

Report to the GTAP Advisory Board 2008

The Agricultural Economic Research Institute (LEI) has been a member of the GTAP consortium since November 1996. We use GTAP for a variety of research activities related to international trade in agri-food products. The following presents a summary of our activities over 2007/08

Consortium related

Torbjörn Jansson attended the 2007 GTAP short course.
Le Chen will attend the 2008 GTAP short course.

People

We currently have eight researchers actively involved in GTAP: Martin Banse, Lindsay Chant, John Helming, Torbjörn Jansson, Marijke Kuiper, Hans van Meijl, Andrzej Tabeau and Geert Woltjer.

Research involving GTAP in 2007/08

LEI's activities with GTAP focused on four key areas:

Model linking and development

- Linking CAPRI and GTAP: also as part of SEAMLESS we are working on linking CAPRI and GTAP to exploit the comparative advantages of both models. A paper will be presented at the 2008 conference in an organized session on model linking.
- Changes in China's agriculture: a project has started to analyze the impact of changes in China's agriculture on the world economy and the EU in particular. In this project GTAP will be linked to a detailed model of China's agriculture (CHINAGRO developed by SOW and CCAP) and to a model of EU's agriculture (FEA). This work is part of CATSEI, an EU FP6 project.
- GE-PE linkage: Project "agriculture in the overall economy" for DG Agri. Linking LEITAP model with the partial agricultural equilibrium model ESIM. The results of this project and the model linking will be presented in a paper on the 2008 GTAP conference.
- AG2020 Foresight Analysis for World Agricultural Markets (2020) and Europe: This project is in its 2nd year. It will provide a long-term baseline projection for the EU agricultural sector, including the current WTO regulations and the 2003 Reform of the Common Agricultural Policy with an assessment of the impacts of different trade and market policy scenarios on European agriculture, including various degrees of international trade liberalisation. To perform the analysis a modeling framework has been constructed, existing of four economic models (ESIM, CAPRI, IMPACT, LEITAP) and a more ecological-environmental based model framework (IMAGE).
- Model cleaning and integration. Cleaned up LEITAP, and merged it with GTAP-E, GTAP-AGR and GTAP-dyn into one model. Only some minor details about elasticities from GTAP-AGR have been skipped. The nesting structure of GTAP-E has been further simplified.

Biofuels

- Biofuels: In the EUruralis project the production structure is adjusted to take into account biofuels. The GTAP-E nesting structure is integrated in the LEITAP model and extended with a biofuel component. One paper on this subject will be presented during the 2008

conference which focuses on global biofuel policies and also reflects on the modeling of 2nd generation biofuel crops.

- A paper on the EU Biofuels Directive is accepted in the European Review of Agricultural Economics

Trade policy analysis

- *EU-India regional trade agreement:*
For the Dutch Ministry of Agriculture, Nature and Food Quality we are analyzing the impact of an EU-India bilateral trade agreement in addition to a Doha agreement. We use GTAP-AGR and the Version 7 pre-release 3 data (the GTAP-AGR parameters files for running FLEXagg have been adjusted for using it with Version 7). GTAP analyses are complemented by analyses of the institutional context in which a RTA would be implemented in India.

Agro-ecological zones in GTAP: AEZ data of the land use project are included in a modified version of GTAP-AGR to capture differences in production potential, especially water and temperature limitations. First results of including AEZs when assessing the impact of trade liberalization on developing countries has been presented at the 2007 conference. Work is still ongoing as part of SEAMLESS a large-scale EU FP6 'integrated project'.

Model development

- The LEITAP model has been cleaned up and integrated with GTAP-E, GTAP-AGR and GTAP-DYN.
- The theoretical underpinning of the land supply curves in LEITAP is developed further, based on Ricardian rent theory. A paper about this will be presented at the conference.
- We plan to implement the substitution between biofuels and crude oil in a more dynamic way and to dynamize the land market.
- We plan to rethink the dynamics in GTAP-DYN, for example by making investment sector-specific and modeling a more explicit equity market.

Data and model management software

- *Tariff-tool:* LEI has developed a tool to generate tariffs at GTAP level (or any other aggregation of the 6 digit codes) from the MacMap dataset. Although the first version of the user interface is ready, completion of this project is hindered by a bug in the SQL software which Microsoft so far has not been able to solve.
- *Software tools:*
 - A dynamic steering system for dynamic simulations has been developed, that is very flexible in its use, and makes comparisons between different scenario's easier. The time variable is automatically shocked according to the periods given, and CDE parameters consistent with PPP-corrected GDP driven income elasticities are automatically calibrated at the start of each simulation period, where the average PPP-corrected GDP is used as the base of the calculation for the income elasticities. Calculated shocks (shockseo.exe) are written to a HAR-file, preventing mistakes, and have been made more flexible.
 - A flexible data analysis tool has been developed, that is able to aggregate countries and sectors with one click, also for prices and indices.

Other activities

- *Land markets:* LEI together with MNP performs simulations for the OECD Environmental Outlook. The modeling of land supply and demand and the linking of the LEITAP model with the biophysical IMAGE model is crucial in this respect. LEI focuses on the economic implications of the scenarios and MNP on the environmental.

- *Greenhouse emission and agricultural trade liberalization*: A project for the Dutch Ministry of Agriculture using GTAP and the land use model IMAGE to calculate changes in agricultural production after abolition of milk quota or tariff reforms in agriculture. Then the climate model of IMAGE calculates the consequences for Greenhouse emissions from agriculture.
- *Future of EU agriculture*: LEI is one of the partners in the SCENAR2020 project. In this project the future of EU agriculture and rural development is central. GTAP will be used in combination with two EU agricultural models (ESIM and CAPRI). The final report of this study will be published as a book (hard cover) by the EC commission in 2007. A follow up of this project might run in 2008.
http://ec.europa.eu/agriculture/publi/reports/scenar2020/index_en.htm
- *EUruralis 3.0* is a policy discussion instrument with regard to the future of EU agricultural markets and rural areas. Next to four, SRES type scenarios, policy makers can play with policies to obtain an idea of the impact of these policies on people, planet and profit indicators within the four scenarios. The policies are domestic support, border support and the EU biofuel directive. The results will be presented in a paper during the conference. In 2008 EUruralis focuses on first and second generation biofuels and regionalization.
- *Land use and sustainable development policies in developing countries*: in February an EU FP6 project started where modeling tools developed in SEAMLESS and SENSOR will be adapted for use in developing countries. GTAP will be used to assess changes in global markets relevant for the different case study countries.

GTAP-related publications

- Abler, D., Banse, M., Kuiper, M, Roza, P (2008). EU Agricultural Trade Relations with Asian Countries. Study commissioned by DG JRC/IPTS. Seville, Spain.
- Banse, M., H. van Meijl, A. Tabeau and G. Woltjer. Will EU Biofuel Policies Affect Global Agricultural Markets. *European Review of Agricultural Economics*. (forthcoming).
- Banse, M. and H. Grethe (2008). Top Down, and a little Bottom Up: Modelling EU Agricultural Policy Liberalization with LEITAP and ESIM. Paper at the organized session on 'Model Linking', GTAP Conference 2008, Helsinki, Finland
- Banse, M., H. van Meijl, and G. Woltjer (2008). The Impact of First Generation Biofuels on Global Agricultural Production, Trade and Land Use. Paper accepted for the XIIth Congress of the European Association of Agricultural Economists Congress. Ghent, Belgium August 26 – 29, 2008
- Banse, M., H. van Meijl, A. Tabeau and G. Woltjer (2008). The Impact of Biofuel Policies on Global Agricultural Production, Trade and Land Use. Background paper for the FAO Expert 'Meeting on Bioenergy Policy, Markets and Trade and Food Security' FAO, Rome February 18-20, 2008
- Banse, M. and H. Grethe (2008). Modelling EU Agricultural Policy Liberalization: A Combination of a Partial Equilibrium and a General Equilibrium Model. Paper presented at the IATRC January 2008 Annual Meeting Washington, DC January 7-9, 2008.
- Banse M. (2008). Interaction Between Partial And General Equilibrium Models. Plenary paper prepared for presentation at the 107th EAAE Seminar "Modeling of Agricultural and Rural Development Policies". Seville, Spain, January 29th -February 1st, 2008
- Banse, M., H. van Meijl, and G. Woltjer (2008). Modeling 2nd Generation Bio-energy with GTAP-IMAGE/TIMER. Modelling results for the Matisse Project. The Hague.
- Chant, L., B. Baulch and S. Robinson (2008). What Happens between the Waves? Estimating Inter-Wave Dynamics from Limited Survey Data with Application to Poverty Transitions in South Africa and Vietnam. Paper prepared for the 11th Annual GTAP Conference, Helsinki, Finland, June 12-14, 2008.
- Banse, M., H. van Meijl, and G. Woltjer (2008). The Impact of First and Second Generation Biofuels on Global Agricultural Production, Trade and Land Use. Paper prepared for the 11th Annual GTAP Conference, Helsinki, Finland, June 12-14, 2008.
- Faaij, A., Banse, M., Dornburg, V. (2008). Analysis of the Economic Impact of Large-Scale Deployment of Biomass Resources for Energy and Materials in the Netherlands. Project co-ordinated by Copernicus Institute for Sustainable Development Department of Science, Technology & Society – Utrecht University.
- Jansson T., M. Kuiper, M. Banse, T. Heckelei and M. Adenäuer (2008). Getting the best of both worlds? Linking CAPRI and GTAP for an economywide assessment of agriculture. Paper prepared for the 11th Annual GTAP Conference, Helsinki, Finland, June 12-14, 2008.
- Verburg, R., G. Woltjer, A. Tabeau, B. Eickhout and E. Stehfest (2008). Agricultural trade liberalisation on greenhouse gas emissions; A simulation study using the GTAP-IMAGE modelling framework, Den Haag, LEI, Rapport 3.08.02
- Woltjer, G. and A. Tabeau (2008). Biofuels and long-term land use dynamics. Paper at the organized session on 'Model Linking', GTAP Conference 2008, Helsinki, Finland.
- Woltjer, G. (forthcoming). The drivers of the Environmental Kuznets Curve in a policy assessment tool, in: F. Brouwer and M. van der Heide, Multifunctional Rural Land Management: Economics and Policies, Earthscan, forthcoming.