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# NEGOTIATIONS ON SPECIAL AGRICULTURAL SAFEGUARDS: ISSUES, ANALYSIS OPTIONS AND A CASE STUDY

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The Special Agricultural Safeguard (SAG) is a provision that may be invoked by a Member country of WTO for a product subject to tariffication. It is for the application of the special safeguard designated in the Member's Schedule. It is designed to prevent disruption on domestic markets due to import surges. The current paper provides the answer to the research question, whether special agricultural safeguards have impact on international trade flow or not? Time series data of imports of butter in USA from 13 countries was modeled and estimated by using OLS technique. The adjusted coefficient of determination for the import demand equation of the butter was 0.56, which indicates that the variables included in the equation explained 56 per cent of the variation in imports of butter in the USA. The overall result of the model was also significant as reflected through estimated F-value. The results also showed that in the import demand equation, the coefficients of price, in-quota tariff and over-quota tariff were negative as per *a priori* expectations. The positive sign of SAG revealed that total volume of imports and the commitments of suppliers plays important role in the import of butter.
**Keywords**: Special Agricultural Safeguards, import demand, Tariff-Rate Quota

## INTRODUCTION

A "safeguard" action means restricting imports of a product temporarily to protect a specific domestic industry from an increase in imports of any product which is causing serious injury to the industry. The WTO agreement sets out requirements for safeguard investigations by national authorities. The emphasis is on transparency and on following the recognized rules and regulations. While imposing, a safeguard measure should be applied only to the degree necessary to prevent serious injury and to help the industry concerned to adjust accordingly. A safeguard measure should not prevail more than four years. But this could be extended up to eight years subject to a determination by competent national authorities that the measure is needed to the extent of adjustment of industry. The WTO's Safeguards Committee is responsible for the surveillance. Governments are responsible for reporting each phase of an investigation and related decision-making, and the safeguard committee reviews these reports (WTO, 2001). The Special Agricultural Safeguard (SAG) is a provision of the Uruguay Round Agreement on Agriculture that may be invoked by a World Trade Organization (WTO) Member for a product subject to tariffication and for which application of the special safeguard is designated in the Member's Schedule. It allows WTO Members to impose additional tariffs on agricultural products if their import volume exceeds defined trigger levels or if prices fall below specified trigger level. It is designed to prevent disruption on domestic markets due to import surges or abnormally low import prices, and can apply only to imports that exceed tariff-quota volumes. The special agricultural safeguard clause is an alternative to the general safeguard provisions in the General Agreement on Tariffs and Trade (GATT). This clause is much easier to invoke because it does not require a test of injury or the provision of compensation (OECD, 2003).

The World Bank in 2003, prepared a draft on the issue which contained the following elements

a) The current SAG would cease to apply for developed countries;
b) Developing countries could continue to use the current SAG for products identified in their UR tariff schedules;
c) Developing countries could apply the current SAG to new strategic products designated with special safeguard mechanism (SSM) in their tariff schedules;
d) There would be a review of Article 5 of the Agreement on Agriculture to ensure whether it meets the needs of developing countries.

Later on the following changes were made in the 3rd and 4th point.

- Developing countries may not apply the current SAG and a new SSM to a product, concurrently.
- Technical work will be undertaken on the development of an SSM.

The main objective of current paper is to provide the answer to the question, whether special agricultural safeguards has impact on the trade flow. The second part of paper presents a

theoretical framework to explain butter purchase decisions of U.S. importing firms. The theoretical model leads to testable hypotheses. At the end of this section, various options for analysis are given. The description about data is presented in the third section. Section 4 presents estimated results. The last section concludes and discusses some possible extensions to the current framework.

## MATERIALS AND METHODS

Consider a world with Z countries that supply butter to the United States. Consumers in the U.S. have a two-tier preference structure (Lai and Trefler, 2004) in which the upper tier is a Cobb-Douglas function over different goods while the lower tier is a Dixit-Stiglitz Constant Elasticity of Substitution (CES) function over varieties of the different goods. The logarithm of the lower tier utility function for a representative consumer in the importing country is:

$$U = \mu\sigma/(\sigma-1)\ln\left(\sum_z \int_0^{n_z} m_z(v)^{(\sigma-1)/\sigma}\, dv\right)$$

Where μ is the constant share of income spent on butter, σ is the elasticity of substitution between butter varieties, $m_z$ measures consumption of variety ν produced in country *z*. The reparability assumption implies that the representative consumer maximizes the lower tier utility function subject to his budget constraint,

$$\mu Y = \sum_z \int_0^{n_j} p_z m_z(v)\, dv$$

where *Y* represent the total income of the representative consumer in the importing country and $p_z$ is the retail price in country *z*. Total imports coming from country *j* in sector *s* are:

$$M_j = n_j m_j = \mu Y \frac{(p_j)^{-\sigma} n_j}{\sum_z (\Phi_z p_z)^{1-\sigma} n_z}$$

And $\Phi_z \geq 1$ is the *ad valorem* equivalent of trade costs associated with shipping goods from country *z* to the importing country. We assume that each variety is produced by one firm and that there is a continuum of firms amounting to a total of $n_z$ in sector *s* of the country.

The implicit assumption in the consumers' utility maximization problem is that processed goods are differentiated by country of origin (the Armington (1969) assumption). Exporters sell to U.S. retailers/traders who produce differentiated commodities under constant average variable costs. Profit maximization implies a constant mark-up pricing rule in the processing sector:

$$p_j = \frac{\sigma}{\sigma-1} c_j$$

Where $c_j$ is the constant marginal cost of traders/retailers. Marginal cost is the selling price of producers in the exporting country (denoted $w_j$) multiplied by an *ad valorem* trade cost function $\Phi_z \geq 1$ such that $c_j = \Phi_z w_j$. The *ad-valorem* trade barrier must account for the special agricultural safeguard (SAG). If the price charged by the exporting firm is below some threshold value (which is the average of the 1986-1988 average import price and denoted by $\bar{w}_j$), a snapback tariff equal to $t_j$ is applied. Moreover, butter imports are subject to a Tariff-Rate Quota (TRQ) with in-quota and over-quota tariffs denoted respectively by $\tau_j^{iq}$ and $\tau_j^{oq}$.

$$\Phi_j = (\tau_{j,h})^{\rho} (t_j)^{\lambda}; \quad h = iq, oq$$

where ρ and λ are coefficients to be estimated.

The import demand function can be rewritten in logarithmic form as:

$$M_j = \ln\mu Y - \sigma(\rho \ln\tau_{j,h} + \lambda \ln t_j + \ln w_j) + \ln n_j - \ln\sum_z (\Phi_z w_z)^{(1-\sigma)} n_z$$

As mentioned before, trade in U.S. dairy products is protected with a TRQ. Because of that protection structure and the fact that the price-based SAG is a snapback tariff that can be triggered within a marketing year, three situations may arise:

1. The minimum access of the TRQ is not filled and thus $\tau_{sj} = t_{sj} = 1$.
2. The TRQ minimum access is filled and $\tau_{sj} > 1$; $t_{sj} = 1$.
3. The TRQ minimum access is filled and $\tau_{sj} > 1$; $t_{sj} > 1$.

The term μ*Y* is the fraction of total income (*Y*) spent on butter imports. Hence, it can be proxied by $\mu Y = \sum_j p_j M_j$ which is the total value of U.S. imports. The term $\ln\sum_z (\Phi_z w_z)^{(1-\sigma)} n_z$ is a multilateral resistance index and is invariant with respect to the importing country. Hence, it can be considered as a constant in the empirical model if one is not particularly interested in estimating the structural parameters of the model. Finally, the number of butter varieties sourced by each country (denoted $n_j$) can be proxied by a dummy variable for the source countries.

Imports at time *t* from country *j* can be modeled as a random effect model:

$$M_{jt} = \alpha_0 + \beta_j + \alpha_1 \ln w_{jt} + \alpha_2 \ln \mu Y_{jt} + \alpha_3 \ln\tau_{jt,h} + \alpha_4 \ln t_{jt} + \varepsilon_{jt}$$

Where $\varepsilon_{jt}$ is a random error term that satisfies the usual properties and $\beta_j$ measures the unobserved number of varieties from each country (assumed constant throughout the sample and uncorrelated to the set of independent variables). Equation (6) can be estimated with standard OLS techniques assuming that all independent variables are observed (more on that later). There is a direct correspondence between equations (5) and (6) and one could estimate directly the structural parameters such as the

elasticity of substitution ($\sigma$) and trade barriers elasticities ($\rho$,$\lambda$); but this is not of particular interest at this time.

The important parameter in the model is the coefficient $\alpha_4$ which measures the efficiency of the safeguard in controlling import surges. A small and/or insignificant coefficient implies that safeguards are not especially useful in controlling import surges; and thus would cast doubt on the theory that safeguard can be used as insurance policy when liberalizing trade. Conversely, a large and significant coefficient would support the argument that safeguard can be used to liberalize trade in an "orderly" manner. Note that the safeguard coefficient is the product of the substitution elasticity ($\sigma$) and the trade cost parameter ($\lambda$).

**Options for Analysis**

The problem is that import prices ($w_{jt}$) are not observed when trade flows are zero. We have basically three options to deal with this problem:

a) Pretend zeros do not exist and analyzing the data for positive trade flows.
b) Impute the missing prices using a program like Amelia available at gking.harvard.edu/amelia/ (Honaker *et.al* 2007). The strategy is straightforward: use the observed prices to impute missing prices. For example, assume that import prices are jointly normally distributed. Imputed prices are generated to form a "complete" dataset. The strategy is to generate N such datasets to run the empirical model. The parameters of interest are simple weighted means of all different estimates for each simulated dataset.
c) The final option is to specify a selection equation before specifying the import equation. Hence, the first stage would whether or not imports are positive and, given imports are positive, the second stage would explain the level of imports.

**Data**

The paper in hand addresses the first option i.e zeroes do not exist and there are a positive trade flows. For this purpose the data of U.S. imports of butter from different countries were collected from the websites of United States Department of Agriculture (USDA), Foreign Agricultural Service (FAS). The exporter selling price was proxied by import unit values. Data of in-quota and over quota tariff and Special Agricultural Safeguards were compiled from the website of United States International Trade Commission. The sample consists of positive trade flow of monthly imports data of butter from 1998-2008. After making the panel data, the sample size was consisted of 1064 observations. Definitions of variables as well as their sample statistics are presented in Table 1.

A total of 55 countries exported butter to USA during the period 1998-2008. Thirteen countries exported about 94 percent quantities of butter during this period. Table 2 shows the list of countries and the percentage of their supplies.

**RESULTS AND DISCUSSION**

The results of the model are presented in Table 3. The OLS estimation was carried out by using the STATA software. The adjusted $R^2$ for the import demand equation of the butter was 0.56, which indicates that the variables included in the equation explained 56 per cent of the variation in imports of butter in the USA. The overall result of the model was also significant as is shown by the F-value.

**Table 1. Variable Definitions and Sample Statistics (Sample Size 1064)**

| Variable | Mean | SD |
|---|---|---|
| Quantity (Metric tons) | 105.85 | 244.34 |
| Price ($/kg.) | 3.25 | 1.92 |
| Total Import Value (000 $) | 2041.82 | 1921.05 |
| In-Quota Tariff ($/kg.) | 0.083 | 0.061 |
| Over-Quota Tariff ($/kg.) | 0.095 | 0.135 |
| SAG ($/kg.) | 0.036 | 0.082 |
| (Number of observations in the sample) | 49 | |
| Argentina | 103 | |
| Australia | 42 | |
| Canada | 50 | |
| Czech Republic | 110 | |
| Denmark | 131 | |
| France | 100 | |
| Ireland | 41 | |
| Israel | 126 | |
| New Zealand | 37 | |
| Norway | 81 | |
| Poland | 15 | |
| South Africa | 53 | |
| Uruguay | 126 | |
| ROW | | |

**Table 2. List of Countries Exporting Butter to USA (1998-2008)**

| Countries | Percent of Export |
|---|---|
| Argentina | 2.13 |
| Australia | 13.68 |
| Canada | 1.64 |
| Czech Republic | 4.52 |
| Denmark | 2.29 |
| France | 2.08 |
| Ireland | 3.12 |
| Israel | 3.24 |
| New Zealand | 44.45 |
| Norway | 3.36 |
| Poland | 3.21 |
| S. Africa | 2.08 |
| Uruguay | 8.11 |
| ROW | 6.11 |
| Total % | 100.00 |

Source: Calculations from the data obtained from USDA website.

**Table 3. Estimates of the Import Model of Butter in USA**

| Variable | Coefficients | S.E. |
|---|---|---|
| **Import Demand Equation** | | |
| Price | -1.46 | 0.102 |
| Total Import Value | 0.66 | 0.042 |
| In-quota Tariff | -0.24 | 0.081 |
| Over-quota Tariff | -0.31 | 0.111 |
| SAG | 0.03 | 0.027 |
| Australia | 0.76 | 0.095 |
| Canada | 0.04 | 0.090 |
| Czech Republic | 0.22 | 0.054 |
| Denmark | 0.28 | 0.040 |
| France | 0.24 | 0.034 |
| Ireland | 0.18 | 0.027 |
| Israel | 0.04 | 0.035 |
| New Zealand | 0.28 | 0.020 |
| Norway | 0.10 | 0.024 |
| Poland | 0.02 | 0.018 |
| S. Africa | 0.09 | 0.027 |
| Uruguay | 0.09 | 0.017 |
| ROW | 0.10 | 0.013 |
| $R^2$ | 0.57 | |
| Adjusted $R^2$ | 0.56 | |
| F-value | 77.10 | |

The results showed that in the import demand equation, the coefficients of price, in-quota tariff and over-quota tariff were negative as per *a priori* expectations. The value of coefficient price was -1.46 and was significant at 1 percent level. The values of coefficient of in-quota tariff and over-quota tariff were -0.24 and -0.31 respectively. Both coefficients were significant at 1 per cent level. The value of coefficient of SAG was 0.03 but was non-significant. The positive sign of SAG variable could be due to the reason that tariff policy significantly controlled the import surge and decrease of domestic price of butter. The coefficients of total import value was positive and having value of 0.66. The coefficient of total import value was significant at 1 per cent level. The dummy variables for countries have mixed signs and significance levels. The coefficients of all dummy variables were positive but the coefficients for Australia, Czech Republic, Denmark, France, Ireland, New Zealand, Norway, South Africa, Uruguay and ROW were significant at 1 per cent level.

The special agricultural safeguard concerns that removing non-tariff measures might result in either a flood of imports that would hurt domestic production or depress domestic prices because duties bound through the tariffication process alone might not be sufficient. A natural question to ask is whether a special agricultural safeguard is efficient in providing insurance to any import competing sector against sharp decline in prices when liberalizing trade? The purpose of this research paper was to provide an answer to this critical question by using an econometric approach. The current paper relies on statistical tools to investigate the efficiency of the special agricultural safeguard policy applied in the U.S. butter industry. On the current research theme, very few studies are available and that too a work conducted on empirical basis.

In the import demand equation the coefficients of price, in-tariff quota and over-tariff quota were having negative sign and significant at 1 per cent level. The coefficients of total import value and SAG were positive. The coefficient of total import value was significant at 1 % level but the coefficient of SAG was non-significant. The positive sign of SAG revealed that total volume of imports and the commitments of suppliers plays important role in the import of butter. The countries dummy variables have all positive signs and different significance levels.

## CONCLUSIONS

At this stage, these are important results indicating the impact of special agricultural safeguards policy on imports of commodities. We are bit conscious as well because it can create bias if the number of zeros in the dataset is important. The way forward towards new horizon of research is to impute the missing prices using a program like Amelia (http:// gking.harvard.edu/ amelia/) by using the observed prices to impute missing prices. The strategy is to generate N such datasets to run the empirical model like that of Tobit model to evaluate random effect. The parameters of interest are simple weighted means of all different estimates for each simulated dataset. Another option could be to specify a selection equation before specifying the import equation. Hence, the first stage would determine whether or not imports are positive and, given imports are positive; the second stage would explain the level of imports.

## REFERENCES

Armington, P.A. 1969. A theory of demand for products distinguished by place of production. IMF staff papers. 16 (3): 159–76.

Honaker, J., G. King and M. Blackwell. 2007. Amelia II: A program for missing data. Harvard University, USA [Online]. Available at http://gking.harvard.edu/amelia/ (accessed on 20 Jan. 2009).

Lai, H. and D. Trefler. 2004. On estimating the welfare gains from trade liberalization. Working paper, University of Toronto [Online]. Available at citeseerx.ist. psu.edu/ viewdoc/summary?doi=10.1.1.69.6776 (accessed on 21 Jan. 2009).

OECD. 2003. Glossary of statistical terms: Special agricultural safeguards [Online]. Available at http://stats.oecd.org/glossary/detail.asp?ID=2513 (accessed on 21 Jan. 2009).

WTO. 2001. Agricultural negotiations: backgrounder. Special agricultural safeguards [Online]. Available at http:// www.wto.org/ english/tratop_e/ agric_ e/negs_ bkgrnd06_access_e.htm#specialsafeguards (accessed on 25 Jan. 2009).