วารสารเศรษฐศาสตร์และนโยบายสาธารณะ 1(2) : 22 – 40

ISSN 1906 – 8522

Impacts of Export Tax Implications on Sesame in Myanmar

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Abstract

Export tax as a price control has been imposed on agricultural products of Myanmar. Sesame, one of the high potential export commodities from Myanmar, is also distorted by government export tax policy to shrink the volume of trade. This study investigates the impacts of imposing export tax on sesame seed trade under the assumption of dominant exporting country. To understand the closely related market nature, sesame market structure is estimated using simultaneous equations. Partial equilibrium view of policy simulation is further examined for clarification of alternative policy impacts (10%, 8%, and 5% export tax) on market participants. Simulation results report that current export tax causes the consumer surplus in both direct consumption and crushing sectors. A part from this it shows the best results not only in government revenue but also in society surplus. The recommendation can therefore be drawn out of this study that the export volume should not totally be banned and the export tax should not be totally eliminated for this commodity. Moreover, the tax revenue should be used in sesame industry improvement.

Keywords : sesame, export tax, partial equilibrium, simultaneous equations, policy simulation, welfare.

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1. Introduction

Export taxes have a long history of use by primary-product or raw-material exporting nations as a way to secure revenue for the central government. Another reason is that to deliberately depress domestic raw material prices to protect internal processors or consumers of the exported product from having to pay higher international prices (Houck, 1986; Hudson and Ethridge, 2000). It would be in some violation of effective WTO rules and prohibition of good negotiation among trading partners. This is because many countries believe that free trade optimizes utilization of the given resources in the production of goods through specialization and also maximizes consumer utility and further stimulates competition among nations. However, world trade is far from free. Most nations use various trade barriers to protect relatively inefficient industries. This is especially true for agriculture. The average tariff for agricultural goods (30%) is much higher than that for industrial goods (6%) (Koo and Kennedy, 2005).

The export tax that is levied by Myanmar government on agricultural products is not comparatively higher than the other low income nations. The customs duty on exports is 10 percent on export earning, comprising: a) 8 percent commercial tax and b) 2 percent income tax (GMS business forum and directory, 2006). Such a tax might be levied by a low-income nation on its exports of a crucial staple food product like rice, wheat, or vegetable oil (Houck, 1986; Piermartini, 2004). Nonetheless, many complaints are caused both domestically and internationally that Myanmar sesame trade is not facilitating because of such a big disincentive levy.

Generally developing countries are individually small in facing international market, that they cannot influence world market prices. Myanmar sesame case, however, has a market power in international market for sesame in accordance with the obvious world figures. Interestingly, Myanmar stood as the second largest producer of sesame production (661,000 tons in 2007) in the world and the fifth largest exporter (61,200 tons) in the world sesame market (American Sesame Growers Association (ASGA), 2008). The value of this export was 49 millions US dollars (FAO STAT, 2010).

In fact, abrupt changes in Myanmar Government policy occur frequently, which can be highly disruptive for the normal marketing process (Food and Agriculture Organization (FAO), 2004). Nevertheless, oilseeds and oilseed products, especially edible oils, are the second most important staple food in the country and the

Government still holds its protection mechanism in sesame trade. Besides, helping the consumer groups is a good political strategy in the most developing nations. Further, it would argue that this is a kind of qualified infant-industry argument for protection. The reason is that sesame is a kind of agricultural product which is determined under multi-market systems where one raw product is a primary input into the processing sector and its joint products are produced in approximately fixed proportion (Houck, Ryan, and Subotnik,1972; Hudson and Ethridge, 2000; Tomek and Robinson,1990). Undoubtedly, policy impacts on one raw sector would also affect both processing and final product sectors.

Unfortunately, there have not been any economic analyses for welfare impacts of government policies on sesame of Myanmar as well as on the other oilseeds yet. To develop sesame processing industry and secure such staple food in the country, it is essentially needed to understand the market structure of sesame industry and policy impacts on it. Accordingly, the research question of what are the impacts of export tax that restricts the free transaction of sesame in Myanmar is examined in this article. Under the limited data condition, this study tries to investigate the partial equilibrium welfare impacts of the export tax implications on sesame seed market.

The paper is composed of seven consecutive sections. Section 2 presents literature review followed by conceptual framework in section 3. Theoretical model is in section 4 and section 5 presents data and estimation procedures. The results are discussed in section 6 and section 7 provides conclusion and recommendation.

2. Literature Review

Holding the fundamental theorem of welfare, partial equilibrium model reflects the agricultural policy changes in the eyes of microeconomic theory. In spite of its weak ceteris paribus assumption, the model has been applied by numerous scholars in the advantages of simplicity and relatively small data demands. This theory was developed by Cournot (1801-1877) and Marshall (1892-1924) and generally speaking, that partial equilibrium theory usually looks at the relationship between two economic variables, assuming other variables are constant in value. Besides, the meaning of the partial equilibrium analysis can define that the effects of policy actions are examined only in the markets which are directly affected (Suranovic, 1997). Empirically, the approach has been developed broadly since the late nineteenth century. Houck, Ryan and Subotnik (1972), Penn and Irwin (1971), and Woo,

Calkins and Meyers (1986) explored the trade and production policy impacts on soybean and soybean product markets employing partial equilibrium (PE) framework. In Houck et al study, the main results of policy changes suggested that gross annual farm income from soybeans by boosting up the price support rate under market domination increased significantly but under free market situation, those effects were not obvious. In Woo et al study, six different policies scenarios on soybean sector and related livestock sector were also evaluated. The major findings of simulation showed that growth factors had greater impacts than policy factors had upon soybean import demand. Technological improvement in the soybean crushing process increased soybean import demand but decreased soy meal and soy oil import demand. Furthermore, an increase in net livestock exports also increased soybean import demand. Their studies practically highlighted the application of PE on closely-interlinked related markets which are affected by existing and alternative policy actions.

While it is valuable to be able to measure the general equilibrium welfare effect of an exogenous change in a single market, especially when it is difficult to obtain data from all related markets, partial equilibrium analysis in individual markets is also desirable for the information it provides on the distribution of welfare changes. between market sectors (Zhao, Mullen, and Griffith, 2005).

As the export taxes are mainly designed by developing and least-developed countries, their impacts on social welfare of specific sector of those countries are interesting to examine. The impacts of export tax policy developed by Hudson and Ethridge (2000) provided the partial equilibrium welfare impacts of cotton and yarn sectors in Pakistan. Their welfare findings showed that the export tax on cotton increased domestic consumption, decreased exports of cotton and transferred income from cotton producers to yarn spinners and the government. There was a social loss to Pakistan in the cotton sector. In opposition, the export tax on cotton increased domestic yarn production, consumption, exports, and incomes of yarn spinners, but large social loss occurred out of the yarn sector.

The effects of alternative export taxes policy on Argentine soybean products were also analyzed by Deese and Reeder (2007). As Argentina exported all soybean products like soybean, soybean oil and soybean meal, policy simulation was evaluated for four policy experiments. First, only the 23.5 percent export tax on soybeans was totally removed; second, the export taxes on soybean products were removed while leaving the export tax on soybeans in place; third, all export taxes on all products were set to 10 percent, and last, all export taxes on all products were removed. The key findings of simulations

showed that scenario 1 and scenario 3 caused the soybean export rose to 5 percent and all three products each rose by about 2 percent. It is therefore concluded that the peso devaluation of 60 percent in real terms likely had a greater effect on Argentine soy exports than export taxes.

On the other hand, Warr (2001) widely formulated the welfare effects of a rice export tax on Thailand economy. The analysis employed the general equilibrium technique instead to derive optimal tax rates and show the detailed relationship between various tax rates and their effects on aggregate welfare. Welfare effects were examined as changes in real consumption resulting from various levels of rice export tax. The principle finding from the simulations indicated that an export tax actually harms the poor, both in rural and urban areas.

Apart from the export tax, the impacts of many agricultural trade and production policies on endogenous prices, demand and supply of oilseeds and oilseed products markets through the PE analysis were also conducted by many scholars. Recently, Seesai (1997) estimated demand and supply analysis of soybean and soybean products in Thailand. Seven behavioral and five identity simultaneous equation models were developed in that study. The dynamic policy simulation for six policy scenarios such as the abolition of import taxes and import quota, an extreme decrease in import price of soybean meal, an extreme increase of that, an increase in production support budget, an extreme increase in domestic soybean price, and a reduction of import taxes and an increase in market access under WTO agreement were evaluated. Simulated findings reported that scenario 1 and 2 had negative effects on domestic production of soybean and domestic soybean demand for crushing of soy meal and soy oil. The simulation of scenarios 3, 4 and 5 showed that the production of soybean and crushed soybean increased while the import of soybean meal and oil decreased. Finally, soybean farmers and processing industries as well as soybean consumers benefited from scenario 6.

Furthermore, Sharma (2002) formulated the demand and supply relationships for Indian vegetable oil industry following partial equilibrium multi commodity approach. Eleven simultaneous equation models for peanut oil, sesame oil, mustard oil, cotton seed oil were estimated. The exogenous changes of price and income were simulated under static condition. The simulation results indicated that five percent increase in personal income raised total demand for vegetable oil, liquid oil and vanaspati production. On the other hand, five percent increase in vanaspati price increased total demand for vegetable oil, liquid oil consumption and industrial consumption, however, the exports declined.

3. Conceptual Framework

Having studied many literatures and followed the familiar Marshallian supply-demand concepts, a partial equilibrium view of export tax policy implication on sesame market is illustrated by sketching the simple conceptual framework (Figure 1). In fact, partial equilibrium trade analysis often assumes zero transportation costs. This simplifies the issue and allows researchers to determine the direction of price movements when considering the impact of various trade policies (Koo and Kennedy, 2005). Besides, the price - taking behavior on the part of both suppliers and demanders should be assumed necessarily throughout the model (Nicholson, 2005). The impacts of the alternative export tax policies on social welfare of market participants in sesame sector would be measured through the policy simulation since the partial equilibrium provides sharp results that highlight the important differences among policy measures.

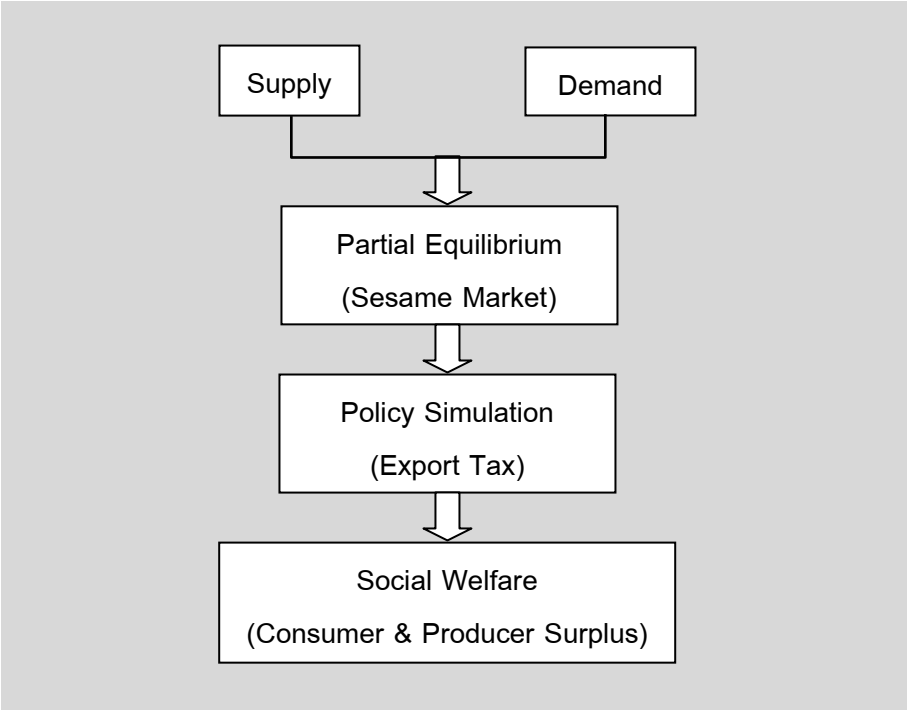

Figure 1 Conceptual Framework

4. Theoretical Model

To accomplish such framework, the structural model of estimating the impacts of export tax policy on sesame seed market is firstly illustrated. To reflect the clear vision of the social welfare effects of this export tax, the international trade model of sesame is secondly discussed.

Sesame market model

A simultaneous equation model is developed to examine the demand and supply relationships of sesame market. The constructed models are presented in Table 1. All models specifications are based on the well known microeconomic theory. On one hand, total quantity supplied for sesame seed (equation 1) is specified as a function of its output price and competitive crop price since the input cost of local sesame production is not prominent in comparing with the competitive price factor. On the other hand, total quantity demanded including direct consumption demand, crushing demand and export demand for sesame seed are examined as endogenous variables. Because the total quantity supplied for sesame seed can be structured as 13 % for direct consumption demand, 75 % for crushing demand, and 12 % for export demand.

Quantity demanded is used to specify as a function of own and substitute commodity price and income (Boonsaeng and Wohlgenant, 2007 ; Sharma, 2002; Srinivasan, 2005). In this model, direct consumption demand (equation 2) is assumed to be a function of own price and per capita income of the country (Ghosh, 2009; Seesai, 1997). The crushing demand is generally used to estimate as a function of input price and output price of crushing industry (Persaud and Chern, 2002). The crushing demand is the derived demand, which is derived from the demand for the final products, and is based on the cost-minimization strategy for a given level of output. In fact, local sesame oil mills used to crush sesame and groundnut simultaneously and the prices of these two oilseeds are very relative for domestic sesame oil millers to produce sesame oil and cake. In this analysis, sesame seed price with respect to groundnut seed price is used as input price and sesame oil price is used as output price from sesame crushing process. Sesame cake price, however, is not available for long time series and the production quantity of marine fish was used as the proxy for that variable in equation 3 (Woo, Calkins, and Meyers, 1986). Domestic fish production is demanding sesame cake for its higher protein content and consequently it would lead larger consuming sesame seed to crush in local oil mills.

Furthermore, export demand of sesame seed (equation 4) is constructed as a function of export price of sesame seed, the price of competing commodity in importer's market, and real per capita income of country's trading partner (Banik 2005; Fortenbery and Park, 2008; Kyi and Oppen, 2003; Sarwar and Anderson, 2007; Sharma, 2000; Warr and Wollmer, 2000). Thereafter, the price linkages between farm and wholesale levels and farm and export levels are specified by equations 5 and 6 (Boonsaeng and Wohlgenant, 2007; Woo, Calkins, and Meyers, 1986). Export price (equation 5) is determined behaviorally as a function of farm price and export tax based on the marketing margin concept. The identity equation 6 is mathematically derived from two steps margin. It is also based on the marketing margin concept and the study of Westhoff (1986). Firstly, farm price is the difference between wholesale (retail) price and margin, then wholesale price equals export price less export tax minus margin again. After summing these the identity linkage, equation (6), is simply obtained. It is assumed that a constant absolute marketing margin exists among export price, wholesale price and farm price of sesame seed.

In fact, an ad valorem tariff is a fixed percentage of the price of a good (Koo and Kennedy, 2005). Such kind of export tax is calculated as a fixed rate in percentage terms multiplied by export price of the good (equation 7). The export tax policy would affect the export price of sesame seed via shifting excess supply function. Then the changes in equilibrium prices would affect the supply and demand of sesame markets. Market clearing identity is also developed in equation 8 (Hirankitrangsee, 1987; Houck, 1964; Seesai, 1997). To expose all model equations, the definition of variables used and their units is presented in Table 2.

Table 1 Sesame Market Model

Models for estimating sesame market			**Equations**
$Sdse_t$	=	$a_0 + a_1\ Pfse_t + a_2\ Pcp_t + u_{1t}$	(1)
$Dcose_t$	=	$b_0 + b_1\ Pfse_t + b_2\ YM_t + u_{2t}$	(2)
$Dcrse_t$	=	$c_0 + c_1\ Pmse_t/Pmgn_t + c_2 Pose_t + c_3\ Qf_t + u_{3t}$	(3)
$Dese_t$	=	$d_0 + d_1 Pese_t + d_2 YJ_t + d_3 PigJ_t + u_{4t}$	(4)
$Pese_t$	=	$e_o + e_1 Pfse_t + e_2 ExT_t + u_{5t}$	(5)
$Pmse_t$	=	$0.5\ (Pese_t - ExT_t + Pfse_t)$	(6)
ExT_t	=	$T * Pese_t$	(7)
$Sdse_t$	=	$Dcose_t + Dcrse_t + Dese_t$	(8)

Endogenous variables: Sdse, Dcose, Dcrse, Dese, Pese, Pfse, Pmse, ExT

Exogenous variables: Pcp, YM, Pose, Qf, YJ, PigJ, T, Pmgn

u_{1t} to u_{5t} are disturbance terms and assumed to have zero mean, E (μ_i) = 0, constant variance, var (μ_i) = σ^2, and uncorrelated over the sample, E (μ_i, μ_j) = 0, for i $\neq$ j.

$_t$ represents time period.

Table 2 Definition of Variables and Their Units

Variables	Definition	Units
Sdse	Quantity supplied of sesame seed	Tons
Dcose	Quantity demanded for direct consumption of sesame seed	Tons
Dcrse	Quantity demanded for crushing of sesame seed	Tons
Dese	Quantity demanded for export of sesame seed	Tons
Pfse	Average farm gate price of sesame seed	Kyats per Ton
Pmse	Average wholesale price of sesame seed	Kyats per Ton
Pese	Export price for sesame exports	Kyats per Ton
Pcp	Average wholesale price of cow pea	Kyats per Ton
Pose	Average wholesale price of sesame oil	Kyats per Ton
Pmgn	Average wholesale price of groundnut seed	Kyats per Ton
PigJ	Cif price of groundnut in Japan market	US $ per Ton
YM	Myanmar per capita income	Kyats
YJ	Japan per capita income	US $
Qf	Production quantity of Marine fish and other	Tons
T	A fixed tax rate in percentage terms	Percent
ExT	Ad valoem export tax for sesame seed export	Kyats per Ton

International trade model for export tax policy on sesame market

The model is simply based on standard trade theory and the fundamental consequences of government intervention export tax policy are depicted graphically in Figure 2. Myanmar is assumed as a large country in the international market for sesame. For that reason, the country is facing the downward sloping demand curve, ED(R), of the rest of the trading world (Houck, 1986).

Currently, Myanmar government levies 10 % ad valorem export tax and it generates the tax-burdened excess supply function (ES*) faced by the rest of the world. The establishment of this tax, T_1, presses the domestic sesame seed price (Pm) down to Pm_1 and boosts the world price up to P_{e1}. Domestic production decreases from q to q_1' and consumption increases from q to q_1, then the volume of export shrinks from Qe to Qe_1. Consumer surplus gains by the area $Pmacpm_1$ and producer surplus loses by the area $Pmkepm_1$.Certainly, government could capture the tax revenue by the area bjce. Theoretically,

this revenue is incurred by consumers in importing countries and producers in exporting countries. As a consequence, society losses occur by releasing the variable inputs from higher-valued production and by selling with reduced price to domestic buyers rather than foreign buyers with the higher price. Area abc and jke could represent those losses.

Thereafter, our intention allows this policy to relax by setting 8% and 5% of export tax respectively keeping all other things constant. As shown in figure 2, the tax, T_2, would generate the new excess supply function (ES**) and consequently world price reduction, Pe_2, and domestic price increasing, Pm_2, would occur. The export volume may expand again, Qe_2, by producing more output and less consuming quantity, q_2, domestically. The new policies would have the effects of social welfare changes for all participants in this market. Government revenue loss and social welfare loss would be measured by the shaded areas.

5. Data and Estimation Procedure

Annual data covering the period from 1988 to 2007 are utilized to estimate the parameters in this study. The supply and demand quantities of sesame seed and the marine fish production quantity are drawn from the data source of FAOSTAT andMinistry of Agriculture and Irrigation, Myanmar. All domestic prices are collected from FAOSTAT, Statistical Year Book (CSO), Myanmar, and Market Information Service (MIS), Myanmar. Per unit value of export for Myanmar sesame available from FAOSTAT is used as sesame export price by converting with market exchange rate. All prices are in real term are in real term deflated by Consumer Price Index (CPI). In this study, Japan market is assumed as a major importer of Myanmar sesame seed and the real per capita income of this trading partner is drawn from International Monetary Fund (IMF) data base. Myanmar per capita income is also collected from IMF and Asian Development Bank (ADB) sources, and it is deflated by GDP deflator.

The system of simultaneous equations for sesame seed market is estimated by using two-stage least squares (2SLS) and three-stage least squares (3SLS) methods to correct the simultaneity bias (Henningsen and Hamann, 2006). The estimates of 3SLS show the small difference from the 2SLS estimates under the probable contemporaneous correlation of error terms of the various equations and thus the estimates of 3SLS are presented in this paper. In some circumstances, the application of 2SLS would ignore part of the information included in the entire system and hence the estimates of 3SLS would be more efficient (Koutsoyiannis,1977). All structural equations

are estimated using linear functional form in order to simplify the calculation of welfare effects. The model that is containing 5 behavioral and 3 identity equations consisted of 8 endogenous and 8 exogenous variables. Based on Gujarati (1995), the pre-estimation identification properties of the model are examined as a necessary condition and all structural equations are over identified. In addition, the rank condition of the models is also examined and the results show that all equations are identified. The baseline models as well as alternative scenarios for policy simulation are solved by using Gauss-Seidel algorithm. The procedures are fortunately incorporated in Eview software. In the analysis, appropriate respecifications are undertaken whenever each equation fails to accept theoretical and statistical validation.

After all, welfare effects of policy simulation are calculated following the standard geometric areas calculation. Simulation is used to estimate the distributional impacts associated with the export tax policy (Hudson and Ethridge, 2000). The fixed tax rate (T) is played as a policy variable in the sesame market model and its impacts on supply and demand of sesame via price variables are presented in Figure 3. The impacts of liberalizing sesame trade would simply be examined by reducing the tax rate in alternative scenarios.

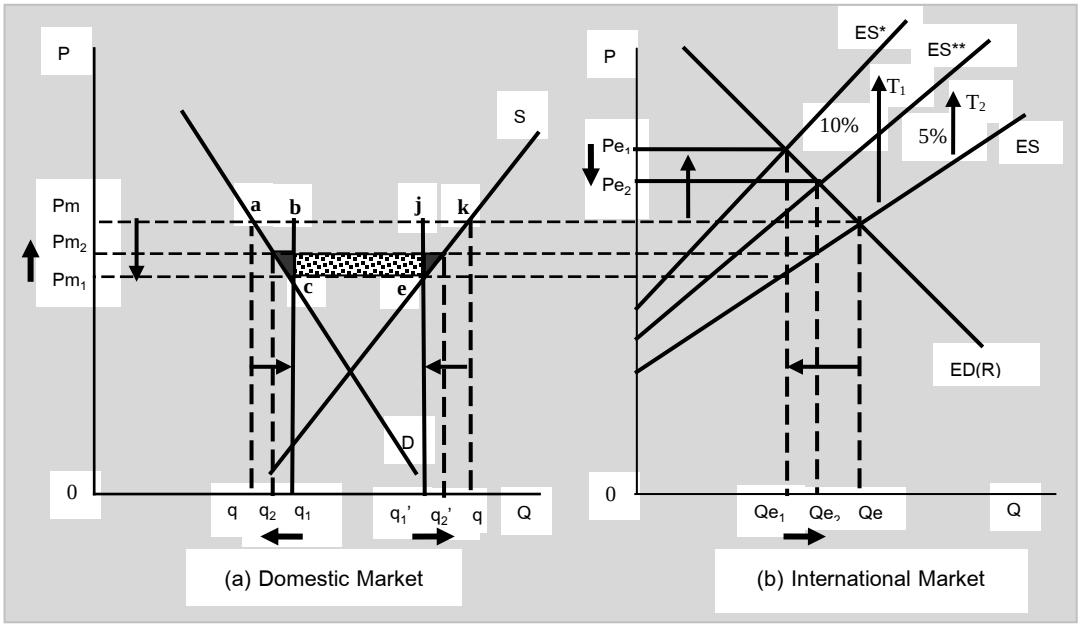

Figure 2 Impacts of export tax policy on supply and demand of sesame model

Note : The model was adapted from Houck, 1986

6. Results and Discussions

This section discusses the results for estimation and policy simulation. In summarizing, the structural models perform well following the data (Table 3). The system of equations is evaluated based on the theoretical and statistical criteria. All estimation results show the priori expectation in the directions and the estimated parameters reveal statistically significant.

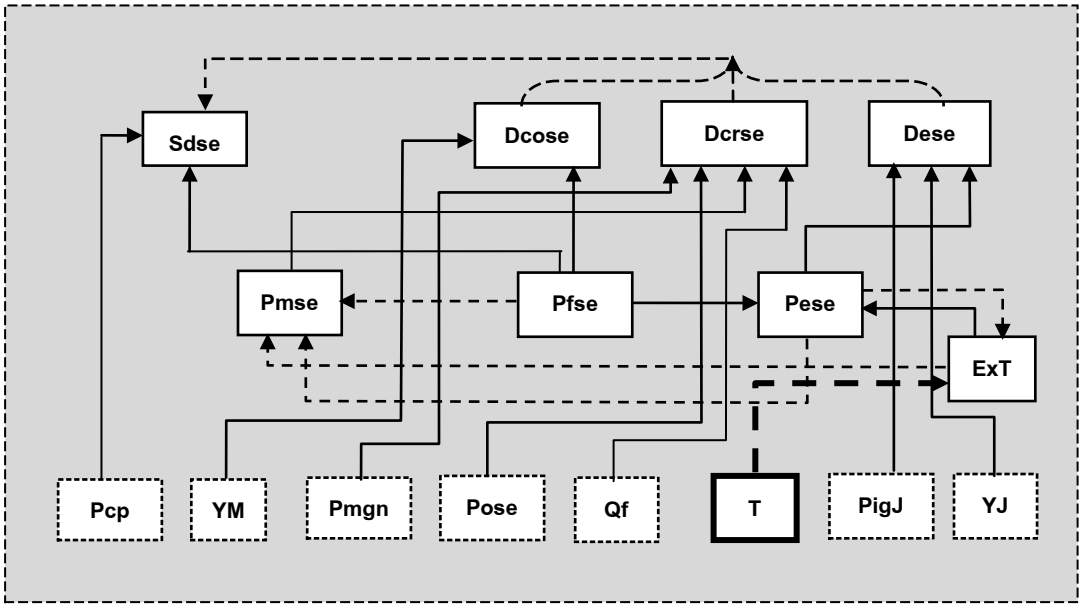

Figure 3 Impacts of export tax variable on sesame seed market

Note: = Endogenous variable, = Exogenous variable, = Identity equation

= Structural equations, = Policy variable

Note : The abbreviations used are :

Sdse	=	Total quantity supplied	Dcose	=	Direct consumption demand	Pfse	=	Farm gate price
Qf	=	Production quantity of fish	Dcrse	=	Crushing demand	Pmse	=	Wholesale price
ExT	=	Export tax	Dese	=	Export demand	Pese	=	Export price
Pmgn	=	Groundnut price	YM	=	Myanmar income	PigJ	=	Cif Japan groundnut price
Pcp	=	Cowpea price	YJ	=	Japan income	Pose	=	Sesame oil price

Table 3 Estimated results of sesame market

Equations	Coefficient	Standard Error	t-value	Adjusted R^2	LM-test
Eq.1: Seed supply (Sdse)				0.54	2.06 (0.14)[a]
Constant (a_0)	206075.0	3441.5	59.8794***		
Pfse	3.2841	0.2869	11.4476***		
Pcp	-3.0692	0.5834	-5.2607***		
Eq.2: Direct consumption (Dcose)				0.91	1.89 (0.40)
Constant (b_0)	-14963.57	4262.301	-3.5107***		
Pfse	-0.048001	0.025494	-1.8828**		
YM	3.992913	0.328207	12.1658***		
Eq.3: Crushing demand (Dcrse)				0.64	2.2 (0.11)
Constant (c_0)	461522.3	152667	3.0231***		
Pmse/Pmgn	-527756.9	111785.9	-4.7211***		
Pose	0.454131	0.193282	2.3496**		
Qf	0.353049	0.1494	2.3628**		
Eq.4: Export demand (Dese)				0.55	1.60 (0.47)
Constant (d_0)	-206343	47938	-4.3044***		
Pese	-0.1199	0.0345	-3.4708***		
YJ	2.7550	0.6681	4.1233***		
PigJ	163.671	38.114	4.2942***		
Eq.5: Export price (Pese)				0.95	1.7 (0.71)
Constant (e_0)	8318.0	3778.3	2.2015**		
Pfse	1.0335	0.0519	19.9165***		
ExT	0.4359	0.1147	3.7993***		

Note: ***statistically significant at 0.01 level, ** at 0.05 level, and *at 0.10 level.

[a] Lagrange Multiplier Test: ρ-values in parenthesis report that the residuals are not autocorrelated at the level of confidence interval.

Table 4 Simulation error statistics for endogenous variables in sesame market

Endogenous variables	Static-Deterministic Simulation (1988 to 2007)	
	Mean Absolute Error (%)	Theil's Inequality Coefficient
Seed Supply	1.17	0.06
Direct Consumption Demand	4.43	0.04
Crushing Demand	0.49	0.1
Export Demand	1.67	0.1
Export Price	5.38	0.06

Source : Calculation

This study further calculates price elasticities of supply and demand at mean value by using the marginal effect of respective variables since the prices play as the key role in this framework.

Despite its magnitude rather high, the elasticity of sesame supply with respect to its price shows inelastic (0.72), other factors hold constant. This is certainly due to the higher export opportunity of sesame seed since the continuous export makes the suppliers more responsive to its incentive price. The estimate of sesame direct consumption demand is less responsive to its own-price and the elasticity is approximately -0.1 at mean value. In fact, sesame seed is a unique commodity for local consumers and it has no other substitutes so far. The relative price elasticity of crushing demand or derived demand of sesame crushing is elastic and approximately - 2.13 at mean value. The result is more price responsive and it would be reasonable since the larger is the proportion of total costs accounted for by a particular variable input; the greater is the elasticity of demand for that input. The price elasticity of export demand for sesame is inelastic and calculated result shows - 0.27 at mean value. The negative relation between export price and export demand follows the conventional trade theory as we expected. Small price responsive of export demand would lead to increased export revenue with the price increases.

The results of simulation error statistics are further reported in Table 4. Two simulation error measures that compare the estimated and actual value are utilized in this study. The first indicator that employs for over-all reliability of each model is Mean Absolute Percentage Error (MAPE) and the second one is Theil's inequality coefficient (U_2). As shown in table 4, mean absolute error percent for endogenous variables in sesame model shows less than 10 percent. Theil U_2 value also reveals the less error which varies between 0.04 and 0.1. The results suggest that the sesame model is appropriate for policy simulation.

Three scenarios are conceived for policy simulation in this study seeing that the higher tax rates are not desirable policies for WTO and the other effective agreements. The first one is base line scenario which is the original government levying 10% export tax. Scenario 2 and 3 are set up by relaxing the export tax to 8% and 5% on sesame seed trade respectively. All scenario effects firstly generate the export price variation by shifting excess supply as discussed in previous section. Domestic prices fluctuations are also affected. Afterwards, dwindling and expanding of productions and consumptions are obvious in the domestic market.

Welfare effects of these simulation results

are reported in Table 5. The change in producer surplus is negative in the base case which is consistent with the priori expectation following the theory. Relaxing the export tax policy to 8% and 5% in other scenarios let the farmers gain in positive change by boosting up the domestic prices. On the other hand, consumers for direct consumption seed have been positively affected by government policy by transferring income from farmers in the base case. Undoubtedly, an export tax designed principally to protect domestic consumers from eager foreign buyers (Houck, 1986). Accordingly, scenario 2 and 3 reveal that reducing tax rate causes consumer surplus loss. In order to closely related markets nature, applying the export tax policy on raw products make the processors benefit by spending less effective input costs for such major raw products (Houck, 1986; Hudson and Ethridge 2000). Following the concept, consumer surplus for the crushing sector of sesame seed benefits well in the base case and reduces their surplus in successive scenarios.

Table 5 Effects of export tax policy implication on sesame seed

Welfare Items	Estimated Effects (Million Kyats*)		
	Base case (10%)	Set (8%)	Set (5%)
Change in :			
Producer Surplus	-8451	1870	4493
Consumer Surplus (Direct consumption)	1196	-270	-644
Consumer Surplus (Crushing)	5663	-1359	-3162
Tax Revenue for Government	3043	-2500	-3135
Net Social Effects	1451	-2259	-2448

Note: The figure was calculated by using the average value from 1988 through 2007.

* Myanmar currency

Source: Calculation

Government revenue by imposing 10% export tax on sesame seed is relatively higher as reported in results. In fact, this revenue is transferred from foreign consumers and domestic producers. Certainly, the revenue losses occur when the export tax rates are reduced at 8 % and 5 % Interestingly, the net social effects show positive from this current policy represented by area abc and jke as presented in earlier section. This means that consumers in foreign countries are more burdened by this policy rather than producers in exporting countries (Koo and

Kennedy, 2005). The result is reasonable since the price elasticity of demand for quantity export is inelastic. For that reason, the revenue would loss and society would incur for setting policy to 8% and 5% export tax in scenario 2 and 3 (Table 5).

7. Conclusion and recommendation

In accordance with the above mentioned results, this study can draw out two main conclusions. Firstly, as a satisfactory results of structural models estimations, the analysis could through accomplishment of policy simulation. Secondly, depend on the simulation results, government intervention on sesame seed trade is concluded as follows. Restricting the volume of export by imposing 10 % export tax on sesame seed trade generates the government revenue as well as the positive surplus to society in spite of the growers' negative surplus in some proportion. Setting less percentages of this imposition or overall elimination of it would generate negative impact on local government and society.

The conclusion would be in some arguments of liberalization view. This is because the consideration of the economic impacts of an export tax on one market level is incomplete without consideration of the "spillover" effects on other market levels (Hudson and Ethridge, 2000). However, it should also be remembered that export taxes can be used as an instrument for keeping domestic food prices relatively low, and in these circumstances their removal could have a negative impact on food security (FAO, 2003).

Accordingly, what should be the recommendation for policy makers from this study is that the government should not totally ban the high potential sesame seed trade that would benefit the local sesame farmers since the trade prohibition would lead the least incentive of local farmers. Nevertheless, abolishing to zero tax on this product should not be necessarily imposed. The reason is that the existing tax benefits the domestic consumers by the positive purchasing power effect, ensures the government revenue and eventually it generates the positive net social effect. Furthermore, the existing tax rate (10%) is relatively lower for a developing country that can influence the world market. However, the government should spend this export tax revenue on sesame industry improvement by upgrading technology and management. The more efficient industries would lead the more secure staple food items, and consequently it would generate the social welfare of poor groups concerning with this sector.

The further study should be developed as the option of optimal export tax on sesame

seed trade if the elasticity of excess supply and excess demand would be accurately available. Apart from this, the other appropriate policy scenarios for the whole oilseeds sector should also be developed to provide the useful information for policy makers. ✍

ACKNOWLEDGEMENT

This is a part of research work to fulfill my PhD study, and I would like to express my deepest thanks to anonymous referees for their constructive comments and valuable suggestions. We also would like to acknowledge Oil Crop Development Project, Myanmar funded by OPEC and representative FAO for its scholarship support throughout this study.

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