AGMEMOD

AGMEMOD is an econometric, dynamic, partial-equilibrium, multi-country, multi-market model that covers the main EU agri-food markets at national level. It is built as a set of commodity-specific model templates in country-specific models. This allows for combination of national markets into the EU block. The model includes: six types of cereals, three types of oilseeds and their processed products, oil and meal, sugar beet and sugar, protein crops and potatoes, live animals (cattle, pigs, sheep and goats) and meats (beef, pig meat, poultry, sheep and goat meat), raw milk and its processed products drinking milk, cream, fresh dairy products, butter, skimmed milk powder, whole milk powder and cheese. Vegetables and fruit commodities are currently being built in.

The variables simulated for the crop sectors include market prices, area harvested, yield, total production (as a product of yield and area), total domestic use as a sum of food, feed, processing uses and losses, total import, export and change in stocks. Apart from the markets for meat and dairy products, AGMEMOD considers markets for live animals and simulates such variables as livestock herds (i.e., number of dairy cows, beef cows, sows, ewes, slaughter pigs, etc.), animals crop and slaughter weight.

The agricultural sectors interact in the model on the demand and supply sides as substitutes in consumption and production. This interaction is captured by the model structure that allows for solving the AGMEMOD system for each of the projection years following the partial equilibrium approach of market clearing prices.

The endogenous variables of the model are computed with equalities and behavioural equations. For example, rapeseed oil production in AGMEMOD is computed as equality. It is a product of rapeseed use for processing and the crush coefficient. The use of rapeseed for processing is, in turn, a behavioural equation. Its parameters are econometrically estimated from the time series data. Some of the parameters of the behavioural equations in AGMEMOD rely on expert knowledge and literature.

AGMEMOD uses EUROSTAT, national statistics and expert data sources. These comprise AGMEMOD database which prior to the use for estimation of the model's equations is subject to the "balancing" process. This process implies generation of the missing observations in the series and examination for adhering to the balance principles (e.g., crop yields equal total production divided by area harvested, the sum of production, domestic use, stocks, import and export equals zero).

Thanks to the use of econometrically estimated equations, AGMEMOD does not require the classic parameter calibration process and the use of the external baseline to produce its projections. In the recent years, however, the model has been used for producing the JRC baseline at the EU

countries level. Therefore, AGMEMOD projections at the EU aggregate level have been scaled to the official baseline of the European Commission, i.e., EU Medium-Term Outlook 2019 generated by the Aglink-COSIMO model. The scaling procedure aims at bringing the values of the aggregated variables as close as possible between the two models. It follows a standardized step-wise process, which is based on adjustment of the AGMEMOD parameters (the sources for this section are Chantreuil et al. 2012 and Salamon et al. 2017).

The AGMEMOD model version used for producing this report is of April 2020. It includes the new isoglucose sector, updated model database and a baseline that has been scaled to the MTO2019 and revised by the market experts at the Brussels workshop in February 2020.

References:

Blanco, M., P. Martinez, P. Witzke, M. van Leeuwen, R. Jongeneel, P. Salamon, S. Frank, P. Havlík, J. Barreiro-Hurlé, M. L. Rau, H. van Meijl, A. Tabeau, J. P. Lesschen (2019). Deliverable 1.5: Documentation of the SUPREMA model tools. Project Support for Policy Relevant Modelling of Agriculture (SUPREMA). Online: https://www.suprema-project.eu.

Chantreuil, F., K. F. Hanrahan, M. van Leeuwen (2012). The Future of EU Agricultural Markets by AGMEMOD. Springer Science+Business Media B.V. Springer Netherlands.

Salamon, P., M. Banse, J. Barreiro-Hurlé, O. Chaloupka, T. Donnellan, E. Erjavec, T. Fellmann, K. Hanrahan, M. Hass, R. Jongeneel, V. Laquai, M. van Leeuwen, A. Molnár, M. Pechrová, G. Salputra, W. Baltussen, J. Efken, S. Hélaine, J. Jungehülsing, O. von Ledebur, I. Rac, F. Santini (2017). Unveiling diversity in agricultural markets projections: from EU to Member States. A medium-term outlook with the AGMEMOD model. JRC Technical Report, 29025 EUR, Publications Office of the European Union, Luxembourg, ISBN 978-92-79-77335-8, doi:10.2760/363389.