply-demand approach has stimulated further applications and extensions. Becker (1983, 1985) has substantially broadened the scope of this analysis, and the hybrid models have been developed by Gardner (1983, 1987a), and Rausser and Foster (1990).

Becker (1983), on the basis of the Stigler-Peltzman models, has developed a model of competition among pressure groups for political influence. Interest groups organise to exert pressure on politicians to raise their welfare. The basic assumption underlying Becker's model is that any regulation - in his case is taxes and subsidies- is redistributive in nature and are used to raise the welfare of more influential pressure groups. Characterised by Olson's theory, Becker uses an influence function to represent the supply of government policies in response to group pressure. Becker assumes that government behaviour is determined by political pressure exerted by various interest groups which compete to obtain welfare transfers. In Becker's model, interest groups that most efficiently produce political pressure obtain favourable government policies. The political game he models is zero-sum in influences and negative-sum in taxes and subsidies because of transaction costs and deadweight losses. He defines the political equilibrium as a balancing of the influence function:

$$-I'(p_s, p_t, x) \dots I^s(p_s, p_t, x) \quad (4.3)$$

where  $I^t$  and  $I^s$  are influence functions of group  $t$  and  $s$  respectively, which depend on the pressure ( $p_i$ ) exerted by  $s$  and  $t$  and the variables ( $x$ ). These influence functions determine the amount transferred. Thus:

$$n_t F(R_t) = -I^t(p_s, p_t, x), \text{ and} \quad (4.4)$$

$$n_s G(R_s) = I^s(p_s, p_t, x) \quad (4.5)$$

where:  $R_t$  is a vector of taxes paid by the  $n_t$  members of taxed group.

$R_s$  is a vector of subsidies to the  $n_s$  members of subsidised group.

$F$  and  $G$  represent the deadweight losses associated with taxes and subsidies respectively.

This equilibrium says that transfers to a group are directly correlated with groups' influence, and, in turn, that influence is correlated with lobbying efficiency. The notion that the political equilibrium is a balancing of the influence function makes his formulation is similar to Peltzman's model in the sense that interest groups organise to exert pressure on the political process to grant them benefits. However, Becker extends Peltzman's model by introducing deadweight losses as a constraint on inefficient regulatory policies.

Becker recognises the existence of deadweight losses in the wealth transfer such that, in reality, the amount transferred is lower than that which is taxed [ $F(R_t) \leq R_t$ ], and the amount available for subsidy is higher than that which is subsidised [ $G(R_s) \geq R_s$ ].

This formulation produces a political equilibrium with deadweight losses.

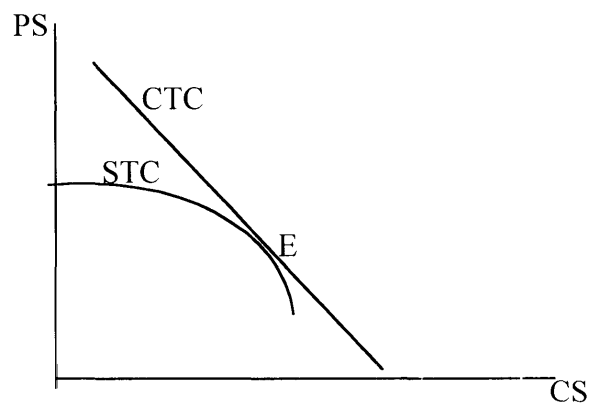
The existence of deadweight losses in the equilibrium has been a central argument in the Becker model. It make a political process move toward efficient modes of redistribution. This is because costless transfers allow a government to redistribute wealth so as to make all groups better-off and at the same time maximise political support. Neither winner nor losers are rationally against policy changes that reduce deadweight losses.

To conclude his theory, Becker states that policy should favour efficient redistribution in terms of deadweight losses, a result that has been indicated in his previous work (Becker 1976). Becker proposes the efficient redistribution hypothesis, which was then elaborated by Gardner (1983). This conclusion has greatly influenced recent studies on government intervention and Becker's model is often judged as the standard formal theoretical foundation for the new political economy framework.

The works of Peltzman and Becker represent a major development in the theory of regulation. However, as an extension of Peltzman's model Becker emphasises some differences. While Peltzman used proportional voting models, Becker uses pressure groups as the institutions through which political decision-making occurs. Their similarity is that a political equilibrium represents a balancing of marginal pressure exerted by winners and losers.

Gardner (1983) extends the Peltzman and Becker principles in the context of efficient redistribution. He explicitly models the redistribution by relating the deadweight cost with any transfer in wealth.

Graphically, Gardner develops the Surplus Transformation Curve (STC) as depicted in Figure 4.1 to show a trade-off and efficient transfer between producers (measured by producers surplus) and consumers (measured by consumers surplus).



**Figure 4.1: Surplus Transformation Curve**

The STC is obtained by solving performance measures (PS and CS) for a given mode of redistribution or policy instrument. Constant Transfer Curve (CTC) with slope  $-1$  represents a lump-sum transfer, and the STC represents transfers through market intervention. While point E is the maximum sum of consumer's and producer's surpluses, the points to the left of E (along STC) generate surplus transfers from consumers to producers which incorporate deadweight losses. Optimal policy could be any point along STC, and efficiency at the margin is measured by the slope of the STC at this point. This must be less than  $|-1|$  of which the deadweight loss is reflected by the gap between CTC and STC.

Using the STC, Gardner shows that cost of transfers may differ from one policy instrument to another. It enables him to rank several alternative policies on the basis

of the efficiency of redistribution. This principle has been employed to explain the case of the U.S. farm program. In particular, why different commodities receive different level of program benefits. In this work, Gardner points out that the efficient method of intervention depends on market parameters. Inelastic demand favours production control, while inelastic supply favours a deficiency payment program.

In the later work, Gardner (1987a, 1987b) introduces a government objective function to explain the motives behind agricultural policies. By doing so, Gardner views government behaviour as a more active one to direct regulation. Governments have been modelled as autonomous agents with objectives of their own. In Gardner's model, government chooses policy instruments so as to maximise its own 'utility' function. This has been shown by Gardner's criterion function as:

$$J = J(CS, PS, \theta_i) \quad (4.6)$$

where  $J$  = objective function

$CS$  = Consumers performance measure cq. consumers surplus

$PS$  = producers performance measure cq. producers surplus

$\theta$  = parameter representing political weights assigned to interest groups

Using this objective function, Gardner offers a direct method in explaining the determinants of the level of government regulation. In his empirical model, Gardner also tries to prove the existence of efficiency and the effectiveness of group size in exerting pressure.



To summarise the economic theory of regulation, it is important to note of Peltzman's (1989) re-examination of the theory. In general, the theory is a model of the forces affecting regulation. Thus, it provides useful insights into the nature of the political process. But Peltzman claims that the theory does not specifically provide an explanation of entry into and exit from regulation. It is not sufficiently well developed to generate sharp predictions about where and when entry or exit will occur. Hence, to some extent the conventional explanation of market failure may still be valid for understanding government regulation. Rasmusen and Zupan (1991) consider the deficiencies of the theory as they try to extend it to choice of policy instrument. This has also been an important subject in several studies of political economy of government intervention (e.g. Magee, Brock, and Young 1989).

## **4.4 Explaining Government Behaviour**

### **4.4.1 Productive and Predatory Objectives**

The basic difference between traditional neoclassical economics and the political economy approach lies in their different perceptions of government. Traditional neoclassical economics assumes government policies as exogenous, while the political economy approach argues that government policies are at least partly endogenous, and in important ways, reflect the desires of special interest groups in society.

These two approaches result in a different perspective on the role of government. On the one hand, the conventional social welfare perspective views government in a more altruistic way. On the other hand, the political economy approach assumes governments (i.e. politicians) act in their own self-interest, responding to interest

groups. The economic market is not the only reason for government intervention. The judgment must be found in the behaviour of government itself. However, it is difficult to distinguish the altruistic behaviour of politicians from their own self-interested actions. And most likely a mixture of motives is at work. The issue of the relation between policies determined by self-interested politicians and those determined by socially concerned politicians has become the subject of many studies (see Baldwin 1989).

Rausser (1982, 1992) has addressed this problem by dividing government activities into predatory and productive ones. He differentiates between what he has called PERTs (Political Economic Resource Transactions) and PESTs (Political Economic-Seeking Transfer) policies. PERTs have the objective of correcting market failure or providing public goods and they are, in principle, welfare increasing. In contrast, PESTs are introduced to redistribute wealth from one group to another and are welfare transferring. Using his category, Rausser has examined U.S. Agricultural policies in term of producer subsidy equivalents (PSE) across commodity and decomposed these into PERT and PEST components. He concluded that products with inelastic demands (sugar, milk, rice) receive a lower proportion of their public support in the form of productivity enhancing policies while products with elastic demand (soybeans and meats) receive a higher proportion of their support in the form of productivity enhancing policies.

In his work, Rausser argues that two markets should be recognised in analysing government intervention, the political market and economic market, and these markets are inseparable. This explanation has been important in analysing the role of

government and in finding the reasons for government intervention. Some further research has been devoted to enhancing this line of argument. Rausser and Irwin (1988), Rausser and Foster (1990), Rausser and de Gorter (1991) examine government intervention policy and decompose policies in terms of predatory and productive ones. These authors consistently argue that understanding the origin of policies is important to formalising necessary policy reform.

So far, Rausser has explained that there are two motives in government intervention. It can not be expected that either government or market failure view of government intervention is strictly correct. The cause of government intervention is that most likely a mixture of motives. Rausser himself believes that government behaviour has historically been neither completely predatory, as modelled in the Public Choice school, nor totally benign, as portrayed in the social welfare literature. The works of Rausser and de Gorter (1991) and de Gorter, Nielsen, and Rausser (1992, 1995) show that there is relation between productive and predatory policies. Specifically, they hypothesise that increases in productive investment are positively related with increases in redistribution policies.

#### **4.4.2 The Political Economy Explanation of Agricultural Policies**

Two general approaches are usually used to evaluate endogenous government policies, the *clearinghouse* government formulation and the *self-willed* government formulation (Bhagwati 1989, Alston and Carter 1991, Brooks 1996). The former assumes that governments react to the interaction of interest groups in such a way as to maximise political support while with the latter the government maximises an objective function. Becker's (1983) model is a typical example of clearinghouse

government and Gardner (1987a, 1987b) provides examples of self-willed government.

The clearinghouse government models the government as a budget balancer for political influence, since it trades off political pressures among interest groups. Thus, it is an arena where lobbies clash over policy. The political equilibrium is determined by the efficiency of each group in producing pressure. In this regard, government policy is an outcome of these pressures such that it leads to two questions: the choice of policy instrument and the level of the instrument.

The self-willed government maximises welfare transfers to interest groups. To some extent, the self-willed government is similar to the clearinghouse government except that the self-willed government has a more direct political intention, which is reflected in its objective function. The self-willed equilibrium is, therefore, at the point where its objective function is tangent to STC, whereas the clearinghouse equilibrium lies anywhere along the STC. Since government in the self-willed model has more autonomy, the question of policy choice and the level of policy instruments rely on the government's willingness to make these decisions.

## **4.5 Toward a Theory of Political Preference Function**

### **4.5.1 Basic Features of the Model**

The economic theory of regulation, specifically as extended by Becker (1983, 1985) and Gardner (1983, 1987a) has moved agricultural policy studies from the analysis of policy effects toward explaining the underlying causes of agricultural policy. The theory, along with arguments proposed to explain the government intervention, recognises that there is an equilibrium between the economic market and political

market that results in an optimal policy. It leads to an empirical model in which policy instruments are endogenous variables. One of the important models focuses on government agencies making the policy decision.

It is assumed that the governing criterion function exists to set the policy instruments. Once the policy instruments have been chosen, it could make some groups better off at others' expense. In this regard, governments weigh the welfare gains of one group against the welfare losses of others. This kind of the criterion function is usually formulated as a political preference function (PPF) reflecting the power and influence of various interest groups (Rausser 1982; Gardner 1987a, 1987b, Rausser and Foster 1990, Johnson, Mahe, and Roe 1993). In choosing policy instruments, governments consider the effect of policies on welfare of various groups.

The PPF framework for agricultural markets usually aggregates interest groups into producers and consumers. The standard objective function is similar to that in Gardner's model (shown by equation (4.6)). The government or authority maximises this objective function subject to economic structure (i.e. supply and demand), to get its optimal policies. (e.g. Winters 1987).

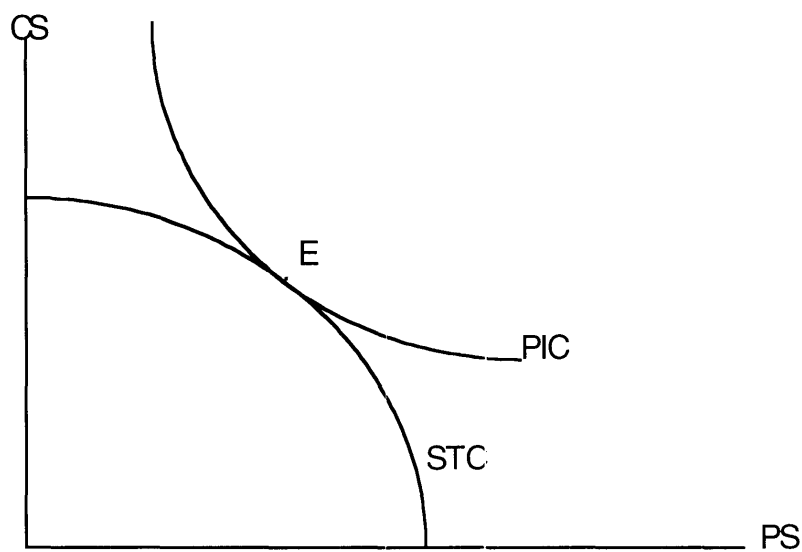
The PPF analysis can be traced back to the works of Josling (1974) and Rausser and Freebairn (1974). However, it is Becker who explicitly models the role of interest groups, and Gardner who develops the Surplus Transformation Curve representing the efficient redistribution hypothesis; advancing the PPF as powerful tool in explaining the origin of agricultural policies.

The PPF approach assumes that a group's voting or lobbying behaviour is related to its economic well-being and that policy-makers are primarily concerned with attaining or maintaining their power (von Cramon-Taubadel 1992). In PPF analysis, interest is often focused on income redistribution policies under which benefits are passed on to special interests at the expense of another interest group. Hence, policy-makers adjust policy instruments so as to create a welfare distribution which maximise political support.

The PPF is established by recognising both economic markets and political markets. In the PPF, the optimal policy is reached in where the economic market is equal to political market. Economic markets represent the supply side of political-economic equilibrium, while political markets represent the demand side of the equilibrium. It mirrors the Peltzman-Becker model of regulation where governments supply optimal regulation (policy) in response to demand by interest groups.

Supply can be represented by Surplus Transformation Curve (STC) which has been developed by Gardner (1983, 1987b), measuring trade-off between consumers' and producers' surpluses. Demand can be represented by the Political Indifference Curve (PIC), which is analogous to a consumer's indifference curve. The idea of Political Indifference Curve comes from Social Indifference Curve (SIC) analogous to consumer indifference curve. In fact SIC represents Social Welfare Function (SWF) which allows one to rank alternative allocation or distribution of wealth (Gardner 1987b).

Theoretically, the STC is assumed to be strictly concave, and PICs are convex, analogous to consumer theory (Gardner 1987b, 1989). However, the convexity of PICs has been a controversial issue (see section 4.6). Optimal policy, which means political-economic equilibrium, in PPF is the point of tangency between the STC and the PIC. Figure 4.2 shows that E is the political-economic equilibrium where STC is tangential of PIC.



**Figure 4.2: Political-economic Equilibrium.**

Suppose the form of PPF (from (4.6)) is a linear-additive one. It can be represented as:

$$J = \theta_1 PS + \theta_2 CS \quad (4.7)$$

Maximising with respect to policy instrument  $p$  will result in FOC:

$$\theta_1 \frac{dPS}{dp} + \theta_2 \frac{dCS}{dp} = 0$$

$$\frac{dPS}{dp} / \frac{dCS}{dp} = -\frac{\theta_2}{\theta_1} \quad (4.8)$$

This represents a political-economic equilibrium which results in an optimal policy. This equilibrium is a point with two sides; the *transformation* side which reflects a change along the STC, and the *substitution* side which reflects a change along the PIC (Bullock and Jeong 1994). The transformation side, reflected in the observed policy instrument, shows how government can transform one group's welfare into another's by changing policy instrument. The magnitude of transformation or Marginal Rate of Transformation (MRT) can be inferred from the coefficient of the slope of the tangent to the STC. The substitution side is reflected in the PPF itself, which shows how government is willing to substitute one group's welfare for another's. The magnitude of substitution can be inferred as Marginal Rate of Substitution (MRS) represented by the coefficient of the tangent to the PIC. The equilibrium condition means that MRT equals MRS. Understanding these two sides of the equilibrium is important in the PPF, especially in addressing the problem of stability raised by von Cramon-Taubadel (1992). This is also a significant factor considering that in most PPF studies the unobservable MRS is represented as political power weights.

One interpretation of the political economy behind the PPF is that the interest groups (e.g. producers and consumers) have organised their members in lobbies to achieve through agricultural policies what they could not achieve in the market (Johnson, Mahe, and Roe 1993). These lobbies produce pressure or political power as a determinant of government policies which may create market distortions. By distorting agricultural markets, policies distribute the gains to favour groups with greater political weights. Hence, the political weights reflect the relative political influence of interest groups in the political process.



This basic model has been adopted by Carter et. al. (1990) to explain government intervention in Canadian agriculture. Sarker, Mielke, and Hoy (1991, 1993) also adopt the Gardner's model and modify it to make the political weights endogenous variables. Tyers (1990) applies and modifies the model to explain trade policies in the EC. Using the model, he also simulates several alternative trade policies for the EC. Rausser and Foster (1990) modify the model to introduce welfare increasing measures in agricultural policies. This study also represents further development of the PERTs and PESTs concepts introduced by Rausser (1982).

#### **4.5.2 Empirical PPF Studies**

The nature and number of arguments in the PPF are, in principle, unrestricted. Empirical studies using the PPF framework have modified or expanded the basic structure of the model. They use various alternatives of performance measures, extend the number of interest groups, and treat political weights in a different way.

The popular performance measure of interest groups is the welfare surplus measure. Studies using this measure are Sarris and Freebairn (1983), Riethmuller and Roe (1986), Gardner (1987a, 1987b), Rausser and Foster (1990) and Tyers (1990). Alternative performance measures used are profit and income. The works that have employed these measures are Paarlberg and Abbott (1986), Rausser and de Gorter (1991); de Gorter, Nielsen, and Rausser (1992).

Some previous studies also show that the arguments or number of interest groups can be different. The widely used interest groups are producer, consumer, taxpayer, and government. However, some studies have expanded the arguments in the PPF. Sarris

and Freebairn (1983) model the PPF by incorporating government preference for producer and consumer stability. He argues that in the optimisation of domestic welfare there is a trade-off between producers and consumers welfare, government treasury gains and preferences for producer and consumer stability. In subsequent work, Vanzetti and Kennedy (1988) reformulate Sarris and Freebairn's model to account for impact of policies on world price. Similar to Sarris and Freebairn, Paarlberg and Abbott (1986) analyse the world wheat market by endogenising policy decisions in the PPF framework. But, unlike Sarris and Freebairn, Paarlberg and Abbott extend the number of interest groups involved in the criterion function i.e. producers and livestock producers, consumers, private stockholders and taxpayers.

In terms of the objective of the studies, Alston and Carter (1991) and Swinnen and van der Zee (1993) note that the majority of PPF studies attempt (a) to determine policy instrument levels for a given set of political weights, and (b) to estimate implicit political weights of different groups.

Studies aiming to determine policy instrument levels are many. They include among others Sarris and Freebairn (1983), Paarlberg and Abbott (1986), Rietmuller and Roe (1986), Vanzetti and Kennedy (1988) and Lopez (1989). These studies show that the incorporation of political weights has given different results from the conventional model. They mostly conclude that the political weight has been one consideration for government or policymakers in employing a particular policy. Specifically, they argue that the level of government intervention is influenced by both economic and political variables. These studies have proved to be useful for explaining the nature of agricultural policies.

Some studies that empirically estimate political weights are Lianos and Rizopoulos (1988) for the case of Greek Cotton economy, Ohmke and Yao (1990) for the case of U.S. wheat market in a dynamic setting. Other studies, Sarker, Meilke, and Hoy (1991, 1993) for agricultural policies in Canada, and Lopez (1994) for sugar policy in the Philippines. Most studies aim to estimate the political weights and they assume that the weights are the end result of some political process. The exception is Lopez (1995) who considers that the optimal policy instrument is the result of a political economic equilibrium, but at the same time considers the possibility of changing political weights as a result of exogenous political conditions.

These studies examine the role of political weights in the PPF framework. This is a crucial topic in the PPF, since the weights reflect the political content explaining government behaviour.

#### **4.5.3 Political Weights in the PPF**

The weights in the PPF represent the relative political concern governments put on the welfare of interest groups. The underlying assumption is that politicians maximise political support, and the political support - implied weights in it - from each group is a function of their economic welfare. They also describe the direction of the effects of a policy in redistributing wealth. Equal weights mean there is no transfer between the groups. Rausser and Foster (1990) show that the political weights are indicative of politically efficient outcome of the various actions taken by interest groups in their efforts to influence policy.

Most studies infer the relative weights on groups welfare from observable Marginal Rates of Transformation of one surplus measure into another (Gardner 1987b, Rausser and Foster 1990). This is shown before by expression (4.8). The ratio of these weights, therefore, reflects the direction as well as the degree of wealth transfer from one group to another through government policy.

The reason why government gives different weights to producers and consumers is not given by the PPF structure. It may be because of interest group pressure activities (e.g. Becker 1983, Gardner 1987a); because of interaction among politicians and voters (e.g. Downs 1957, de Gorter and Tsur 1991); or because of other political processes.

One view is that the weights express the willingness of government to redistribute wealth among interest groups in a society. Since the weights are the outcome of a political process, the problem arises in treating them in the governing criterion function. It is difficult to conclude whether these weights are determined endogenously, as a response to political pressures; or exogenously, simply as a political will. Some previous studies on PPF estimate either implicit political weights (treating weights as endogenous) or policy instruments (treating weights as exogenous).

Lianos and Rizopoulos (1988) estimate the implicit distributional weights for Greek Cotton producers and they examined the policies in terms of these changing weights. They argue that policies are not determined independently by government on the basis of its own preferences, but, rather, policy-making involves consideration of the

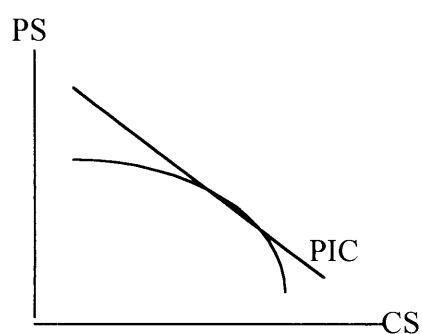
bargaining powers of various interest groups. An interest group expends resources in an effort to influence government policy in its favour. This implies that the political weights are the outcome of a complex decision making process. In this vein, Sarker, Meilke, and Hoy (1991, 1993) examine agricultural policy in Canada, and Lopez (1994) assesses sugar policy in the Philippines, all by treating the political weights as endogenous variables. That is, by taking into account both demand for, and supply of, political favouritism.

Sarris and Freebairn (1983), Paarlberg and Abbott (1986) and Vanzetti and Kennedy (1988) model endogenous price policies by estimating the weight for producers. However, neither of them considers the possibility of endogenous welfare weights.

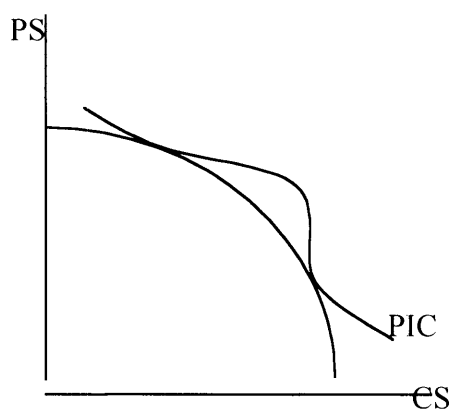
Although Gardner (1987a) notes the possibility that political weights are endogenous, he maintains the assumption of fixed political weights in his analysis. The argument is found in his later work (Gardner 1989). Analogous to consumer theory, PIC should be convex. But, fixed-weight political preference functions which imply linear PIC are more widely used. Suppose the political weights are treated as endogenous, and their degree depends on how much the group spends on political action. Then, applying Becker's result, which states that interest groups having 'more to gain or to lose' from a particular policy will be more politically active and have a greater influence on the political outcome, this treatment would be mathematically implausible. The simultaneous interaction means that supporting one group -by increasing wealth- will generate more political action, which in turn would increase the group's political weight. Increasing wealth encourages further political action.

This positive interaction raises the possibility of a non-convex PIC, a result that contradicts the assumption.

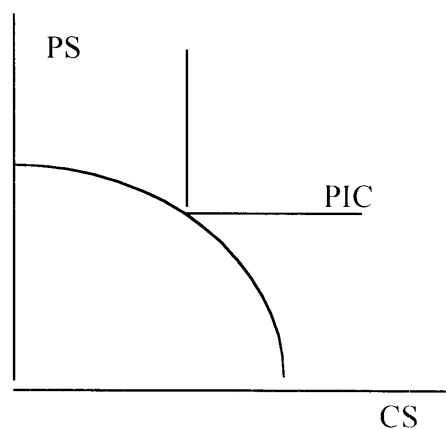
This argument also indicates that several forms of PIC may exist (Pudney 1989). The non-convex PIC (the curve bulges-outward in one region) is one example, though this form is likely to be rare. The extreme example of the PIC is the case where the preferences represent perfect complementary (Figure 4.3c). Because the flat sections are parallel to the axes, the only combination of PS and CS that 'touches' is the kink in the indifference curve. Though it is also rare case, this may arise from some strict relation which involves fixed proportions of transfer.



**(a) Linear Assumption**



**(b) Non-convex Assumption**

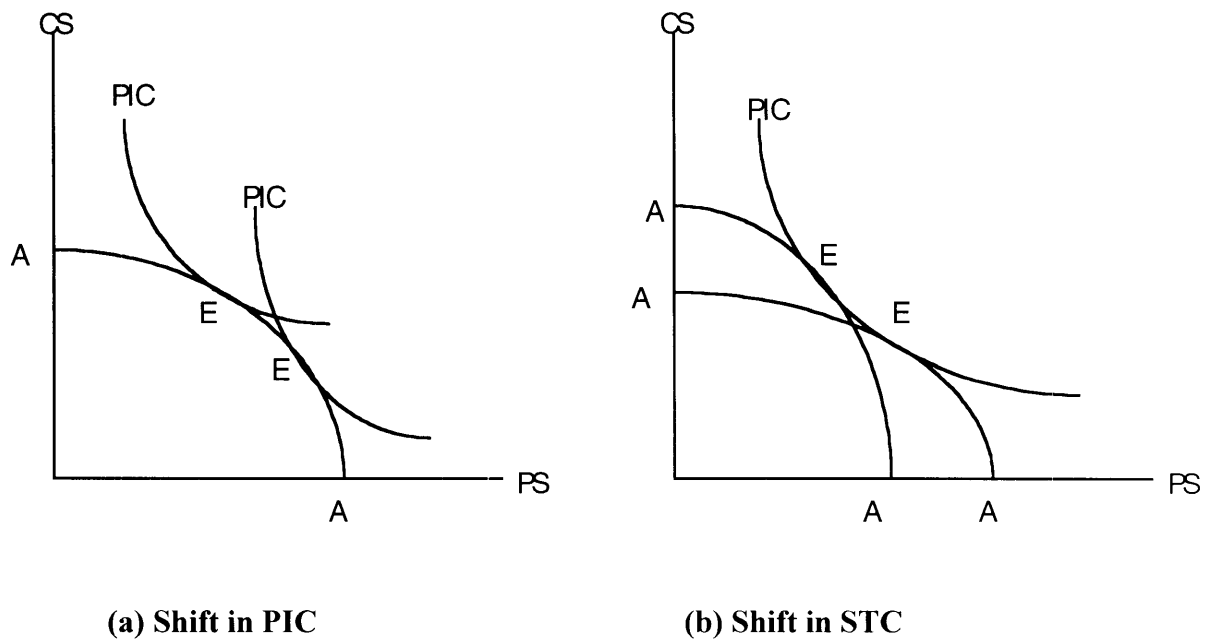


**(c) Kink Assumption**

### Figure 4.3: The Forms of PIC

The linear assumption in some versions of the preference function may be interpreted as there being a perfect substitute in the transfer of wealth. But, in the sense that there is a transfer between PS and CS, this transfer is dictated by observable STC, whereas PIC determines the political constraint at the optimal point. The substitution, however, is indirectly inferred on to the STC.

The other reason, which does not involve endogenising the political weights, is concerning the stability of the PIC and STC (von Cramon-Taubadel 1992). He states that the PPF approach is based on the concept of a market for government intervention. Therefore, it is misleading to say that the change in PPF is exclusively attributed to political preferences. Most works on the PPF attempt to find political weights, so that the changes in the PPF are usually attributed to changes on the demand side (the political weights). However, STC may be shifted as a result of changing policy instruments. Thus, the changing in PPF could be from both sides, demand and supply. Figure 4 depicts a market of government intervention where the surplus transformation curve (STC) AA represents supply side and political indifference curve (PIC) represents demand side. Government maximises their political utility at a point such as  $E^{\circ}$  (initial point) and  $E'$  (subsequent period) where the PIC is tangential to the STC. The change from  $E^{\circ}$  to  $E'$  cannot be attributed to the shift of PIC alone (as depicted in Figure 4a), but there is a possibility that change is occurs in the absence of demand shifts (as illustrated in Figure 4b). While the shift in demand side may result from different political process, the shift in supply side could be from the choice of instrument.



**Figure 4.4: Changes in PPF Weights**

Since both market parameters and political preference can change simultaneously, there is an identification problem. To cope with this problem, a restriction is imposed.

In this case, PICs are assumed to be linear which implies fixed weights  $\frac{-\theta_2}{\theta_1}$ , and shifts in the STC will affect neither the marginal rate of substitution nor the PPF weights. In other words, the political weights must be assumed to be exogenous.

In summary, the constant weights ( $\theta$ ) can be argued in two different ways. Firstly, stability of the system needs a linear approximation to the convex PIC which can be interpreted as the willingness of government to orchestrate -as argued by von Cramon-Taubadel- 'a given transfer from one group to another regardless of the initial



distribution of welfare' (von Cramon-taubadel 1992, p.378). At the same time, this is an approximation to a more complex form of the criterion function (see Just, Rausser, and Zilberman 1995). Secondly, political weights which result from the political process are beyond PPF analysis and a different system may provide different weights. The PPF does not evaluate the political system exclusively, but views political weights as given with the magnitude provided by equilibrium conditions, i.e. the balance between the political market and the economic market.

#### **4.5.4 Determination of Political Weights**

There are several approaches to estimating political weights. They range from a revealed set of criterion functions (Rausser and Freebairn 1974) and Game Theory (Zusman 1976). The methods have been subject to long discussion.

Among such methods, the revealed method is more common and widely used. This method assumes policy instruments to be endogenous. Consistent with the discussion of self-willed government in the PPF framework, the common method of endogenising policy choice is largely empirical. This structure claims that political weights reflecting social power of interest groups are inferred from past policy actions. This revealed preference method provides relevant information on the changes in weights of each group which lead to a change in the level of policy instruments. Moreover, the nature of wealth transfers can be explained by this method.

The method of revealed preference assumes that government is efficient in the sense that it chooses the policy with the least social cost. This untested efficient government

assumption makes it possible to estimate or infer the political weights from the optimal level of existing policy. By this assumption, it is important to understand the efficient redistribution hypothesis underlying the theory (see Becker 1983, Gardner 1983).

#### **4.6 Efficient Redistribution Hypothesis (ERH)**

Using the pressure group model, Becker (1983) argues that a politically feasible government program tends to be ‘cheaper’ than any others in terms of marginal deadweight costs. Gardner (1983) names this assertion as the Efficient Redistribution Hypothesis (ERH). This is the political process which will result in an optimal point “at which resources are used as efficiently as possible given the political preference function” (Gardner 1983, p.233).

Redistribution efficiency can be measured in terms of deadweight cost which is related to the economic surplus transferred. The most efficient redistribution is the one which has the smallest cost (or associated deadweight loss) of achieving a given transfer in surplus.

This notion of efficient redistribution has been implicitly assumed in many studies in of political economy concerning the origin of policy choices. However, it is rarely treated in a formal way.

#### **4.7 Importance of ERH in PPF**

The assumption that governments maximise a criterion function, such as a Political Preference Function (PPF), implies that observed policy outcomes are efficient in the

sense that the optimal policy is the 'cheapest' one. This has been emphasised by Bullock (1994, 1995) who points out that efficient point is actually Pareto optimal. In other words, the structure of the PPF framework suggests the ERH must hold to find political power weights embodied in the optimal policy. If the ERH does not hold, the weights in the PPF cannot be observed. Therefore, the ERH is a necessary assumption for PPF studies to measure political power or implicit political weights of interest groups. In this regard, the ERH provides a basis for the claim that agricultural policies are efficient. Though this phenomenon of efficiency is not explicitly recognised, it has been assumed in previous studies. To some extent, this efficiency assumption has caused a great deal of argument on how it should be precisely defined and measured.

Most political economy studies explain redistribution and the existence of criterion functions from the standpoint of the Social Welfare Function (SWF). Maximising a SWF will result in a Pareto optimal policy (Gardner 1987b, Varian 1992). That is, the policy outcome is Pareto efficient, and hence must lie on the Pareto frontier. The boundary of all possible Pareto efficient reallocations is usually called the Utility Possibility Frontier (UPF). Gardner (1987b) emphasises that the UPF is Pareto optimal.

In some respects, however, the PPF is different to the SWF. The PPF focuses on income redistribution policies where benefits are passed to particular interest groups at the expense of others. The choice of policy instruments is an important part in this transfer. Thus, in contrast to a lump-sum transfer, specific policy instruments for redistribution may cause deadweight losses. Optimised PPF, however, may not

generate efficient policies in as much as ‘better’ policies may exist. Beghin and Foster (1992) point out that the existence of deadweight losses associated with a transfer is *prima facie* evidence of inefficiency.

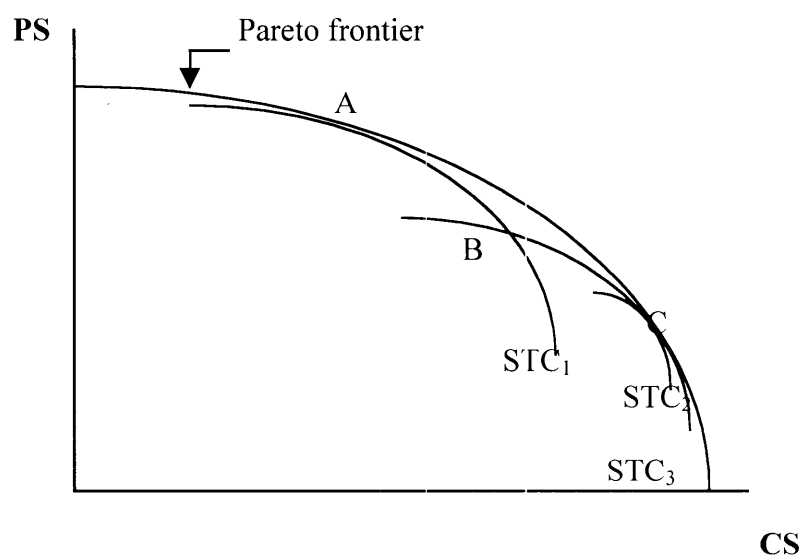
The common understanding of efficiency in political economy is represented by the political-economic equilibrium. The redistribution will reflect a policy choice which is bounded by a surplus transformation curve (STC) that reflects a possible efficient transfer. At this point, according to Beghin and Foster (1992), the criterion function (PPF) represents the tangent to the feasible set characterising an economy that constraints government choice. This characteristic allows the simultaneous existence of Pareto efficiency with deadweight losses.

Gardner (1987b) observes that the most efficient policy is the lump-sum transfer. In terms of Surplus Transformation Curve (STC), this is a no-program point with slope equal to -1, since the lump-sum transfer does not create a deadweight loss. This line may be analogous to the Utility Possibility Frontier (UPF) line in the SWF. In any other transfer policy, assuming that the objective function is:

$$J = \theta_1 PS + \theta_2 CS$$

the marginal rate of surplus transformation is  $\left| \frac{f_{PS}}{f_{CS}} \right| < | -1 |$  which recognises the existence of deadweight losses. Since a lump-sum transfer is practically impossible, Gardner treats the STC as the proper analog to the UPF, and hence as the appropriate constraint facing redistribution policies (Gardner 1987b, p.191). It could define STC as the surplus possibility frontier (as mentioned by Raussler and Foster 1990), or the efficient surplus transformation curve (Alston, Carter, and Smith 1993).

Using these arguments, Gardner points out that the optimal solution of the PPF is only an approximation of the theoretically perfect efficient redistribution. This reflects the claim made by Zusman (1976) -recognising that the optimal solution in the real world is near the economic frontier- that “the ‘closeness’ of actual behaviour to the economic efficiency frontier may serve as one criterion for selecting objective functions...” (Zusman 1976, p.457).



**Figure 4.5: STCs and Pareto frontier**

Unlike Gardner, Bullock (1994) claims that a Pareto frontier exists. It has been defined as the set of all welfare outcomes of efficient policies. Conceptually, the Pareto frontier is an extension of Gardner’s surplus transformation curve, which also constrains policy choice. The relationship between the STCs and the Pareto frontier is illustrated in Figure 4.5. The interest groups' welfare is a function of the policy instrument choice either  $p_1$ ,  $p_2$ , or  $p_3$ , which are represented by surplus transformation

curves  $STC_1$ ,  $STC_2$ , and  $STC_3$  respectively. Policy instrument  $p_1$  is efficient at point A which is on the Pareto frontier. The government can move the economy along  $STC_1$  by changing the level of the instrument, but the efficient point is A.

Employing two instruments, say  $p_1$  and  $p_2$ , may result in point B which is Pareto inferior to point A. It is better to employ  $p_2$  and  $p_3$  of which the welfare outcome is point C on the Pareto frontier. In general, many policy instruments may exist, however the efficient instruments are the ones that have the same slope as the Pareto frontier.

Although the ERH plays a significant role, and has been a maintained hypothesis, in many recent political economy studies, it is an empirical question whether the hypothesis is valid in specific policy situations. The question of whether observed policies are efficient remains open and has been the subject of many political economy studies.

#### **4.8 Deadweight Losses and Policy Reform**

One implication of the economic theory of regulation is that transfer of wealth has been tied to the existence of deadweight losses. This means government redistribution should be driven by marginal deadweight losses. It becomes clear that efficiency has been the main criterion to evaluate the policy reform.

Following Becker (1983) many studies have defined policy reform in term of efficiency criterion of minimizing deadweight losses (Gardner 1983, macaroon 1992). Here deadweight losses are interpreted as costs to produce the policy. On the meaning

of policy reform, Raiser and Foster (1990) explicitly explain the role of political cost in the income redistribution. They propose that policy reform does not only simply means income transfer between interest groups, but also involve resource expend by the groups to influence such transfer. Here, they differ distribution policy which does not concern with efficiency change from distribution policy which is driven by reducing costs. Using PPF, Rausser and Foster (1990) conclude that policy reform must involve the alteration of political weights through changes in the underlying costs to each group determining political support.

Though efficiency criterion in the distribution policy has tied marginal deadweight losses with marginal benefit, but the studies hardly mention the direct relation between them to measure the degree of efficiency. Rodrik (1994a) introduces a relatively new interpretation of political cost in his study of trade reform. Focus has been given to the possibility of implementing redistribution policy by evaluating efficiency gain from the policy reform and policy costs to make such reform. He introduces Political Cost Benefit Ratio (PCBR) index defined as:

$$PCBR = \frac{1}{2} \frac{\left( \sum_j |\Delta income_j| - net\ gain \right)}{net\ gain} \quad (4.9)$$

Where net gain stands for the efficiency gain of the reform,  $j$  indexes groups in society, and  $\Delta income_j$  is the change in the income group  $j$ . The numerator captures the political cost of the reform, while the denominator captures its benefit. Political costs here to mean the costs to compensate the loser from policy reform.

Though the interpretation of the cost of redistribution is similar to Gardner (1987b), using this index Rodrik explicitly interprets the costs as the political cost of creating the redistribution. It allows Rodrik (1994a) to simulate trade reforms using this index, and finds that altering the distribution of income, or reform, is politically costly. This political cost is one reason of the contentiousness of the trade policy. Thus, policy reform is difficult to be implemented. The difficulty of the reform could be reflected by the fact that less efficient policies are still exist. In other studies, Rodrik (1994b, 1995) states that the difficulty involves competition between groups may invite intervention. The trade is not free because politically-influential groups can be made better off by policy intervention in trade.

MacLaren (1992) argues that the existence of implemented policy which have low rank in efficiency suggest to employ other criteria in evaluating the policy outcome, such as instrument obfuscation which is explained by Magee, Brock and Young (1989). This is supported further by Coate and Morris (1995) by constructing a model in which voters have uncertainty, or lack of information, and using this model, they demonstrate that inefficient transfer will sometimes be made.

However, almost all studies agree that the policy reform is actually an outcome of political process (Rausser and Foster 1990, Tyers 1990), and this is reflected by alteration of the political weights. However, Rausser and Foster (1990) put note that PPF is an expression of the more complicated structure of political system, in which the origin of the political power is often not quite clear (Summarized by Potters and Sloof 1996).



## **4.9 Testing the ERH**

A different view of efficiency has resulted in a different approach to it. So far, several methods have been used to test the ERH. Each serves its own objective in terms of redistribution policies and their outcomes.

### **4.9.1 Testing the Response of Agricultural Policy**

Efficient redistribution consists of group of performance measures, such as PS and CS, resulting from choice of policy instrument of which the optimal level has been tied to the size of the transfer. In these terms, the optimal is an equilibrium point. Gardner (1987a) has developed a method that departs from the common understanding of Pareto efficient in terms of equilibrium point, namely equal slopes of the Political Indifference Curve (PIC) and the STC. He argues that a lump-sum transfer is impossible, and states that the most efficient policy in terms of zero deadweight loss does not exist. However, Gardner's test of ERH is not to prove the existence of the UPF or of a Pareto frontier, but rather to test whether the observed policy instrument is in the equilibrium in relation to market parameters and public choice variables. By doing so, he intends to test that, given political forces, agricultural policy programs redistribute income efficiently.

More specifically, the method used by Gardner (1987a) is to use measured supply and demand elasticities to explain changes in government welfare policy. He tests the model by regressing the level of intervention, measured by an estimate of producers gains generated by farm programs on market parameters and several variables that reflect political pressure. A similar regression is found in Miller (1991) who tests the

effect of political variables on the level of agricultural protection. Gardner's result shows; (1) that government policy becomes less interventionary as deadweight losses grow as a result of supply or demand being more elastic; and, (2) there exists an optimal size for interest groups in exerting a political pressure. In other words, Gardner argues that policies tend to be efficient in the sense that they minimise deadweight losses. These conclusions confirm the results of the models by Peltzman and Becker about efficient government.

To some extent, Gardner's method is a typical test of a political economy framework. Empirically, this has been widely employed by regressing the level of government intervention on economic and political variables (Honna and Hayami 1986, de Gorter and Tsur 1991, Trefler 1993, Beghin and Kherallah 1994, Beghin, Foster, and Kherallah 1996).

Carter et. al. (1990) used Gardner's methods to test the Efficient Redistribution Hypothesis in the Canadian context. A negative sign on market parameters has been used as a basis by Carter et. al. to argue for the existence of inefficiency in redistribution policy in Canadian agriculture. Consistent with the Becker's conclusion of efficient government, they investigate whether current reform of the Canadian agricultural program is likely to improve its efficiency.

One difficulty with Gardner's method is that he uses one policy instrument exclusively, while each instrument has its own STC or economic constraint which may serve different equilibrium. Alston and Hurd (1990) show that using combined instruments results in a different STC frontier, which may provide a different optimal

policy. To express this differently, the type of policy instruments used may result in different levels of optimal government intervention. This is not adequately addressed in Gardner's regression analysis. Bullock (1995) also criticises Gardner's method on the grounds that a Pareto efficient solution must be sensitive to the type of policy instruments chosen and simultaneous use of the instruments.

#### **4.9.2 Comparing Several Policy Options**

This method follows the notion by Gardner (1983) that the efficiency of policy instruments in terms of redistribution can be explained using the Surplus Transformation Curve (STC) framework. The STC is the key analytical tool of this method which provides two principles: (a) slopes of different STCs can be compared, which facilitates theoretical comparison of the relative marginal efficiencies of different instruments; and (b) the STC framework makes clear the importance of transfer size in comparing the efficiencies of alternative programs. In short, the STC analysis provides an insight into the most efficient policy based on the size of deadweight losses and of the surplus that is transferred. This has been demonstrated by Gardner (1983) and empirically supported by Bullock (1992). This method not only allows ranking of several alternative policy instruments but also explains the influence of market parameters in enhancing redistribution efficiency.

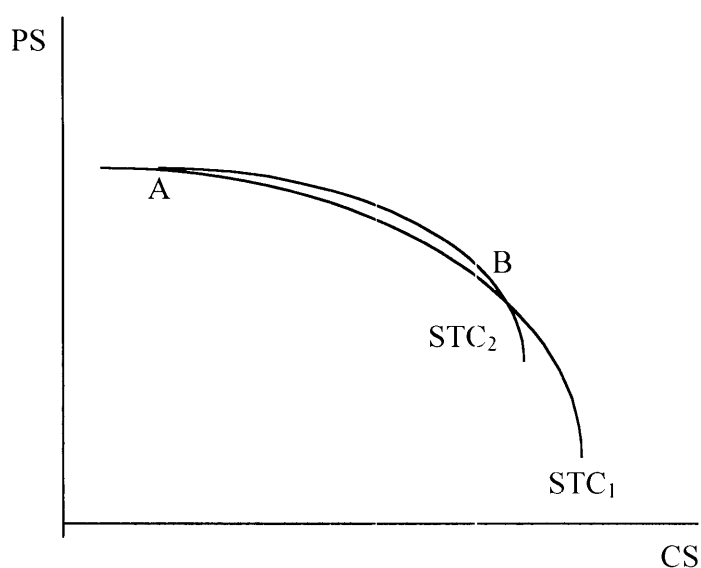
Some studies on political economy have compared several policy instruments based on their efficiency guided by ERH. The representative examples are, among others, de Gorter and Meilke (1989), Bullock (1992), Alston, Carter, and Smith (1993), Gisser (1993), and Salhofer (1995, 1996). Using this method, they show that an observed

policy may be more efficient than any alternative policies and they provide a ranking of efficient instruments.

In the spirit of de Gorter and Meilke (1989), Bullock (1992) studies four instruments in the Common Agricultural Policy, namely the production levy, support price, the 'two-price' system (i.e. the price domestic producers receive for production utilised in domestic consumption), and the production quota. Bullock extends previous STC analysis by simulating several combined policy instruments.

By analysing the effect of using a production quota on a given support price program, for example, Bullock can show the different STCs as depicted in Figure 4.6. Points along  $STC_2$  (price support) between A and B are Pareto superior to points along  $STC_1$  (production quota with a given level of price support) between A and B, which also means that adding production quota will improve efficiency. This superiority is, however, only between these points, while PS levels to the north of point A indicating that price support is superior. This result supports Bullock's recommendation to examine all surplus transformation possibilities to identify the most efficient instrument. Bullock has also found that simulating all possible instruments will result in intersected STCs (as depicted in the figure). This means that none of the studied instruments is uniformly Pareto-superior to all the others. Based on this result, he concludes that redistribution efficiency is also correlated to the level of intervention which confirms Gardner's test based on the previous method. Thus, the optimal policy does not always lie in the single instrument or STC exclusively.

Alston and Hurd (1990) also show that the efficient redistribution will be enhanced by combining policy instruments. Specifically, they demonstrate that a subsidy (at any given production control) will raise surplus transfer without creating additional deadweight loss. Again, this result extends Gardner's analysis which considers exclusively either supply control or output subsidies.



**Figure 4.6: STCs for Price Support and Production Quota with a Given Level of Price Support**

Gisser (1993) demonstrates that the public choice ranking of the various policies according to an increasing order of efficiency is output controls, target prices, and a combination of target prices and acreage controls. Gisser (1993) also shows that the ranking of the instruments is sensitive to functional form. The acreage control program does not enhance efficiency if a Cobb Douglas production function is assumed, while it does if a generalised CES is assumed. Gisser concludes that the demonstrated increase in redistribution efficiency which results from combining target price and acreage controls lends strong support to the ERH of Becker and Gardner.

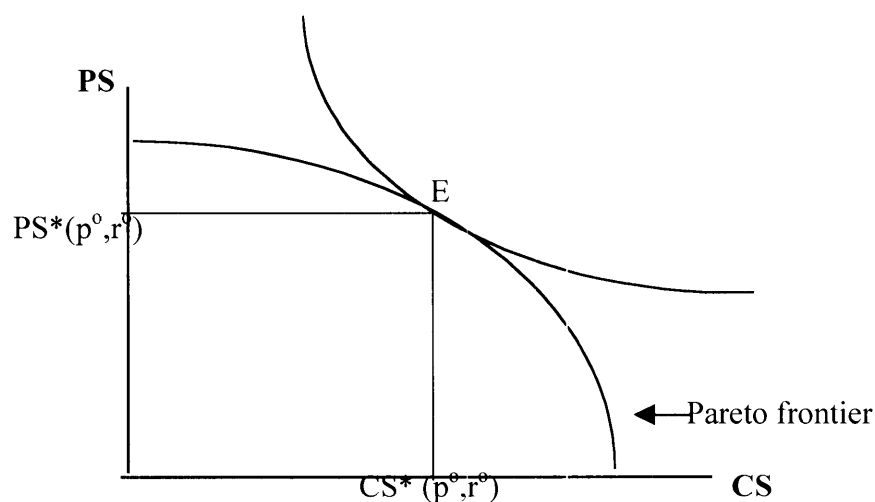
This method suffers from the critique that it does not directly prove the ERH, or show that observed government policy is efficient. At best, it shows that alternative policies are inferior. To some extent, this method provides a contribution to the analysis of redistribution efficiency because it allows ranking of the possible alternative policies. Since the focus is only on transformation side through the Surplus Transformation Curve, it does not reveal anything about the optimal level subject to the criterion function (PPF). The efficient policy ultimately depends upon the econometric estimate of the market parameters, but political parameters are needed to achieve an optimal policy. In other words, the efficient STC does not always give the optimal policy choice considering the interest group political pressures. This suggests the need to extend the analysis by adopting the criterion function, such as PPF, representing political constraint.

#### **4.9.3 Proving the Existence of a Pareto frontier**

This method has been proposed by Bullock (1995). It provides, as he claims, a test to show that an optimal policy exists and lies on the Pareto frontier. In defining the Pareto frontier, Bullock believes that Pareto efficient policy is not a lump-sum transfer with no-deadweight losses. He argues that a government program may be Pareto efficient and yet still bring deadweight losses to an economy.

Bullock's method is based on the fact that PPF studies measure the Marginal Rate of Transformation (MRT) of the economic constraint and that these rates infer political weights which are not directly observable. Thus, the study shows that optimal interest group welfare lies on the Pareto frontier when particular policy instruments solve the

maximisation problem with a government objective function (PPF). It is depicted in Figure 4.7 where  $PS^*$  and  $CS^*$  are the optimum welfare for producers and consumers evaluated at policy level  $p^o$  and market parameter  $r^o$  on the Pareto frontier. At the optimum point E, the observable Marginal Rate of Transformation



**Figure 4.7: Optimum Policy along the Pareto frontier**

(MRT) -evaluated at STC or Pareto frontier- has the same slope as unobservable Marginal Rate of Substitution (MRS) -evaluated at Political Indifference Curve. Bullock's method is to find this optimal point to infer the political weights.

In short, Bullock's method aims to calculate the political weights represented by optimal policies. The method is based on the matrix solution of the equilibrium condition. Suppose the PPF with two interest groups represented in equation (4.7) is expanded to three interest groups, which gives:

$$J = \theta_1 g_1 + \theta_2 g_2 + \theta_3 g_3 \quad (4.10)$$

Maximising with respect to policy instruments  $p_1$  and  $p_2$  gives

$$\theta_1 \frac{fg_1}{fp_1} + \theta_2 \frac{fg_2}{fp_1} + \theta_3 \frac{fg_3}{fp_1} = 0 \quad (4.11a)$$

$$\theta_1 \frac{fg_1}{fp_2} + \theta_2 \frac{fg_2}{fp_2} + \theta_3 \frac{fg_3}{fp_2} = 0 \quad (4.11b)$$

This system can be written in matrix form as

$$\begin{array}{ccc} \frac{-fg_2}{fp_1} \downarrow & \frac{-fg_3}{fp_1} \downarrow & \frac{-\theta_2}{\theta_1} \downarrow \\ \frac{-fg_2}{fp_2} \downarrow & \frac{-fg_3}{fp_2} \downarrow & \frac{-\theta_3}{\theta_1} \downarrow \end{array} = - \begin{array}{c} \frac{-fg_1}{fp_1} \downarrow \\ \frac{-fg_1}{fp_2} \downarrow \end{array} \quad (4.11)$$

Similarly, for the case of  $j$  interest group, and  $k$  instruments, the equilibrium is:

$$\begin{array}{ccc} \left( \frac{fg_2}{fp_1} \right) \cdot \cdot \cdot & \left( \frac{fg_j}{fp_1} \right) & \theta_{2l} \\ \left( \frac{fg_2}{fp_2} \right) \cdot \cdot \cdot & \left( \frac{fg_j}{fp_2} \right) & \theta_{3l} \\ & & = - \end{array} \quad (4.13)$$

$$\left( \frac{fg_2}{fp_k} \right) \cdot \cdot \cdot \left( \frac{fg_j}{fp_k} \right) \theta_{jl} \quad \left( \frac{fg_1}{fp_k} \right)$$

Or, in a compact form:  $A \mathbf{x} = \mathbf{b}$

where:  $g_j$  is interest group performance measures

$p_k$  is policy instruments

$\theta_j$  is political weights

$\theta_{jk}$  is marginal rate of substitution, evaluated as  $\left[ \frac{\theta_j}{\theta_k} \right]$



The restriction of this method, to have a unique solution of  $\theta$ , is that  $k = j-1$  (where  $j$  is the number of interest groups, and  $k$  is the number of policy instruments). This is because Bullock needs a square matrix  $A$  to calculate its determinant. The solution of the matrix will indirectly give MRS ( $\theta_{jk}$ ), which can be used to calculate the political weight ( $\theta$ ). Though Bullock claims that his method is not sensitive to the PPF form, his matrix is derived from the linear form of PPF as used by most PPF studies.

While Bullock upholds his method by criticising Gardner's method, his method actually tries to prove that the previously recognised political-economic equilibrium to lie on what he has called the Pareto frontier. In the sense that optimal policy may change with respect to instrument choice, Bullock's method for finding optimal policies along the Pareto frontier has been indicated in previous studies (e.g. Becker and Labson 1991). The positive difference is that Bullock's method formally models the equilibrium, and it also applies to more than two interest groups. Thus, it represents a more general method. However, it has the restriction of required number of policy instruments related to interest groups. The advantage of this method, however, is that it is not sensitive to the PPF form as it is not necessary for this method to exactly form a PPF model given the performance or surplus measures have been calculated.

#### **4.10 Remarks on the ERH**

The ERH has been demonstrated to have a significant role in PPF studies. Different views, however, have served different objectives in these studies. It ranges from models explaining why certain social groups are more politically powerful than

others, or why certain commodities have been treated with different policies (e.g. Gardner 1987a), models investigating the rank of efficient policies (e.g. Bullock 1992, Gisser 1993), to models attempting to measure relative political power (e.g. Oehmke and Yao 1990). All models have recognised that efficient redistribution is an essential maintained hypothesis.

Pareto efficiency in the ERH has been interpreted as the equilibrium level where political power (represented by the government's criterion function) is constrained by market parameters. This has been implicitly assumed or explicitly proved. Some studies provide misleading conclusions by judging efficiency on the grounds of market parameters alone.

The crucial point in finding Pareto efficiency lies in the estimation of political weights. Since they are unobservable, the value can only be inferred from an economic model. In this regard, the different economic parameters will give different values for political weights, all serving the optimal points. Thus, there is a problem of stability. Bullock's method reduces the problem by ignoring the PPF form, but it still needs empirical evidence. Until a rigorous method is found, the ways of improving quality of inferences based on observed economic information are needed as suggested by Beghin and Foster (1992).

#### **4.11 Summary**

This chapter has reviewed previous studies on the political economy of agricultural policy. Special emphasis has been given to the PPF as one branch on the political economy studies. Two major focuses in the PPF, the role of political weights and the

efficiency meaning of the policy, have been explored. These will be used as a basis of developing framework in this study.

## 5. Political Economy Framework for Indonesian Sugar Market

---

### 5.1 Introduction

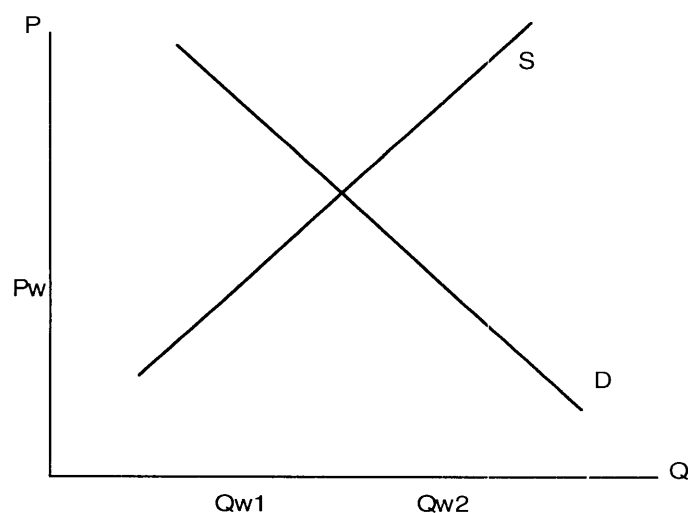
The objective of this chapter is to develop a framework to explain Indonesian sugar policy. The framework is based on the theory of the Political Preference Function reviewed in the previous chapter. The chapter begins by describing the policy options, which is then followed by a description of the political structure. It finishes with an analysis of the predictive ability of the model for explaining the policy outcome.

### 5.2 Policy Options in the Sugar Market

As explained in Chapter 2, the Indonesian sugar market has long been characterised by government intervention. This has taken the form of government control over prices and trade through the government marketing board Bulog. The stated objective of the intervention is to support producers and to protect consumers. However, the price structure set by the government (Table 2.3) shows that Bulog incurs revenue from that intervention. The control power has enabled Bulog to implement several possible policy instruments to achieve its objective. The following describes how Bulog sets the policy and gets revenue from sugar policy.

Figure 5.1 shows the sugar market without Bulog intervention. It is a small country importer with domestic supply  $S$  and demand  $D$  and an import supply curve which is perfectly elastic at  $P_w$ . In the absence of intervention, domestic consumption exceeds

domestic production with the gap filled by imported sugar. The price that domestic producers receive and consumers pay is world price  $P_w$  (domestic price equal to world price) and imports are  $Q_{w2} - Q_{w1}$ . This free open market does not give any revenue to the government.

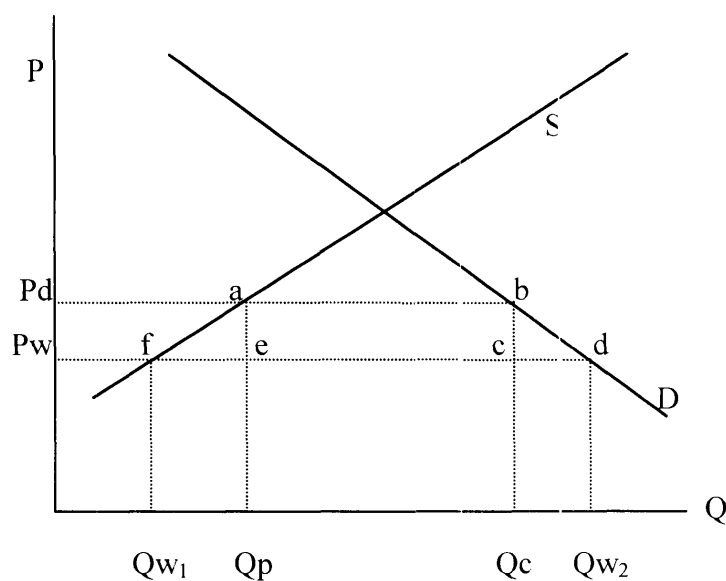


**Figure 5.1: Sugar Market without Intervention**

Bulog may implement a number of policy options. They are, among others, import quota, setting producer price and setting consumer price. However, in the absence of stocks, setting of any two of these policy instruments pre-determines the setting of the third. Figure 5.2 depicts a sugar market where the import quota is implemented. The quota limits quantity imported, from  $Q_{w2} - Q_{w1}$  to  $Q_c - Q_p$ , and in turn creates domestic price  $P_d$  which is higher than  $P_w$ . Import rent  $abde$  -as a result of the quota- goes to Bulog. This transfer incorporates the deadweight losses of  $a.e.f.$  and  $b.c.d.$

Figure 5.3 represents the sugar markets in where Bulog sets either producer price or consumer price. By implementing the producer price instrument, Bulog sets domestic

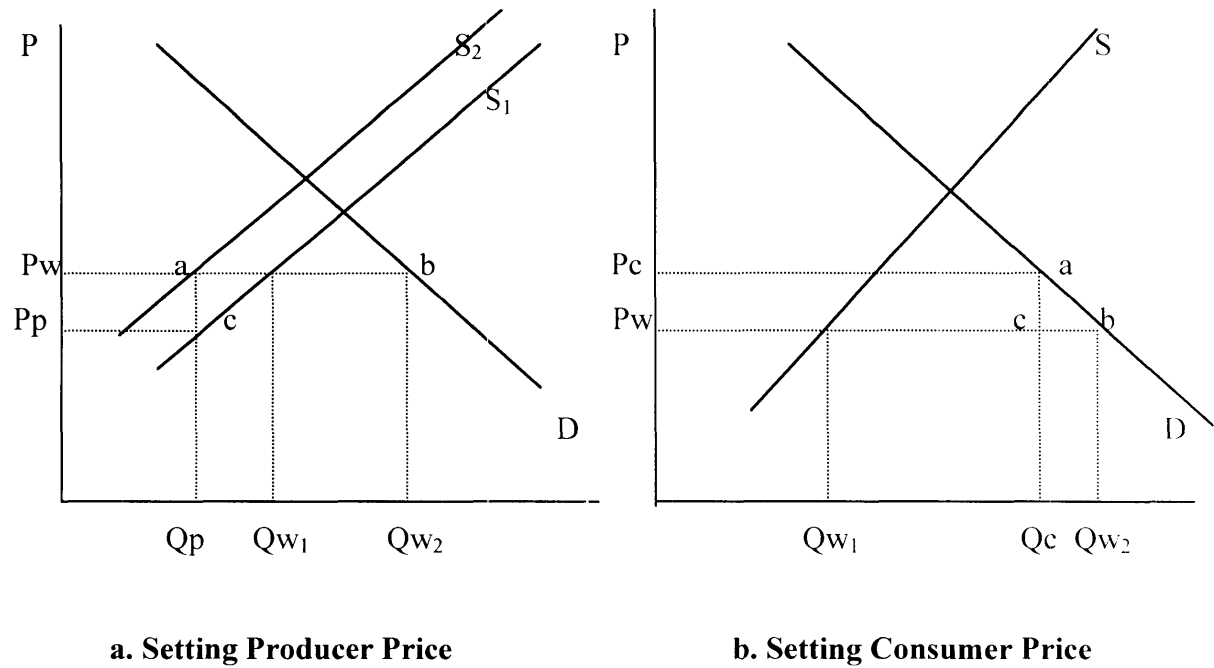
producer price ( $P_p$ ) lower than the world price ( $P_w$ ) and leaves consumer price at the same level as the world price. This lower producer price makes domestic supply decrease from  $Q_{w1}$  to  $Q_p$  which also means increasing imports from  $Q_{w2} - Q_{w1}$  to  $Q_{w2} - Q_p$ . This instrument creates revenue  $P_w.a.c.P_p$  for Bulog, and deadweight losses of  $a.b.c$  to the economy.



**Figure 5.2: Sugar Market with Import Quota**

Unlike producer price policy, the option of consumer price policy leaves producer price at the same level as world price whereas setting consumer price ( $P_c$ ) above the world price level. This instrument cuts domestic consumption from  $Q_{w2}$  to  $Q_c$  which also means cutting imports from  $Q_{w2} - Q_{w1}$  to  $Q_c - Q_{w1}$ . This policy provides revenue  $P_c.a.c.P_w$  for Bulog, and deadweight losses  $a.b.c$ . By setting the producer price Bulog extracts revenue from producers, while by setting consumer price it gets revenue from consumers.

Bulog may implement a combination of policy instruments ( $P_p$  and  $P_c$ ) simultaneously. This enables government to get revenue from both sides -producers and consumers.



**Figure 5.3: Sugar Market with Determined Producer and Consumer Prices**

All of those policy instruments demonstrate that, Bulog has the flexibility to design policy which serves its the particular objective.

If the demand and supply functions are

$$\text{Demand} \quad : \quad Q_d = D(P) \quad (5.1)$$

$$\text{Supply} \quad : \quad Q_s = S(P) \quad (5.2)$$

those several policy options have different welfare targets as shown in table 5.1

If Bulog set the policy in order to get revenue from that policy, that revenue can be taken from several alternative policies. For example, Bulog can set either import controls, producer price, or consumer price. With reference to Figure 5.2 and 5.3, the effect of those policy options are illustrated in Table 5.1<sup>1)</sup>. Table 5.1 shows that each policy instrument provides different levels of transfer; thus different revenues to Bulog. Since these choices have also different effect on other groups (producers and consumers), Bulog chooses its policy based on particular criterion. This subject will be dealt in the next section on how Bulog determines the policy choice and its level.

---

<sup>1)</sup> Detail mathematical derivation of these policies is in Appendix A.5.1



**Table 5.1: Effects of several policy options**

Policy Options (K)	Producer Surplus (PS)	Consumer Surplus (CS)	Government Revenue (G)	Effect on Govern $\frac{dG}{dK}$
Free Market	$\begin{matrix} P_w \\ S(P).dP \\ 0 \end{matrix}$	$\begin{matrix} \alpha \\ D(P).dP \\ P_w \end{matrix}$	-	-
Import Quota	$\begin{matrix} P_d \\ S(P).dP \\ 0 \end{matrix}$	$\begin{matrix} \alpha \\ D(P).dP \\ P_d \end{matrix}$	$(P_d - P_w - k)(Q_c - Q_p)$	$(Q_c - Q_p) + (\eta Q_c - \epsilon Q_p)$
Producer Price	$\begin{matrix} P_p \\ S(P).dP \\ 0 \end{matrix}$	$\begin{matrix} \alpha \\ D(P).dP \\ P_w \end{matrix}$	$(P_w - P_p - k_1)Q_p$	$\left(\frac{P_w - k_1}{P_p}\right)\epsilon - (1 + \epsilon)$
Consumer Price	$\begin{matrix} P_w \\ S(P).dP \\ 0 \end{matrix}$	$\begin{matrix} \alpha \\ D(P).dP \\ P_c \end{matrix}$	$(P_c - P_w - k_2)Q_c$	$\left((1 + \eta) - \frac{P_w + k_2}{P_c}\right)\eta$

Note  $\eta$  = elasticity of demand

$\epsilon$  = elasticity of supply

$k_i$  = unit cost

$\alpha$  = arbitrary value in demand function

### **5.3 Conceptual Structure of Political Economy Framework**

The political economy framework to analyse sugar policy begins with identification of interest groups involved in the market. In this study, they are aggregated into two main groups, producers and consumers. However, in the case of agricultural policy, many studies have pointed that government has its own objectives as a separate interest group representing the national interest as a whole, e.g. self-sufficiency, lowering costs of farm programs, or even taking revenue by taxing the farm sector. Such objectives are often directly or indirectly in conflict with those of private groups that may disregard nationwide goals. Thus, in this study the government has been considered as another interest group in the sugar market. Assuming that the government has its own interest in the sugar policy, there are three interest groups in this study, producers, consumers, and government.

The treatment of producers, consumers, and government in three separate players should not create overlapping between the groups. There may be a concern that producers would also constitute consumers and would be affected by policy aimed at consumers. However, the overlapping between them could be significantly reduced for two reasons. Firstly, the way that the sugar policy is implemented can hinder producers to be affected by the instrument aimed at consumers. Before being procured by the government, part of the sugar produced by the mills, 2 - 4 per cent, goes back to farmers in kind for the purpose of home consumption. Thus, the government procures about 96 – 98 per cent sugar to be distributed to consumers. It means, any changing in consumer price, for example, would not affect farmers or producers who already keep sugar for their consumption. Secondly, sugar producers constitute only

small proportion of the whole consumers. Thus, consumer price would only give, as an aggregate, small impact to producers, if any.

The policymaker or the government in the sugar market is represented by Bulog. This is because this government marketing board has been assigned to implement policy in the sugar market. Other government body interests, such as MOF, have been represented by Bulog in the form of policy designed. Included on the government side is licensed traders which are treated as Bulog's agents.

The political economy framework follows a PPF which portrays the government objective in setting policy by considering the weighted welfare of interest groups. The governing function is represented as

$$J = (CS, PS, G, \theta_i) \quad (5.3)$$

where: CS - welfare measure of consumers

PS - welfare measure of producers

G - welfare measure of government

$\theta_i$  - weights assigned to each group

This governing criterion function suggests that the political economy structure consists of three main components; (a) economic structure, (b) policy instruments, and (c) interest group power functions. The economic structural equations determine the welfare of interest groups. The weights assigned to interest groups reflect the

political power of each group. This function may be based on the pressure exerted by groups to influence policy. However, in this study it is assumed that the power or weights are exogenously assigned by government. Thus, there is no attempt to reveal weights based on the bargaining process between interest groups. Assuming the government has total control over policy, the weights here do not reflect the true power function of each group, but, rather, reflect government preferences.

#### **5.4 Sugar Policy Instruments**

The policy instruments need to be identified in the Bulog criterion function. These instrument act as tools by which Bulog solves its objective function to maximise the welfare of interest groups. It has been previously explained that as a single governing body Bulog has some policy options. However, the stated policy instruments implemented in the sugar market are sugar prices. Though Bulog also control sugar imports, it claims that import is only to fill the lack of supply for domestic demand (Bulog 1990). Thus, in this study imports is treated as residual which is indirectly determined by the setting of consumer and producer prices.

This study formally uses producer price ( $P_p$ ) and consumer price ( $P_c$ ) as policy instruments. This choice has been justified on the ground that, aside from the fact that these are the stated instruments, their levels are determined by government.

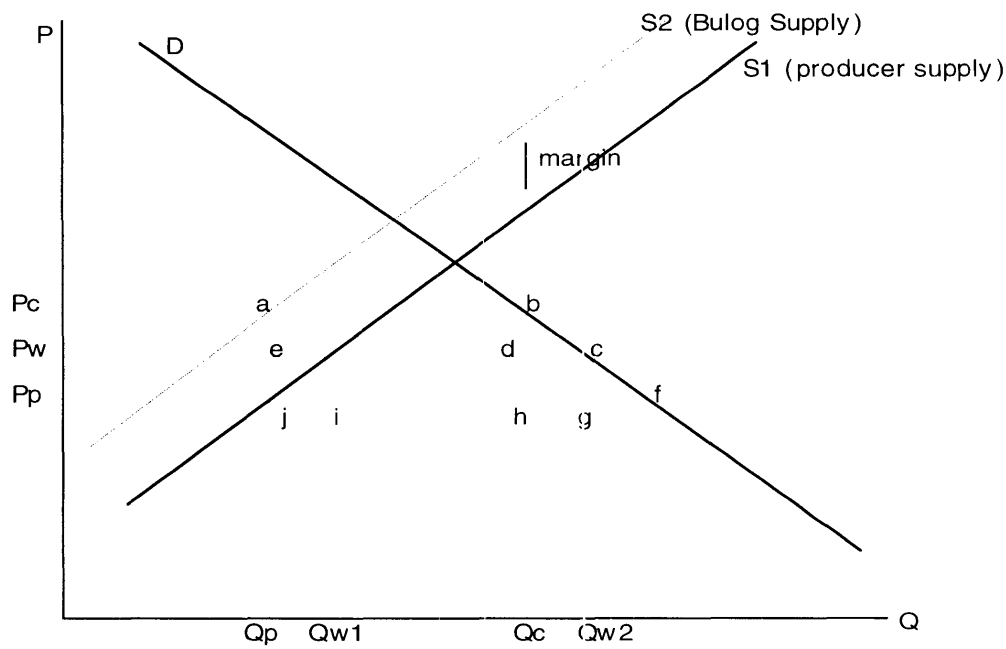
It is shown in Figure 5.4 that Bulog uses these two prices in order to achieve its objective of domestic price stabilization and supporting producers. However, the other objective of guarantee government revenue (Amang 1993) has resulted in setting consumer prices higher than producer price. Officially, the government sets the sugar

producer and consumers prices such that there is an accepted margin for the traders to bring the sugar from producers to consumers. Clearly, the revenue accrued by the government is for two objectives; the revenue for the government itself and the trader margin as a marketing incentive.

## 5.5 Welfare Measurement of Interest Groups

Welfare of interest groups is determined using Marshallian surplus measures. - Figure 5.4 represents the sugar market with Bulog intervention using producer price and consumer price. This intervention has created producer price  $P_p$  below the world price and consumer price  $P_c$  above the world price. In this case, Bulog procures sugar from producers at price  $P_p$ , and then sells it to consumers at price  $P_c$ , introducing a margin  $m = P_c - P_p$ . At price  $P_p$  producers supply  $Q_p$ , and at price  $P_c$  consumers demand  $Q_c$ , and the gap  $Q_c - Q_p$  is imported by Bulog.

By setting these prices Bulog indirectly controls the quantity imported. In this case it has adjusted imports from  $Q_{w2} - Q_{w1}$  (without intervention) to  $Q_c - Q_p$  (with intervention) where the level of difference between them depend on the price gap  $P_c - P_p$ , the policy instruments.



**Figure 5.4: Sugar Market with Government Intervention**

Where :  $P_c$  = consumer price  
 $P_w$  = world price  
 $P_p$  = producer price  
 $Q_p$  = producer supply = domestic supply  
 $Q_c$  = consumer demand = domestic demand  
 $Q_{w2} - Q_{w1}$  = import without intervention  
 $Q_c - Q_p$  = import with intervention

Relative to the free market situation, the policy creates a welfare loss of  $P_w . e . j . P_p$  for producer, a welfare loss of  $P_c . b . c . P_p$  for consumer, and revenues  $P_c . a . j . P_p$  (margin revenue) and  $a . b . d . e$  (import rent) for Bulog.

If demand and supply functions are represented by equations

$$Q_d = D(P) \quad (5.5)$$

$$Q_s = S(P) \quad (5.6)$$

welfare positions after intervention are consumer surplus:

$$CS = \int_{P_c}^{\alpha} D(P).dP \quad (5.7)$$

Since under the constant elasticity assumption, the demand curve does not meet the prices axis, an arbitrary number of  $\alpha$  is used, such that at  $\alpha$ ,  $Q_{\alpha} \neq 0$ .

Producer surplus is:

$$PS = \int_0^{P_p} S(P).dP \quad (5.8)$$

Government revenue is:

$$\begin{aligned} G &= (Q_c - Q_p)(P_c - P_w - k_1) + Q_p(P_c - P_p - k_2) \\ &= (D(P_c) - S(P_p))(P_c - P_w - k_1) + S(P_p)(P_c - P_p - k_2) \end{aligned} \quad (5.9)$$

where  $k_1$  is cost of importing and  $k_2$  is cost of domestic distribution.

Bulog sets two policy instruments, producer price ( $P_p$ ) and consumer price ( $P_c$ ). The choice of instrument levels ( $P_p$  and  $P_c$ ) are made to maximise an objective function, where producer surplus, consumer surplus, and the government revenue resulting from a given policy are the independent arguments.

## 5.6 Endogenous Policy Decision

Following the concept of efficient government redistribution, a PPF framework is employed as a methodology for dealing with endogenous policy decisions. In this framework, the policy is intended to transfer wealth from one group to another. Bulog's objective function is taken to be weighted welfare levels of producers.

consumers and government. This framework implicitly assumes that the policy decisions in the sugar market are characterised as if Bulog is a single policymaker accommodating conflicting political pressure from interest groups. In other words, when Bulog formulates the policy instruments it should consider the interests of producers, consumers and government itself. The framework can be interpreted so that political weights estimated by a PPF are taken to be the results of the political bargaining process to influence policy that are transmitted to the policymaker's political preference toward interest groups.

Assume that Bulge's objective can be characterised by the preference function, and assume that the functional form of (5.4) is an additive-linear one. The Bulog<sup>2)</sup> objective function is:

$$\underset{P_p, P_c}{Max} : J = \theta_c CS + \theta_p PS + \theta_g G \quad (5.9)$$

where  $J$  = Bulog's objective function

$CS$  = consumers surplus

$PS$  = producers surplus

$G$  = government revenue or expenditure

$\theta_c$ ,  $\theta_p$ , and  $\theta_g$  are the weights for consumers, producers, and government respectively.

Substituting (5.6), (5.7), (5.8) into (5.9) yields

$$J = \theta_c .CS + \theta_p .PS + \theta_g G$$

---

<sup>2)</sup> Since the performance measure of G is for the government, Bulog here also means the government. The term 'Bulog' and 'the government' will be used interchangeably through the thesis to represent policymaker. Any specific meaning of the term will be explained.



$$\begin{aligned}
&= \theta_c \int_{P_c}^{\alpha} D(P) dP + \theta_p \int_{P_p}^{P_r} S(P) dP \\
&\quad + \theta_g \left[ (D(P_c) - S(P_p)) (P_c - P_w - k_1) + S(P_p) (P_c - P_p - k_2) \right]
\end{aligned} \tag{5.10}$$

Bulog's problem is to jointly select the politically optimal level of policy instruments, producer price ( $P_p$ ) and consumer price ( $P_c$ ). Equation (5.10) can, in principle, be solved for the two policy variables  $P_p$  and  $P_c$ .

Maximising  $J$  with respect to  $P_c$

$$\begin{aligned}
\frac{fJ}{fP_c} &= \theta_c [-D(P_c)] \\
&\quad + \theta_g \left[ \frac{-dD(P_c)}{dP_c} (P_c - P_w - k_1) + (D(P_c) - S(P_p)) + S(P_p) \right] = 0
\end{aligned}$$

and, assuming that elasticity of demand with respect to price is constant:

$$\frac{dD(P_c)}{dP_c} \frac{P_c}{D(P_c)} = \eta = \text{elasticity of demand}$$

$$\begin{aligned}
& \left[ \theta_c [-D(P_c)] \right. \\
& \quad \left. + \theta_g \left[ \frac{-dD(P_c)}{dP_c} \frac{P_c}{D(P_c)} D(P_c) - \frac{-dD(P_c)}{dP_c} \frac{P_c}{D(P_c)} \frac{D(P_c)}{P_c} (P_w + k_1) + (D(P_c) - S(P_p)) + S(P_p) \right] \right] = 0
\end{aligned}$$

$$\left[ \theta_c (-Q_c) + \theta_g \left[ \eta Q_c - \eta \frac{Q_c}{P_c} (P_w + k_1) + Q_c \right] \right] = 0$$

$$\int \theta_c P_c = \theta_g [(1 + \eta)P_c - \eta(P_w + k_1)] \quad (5.11)$$

Maximising  $J$  with respect to the other policy instrument  $P_p$ ,

$$\frac{fJ}{fP_p} = \theta_p (S(P_p)) + \theta_g \left[ -\frac{dS(P_p)}{dP_p} (P_c - P_w - k_1) - S(P_p) + \frac{dS(P_p)}{dP_p} (P_c - P_p - k_2) \right] = 0$$

and assuming the elasticity of supply is constant:

$$\frac{dS(P_p)}{dP_p} \frac{P_p}{S(P_p)} = \varepsilon = \text{elasticity of supply}$$

$$\int \theta_p (S(P_p)) + \theta_g \left[ -\frac{dS(P_p)}{dP_p} \frac{P_p}{S(P_p)} \cdot \frac{S(P_p)}{P_p} (P_c - P_w - k_1) - S(P_p) - \frac{dS(P_p)}{dP_p} \frac{P_p}{S(P_p)} S(P_p) + \frac{dS(P_p)}{dP_p} \frac{P_p}{S(P_p)} \frac{S(P_p)}{P_p} (P_c - k_2) \right] = 0$$

$$\int \theta_p Q_p + \theta_g \left[ -\varepsilon \frac{Q_p}{P_p} (P_c - P_w - k_1) - Q_p - \varepsilon Q_p + \varepsilon \frac{Q_p}{P_p} (P_c - k_2) \right] = 0$$

$$\int \theta_p P_p + \theta_g (\varepsilon (P_w + k_1 - k_2) - P_p (\varepsilon + 1)) = 0$$

$$\int \theta_p P_p = \theta_g (P_p (\varepsilon + 1) - \varepsilon (P_w + k_1 - k_2)) \quad (5.12)$$

Expressions (5.11) and (5.12) reflect the way in which interest groups' welfare (producers, consumers, and government) are balanced against each other in Bulog's choice of  $P_p$  and  $P_c$ . These indirectly show that, if Bulog's objective is to be maximised with respect to  $P_c$ , the consumer price must be determined such that the

weighted marginal cost to consumers of increasing consumer price ( $\theta_c P_c$ ) is equal to the weighted marginal benefit of surplus transferred to government ( $\theta_g [(1+\eta)P_c - \eta(P_w + k_1)]$ ). Similarly, in the interest of maximising its objective function, Bulog should determine producer price ( $P_p$ ) such that the weighted marginal cost of decreasing producer price ( $\theta_p P_p$ ) is equal to the weighted marginal benefit of surplus transferred to government ( $\theta_g (P_p(\varepsilon + 1) - \varepsilon(P_w + k_1 - k_2))$ ).

The market at the producer level is assumed to clear in response to market forces at the price level of  $P_p$ , and the market at the consumer level at the price level of  $P_c$ . Therefore, conditions (5.11) and (5.12) can be arranged to yield endogenous prices:

$$\int P_c = \frac{\theta_g \eta}{\theta_g (1+\eta) - \theta_c} (P_w + k_1) \quad (5.13)$$

$$\int P_p = \frac{\theta_g \varepsilon}{\theta_g (\varepsilon + 1) - \theta_p} (P_w + k_1 - k_2) \quad (5.14)$$

Equations (5.13) and (5.14) represent Bulog's decision rules in period  $t$ . Given the market parameters of  $\eta$  and  $\varepsilon$ , Bulog will offer producers a price level of  $P_p$ , and offer consumers a price level of  $P_c$ . They are the endogenous optimal price policies explaining factors affecting to the level at which the policy instruments ( $P_p$  and  $P_c$ ) are set. Here, they are determined by their corresponding elasticity and political weights and also the world price,  $P_w$ .

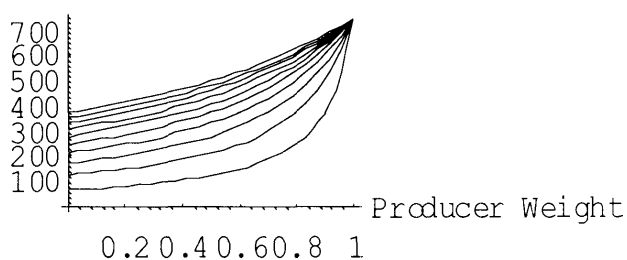
These relationships show that government preferences toward particular groups determine the optimum settings of the policy instruments, and the level of wealth transfers. The condition  $\theta_p < \theta_g$  implies that  $P_w > P_p$ . In other words, if government is given a higher weight than producers, producer price  $P_p$  is set lower than world price  $P_w$ , creating a welfare loss to producers. Again, if government is given a higher weight than consumers ( $\theta_c < \theta_g$ ), consumer price  $P_c$  is set higher than world price  $P_w$ , creating a welfare loss to consumers. If Bulog does not discriminate between consumers, producers, and government (budget), then  $P_p = P_c - k_1 = P_w - k_1 - k_2$ , which is the 'free market' situation.

Though Bulog determines prices simultaneously, either optimal producer price or consumer price is influenced by its own weight. The weight ratios  $\left(\frac{\theta_c}{\theta_g} \text{ and } \frac{\theta_p}{\theta_g}\right)$  reflect the level of transfer from consumer to government and from producer to government respectively. Thus producers' weight does not influence consumer transfers, and consumers' weight does not affect producer transfers. In other words, these expressions show that each policy instrument affects each group differently.

## 5.7 Relationship Between Prices, Weight, and Market Parameters

The elasticities of supply and demand affect optimal prices differently. Section 5.6 explains the direction of price movement when the ratio of government weight and producers' (consumers') weight changes. However, this movement varies in accordance with the elasticity of the functions.

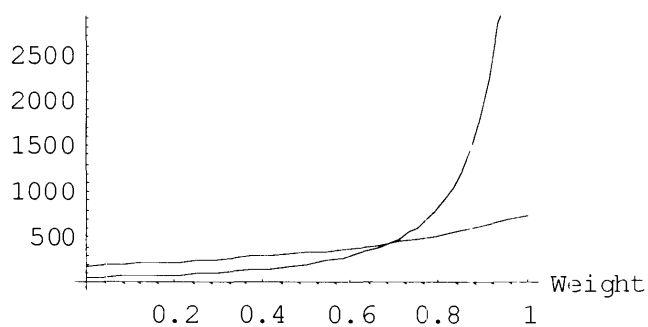
Producer Price



**Figure 5.5: Relationship Between Producer Price and Weight for Various Elasticities**

Figure 5.5 illustrates the effect of producers' weight on optimal producer price. Here it is assumed that the government's weight is equal to unity and the sugar world price is Rp.750.00. It is expected that Bulog gives weight to producers that is less than one, which simply means Bulog taxes producers. The figure shows that policy in favour of producer, or giving a higher weight to producers, will lead to a higher producer price. The elasticity of supply also makes a difference in setting of optimal producer price. For a given weight, the optimal producer price increases when the elasticity of supply also increases.

MRPC

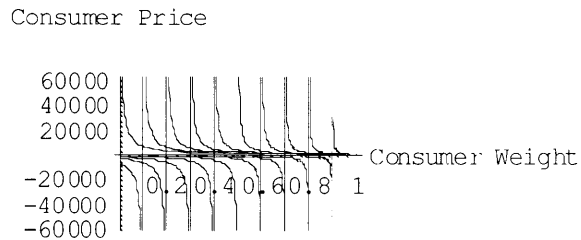


**Figure 5.6: Marginal Rate of Price Change for Producers**

Surprisingly, the ‘marginal rate of price change’ is different between the elasticities. As the producers’ weight moves approaching one (close to government’s weight), the marginal rate of price change for inelastic supply surpasses that for elastic supply (Figure 5.6). If we can interpret weights as the outcome of political process, this phenomenon suggests that producers with less elastic supply have more effective power in influencing Bulog (to increase producer price). Here, Becker’s result is more applicable to inelastic supply than to elastic supply. However, this argument is less convincing considering the way political weights are interpreted.

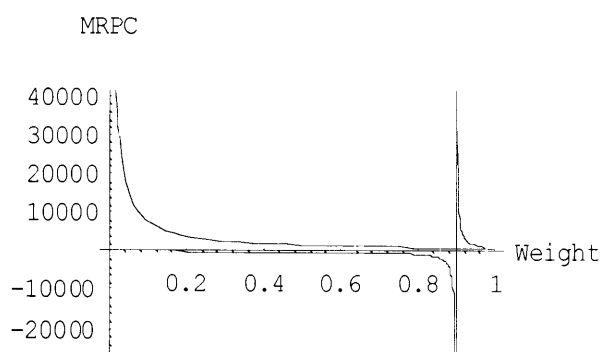
Figure 5.7 illustrates how the consumer price is affected by various consumers’ weights, given its elasticity of demand (the negative value of price must be ignored). It shows that for a given weight, optimal consumer price is higher for inelastic demand than for elastic demand. It is important to note that the optimal consumer price leads to infinity. Consider an example of a consumer with a demand elasticity of  $-0.5$ . Bulog must give consumers a weight higher than  $0.6$  if the elasticity of demand is  $-0.5$ , otherwise Bulog cannot offer the optimal consumer price as it is approaching infinity. To state this differently, consumer price is very responsive to weight changes, especially when the demand function is inelastic. Here the marginal rate of price change for inelastic demand is much higher than that for elastic demand (Figure 5.8). Lowering the consumers’ weight will significantly increase consumer price, harming consumers with inelastic demand more than consumers with elastic demand. The fact that consumers with inelastic demand capture more transferred welfare, compared to the elastic demand consumers, in the form of consumer surplus, this also

means that inelastic demand consumers have more political power than elastic demand consumers.



**Figure 5.7: Relationship Between Consumer Price and Weight for Various Elasticities**

Here, Becker's result also applies to consumers with inelastic demand. Again, if the weights can be interpreted as the outcome of political process, this phenomenon reveals that consumers with inelastic demand have more effective bargaining power than those with elastic demand. This is because with the same political outcome –the same weight- the inelastic demand consumer can capture more rent.



**Figure 5.8: Marginal Rate of Price Change for Consumers**

## **5.8 Summary**

This chapter has used the economic theory of regulation to develop a framework for analysing government intervention in the sugar market. One model, the Political Preference Function, has been developed to explain the effects of government behaviour in policy decision making. This model allows analysts to make policy instruments endogenous which provides a clearer explanation of the origin of the policies.

The political preference framework provides a basic feature of the policies and its consequences. This will be used in later chapters to develop an empirical model to analyse political economy of sugar policy in Indonesia.



## Appendix A.5

### Effect on the government from several policy options

The derivations use supply and demand function as in Equations (5.1) and (5.2). The welfare measure of government policy/intervention is based on an open market as a reference point for free market competition as stated in the first row equation of Table 5.1.

#### 1. Import Quota

$$\text{Producer Surplus (PS)} = \int_0^{P_d} S(P).dP$$

$$\text{Consumer Surplus (CS)} = \int_{P_d}^{\alpha} D(P).dP$$

$$\text{Government Revenue (G)} = (P_d - P_w - k)(D(P_d) - S(P_d))$$

Marginal effect of government revenue:

$$\begin{aligned} \frac{fG}{fP_d} &= \frac{f((P_d - P_w - k)(D(P_d) - S(P_d)))}{fP_d} \\ &= (D(P_d) - S(P_d)) + (P_d - P_w - k) \left( \frac{d.D(P_d)}{dP_d} - \frac{d.S(P_d)}{dP_d} \right) \end{aligned}$$

note:

$$\frac{dD(P_d)}{d.P_d} \frac{P_d}{D(P_d)} = \eta = \text{elasticity of demand}$$

$$\frac{d.S(P_d)}{d.(P_d)} \frac{P_d}{S(P_d)} = \varepsilon = \text{elasticity of supply}$$

$$= (D(P_d) - S(P_d)) + (P_d - P_w - k) \left( \frac{\eta D(P_d) - \epsilon S(P_d)}{P_d} \right)$$

## 2. Producer Price

$$PS = \int_0^{P_p} S(P) \cdot dP$$

$$CS = \int_{P_w}^{\alpha} D(P) \cdot dP$$

$$G = (P_w - P_p - k_1) \cdot S(P_p)$$

Marginal effect of government revenue due to producer price ( $P_p$ )

$$\frac{f \cdot G}{f P_p} = \frac{f(P_w - P_p - k_1) S(P_p)}{f P_p}$$

$$= (P_w - P_p - k_1) \cdot \frac{d \cdot S(P_p)}{d \cdot P_p} - S(P_p)$$

note:

$$\frac{d \cdot S(P_p)}{d \cdot P_p} \frac{P_p}{S(P_p)} = \epsilon = \text{elasticity of supply}$$

$$\begin{aligned} &= (P_w - P_p - k_1) \frac{S(P_p)}{P_p} \epsilon - S(P_p) \\ &= \frac{(P_w - k_1)}{P_p} S(P_p) \cdot \epsilon - ((1 + \epsilon) \cdot S(P_p)) \\ &= \left( \frac{P_w - k_1}{P_p} \cdot \epsilon - (1 + \epsilon) \right) S(P_p) \end{aligned}$$

### 3. Consumer Price

$$PS = \int_0^{P_w} S(P).dP$$

$$CS = \int_{P_c}^{\alpha} D(P).dP$$

$$G = (P_c - P_w - k_2).D(P_c)$$

Marginal effect of government revenue due to consumer price ( $P_c$ )

$$\frac{fG}{dfP_c} = \frac{f((P_c - P_w - k_2).D(P_c))}{f.P_c}$$

$$= D(P_c) + (P_c - P_w - k_2). \frac{d.D(P_c)}{d.P_c}$$

note:

$$\frac{d.D(P_c)}{d.P_c} \frac{P_c}{D(P_c)} = \eta = \text{elasticity of demand}$$

$$= D(P_c) + (P_c - P_w - k_2). \frac{D(P_c)}{P_c} \eta$$

$$= (1 + \eta).D(P_c) - \frac{(P_w + k_2)}{P_c}.D(P_c).\eta$$

$$= \left( (1 + \eta) - \frac{(P_w + k_2)}{P_c} \eta \right) D(P_c)$$