The Effects of Trade Liberalization on Groundnut Market in Myanmar

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Abstract Groundnut has been enjoying a larger share in the domestic oilseed market and assuming a significant role in the livelihood of farmers and processors as well as consumers. However, oilseeds and oilseed product markets in Myanmar have been distorted by the government's trade and agricultural policies. In order to achieve self-sufficiency in edible oil, groundnut seed export has been frequently banned even though the commodity has price competitiveness in the international market. Opening the market for groundnut would benefit the growers and processors under the multimarket aspects of this commodity. This study examines the impacts of trade liberalization of groundnut by constructing the supply and demand of groundnut seed market using simultaneous equations system. The partial equilibrium framework describes the welfare impacts on producers, consumers and society by measuring alternative scenarios of export demand. The results show that welfare gains of farmers are larger than the consumer surplus losses in both direct consumption and crushing sectors and consequently leading to a net gain for society.

Keywords: groundnut, simultaneous equations, partial equilibrium, welfare

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ผลกระทบของการค้าเสรีที่มีต่อตลาดถั่วลิสงในประเทศพม่า

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บทคัดย่อ สินค้าถั่วลิสงมีส่วนแบ่งตลาดภายในประเทศสูง และมีบทบาทสำคัญต่อการความเป็นอยู่ของ
เกษตรกร ผู้แปรรูป และผู้บริโภค อย่างไรก็ตามรัฐบาลพม่าได้มีการแทรกแซงตลาดพืชน้ำมันและผลิตภัณฑ์ผ่าน
นโยบายเกษตรและการค้า โดยห้ามส่งออกเมล็ดถั่วลิสงแม้ว่าสินค้านี้มีความสามารถในการแข่งขันในตลาด
ต่างประเทศก็ตาม ทั้งนี้เพื่อรักษาปริมาณให้เพียงพอต่อความต้องการใช้น้ำมันพืชภายในประเทศ การเปิดตลาด
ถั่วลิสงน่าจะทำให้เกษตรกรและผู้แปรรูปได้รับประโยชน์ภายใต้การพิจารณาหลายๆ สถานการณ์ตลาด การศึกษา
นี้วิเคราะห์ถึงผลกระทบหากจะมีการค้าเสรีของถั่วลิสงโดยการสร้างแบบจำลองอุปทานและอุปสงค์ของตลาด
เมล็ดถั่วลิสงในลักษณะระบบสมการเกี่ยวพัน รวมถึงการวิเคราะห์ผลกระทบต่อสวัสดิการของผู้ผลิต ผู้บริโภค
และสังคม ภายใต้โครงสร้างดุลยภาพบางส่วนตามสถานการณ์ต่างๆ ของจำลองอุปสงค์การส่งออก ผลการศึกษา
ชี้ให้เห็นว่าการเปิดการค้าเสรีถั่วลิสงจะทำให้สวัสดิการของเกษตรกรเพิ่มขึ้นมากกว่าสวัสดิการของผู้บริโภคที่จะ
ลดลงทั้งในด้านการบริโภคโดยตรงในรูปเมล็ดงาและน้ำมัน จะเป็นผลให้การเปลี่ยนแปลงสวัสดิการสุทธิทางสังคม
ดีขึ้น

คำสำคัญ: ถั่วลิสง ระบบสมการเกี่ยวพัน ดุลยภาพบางส่วน สวัสดิการ

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Introduction

Trade affects growth in three primary ways: it encourages flow of resources from low productive to high productive sectors, leading to an overall increase in output; with unemployed resources, an increase in export sales leads to an overall expansion in production and a fall in unemployment rate; and it allows for the purchase of capital goods from foreign countries and exposes an economy to technological advances of the developed countries (Banik, 2005).

As a member of the WTO, Myanmar has followed the commitments on domestic support reduction for most of the country's agricultural enterprises. Nevertheless, in establishing a fair and market-oriented agricultural trading system, the state economy is still adopting policies that tend to distort both export and import competition. After 1988, adopting the market-oriented policy and allowing the private sector to play a bigger role in trade and marketing of pulses and some kitchen crops has provided a large price incentive to local farmers and other participants in those sectors. There were many arguments in the oilseed sector that the trade and marketing of this sector can be better encouraged with price incentive practices.

Oil crops are becoming economically important in the world for human food, animal feed and bio-fuel. Oilseed production and trade has a long history in the economy of Myanmar. Edible oil is the second most important staple food for Myanmar people. For this reason, the government emphasized two strategic goals, namely, self-sufficiency and price stability in oilseeds and edible oils. However, the oilseed sector is complex and not easy to manage; a chronic deficit in locally produced edible oil made the government import large volumes of palm oil to meet demand, which made the price of locally produced oilseed unattractive to farmers. There was not much incentive to produce more for the local market or for export because of an export tax on sesame seed, a ban on the export of groundnut seed, and an import quota on palm oil. These trade-distorting measures have impacted on the local producers, processors and traders of oilseed and oilseed products.

Among the important oilseed commodities, the share of groundnut is significant; harvested area increased by 131 percent and grain production increased by 192 percent from 1988 to 2007 (FAO stat, 2008). Nevertheless, the government frequently bans trade on groundnut. This policy has been a barrier to groundnut marketing, a factor for inefficient resource use as a whole and a disincentive to market participants. Unfortunately, there has not been any empirical economic analysis of the welfare impacts of government policies on groundnut and other oilseeds.

A related study assessed the price competitiveness of groundnut in the Japanese and Indian markets based on the Nominal Protection Rate (NPR) by Mon (2004). It showed that Myanmar groundnut seed had price competitiveness in Japan market during some trading years.

The major aim of this study is to measure the welfare effects on market participants of opening the groundnut market. Liberalization of Myanmar's groundnut seed trade would lead to an increase in domestic price and a reduced consumption in the crushing sector and in the direct consumption sector. Farmers and processors would benefit from higher prices. To inform a more effective and appropriate agricultural policy on oilseed, this study would simulate a policy scenario on one oilseed, groundnut. Under the limited data condition, this study conducts a partial equilibrium analysis of the effects of exogenous shock on demand and supply of groundnut seed. Exogenous changes in one sector of an industry have spill-over effects in other vertically and horizontally related markets. While it is valuable 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).

The market linkages for joint products have been provided by Houck, Ryan, and Subotnik (1972) based on the U.S. soybean sector. Under the partial equilibrium framework, supply and demand curves are used to depict the price effects of policies. Producer and consumer surplus is used to measure the welfare effects on participants in the market (Suranovic, 1997). The approach has been explored by many studies including Abranham, Deardorff, and Stern (1987), Ghosh (2009), Hudson and Ethridge (2000), Persaud and Chern (2002), and Srinivasan (2005).

The research question,"What are the welfare impacts of liberalizing groundnut market" is examined in this study. The paper consists of five sections. After this introduction is the conceptual framework followed by model specifications, results and discussion, and conclusion and recommendations.

Conceptual Framework

In accordance with the partial equilibrium technique, the clearance on the market of groundnut industry will be obtained independently from prices and quantities supplied and demanded in other markets. This theory was developed by Cournot (1801-1877) and Marshall

(1892-1924). Partial equilibrium theory usually looks at the relationship between two economic variables, assuming other variables are constant in value. The effects of policy actions are examined only in the markets that are directly affected (Suranovic, 1997). To simplify the model, the assumption of perfect competition is usual made and there would be no argument for that because both raw and crush firms of groundnut are uncontrolled by state economy. Social welfare effects would be reflected through policy simulation. In line with this approach, the above research question can be answered through this conceptual framework (Figure 1).
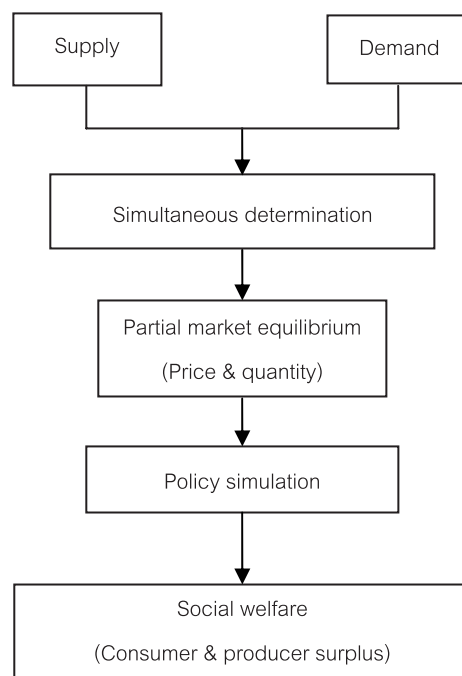

Figure 1 Conceptual framework

The theoretical model of an open market policy on groundnut market is presented in Figure 2, where total quantity supplied (Sdgn) and total quantity demanded (Dcogn+Dcrgn+Degn) are set up for the market equilibrium of groundnut seed. For the total demand, two domestic demands (Dcogn and Dcrgn) are examined endogenously and one international demand (Degn) is specified exogenously in accordance with their proportions. The linkage of farm price and wholesale price (Pfgn and Pmgn) affects both supply and demand. The related microeconomic variables such as input price (Pf), income (YM), output price (Pogn), would also affect the groundnut

market theoretically. Then, the impacts of liberalizing trade can simply be examined by increasing the export quantity of groundnut as exogenous shock in the domestic demand function. Additionally, the concepts of trade theory support to measure the welfare effects of participants at the new market equilibrium of groundnut.
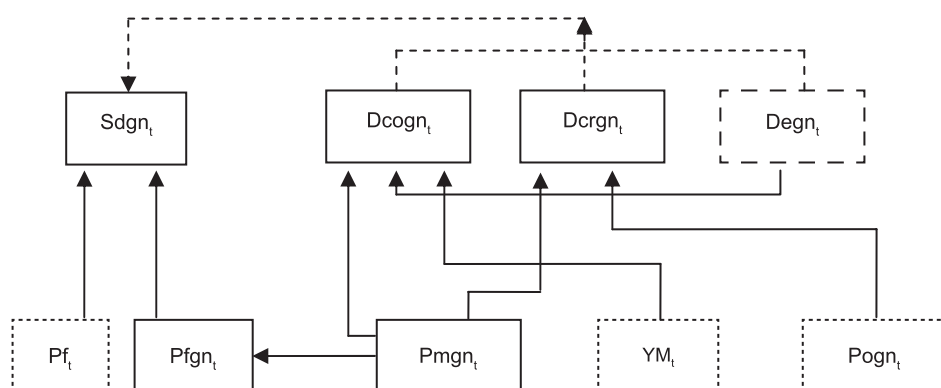

Figure 2 Theoretical model of trade liberalization on supply and demand of groundnut in Myanmar

Key: □ = Endogenous variable   ┊┊ = Exogenous variable,   ⌐ ¬ = Shock variable

⟶ = Structural equations   - - - -▶ = Identity equation

Note: Sdgn = total quantity supplied of groundnut seed, Dcogn = domestic direct consumption, Dcrgn = domestic crushing, Degn = export demand, Pfgn = farm price, Pmgn = wholesale price, Pf = fertilizer price, YM = per capita income, Pogn = wholesale price of groundnut oil

Model

A simultaneous equations model is developed in order to estimate the supply and demand relationships for groundnut seed market. And to see the welfare effects of an open market, a policy simulation is developed.

Simultaneous Equations Model

An econometric model for groundnut seed market is specified based on the well-known microeconomic theory. On one hand, total quantity supplied of groundnut seed is specified as a function of its output price and factor price (Ghosh 2009; Boonsaeng and Wohlgenant 2007). These two prices can positively and negatively affect the quantity supplied so that the supply equation of groundnut is structured as:

$$Sdgn_t = a_0 + a_1 Pfgn_t + a_2 Pf_t + \mu_1 \tag{1}$$

where $Sdgn_t$ is the total quantity supplied of groundnut seed (tons) at time t, $Pfgn_t$ is the average farm gate price of groundnut seed (kyats/ton), and Pf_t is the average fertilizer price (N,P,K) (kyats/ton) in the country.

On the other hand, total quantity demanded for groundnut seed is examined separately into direct consumption demand, crushing demand, and export demand. The first two are examined as endogenous variables and the third is specified as exogenous variable. Because the share of export quantity for groundnut seed is very small (0.5%) compared to crushing quantity (73%) and direct consumption quantity (26.5%). In addition, there are generally two kinds of groundnut seed in the local market, one for oil extraction the other for direct consumption. The groundnut seed for oil extraction is less attractive in the international market. For these reasons, the export quantity is specified exogenously in domestic direct consumption demand to see how the domestic market will change with the opening of the market for groundnut export. The quantity demanded for direct consumption of groundnut seed ($Dcogn_t$), then, has been assumed as a function of own price, income and quantity exported (Ghosh, 2009).

$$Dcogn_t = b_0 + b_1 Pmgn_t + b_2 YM_t + b_3 Degn_t + \mu_2 \tag{2}$$

where, $Pmgnt$ is the average wholesale price of groundnut seed (Kyats/ton), YMt is Myanmar's per capita income (Kyats), and $Degn_t$ is quantity demanded for export of groundnut seed at time t.

Quantity demanded for crushing is considered as a derived demand of industry operation. The reason is that the manufacture of meal and oil from whole beans ("crushing") is a physical and chemical process with relatively fixed technological coefficients (Houck 1964; Tomek and Robinson 1990). Such kind of demand is generally estimated as a function of input price and output price of its crushing industry (Persaud and Chern, 2002). Accordingly, the function can be constructed as:

$$Dcrgn_t = c_0 + c_1 Pfgn_t / Pfse_t + c_2 Pogn_t + \mu_3 \tag{3}$$

where $Dcrgn_t$ is quantity demanded for crushing of groundnut seed at time t, $Pfgn_t / Pfse_t$ is the average farm gate price of groundnut seed with respect to average farm gate price of sesame seed (Kyats/ton), and $Pogn_t$ is average wholesale price of groundnut oil (Kyats/ton) at time t.

In addition, Equation 4 represents the price linkage which is based on the marketing margin concept. It is assumed that a constant absolute marketing margin exists between wholesale price and farm price of groundnut seed.

$$Pfgn_t = d_0 + d_1 Pmgn_t + \mu_4 \qquad (4)$$

where $Pfgn_t$ is the average farm gate price of groundnut seed at time t, and $Pmgn_t$ is the average wholesale price of groundnut seed at time t.

Market clearing identity for groundnut seed is depicted by Equation 5 (Hirankitrangsee, 1987; Houck, Ryan, and Subotnik, 1972; Seesai, 1997).

$$Sdgn_t = Dcogn_t + Dcrgn_t + Degn_t \qquad (5)$$

where $Sdgn_t$ is total quantity supplied of groundnut seed at time t, $Dcogn_t$ is quantity demanded for direct consumption of groundnut seed at time t, $Dcrgn_t$ is quantity demanded for crushing of groundnut seed at time t, and $Degn_t$ is quantity demanded for export of groundnut seed at time t, respectively.

From Equations 1 to 4 where the disturbance terms (μ_1 to μ_4) are assumed to have a zero mean, $E(\mu_i) = 0$, then the covariance matrix of the μ_i is assumed the same at each observation, $var(\mu_i) = \sigma_i^2$ and are assumed to be uncorrelated over the sample, $E(\mu_i, \mu_j) = 0$ (Intriligator, Bodkin, and Hsiao, 1996).

The system of simultaneous equations is estimated by using two-stage least squares (2SLS) and three-stage least squares (3SLS) methods to correct the simultaneity bias (Arne and Jeff, 2006). The estimates of 3SLS showed small difference from the 2SLS estimates under the probable contemporaneous correlation of error terms of the various equations. 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). Thus the estimates of 3SLS are presented in this paper. All structural equations are estimated using linear functional form in order to simplify the calculation of welfare effects. The complete model comprising 4 structural and 1 identity equations consisted of 5 endogenous (Sdgn, Dcogn, Dcrgn, Pfgn and Pmgn) and 5 exogenous or predetermined variables (Pf, YM, Degn, Pfse, and Pogn). 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 examined and the results show that all equations are identified. The baseline model is solved by Gauss-Seidel algorithm. (The procedures are incorporated in EViews software). In the analysis, appropriate re-specifications are made whenever each equation failed to accept theoretical or statistical validation.

The Simulation Model of Measuring the Welfare Effect

Welfare effects of liberalizing groundnut trade are presented graphically in this portion by price and quantity diagrams of groundnut markets (Figure 3). The study emphasizes on the groundnut seed markets (from section A to section D) in the lower parts of Figure 3. Where direct consumption demand of groundnut seed (Dcogn) in section (A) adds horizontally to crushing demand (Dcrgn) in section (B), and export demand (Degn) in section (D) to form total demand (Ddgn) in section (C). Total supply of groundnut seed (Sdgn) in section (C) can be assumed to structure as 26.5 percent for direct consumption, 73.0 percent for crushing and 0.5 percent for export. The intersection of this total supply (Sdgn) and total demand (Ddgn) produces the equilibrium price (p1) which rations the available supply into crushing, direct consumption and export indicated by the first horizontal dotted line through section A to D. Only the policy impacts on these seed markets are examined.

Groundnut has closely related market sectors and the possible impacts of policy on these related markets are explored. Accordingly, the middle and upper parts of Figure 3 are discussed as follows. Crushing quantity of groundnut seed (Dcrgn) in section (B) can yield fixed amounts of groundnut cake and oil as shown by the dotted vertical line through sections G and H since oil production (Sogn) in section (H) and cake production (Scgn) in section (G) are locked together through technically fixed crushing yields for cake and oil (Houck, Ryan, and Subotnik, 1972). This is the possible way to illustrate the joint-product relationship between oil and cake. It can also be mentioned in simplified equation forms as:

$$\text{Sogn}_t = \text{Fogn}_t * \text{Dcrgn}_t \tag{6}$$

$$\text{Scgn}_t = \text{Fcgn}_t * \text{Dcrgn}_t \tag{7}$$

where Sogn and Scgn represent the groundnut oil and cake productions, Fogn and Fcgn are fixed ratios of oil and cake meaning that fixed yield of oil and cake per ton of groundnut seed. Further total demand of cake (Dcgn) in section G is also horizontal summation of the domestic demand (section F) and foreign demand of groundnut cake (section E). The total demand for groundnut oil at wholesale is shown in section (H). Import and export of groundnut oil are negligible and therefore, domestic demand for this oil is assumed as total demand for this. Pogn and Pcgn represent oil and cake prices and Qogn and Qcgn indicate oil and cake quantities. Inventories and handling costs would be ignored. In order to this relationship, changes in equilibrium price and quantity of raw product sector by one policy impact would also affect prices and quantities on those final product sectors through the processing sector.
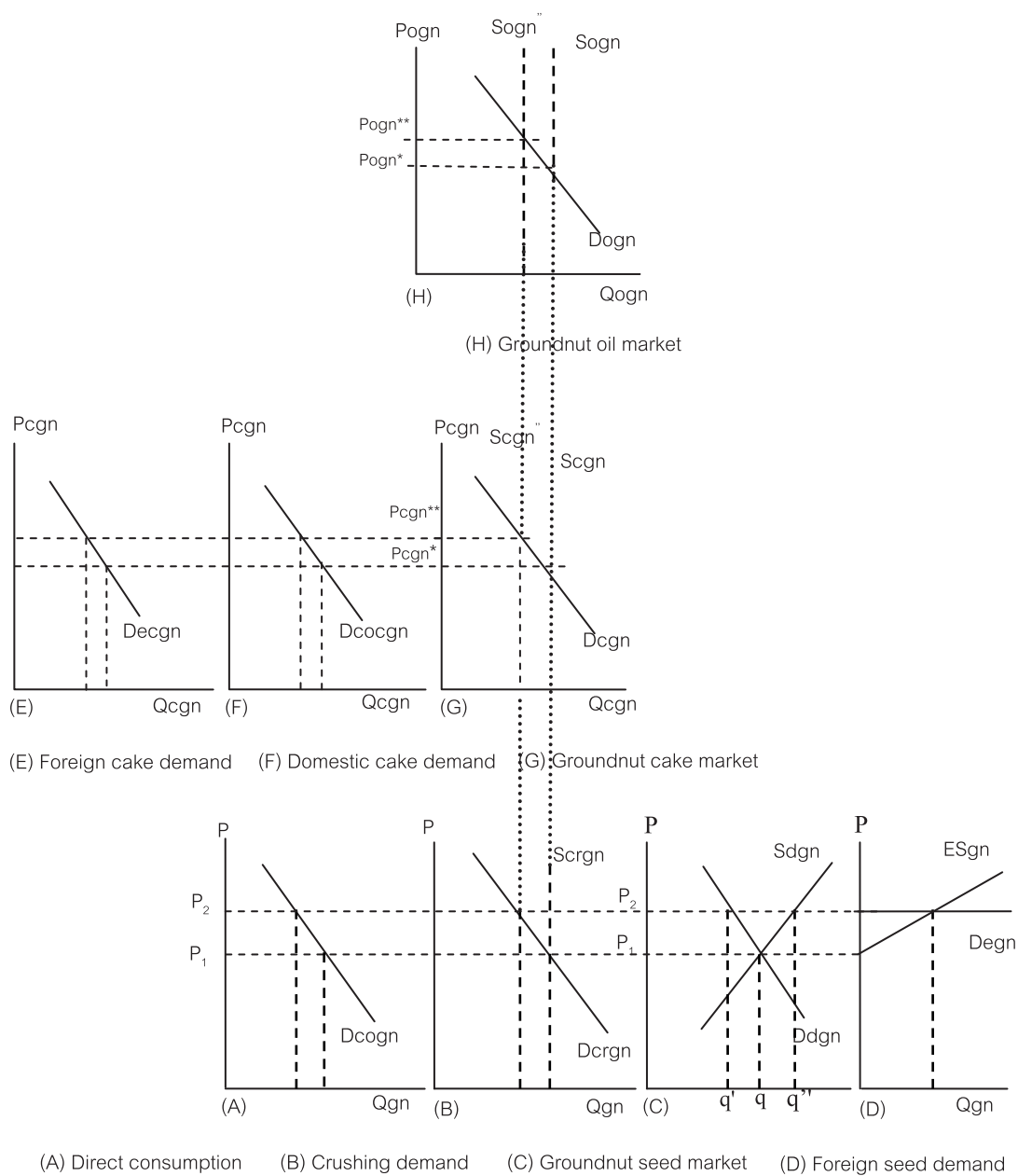
Pogn   Sogn"   Sogn

Pogn**

Pogn*

Dogn

(H)   Qogn

(H) Groundnut oil market

Pcgn   Pcgn   Pcgn Scgn"   Scgn

                                    Pcgn**
                                    Pcgn*

Decgn   Dcocgn   Dcgn

(E)   Qcgn (F)   Qcgn (G)   Qcgn

(E) Foreign cake demand   (F) Domestic cake demand   (G) Groundnut cake market

P   P   P   P

                    Scrgn   Sdgn   ESgn
P₂   P₂
P₁   P₁   Degn

          Dcogn   Dcrgn   Ddgn

(A)   Qgn (B)   Qgn (C) q' q q" (D)   Qgn

(A) Direct consumption   (B) Crushing demand   (C) Groundnut seed market   (D) Foreign seed demand

Figure 3 Effects of trade liberalization on supply and demand of groundnut industry

Source: Adapted from Houck *et al.* (1972)

Now our main intention turns to focus on opening the market for groundnut seed by increasing export quantity. Myanmar is assumed as a small nation for groundnut case. Once the market opens up for groundnut seed, by ignoring the transfer costs, the horizontal excess demand curve for the rest of the trading world ED (R) (so called Degn in section D) determines the domestic price (P_2) (Houck, 1986; Koo and Kennedy, 2005). Domestic equilibrium prices and quantities would change. All domestic demand successively decrease to q' with the higher price, and domestic producers who receive the attractive price produce more output, q'', as shown in the lower part of Figure 3.

To reflect the welfare effects on participants, simulation of alternative scenarios (10%, 20%, 30%, 40%, and 50% increases in quantity demanded for export) are employed keeping all other factors constant. The alternative scenarios are solved by Gauss-Seidel algorithm by using EViews software. In general, simulation refers to the determination of the behavior of a system via the calculation of values from an estimated model of the system. Once market equilibrium values of prices and other variables are determined for each of the alternative scenarios depicting different ways of protecting domestic oilseed growers, the welfare impacts on consumers, producers and processors is obtained (Hudson and Ethridge, 2000; Intriligator, Bodkin, and Hsiao, 1996; Srinivasan, 2005).

Consumer surplus is traditionally defined by the area between the demand curve and the equilibrium price as the demand curve shows the amount the consumer is willing to pay for an additional unit of output. Similarly, producer surplus is traditionally defined by the area above the supply curve and below the equilibrium price as the supply curve shows the price producers require to produce an extra unit of output. Social surplus is the sum of producers' and consumers' surpluses. It represents the gains to society from the production, trade and consumption of the particular good being examined (Oehmke and Crawford, 2004). Accordingly, changes in consumers, producers and social surplus are calculated using the mathematical calculations of areas by supporting the graphical evidence depicted in section (C) of Figure 3.

Data

Annual data covering the period 1988-2007 are used for this analysis. All price variables are deflated by consumer price index (CPI). The per capita GDP of the country is used as the proxy of country's per capita income by deflating with GDP deflator. The variables used and their sources appear as Table 1.

Table 1 Variable explanation and sources of data

Variables	Explanation	Units	Sources
$Sdgn_t$	Quantity supplied of groundnut seed	Tons	faostat.fao.org
$Dcogn_t$	Quantity demanded for direct consumption of groundnut seed	Tons	faostat.fao.org
$Dcrgn_t$	Quantity demanded for crushing of groundnut seed	Tons	faostat.fao.org
$Pfgn_t$	Average farm gate price of groundnut seed	Kyats per Ton	faostat.fao.org
$Pmgn_t$	Average wholesale price of groundnut seed	Kyats per Ton	faostat.fao.org; CSO[1]; MIS[2]
YM_t	Myanmar per capita income	Kyats	ADB[3]; IMF[4]
$Degn_t$	Quantity demand for export of groundnut seed	Tons	faostat.fao.org
Pf_t	Average fertilizer price (N, P, K)	Kyats per Ton	Owned survey; Agri-Business News
$Pogn_t$	Average wholesale price of groundnut oil at Yangon & Mandalay market	Kyats per Ton	CSO
$Pfse_t$	Average farm gate price of sesame seed	Kyats per Ton	faostat.fao.org

Note: [1] Statistical Year Book, Ministry of National Planning and Economic Development, Myanmar

[2] Market Information Service, Department of Agricultural Planning, Ministry of Agriculture and Irrigation, 2006-2007

[3] Myanmar Key Indicators, Asian Development Bank

[4] International Monetary Fund

Results and Discussion

The structural equation models performed well, as indicated in Table 2. The results show that the priori expectation in directions and the estimated parameters are statistically significant. Additionally, Theil inequality coefficient and mean absolute percentage error are applied to evaluate the model for policy simulation.

This study also calculates price and income elasticities at mean value. The price elasticity of supply for groundnut is inelastic and approximately 0.14 at mean value. The price elasticity of demand is also inelastic and approximately -0.17 at mean value. Income elasticity is elastic and approximately 1.8 at mean value. This is because; income elasticites are generally higher for better-quality products or preferred grades. Price elasticity of supply and demand shows that small changes in quantity result in slight changes in price.

Table 2 Results of structural equations model for groundnut market in Myanmar

Equations[a]	Coefficients[b]	Standard error	Adj. R-squared	LM-test[c]
$Sdgn_t$			0.93	2.09 (0.58)
$Pfgn_t$	0.9864**	0.4029		
Pf_t	-0.3729*	0.2124		
Constant (a_0)	226613[ns]	182522		
$Dcogn_t$			0.86	1.80 (0.15)
$Pmgn_t$	-0.2715***	0.0636		
YM_t	14.9247***	1.0917		
$Degn_t$	-1.9517***	0.5305		
Constant (b_0)	-101978***	12237		
$Dcrgn_t$			0.52	1.99 (0.68)
$Pfgn_t/Pfse_t$	-529226**	201166		
$Pogn_t$	0.5927***	0.0741		
Constant (c_0)	634451***	149969		
$Pfgn_t$			0.97	2.03 (0.12)
$Pmgn_t$	0.7689***	0.0273		
Constant (d_0)	-3158[ns]	3136		

Endogenous variables	Mean absolute percentage error	Theil inequality coefficient
Groundnut supply	0.80	0.04
Direct consumption demand	1.97	0.03
Crushing demand	4.67	0.10
Farm gate price	5.56	0.04

Note: [a] The abbreviations used are: Sdgn = total quantity supplied of groundnut seed, Dcogn = domestic direct consumption, Dcrgn = domestic crushing, Degn = groundnut exports, Pfgn = farm price of groundnut seed, Pmgn = wholesale price of groundnut seed, Pfse = wholesale price of sesame seed, Pf = fertilizer price, YM = Per capita income, Pogn = wholesale price of groundnut oil.

[b] ***, **, * indicate the statistical significance at 0.01, 0.05 and 0.10 levels, respectively. [ns] represents non-statistical significance at all levels.

[c] The probability of accepting the null hypothesis implies that the residuals are not auto-correlated at the level of confidence interval as indicated by the ρ-values in parentheses.

After simulation, Table 3 shows the percent increases in two domestic prices through alternative scenarios. The endogenous variables affected by a shocking exogenous variable, namely, export demand, are: Quantity supplied of groundnut seed ($Sdgn_t$), Quantity demanded for direct consumption ($Dcogn_t$), Quantity demanded for crushing ($Dcrgn_t$), Farm gate price of groundnut seed ($Pfgn_t$) and Wholesale price of groundnut seed ($Pmgn_t$).

Welfare effects of trade liberalization of groundnut seed are also presented in Table 3. Since liberalizing international trade boosts the domestic price in the exporting country, there is a gain in producer surplus from an increase in output price and higher production Therefore, producer surplus change shows positive in all scenarios. On the other hand, direct consumers who consume the groundnut seed as direct consumption and consumers who consume it as major input in their oil mills suffer from the increase in domestic price of groundnut seed. Their consumptions successively decrease and transfer their income to domestic producers. Consumer surplus changes, therefore, are negative in all scenarios in both of the consumption sectors. Nonetheless, the substantial producers gain is more than the total consumer losses, which results in a positive social surplus, as Table 3 shows.

Table 3 Effects on prices and welfare in case of liberalizing the groundnut export trade

Effects	Scenarios of export quantity increase				
	10 %	20 %	30 %	40 %	50 %
Price changes (percent)					
Domestic farm price	0.08	0.16	0.24	0.31	0.39
Domestic wholesale price	0.07	0.15	0.22	0.30	0.37
Welfare changes (in million kyats)					
Producer surplus	86307	172574	258896	345178	431445
Consumer surplus (direct consumption sector)	-24979	-49885	-74747	-99536	-124260
Consumer surplus (crush sector)	-58213	-116221	-174086	-231747	-289218
Total social surplus	3114	6467	10062	13894	17966

Conclusion and Recommendations

Trade liberalization effects have been investigated in many different ways all over the world. In this paper, the estimation is conducted to examine only the effects of a trade ban and of trade liberalization of a commodity. Two main conclusions are drawn from the result: (1) the satisfactory results of the structural model estimation and simulation error evaluation suggest that policy simulation can be provided an effective guide for policy formulation and (2) in accordance with the simulation results, liberalizing groundnut trade would benefit farmers through higher prices and the substantial producer gain would be more than the consumer losses in all scenarios. Therefore, it has a positive net effect on society as well as in groundnut production. Unfortunately, in the short term this welfare effect from trade liberalization would not favor the domestic consumers (both in the direct consumption and crushing sectors). But in the long term, there might be an incentive to farmers to increase the production in response to the demand from export that might also help to improve the consumers' welfare effect.

A recommendation from this study is that the policy makers should not ban groundnut trade but rather provide the opportunity for opening the trade in groundnut sector as it results in a net benefit to society. In addition, because the consumers are worse off with trade liberalization, there should be measures to compensate the consumer sectors for the loss or policies that complement trade liberalization that minimize the negative impacts on consumers. Appropriate policy scenarios and their welfare effects for the entire oilseed sector could be the subject for further study.

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