



The WTO Special Safeguard Mechanism: A Case Study of Wheat

CATPRN Working Paper 2005-2

April 8, 2005

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Financial support for this project was provided by the Ontario Ministry of Agriculture and Food, and Agriculture and Agri-Food Canada. The views expressed in the paper are those of the authors and should not be attributed to CATPRN or to the funding agencies.

Abstract

A special safeguard mechanism is an attractive policy tool for low income importing countries because it is automatic and does not require an injury test. Exporters might accept a safeguard for low income countries if it results in larger tariff cuts than in its absence. Using wheat as a case study the effects of a special safeguard mechanism on market stability and welfare are evaluated. The results show that a safeguard mechanism is not very trade distorting and costs less than 20 percent of the world welfare gain that would be realized if developing countries were not granted a safeguard.

Keywords: Special Safeguard Mechanism, price stability, import stability, wheat, WTO.

Background

WTO member countries have a number of legal means to cope with import surges. For “fairly” traded imports they can rely on the provisions of Article XIX of the GATT 1994 and the Uruguay Round Agreement on Safeguards. For “unfairly” traded imports they have recourse to countervailing duties and anti-dumping actions¹. However, each of these trade actions requires the importing country to provide proof of injury and in the case of the general safeguard provision to provide compensation². For low income countries, proving injury and providing compensation is often beyond their technical and financial capabilities. For this reason, the Special Agricultural Safeguard (SSG) made available to Members in the Uruguay Round (UR) of trade negotiations has considerable appeal to developing country importers. First, the SSG was designed to counter import surges and sharp declines in import prices. Second, the rules for its application are transparent and it requires no injury test, nor the provision of compensation. However, one of the preconditions for SSG use by Members was the requirement to convert all non-tariff barriers to equivalent tariffs during the UR and to include the SSG designation in their schedule of commitments³. Many low income countries are not eligible to use the current SSG because they set bound tariffs outside the tariffication process, meaning they did not apply non-tariff barriers before the UR. Of the 148 current members of the WTO only 39 countries reserved the right to use the SSG, of which 29 are developing countries. However, since 1995, the use of the SSG has been dominated by three developed countries⁴.

In the WTO agricultural negotiations leading up to the launch of the Doha Development Round (DDR) low income countries tabled numerous proposals calling for *Special and Differential Treatment*. One aspect of *Special and Differential Treatment* mentioned in many of these proposals is the need for a *Special Safeguard Mechanism* (SSM) to help manage import surges and rapid price declines in staple commodities. The special role of low income countries in the DDR was recognized in the Ministerial Declaration launching the Round (WTO 2001):

“...developing countries form an integral part of the trade negotiations both in terms of countries’ commitments and in terms of food security and rural development”

The need to have developing countries fully “on-side” was further demonstrated in Cancún in September 2003; with the failure of the WTO Ministerial Conference to agree on the modalities for the negotiations. This stalemate was not resolved until 1 August 2004 when the WTO Members agreed on a *Work Programme* to guide the remainder of the negotiations (WTO 2004).

¹ These actions are governed by the Agreement on Subsidies and Countervailing Measures and the Agreement on Implementation of Article VI of the GATT 1994.

² Generally, compensation is provided by the importing country lowering its tariffs on other commodities. This compensation requirement of Article XIX has become one of the largest deterrents against its use especially among low income countries.

³ See Article 5 of the WTO Agreement on Agriculture for further details regarding the SSG.

⁴ The three countries are: the United States, the European Union and Japan.

A well designed SSM might form an important part of an acceptable agricultural package for low income countries. The need for an SSM is recognized in several important WTO documents but the wording changes through time suggest a lack of consensus on the exact form a new SSM should take. The following elements were contained in the 12 February 2003 draft text prepared by the Chair of the agricultural negotiations, Stuart Harbinson (WTO 2003a):

- 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 would 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 text (WTO 2003b). In this text the wording surrounding a new special safeguard measure was changed. The new wording maintains bullets one and two above, but replaces bullets three and four with the following wording:

- 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). In the 1 August 2004 *Work Programme* the wording is changed to “A special safeguard mechanism will be established for use by developing country members” (WTO 2004).

This commitment to an SSM, but the lack of detail on the exact parameters suggests there is scope for research to shed light on this issue⁵. Basically, an SSM is a temporary tariff and the economics of tariffs are well known. Exporters favor the elimination of tariffs and importers lower them with great reluctance, in spite of the fact that there are often welfare gains in importing countries as a result of tariff elimination. The attraction of an SSM, to an exporter, stems from the realization that the existence of an SSM might entice a low income importer to lower its tariffs more than in the absence

⁵ Very little analysis of special safeguard mechanisms is available in the literature. Somwaru and Skully have examined a special agricultural safeguard but using a methodology quite different from what is employed in this study. Ruffer and Vergano provide a good discussion of the rationale for an SSM.

of an SSM. The use of an SSM is discretionary; an importer has the right but not the obligation to use the measure when it is triggered. Hence, from the exporter's perspective it might be better to face higher tariffs part of the time, than high tariffs all of the time. This is clearly an empirical question that hinges on the size of the tariff cuts, the size of the additional tariff an importer can impose when the SSM is triggered, how often the SSM is triggered, and on how often the importing country will actually use the SSM when it is triggered. It is on these questions that this study is focused.

Objectives

Since the economic effects of an SSM are largely an empirical issue a case study approach is adopted. Wheat is chosen for analysis for a number of reasons: 1) it is a staple commodity; 2) it is of export interest to a number of developed countries; and 3) it is a major importable of low income countries. The focus of this study is on three questions: 1) will an SSM stabilize commodity markets in low income countries; 2) does an SSM have the potential to entice low income countries to accept larger tariff cuts; and 3) how costly would an SSM be for wheat exporters, who consist primarily of developed countries.

The Special Safeguard Mechanism

None of the proposals tabled during the WTO negotiations contain explicit parameters for an SSM but many of the proposals make reference to the current SSG. For that reason it is assumed that the parameters of a new SSM will mirror those of the current SSG. Consequently, the SSM will consist of a "price safeguard" and a "volume safeguard". A country can apply the price safeguard whenever its import price falls to less than 90 percent of the average price in the previous three years⁶. The price safeguard applies on a per shipment basis which creates a number of modeling difficulties that are discussed in the next section. The remedy under the price safeguard is an additional duty, where the additional duty increases the further the import price falls below the reference price (Figure 1). For example, if the import price falls 30 percent below the reference price the additional duty is six percent but if it falls 60 percent then the additional duty is 19 percent.

The calculation of the volume safeguard is more complex and is not illustrated here, but an understanding of its objective is important⁷. In general, the larger the share of imports in domestic consumption, the smaller the import surge required to trigger the volume SSM. The volume safeguard remedy is an additional tariff equal to one-third of the country's applied tariff. Note that member countries may not apply the volume based SSM and the price based SSM concurrently. Furthermore, no country is required to apply the additional tariffs allowed by an SSM. However, in this analysis it is assumed that a country will always apply a safeguard when it has the right to do so, and further if

⁶ The Uruguay Round SSG used average prices over the 1986-88 period to form the price trigger level and in this study the reference period is updated to 1999-2001.

⁷ For details concerning the calculation of the volume safeguard see Article 5 of the Agreement on Agriculture.

it has the choice of applying either the price or volume safeguard it will choose the one allowing the highest additional duty.

The Model and Data

The model is a static, synthetic, stochastic, partial equilibrium model of the wheat sector calibrated to supply and demand data averaged over 1999-2001⁸. Thirty-eight countries/regions are included in the model. Of these, 32 are net importers. 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 price adjustment for tariffs and there are modifications made to handle a few domestic policies as discussed in the next section.

$$PD_i = PWH*(EXCH_i + \varepsilon_{1t})*(1+APPT_i) \quad (1)$$

$$QWH_i = \alpha_0 + \beta_0 PD_i + \varepsilon_{2t} \quad (2)$$

$$DFOWH_i = \alpha_1 - \beta_1 PD_i + \varepsilon_{3t} \quad (3)$$

$$DFEWH_i = \alpha_2 - \beta_2 PD_i \quad (4)$$

$$NTWH_i = QWH_i - DFEWH_i - DFOWH_i - (ESTWH_i - BSTWH_i) \quad (5)$$

$$\sum NTWH_i = 0 \quad i = 1 \dots 38 \quad (6)$$

Ignoring for the moment the random error terms, equation (1) relates the domestic wheat price (*PD*) to the world wheat price (*PWH*), converted to local currency (*EXCH*) and adjusted for the appropriate applied *ad valorem* tariff (*APPT*)⁹. Equation (2) determines the local wheat supply (*QWH*) as a function of the local price and equations (3) and (4) determine local food (*DFOWH*) and feed (*DFEWH*) wheat demand respectively. Equation (5) calculates the net trade position (defined as net exports) of each country with beginning (*BSTWH*) and ending (*ESTWH*) stocks held fixed. Finally, equation (6) is the market clearing condition that determines the world price by forcing the sum of net trade, across all of the countries, to zero. The parameters in the model are largely derived from elasticities in the OECD's AGLINK model¹⁰.

⁸ In the theoretical and empirical analysis it is assumed that producers and consumers are risk neutral.

⁹ In equation (1) it is assumed that world price changes are fully reflected in domestic prices. Since the price safeguard is triggered by border prices this is an appropriate assumption. However, if domestic prices are partially insulated from world price changes the model will overstate fluctuations in imports, and hence trigger the use of the volume safeguard more often than warranted. Since sufficient data to estimate the degree of price insulation for the low income countries included in this study are difficult to obtain, the results should be considered an upper bound for the use of the volume safeguard.

¹⁰ The AGLINK model elasticities were provided to the authors by Agriculture and Agri-Food Canada. However, none of the results in this study should be attributed to AAFC or OECD. The elasticities used are provided in Grant and available from the authors upon request.

In order to simulate the operation of the volume safeguard of the SSM, pseudo-random error terms are added to the supply and food demand equations¹¹. Random shocks in an individual country's wheat supply and food wheat demand result in random net imports. As net imports increase the volume trigger of the safeguard mechanism can be breached and the importing country allowed to impose a safeguard duty. Because of the pseudo-random errors not all importers will breach the volume trigger at the same time.

Modeling the price safeguard 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. In order to introduce some differentiation in local price movements a pseudo-random error term is attached to the exchange rate in each country's price linkage equation¹². Although it is impossible to introduce shipment-by-shipment price variability; in this way some countries will be applying the price safeguard while others are not, and the size of the additional duty allowed by the price safeguard varies across countries depending on the size of the error term.

The model contains 38 countries/regions. Six of the countries/regions are net exporters and 32 are net importers. The 32 net importers consist of 23 individual countries, accounting for every country with net imports of wheat averaging more than 1.0 million metric tons (mmt) over 1999-2001. The remaining net importers are aggregated into groups based on region and economic development. Data on the supply, distribution and trade flows of wheat are obtained from the PS&D database (USDA 2002b). While this database provides data for many countries, it does not include data for all low income and non-WTO countries. Where data are missing FAOSTAT data are employed (FAO). World prices for wheat are taken from the OECD's database and reflect the free on board (fob) US dollar price per metric ton of wheat. Exchange rate data for all countries are taken from the USDA Agricultural Exchange Rate Database and the International Monetary Fund's *Financial Statistics Yearbook* for the period 1999-2001 (IMF, OECD, USDA 2002a). Tariff data and other border measures are taken primarily from the Agricultural Market Access Database (AMAD) and, in some cases, from UNCTAD's Trade Analysis and Information System data base (UNCTAD).

¹¹ To obtain the pseudo-random error terms an individual country's production and food demand were regressed on a linear trend for the time period 1990 to 2001. The random errors from these regressions were then used to obtain a variance-covariance matrix that takes into account the correlations among the error terms, across countries, and this matrix was used to generate 1,000 pseudo-random error terms. More details on the way the pseudo-random errors were generated and some modifications made to them for the empirical analysis are contained in Grant.

¹² To obtain the exchange rate pseudo-random errors the regressions were based on three years of monthly data in an attempt to account for short-run variations in exchange rates and not structural changes that occurred in the early 1990's in many low income countries.

Policy Set

The primary policies considered in this study are border policies, tariffs in particular. However, before moving to a detailed discussion of tariffs it is important to outline the other policies explicitly incorporated into the model. In terms of domestic policies only the United States loan rate and the EU's intervention price are considered. In the United States the average loan rate (1999-2001) was US\$94.80/mt and the average farm price was US\$96.63/mt. Hence, in the baseline simulations the loan rate is not binding. However, in the stochastic simulations the farm price often drops 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. Consumer prices in the U.S. are allowed to follow market prices to levels below the loan rate.

Calibrating the model in the EU is more difficult¹³. The EU paid substantial export subsidies in 1999 and 2000 when the intervention price was 119 euro/mt, and almost no export subsidies were paid in 2001 when the intervention price was 101 euro/mt. The WTO notifications show that EU export subsidy payments averaged 15 euro/mt for the three years 1999-2001. In the model, it is assumed 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 intervention price the appropriate export subsidy is calculated. However, in each of the liberalization scenarios the intervention price is lowered from 110.6 euro/mt to 101 euro/mt, its actual value since 2001, and export subsidies are then calculated relative to the 101 euro/mt export price.

For this study the tariffs in all countries are converted to their *ad valorem* equivalents. Figure 2 shows the simple average difference in bound and applied tariffs for developed, developing and least developed net importing countries. The first thing to note is the huge gap between bound and applied tariffs. The simple average difference between bound and applied tariffs for all 32 net importing countries is 61 percentage points. For the 23 countries with bound tariffs of 100 percent or less only one country applies a tariff above 50 percent. Four of the nine countries with bound tariffs above 100 percent apply tariffs below 25 percent. Figure 2 raises the question of why countries with such large gaps between their bound and applied tariffs are worried about a *Special Safeguard Mechanism*? It appears that undesirable import surges could be remedied by raising applied tariffs, but there are at least three reasons why a country might not want to do this. First, the applied tariffs might be 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.

¹³ The EU is defined to include the 25 current member countries.

The data on applied and bound tariffs make it clear that only aggressive tariff cutting exercises in the wheat sector will have a significant liberalizing effect. For example, if the DDR negotiators agree on an UR formula for cutting tariffs (a 36 percent cut to bound rates) it would be binding for only one country (Egypt) and only because Egypt's applied and bound tariffs are both five percent¹⁴.

Expected Outcomes

Before proceeding to the empirical analysis it is useful to have an idea of what outcomes to expect. The expected direction of change in the mean values of key variables is relatively straightforward. However, an SSM has an implied objective of market stability although exactly what is to be stabilized is often left unstated. Since the SSM is triggered by changes in prices and import quantities it seems reasonable to monitor the stability of these variables, especially given the current design of the safeguard mechanism.

The work of Zwart and Meilke provides a theoretical framework that is useful for this purpose although they only considered random supply shocks. Consider the following two-country model that includes random errors on supply and demand:

$$DE = a - bPW + \varepsilon_1, \quad (7)$$

$$SE = c + dPW + \varepsilon_2, \quad (8)$$

$$DI = e - fPD + \varepsilon_3, \quad (9)$$

$$SI = g + hPD + \varepsilon_4, \quad (10)$$

$$SE - DE = DI - SI, \quad (11)$$

$$PD = \gamma PW \quad (12)$$

where, DE represents demand in the exporting nation, SE is supply in the exporting nation, DI and SI are demand and supply in the importing region respectively, PW is the world price and PD is the importer's domestic price of the commodity. The random error term, ε_i , is 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.

Zwart and Meilke show that when $\gamma = 1$ (a free trade scenario), the domestic price equals the world price (PW) with expected value $E[PW]$ and variance, $var[PW]$:

¹⁴ The 36 percent average tariff reduction applied to developed countries, developing countries were required to reduce tariffs, on average, by only 24 percent.

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

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

The form of policy intervention in the empirical SSM model is an *ad valorem* tariff as well as a safeguard mechanism that enters asymmetrically¹⁵. That is, the safeguard duty is applied if the volume or price safeguard is triggered. Equation (15) illustrates this specification.

$$PD = \gamma PW + \delta(VT)PW + \theta(PT)PW \quad (15)$$

where,

$\gamma = (1+t)$ and (t) is the *ad valorem* tariff;

$\delta = 0.33t$ and is the additional duty allowed under the volume safeguard;

θ is the additional duty allowed under the price safeguard and the size of θ increases the further the world price falls below the domestic price (Figure 1); and

VT and PT are dummy variables equal to one when the volume safeguard (VT) or price safeguard (PT) is triggered, and zero otherwise¹⁶.

Because it is the importing country that implements a tariff and the SSM, equations (9) and (10) can be re-expressed as,

$$DI = e - f(\gamma PW + \delta(VT)PW + \theta(PT)PW) + \varepsilon_3, \text{ and} \quad (16)$$

$$SI = g + h(\gamma PW + \delta(VT)PW + \theta(PT)PW) + \varepsilon_4. \quad (17)$$

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

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

¹⁵ We are grateful to an anonymous referee for pointing this out.

¹⁶ Members are not allowed to use the volume and price safeguard concurrently, so if $PT=VT=1$ we assume the importer will select the safeguard with the highest additional duty and equation (15) becomes:
 $PD = \gamma PW + (MAX(\delta, \theta))PW$.

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

The variance of the domestic price in the importing region is (Zwart and Meilke),

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

Now assume that in addition to the importer's applied tariff (γ), conditions are such that the SSM is also triggered. Whether the price or volume safeguard is triggered (or both) depends on the state of the world. For the volume safeguard, when VT = 1 and PT = 0 equations (16) and (17) become

$$DI = e - f(\gamma PW + \delta PW) + \varepsilon_3, \text{ and} \quad (21)$$

$$SI = g + h(\gamma PW + \delta PW) + \varepsilon_4. \quad (22)$$

The expected value and variance of world price is then

$$E[PW] = \frac{e - g + a - c}{(d + b + (\gamma + \delta)(f + h))} \quad (23)$$

$$Var[PW] = \frac{\sum_{i=1}^4 \sigma_i^2}{(d + b + (\gamma + \delta)(f + h))^2} \quad (24)$$

With the volume safeguard the domestic price is,

$$PD = \gamma PW + \delta PW = (1 + t + 0.33t)PW = (\gamma + \delta)PW, \quad (25)$$

and the variance of the domestic price is,

$$Var[PD] = (\gamma + \delta)^2 Var[PW] \quad (26)$$

Equations (18) through (20) and (23) through (26) illustrate three 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). Second, the expected value and variance of world price (domestic price) is further decreased (increased) when the volume safeguard is triggered because δ is positive. Calculations for the price safeguard are analogous to the volume equations shown above with δ being replaced by θ .

Policy Scenarios

The most detailed tariff cutting proposals tabled in the DDR are the cuts from bound rates contained in Mr. Harbinson's draft text of 18 March 2003 and the United States early proposal to employ a Swiss-25 tariff reduction formula from applied rates (WTO 2003b)¹⁷. The tariff cuts proposed by Harbinson are shown in table 1. The Harbinson formula contains a harmonization element with high tariffs subject to larger cuts than small tariffs. In addition, the commitments for developing countries are lower than for developed countries. However, given the huge gap between bound and applied tariffs the Harbinson formula, using average tariff cuts to bound rates, would only lower applied tariffs in four countries: Japan (225 to 158 percent), Egypt (5 to 3.8 percent), the developed country group (121.5 to 81 percent) and the EU (62 to 37 percent)¹⁸. 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 and in such cases, the EU may become a net importer of wheat. However, as revealed in the next section the Harbinson tariff cuts do not imply much liberalization of market access.

In order to analyze a more aggressive tariff cutting exercise the second scenario involves the use of a Swiss-25 harmonization formula to cut tariffs from applied rates. Under this scenario, all applied tariffs are cut to 25 percent or less, and the tariff cutting exercise is binding on all countries. Hence, the two scenarios involve one very conservative scenario, at least as far as reducing applied tariffs in the wheat sector are concerned, and one aggressive scenario where all applied tariffs are reduced. In both of these liberalization exercises the EU's intervention price is lowered from 110.6 euro/mt to 101.25 euro/mt while US domestic policies are left unaltered.

In all, four policy experiments are reported in tables 2 and 3: 1) Harbinson with no SSM (scenario 1); 2) Swiss-25 with no SSM (scenario 2); 3) Harbinson with an SSM (scenario 3); and 4) Swiss-25 with an SSM (scenario 4). Scenarios one and two are compared to the status quo simulation and scenarios three and four are compared to the comparable scenario with no SSM to isolate the price and welfare effects of an SSM. The comparisons are based on the results obtained and averaged over 1000 drawings of pseudo-random errors. As a result it is possible to measure the number of times the SSM is triggered and its effects on the stability of all of the endogenous variables.

In evaluating the results with an SSM it is helpful to know the additional SSM duties and the frequency of SSM use for the 24 low income WTO countries that are

¹⁷ The *Work Programme* agreed to by WTO Members in 2004 commits members to a "tiered" tariff cutting formula, but the exact formula and the parameters remain under negotiation. The Harbinson formula encompasses a tiered approach and proves a good example of a modest tariff cutting outcome.

¹⁸ For example, to calculate Japan's tariff cut from 225 percent to 158 percent note that Japan is a developed country and faces a reduction commitment of 60 percent since its current bound tariff rate of 396 percent is greater than the 90 percent threshold contained in Harbinson's tiered tariff cutting formula (see table 1). Define t_0 as the original bound tariff rate prior to any reduction commitment, t_a as Japan's original applied tariff rate and t_N as the new bound tariff rate after a 60 percent Harbinson reduction commitment. Then, $t_N = t_0(1 - 0.60) = 158$ percent. Because $t_N < t_a$, the reduction commitment is binding and for modeling purposes, Japan's applied tariff rate is reduced to 158 percent.

eligible to apply the safeguard mechanism (table 4)¹⁹. Note that the additional duty allowed under the volume safeguard (δ) is usually greater than the additional duty allowed with the price safeguard (θ), when the degree of trade liberalization is conservative (table 4, scenario 3). This is due to the fact that most applied tariffs are unaffected under a conservative liberalization scenario that cuts bound tariffs but does not force a reduction in applied tariffs. In this case, the volume safeguard will decrease (increase) the mean and variance of the world price (domestic price) more than the price safeguard. For the aggressive tariff cutting scenario where all applied tariffs are reduced, table 4 shows that in some cases the additional duty allowed under the price safeguard (θ) is larger than under the volume safeguard (δ) (e.g., compare scenarios 3 and 4 for Morocco and Nigeria in table 4).

Because the objective of this study is to estimate the effects of an SSM on market stability and economic welfare, the discussion of the results focus primarily on scenarios three and four²⁰. Table 2 summarizes the price and stability effects of all four policy scenarios and table 3 summarizes the welfare effects. A full list of individual country results for scenarios three and four are given in tables 5 and 6.

Scenario 1: Harbinson Tariff Cuts with No SSM

In terms of the price and welfare effects, the impacts of the Harbinson (HB) scenario on most countries are small (scenario 1, tables 2 and 3). World prices rise but by only 3.4 percent and most of this price rise (2.5 percentage points) is due to the lowering of the EU intervention price because the HB tariff cutting proposal is binding on only four countries. Domestic prices in all three net importing countries that reduce tariffs become more stable while domestic prices are slightly less stable for 30 out of 31 net importing countries not making tariff cuts (scenario 1, table 2).

The welfare findings are summarized using four country groupings (table 3)²¹. Low income countries (developing plus least developed) suffer small welfare losses from the lowering of bound tariffs and the EU intervention price (scenario 1, table 3). The losses stem from the decline in consumer surplus from higher food prices, and in some cases (Egypt) from losses in tariff revenue as importers reduce their demand for higher priced imports. In the EU and US the cost of their domestic support programs (not

¹⁹ The results are judged with respect to 31 low income countries. However, only 24 of these countries are WTO Members and for modeling purposes only these countries are given the right to apply the SSM.

²⁰ Individual county results for the pure tariff liberalization scenarios without an SSM are available from the authors upon request.

²¹ 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) consisting of Iceland, New Zealand, Norway and Switzerland; 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; 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).

shown) fall by 96 and 75 percent respectively (\$157 and \$90 million). Globally, world welfare increases by 0.65 percent or \$716 million (scenario 1, table 3)). However, the distribution of welfare changes in the Harbinson scenario are mixed with the developed country importers gaining 11.8 percent on average and developing and least developed countries losing 1.8 and 2.4 percent respectively (scenario 1, table 3).

Scenario 2: Swiss-25 Tariff Cuts with No SSM

Applying a Swiss-25 tariff cutting formula, from applied rates, results in all countries with positive tariffs facing a reduction commitment. As a result, world prices rise 5.7 percent (scenario 2, table 2)²². Following the tariff cuts 25 low income countries face higher domestic prices, and, with the exception of Indonesia, prices are stabilized in all low income countries.

World welfare increases by 1.6 percent or \$1.8 billion (scenario 2, table 3). Table 3 shows that the welfare gains in the developed country exporters (2.1 percent) are greater than in the HB scenario (1.3 percent). Again, the major gains under a Swiss-25 tariff cut accrue to developed country importers (28.5 percent), where steep applied tariffs are cut to less than 25 percent. Low income countries, as a group, lose more economic welfare under the Swiss-25 scenario than under the Harbinson scenario but this time the results vary greatly across countries depending on the initial levels of distortion.

We now turn to a discussion of the effects of an SSM when it is combined with a particular tariff cutting formula. A summary of the price and stability effects of scenarios three and four are presented in table 2 and the welfare effects of these scenarios are summarized in table 3. Tables 5 and 6 present the results for all of the individual countries.

Scenario 3: Harbinson Tariff Cuts with an SSM

In this scenario, the Harbinson tariff cutting proposal with an SSM is compared to the Harbinson tariff cutting proposal without an SSM. The SSM results in domestic prices rising in 19 of 31 low income countries and becoming less stable in 16 of 31 low income countries (scenario 3, table 2). However, imports in 26 low income countries are stabilized, and the standard deviation of net trade is reduced by over ten percent in eight low income countries (table 5). World prices fall slightly (-0.2 percent) as a result of the SSM causing increased production and lower consumption in the majority of, low income countries.

Morocco and Nigeria experience large increases in the standard deviation of domestic prices because of the size and frequency with which they apply safeguard duties (table 4 and table 5). Table 4 shows that Morocco and Nigeria apply the volume safeguard 35 and 29 percent of the time (350 and 290 times out of 1000) and the additional duties for these two countries are among the highest at 16.2 and 26.9 percent

²² In this scenario, a smaller fraction of the world price increase is attributed to the lowering of the EU-25 intervention price at 1.86 percent.

respectively. Both countries use the price safeguard less than 0.30 percent of the time (less than 3 times out of 1000). For Ethiopia, a 0.87 percent increase in its average domestic price comes with a 3.86 percent increase in price volatility (table 5). In Ethiopia's case, the additional duty under the volume safeguard is small (1.7 percent) but the frequency with which Ethiopia uses the volume safeguard is the highest of all the low income countries at 66 percent (table 4). Conversely, least developed African countries (NAG and SAG regions) increase and stabilize their domestic price of wheat (table 5) because they apply the volume SSM in moderation (22 and 13 percent respectively) and they apply smaller SSM duties at just over 2.0 percent (table 4).

In summary, Morocco and Nigeria increased their domestic price instability by applying relatively high additional duties even though these duties are applied less frequently than in the case of Ethiopia. Ethiopia increases its domestic price instability by using the SSM much more frequently even though it applies a lower additional duty compared to Morocco and Nigeria. In the ideal case, NAG and SAG countries increase and stabilize their domestic prices by applying small additional duties relatively infrequently.

Among the exporting nations, Canada suffers a drop in its price of wheat (-0.20 percent) and an increase in its producer price variability of 2.6 percent (table 5). The small decrease in world price caused by the SSM is accompanied by small reductions in the domestic price variation in the US (-0.16 percent) and the EU (-0.04 percent), however, the tiny drop in the world price increases the cost of domestic farm programs by 18.4 percent in the US and 5.4 percent in the EU (table 5).

The welfare cost of an SSM under the Harbinson proposal is \$146 million (table 5). This needs to be taken in context with the welfare gain from trade liberalization under the Harbinson formula of \$716 million. Thus, almost 80 percent of the increase in world welfare is still realized when low income countries are granted an SSM.

As shown in table 3 (scenario 3), developed country welfare for both net exporters and net importers is nearly unchanged as a result of the application of the SSM. For the US and the EU, slightly lower food and feed prices almost offset the increases in domestic program costs (table 5). Individual developing countries tend to gain by using the SSM, however the losses in the AFD (-0.26 percent), Morocco (-0.36 percent) and Nigeria (-4.0 percent) are large enough to result in an average loss (-0.11 percent) for all developing countries (scenario 3, table 3).

Scenario 4: Swiss-25 Tariff Cuts with an SSM

The results of allowing an SSM along with the reduction of applied tariffs using a Swiss-25 formula are summarized in [tables 2 and 3](#) (scenario 4). Domestic prices in 16 of 31 low income countries rise from use of the SSM and domestic prices are stabilized in 18 countries. Imports decline in 19 of 31 low income countries but are stabilized in a remarkable 27 of 31 low income countries. On this criterion alone the SSM would have to be considered a major success.

Under the Swiss-25 scenario the world welfare cost of the SSM is only \$133 million compared to a welfare gain of \$1.79 billion from liberalization using a Swiss-25 formula with no SSM (table 6). Developed exporting nations lose slightly (-0.07 percent) in terms of net national welfare (scenario 4, table 3) and in the case of the US and EU, both countries face rising costs of their domestic programs of 17.8 and 4.4 percent respectively (table 6). With this more aggressive tariff cutting scenario, almost 93 percent of the increase in world welfare is still realized when low income countries are granted an SSM. The low cost of the SSM stems from the fact that the additional duties allowed under the volume safeguard decline as applied tariffs fall.

Among the developing countries, Mexico and Nigeria lose economic welfare as average prices increase 2.8 and 7.4 percent but this rise is accompanied by a significant decline in the standard deviation of domestic prices of 7.7 and 22.8 respectively (table 6). Again, the reduction in the standard deviation of prices (and net imports) in these countries can be explained in terms of how often the SSM is triggered and the magnitude of the additional SSM duties (table 4). Although Mexico applies the volume trigger more often in scenario four than in scenario three (770 versus 250 respectively) the additional duty is roughly one-half as large as in scenario four (4.4 percent in scenario 4 versus 9.2 percent in scenario 3). Because the tariff cuts in scenario four are more aggressive, Nigeria relies more on the price safeguard (930 times) but applies an SSM duty of 14.7 percent, roughly one-half the level it applied in scenario three using the volume safeguard. In the Philippines, economic welfare rises when the Swiss-25 tariff reductions are combined with an SSM policy and prices and net imports are stabilized by over ten percent (table 6).

In terms of the least developed countries, Ethiopia loses slightly (-0.01 percent) as the increases in tariff revenue and producer surplus of 40.5 and 1.8 percent are not enough to offset the loss in consumer surplus of 1.5 percent. Least developed NAG and SAG regions gain economic welfare and prices in both countries are stabilized, as are net imports whose variability is reduced by 4.1 and 3.0 percent respectively.

Conclusions

Summarizing the results of the SSM analysis is difficult because in some sense each country has a different stake in the trade negotiations depending on its initial tariff levels and its trade position in the wheat market. However, some general observations are possible.

First, an examination of the individual country results (not reported) from trade liberalization scenarios one and two reveals that 29 out of 31 (27 out of 31) low income countries lose economic welfare under Harbinson (Swiss-25) suggesting that these countries are unlikely to be enthusiastic supporters of reducing their own tariffs. These results are similar to those obtained by Vanzetti and Peters in a more comprehensive analysis of the effects of trade liberalization on developing countries. Conversely, developed countries, both importers and exporters gain from wheat trade liberalization.

Thus, if developed countries should unilaterally liberalize their own trade, it is likely that reform by low income countries will minimize their welfare losses and make them better off relative to developed country reform only.

Second, the potential use of the SSM increases as the degree of trade liberalization increases and domestic prices fall. With Harbinson reforms low income countries would be able to use the SSM about 21 percent of the time and would almost always apply the volume safeguard. With Swiss-25 reforms low income countries would have the right to apply SSM duties nearly 40 percent of the time and although the volume safeguard would still be the dominant instrument, the price safeguard would account for about 8 percent of the SSM actions.

Third, the larger the trade reforms, the smaller (larger) the average volume safeguard (price safeguard) duty. Under Harbinson reforms the average volume (price) safeguard duty is 5.2 (1.3) percent and under the Swiss-25 reforms the average volume-based (price-based) SSM duty is 2.5 (4.5) percent.

Fourth, under the Harbinson reform scenario with an SSM six low income countries lose economic welfare compared to a scenario with no SSM, and the loss of consumer surplus in two countries is greater than two percent: Nigeria (-13.0 percent) and Africa Developing Group (-2.4 percent). The same is true, although the magnitudes are smaller, for these same two countries using an SSM under Swiss-25 reforms.

Fifth, the SSM, especially under Swiss-25 reforms significantly stabilizes the level of imports in 27 of 31 low income countries and stabilizes producer surplus in 23 of 28 low income countries. Furthermore, if we restrict our attention to the 24 out of 31 low income WTO countries that are allowed to invoke the safeguard, prices are stabilized in 18 of 24 countries and imports are stabilized in a notable 23 of 24 countries under Swiss-25 reforms.

Sixth, as the tariff cuts get more aggressive the gains in economic welfare not only get bigger but the cost of allowing an SSM becomes smaller. This result is more obvious in Grant (2003) where he considered a larger range of tariff cutting scenarios.

Finally, we have not explored empirically the implications of safeguard rules other than those used under the current SSG. Sharma sheds some light on this issue by calculating the additional tariffs that would be necessary to completely stabilize domestic prices relative to a moving average trend. However, it is hard to imagine that trade negotiators will agree on an SSM policy that is flexible enough for developing countries to almost completely stabilize their domestic prices. Valdes and Foster calculate the required tariff levels that would be necessary to prevent Chile's wheat and sugar prices from falling below a historical trend. Their results, which are consistent with Sharma, show that tariffs in the neighborhood of 20 to 40 percent would suffice. Yet, neither study looked at the impact of stabilizing domestic prices on imports, producer surplus or total welfare.

The key issue with any safeguard will be how often it is applied and how large the additional duties are when it is used. Our Swiss-25 results suggest that a frequently used SSM costs developed exporting nations far less than one percent of the gains from liberalization that would be realized without an SSM as long as the additional duties are small (in only two cases do the safeguard duties average more than 10 percent). Hence, if developing countries are willing to accept larger cuts in tariffs in return for an SSM, it is trade-off developed countries should accept – at least at far as the wheat market is concerned.

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Figure 1: Effect on import price of the price safeguard

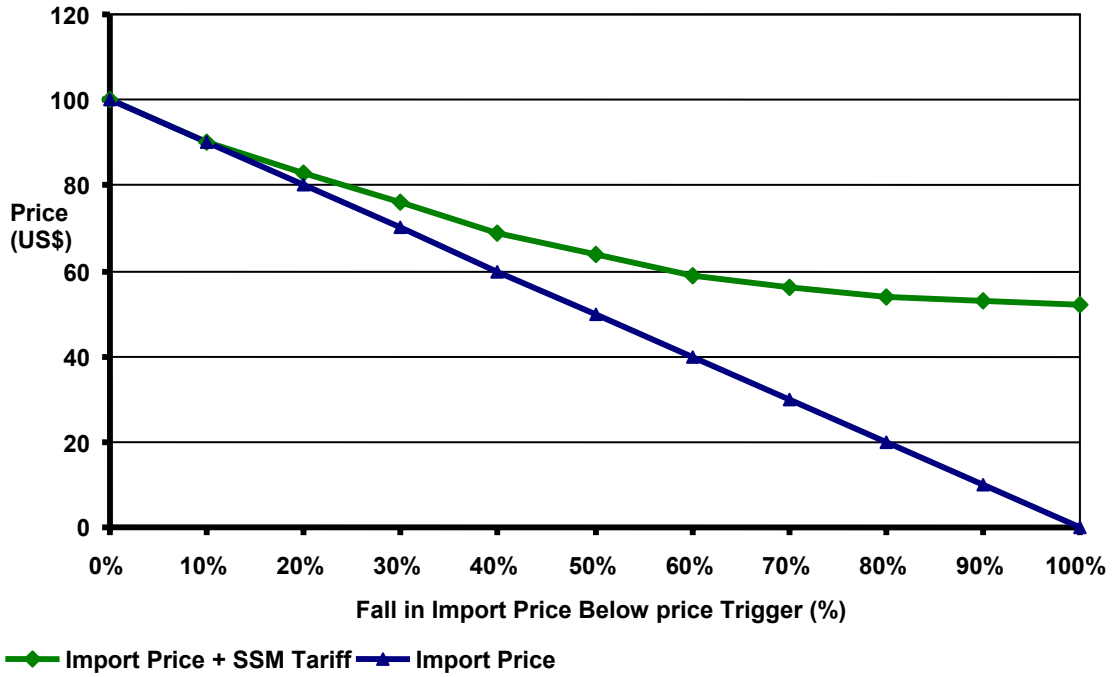
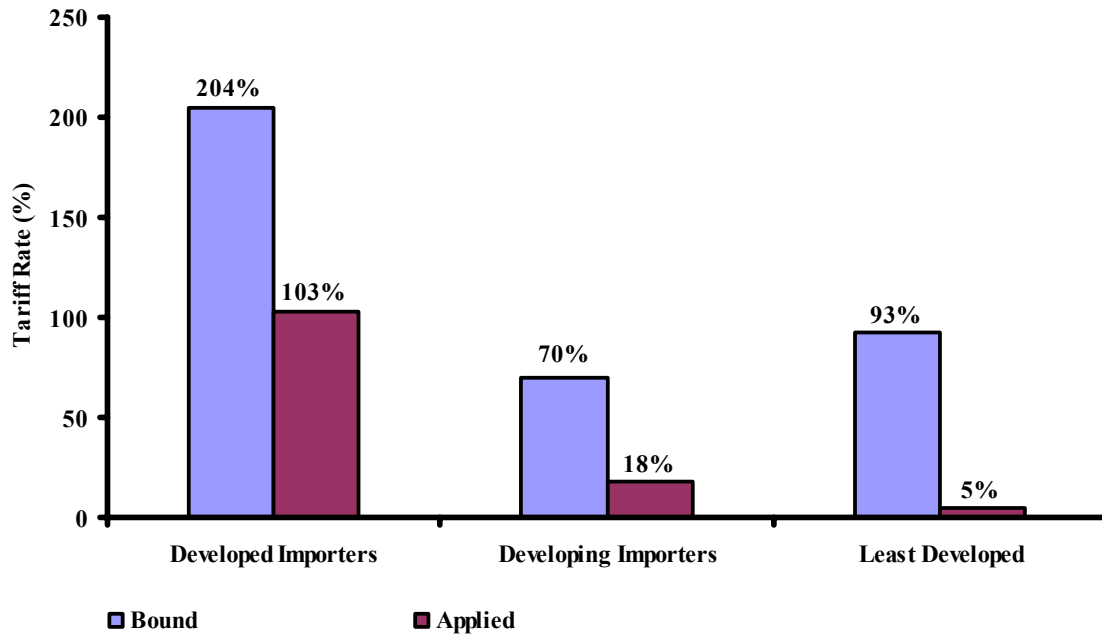


Figure 2: Average bound and applied wheat tariffs for developed, developing and least developed net importing countries*



* 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 1: Harbinson tariff reduction commitments

Development Status	Agricultural Tariff	Average Tariff Cut*	Minimum Tariff Cut*
Developed	T > 90%	60%	45%
	15% < T ≤ 90%	50%	35%
	T ≤ 15%	40%	25%
Developing	T > 120%	40%	30%
	60% < T ≤ 120%	35%	25%
	20% < T ≤ 60%	30%	20%
	T ≤ 20%	25%	15%
	“SP” Products*	10%	5%

* Average and minimum tariff cuts are from bound rates as contained in WTO (2003b).

Table 2. Price and stability effects for low income countries

	Scenarios 1 and 2 - No SSM ^a								Scenarios 3 and 4 - With an SSM ^b							
	<i>(1) Harbinson</i>				<i>(2) Swiss-25</i>				<i>(3) Harbinson</i>				<i>(4) Swiss-25</i>			
	<i>Mean^c</i>		<i>Stability^c</i>		<i>Mean^c</i>		<i>Stability^c</i>		<i>Mean^c</i>		<i>Stability^c</i>		<i>Mean^c</i>		<i>Stability^c</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>	<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	25	6	30	1	19	12	16	15	16	15	18	13
Producer Surplus	28	0	13	15	22	6	18	10	17	11	21	7	15	13	23	5
Imports	3	28	27	4	9	22	27	4	9	22	26	5	12	19	27	4
	World Price Increase = 3.42%				World Price Increase = 5.65%				World Price Decrease = 0.20%				World Price Decrease = 0.19%			

^a Scenarios 1 and 2 are measured relative to the baseline simulation calibrated to average supply, demand and tariff rates for the years 1999-2001.

^b Scenarios 3 and 4 are measured relative to the corresponding scenarios 1 and 2.

^c The results in the table 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.

Table 3. Aggregate changes in welfare

	Scenarios 1 and 2 - No SSM ^a						Scenarios 3 and 4 - With an SSM ^b					
	<i>(1) Harbinson</i>			<i>(2) Swiss-25</i>			<i>(3) Harbinson</i>			<i>(4) Swiss-25</i>		
	<i>Gain^c</i>	<i>Loss^c</i>	<i>Welfare Δ (%)</i>	<i>Gain^c</i>	<i>Loss^c</i>	<i>Welfare Δ (%)</i>	<i>Gain^c</i>	<i>Loss^c</i>	<i>Welfare Δ (%)</i>	<i>Gain^c</i>	<i>Loss^c</i>	<i>Welfare Δ (%)</i>
Developed Exporters	4	0	1.31	4	0	2.09	0	4	-0.07	0	4	-0.07
Developed Importers	2	1	11.78	2	1	28.50	3	0	0.11	3	0	0.07
Developing Countries	2	24	-1.80	4	22	-1.97	20	6	-0.11	19	7	0.02
Least Developed Countries	0	5	-2.44	0	5	-3.94	5	0	0.13	4	1	0.13
World	8	30	0.65	10	28	1.61	28	10	-0.13	26	12	-0.12

^a Scenarios 1 and 2 are measured relative to the baseline simulation calibrated to average supply, demand and tariffs for the years 1999-2001.

^b Scenarios 3 and 4 are measured relative to the corresponding scenarios 1 and 2.

^c The results for *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.

Table 4. Frequency of use and average additional duties under the SSM

Country	Scenario 3 - Harbinson				Scenario 4 – Swiss-25			
	<i>SSM Duty (%)</i>		<i>SSM Frequency (%)</i>		<i>SSM Duty (%)</i>		<i>SSM Frequency (%)</i>	
	Price ^a	Volume ^a	Price ^b	Volume ^b	Price ^a	Volume ^a	Price ^b	Volume ^b
Developing								
Algeria	1.7	0.9	1.0	18	0.2	0.8	0.1	13
Brazil	7.1	4.3	1.6	27	7.8	2.9	3.3	31
Columbia	2.3	5.0	0.8	14	3.0	3.1	1.5	21
Egypt	2.5	1.3	1.2	27	1.5	1.4	0.3	20
Indonesia	10.5	0.0	12	0	9.2	0.0	9.0	0.0
Malaysia	0.7	3.7	0.2	6.5	0.4	2.5	0.2	7.7
Mexico	1.4	9.2	0.1	25	4.3	4.4	0.3	77
Morocco	2.9	16.2	0.3	35	10.0	5.5	21	78
Nigeria	0.8	26.9	0.1	29	14.7	6.4	93	6.3
Peru	0.9	6.7	0.2	19	2.2	3.7	1.6	33
Philippines	3.1	4.9	0.1	15	3.0	3.1	0.1	25
South Korea	2.4	1.4	0.3	20	1.6	1.2	0.2	14
Tunisia	2.1	0.0	1.5	0	3.0	3.7	1.5	61
United A.E.	0.7	1.4	0.1	39	0.0	1.2	0.0	37
Venezuela	1.3	5.0	0.4	5.0	1.0	3.1	1.1	8.2
AFD	2.3	9.7	0.2	23	5.0	4.5	3.2	66
CTA	1.1	1.5	0.2	19	0.0	1.3	0.0	16
STA	2.5	3.4	0.1	23	1.9	2.4	0.1	25
ASG	1.5	3.3	0.1	20	1.4	2.3	0.1	22
Least Developed								
Bangladesh	1.2	1.8	0.5	7.3	0.6	1.5	0.1	6.5
Ethiopia	1.0	1.7	0.1	66	0.0	1.4	0.0	63
Yemen	1.4	0.0	0.7	0.0	0.0	0.0	0.0	0.0
NAG	2.1	2.2	0.3	22	1.1	1.7	0.1	9.3
SAG	2.2	2.1	0.2	13	0.9	1.7	0.1	20
Average (%)	2.3	5.2	1.0	20.0	4.5	2.5	8.0	27

^a Price (Volume) refers to the additional safeguard duty calculated in the model

^b Price (Volume) refers to how often the safeguard is triggered as a percentage out of 1000 pseudo-random error draws.

Table 5. Scenario 3 - Harbinson tariff cuts with an 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	-0.20	1.77	-0.11	-0.20	0.05	1.18	-0.18	-0.22	0.08	0.45	-0.29	-0.45	----	----	-0.13	-0.43
Canada	-0.20	2.65	-0.12	-0.16	0.13	2.03	-0.22	-0.12	0.08	0.26	-0.29	-0.19	----	----	-0.12	-0.30
EU-25 ^b	-0.04	-0.34	-0.02	-0.41	0.02	-0.32	-2.02	-1.23	0.05	-0.25	-0.06	-1.05	5.36	4.28	0.00	-0.11
Israel	-0.20	2.33	-0.08	2.33	0.11	1.36	0.12	1.41	0.03	0.03	-0.24	2.22	-0.08	1.14	0.05	0.07
Japan	-0.19	0.88	-0.26	0.26	0.13	0.70	0.15	0.73	0.23	0.74	-0.45	-0.01	0.08	-0.08	0.18	0.60
USA ^b	-0.16	0.53	-0.07	-0.04	0.10	2.27	-0.28	-0.16	0.04	0.21	-0.20	-0.20	18.38	11.86	-0.03	-0.21
DCG	-0.20	2.02	-0.30	0.94	0.09	0.50	0.34	1.07	0.14	0.27	-0.56	0.57	0.12	-0.06	0.10	0.18
Developing																
Algeria	-0.04	0.69	-0.03	-0.45	0.01	-0.81	0.02	-1.19	0.02	-0.81	-0.11	-0.61	6.62	149.28	0.06	0.00
Argentina	-0.20	3.16	-0.11	-0.14	0.06	0.27	-0.18	-0.13	0.13	0.34	-0.28	-0.18	----	----	-0.12	-0.24
Brazil	0.79	-8.44	0.55	-2.95	-0.46	-8.42	-0.81	-9.21	-0.89	-8.97	0.91	-3.11	8.71	143.26	0.05	-0.13
China	-0.19	2.87	-0.03	-0.17	0.13	2.23	-6.13	-0.62	0.25	2.28	-0.21	-0.56	0.00	0.00	0.00	-0.06
Columbia	0.39	-3.41	----	----	-0.14	-5.92	-0.14	-5.92	-0.32	-6.51	0.39	-3.41	4.53	134.87	0.10	0.07
Egypt	0.12	-1.47	0.06	-1.61	-0.03	-1.72	-0.11	-2.95	-0.06	-1.79	0.14	-2.20	9.66	135.33	0.03	-0.03
Indonesia	-0.02	-2.82	----	----	0.02	-1.39	0.02	-1.39	-0.03	-1.76	----	----	C	D	0.42	0.40
Iran	-0.20	2.87	-0.13	0.06	0.04	0.14	0.27	0.15	0.08	0.18	-0.29	-0.02	----	----	0.03	0.06
Iraq	-0.20	3.16	-0.13	0.08	0.02	-0.01	0.05	-0.02	0.03	0.01	-0.28	-0.05	----	----	0.03	0.01
Kazakhstan	-0.20	0.48	-0.10	-0.01	0.06	0.08	-0.28	-0.01	0.04	0.01	-0.26	-0.13	----	----	-0.05	-0.05
Malaysia	0.01	-0.82	----	----	0.00	-2.85	0.00	-2.85	-0.01	-3.08	----	----	1.98	121.81	0.11	0.51
Mexico	1.51	-16.36	1.01	-13.00	-0.81	-16.64	-3.45	-24.52	-1.44	-15.47	2.13	-15.72	4.92	50.62	-0.17	-1.70
Morocco	3.60	43.32	3.28	-10.64	-0.81	-1.03	-4.01	-17.26	-1.66	-2.02	4.75	-8.10	8.93	45.14	-0.36	1.22
Nigeria	3.99	32.47	2.94	0.57	-6.23	-33.81	-6.47	-33.81	-12.98	-39.61	6.44	5.64	2.44	22.35	-3.97	-22.73

^a The percentage changes are measured relative to Harbinson tariff cuts with no SSM (scenario 1).

^b The figures under government revenue for the US and the EU show changes in the cost of their government programs.

C = 8.8 million

D = 32.8 million

Table 5 continued

COUNTRY	Wheat Variables - Percent Change															
	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	0.83	0.00	0.63	-1.38	-0.29	-9.17	-0.42	-11.00	-0.67	-10.01	1.33	-0.79	5.95	172.17	0.08	-0.05
Philippines	0.39	-10.62	----	----	-0.41	-11.95	-0.40	-11.95	-0.31	-4.77	----	----	4.35	248.37	0.12	-0.28
South Korea	0.05	-3.73	----	----	-0.05	-3.76	-0.05	-3.76	-0.05	-3.03	0.05	-3.73	6.54	707.73	0.23	1.19
Tunisia	-0.19	1.78	-0.12	0.12	0.05	0.04	0.23	0.16	0.09	0.09	-0.27	0.05	0.07	-0.13	0.04	0.03
United A.E.	0.32	2.71	----	----	-0.17	-1.27	-0.17	-1.27	-0.44	-1.56	0.32	2.71	15.08	82.61	0.18	0.13
Venezuela	0.01	-0.17	0.01	-0.22	0.00	-3.24	0.00	-3.25	-0.02	-3.60	0.01	-0.36	1.51	90.20	0.14	0.22
AFD	1.46	-6.83	1.60	-4.00	-1.10	-15.50	-1.86	-19.52	-2.37	-17.29	2.87	-2.61	5.89	87.11	-0.26	-2.99
CTA	0.06	1.06	----	----	-0.03	-2.42	-0.03	-2.42	-0.09	-2.70	0.06	1.06	6.44	167.64	0.20	0.42
STA	0.46	-7.36	0.45	-6.85	-0.22	-6.80	-1.18	-10.42	-0.47	-7.18	0.78	-6.18	7.08	65.37	0.02	0.17
ASG	0.37	-5.29	0.32	-3.39	-0.27	-7.48	-0.65	-10.20	-0.56	-7.38	0.54	-3.34	6.28	102.11	0.08	0.21
MEG	-0.20	3.05	----	----	0.08	0.44	0.08	0.44	0.16	0.53	-0.20	3.05	0.80	241.87	0.15	0.54
ROW	-0.20	3.05	-0.15	0.76	0.16	0.25	0.90	0.63	0.31	0.32	-0.31	0.89	0.66	0.10	0.06	0.10
Least Developed																
Bangladesh	-0.07	2.11	-0.03	-0.54	0.04	-0.96	0.13	-1.35	0.06	-1.14	-0.10	-0.69	3.43	30.21	0.06	0.12
Ethiopia	0.87	3.86	0.35	-1.05	-0.43	-1.89	-2.86	-3.09	-0.90	-2.18	1.06	-1.30	24.88	35.06	0.01	0.02
Yemen	-0.19	2.38	-0.05	0.01	0.08	0.08	0.09	0.08	0.16	0.17	-0.22	0.07	----	----	0.15	0.16
SAG	0.04	-2.44	0.03	-0.88	-0.03	-3.81	-0.04	-4.04	-0.07	-4.21	0.06	-1.05	4.12	172.45	0.18	0.63
NAG	0.24	-2.67	0.21	-0.48	-0.22	-4.77	-0.23	-4.82	-0.53	-5.48	0.41	-0.31	7.62	139.89	0.28	0.58
WORLD	-0.20	3.16	-0.02	-0.43	-0.02	-0.43	0.00	0.00	----	----	----	----	----	----	-0.13	-4.48
Welfare Difference From Scenario 1 (\$US) = \$ -146 Million																

Table 6. Scenario 4 - Swiss-25 tariff cuts with an SSM^a

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	-0.19	0.74	-0.11	-0.09	0.05	0.48	-0.17	-0.10	0.08	0.20	-0.27	-0.31	----	----	-0.12	-0.29
Canada	-0.19	1.19	-0.12	-0.09	0.12	0.90	-0.21	-0.08	0.08	0.13	-0.27	-0.23	----	----	-0.12	-0.25
EU-25 ^b	-0.10	-0.55	-0.06	-0.47	0.06	-0.55	-3.54	-1.15	0.11	-0.43	-0.14	-1.08	4.41	2.42	0.00	-0.13
Israel	-0.19	1.00	-0.07	1.00	0.11	0.56	0.12	0.58	0.03	0.02	-0.23	0.92	-0.07	0.48	0.05	0.04
Japan	-0.19	0.27	-0.33	-0.02	0.04	0.13	0.05	0.17	0.08	0.14	-0.48	-0.24	-0.14	0.32	0.07	0.13
USA ^b	-0.21	0.60	-0.10	-0.06	0.10	1.03	-0.33	-0.11	0.04	0.09	-0.27	-0.26	17.76	11.45	-0.03	-0.14
DCG	-0.19	0.94	-0.37	0.26	0.05	0.12	0.14	0.31	0.08	0.08	-0.70	-0.11	-0.05	-0.07	0.07	0.07
Developing																
Algeria	-0.09	0.31	-0.06	-0.38	0.02	-0.50	0.04	-0.93	0.04	-0.48	-0.17	-0.56	4.68	131.22	0.06	0.06
Argentina	-0.19	1.53	-0.10	-0.09	0.06	0.12	-0.17	-0.09	0.13	0.19	-0.26	-0.25	----	----	-0.12	-0.23
Brazil	0.63	-7.25	0.43	-2.22	-0.36	-7.00	-0.63	-7.28	-0.70	-7.41	0.73	-2.43	10.82	165.51	0.08	-0.09
China	-0.19	1.52	-0.03	-0.08	0.13	1.19	-3.66	-0.32	0.26	1.27	-0.21	-0.46	0.00	0.00	0.00	-0.10
Columbia	0.37	-3.46	----	----	-0.13	-5.09	-0.13	-5.09	-0.29	-5.51	0.37	-3.46	6.67	176.21	0.11	0.06
Egypt	0.07	-2.22	0.03	-1.75	-0.02	-1.58	-0.07	-2.84	-0.04	-1.66	0.08	-2.54	7.18	116.18	0.03	0.02
Indonesia	-0.07	-2.15	----	----	0.08	-1.05	0.08	-1.05	0.10	-1.28	----	----	C	D	0.41	0.26
Iran	-0.19	1.39	-0.12	0.03	0.04	0.07	0.27	0.08	0.07	0.11	-0.28	-0.10	----	----	0.03	0.04
Iraq	-0.19	1.53	-0.12	0.04	0.02	0.00	0.05	-0.01	0.03	0.01	-0.28	-0.12	----	----	0.02	0.01
Kazakhstan	-0.19	0.11	-0.10	-0.02	0.06	0.01	-0.27	-0.02	0.04	0.01	-0.25	-0.18	----	----	-0.05	-0.08
Malaysia	-0.01	-1.66	----	----	0.00	-2.58	0.00	-2.58	0.00	-2.75	----	----	2.42	151.28	0.11	0.28
Mexico	2.77	-7.69	1.80	-6.41	-1.29	-8.58	-4.73	-12.59	-2.24	-8.36	4.05	-7.07	20.33	99.41	-0.12	-0.28
Morocco	4.05	-0.14	3.62	-1.62	-0.69	-0.97	-2.96	-2.74	-1.43	-1.67	6.74	1.55	26.85	47.81	-0.13	0.09
Nigeria	7.35	-22.83	4.80	-0.28	-5.12	-2.60	-5.25	-2.65	-9.94	-7.59	11.09	6.66	39.38	59.27	-0.98	-0.12

^a The percentage changes are measured relative to Swiss-25 tariff cuts with no SSM (scenario 2).

^b The figures under government revenue for the US and the EU show changes in the cost of their government programs.

C= 5.8 million

D = 26.1 million

Table 6 continued.

COUNTRY	Wheat Variables - Percent Change															
	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	0.90	-2.35	0.68	-1.99	-0.30	-7.61	-0.42	-9.28	-0.66	-8.13	1.43	-1.53	10.88	237.39	0.10	0.20
Philippines	0.47	-11.29	----	----	-0.47	-12.52	-0.46	-12.52	-0.36	-4.62	----	----	7.66	347.34	0.13	-0.21
South Korea	-0.04	-2.84	----	----	0.05	-2.86	0.05	-2.86	0.03	-2.31	-0.04	-2.84	4.63	551.25	0.22	0.56
Tunisia	1.84	3.21	1.14	-2.86	-0.43	-2.75	-2.01	-5.90	-0.88	-3.11	2.50	-2.71	20.22	69.45	-0.01	-0.09
United A.E.	0.24	1.27	----	----	-0.13	-1.13	-0.13	-1.13	-0.35	-1.38	0.24	1.27	14.73	82.06	0.18	0.10
Venezuela	0.04	-1.20	0.02	-0.26	-0.02	-3.60	-0.02	-3.60	-0.05	-3.93	0.05	-0.48	2.66	140.35	0.14	0.11
AFD	2.41	-5.66	2.67	-2.40	-1.52	-10.34	-2.44	-13.06	-3.10	-11.32	5.04	-0.02	19.67	143.13	-0.14	-0.78
CTA	0.00	-0.28	----	----	0.00	-1.96	0.00	-1.96	-0.02	-2.18	0.00	-0.28	5.39	154.51	0.19	0.29
STA	0.35	-6.39	0.34	-5.56	-0.17	-5.68	-0.87	-8.67	-0.35	-5.97	0.58	-5.09	8.34	76.80	0.04	0.08
ASG	0.26	-4.89	0.23	-2.76	-0.19	-6.40	-0.46	-8.51	-0.40	-6.19	0.38	-2.78	7.13	114.35	0.09	0.07
MEG	-0.19	1.54	----	----	0.08	0.19	0.08	0.19	0.15	0.27	-0.19	1.54	-0.11	0.32	0.15	0.27
ROW	-0.19	1.46	-0.15	0.30	0.15	0.11	0.97	0.26	0.30	0.22	-0.30	0.27	0.76	-0.06	0.05	0.11
Least Developed																
Bangladesh	-0.39	0.78	-0.13	-0.42	0.22	-0.83	0.67	-1.15	0.41	-0.78	-0.47	-1.15	-3.21	21.94	0.06	0.10
Ethiopia	1.44	3.58	0.57	-1.05	-0.72	-2.01	-4.98	-3.24	-1.47	-2.57	1.77	-0.85	40.56	53.51	-0.01	0.00
Yemen	-0.19	1.20	-0.05	0.01	0.08	0.04	0.09	0.04	0.16	0.13	-0.21	-0.05	----	----	0.14	0.12
SAG	-0.05	-2.24	-0.04	-0.92	0.03	-2.74	0.04	-2.96	0.05	-3.01	-0.09	-1.12	3.10	147.13	0.18	0.32
NAG	0.13	-2.65	0.11	-0.46	-0.12	-4.09	-0.12	-4.14	-0.31	-4.69	0.21	-0.39	6.89	135.10	0.28	0.14
WORLD	-0.19	1.53	-0.02	-0.25	-0.02	-0.25	0.00	0.00	----	----	----	----	----	----	-0.12	-4.68
Welfare Difference From Scenario 2 (US\$) = \$ -133 Million																