

**TRIGGERS, REMEDIES AND TARIFF CUTS: ASSESSING THE IMPACT OF
THE G33 SPECIAL SAFEGUARD MECHANISM AND G20 TARIFF CUTS**

DRAFT – COMMENTS WELCOME

Jason H. Grant^{a,*}, Karl D. Meilke^b

^a *Dept. of Agricultural & Applied Economics, Virginia Polytechnic Institute and State
University, Blacksburg, VA, USA*

^b *Dept. of Food, Agricultural and Resource Economics, University of Guelph,
Guelph, Ontario, Canada*

Abstract

The Framework Agreement and Chairman Falconer's recent draft text commits WTO Members to establish a new *Special Safeguard Mechanism* (SSM) for developing countries. An SSM may be an attractive policy tool for low-income countries because it is automatic and it does not require an injury test nor the provision of compensation. In this study we calibrate a global, stochastic, partial equilibrium model to assess the economic impact of the recent G33 SSM proposal on low-income, developing countries. We pay close attention to the stabilization effects of the G33 SSM on developing country domestic markets as well as the welfare cost on developed country exporters using the world wheat market as our case study. The results show that an SSM can stabilize domestic markets and costs very little in terms of economic welfare. However, the SSM can destabilize domestic market conditions. Frequent use of the volume-based SSM leads to domestic price instability in 22 out of 31 low income countries examined.

* Tel.: +1 540 231 7559; fax: +1 540 231 7417.
E-mail address: jhgrant@vt.edu

Introduction

Low-income developing countries will form an integral part of the Doha Development Agenda (DDA) negotiations of the World Trade Organization (WTO). This is recognized in the DDA Ministerial Declaration launching the negotiations (WTO, 2001): "...special and differential treatment for developing countries shall be an integral part of the negotiations to enable developing countries to effectively take account of their development needs, including food security and rural development" (p.6). However, the WTO agricultural negotiations have made only limited progress. Since the negotiations began in November of 2000, most of the key deadlines have been missed. On 1 August 2004, WTO Members adopted a "Framework Agreement" (WTO 2004) that along with the Doha Declaration (WTO 2001), the Hong Kong Ministerial Declaration (WTO 2005) and the recent draft text of Chairman Falconer (WTO 2008), constitutes the basis for future modality commitments.

One aspect of *Special and Differential Treatment* (SDT) that has been mentioned in the numerous proposals by low-income countries is the need for a new, simple-to-use *Special Safeguard Mechanism* (SSM).¹ Indeed, the "Framework Agreement" and Chairman Falconer's draft text for modalities (herein called the Draft Text) commits WTO Members to establish an SSM with a price and volume trigger to help low-income countries take account of their development needs. Low-income WTO Members currently have recourse to general safeguards under Article XIX of the General Agreement on Tariffs and Trade (GATT), as well as the *Special Agricultural Safeguard* (SSG) established in the Uruguay Round Agreement on

¹ Special Products are another important aspect of *SDT*. According to paragraph 41 of Annex A of the Framework Agreement, special products will be subject to "more flexible treatment" through lower tariff reductions over longer implementation periods. At the WTO ministerial Conference in Hong Kong in December 2005, Members agreed that developing countries will have the flexibility to self-designate an appropriate number of SPs but that this designation should be guided by indicators of food security, livelihood and rural development initiatives.

Agriculture (URAA); however, there are at least three reasons why developing countries are calling for a new SSM.

First, although the general WTO safeguard under Article XIX addresses the issue of price declines and rapid import surges, it requires an injury test as well as the provision of compensation when it is used. Proving injury and providing compensation are often beyond the technical and financial capabilities of low income countries (Grant and Meilke 2006). Second, the UR SSG is restricted to products that were included in the UR tariffication process, a process that applies to fewer than 20 percent of agricultural tariff lines in developing countries (Valdes and Foster 2005). Most developing countries set bound tariffs outside the tariffication process because they did not apply non-tariff barriers prior to the UR. As a result, many developing countries are not eligible to use the UR SSG. Finally, developing countries have fewer fiscal resources to provide domestic support to agricultural producers during the periods of increased imports or depressed prices of staple commodities.

A new, simple-to-use SSM will give developing countries the ability to temporarily raise tariffs to protect domestic agriculture from sharp price declines or rapid import surges. An SSM is a simple tariff that is triggered when prices fall below or imports rise above an exogenous reference level. The economics of tariffs are well known. Exporters favor their elimination while importers lower them with great reluctance despite the fact that there are welfare gains associated with tariff cuts. Surprisingly, very little quantitative analysis has been conducted to evaluate the possible welfare costs of an SSM. One reason for this is the lack of structure and detail in the proposals for an SSM making it difficult to implement the policy in a quantitative framework.

Sharma (2006) evaluated the effectiveness of alternative reference periods to define the price and volume trigger of an SSM and concluded that three and five year moving averages provided reasonable reference periods in terms of the frequency of SSM triggers and the magnitude of additional duties. However, Valdes and Foster (2005) concluded that a regression trend reference price is superior to moving averages or base period references. Grant and Meilke (2006) provide a comprehensive analysis of the effects of the UR SSG in a stochastic simulation framework using wheat as a case study, but did not investigate alternative formulations for a new SSM. Montemayer (2007) developed a simulation exercise to evaluate the frequency of use and additional duties of the G33 SSM proposal in six net-importing countries and several commodity case studies. However, the study by Montemayer (2007) did not identify the welfare costs of the SSM on developed countries nor did it evaluate the frequency of use and additional SSM duties when it is combined with a contemporaneous tariff cutting exercise (such as the G20 proposal).

This study contributes in three ways. First we evaluate the effectiveness of the G33-based SSM proposal when it is combined with the G20 proposed tariff cuts. Both proposals, or slight variations of them, are likely to form the basis of an acceptable agricultural package in the DDA. Moreover, the frequency of use and the additional SSM duties that are allowed under a new SSM depend fundamentally on the size of the tariff cuts that may force a reduction in applied rates. Thus it is important to be able to model both scenarios in a quantitative framework. Second, we evaluate the ability of the G33-SSM to stabilize domestic markets in low-income wheat importing countries. Finally we assess the welfare cost of the G33-SSM on developed country exporters who may accept a new SSM for developing nations if it results in larger tariff cuts than in its absence.

The Design of a New SSM

The need for an SSM is recognized in several important WTO documents. However, Members continue to disagree over the exact form a new SSM should take. Too briefly recount the discussions over its design, on 12 February 2003, Harbinson, Chair of the Agricultural negotiations, articulated that a well-designed SSM will form part of an acceptable agricultural package for low-income countries (WTO 2003a). The following elements for a new SSM were suggested:

- The current SSG would cease to apply for developed countries;
- Developing countries could continue to use the current SSG for products identified in their UR tariff schedules;
- Developing countries could apply the current SSG to new strategic products designated with an SSM in their tariff schedules;
- There will be a review of Article 5 (the article describing the SSG) of the Agreement on Agriculture to ensure it meets the needs of developing countries.

On 18 March 2003, Mr. Harbinson tabled a revised draft (WTO, 2003b) that changed the wording surrounding a new SSM. The new wording maintains the first two bullets above, but replaces the third and fourth with:

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

In the 13 September 2003 Draft Cancún Ministerial Text tabled by Mexican Foreign Minister Lois Ernesto Derbez, the wording was refined to: “A special agricultural safeguard shall

be established for use by developing countries subject to conditions for products to be determined,” (WTO 2003c, p. A-3).

On 31 July 2004, Paragraph 42 of the “Framework Agreement” committed Members to establishing an SSM for use by developing countries (WTO 2004, p. A-6, 2004). By the end of the Hong Kong Ministerial Conference in December of 2005, Ministers agreed that (WTO 2005):

- The SSM shall be established for all developing countries and will have both a *price and a volume trigger mechanism* (Bernal 2005).

Along with developing and least-developed countries, Chairman Falconer’s 8 February 2008 Draft Text adds *small vulnerable economies* to the list of countries eligible to use the SSM. However, the parameters in the Draft Text such as the size of the import surge and/or price decline as well as the additional duty contain numerous options that imply a multitude of scenarios. For example, the lowest volume surge, a five to ten percent increase in average import volumes over the most recent three-year period, will trigger additional duties of 40 percentage points or half the current bound rate, whichever is higher. In another scenario, no duties will be imposed until imports reach at least 30 to 35 percent above the reference level with additional SSM duties not exceeding 20 percentage points or one-fifth of the current bound rate. Other bracketed provisions constrain SSM duties within the maximum bound tariff rates established in the UR. The price-based SSM, which is triggered by a fall in prices below an exogenous trigger level, contains similar options.

Due to the uncertainty of the SSM parameters in Falconer’s Drat Text and the multitude of possible scenarios, this study focuses on a more concrete proposal tabled by the G33 group of

developing nations.² Table 1 summarizes the current G33 proposed SSM, circulated on 23 March 2006 (WTO 2006). The G33-SSM volume remedy depends on the size of the import surge relative to the volume trigger – the greater the surge in imports, the greater is the additional SSM duty that can be levied. The G33 volume trigger is equal to the average of the three previous years imports for which data are available. If current imports (X) are less than or equal to 105 percent of the volume trigger, no additional SSM duty is allowed. For imports that exceed 105 percent but are less than or equal to 110 percent of the volume trigger, the additional duty is equal to 50 percent of a Member's bound tariff (BT). Similarly, for imports greater than 110 percent but less than or equal to 130 percent of the volume trigger, the additional duty is 75 percent of a Member's current BT . Finally, if imports are greater than 130 percent of the volume trigger, the additional SSM duty is equal to 100 percent of the Members' bound tariff. Clearly, one shortcoming of the G33 SSM is that it does not reward countries with low bound tariff rates, the flexibility to levy greater additional SSM duties.³

The price-based SSM, illustrated in the lower portion of table 1 is less complex because it allows for full compensation once prices fall below an exogenous price trigger. In the G33 SSM, the price trigger is equal to the monthly average of import prices for the three previous years for which price data are available. Letting P^m denote the current *c.i.f.* import price in local currency

² As of April 2005, the 42 Members of the G33 were: Antigua and Barbuda, Barbados, Belize, Benin, Botswana, China, Congo, Cote d'Ivoire, Cuba, Dominican Republic, Grenada, Guyana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Korea, Mauritius, Madagascar, Mongolia, Mozambique, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & Grenadines, Senegal, Sri Lanka, Suriname, Tanzania, Trinidad and Tobago, Turkey, Uganda, Venezuela, Zambia, and Zimbabwe.

³ However, in many ways the G33 proposed SSM is an improvement over the UR SSG. The SSG is based on a much older price and volume reference period (1986-88) and the SSG trigger levels are more complex and data intensive because it depends on imports and domestic consumption. Moreover, the additional duties allowed under the SSG volume trigger were fixed at 1/3 of the current applied tariff rate and therefore had no relationship between the actual duty and the severity of the problem, as is addressed in the G33 proposed SSM.

and PT the price trigger level, the remedy allowed under the price based SSM is equal to the additional *ad valorem* tariff that completely offsets the fall in the import price $(P_m/PT-I)$.⁴

Stochastic Simulation Model

The model is a static, synthetic, stochastic, global, partial equilibrium model of the world wheat sector calibrated to supply and demand data averaged over the 1999-2001 reference years. The model includes 38 countries/regions, 32 of which are net importers (table 2). The equations used to represent a typical wheat importing country (i) are shown below. Domestic price linkage equations for the net exporting countries are the same as equation (1) except there is no adjustment for tariffs and modifications are made to handle a few domestic policies as discussed in the next section.

$$(1) \quad P_i^D = P^W (E_i + \varepsilon_i^1) * (1 + T_i)$$

$$(2) \quad Q_i^D = \alpha_0^D + \beta_0^D P_i^D + \varepsilon_i^2$$

$$(3) \quad C_i^D = \alpha_1^D + \beta_1^D P_i^D + \varepsilon_i^3$$

$$(4) \quad F_i^D = \alpha_2^D + \beta_2^D P_i^D$$

$$(5) \quad NT_i^D = Q_i^D - C_i^D - F_i^D - (ES_i^D - BS_i^D)$$

$$(6) \quad \sum_{i=1}^{38} NT_i^D = 0$$

Ignoring for the moment the random error terms (ε), equation (1) relates the domestic wheat price (P_i^D) to the world wheat price (P^W), converted to local currency (E_i) and adjusted for the appropriate applied *ad valorem* tariff (T_i). Equation (2) determines the local wheat supply

⁴ The G33 proposed SSM is clearly easier to use than the former UR SSG. Under the price-based UR SSG the calculation of the additional duty was complex because it followed a graduated scale where the duty increased the further import prices fell below the price trigger. The remedy in the price-based G33 SSM simply allows for full compensation.

(Q_i^D) as a function of the domestic price and equations (3) and (4) determine local food (C_i^D) and feed (F_i^D) wheat demand, respectively. Equation (5) calculates the net trade position (defined as net exports) of each country with beginning (BS_i^D) and ending (ES_i^D) stocks held fixed.⁵ Finally, equation (6) is the global market-clearing condition that determines P^W by forcing to zero the sum of net trade across all countries. The parameters in the model are derived from elasticities in the Organisation for Economic Co-operation and Development's AGLINK model (OECD 2002)⁶.

In order to simulate the operation of the volume based G33-SSM, pseudo-random error terms (ε) are incorporated into the supply and food demand equations. Random shocks in an individual country's wheat supply and food wheat demand result in random net imports. As imports increase, the volume trigger of the SSM can be breached and the importing country is allowed to impose an SSM duty. Because of the pseudo-random errors, not all importers will breach the volume trigger at the same time.

Modeling the G33 price SSM is more challenging. If nothing else is done, prices will vary as the random supply and demand shocks are applied to the model. However, all countries will face the same world market price and with fixed exchange rates, domestic price variability across all countries will be similar, depending only on the size of their *ad valorem* tariffs. To introduce some differentiation in domestic price movements, a pseudo-random error term is attached to the exchange rate in each country's price linkage equation. In this way some

⁵ Due to the potential size of the additional volume based SSM duties (discussed shortly), we added an autarky condition to each WTO developing country's net trade equation (5) that does not allow them to switch to a net exporter in the model.

⁶ The elasticities used are provided in Grant (2003) and available from the authors upon request.

countries will be applying the price based G33-SSM while others are not and the size of the additional duty allowed will vary across countries depending on the size of the error term.⁷

Data and Domestic Policy Set

Ad valorem tariffs are the primary policies considered. Figure 1 shows the simple average difference in bound and applied tariffs for wheat in developed, developing and least developed net importing countries. The first thing to note is the 61 percentage point gap between the average bound and applied tariff for the 32 net importing countries. Only one out of 23 countries with bound tariffs of 100 percent or less applies a tariff above 50 percent. Four of the nine countries with bound tariffs above 100 percent apply tariffs below 25 percent.

Figure 1 begs the following question: why are countries with such large differences between their bound and applied tariffs worried about an SSM since undesirable import surges could be remedied by raising applied tariffs? There are at least three reasons why a country might not want to raise applied tariffs. First, applied tariffs are usually specified in domestic legislation and not easily changed. Second, raising applied tariffs makes it clear that the government is favoring domestic producers over domestic consumers. Finally, while wheat tariffs might not be a problem for most low- income countries, there may be a few politically sensitive commodities where applied and bound tariffs are similar. If a country wants an SSM for even a few commodities, it must support the proposal to create this mechanism whether the SSM applies to a few commodities or to all commodities (Grant and Meilke 2006).

We incorporate two domestic policies in the model: the U.S. loan rate and the EU's intervention pricing system. In the U.S., the average loan rate (1999-2001) was US\$94.80/mt and the average farm price was US\$96.63/mt. Thus, in the benchmark equilibrium, the loan rate

⁷ Due to the quality of domestic price data that exists developing and least-developed countries, it is extremely difficult to introduce shipment-by-shipment price variability for each country.

is not binding. However, in the stochastic simulations, the farm price may drop below the loan rate. In this case, the price received by U.S. producers is not allowed to fall below the loan rate and the government cost of an implied deficiency payment equal to the difference between the loan rate and the market price is calculated. We assume that U.S. consumer prices for food and feed demand are allowed to follow market prices to levels below the loan rate.

Calibrating the EU's intervention policy is more difficult. The EU paid substantial export subsidies on wheat in 1999 and 2000, when the intervention price was 119 euro/mt. Almost no export subsidies were paid in 2001, when the intervention price was lowered to 101 euro/mt. The WTO notifications show that EU export subsidy payments averaged 15 euro/mt 1999-2001. Thus, we assume that the EU farm price equals the average intervention price and a 15 euro/mt export subsidy payment is incorporated by defining an EU export price for wheat. This export price is equal to the farm price minus 15 euro/mt or 95.6 euro/mt. In the stochastic simulations, when the world price falls below the 110.6 euro/mt average intervention price, the appropriate export subsidy is calculated. However, in the liberalization scenario, the intervention price is lowered from 110.6 euro/mt to 101 euro/mt, its actual value since 2001. Export subsidy payments are then calculated relative to the 101 euro/mt export price.

Expected Outcomes

In this section we develop a set of expected outcomes of the SSM policy using a two-country, stochastic supply and demand model. The expected direction of change in prices and quantities with a simple tariff policy is relatively straightforward. However, an SSM policy has the implied objective of market stability. Zwart and Meilke (1979) and the expanded SSM version in Grant and Meilke (2006) provide a useful theoretical framework. Consider the following two-country model:

$$(7) \quad D^E = a - bP^W + \varepsilon_1,$$

$$(8) \quad S^E = c + dP^W + \varepsilon_2,$$

$$(9) \quad D^I = e - fP^D + \varepsilon_3,$$

$$(10) \quad S^I = g + hP^D + \varepsilon_4,$$

$$(11) \quad S^E - D^E = D^I - S^I,$$

$$(12) \quad P^D = \gamma P^W$$

where, D^E represents demand in the exporting nation, S^E is supply in the exporting nation, D^I and S^I are demand and supply in the importing region respectively, P^W is the world price and P^D is the importer's domestic price of the commodity. The random error terms, ε_i , are assumed to be normally and independently distributed: $\varepsilon_i \sim N(0, \sigma_i^2)$ for $i = 1 \dots 4$. Parameters (a) through (h) are supply and demand constants and slope coefficients, and γ equals $(1 + t)$ where t is the applied *ad valorem* tariff.

When $\gamma = 1$ (a free trade scenario), the domestic price equals the world price (P^W) with expected value $E[P^W]$ and variance, $var[P^W]$ (Zwart and Meilke 1979):

$$(13) \quad E[P^W] = \frac{e - g + a - c}{d + b + f + h}$$

$$(14) \quad Var[P^W] = \frac{\sum_{i=1}^4 \sigma_i^2}{(d + b + f + h)^2}$$

The policy intervention in this framework is an *ad valorem* tariff as well as an additional G33-SSM duty that enters asymmetrically – depending on whether the volume or price safeguard is triggered. Equation (15) illustrates this specification,

$$(15) \quad P^d = \begin{cases} \gamma P^w & \text{if } V = 0; P = 0 \text{ (i.e. No SSM)} \\ (\gamma + \theta) P^w & \text{if } P = 1; V = 0 \text{ (i.e. Price SSM is triggered)} \\ (\gamma + \delta) P^w & \text{if } V = 1; P = 0 \text{ (i.e. Volume SSM is triggered)} \\ \text{MAX}\{(\gamma + \theta) P^w, (\gamma + \delta) P^w\} & \text{if } V = P = 1 \text{ (i.e. Both SSMs are triggered)} \end{cases}$$

where, V and P are dummy variables equal to one when the volume safeguard (V) or price safeguard (P) is triggered, and zero otherwise; $\gamma = (1+t)$ and (t) is the applied *ad valorem* tariff;

$\theta = \frac{\bar{P}_j^d}{P^d} - 1$ is the additional duty allowed under the price safeguard, where $\bar{P}_j^d$ is the price

trigger defined as the 36 month (j) average of domestic import prices over the period 1999-2001; and δ is one plus the additional duty allowed under the volume safeguard.⁸ The final element of equation (15) is the price linkage when both the price and volume triggers are breached. In this case, we allow developing or least-developed countries to choose the maximum of the applied tariff (γ) plus the additional price SSM duty (θ); or, the applied tariff plus the additional volume SSM duty (δ).

Because it is the importing country that implements the SSM duty, equations (9) and (10) can be re-expressed by collapsing (15) as,

$$(16) \quad D^I = \begin{cases} e - f\gamma P^w + \varepsilon_3 & \text{if } V = P = 0 \\ e - f[\text{MAX}\{(\gamma + \theta) P^w, (\gamma + \delta) P^w\}] + \varepsilon_3 & \text{if } V = 1 \text{ and/or } P = 1 \end{cases}$$

⁸ In the model all applied, bound, and SSM duties are *ad valorem*.

$$(17) \quad S^I = \begin{cases} g - h\gamma P^W + \varepsilon_4 & \text{if } V = P = 0 \\ g - h[\text{MAX}((\gamma + \theta)P^W, (\gamma + \delta)P^W)] + \varepsilon_4 & \text{if } V = 1 \text{ and/or } P = 1 \end{cases}$$

If neither the price nor the volume based safeguard is triggered ($V = P = 0$), the expected value and variance of the world price is:

$$(18) \quad E[P^W] = \frac{e - g + a - c}{d + b + \gamma(f + h)}, \text{ and}$$

$$(19) \quad \text{Var}[P^W] = \frac{\sum_{i=1}^4 \sigma_i^2}{(d + b + \gamma(f + h))^2}$$

The variance of the domestic price in the importing region is:

$$(20) \quad \text{Var}[P^D] = \frac{\gamma^2 \sum_{i=1}^4 \sigma_i^2}{(d + b + \gamma(f + h))^2} = \gamma^2 \text{Var}[P^W]$$

Whether the price or volume safeguard is triggered (or both) depends on the level of the import surge relative to the price decline. If conditions are such that the G33 price-based SSM is triggered ($P = 1$), the expected value and variance of world price is then:

$$(21) \quad E[P^W] = \frac{e - g + a - c}{(d + b + (\gamma + \theta)(f + h))}$$

$$(22) \quad \text{Var}[P^W] = \frac{\sum_{i=1}^4 \sigma_i^2}{(d + b + (\gamma + \theta)(f + h))^2}$$

and the variance of the domestic price is:

$$(23) \quad \text{Var}[P^D] = (\gamma + \theta)^2 \text{Var}[P^W]$$

One will note that the analytical model compares free trade (as the baseline) to a tariff distortion (as the counterfactual). The policy simulations in this study move in reverse, starting from a world with pre-existing distortions (i.e. the UR) and moving towards freer trade (i.e. the

G20 tariff cuts). However, equations (18) through (23) illustrate two things. First, the expected value and the variance of world price (domestic price) decreases (increases) when an importing nation imposes a tariff because $\gamma = (1+t)$ is greater than one, thereby increasing the denominator (numerator) in equations (18) through (20).⁹ Second, the expected value and variance of world price (domestic price) decreases (increases) when the price safeguard is triggered because θ is positive.

The results are illustrative of a large importing country that can influence the level and variability of world prices. In the empirical model, only low-income importers are allowed to use an SSM and many of these are small countries where world prices are largely given. However, if the SSM is triggered simultaneously in many small countries the cumulative effect resembles that of a large country. In this case, the direction of change in domestic price depends on the magnitude of the additional SSM duty relative to the decrease in world price.

Policy Scenarios

WTO Members have agreed on a tiered approach to cutting tariffs in the DDA. The tariff cutting proposal considered in this study is the widely circulated G20 formula that calls for separate tiers for developing and developed countries and the requirement that developed countries make larger cuts than developing nations.¹⁰ While the G20 proposal contains an element of harmonization by cutting higher tariffs relatively more, the proposal sets different thresholds based on countries' development status arguing that differential tariff reductions are necessary to ensure that developing countries do not end up with a disproportionate burden of commitments.

⁹ In the reverse direction as in the simulation exercise, the expected value and variance of the world price (domestic price) increases (decreases) when a large importing nation reduces/removes its tariff policy (γ).

¹⁰ The G20 also requires an average minimum tariff reduction of 54 percent in developed countries and an average maximum tariff cut of 36 percent in developing countries.

Table 3 illustrates the G20 proposal that Chairman Falconer has indicated is likely to form the basis of a final agreement (WTO 2007). In the top half of table 3, developed countries have tiers of less than 20 percent, 20-50 percent, 50-75 percent, and over 75 percent, and would be required to make cuts of 45, 55, 65, and 75 percent, respectively. Developing countries would make cuts of 25, 30, 35, and 40 percent in their tariff bands of less than 30 percent, 30-80 percent, 80-130 percent, and over 130 percent, respectively. Both developed and developing countries would be subject to a tariff cap of 100 and 150 percent, respectively.¹¹

Table 4 reports UR bound and applied tariffs averaged over the period 1999-2001; the new, post-G20 bound tariffs; and the maximum volume-based SSM duties for four developed countries and 25 low-income WTO Members. Despite cutting higher tariffs relatively more, the G20 formula forces a reduction in applied tariffs in only four countries - Japan (225 to 99 percent), Egypt (5 to 3.8 percent), the developed country group (DCG) (121.5 to 50.35 percent) and the EU (62 to 23 percent) (table 4) – because of the large gaps between applied and bound tariffs.¹² The average difference between UR bound and applied rates is 66 percentage points with notable differences of 195 (122) percentage points in Bangladesh (Morocco). After the G20 tariff cuts (column 4, table 4) the simple average difference falls to 42 percentage points, keeping in mind that least-developed countries are exempt from tariff cuts.¹³

The final three columns in table 4 report the maximum SSM duty that can be levied if the volume trigger is breached.¹⁴ As expected, the G33 proposed SSM may be quite protectionist in nature, because the additional SSM duties are a function of bound tariff levels. For example, if

¹¹ In the model, we impose these two constraints.

¹² The tariff cut in the EU is important because there are cases where the tariff is not high enough to “protect” the EU’s intervention price. In such cases, the EU may become a net importer of wheat.

¹³ More aggressive tariff cutting scenarios including a Swiss-25 formula applied to applied and bound rates is contained in Grant (2003) and Grant and Meilke (2006).

¹⁴ The price-based SSM duties are not shown in table 4 because the additional duties allowed not a function of the bound tariffs. The additional duty allowed under the price-based SSM is the percentage drop in price below the trigger level defined as the average *cif* import price for the most recent three years of data.

the depth of the import surge is greater than 130 percent of the most recent three year average of imports (final column in table 4), the average additional SSM duty applied by eligible developing countries is some 57 percent, over and above a Member's current applied tariff rate.

Results

Two policy experiments are conducted. In scenario 1 (G20 Tariff Cuts) we assess the impact of the G20 tariff cutting proposal. In scenario 2 (G20 Tariff Cuts with a G33-SSM) we assess the market stability and welfare costs of the G33 proposed SSM for developing countries in conjunction with the G20 tariff cuts.¹⁵ The results of the G20 tariff cuts (scenario 1) are measured relative to the benchmark equilibrium (1999-2001). In scenario 2 (G20 tariff cuts with a G33-SSM) the results are measured relative to scenario 1 with no SSM to isolate the price and welfare effects of the G33-SSM policy. The policy results are obtained by averaging the results over 1000 drawings of pseudo-random errors. In this way, it is possible to measure the number of times the G33-SSM is triggered and its effects on the stability of all the model's endogenous variables. In both policy experiments, the EU intervention price is lowered from 110.6 euro/mt to 101.25 euro/mt, while U.S. domestic policies (loan rate program) are left unchanged.

Scenario 1: G20 Tariff Cuts

The impact of the G20 tariff cuts from bound rates are modest and result in small price and welfare impacts in most countries (table 5). World prices rise but by only 3.95 percent and most of this price rise (2.2 percentage points) is due to lowering the EU intervention price. This important result is driven by the large differences between applied and bound tariffs in most developing countries (table 4). Domestic prices fall in Japan and the DCG due to the lowering of applied tariffs but rise by 2.73 percent in the case of Egypt. This is because the G20 tariff cuts forced a small reduction in Egypt's applied tariff (from 5 percent to 3.8 percent) but world prices

¹⁵ In scenario 1, least developed countries are not required to make tariff cuts.

rose by nearly 4 percent which is enough to offset the small reduction in its applied tariff. In the EU, domestic prices decreased due to the lowering of the EU's intervention price.

Table 6 summarizes the market stability effects. In terms of market stability of the G20 tariff cuts, domestic prices are more stable for 30 out of 31 net importing countries (the exception being Brazil), the majority of which are not forced to make any tariff cuts (table 6). For Japan and the DCG, large tariff cuts result in domestic prices becoming much more stable, with their standard deviations falling by over 40 percent.

The welfare findings are summarized using four country groupings in table 7.¹⁶ Low-income importing countries (developing plus least developed) suffer small welfare losses from the lowering of bound tariffs in four countries and the lowering of the EU intervention price (table 7). The losses stem from the decline in consumer surplus from higher food prices, and in some cases such as Egypt from losses in tariff revenue (-23 percent, table 5) as net importers reduce their demand for higher-priced imports. In the EU and the U.S., the cost of domestic support programs fall by an average of 97 and 81 percent, respectively (\$158 and \$98 million, table 5). Globally, world welfare increases by 1.22 percent or \$1.35 billion (table 7, table 5). However, the distribution of welfare changes in the G20 tariff cutting scenario is mixed. Developed country importers gain 23.19 percent on average due to the large tariff cuts (and welfare gains) in Japan and the Developed Country Group (DCG). Developing and least developed countries lose 2.08 and 2.81 percent, respectively, due to higher world prices. All

¹⁶ The countries in each group are: 1) Developed Country Exporters – Australia, Canada, EU-25 and the USA; 2) Developed Country Importers – Israel, Japan and an aggregated developed country group (DCG); 3) Developing Countries – Algeria, Argentina, Brazil, China, Columbia, Egypt, Indonesia, Iran, Iraq, Kazakhstan, Malaysia, Mexico, Morocco, Nigeria, Peru, Philippines, South Korea, Tunisia, United Arab Emirates, Venezuela and six geographically aggregated groups consisting of African developing countries (AFD), Central American developing countries (CTA), South American developing countries (STA), Asian developing countries (ASG), Middle East developing countries (MEG) and a Rest of the World (ROW) group; and 4) Least Developed Countries – Bangladesh, Ethiopia, Yemen and two geographically aggregated groups consisting of South African least developed countries (SAG) and North African least developed countries (NAG).

four developed country exporters gain by an average of 1.50 percent due to higher world prices for their exports.

Scenario 2 – G33-SSM Frequency and Additional Duties

In scenario 2, we repeat the G20 tariff cutting exercise, only this time we allow developing country WTO Members the right to apply the G33-SSM. First, we present and discuss the frequency of SSM use and the additional duties levied over 1,000 pseudo-random draws. This is followed by a discussion of the market stability and welfare costs of the G33-SSM compared to the G20 tariff cuts alone. When the SSM is triggered, importing countries have the right but not the obligation to apply the additional duty. We assume that all countries will apply the SSM whenever it has the right to do so. If both the price and volume based SSM are triggered at the same time, we assume the importing country will apply the highest additional duty. Thus, the welfare results in this scenario should be considered an upper bound.

Table 8 reports the frequency and use of the G33-SSM. The column labeled “Frequency” reports the number of times the SSM is triggered and used over 1000 pseudo-random draws. “Mean” reports the average SSM duty over 1000 pseudo-random draws when the price or volume-based SSM is triggered and used. Finally, the column labeled “Maximum Duty Necessary” reports the highest SSM duty (over 1000 pseudo random draws) that is needed to fully offset the price declines caused by either price drops or import surges.¹⁷

The average price-based SSM duty applied by all 20 eligible developing countries is 4.1 percent (table 8). More importantly however, the maximum price-based SSM duty needed in the most severe price depression averaged 18.1 percent. However, there is considerable variation in the maximum price-based SSM duties required for full compensation. Whereas South American

¹⁷ In the model, the maximum duty necessary of the volume-based SSM is determined by calculating an *implicit* world price at the volume trigger level of imports and then computing the *ad valorem* duty required to bring prices back to that implicit volume trigger price level when import surges cause world prices to drop below it.

countries (STA) required a maximum price-based SSM duty of 10.1 percent, Indonesia required a 50.6 percent additional duty. This underscores the flexibility of the G33-SSM proposal in terms of the needs of the differential needs of developing countries.

Indonesia, Mexico, Morocco, Nigeria, Tunisia and United Arab Emirates use the volume-based SSM more than the price-based SSM (table 8). The additional duties allowed under the volume-based SSM are substantially higher than the price-based SSM duties because volume-based SSM duties are based on a percentage of the bound duty. Recall that the average bound tariff was over 56 percent (table 4) for most developing countries after the G20 tariff cuts. For example, Morocco applied a 121.1 percent additional volume duty, on average, with a maximum of 132.6 percent. We now turn to a discussion of the market stabilization and welfare effects of the G33-SSM.

The G33-SSM results in domestic prices rising in 20 out of 31 low-income countries but becoming less stable in 22 out of 31 low-income countries (scenario 2, table 6) relative to G20 tariff cuts alone (scenario 1). Remarkably however, imports in 24 low-income countries are stabilized (table 6), and the standard deviation of net trade is reduced by over 10 (20) percent in thirteen (eleven) low-income countries (table 9). World prices fall slightly (-0.74 percent) as a result of the SSM and become less stable with the standard deviation increasing by over 14 percent compared to scenario 1 with no G33-SSM. Domestic prices rise in the majority of low-income countries, causing increased production and lower consumption.

On the other hand, several countries including Algeria, Columbia, Mexico, Morocco, Nigeria, Tunisia, United Arab Emirates and Central American countries (CTA) increased domestic prices but experienced large increases in the standard deviation of these prices. This important result is driven by the size and frequency with which they apply the volume based

SSM. The simple correlation between the standard deviation of domestic prices and the frequency of application of the SSM is 49 percent. Among other things, this suggests that larger additional duties applied relatively frequently lead to greater domestic price instability.

For example, Morocco increased its domestic price instability because it applies the volume safeguard 28 percent of the time (280 times out of 1000) (table 8), well above the 12.5 percent average for all eligible SSM countries. Moreover, the size of Morocco's bound duty plus the additional volume based SSM averaged 121 percent, the highest of all countries. Tunisia increased its domestic price instability by an astonishing 337 percent by applying the volume SSM 30 percent of the time with an additional duty of 78 percent, well above the average in both categories (table 8 and 9). Conversely, the Philippines and South Korea increase and stabilize their domestic wheat prices (table 9) because they apply the volume SSM in moderation (4.6 and 2.8 percent respectively) and they impose smaller volume SSM duties with maximums at just over 24 and 7 percent respectively (table 8).

Among the exporting nations, the small decrease in world price caused by the SSM is accompanied by small reductions in the domestic price variation in the United States (-0.55 percent) and the EU (-0.22 percent). However, the small drop in the world price coupled with a large increase in the standard deviation of prices increased the cost of domestic farm programs by 103 percent (US\$24 million) in the United States and 16 percent (US\$0.9 million) in the EU (table 9).

The welfare cost of the G20 tariff cuts when it is combined with a G33-SSM is \$215.2 million (table 9), compared to the welfare gain of \$1.35 billion from trade liberalization (i.e., just cutting tariff alone). Thus, 84 percent of the increase in world welfare is still realized when low-income countries are granted an SSM. As shown in table 7 (scenario 2), developed country

welfare for both net exporters and net importers is nearly unchanged from application of the SSM. For the United States and the EU, slightly lower food and feed prices almost offset the increases in domestic program costs (table 9). Individual developing countries tend to gain by using the SSM; however, the losses in the Morocco (-1.91 percent), Nigeria (-1.26 percent), Tunisia (-1.23 percent) and United Arab Emirates (-2.56) are large enough to result in an average loss (-0.16 percent) for all developing countries (scenario 2, table 7).

Conclusions

The critical elements of the SSM are product coverage, reference periods, trigger mechanisms and remedy measures.¹⁸ Discussion of a new SSM for developing countries has only recently begun to take center stage of the DDA agricultural negotiations. Chairman Falconer's recent Draft Text commits WTO Members to establish an SSM for developing countries as part of an acceptable agricultural package. However, most proposals at this stage have contained very little information on the specific form the SSM will take. One exception is the recent SSM proposal by the G33 group of developing nations. In this study we assessed the impact of the G33-SSM in conjunction with the G20 tariff cuts using a global, stochastic, partial equilibrium model of the world wheat market.

Tariff cuts according to the G20 formula result in very little market access opportunities. This is because the G20 formula, which cuts bound tariffs, forces a reduction in applied rates in only four countries. While most developing countries lose from higher world prices, it is likely that some form of developing country tariff liberalization will mitigate their welfare losses and make them better off relative to developed country reform only. These results are similar to

¹⁸ There are other elements of the SSM currently under negotiation including country eligibility and the duration of additional duties or other remedies.

Vanzetti and Peters (2003) in a more comprehensive analysis of the effects of trade liberalization on developing countries.

Next, we combined the G33 SSM proposal with the G20 tariff cuts to evaluate the market stabilization and welfare effects of a new SSM for developing countries. Interestingly, eligible developing countries used the price-based SSM 22 percent of the time compared to just 12.5 percent of the time for the volume-based SSM. The additional duties levied under the volume-based SSM exceeded those levied under the price-based SSM. This result is driven by the fact that the volume-based G33-SSM allows countries to levy additional duties that are based on a percentage of bound tariffs. However, larger trade reforms will result in smaller (larger, but still modest) average volume safeguard (price safeguard) duties (Grant and Meilke 2006).

The SSM stabilized import surges in 24 of 31 low-income countries examined. However, stabilizing import surges came at a cost. Producer surplus in 15 out of 28 (54 percent) low-income countries became less stable as did domestic prices in 22 out of 31 low-income countries. If we restrict our attention to the 20 out of 31 low-income WTO Members that are allowed to invoke the SSM, prices are stabilized in 11 out of 20 countries, producer surplus is stabilized in 9 out of 17 countries (recall three of the 20 countries have no wheat production) and imports are stabilized in a remarkable 20 out of 20 countries!

The G33-SSM costs very little in terms of economic welfare. In the G20 tariff cuts alone (scenario 1) global welfare increased by 1.22 percent, or US\$1.35 billion. When we allow developing WTO Members the use of a G33-SSM in conjunction with the G20 tariff cuts (scenario 2), global welfare fell by only US\$215 million compared to the G20 tariff cuts alone. Thus, almost 84 percent of the gains from trade liberalization under a G20 tariff cutting scenario are still realized when developing countries are granted a G33-SSM ($1 - 0.215/1.35 = 84\%$). In

terms of individual countries, 12 out of 20 countries eligible to use the G33-SSM gained economic welfare under an SSM scenario despite decreased consumer surplus from higher domestic prices. The gains are driven by increased producer surplus and substantial increases in tariff revenues which are important in many net importing developing countries. Where individual countries experienced losses from applying the G33-SSM, the losses exceeded one percent in only four cases: Morocco (-1.91%), Nigeria (-1.26%), Tunisia (-1.23%) and the United Arab Emirates (-2.56%). Moreover, the losses in these countries can be attributed to the extremely large volume based SSM duties applied relatively frequently.

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Table 1: The G33 Proposed Special Safeguard Mechanism`

-----G33 Volume-Based SSM-----	
<i>Import Surge</i>	<i>Remedy</i>
$X \leq 105\%$ of VT	No Remedy
$105\% < X \leq 110\%$ of VT	0.50*BT
$110\% < X \leq 130\%$ of VT	0.75*BT
$X > 130\%$ of VT	BT
-----G33 Price-Based SSM-----	
<i>Price Decline</i>	<i>Remedy</i>
$P^m < PT$	Full compensation equal to: $(1-P^m/PT)*100$

Note: X = current quantity of imports; BT = current bound MFN tariff rate; and VT denotes the volume trigger defined as the average annual volume of imports for the most recent three year period preceding the year of importation for which data are available (WTO 2006). P^m = current c.i.f import price; PT = price trigger defined as the (monthly) average *cif* import price in domestic currency of the three previous years for which data are available.

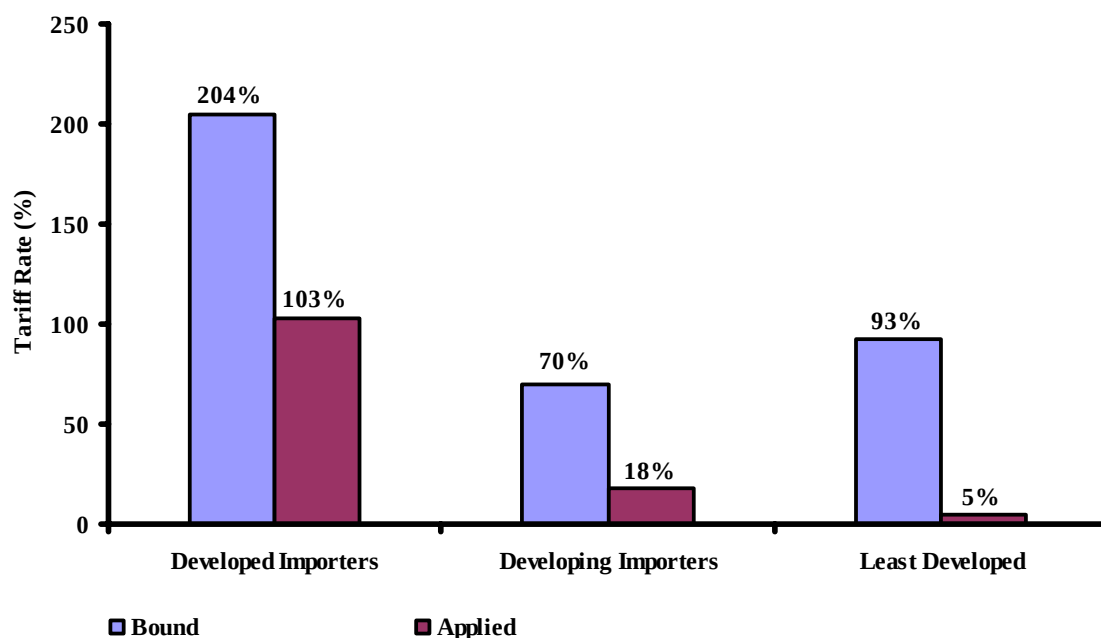


Figure 1: Average bound and applied wheat tariffs for developed, developing and least developed net importing countries

Note: developed importers include Japan, Israel and a Developed Country Group; Developing Importers include Algeria, Brazil, China, Columbia, Egypt, Indonesia, Iran, Iraq, Malaysia, Mexico, Morocco, Nigeria, Peru, Philippines, South Korea, Tunisia, United Arab Emirates, Venezuela, African Group, Central American Group, South American Group, Asian Group, Middle East Group and the Rest of the World; Least Developed countries include Bangladesh, Ethiopia, Yemen, a South African Group and a North African Group.

Table 2: Country and Regional Aggregation

-----Individual Model Countries-----			-----Developing Country Aggregation-----				Least-Developed Country Aggregation		-----Other-----
<i>Developed</i>	<i>Developing</i>	<i>Least Developed</i>	<i>Africa</i>	<i>Central American</i>	<i>South America</i>	<i>Asia</i>	<i>South Africa</i>	<i>North Africa</i>	<i>Rest of World</i>
Australia	Algeria	Bangladesh	Botswana	Zimbabwe	Fiji Islands	Armenia	Angola	Benin	Azerbaijan
Canada	Argentina	Ethiopia	Cote d'Ivoire	Bolivia	Uruguay	Brunei Darussalam	Congo Rep of	Burkina Faso	Bahamas
EU-25	Brazil	Yemen	Gabon	Chile	Barbados	Georgia	Congo, Dem Rep	Cameroon	Belarus
Israel	China		Ghana	Ecuador	Belize	Kyrgyzstan	Haiti	Djibouti	Bhutan
Japan	Columbia		Kenya		Costa Rica	Mongolia	Lesotho	Guinea	Bosnia/Herzog
USA	Egypt		Mauritius		Cuba	Pakistan	Madagascar	Mali	Cambodia
DCG	Indonesia		Namibia		Dominican	Singapore	Malawi	Mauritania	Cape Verde
	Iran		Swaziland		El Salvador	Sri Lanka	Maldives	Myanmar	China, HK, SAR
	Iraq				Grenada	Thailand	Mozambique	Niger	Eritrea
	Kazakhstan				Grenadines	MEG	Myanmar	Senegal	Faeroe Islands
	Malaysia				Guatemala	Bahrain	Solomon Islands	Sierra Leone	French Polynesia
	Mexico				Guyana	Jordan	Tanzania	Togo	Greenland
	Morocco				Honduras	Kuwait	Zambia	Uganda	Korea
	Nigeria				Jamaica	Oman			Lebanon
	Peru				Netherland Ant.	Qatar			Liberia
	Philippines				Nicaragua				Libyan Arab
	South Korea				Panama				Macedonia
	Tunisia				Suriname				Nepal
	United A.E				Trinidad Tob.				New Caledonia
	Venezuela								Saudi Arabia
									Seychelles
									Somalia
									Sudan
									Tajikistan
									Turkmenistan
									Uzbekistan
									Viet Nam
									Yugoslavia

Table 3. G20 Proposed Tariff Cuts

Development Status	Tariff Bands	Tariff Cut
Developed Countries	$0\% < T \leq 20\%$	45%
	$20\% < T \leq 50\%$	55%
	$50\% < T \leq 75\%$	65%
	$T > 75\%$	75%
Tariff cap of 100% applies		
Developing Countries	$0\% < T \leq 30\%$	25%
	$30\% < T \leq 80\%$	30%
	$80\% < T \leq 130\%$	35%
	$T > 130\%$	40%
Tariff cap of 150% applies		

Note: all tariff cuts are linear and from bound rates as contained in the G20 market access proposal

Table 4. G20 tariff cuts and G33 volume-based SSM duties

Country	-----Tariffs-----			-----Volume-Based SSM Tariffs-----		
	UR Applied	UR Bound	Bound Tariff After G-20 Tariff Cut	110% < X ≤ 120% ^a Volume SSM	120% < X ≤ 130% ^b Volume SSM	X > 130% ^c Volume SSM
Developed Countries						
European Union	61	92	23	----	----	----
Japan	225	396	99	----	----	----
Israel	5	128	32	----	----	----
<i>DCG^d</i>	121.5	201.4	50.35	----	----	----
Developing Countries						
Brazil	13.0	55.0	38.5	19.3	28.9	38.5
Algeria	2.6	80.0	56.0	28.0	42.0	56.0
Egypt	5.0	5.0	3.8	1.9	2.9	3.8
Korea	4.1	9.0	6.8	3.4	5.1	6.8
Morocco	48.5	170.0	102.0	51.0	76.5	102.0
Philippines	14.6	30.0	22.5	11.3	16.9	22.5
Mexico	27.5	67.0	46.9	23.5	35.2	46.9
Indonesia	0.0	30.0	22.5	11.3	16.9	22.5
Nigeria	80.7	150.0	90.0	45.0	67.5	90.0
Tunisia	20.0	100.0	65.0	32.5	48.8	65.0
Peru	20.0	68.0	47.6	23.8	35.7	47.6
Venezuela	15.0	118.0	76.7	38.4	57.5	76.7
China	61.0	114.0	74.1	37.1	55.6	74.1
Columbia	15.0	124.0	80.6	40.3	60.5	80.6
Yemen	0.0	80.0	56.0	28.0	42.0	56.0
Malaysia	11.0	69.0	48.3	24.2	36.2	48.3
United Arab Emirates	4.2	80.0	56.0	28.0	42.0	56.0

See notes next page

Table 4 continued

Country	-----Tariff Cuts-----			-----Maximum Allowable Volume-Based SSM Duty-----		
	Applied	Bound	Bound Duty After G-20 Tariff Cut	110% < X ≤ 120% ^a Volume SSM	120% < X ≤ 130% ^b Volume SSM	X > 130% ^c Volume SSM
Developing Country Groups						
AFD ^e	29.2	72.0	50.4	25.2	37.8	50.4
CTA ^f	4.5	83.4	54.2	27.1	40.7	54.2
STA ^g	10.3	36.3	25.4	12.7	19.1	25.4
ASG ^h	9.8	33.8	23.7	11.9	17.8	23.7
Least Developed Countries^k						
Bangladesh	5.3	200.0	200.0	100.0	150.0	200.0
Ethiopia	5.2	30.0	30.0	15.0	22.5	30.0
Least Developed Groups						
NAG ⁱ	6.5	75.0	75.0	37.5	56.3	75.0
SAG ^j	6.3	78.4	78.4	39.2	58.8	78.4
World	28.7	95.7	56.4	28.6	42.9	57.2

Note: In the model, all volume and price based SSM duties are not allowed to exceed pre-DDA bound rates in column 2

^a SSM duties based on 50% of G20 bound rates in column 4

^b SSM duties based on 75% of G20 bound rates in column 4

^c SSM duties based on 100% of G20 bound rates in column 4

^d DCG = Developed Country Group

^e AFD = African developing countries.

^f CTA = Central American developing countries.

^g STA = South American developing countries.

^h ASG = Asian developing countries.

ⁱ NAG = North African least developed countries.

^j SAG = South African least developed countries.

^k Least Developed Countries and Groups are not required to make tariff cuts

Table 5. G20 Tariff Cutting Results

Wheat Variables - Percent Change																
Country	Price (%)		Production (%)		Total Use (%)		Net Trade (%)		Consumer Surplus (%)		Producer Surplus (%)		Gov't Revenue (%)		Net Welfare (%)	
	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Developed																
Australia	3.95	-11.79	2.27	0.77	-0.94	-8.46	3.62	0.79	-1.57	-4.06	5.67	4.42	----	----	2.46	4.62
Canada	3.96	-15.54	2.38	1.26	-2.39	-12.74	4.46	0.96	-1.49	-2.55	5.76	3.94	----	----	2.33	4.75
EU-25	-4.99	609.19	-3.05	-21.75	3.06	263.18	-70.88	-27.12	6.11	117.25	-7.16	-30.23	-96.55	-87.05	0.69	11.65
Israel	3.96	-12.80	1.51	-12.80	-2.08	-7.43	-2.28	-7.67	-0.66	-0.31	4.91	-11.32	1.63	-9.55	-1.03	-0.50
Japan	-36.34	-40.37	-45.43	-9.95	33.45	-33.74	42.16	-32.81	65.99	-10.89	-68.12	-50.15	58.11	-35.42	60.58	-20.96
USA	3.28	16.94	1.48	-2.02	-1.89	-14.72	5.91	-0.69	-0.71	-1.74	4.22	0.67	-80.83	-63.16	0.52	2.43
DCG	-29.45	-43.38	-41.12	-24.10	17.47	-15.76	87.38	-27.53	27.57	4.66	-65.05	-55.22	-18.58	-69.27	10.01	-7.20
Developing																
Algeria	3.94	-18.09	2.39	-0.20	-0.82	-3.42	-1.71	-1.70	-1.66	-4.20	5.70	3.00	2.21	-1.79	-1.16	-2.08
Argentina	3.95	-19.37	2.14	1.17	-1.24	-1.86	3.61	1.14	-2.51	-3.15	5.52	3.79	----	----	2.35	3.77
Brazil	3.98	1.09	2.74	0.19	-2.21	0.81	-3.85	0.73	-4.04	-1.40	6.14	4.18	-0.04	4.35	-2.42	-0.86
China	3.53	-11.10	0.49	0.86	-2.24	-7.94	1705.79	4.46	-4.35	-9.34	3.84	6.92	----	----	-0.10	1.49
Columbia	3.95	-11.55	----	----	-1.35	-2.52	-1.38	-2.52	-2.73	-3.89	3.95	-11.55	2.55	-3.98	-2.20	-3.13
Egypt	2.73	-7.81	1.29	-1.91	-0.57	-0.77	-2.43	-1.94	-1.14	-1.32	3.57	-2.55	-23.87	-22.30	-0.69	-0.95
Indonesia	3.96	-0.31	----	----	-3.94	-0.40	-3.90	-0.40	-7.55	-4.38	----	----	----	----	-7.55	-4.38
Iran	3.96	-17.74	2.54	-0.80	-0.70	-1.04	-5.02	-1.56	-1.44	-1.77	5.86	1.84	----	----	-0.57	-0.60
Iraq	3.95	-19.37	2.55	-0.58	-0.32	0.04	-0.92	0.06	-0.61	-0.27	5.79	2.66	----	----	-0.50	-0.19
Kazakhstan	3.94	-3.47	1.96	-0.63	-1.08	-1.20	5.73	-0.84	-0.72	-0.47	5.24	1.88	----	----	0.85	1.21
Malaysia	3.95	-19.37	----	----	-1.17	-3.73	-1.17	-3.73	-2.44	-4.94	----	----	2.77	-9.83	-2.12	-4.22
Mexico	3.96	-14.96	2.63	-4.34	-2.03	-6.94	-8.13	-8.26	-3.49	-7.31	5.93	-3.32	-4.34	2.41	-1.31	-2.13
Morocco	3.95	-17.89	3.59	-0.23	-0.85	-1.69	-4.10	-0.73	-1.75	-2.57	7.12	3.77	-0.22	3.71	-0.91	-0.20
Nigeria	3.96	-14.33	2.88	-0.36	-5.68	-4.31	-5.88	-4.35	-10.98	-9.85	6.26	3.12	-2.04	4.02	-5.84	-4.23

Table 5. Continued

Wheat Variables - Percent Change																
Country	Price (%)		Production (%)		Total Use (%)		Net Trade (%)		Consumer Surplus (%)		Producer Surplus (%)		Gov't Revenue (%)		Net Welfare (%)	
	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Peru	3.95	-18.25	2.98	-6.45	-1.34	-1.83	-1.91	-2.80	-2.81	-3.22	6.36	-5.40	2.02	-1.85	-1.92	-2.14
Philippines	3.95	-12.62	----	----	-3.87	-9.37	-3.78	-9.37	-2.78	-3.15	----	----	0.11	2.52	-3.39	-4.71
South Korea	3.97	-4.16	----	----	-4.25	-4.26	-4.15	-4.26	-3.32	-5.16	3.97	-4.16	-0.31	15.86	-4.35	-7.53
Tunisia	3.94	-18.14	2.47	-0.63	-0.94	-0.76	-4.52	-1.41	-1.88	-1.69	5.76	2.00	-0.63	3.89	-0.77	-0.76
United A.E	3.95	-19.37	----	----	-2.04	-0.37	-2.04	-0.37	-3.89	-2.43	3.95	-19.37	1.89	3.67	-3.67	-2.28
Venezuela	3.95	-18.61	2.10	-1.76	-1.68	-3.88	-1.69	-3.88	-3.35	-5.51	5.41	-2.35	2.24	-5.29	-2.79	-4.44
AFD	3.94	-15.86	4.33	-1.69	-2.81	-4.07	-4.66	-5.34	-5.55	-6.76	8.44	2.47	-0.78	4.13	-3.30	-3.65
CTA	3.95	-17.82	----	----	-1.92	-2.28	-1.92	-2.28	-3.91	-4.22	3.95	-17.82	2.01	-0.06	-3.65	-3.92
STA	3.95	-12.15	3.84	-2.72	-1.80	-7.36	-8.97	-6.29	-3.63	-9.12	7.74	0.82	-5.22	3.44	-1.32	-2.95
ASG	3.96	-14.24	3.41	-1.14	-2.78	-7.39	-6.36	-6.58	-5.30	-8.68	7.02	2.28	-2.55	4.03	-2.63	-3.74
MEG	3.95	-19.49	----	----	-1.49	-3.61	-1.50	-3.61	-2.97	-5.10	3.95	-19.49	2.43	-6.22	-2.88	-4.99
ROW	3.96	-18.71	3.01	-5.15	-2.94	-2.04	-15.09	-4.63	-5.66	-4.24	6.42	-4.09	-11.52	2.32	-1.21	-2.26
Least Developed																
Bangladesh	3.95	-18.17	1.33	-0.64	-2.08	-0.75	-6.06	-1.13	-4.09	-2.90	4.78	-5.00	-2.24	3.98	-1.20	-1.98
Ethiopia	3.88	-17.85	1.50	-0.82	-1.82	-1.21	-11.10	-2.06	-3.58	-2.95	4.82	-0.64	-7.16	2.14	-0.66	-1.36
Yemen	3.95	-16.40	0.91	-0.12	-1.58	-0.77	-1.78	-0.82	-3.12	-2.39	4.48	1.12	----	----	-2.75	-2.31
SAG	3.96	-14.86	3.26	-6.26	-2.51	-6.09	-3.45	-7.14	-4.97	-8.59	6.76	-4.18	0.45	2.56	-3.65	-7.24
NAG	3.93	-16.49	3.47	-2.52	-3.39	-4.90	-3.55	-5.03	-6.71	-8.18	7.03	0.62	0.36	3.48	-5.81	-7.35
WORLD	3.95	-19.37	-0.03	-5.10	-0.03	-5.10	----	----	----	----	----	----	----	----	1.22	-0.31
Welfare Difference From Baseline (\$US) = \$1.35 Billion																

Table 6. Price and Stability Effects for 31 Low-Income Countries

	-----Liberalization Scenario-----							
	(1)				(2)			
	G20 Tariff Liberalization – No SSM				G20 Tariff Liberalization with G33-SSM			
	<i>Mean</i>		<i>Stability</i>		<i>Mean</i>		<i>Stability</i>	
	<i>Up</i>	<i>Down</i>	<i>More</i>	<i>Less</i>	<i>Up</i>	<i>Down</i>	<i>More</i>	<i>Less</i>
Domestic Price	31	0	30	1	20	11	9	22
Producer Surplus	28	0	13	15	17	11	13	15
Imports	3	28	27	4	8	23	24	7
	World Price Increase = 3.95%				World Price Decrease = -0.74%			

Note: The results in the table are based on 1,000 pseudo-random draws and show the number of countries in each category. For domestic price and imports, there are 31 low-income countries. For producer surplus, three low-income countries (Indonesia, Malaysia and Philippines) have no wheat production for a total of 28 countries in this category.

^a Scenario 1 is measured relative to the baseline simulation calibrated to average supply, demand and tariff rates for the years 1999-2001.

^b Scenarios 2 is measured relative Scenario 1 to isolate the effects of the G33-SSM.

Table 7. Summary of Welfare Changes across each Scenario

	-----Liberalization Scenario-----					
	(1)			(2)		
	G20 Tariff Liberalization – No SSM			G20 Tariff Liberalization with a G33-SSM		
	<i>Gain</i>	<i>Loss</i>	<i>Welfare Δ (%)</i>	<i>Gain</i>	<i>Loss</i>	<i>Welfare Δ (%)</i>
Developed Exporters	4	0	1.50	0	4	-0.26
Developed Importers	2	1	23.19	3	0	0.29
Developing Importers	2	24	-2.08	16	10	-0.16
Least Developed Countries	0	5	-2.81	5	0	0.58
World	8	30	1.22	24	14	-0.19

Note: The results in the table are based on 1000 pseudo-random draws. *Gain* and *Loss* show the number of countries in each category. For a listing of countries in each category see endnote 20. *Welfare Δ (%)* is the average change in aggregate economic welfare for the countries belonging to a particular category.

^a Scenario 1 is measured relative to the baseline simulation calibrated to average supply, demand and tariff rates for the years 1999-2001

^b Scenarios 2 is measured relative Scenario 1 to isolate the effects of the G33-SSM

Table 8. SSM Frequency and Additional Duty Results, Scenario 2

Country ^d	-----Price Based SSM-----			-----Volume Based SSM-----		
	Frequency ^a	Mean ^b	Maximum Duty Necessary ^c	Frequency ^a	Mean ^b	Maximum Duty Necessary ^c
Algeria	24.0%	4.2%	17.1%	5.9%	61.7%	67.2%
Brazil	24.7%	4.8%	23.7%	17.5%	43.7%	50.1%
Columbia	28.9%	4.3%	18.1%	3.2%	88.7%	88.7%
Egypt	34.4%	5.5%	22.7%	8.5%	4.2%	4.5%
Indonesia	21.4%	7.3%	50.6%	24.5%	26.5%	29.3%
Malaysia	24.8%	3.8%	16.2%	0.3%	53.1%	53.1%
Mexico	13.0%	2.4%	11.2%	17.9%	54.2%	61.0%
Morocco	16.6%	3.9%	16.1%	28.1%	121.1%	132.6%
Nigeria	14.6%	3.3%	12.4%	19.5%	102.9%	117.0%
Peru	22.2%	3.8%	13.3%	5.3%	52.4%	52.4%
Philippines	26.6%	3.5%	24.8%	4.6%	24.8%	27.0%
South Korea	33.6%	5.0%	24.5%	2.8%	7.5%	7.5%
Tunisia	14.1%	4.2%	14.5%	30.3%	78.3%	84.5%
United A.E	15.2%	3.6%	16.2%	30.7%	66.4%	72.8%
Venezuela	23.6%	3.9%	14.5%	0.9%	84.4%	84.4%
AFD	18.7%	3.7%	14.7%	14.9%	56.6%	65.5%
CTA	20.6%	3.9%	14.0%	7.2%	59.8%	65.0%
STA	16.8%	3.3%	10.1%	15.7%	29.5%	33.0%
ASG	19.9%	3.0%	11.0%	12.2%	26.7%	30.8%
MEG	24.2%	3.7%	16.0%	0.8%	27.0%	27.0%
All Developing Countries	21.9%	4.1%	18.1%	12.5%	53.5%	57.7%

^a Frequency refers to the number of times out of 1000 random draws that the price-based *SSM is used* (i.e. not how many times it was triggered)

^b Mean denotes the average SSM duty applied over 1000 random draws when the price or volume-based SSM is triggered and used.

^c Maximum Duty Necessary denotes the highest (i.e., maximum) *ad valorem* duty needed, over 1000 random draws, to raise prices back to the price or volume trigger levels.

^d Least Developed Countries (LDCs) were not granted an SSM because they are not required to make tariff cuts.

Table 9. G20 Tariff Cuts with a G33-SSM

Wheat Variables - Percent Change																
Country	Price (%)		Production (%)		Total Use (%)		Net Trade (%)		Consumer Surplus (%)		Producer Surplus (%)		Gov't Revenue (%)		Net Welfare (%)	
	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Developed																
Australia	-0.74	8.38	-0.43	-0.84	0.19	5.75	-0.68	-0.89	0.31	2.28	-1.10	-1.70	----	----	-0.50	-1.67
Canada	-0.74	12.47	-0.45	-0.59	0.48	9.66	-0.83	-0.33	0.30	1.24	-1.08	-0.42	----	----	-0.45	-1.05
EU-25	-0.22	-0.02	-0.13	-1.00	0.13	0.01	-10.30	-2.26	0.25	0.20	-0.32	-2.29	15.57	12.35	0.00	-0.49
Israel	-0.74	10.70	-0.29	10.70	0.41	6.02	0.46	6.23	0.13	0.09	-0.91	10.15	-0.32	5.69	0.20	0.24
Japan	-0.74	4.74	-1.08	0.90	0.32	3.26	0.38	3.36	0.59	3.12	-1.73	-0.28	-0.29	3.00	0.38	2.29
USA	-0.55	2.14	-0.25	-0.16	0.38	9.84	-1.02	-0.65	0.14	0.75	-0.72	-0.67	103.27	63.22	-0.11	-0.71
DCG	-0.74	8.60	-1.25	3.29	0.27	1.51	0.83	3.73	0.41	0.77	-2.29	1.75	0.03	-0.76	0.30	0.53
Developing																
Algeria	3.34	154.15	2.06	-7.84	-0.73	21.22	-1.53	-6.28	-1.44	18.87	4.10	-6.84	146.26	5943.42	0.15	-0.15
Argentina	-0.74	14.18	-0.41	-0.57	0.25	1.10	-0.68	-0.54	0.50	1.37	-1.04	-0.53	----	----	-0.46	-0.87
Brazil	4.35	-20.95	3.03	-11.01	-2.57	-24.38	-4.54	-32.87	-4.80	-26.79	5.70	-11.05	38.13	787.31	-0.18	-3.32
China	-0.70	12.12	-0.10	-0.67	0.47	9.82	-19.51	-2.14	0.94	10.06	-0.78	-1.81	----	----	0.01	-0.22
Columbia	2.07	65.64	----	----	-0.75	-5.91	-0.76	-5.91	-1.54	-7.14	2.07	65.64	18.97	1032.31	0.26	-2.31
Egypt	1.01	-30.14	0.48	-6.97	-0.22	-2.06	-0.95	-6.25	-0.44	-2.29	1.27	-15.40	48.23	749.46	0.12	0.14
Indonesia	6.41	-14.62	----	----	-6.90	-34.45	-6.83	-34.45	-14.43	-41.12	----	----	A	B	0.01	-3.95
Iran	-0.74	12.83	-0.48	0.30	0.14	0.63	1.03	0.74	0.29	0.78	-1.09	0.09	----	----	0.11	0.25
Iraq	-0.74	14.18	-0.49	0.40	0.06	-0.04	0.18	-0.09	0.12	0.02	-1.04	-0.06	----	----	0.10	0.01
Kazakhstan	-0.75	1.38	-0.38	-0.03	0.22	0.17	-1.07	-0.02	0.14	0.02	-1.00	-0.57	----	----	-0.17	-0.22
Malaysia	0.13	-12.36	----	----	-0.04	-2.83	-0.04	-2.83	-0.09	-2.96	----	----	8.07	465.88	0.43	1.98
Mexico	2.95	24.46	1.98	-17.06	-1.60	-8.59	-6.86	-23.64	-2.77	-11.35	4.30	-15.29	7.31	79.06	-0.39	-3.46
Morocco	13.05	11.86	11.91	-29.71	-2.94	48.61	-14.68	-30.34	-5.81	41.92	20.29	-23.20	17.02	99.46	-1.91	12.75
Nigeria	1.76	3.77	1.30	-0.41	-2.79	-25.69	-2.90	-25.82	-6.31	-30.82	2.77	1.65	2.34	19.00	-1.26	-14.22

Note: There is no tariff revenue collected by Indonesia in scenario 1. In this scenario, Indonesia uses the SSM and therefore collects tariff revenue equal to

We report A = \$280,487,891 (local currency) and a standard deviation of B = \$403,953,154 for Indonesia because its applied tariff rate is zero in the benchmark

making the percentage change calculation in tariff revenues from the G33-SSM meaningless.

Table 9. Continued

Wheat Variables - Percent Change																
Country	Price (%)		Production (%)		Total Use (%)		Net Trade (%)		Consumer Surplus (%)		Producer Surplus (%)		Gov't Revenue (%)		Net Welfare (%)	
	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Peru	1.25	31.56	0.95	5.85	-0.44	-10.90	-0.64	-12.23	-1.00	-11.75	2.07	12.97	10.60	458.58	0.31	-0.29
Philippines	0.41	-21.89	----	----	-0.44	-15.83	-0.43	-15.83	-0.32	-3.24	----	----	8.33	432.94	0.55	0.98
South Korea	0.86	-24.27	----	----	-1.00	-23.35	-0.98	-23.35	-0.80	-16.28	0.86	12.97	40.90	4320.81	0.79	4.86
Tunisia	14.00	337.77	8.90	-5.27	-3.52	-20.30	-17.50	-28.71	-7.10	-23.12	21.11	28.67	45.00	266.18	-1.23	-6.60
United A.E	17.72	565.04	----	----	-9.68	-38.44	-9.69	-38.44	-20.30	-47.13	17.72	565.04	418.97	2914.61	-2.56	-9.68
Venezuela	0.47	26.67	0.25	4.38	-0.21	-1.08	-0.21	-1.07	-0.43	-1.61	0.71	13.83	8.00	591.50	0.46	0.31
AFD	2.70	21.81	2.96	-5.43	-2.06	-19.71	-3.49	-25.54	-4.28	-21.56	5.49	-3.21	10.61	175.94	-0.42	-6.66
CTA	3.60	194.56	----	----	-1.85	-7.57	-1.85	-7.57	-3.83	-10.31	3.60	194.56	88.83	3726.89	0.29	-4.10
STA	2.22	-7.29	2.16	-17.62	-1.07	-15.77	-5.77	-27.02	-2.20	-17.03	4.07	-16.12	23.27	241.88	-0.07	-0.41
ASG	1.52	-0.96	1.32	-7.19	-1.14	-15.84	-2.72	-22.41	-2.26	-16.60	2.49	-6.78	21.37	393.52	0.16	-0.12
MEG	0.25	-16.37	----	----	-0.10	-4.43	-0.10	-4.43	-0.22	-4.74	0.25	-16.37	561.54	34016.11	0.58	2.42
ROW	-0.74	13.68	-0.57	3.17	0.59	1.22	3.47	2.84	1.17	1.43	-1.18	3.86	2.52	0.54	0.24	0.46
Least Developed																
Bangladesh	-0.74	13.17	-0.26	-0.19	0.41	0.30	1.26	0.29	0.83	0.71	-0.90	2.97	0.46	-0.81	0.23	0.38
Ethiopia	-0.73	12.17	-0.29	0.17	0.36	0.60	2.45	0.84	0.73	0.99	-0.91	0.87	1.50	-0.26	0.13	0.35
Yemen	-0.74	11.08	-0.18	0.07	0.31	0.37	0.35	0.39	0.63	0.69	-0.84	0.58	----	----	0.56	0.64
SAG	-0.74	11.49	-0.61	5.05	0.50	4.60	0.70	5.51	1.03	5.28	-1.22	5.18	-0.10	-0.45	0.75	4.17
NAG	-0.75	7.83	-0.66	1.01	0.69	2.31	0.72	2.37	1.42	3.16	-1.29	0.48	-0.07	-0.74	1.22	2.83
WORLD	-0.74	14.18	-0.05	-1.59	-0.05	-1.59	----	----	----	----	----	----	----	----	-0.19	-5.31
Welfare Difference From Baseline (\$US) = \$-215.2 Million																