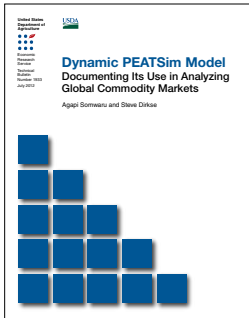


ERS *Report Summary*

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This is a summary
of an ERS report.

Find the full report at
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Dynamic PEATSim Model: Documenting Its Use in Analyzing Global Commodity Markets

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Background

PEATSim (Partial Equilibrium Agricultural Trade Simulation) is a dynamic, partial equilibrium, mathematical-based model that enables users to reach analytical solutions to problems, given a set of parameters, data, and initial conditions. This theoretical tool developed by ERS incorporates a wide range of domestic and border policies that enables it to estimate the market and trade effects of policy changes on agricultural markets. PEATSim captures the economic behavior of agricultural producers, consumers, and markets in a global framework. It includes variables for production of crops and livestock activities, consumption, exports, imports, stocks, world prices, and domestic producer and consumer prices.

In 2010, ERS updated and modified the model extensively. The original model, static in its specification, was developed through a collaborative effort between ERS and Pennsylvania State University. This report supports requirements for documentation and information quality as specified by the U.S. Office of Management and Budget.

What Is the Contribution?

PEATSim's innovative and flexible design enables users to analyze a variety of domestic and trade policy issues. The model is written in GAMS (General Algebraic Modeling System) using PATH, a Mixed Complementarity Problem (MCP) solver. MCP enables PEATSim to account for a discontinuous policy regime, such as a tariff rate quota or a trade ban. This report makes the model transparent and available to a larger audience.

In 2010, PEATSim was modified to include new features and enhanced capabilities:

- PEATSim was augmented to incorporate different sets of production activities; links between upstream and downstream sectors; and interactions of producers, processors, and consumers at a global level.
- Unlike previous versions, the updated model's dynamic specification and enhanced flexibility enable researchers to analyze short-term and long-term effects of domestic and border policies.
- The model accounts for simultaneous interactions between livestock and crop activities and has the ability to capture and solve different sets of production activities worldwide.

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- PEATSim now includes 27 countries/regions, up from 12 in the previous version. The updated version also allows flexible aggregation of the countries in the model to accommodate various modeling needs.
- The updated model includes 31 agricultural commodities in addition to 3 biofuel-related commodities (ethanol, biodiesel, and distillers' dried grains with solubles).
- The data in PEATSim calibrate to *USDA Agricultural Projections to 2019* and *OECD-FAO Agricultural Outlook 2010-2019*, while an innovative econometric method (i.e., cross entropy) equilibrates supply and use.
- PEATSim uses transparent, clearly listed programming codes, data inputs, equations, data rules, policies, and parameters.

How Was the Study Conducted?

This report documents the latest version of PEATSim. To illustrate the model's capabilities, we evaluate the effects on the biofuels sector of alternative macroeconomic conditions and crude oil prices, taking into account biofuel production on a global scale from different feedstocks across countries.