

How to use CGE models and how to analyze their results: Illustrations from a case study

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Presented by:

Yves Surry: Professor at the Swedish University of
Agricultural Sciences, Uppsala, Sweden

Case study: Simulation of the 1990's Reform of the Common Agricultural Policy (CAP) of the EU

1) The Common Agricultural Policy at the end of the 1980s and early 1990s

- System of guaranteed price for EU farmers for many agricultural commodities
- System of protectionist barriers (import levies) coupled with export subsidies

2) Economy-wide impacts of the CAP:

- If stable and steady income for farmers were provided, huge negative impacts due to a misallocation of resources domestically.
- Huge production surpluses in the EU for many agricultural products resulting in overuse of inputs, thus having detrimental environmental effects.
- detrimental external effects on international agricultural markets and developing countries
- unequal distribution of support among EU farmers.

Simulation of the CAP reform with the GTAP model

1) Removal of the distorting CAP measures for agriculture:

- Removal of output subsidies
- Reduction of import barriers
- Reduction of export subsidies

2) What to expect of these measures

- Within agriculture in the EU: Reduction in agricultural supply, lower use of intermediate inputs, Higher market prices, lower exports and higher consumer demand
- With other sectors in the EU: Reallocation of primary factors (such as capital and labor), Impact on the returns to primary factors, impact on trade and household demand
- Impact on the Rest of world. Higher world

Implementation of the CAP reform

- 1) **Implementation of the “extension” version of the GTAP model** RUNGTOP
- 2) **Structure of the GTAP model:**
 - Three sectors: Food, Manufacturing and Services
 - Three regions: EU, USA and Rest of world (ROW)
 - Three primary factors: Land, Labour and Capital
 - Economic agents: Households, Firms and Government
- 3) **CAP Measures**
 - Reduction in output subsidies : -6.77%
 - Reduction in import barriers : USA: -28.95% ROW: -29.36%
 - Reduction in export subsidies: ROW: -23.21%

Simulation results: EU

- **Impact on output supply:**
- -Agriculture: -15.3%, Manufacturing: 3.15%, Services:0.7%
- **Impact on Market output prices**
- - Food: 5.93%, Manufacturing: -1.75% Services: -1.87%
- **Impact on export (FOB) prices**
- -Food: USA: 4.91%, EU: 5.93%, ROW: 37.95%
- - Manufacturing: -1.75%, Services: -1.87%
- **Impact on Producer prices:**
- - Food: -1.2% Manufacturing: -1.75%, Services:-1.87%
- **Impact on Prices of primary factors:**
- - Land: -21.6% Labour: -2.1% Capital: -2.1%
- **Impact on primary factor use**
- Labour: Food: -16.02%, Manufacturing: 3.1%, Services:0.7%
- **Impact on price of imports**
- Food: USA:-26.40%, EU:5.93, ROW: -28.19
- **Impact on Final demand**
- Households: Food: -6% Manufacturing: +1%, Services: 0.5%
- **Imports:** Food: 110%, Manufacturing: -4.4%, Services: -4.1%
- **Exports:** Food: -51.4%, Manufacturing:10.5%, Services: 4.8%

Simulation results: US

- **Impact on output supply:**
- -Agriculture: 3.25%, Manufacturing: -0.54%, Services: -0.013%
- **Impact on Market output prices**
- - Food: 0.92%, Manufacturing: 0.68% Services: 0.72%
- **Impact on export (FOB) prices (do not change according to destination)**
- - Food: 0.92%, Manufacturing: 0.68% Services: 0.72%
- **Impact on Producer prices:**
- - Food: 0.92% Manufacturing: 0.68%, Services:0.72%
- **Impact on Prices of primary factors:**
- - Land: 5.29% Labour: 0.70% Capital: 0.78%
- **Impact on primary factor use**
- Labour: Food: 3.57%, Manufacturing: -0.51%, Services: 0.02%
- **Impact on Final demand**
- Households: Food: -0.04 Manufacturing: 0.12%, Services: -0.01%
- **Imports:** Food: -1.6%, Manufacturing: 0.8%, Services: 0.8%
- **Exports:** Food: 29.43 %, Manufacturing: -2.60%, Services: -1.67%

Simulation results: welfare effects

- Several indicators are at our disposals in GTAP
- GDP in value and volume index, consumer utility, Equivalent variation (EV)
- GDP in value: USA: 0.73, EU: 1.05, ROW:1.10
- GDP in volume: USA: -0.01 EU: -0.36 ROW:+0.03
- Level of utility: USA:0.03, EU: 0.21 ROW: 0.14
- EV USA:1540.23, EU:12452.80, ROW:12613.16

The background is a solid blue color with a subtle gradient. A thin, light blue curved line starts from the top left and arcs across the upper portion of the frame. On the right side, there is a large, light blue triangular shape that points towards the center, partially overlapping the curved line.

THANK YOU