

## Gains and Losses of Alternative Food Grains Programmes in Malaysia

AHMAD ZUBAIDI BAHARUMSHAH

Department of Economics

Faculty of Economics and Management

Universiti Pertanian Malaysia

43400 UPM Serdang, Selangor Darul Ehsan, Malaysia.

**Keywords:** welfare cost, substitution effect, tariff, quota and deficiency payments, rice, wheat

### ABSTRAK

Kajian ini melanjutkan analisis keseimbangan separa untuk mengira kesan-kesan kebajikan daripada kuota/tarif dengan mengenal pasti hubungan penggantian di antara beras dengan gandum. Didapati bahawa kos kebajikan adalah terkurang anggaran sekiranya analisis tidak mengambil kira kesan gantian. Tiga opsyen dasar, iaitu, kuota/tarif import, dagangan bebas dan pembayaran kekurangan diambilkira dalam kajian ini. Keputusan menunjukkan bahawa kuota import/tarif bukanlah kaedah yang paling cekap untuk menampung pengeluar-pengeluar tempatan. Kos sosial bersih untuk program beras akan dikurangkan jika opsyen semasa digantikan dengan pelan pembayaran kekurangan. Kos sosial berkaitan dengan harga kuota premium semasa adalah lebih 11 kali ganda lebih besar daripada pelan pembayaran kekurangan.

### ABSTRACT

This study extends the partial equilibrium analysis to calculate the welfare effects of quotas/tariffs by recognizing the substitution relationship between rice and wheat. It is shown that ignoring the substitution effect leads to a significant understatement of the welfare cost. Three policy options, that is, import quota/tariff, free trade and deficiency payment are considered in this paper. The results show that import quota/tariff is not the most efficient way to support the domestic producers. The net social cost of the rice programme will be lower if the current option is replaced by deficiency payment plans. The social cost under current quota price premium is more than 11 times higher than deficiency payment plan.

### INTRODUCTION

Following independence in 1957, the Malaysian government announced the decision to pursue the goal of complete self-sufficiency in rice production. The goal was to facilitate three major policy objectives: (1) reduce the risk attached to dependency upon world market; (2) save foreign exchange; and (3) raise farm income and productivity. These objectives were to be attained through the adoption of modern agricultural inputs, investments in infrastructure and a price support programme. Imports of rice were restricted and the domestic prices were maintained above world prices.

The guaranteed minimum price (GMP) represents the single most important policy instru-

ment protecting Malaysian rice producers. The policy creates a situation where the effective price received by producers exceeds consumers' willingness to pay as measured by the demand curve. The income redistribution of the farm programme has profound effects on several economic agents in the rice market. Producers and consumers are not the only groups affected by the market intervention. Other agents which are affected by the pricing policy are the National Padi and Rice Board (LPN), which gains from its rice import monopoly whenever the world price falls below its ex-mill and the taxpayers, who have to pay for the cost of administration and subsidy programmes<sup>1</sup>.

Although the producers received 1.5 to 2.0 times the border price, Malaysia remains a net

1. The tax collections are used to pay for administration of LPN and other government services. Data on how the tax money is distributed are unavailable for this study. But it is important to emphasize here that the recipients of these services are also gainers.

importer of rice. While 25% of the domestic supply of rice comes from the foreign sector, all the domestic demand for wheat is imported. The high support prices coupled with the favorable world market prices for wheat have allowed wheat to penetrate the domestic market as a substitute. The *per capita* consumption of rice dropped from its 1975 level of 118 kilograms to about 95 kilograms in 1987. However, *per capita* consumption of wheat increased from 25 kilograms to 38 kilograms over the same period (Padi Statistics and Malaysian External Trade). The import demand for wheat increased by more than 50%. The switch from rice to wheat can partially be explained by the fact that real domestic price of rice rose by more than 12% while that for wheat declined by about 16%<sup>2</sup>.

This paper provides estimates of the distribution of costs and benefits associated with three policy alternatives: the current programme which is based on import quota/tariff, no policy (or free trade) option, and deficiency payments. The primary purpose is to improve our understanding of the impact of government intervention in the rice market. The present work attempts to analyse rice programmes by taking into account the substitution relationship between rice and wheat.

### THE ANALYTICAL FRAMEWORK

Partial equilibrium analysis has been extensively used for evaluation of trade restrictions mainly because of its simplicity. Some examples of such studies include Hayami (1979) and Chin *et al.* (1988). The general criticism of this model is that distortion existing elsewhere in the economy is ignored (or assumed to be small). Recently, the analysis has been extended to allow the imported good and competing domestic output to be imperfect substitutes in the demand equation (see Broadway and Treddenick 1978; Rousslang and Suomela 1988). In this model, tariff/quota causes the price of domestic substitute to rise, which causes the import demand curve to shift outward.

The imperfect substitution model is now widely used to measure the gains and losses associated with trade restriction. For instance, Rousslang and Suomela (1988) calculated the welfare effect on import tariffs and quotas. They showed that ignoring the response of domestic prices would lead to overstatement of the net welfare costs of tariffs and a significant understatement of the welfare costs of quotas. For a quota policy, discounting domestic price response may lead to an understatement of the quota rent. It is also possible that a quota option may result in a net welfare gain in the imperfect substitutes model.

Lue *et al.* (1987) analyzed the welfare costs of the U.S. sugar programmes by recognizing the substitution relationship between sugar and high fructose corn sweetener. The sugar market is linked to the high fructose corn sweetener by substitution relationships. The model recognized that high support for sugar prices induced a significant substitution for corn sweeteners. The results of the analysis showed that the measurement errors associated with the traditional partial equilibrium can be large. It was also shown that the substitution effect has reduced the quota rents, thus hurting the quota rent owners (i.e., foreign suppliers).

The Lue *et al.* (1987) model can be used to analyze the rice market in Malaysia since rice has a substitution relationship with wheat. Past policies have kept the domestic price of rice above the free market level. The high price of rice relative to wheat, coupled with the favorable international market for wheat, has contributed to the substantial growth of wheat consumption and reduction in rice demand.

To facilitate the analysis, two simplifying assumptions are needed. Firstly, it is assumed that there is no substitution effect between the controlled imported good and all other goods except wheat, the competing good. Secondly, it is assumed that a dollar of tariff revenue has the same value to the economy as a dollar of private income. This implies that the social cost of raising addi-

2. Byerlee (1987) examined the new trends in food imports by developing countries. Several factors were identified both on the demand as well as supply sides which have led to the increase in wheat consumption in these countries. Examples are rapid technological advances and aggressive credits programmes and subsidization of wheat by major exporting countries.

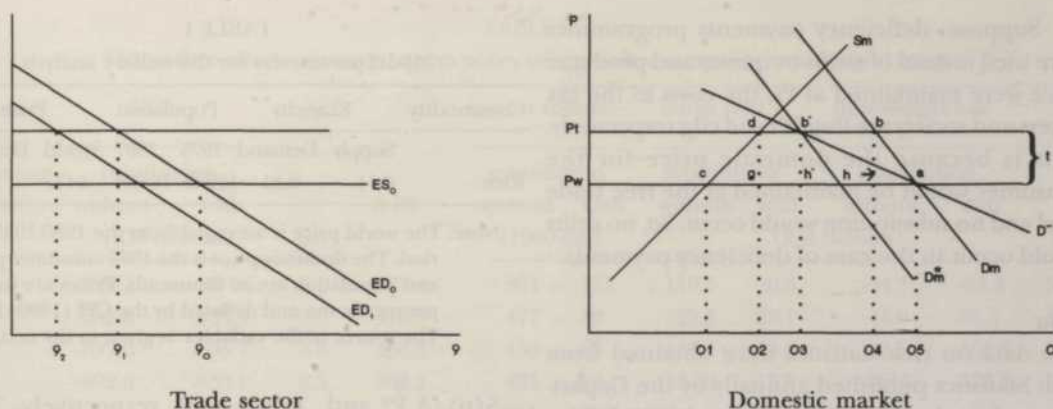


Fig 1: The rice programme with substitution effect in a small country

tional taxes to finance farm programmes is zero. Although these assumptions may be restrictive, they are practical<sup>3</sup>.

The welfare implications of the rice programme are illustrated in Figure 1. The supply and demand schedules for the domestic market are  $S_m$  and  $D_m$ , respectively. Assuming zero transportation cost, the excess demand curve is  $ED_0$  and given the small country assumption, the excess supply curve,  $ES_0$ , for the rest of the world is completely elastic. The free trade equilibrium price is  $P_w$  and  $q_0$  (or  $Q_1Q_5$ ) is the imported quantity.

A fixed tariff of  $t$  (or an equivalent quota of  $Q_2Q_4$ ) raises the domestic price to  $P_t$  while the world price ( $P_w$ ) remains unchanged. The tariff lowers the domestic consumption from  $Q_5$  to  $Q_4$  and increases domestic production from  $Q_1$  to  $Q_2$ . If prices of complements and substitutes are fixed, the domestic demand curve ( $D_m$ ) does not shift. The loss to domestic consumers is given by the trapezoid  $PwabPt$  and domestic producers gain by  $PwcdPt$ . The tariff policy would create a quota rent or tariff revenue of rectangle  $ghbd$ . The net cost of the tariff policy would be  $cabd-ghbd$ .

Next, we relax the above assumption by allowing the substitution of wheat to occur. The switch of rice to wheat, because of the declining international wheat prices, causes the rice demand to shift inward (feed-back substitution). In addition, the higher relative rice prices over the years would induce a trend effect which constantly shifts the

rice demand inward (induced trend effect). Both the substitution and the induced trend effects over the years have resulted in demand for rice to shift from  $D_m$  to  $D_m^*$  and in the trade sector, the excess demand shifts from  $ED_0$  to  $ED_1$ .

The short-run demand curves  $D_m$  and  $D_m^*$  reflect the marginal value of an additional unit of rice holding other prices fixed. The new equilibrium occurs at price  $P_t$  and quantity  $Q_3$ . The relationship  $D^{**}$  traces points as price of rice is altered from  $P_w$  to  $P_t$ , accounting for the equilibrium adjustment in the wheat market. Thus, equilibrium demand ( $D^{**}$ ) reflects the marginal value of rice when adjustments price of substitute (wheat) are taken into account. The change in consumer surplus associated with the demand ( $D^{**}$ ), reflects the net welfare effect for both the rice and wheat sectors. Hence with substitution the consumer surplus and quota rent are reduced to  $Pwab'Pt$  and  $gh'b'd$  respectively (See Just, Hueth, and Schmitz p. 188-192).

In the developed economies (for example, the United States) payments to producers or deficiency payments are commonly used to support the farm sector. Under the deficiency payment the producers are guaranteed a price. The difference between this support price and the market price determines the payment to be made to producers. Under this option, the domestic consumers pay no more than the world price while the taxpayers bear the cost of the programme.

3. Ideally, compensated demand curves should be used in the welfare analysis. However, given the low income elasticities and the grains expenditure is only a small part the consumer budget, the ordinary demand curve would give a reasonable approximation (see Willig 1976). In a related work, Ahmad Zubaidi (1990a) has shown that this assumption introduces only a small error.

Suppose, deficiency payments programmes were used instead of tariffs or quotas and producer price were maintained at  $P_t$ , the costs to the tax payers and society are  $P_{wg}P_t$  and  $cdg$  respectively. This is because the domestic price for the consumer would be maintained at the free trade level and no substitution would occur. So, no shifts would occur in the case of deficiency payments.

#### Data

The data on rice statistics were obtained from Padi Statistics published annually by the Department of Agriculture, Malaysia and USDA Rice Market News. The data for wheat are annual average values obtained from Malaysian Annual Statistics. The macroeconomic variables such as the consumer price index, population and exchange rates were taken from Quarterly Bulletins and Annual Reports of Bank Negara Malaysia.

To compute the costs and benefits of the rice programmes under alternative policies, the study relies on the results of previous studies. Estimates of the demand elasticities ranged from  $-0.14$  (Ahmad Zubaidi 1990) to  $-0.50$  (Nik Fuad 1985). There are differences in the price elasticities estimates due to differences in behavioral assumptions, time period and model specification in the analysis. A value of  $-0.31$  (Ahmad Zubaidi and Muzafar Shah 1991) was chosen for the analysis, given the estimates are current and that the model has been subjected to several specification tests. The supply elasticity estimates used in the analysis is  $0.11$  (Ahmad Zubaidi 1991). The low own-price elasticity is also in agreement with those reported by King (1987). Some of these values together with the parameters needed to construct the supply and demand schedules are summarized in Table 1.

## DISCUSSION

#### Current Policy Option

To measure the consumer and producer surplus, let the supply and demand equations be given by

TABLE 1  
Model parameters for the welfare analysis

Commodity	Elasticity		Population		Price	
	Supply	Demand	1975	1987	World	Domestic
Rice	0.11	-0.31	12248	16558	547	810

Note: The world price is averaged from the 1980-1985 period. The domestic price is the 1987 consumer price and population are in thousands. Prices are in RM per metric ton and deflated by the CPI (1980=100). The source of the variables is given in the text.

$S(p) = A_S P^\alpha$  and  $D(p) = A_D P^\beta$ , respectively. The change in producer surplus associated with the price change from  $P_w$  to  $P_t$  can be approximated by:

$$PS = \int_{P_w}^{P_t} S(p) dp = \frac{A_S}{\alpha+1} (P_t^{\alpha+1} - P_w^{\alpha+1})$$

where PS is the surplus change,  $S(p)$  is the supply function,  $A_S$  is a constant and  $\alpha$  is the supply price elasticity. Similarly, the change in consumer surplus can be approximated by:

$$CS = \int_{P_w}^{P_t} -D(p) dp = -\frac{A_D}{\beta+1} (P_t^{\beta+1} - P_w^{\beta+1})$$

Assuming linearity, the long run (equilibrium) demand curve  $D^{**}$  can easily be estimated once the two points  $b'$  and  $a$  as in Figure 1, are determined<sup>4</sup>. For example, the estimated long-run demand curve for a quota price premium of \$237 per metric ton is  $Q_R = 3730 - 2703P_R$ <sup>5</sup>. Here  $Q_R$  denotes the quantity of rice demanded and  $P_R$  is the price of rice. The demand curve for the remaining quota price premiums are given in Table 2. The change in consumer surplus under  $D^{**}$  for the price between  $P_w$  and  $P_t$  can be approximated by:

$$CS = \int_{P_w}^{P_t} -D(\cdot) dp = -a_0(P_t - P_w) - a_1(P_t^2 - P_w^2)/2$$

4. As shown in Figure 1,  $b'$  is determined by substituting the support price ( $p$ ) in equation  $Dm'$ . Similarly point  $a$  is determined by substituting  $P_a$  in equation  $Dm$ .

5. The estimated long-run demand curves for price premiums of \$263, \$289 and \$316 are  $Q_R = 3730 - 2500P_R$ ,  $Q_R = 3635 - 2326P_R$  and  $Q_R = 3552 - 2174P_R$  respectively.

TABLE 2  
The welfare effects of current quota policy using the linear equilibrium demand curve

Quota price premium (\$/mt)	$\Delta$ CS		$\Delta$ PS	import volume		quota rent		deadweight loss		$\% \Delta$	
	substitution			substitution		substitution		substitution			
	without	with		without	with	without	with	without	with		
	(RM million)			(1000 mt.)		(RM million)					
237	-528.2	-484.0	9.1	374.4	504	111	119.5	26.3	-34.3	-83.3	58.8
263	-582.8	-534.9	9.0	416.3	477	88	125.5	23.1	-41.0	-95.5	57.1
289	-637.0	-585.7	8.8	458.4	450	65	130.1	18.8	-48.5	-108.5	55.3
316	-692.6	-638.1	8.5	502.2	424	43	134.0	13.6	-56.4	-122.3	53.9
Free Trade <sup>a</sup>					816	367					
					(446)	(201)					

Source: Adapted from Ahmad Zubaidi (1992).

Note: The surpluses were estimated in 1980 dollars using the standard Marshallian concepts. The world price was estimated at \$547 per metric ton (mt). Figures in parenthesis denote negative values.

Import volume measured in metric tons. The world price was estimated at \$547 per metric ton.

<sup>a</sup>Under Free trade, the value of rice imports in million ringgit is given in parenthesis.

where  $D(\cdot)$  is the demand curve,  $a_1 < 0$  and  $P_w$  and  $P_t$  are the two price levels<sup>6</sup>. To derive the supply and demand schedules given in Figure 1, we follow closely the approach provided by Lue *et al.* The details on the derivation of the demand and supply schedules are also found in Ahmad Zubaidi (1992).

The difference between the world price converted to Malaysian Ringgit (RM) and the actual domestic price of rice provides an estimate of the quota/tariff price premium due to import quotas, fees and duties of the current rice programme in Malaysia. The distribution of costs and benefits associated with current or alternative depends largely on the assumption made about the price premium, which averaged about \$263 per metric ton of milled rice in the 1980s. The welfare analysis of the rice programme based on this price premium would provide the maximum short run impact of the quota program. Given the volatility of the world rice market, a range of premiums between \$237 to \$316 per metric ton is provided for the analysis<sup>7</sup>.

Table 2 provides the distribution of economic surplus for current policy under alternative price regimes. For a quota price premium of \$237 per metric ton, the consumer cost is estimated at \$528.2 million while the producer's gain is \$374.4 million without substitution. The consumer cost for quota premiums of \$263 to \$316 range from \$582.8 to \$692.6 million, increasing with higher premiums. Similarly the producers' gains and the dead-weight losses associated with higher quota premiums increase when the quota price premium increases. For example, an increase in 10% in the quota premium from \$237 to \$263 would result in a net increase of about 15% in the deadweight loss with substitution effect.

As shown in Table 2 the cost of the consumer is lower if substitution is considered in the welfare analysis. The percentage change (error) for ignoring substitution effect in the consumer surplus ranges from 8.5 to 9.1% depending on the size of the quota premium. The percentage error in approximating the dead-weight loss ignoring

6. The linear demand curve is given by  $D(p) = a_0 + a_1 P$ .

7. The quota premiums of \$237, \$263, \$289 and \$316 are equivalent to support prices of \$784, \$810, \$836 and \$863 per metric ton, respectively. This price range is selected arbitrarily but it would provide information on the program costs under alternative price regimes.

substitution effect is even larger, by about 55% in all cases<sup>8</sup>.

If the domestic price is maintained at \$810 per metric ton (or \$263 quota price premium), the rent created from the programme would amount to \$125.5 million without substitution and the value would decrease to \$23.1 million with substitution. Thus the partial equilibrium analysis of rice policy ignoring the substitution overestimates quota rent by more than 400%. Alternatively, the result suggests that in the longer run the rent due to quota would decline because of the penetration of wheat in the domestic market<sup>9</sup>. The analysis shows that the partial equilibrium model framework, without the substitution effect, tends to overestimate the true cost to the consumer and quota rent. In this study it was found that ignoring the substitution effect would lead to about 133% underestimation of dead-weight loss of the current quota program of \$263 quota price premium. These are sizable errors and should be considered in the final calculation of policy impacts

#### *Alternative Policy Options*

The above results suggest that the current programme does not promote consumer welfare. The current programme incurred significant deadweight loss from inefficient allocation of resources in the rice industry as a result of the market intervention. The artificially high consumer price may have promoted smuggling activities<sup>10</sup>. As noted by Tan (1987) about 30% of the total rice consumed entered the country illegally. Thus, rice smugglers benefited from the current programme and yet they are the non-target group. Policy-makers require information under current and alternative policy options in order to understand the consequences of their policy actions. In the following section, three alternative policies,

free trade, an equivalent tariff and deficiency payments, are discussed.

#### *Free Trade*

The first scenario illustrates a policy change which removes the quota and all supports yielding a free trade or "no policy" option. The scenario would allow world prices to prevail in the domestic economy at the official exchange rate. The major impact of the change in price is, of course, on production and consumption.

Substituting the world (c.i.f import) price into both the supply and demand equations provides estimates of the level of consumption that would prevail in the absence of trade barriers. The value of domestic production and consumption at a world price of \$547/metric ton are 1547 and 1923 thousand metric tons respectively. Thus, in the absence of policy intervention, imports increased from 238 thousand metric tons in 1985 to 376 thousand metric tons. This represents an imports increase of about 58% from the current level. The excess demand for rice would result in a loss of RM201 million of foreign exchange (Table 2).

Clearly the above policy triggers cutbacks in production and increase in domestic consumption with lower prices. Given the lower producer price, producer surplus declines by \$416.3 million while consumer surplus increases by \$534.9 million. The government revenue declines by \$23.1 million due to loss in quota rent. The result is an increase in net welfare of about \$95.5 million. The flow of foreign exchange out of the economy would increase by about 329%<sup>11</sup>.

The results clearly suggest that consumers would have been better off under free trade. A free trade policy would increase importation and consumption of rice. Thus, it is obvious why consumers, importers and rice millers prefer a free

8. It is important to note here that the equilibrium demand curve ( $D^{**}$ ) is derived by extrapolation of two points, that is,  $b'$  and  $a$  (see p. 7 in the text). The welfare calculation based on this linear demand curve assumes linear path of adjustment. The bias obtained from our analysis depends implicitly on this assumption.

9. Note that a support price of \$919 per metric ton or higher would change the net trade position from a net importer to a net exporter.

10. The other reason for smuggling activities could be that the foreign supply of rice is of better quality.

11. The scenario ignores the impact of the wheat market and reflects a short-run impact. Given the lower rice price, it is expected that the consumption of wheat to fall. Thus, the figures provided here may overstate the outflow of foreign exchange.

trade option which would keep domestic prices low and eliminate government intervention. As for the taxpayers, this option generates no rent or government expenditure. The reduction in price hurts the rice producers. We expect resources to be transferred out of rice production into other sectors resulting in heated lobbying.

#### *Tariff Programme*

Suppose an equivalent tariff had been used instead of a quota to support the domestic rice producers. Both the consumer losses and producer gains would be the same as with an equivalent quota programme. The difference, however, is that under the tariff programme the government would benefit in the form of tariff revenues. The revenues generated by the four price regimes are the same as those summarized Table 2. For example, the government gains \$23.1 million when a tariff of \$236 per metric ton is imposed on the imported rice.

#### *Deficiency Payment Options*

Under deficiency payments, producers are guaranteed a "target" price,  $P_t$ , for their product and the consumer price is the world price. Payments equal to the difference between the target price and the world price are made to the producers. This programme increases the producer surplus while the consumer surplus remains unchanged from that of free trade. It adds costs, however, to taxpayers who provide the payments for the programme. The economic welfare consequences of deficiency payments for the same set of support prices as in the previous quota programme are summarized in Table 3. For quota premiums of \$237 to \$316 per metric ton, the dead-weight loss ranges from \$7.0 to \$11.8 million. Thus, the results of the analysis favor deficiency payments based on the least cost criteria<sup>12</sup>.

#### *Quota versus Deficiency Payments*

If the current quota programme is replaced with a deficiency payment programme and domestic

TABLE 3  
The welfare effects of deficiency payments

Quota price premium (\$/mt)	$\Delta CS$	$\Delta PS$	Govt. Expenditure	Deadweight Loss
(RM million)				
237	0	374.4	381.4	(7.0)
263	0	416.3	424.8	(8.5)
289	0	458.4	468.4	(10.0)
316	0	502.2	514.0	(11.8)

*Source:* Estimated from the analysis described in the text  
*Note:* The surpluses were estimated in 1980 dollars. The world price were estimated at \$547 per metric ton. The change in consumer surpluses (CS), producer surpluses (PS), and deadweight loss were computed from the free trade baseline. No change in consumer surplus since under deficiency payment option there is no distortion on the consumption side.

producer's price were maintained at the quota premium levels given in Table 2, the welfare consequences are shown in Table 4. Consumers would gain from consuming more rice at a lower price. The consumers with their dual role as consumers/taxpayers gain by \$484.0 million, while as taxpayers they suffer a loss of about \$381.4 million from the reduction in the consumer price at a \$237 quota premium. Given their net gain of \$484.0 million, we can expect the consumers to support a deficiency payment programme instead of the present tariff/quota policy where as a group they are effectively taxed \$484.0 million.

It is important to emphasize here that the poor consumers would benefit to a greater extent from this option since they are non-taxpayers. Given the high incidence of poverty among the rice producers and that 20% of the domestic paddy produced is retained for home consumption, the deficiency payments plan certainly is a better alternative than the current policy option, if the government objective is to subsidize the poor<sup>13</sup>.

The lower retail price would at least discourage smuggling activities. The decrease in the price of rice would result in a reduction in the price of

12. The most efficient policy is the one with the smallest deadweight loss. It is important to note that the maintained assumption here is that the opportunity cost of a dollar of government spending is one dollar.

13. The figures on home consumption is based on government estimates reported by Tan (1987). The quota policy imposed a tax of about 5% on the household in the poverty group (see Goldman 1975).

TABLE 4  
The welfare effects of moving from current policy option to deficiency payments

Quota price premium (s/mt)	$\Delta$ CS	$\Delta$ PS	Govt. expenditure	Net social gain
(RM million)				
237	484.0	0	381.4	102.6
263	534.9	0	424.8	110.1
289	585.7	0	468.4	117.3
316	638.1	0	514.0	124.1

Source: Estimated from the analysis described in the text.

Note: The surplus were estimated in 1980 dollars and with substitution. The world price were estimated at \$547 per metric ton. The change in consumer (CS), producer surpluses (PS), and net social gain were computed by replacing the quota/tariff with deficiency payments programme and producers prices maintained at the quota level. There is no change in the producer surplus since producer prices are maintained at quota/tariff levels.

rice bran used for animal feed. The lower feed cost would provide more incentive for livestock producers and would enhance the objective of achieving food self sufficiency in Malaysia<sup>14</sup>. The taxpayers in this case would have to bear the costs of the programme. The treasury cost is given in Table 4. For example, to maintain the current price support price of \$810 per metric ton to the producers and given that the world price is \$547, the treasury cost is \$424.8 million. An increase of about 6.5% of the current support price will increase the cost to \$514.0 million, which is more than 20% above current expenditure level.

Table 5 shows the net social cost under alternative policy options. The cost of the rice programme under the deficiency payment ranged from \$7 to \$11.8 million depending on the level of the price premium. Thus the deficiency payment option achieves larger gains than a tariff/quota, but involves larger budget costs. The dead-weight loss is lower because it removes the con-

sumption distortion. Given the current deficit problem in Malaysia, it is unlikely that the government would support this policy option.

The results (Table 5) suggest that the current policy is not the most efficient option. The social cost of a price premium of \$263 under the current policy is 11.2 times higher than that of the deficiency payments plan. The fact that the existing policy regime exists despite the high cost of the programme reflects the strength of the rice producers and LPN in the policy making process. The consumers, and especially the poor consumers who surely outnumber paddy farmers, are unorganized.

The current policy is more effective in saving foreign exchange than the deficiency payments plan. From the data (Table 5) it is obvious the deficiency payment plan results in more foreign exchange loss. For instance, a quota premium of \$263 results in M\$48 million foreign exchange flowing out of the economy but this figure is 8.5 times higher in the case of deficiency payment. Note that in this analysis, we ignore the increase in wheat imports caused by substitution<sup>15</sup>.

## CONCLUSION

This study provides insights into the impact of government pricing policies on major interest groups in the rice market. Importantly, we showed that evaluation of the market intervention must account for the wheat as well as other closely related markets. Although several simplifying assumptions are made to facilitate the analysis, it is evident from the results of this study that treating the rice market independently of all other goods, particularly the wheat market, leads to a significant underestimation of the net economic cost of the programmes.

The main policy instrument of the rice programme in Malaysia has been an import quota. The intervention is expensive and the results of the welfare analysis suggest that the net social cost would be lower if the current programme was re-

14. Under deficiency payments, payments to the producer may be based on previous years' production. The option could also minimize the smuggling activities.

15. Saving foreign exchange is an important policy goal for many developing countries and is the stated policy goal for Malaysia. However, given the inefficiencies on the enacted policies, it is possible that such a policy will result in much lower foreign exchange inflows.



TABLE 5

Net social cost and foreign exchange losses of the Malaysian rice policy

Policy option	Quota/Tariff Price Premium (\$/mt.)			
	237	263	289	316
	( RM million)			
Current Policy				
Net Social cost	83.3	95.5	108.5	122.3
Foreign Exchange Savings	61	48	36	23
Deficiency Payments				
Net Social Cost	7.0 <sup>a</sup>	8.5	10.0	11.8
Foreign Exchange Savings	412 <sup>a</sup>	409	406	403

Source: Estimated from the analysis described in the text.

Note: <sup>a</sup>Substitution would not occur with a deficiency payment.

placed by a deficiency payment. Under a deficiency payment programme, the consumers would pay a lower price, the world price, and consume more. Deficiency payments will also remove distortions in the rice and related markets (including the input markets). Thus, deficiency payments plan represent a potential policy option for supporting the rice producers. This conclusion, however, depends heavily on the assumption that one dollar of tax revenue is worth the same value as one dollar of private income.

A quota/tariff policy on rice alone will keep the domestic price of rice high, relative to that of wheat. A relatively high rice price will result in a substantial growth in wheat consumption and a reduction in rice demand. The increase in the demand of wheat can only be met via the import market. This may be inconsistent with the government's objective of being self sufficient in staple foods and saving foreign exchange. A tariff/quota on rice coupled with a tariff on wheat may improve the gains from the rice policies.

In terms of market participants, it is clear that consumers prefer deficiency payments rather than relying on the present quota system. However, given the government's desire to keep its expenditure down, it is unlikely that the government and the taxpayer would prefer to shift to a deficiency scheme. A quota programme protects producers, taxes consumers, and raises quota revenue.

## REFERENCES

- AHMAD ZUBAIDI. 1990a. The Malaysian Rice Policy: *Welfare Analysis of Current and Alternative Programs*. Ph.D. Thesis. University of Illinois at Urbana-Champaign.
- AHMAD ZUBAIDI. 1990b. Incorporating government intervention in the rice market: The case of rice policy in Malaysia. *Pertanika* 13:289-296.
- AHMAD ZUBAIDI. 1992. Price distortions in agriculture and their effects: the case of Malaysian rice policy. Paper presented at *The 1992 Economics in Business and Government Conference*, Gold Coast, Australia 1-4 September.
- AHMAD ZUBAIDI and MUZAFAR SHAH HABIBULLAH. 1991. On the demand for rice and wheat in a developing economy: test of functional forms and the estimates of income elasticities. *Asean Economics* 79:40-54.
- BALDWIN, R.E., J.H. MUTTI and J.D. RICHARDSON. 1980. Welfare effects on the United States of a significant multilateral tariff reduction. *J. of International Econ.* 10:405-423.
- BROADWAY, R. and J. TREDDENICK. 1978. A general equilibrium computation of the effects of the Canadian tariff structure. *Can. J. of Econ.* 11:424-446.
- BYERLEE, D. 1987. The Political economy of Third World food imports: The case of wheat. *Economic Development and Cultural Changes*. 35:305-326.
- CHEN, NEU-JIN, GLENN C. W. AMES and A. LAWTON HAMMETT. 1988. Implication of a tariff on imported Canadian softwood lumber. *Can. J. of Agric. Econ.* 36:69-81.
- GOLDMAN, R.H. 1975. Staple food self-sufficiency and the distributive impact of Malaysian rice policy. *Food Research Institute Studies*. 14:251-293.
- HAYAMI, Y. 1979. Trade benefits to all: A design of the beef import liberalization in Japan. *Amer. J. of Agric. Econ.* 61:342-47.
- JUST, R.E., D.L. HUETH and A.SCHMITZ. 1982. *Applied Welfare Economics and Public Policy*. Englewood Cliffs, New Jersey: Prentice-Hall inc.
- LUE, GWO-JIUN M., A. SCHMITZ and R.D. KNUTSON. 1987. Gains and losses of sugar program policy options. *Amer. J. of Agric. Econ.* 69:591-602.
- MALAYSIA, DEPARTMENT OF AGRICULTURE. Padi Statistics (various issues).
- MALAYSIA, DEPARTMENT OF STATISTICS. Malaysia External Trade (various issues).

ROUSSLANG D.J. and J.W. SUOMELA. 1988. Calculating the welfare costs of import restrictions in the imperfect substitutes model, *Applied Econs.* 20:691-700.

ROUSSLANG D.J. 1987. The opportunity cost of import tariffs. *Kykloks.* 40:88-102.

TAN, S. H. 1987. *Malaysian Rice Policy: A Critical Analysis.* Kuala Lumpur: Institute of Strategic and International Studies, Malaysia.

WILLIG, R.D. 1976. Consumer's surplus without apology. *Amer. Econ. Rev.* 66(4): 589-97.

(Received 8 June 1993)