Comparing market access formulas for U.S. and EU

What hurts and who benefits?

Christine Wieck and Tom Wahl
Impact Center
Washington State University
Table of Content

- Introduction
- Tariff formulas
- CAPRI Model
- Results
- Conclusions
Introduction

• Market access one of the most contentious policy areas
• Substantial commitments expected by U.S. and EU
  but they are also important producers and exporters
• Uruguay Round could have provided a suitable methodology
  but controversy over
  • Liberalization achievements of Uruguay Round
  • Future reduction formulas and desired tariff profiles
• Objective of the study:
  • Analysis of market access scenarios (tariff reduction/TRQ expansion) for two of the key players
• Disaccord about whether only *tariff levels* or also *tariff dispersion* in national tariff profiles shall be reduced
• Tariff reduction commitments may imply strong liberalization commitments for specific sectors
• Countries defend or promote certain tariff scenarios in line with their strategic import and export interests
Tariff formulas I

- *Uruguay round formula*: Linear tariff cut; in average cut -36%, each single tariff line by at least -15%
  - If applied on a line-by-line basis: progressive
  - No special attention to tariff peaks

- *Swiss formula*:
  \[ t_{1i} = \frac{at_{0i}}{a + t_{0i}} \]
  - A-coefficient: upper limit to all tariffs
  - Strong reduction of all tariff peaks

- WTO draft paper (*Harbinson*): Different cuts according to tariff bands in the range -40% to -60%
  - Progressive reduction of tariff peaks
  - Flexibility in the composition of the average tariff reduction
Tariff formulas II

• **Modified Swiss** (proposal by Francois et al. 2005):
  - B-coefficient incorporates more flexibility
  
  \[ t_{li} = \frac{a \frac{t_{0i}}{b}}{a + \frac{t_{0i}}{b}} \]

• **Konandreas** (2003) proposal ("Panoply"): Reduction in tariff level and tariff dispersion
  
  \[ t_{li} = (1 - \alpha)m_0 + (1 - \beta)(t_{0i} - m_0) \]
  - Formula depends on tariff average and standard deviation of tariff profile
  - Drawbacks in the case of very dispersed tariff profiles, as some small tariffs might be increased
CAPRI Model: Overview

- Common Agricultural Policy Regionalised Impact analysis
- Partial equilibrium agricultural sector model
- Comparative-static
- Consists of
  - Detailed EU supply component
  - Multi-Commodity spatial market module
- Developed within European research network coordinated by Bonn University
- Mainly funded by EU research framework programs
CAPRI Model: Market Module

- Country aggregates:
  
  EU + CEE, U.S., CAN, IND, CHN, CAD, ANZ, MED, ACP, ROW

- Products (HS 2-3): 5 cereals, 3 oilseeds/cakes/oils, pulses, sugar,
  4 meat, eggs, 4 processed milk products

- Armington assumption (bilateral streams, two stage procedure)

- Globally well-behaved behavioral functions calibrated to elasticities from literature

- Welfare analysis based on indirect utility function
CAPRI: Trade policy instruments

- Due to the Armington approach:
  - Bilateral ad valorem and specific tariffs (WTO, OECD, AMAD)
  - TRQs (WTO)
    - Global for most country aggregates and products
    - Bilateral TRQs for some U.S. and EU products
  - PSE/CSE for representation of domestic policies (OECD)
  - EU: Intervention purchases and export subsidies (EU-COM)
Scenario Layout

Reference

Dom. policy: EU implementation of CAP reform 2003; U.S. PSE/CSE from 2000
Trade policy: Uruguay Round extended unchanged until 2009 (EU and U.S.)

Tariff reductions

Uruguay round approach
Swiss formula
Harbinson
Konandreas proposal
Modified swiss

TRQs expansion + MFN reduction

Increase quota to at least 10% of demand
Apply tariff cuts as in previous scenario runs

TRQs expansion + Reduction of MFN, in-quota t.

Increase quota to at least 10% of demand
Apply tariff cuts as in previous scenario runs
Reduce in-quota tariffs if fill rate <= 65%
## Tariff reductions

### Development of tariff profiles

<table>
<thead>
<tr>
<th></th>
<th>United States</th>
<th></th>
<th>European Union</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average tariff (%)</td>
<td>Standard Deviation</td>
<td>Average tariff (%)</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Reference</td>
<td>15.63</td>
<td>26.38</td>
<td>72.42</td>
<td>42.21</td>
</tr>
<tr>
<td>Uruguay</td>
<td>10.00</td>
<td>16.88</td>
<td>46.35</td>
<td>27.01</td>
</tr>
<tr>
<td>Swiss</td>
<td>6.10</td>
<td>6.31</td>
<td>17.30</td>
<td>3.63</td>
</tr>
<tr>
<td>Harbinson</td>
<td>6.88</td>
<td>11.36</td>
<td>33.43</td>
<td>16.84</td>
</tr>
<tr>
<td>Panoply</td>
<td>8.49</td>
<td>11.47</td>
<td>45.49</td>
<td>18.26</td>
</tr>
<tr>
<td>Mod. Swiss</td>
<td>4.15</td>
<td>4.98</td>
<td>13.63</td>
<td>3.92</td>
</tr>
</tbody>
</table>
## Tariff reductions

### Binding trade instruments U.S.

<table>
<thead>
<tr>
<th></th>
<th>Reference</th>
<th>Uruguay</th>
<th>Swiss</th>
<th>Harbinson</th>
<th>Panoply</th>
<th>Mod. Swiss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Barley</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Maize</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Rice</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Oilseeds/cakes/oils</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Sugar</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
</tr>
<tr>
<td>Beef</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
</tr>
<tr>
<td>Pork meat</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Poultry meat</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
<td>MFN</td>
</tr>
<tr>
<td>Cheese</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
</tr>
<tr>
<td>Butter and cream</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Skimmed milk powder</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
<td>binding</td>
</tr>
</tbody>
</table>
### Tariff reductions

#### Binding trade instruments EU

<table>
<thead>
<tr>
<th>Reference</th>
<th>Uruguay</th>
<th>Swiss</th>
<th>Harbinson</th>
<th>Panoply</th>
<th>Mod. Swiss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Barley</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Maize</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Rice</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>abolition of quota</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
</tr>
<tr>
<td>Oilseeds/cakes/oils</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Sugar</td>
<td>over-quota t.</td>
<td>abolition of quota</td>
<td>over-quota t.</td>
<td>over-quota t.</td>
<td>abolition of quota</td>
</tr>
<tr>
<td>Beef</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Pork meat</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>abolition of quota</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Poultry meat</td>
<td>binding quota</td>
<td>abolition of quota</td>
<td>abolition of quota</td>
<td>abolition of quota</td>
<td>abolition of quota</td>
</tr>
<tr>
<td>Cheese</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Butter and cream</td>
<td>in-quota t.</td>
<td>abolition of quota</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
<tr>
<td>Skimmed milk powder</td>
<td>in-quota t.</td>
<td>abolition of quota</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
<td>in-quota t.</td>
</tr>
</tbody>
</table>
Tariff reductions
Import shares & prices

• Import shares in total demand, especially in the EU, are low and remain rather stable in all scenarios (changes U.S.: +0.5% to +3%, EU more divers especially for dairy products)

• Price developments very moderate in most scenarios (less than -2%)

• Conclusion on tariff reduction scenarios:
  – Only very limited new import options by different tariff formulas
  – Markets with low MFN tariffs or binding in-quota tariffs not much affected
  – Markets with high MFN tariffs show stronger reaction; but import shares remain small
Liberalization of TRQ regime
Increase in size

- Mainly targeted markets: U.S. dairy markets; EU meat and dairy markets
- Binding policy instruments remain the same
- No quota expansion in sugar (and EU rice) market in both countries, as they show already high import shares
- **EU:** In some sensitive markets (poultry, butter) import increases occur, but in similar range to tariff scenarios, New imports partially replace trade under preferential agreements
- **U.S.:** Similarly, only slight import increases can be observed (e.g. skimmed milk powder)
- Only very limited price reactions
Liberalization of TRQ regime

Additional in-quota tariff reduction

• In-quota tariff reduction relevant in:
  • U.S.: Dairy markets
  • EU: Cereals, maize, all meat and dairy products

• In-quota tariffs remain binding policy instrument, as demand is not sufficiently elastic to make quotas binding

• U.S.: Stronger increases in butter/cream and skimmed milk powder. But almost no effects on prices

• EU: Stronger increases for wheat, barley, pork, poultry, butter/cream, skimmed milk powder. Slight price depression (-0.5% to -2%)

• Conclusion on TRQ liberalization:
  – General TRQ expansion not very effective
  – Additional in-quota reduction improve market penetration
Beneficiaries of import developments

- **U.S.:** EU (wheat),
  Australia/New Zealand (beef),
  CAIRNS countries (rice, beef),
  and the “other” aggregate, e.g. Ukraine, Russia (wheat), can benefit.

- **EU:** U.S. (wheat, rice, pork, beef meat),
  Australia/New Zealand (butter/cream),
  CAIRNS group (rice, poultry),
  Mediterranean countries (durum wheat, poultry),
  and “others” (wheat, rice, sugar) can benefit.
Conclusions

• With respect to the analyzed formulas:
  • Uruguay < Panoply < Harbinson < Swiss formulas
  • Harbinson approach can serve as a compromise since it addresses tariff levels and tariff dispersion while leaving flexibility

• Overall market impact far from being “substantial”, but exceptions in certain “sensitive” commodities

• In TRQ regimes, strong MFN cuts achieve similar results as TRQ expansion + lower in-quota tariffs

• Market access probably will improve when green/blue box or de minimis definitions are altered
Support for this work from the CAPRI modeling team of Bonn University (Germany) and the CAPRI research network is gratefully acknowledged.

The modeling system is financially supported by research framework programs of the European Commission.
Liberalization options Tariffs

- Reduction according to different formulas
- Market effect depends on:
  - Tariff cut
  - Shape of demand and supply curves
  - Substitution elasticity imports/domestic
# Liberalization options TRQs

## Change in Instrument

<table>
<thead>
<tr>
<th>Change in instrument</th>
<th>Binding policy instrument in initial situation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MFN tariff</td>
</tr>
<tr>
<td>MFN</td>
<td>✔</td>
</tr>
<tr>
<td>Quota expansion</td>
<td>✔ *</td>
</tr>
<tr>
<td>In-quota tariff</td>
<td>_ *</td>
</tr>
</tbody>
</table>

As in tariff case: Import reaction depends on shape of supply/demand curve, substitution elasticities
CAPRI Model: Overview

Regional Prices $Pr$

Supply $Sr = f(Pr)$

Domestic Sales

Imports

Demand $Dr = f(Pr)$

\[ x_{i,r} = \alpha_{i,r} \left[ \sum_{i=1}^{\rho} \delta_{i,r} M_{i,r} \right]^{1/\rho} \]

Regional Prices $Pr$

Supply $Sr = f(Pr)$

Domestic Sales

Imports

Demand $Dr = f(Pr)$

\[ x_{i,r} = \alpha_{i,r} \left[ \sum_{i=1}^{\rho} \delta_{i,r} M_{i,r} \right]^{1/\rho} \]
## Welfare developments

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>587665.04</td>
<td>587717.99</td>
<td>587759.16</td>
<td>587776.58</td>
<td>588360.22</td>
<td></td>
</tr>
<tr>
<td>Harbinson</td>
<td>587665.04</td>
<td>587743.12</td>
<td>587718.37</td>
<td>587738.46</td>
<td>587675.52</td>
<td></td>
</tr>
<tr>
<td>Swiss</td>
<td>587665.04</td>
<td>587746.22</td>
<td>587743.67</td>
<td>587765.38</td>
<td>588218.21</td>
<td></td>
</tr>
<tr>
<td><strong>European Union</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>6508876.1</td>
<td>6509268.23</td>
<td>6509271.82</td>
<td>6509252.17</td>
<td>6509585.32</td>
<td></td>
</tr>
<tr>
<td>Harbinson</td>
<td>6508876.1</td>
<td>6510022.02</td>
<td>6510023.26</td>
<td>6510009.54</td>
<td>6510085.59</td>
<td></td>
</tr>
<tr>
<td>Swiss</td>
<td>6508876.1</td>
<td>6511059.25</td>
<td>6511059.04</td>
<td>6511048.5</td>
<td>6511691.55</td>
<td></td>
</tr>
</tbody>
</table>

*Difference to: Reference [2009]*