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**Technical Annex**

**Alternative Market Access Scenarios in the Agricultural  
Trade Negotiations of the Doha Round**

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This document is the technical annex to the full paper “Alternative Market Access Scenarios in the Agricultural Trade Negotiations of the Doha Round” which is available separately.

**A1. Definition of the Market Access Scenarios**

**1. Harbinson Approach – No Export Subsidies**

The cut implemented is

$$T_1 = cT_0 \quad (1)$$

where  $T_0$  is the initial (bound) tariff,  $T_1$  is the rate after application of the formula, and  $c$  is the constant proportion of the original rate to which tariffs are to be reduced. For developed countries this scenario implies the following:

- 60% reduction if tariffs are greater than 90%;
- 50% reduction if tariffs are greater than 15% and equal to or smaller than 90%;
- 40% reduction if tariffs are equal to or smaller than 15%.

The reduction is smaller for developing countries:

- 40% reduction if tariffs are greater than 120%;
- 35% reduction if tariffs are equal or smaller than 120% and greater than 60%;
- 30% reduction if tariffs are equal or smaller than 60% and greater than 20%;
- 25% reduction if tariffs are equal or smaller than 20%.

## 2. Girard Approach – No Export Subsidies

With the Swiss formula, the new rate  $T_1$  is given by

$$T_1 = \frac{t_a \cdot T_0}{t_a + T_0} \quad (2)$$

where  $t_a$  is the national average of the bound rates within each band, and  $T_0$  is the initial rate.

Formally, the “switching point” ( $\tau$ ), below which cuts are smaller with the Swiss formula than with the linear formula, can be computed by equating the new tariffs resulting from (1) and (2):

$$c\tau = \frac{t_a\tau}{t_a + \tau} \Rightarrow \tau = \frac{t_a(1-c)}{c} \quad (3)$$

### A2. The “Negotiation Game”

Let  $S_i = (a_i^{sq}, a_i^h, a_i^g, a_i^{ft})$  represent the set of all possible strategies that can be employed by agent  $i$ . Each player  $i$  chooses some strategy  $a_i \in S_i$  in order to maximise its payoff given the strategy of the other. A similar set of strategies,  $S_{i+}$ , exists for the other main player (denoted by  $i+$ ). For a given strategy  $a_{i+}$ , government  $i$  will choose  $a_i^*$ , which is one possible best response to  $a_{i+}$ , such that  $EV_i(a_i^*, a_{i+}) \geq EV_i(a_i, a_{i+})$ , for all  $a_i \in S_i$ . A Nash equilibrium is defined as the set of strategies  $(a_i^*, a_{i+}^*)$  where  $a_i^*$  is a best response of  $a_{i+}^*$  for country  $i$ , and  $a_{i+}^*$  is a best response to  $a_i^*$  for country  $i+$ .