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Trade Liberalisation and its Impact on the Rice Sector of Sri Lanka

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ABSTRACT

This paper examines the impact of trade intervention policies. The trade protection for the rice sector was estimated using both nominal and effective protection rates. These show positive protection to producers at the expense of consumers. Current analysis indicates that one rupee of resources is used to produce 56 cents worth of rice valued in foreign exchange. As trade is increasingly liberalised, protection will be eventually eliminated and rice farmers will be forced to produce rice at competitive prices. Consequently, the extent under rice is expected to decrease by 12 per cent and total production decreases by 16 per cent. Meanwhile demand for rice will increase as a result of the reduction in retail price. Overall welfare impacts reveal that it is a gain to the nation. However, the producers face welfare losses. Therefore concerted and simultaneous efforts are imperative to improve productivity growth and reduce the unit cost of production in order to improve the competitiveness of the rice sector so that it can compete with the rest of the world.

Introduction

The agriculture sector continues to be the main contributor to the economy of Sri Lanka and its share in GDP was 21.7 per cent in 1999. Out of this, rice, which is the major staple food crop, contributed 3.5 per cent of the GDP (Central Bank of Sri Lanka, 1999). The annual paddy production in Sri Lanka has been around 2.5 million Mt for the last 13 years (Table 1). The peak production was registered in 1999 when the level of output reached 2.868 million Mt. Rice cultivation employs 1.8 million farmers, of whom, over 67.3 per cent cultivate less than the 0.8 hectares (Department of Census and Statistics, 1982). Annual per capita consumption of rice is around 100 kg/year and production is falling behind the national requirement, consequently resulting in increased

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Table 1: Rice production and imports

Year	Production		Imports (000 Mt)
	Paddy (000 Mt)	Rice equivalent (000 Mt)	
1990	2535	1723	116.789
1991	2390	1625	132.947
1992	2338	1590	237.202
1993	2570	1747	202.785
1994	2683	1824	58.415
1995	2809	1910	9.414
1996	2061	1401	338.669
1997	2239	1522	305.598
1998	2692	1830	167.507
1999	2868	1921	214.191

imports. Currently the paddy sector is given government support and protection through trade policy and price intervention to achieve self-sufficiency. Rice is imported to meet shortfalls in domestic production. In the past, rice was imported under license with the objective of protecting the domestic rice producers. At present rice is imported with an *ad valorem* tariff of 35 per cent. However, recent developments in the area of trade liberalisation, and international trade regimes as reflected in GATT, SAFTA and other regional trade agreements, promote free trade. Eventually all tariff and non-tariff barriers will be removed and the country will enter a free trade era by 2008 (Udegedara, 1996). Therefore, it is hypothesised that liberalisation of rice trade would result in increasing competitive pressures on local rice producers (Thenuwara, 1998). Hence, it is necessary to evaluate the impact of free trade on the rice sector and identify alternative strategies that would help to improve the competitiveness of the rice sector.

Given this background, this paper examines the present level of protection to the rice sector and the possible impact of its removal. More specifically, the paper assesses:

i) The level of protection
ii) Competitiveness of the rice sector

iii) Impact of liberalisation on domestic prices, and

iv) The social welfare impacts of trade liberalisation.

Methodology

The following methods were employed to evaluate the objectives mentioned above.

1. Degree of Protection

The protective measures were calculated using the Nominal Protection Rate (NPR) and the Effective Protection Rate (EPR). These indicators give an idea of how domestic production is protected (Corden, 1971). The formula for NPR and EPR are as follows:

$$NPR = 100(NPC - 1)$$

$$Where, NPC = \frac{Pd}{Pb}$$

$$EPR = 100(EPC - 1)$$

$$Where, EPC = \frac{Pd - \sum_{j=1}^{K} aijPdj}{Pb - \sum_{j-1}^{K} aijPbj}$$

Pd = Producer Prices
Pb = Import Price
aij = Quantity of traded inputs
pdj = input price (domestic)
pbj = Input price (import)

2. Competitiveness

Competitiveness of the rice sector can be measured by the competitiveness coefficient. This shows the resource use efficiency of paddy production in Sri Lanka. The competitiveness coefficient (CC) was calculated from domestic resource cost (DRC) as follows (Tshakok, 1990):

CC = 1/DRC where

$$DRC = \frac{\sum_{j=k+1}^{n} A_{ij} V_j}{P_i^b - \sum_{j=1}^{k} A_{ij} P_j^b}$$

Where, A_{ij}, k+1 to n refer Domestic resources
A_{ij} 1 to k refer to traded inputs
V_j refer shadow price
P_i^b border price of output
P_j^b border price of traded Input

3. Domestic Prices and Production Impacts

Price changes from domestic price (P_d) to world price (P_w) results in reductions in area cultivated and yield leading to reduction in

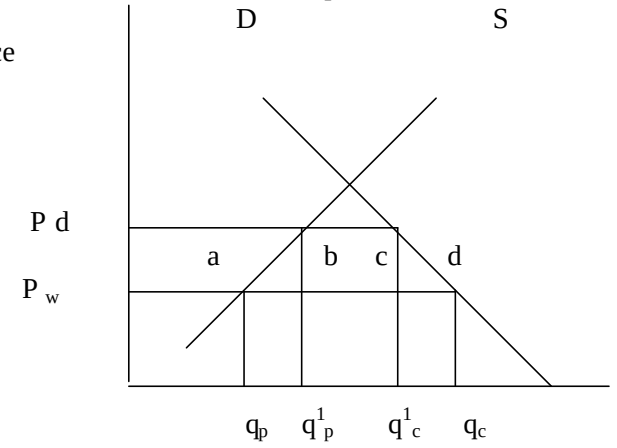
domestic supply of rice. The impact on cultivated area and yields are given by:

dA =(E*A*dP)/P and
dY = (e*y*dp)/P
where dA= Change in area
dY = Change in yield
E = Elasticity of area response
e =Elasticity of yield response
A= Mean area
y = Mean yield
dP= Change in price
P = Mean price

4. Welfare Effects

Welfare distributions were estimated using the classical welfare analysis, which is used to measure the cost of trade policy interventions and impact of trade liberalisation. This analysis shows the level of distribution of benefits and cost among producers, consumers, and society as a whole. The conceptual model shown in figure1 helps to illustrate the effect of an import tariff. Suppose domestic demand is D, domestic supply is S and the intersection of these two is well above the world price P_w. Assume a tariff is imposed. Its main effect is to raise the domestic market price P_d, above the world market price P_w. This causes welfare gains to producers and losses to consumers. Removal of protection will result in domestic price declining to P_w. causing a reversal of welfare gains and losses equal in magnitude and opposite in sign.

Figure 1: Effect of an import tariff.



Welfare impacts of the removal of tariff are summarised as follows (Tweeten, 1989).

Gains to consumer	=a + b + c + d
Producer losses	=a
Losses to government	=c
Gain to Nation	=b + d

Data and Data Sources

Data for this estimation were obtained from various sources[1]. The cost of cultivation studies of the Department of Agriculture were used to derive input data. All inputs were classified as non-tradable or tradable. In some cases, production inputs comprise both tradable and non tradable components When such inputs are used in production, conversion factors were used to separate the tradable and non tradable components. (Eg. Fertiliser application comprises 0.82 tradable and 0.18 non-tradable input costs). C.I.F prices were collected from the Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI). Shadow prices, which reflect the true economic value, were gathered from the National Planning Department. The average conversion factor (0.785) was used to convert the value of the domestic resources into economic or efficiency prices. The demand and supply elasticity coefficients (-0.515 and 0.25 respectively) were extracted from the past studies (Samaratunge, 1984) in order to estimate welfare gains and losses.

Protection of Rice Sector

It is important in the first instance to determine the degree of protection the Sri Lankan rice farmers are enjoying. On the output side, the Nominal Protection Rate (NPR) measures the trade protection on output, while the Effective Protection Rate (EPR) measures protection on both output and input (Table 2). The NPR for rice averages 42 per cent for the entire 1990 to 1998 period. This indicates that on average the barriers to rice imports held the domestic price at 42 per cent above the import price and this is a positive protection to producers at the expense of consumers who have to pay a higher domestic price. EPR for paddy was 32 per cent for the period 1990 to 1998. This shows that the producers are being protected and they receive returns 32 per cent greater than what they would have received under free market conditions.

1. The data are not presented here due to spaces limitations. Those who need the original data should contact the authors.

Table 2: Nominal protection rate and effective protection rates (1990 to 1998)

Year	NPR	EPR
1990	44	33
1991	38	22
1992	41	25
1993	50	39
1994	33	44
1995	33	36
1996	43	29
1997	52	36
1998	45	22

Competitiveness of Rice Sector

There is a fear that removal of trade barriers will offer the rest of the world greater market access to the domestic rice market. Under this situation, the volume of imports or exports will be determined by the price competitiveness of the rice producing countries. This is measured by the competitiveness coefficient, which indicates the efficiency of resource use in production. The competitiveness Coefficient (CC = 1/DRC) was estimated at the country average level and the value was 0.56 during the period 1990 to 1998. This coefficient indicates that one Rupee worth of resources are used to produce 56 cents worth of rice valued in foreign exchange and it indicates a comparative disadvantage. However, this coefficient was estimated at the national aggregate level and it does not imply that rice production is unsuitable for Sri Lanka, as comparative advantage may exist in some regions with high production potentials.

A word of caution in interpreting the data is necessary. While earlier studies, notably the World Bank (1995), have arrived at similar conclusions, it has also been pointed out that the use of simple annual averages in computing NPC, EPC and DRC may bias the estimates and lead to incorrect policy decisions (Shilpi, 1996). However, to the

extent that the Sri Lankan non-plantation agriculture sector receives subsidies on non-tradables, such as on irrigation, research and extension, the actual level of protection would be greater than indicated by NPR calculations.

Since Sri Lanka has a weak comparative advantage in producing rice, this will allow free imports and adversely affect the domestic rice producer. This concept also applies to export where Sri Lanka will not be able to capture the foreign markets. Therefore, this low competitiveness coefficient shows that Sri Lanka's rice sector is still characterised by high cost of production and low yields.

While searching for means to cultivate rice at a lesser cost, an increase in productivity is necessary to reduce unit cost of production. Hence research is needed to improve the efficiency of resource use in rice production and thereby improve the competitiveness.

Impact on Domestic Prices

Once the free trade policy is implemented, trade barriers will be eliminated and this will push domestic prices in rice producing countries to move closer to international prices (Chand, 1998). It is assumed here that the international price of rice will remain at current levels after liberalisation. Consequently, the domestic price of rice would come down and stabilise around the world price. The expected price of rice decreases as shown in table 3 and accordingly, anticipated price per kg of rice is around Rs. 17.84 whereas the price under trade distortion is Rs. 24.00

At the same time, a price increase in agricultural inputs such as fertiliser can be expected following liberalisation as they are currently subsidised by the government. However this component was assumed to be negligible due to the low budget share of urea, the type of fertiliser currently subsidised.

Impact on Rice Production and Consumption

Removal of tariff barriers is expected to decrease rice price. As a result the area cultivated, yield and production will be affected. The analysis (Table 4) shows that the reduction in area cultivated is 100128 ha, which is around 12 per cent of the total cultivated extent. Similarly, the changes in yield in response to the price changes is shown in table 5. However, it is assumed that technology used for the cultivation activities for rice crop would be constant and will remain unaffected by the price changes

following the removal of trade distortions. In response to the price changes, supply change may occur due to changes in either area and

Table 3: Anticipated output price due to trade liberalisation

Item	Rice (Rs./Mt)
Import cost (cif)	15,600.00
Insurance	5460.00
Duty	702.00
Price with Defence levy	21762.00
Other costs	2338.00
Over head profit	24000.00
Selling price with out duty	17838.00
With duty (Rs./ kg)	24.00
Anticipated price (Rs./kg)	17.84

Table 4: Area responses for price changes

Item	Rice
Area elasticity	0.27
Price changes %	187.00
Area (ha)	729810
Area change (ha)	100128.00

Table 5: Yield responses for price changes

Item	Rice
Yield elasticity	0.25
Yield (Mt/ha)	3.70
Yield canges(Mt)	339361.00

yield or both. The results of this analysis are presented in table 6.

The reduction in supply of rice is mainly due to area reduction. As indicated in table 6, a reduction in paddy production by 421000 Mt can be expected due to the price reduction after trade liberalisation and it is about 16 per cent of the total production. On the other hand it is important to glance at the demand for rice as well. As shown in table 7, the estimated increase in quantity demanded due to price reduction of rice is around 298507 Mt valued at about Rs.84.21 million.

Distributional Impact and Welfare Effects of Trade Liberalisation

Distribution of consumer gain, producer losses, government losses and welfare gain for rice for the years 1990 to 1998 based on the model in figure 1 is shown in table 8. This shows that the trade liberalisation policy leads to gains to the nation than under the protectionist policy. The gain to rice consumer is Rs. 334.57 Million in 1998, whereas, losses to rice producer is about Rs. 84.21 million. In the same year government will loose about Rs.13.62 million. The implication of this finding is that the nation is gaining every year as a result of trade liberalisation in the rice market. However as a result of trade liberalisation, producers' revenue will decrease and consumers will enjoy positive surpluses.

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Table 6: Changes in supply

Item	Rice (Mt)
Total supply reduction	421369
Change in supply due to change in area	35448
Chang in supply due to change in yield	339361

Chang in supply due to change in both area and yield	46559

Table 7: Demand responses to changes of output prices

Item	Rice
Demand elasticity	0.52
Price changes(Rs./Kg)	6.16
Ave. Price (Rs./Kg)	20.92
Ave. supply (Mt)	1669962.00
Demand change(Mt)	298507.00

Table 8: Consumer gains, producer losses, government losses and welfare gains (000 Rupees)

Year	Consumer Gains	Producer Losses	Government Losses	Welfare Gains
1990	208580	78088	6720	123772
1991	196127	60945	8260	126922
1992	216692	83650	14820	118222
1993	252832	77590	12090	163152
1994	269314	78106	3400	187808
1995	191987	47194	0620	144731
1996	293490	54672	26200	212618
1997	388664	85122	22480	281062
1998	334575	84216	13620	236739

Conclusion and Policy Implication

Government policies that interfere with the rice sector is a continuous phenomena. Such policies are imposed due to political, social and economic reasons. However, as trade liberalisation is implemented, welfare analysis shows that the nation stands to welfare gain every year. On the other hand, liberalisation would result in decreases in area cultivated and yield. Meanwhile demand for rice will increase as a result of the reduced retail price.

With the decrease in supply and the concurrent increase in demand, a sudden increase in the import bill can be expected. This increase in the import bill would have an adverse effect on the trade balance.

Consumers will enjoy positive gains from the reduction in retail prices. The total rice consumption will increase due to lower prices and definitely improve consumer welfare. However, as a result of decreased output and output price, the producer revenue will decrease. Therefore it is imperative that the government actively gets involved in securing the opportunities opened by liberalisation to the rural population in order to iron out the adverse effects in employment. Promoting the adoption of technology, improvement of national and international technical and commercial information flow, developing efficient land and capital markets, and the development of technologies with higher productive potentials and comparative advantage may be the major activities that demand the government's attention along with trade liberalisation.

With appropriate foreign or local technology in production as well as in processing, the farmers can be provided better income and an atmosphere can be created for more employment opportunities in this sector. However, market intelligence and information, particularly in relation to foreign markets, should be made available. Moreover, reduced local production will result in unemployment in the rural sector and this is one area where the government has to intensify its activities.

Since the majority of farmers in the rice sector are small farmers, they do not have an opportunity to achieve economies of scale, which can be used as an alternative strategy to avoid the negative impact of the trade liberalisation on the producers. This can be achieved by integrating small farmers into systems. The organisational system can be developed as farmers' cooperatives, farmer companies or contract

farming. Further, it is time to review the present tenurial legislation in order to find an alternative solution to fragmentation of agricultural land.

References

Central Bank of Sri Lanka (1999). Annual Report. Central Bank of Sri Lanka, Colombo, Sri Lanka.

Corden, W.M. (1971). The Theory of Protection. Oxford: Clarendon Press.

Chand, R. (1998). Removal of Import Restriction and India's Agriculture: The Challenges and Strategies. Economic and Political Weekly.

Department of Census and Statistics (1982). Sri Lanka Census of Agriculture General Report. Department of Census and Statistics, Colombo, Sri Lanka.

Tshakok, I. (1990). Agricultural Price Policy: A Practitioner Guide to Partial Equilibrium Analysis. Ithaca NY: Cornell University Press.

Samaratunge, P. (1984). An Aggregate Economic Analysis of the Effects of the Price and Distribution Policy on Rice in Sri Lanka. M.Sc. Thesis (Unpublished) University of Philippines, Los Banos.

Shilpi, F.J. (1996). Estimating the Level of Protection: The Implications of Seasonal Price Fluctuations, *World Development*, 24(5): 28-39.

Tweeten, L. (1989). Classical Welfare Analysis: Agricultural Policy Analysis Tools Development. Bouderc: West View Press.

Thenuwara, H. N. (1998). World Trade and Protectionism: Issues for Sri Lanka Survey, Central Bank 8(5), Central Bank of Sri Lanka, Colombo, Sri Lanka.

Udegedara, S. (1996). SAPTA, for Preferential Trading within the SAARC Region. Economic Review 22(2), Peoples Bank, Sri Lanka.

World Bank (1995). Sri Lanka: Non-plantation Crop Sector Policy Alternatives. Report No.14 564 CE. The World Bank, Washington, D.C:

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